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2022 SUBMISSION

EB-2022-0002

ONTARIO ENERGY BOARD

IN THE MATTER OF subsection 25 (1) of the *Electricity Act, 1998*;

AND IN THE MATTER OF a submission by the Independent Electricity System Operator to the Ontario Energy Board for the review of its proposed expenditure and revenue requirements for the fiscal year 2022 and the fees it proposes to charge during the fiscal year 2022.

2022 SUBMISSION FOR REVIEW

1. The Independent Electricity System Operator (IESO) submitted its 2022-2024 Business Plan to the Minister of Energy (Minister) for approval pursuant to subsection 24 (1) of the *Electricity Act, 1998* as amended (Act) and the IESO received a letter from the Minister approving the 2022-2024 Business Plan and budget for 2022.
2. The IESO hereby submits to the Ontario Energy Board (OEB) its proposed 2022 expenditure and revenue requirements and the fees it proposes to charge in 2022 pursuant to subsection 25 (1) of the Act (2022 Revenue Requirement Submission).
3. The IESO proposes a 2022 revenue requirement of \$201.5 million.
4. The current IESO interim usage fees of \$1.271/MWh for domestic customers and \$1.0943/MWh for export customers were made effective January 1, 2022 by a December 2, 2021 OEB decision on interim fees (EB-2021-0318), and remain interim until final fees are approved by the OEB.
5. Pursuant to subsection 25 (1) of the Act, the IESO is seeking the following approvals from the OEB:
 - a. Approval of the proposed 2022 revenue requirement of \$201.5 million.

- b. Approval of the proposed IESO usage fees of \$1.3329/MWh for domestic customers (including embedded generation) and \$1.0126/MWh for export customers to be paid effective January 1, 2022.
 - c. Approval of the proposed 2022 capital expenditure envelope of \$71.2 million for capital projects.
 - d. Approval to charge (or rebate) market participants the difference between the 2022 IESO usage fees approved by the OEB and the interim usage fees they paid, if any, based on their proportionate quantity of energy withdrawn until the end of the month in which OEB approval is received for the 2022 usage fees. Any such charges (or rebates) will be provided in the next billing cycle following the month in which OEB approval is received.
 - e. Approval to rely on and use the information provided to the IESO by Local Distribution Companies (LDCs) on the amount of embedded generation in their service territory under O. Reg. 429/04 in calculating the total usage fee to be billed to each LDC each billing period.
 - f. Approval to charge proponents a Reliable Integration fee at an hourly rate of \$145/hour for activities the IESO undertakes to reliably integrate new or modified facilities to the IESO-Controlled Grid.
 - g. All necessary interim orders, orders and directions, pursuant to the *Ontario Energy Board Act, 1998* and the OEB's Rules of Practice and Procedure, as may be necessary in relation to this 2022 Revenue Requirement Submission.
6. The IESO proposes that the OEB review of the 2022 Revenue Requirement Submission proceed by way of a written hearing.
7. The IESO may amend its pre-filed evidence from time to time, prior to and during the course of the OEB proceeding. Furthermore, the IESO may seek to have additional meetings with OEB Staff and intervenors in order to identify and address any further

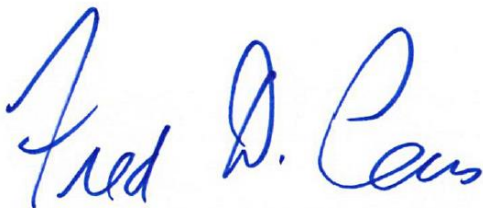
issues arising from this 2022 Revenue Requirement Submission, with a view to an early settlement and disposition of this proceeding.

8. The IESO requests a copy of all documents filed with the OEB by each party to this proceeding, be served on the IESO and the IESO's counsel in this proceeding as follows:

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DATED at Toronto, Ontario, this 4th day of March 2022

INDEPENDENT ELECTRICITY SYSTEM OPERATOR



By its counsel in this proceeding

Fred D. Cass

EXECUTIVE SUMMARY

Introduction

The Independent Electricity System Operator (IESO) is a not-for-profit, non-taxable corporation established pursuant to Part II of the *Electricity Act, 1998* (Act). As set out in the Act, the IESO operates pursuant to a licence (EI-2013-0066) granted by the Ontario Energy Board (OEB).

The IESO's mandate is contained in the Act and associated Ontario regulations.

The IESO ensures the reliability of the province's power system on behalf of all Ontarians, leveraging its expertise and purposeful engagement to advance energy policy that cost effectively achieves this goal. As part of its mandate, the IESO operates Ontario's electricity grid in real-time, governs electricity markets, prepares for the future to ensure electricity will be available when and where it is needed, and helps inform the decisions that will be critical to shaping the future of the sector.

The IESO's 2022-2024 Business Plan (Business Plan) was submitted to the Minister of Energy (Minister) for approval on December 9, 2021 (see Exhibit B-1-1 – IESO's Letter to the Minister Requesting Approval of 2022-2024 Business Plan, and Exhibit B-1-2 – 2022-2024 Business Plan). The Minister approved the Business Plan and the IESO's proposed expenditures for 2022 on February 3, 2022 (see Exhibit B-1-3 – Minister's Letter Approving the IESO's 2022-2024 Business Plan).

Revenue Requirement and Fees

The IESO's 2022-2024 Business Plan sets out the IESO's revenue requirement and associated operations, maintenance and administration and capital spending needed to maintain its critical responsibilities in 2022. Since 2017, the IESO has maintained its revenue requirement at a relatively flat level, absorbing \$14 million of inflation and collective agreement impacts by deferring investments in processes, tools and workspaces, and by finding efficiencies and prioritizing certain work over others. The IESO's efforts allowed budgets to remain relatively flat while continuing to deliver core responsibilities and priority initiatives. This approach also came with impacts, including slower delivery of some initiatives as well as creating a catalogue of work that needed to be completed in future years.

1 The IESO now needs to move forward on key initiatives that are critical to maintaining its core
2 operations, to continue Ontario's electricity transformation, and to address various government
3 initiatives including a pathway to decarbonization in the electricity sector (referred to as
4 pathway to zero emissions in the IESO's 2022-2024 Business Plan).

5 The IESO proposes a 2022 revenue requirement of \$201.5 million and usage fees of
6 \$1.3329/MWh for domestic customers (including embedded generation) and \$1.0126/MWh for
7 export customers effective January 1, 2022. The 2022 proposed usage fees for domestic
8 customers represents a 4.8% increase relative to 2021 OEB approved usage fees, and the 2022
9 proposed usage fees for export customers represents a 7.5% decrease relative to 2021 OEB
10 approved usage fees (see Exhibit C-1-1 – Revenue Requirement and Usage Fee Methodology,
11 and Exhibit C-2-1 – 2022 Revenue Requirement and Usage Fees).

12 The IESO is also requesting approval to charge proponents a Reliable Integration fee for the
13 activities the IESO undertakes to reliably integrate new or modified facilities to the IESO-
14 Controlled Grid (ICG) (see Exhibit C-3-1 – Other Funding and Fees).

15 **Operations, Maintenance and Administration (OM&A) Expenditures**

16 The IESO's operating expenses support business units that ensure the reliability of the
17 province's power system, through the operation of Ontario's electricity grid in real time,
18 governance of the electricity markets, preparedness for the future availability of electricity when
19 and where it is needed, and helping inform decisions that will be critical to shape the
20 transformation of Ontario's electricity sector.

21 The IESO's 2021 OM&A expenses were in-line with the approved budget (0.5% variance), as
22 the IESO was able to manage various unplanned expenses through savings from service
23 contract renegotiations, a favourable exchange rate, re-assessment of external support required
24 for the Market Renewal Program (MRP) and from the prolonged impact of the COVID-19
25 pandemic on in-person gatherings (see Exhibit D-1-1 – OM&A Overview).

26 The IESO continues to carefully review all expenditures and find efficiencies where possible.
27 Investments are needed in 2022 for initiatives in support of the future of the sector and the
28 people, tools and processes that underpin the reliable and cost-effective provision of electricity

1 in the province. The IESO will undertake a number of initiatives to ensure reliability needs are
2 met, more resources are enabled to provide electricity system services, resources that are
3 important to other government policies remain in service, and to develop a pathway to
4 decarbonization in the electricity sector. The IESO will also start preparing for the new functions
5 and services that MRP will introduce when it goes into service.

6 The 2022 budgeted OM&A expenses of \$186.5 million represent an increase of \$12.2 million
7 from the 2021 actual results primarily driven by \$1.9 million in support of MRP implementation
8 and \$7.2 million in support of initiatives critical to transforming Ontario's electricity sector and
9 various government initiatives including a pathway to decarbonization in the electricity sector
10 (see Exhibit D-1-1 – OM&A Overview, and Exhibit D-1-2 – OM&A Business Unit Detail).

11 **Staffing and Compensation**

12 The IESO has made efforts to remain cost-effective in delivering its critical responsibilities
13 including absorbing inflationary costs, mostly related to compensation and benefits, which are
14 the IESO's single largest expense as an organization of knowledge workers (see Exhibit D-1-3 –
15 Staffing and Compensation).

16 In the IESO's 2020-2021 Revenue Requirement Submission proceeding (EB-2020-0230), the
17 IESO committed to report on actions taken towards reaching the 50th percentile for total
18 compensation, as well as file an updated compensation study. When comparing the IESO roles
19 to the energy sector, the results of the review conducted show 2% progress towards the 50th
20 percentile since the IESO's last review in 2018 (see Exhibit D-1-3 Attachment 3 – Non-Executive
21 Total Remuneration Review).

22 The IESO continues to implement initiatives and safeguards to ensure compensation, benefits
23 and pension plans are cost effective while continuing to ensure that it remains competitive in
24 the recruitment and retention of its employees to carry out the IESO's unique mandate (see
25 Exhibit D-1-3 – Staffing and Compensation).

Capital Expenditures

The IESO's business planning process establishes an appropriate capital envelope for capital projects. This practice is consistent with prior years (see Exhibit E-1-2 – Capital Expenditure Planning Process Overview). The IESO received OEB approval for a 2021 capital budget of \$68.6 million, which consisted of \$36.0 million for MRP and \$32.6 million for other capital projects. Actual 2021 total capital expenditures were \$18.3 million lower than budget, largely attributable to \$12 million lower MRP expenses and delays in the initiation of a number of larger projects and in vendor progress towards milestones (see Exhibit E-2-1 – Capital Budget Overview and Progress on Capital Projects).

The IESO proposes a 2022 capital budget of \$71.2 million, which consists of \$41.2 million to support the implementation phase of MRP and \$30.0 million for other capital projects. In addition to delivering a number of core business projects which will allow the IESO to maintain critical services, improve efficiency and meet regulatory compliance obligations, the IESO is continuing to deliver a significant number of strategic initiatives with the aim of: driving business transformation (with projects such as the Replacement of Settlement Systems, and the Data Excellence Program); ensuring system reliability (with projects such as Resource Adequacy, and the Dynamic Limits in Real-Time Project) and enabling competition and advancing sector leadership (addressing Market Surveillance Panel recommendations) (see Exhibit E-2-1 – Capital Budget Overview and Progress on Capital Projects).

Market Renewal Program

The MRP will implement much needed reforms to the Ontario electricity market. The MRP will address known issues with the existing market design and deliver significant ratepayer value by meeting system needs more cost-effectively. MRP is about improving the way electricity is priced and scheduled in order to meet Ontario's electricity needs reliably, transparently, efficiently and at lowest cost.

MRP OM&A 2021 expenses were \$0.6 million lower than the approved budget due to a reduced need for external legal support for market rule and manual drafting. Capital expenses were \$12.0 million lower than the approved budget due to delays in gathering business and vendor requirements, reduced contractor costs, lower interest expenses, and unused contingency.

1 The MRP has progressed into the implementation phase. As part of the implementation phase,
2 the IESO is codifying the Detailed Designs into rules, manuals, processes and tools. The
3 implementation phase also includes critical steps like building and finalizing the business
4 requirements and internal manuals for the IESO, and developing and issuing vendor
5 requirements for building IT systems. Recognizing the importance of change management and
6 adoption through to the goals of MRP, the IESO is also working on market participant readiness
7 activities to support market participants through the Market Renewal transition.

8 The IESO expects that adjustments to timelines will be needed as the project moves closer to
9 in-service. Adjustments will be informed by vendors, stakeholder input, and consideration of
10 other dependent initiatives (see Exhibit G-2-1 – Market Renewal Program Cost Report).

11 **Forecast Variance and Deferral Account**

12 In the OEB's Decision (EB-2019-0002) on the IESO's 2019 Revenue Requirement Submission,
13 the IESO received approval to retain an operating reserve of \$10 million. The OEB concluded
14 that a period of stability was appropriate and ordered that the level of the operating reserve
15 would not be reviewed again for five years unless there is a material change to the operations
16 of the IESO.

17 The balance of the operating reserve is recorded in the Forecast Variance Deferral Account
18 (FVDA). The 2021 opening balance of the FVDA was \$1.3 million. The IESO's year-end financial
19 results recorded a surplus of \$7.4 million, and the closing balance of the FVDA is \$8.7 million.
20 In order to minimize the impact to ratepayers, the 2022 budget does not include any further
21 provision for recovering the operating reserve to the approved \$10 million level (see Exhibit F-
22 1-1 – Forecast Variance Deferral Account).

23 **Multi-Year Application**

24 The IESO continues to work towards the implementation of a multi-year Business Plan and
25 Revenue Requirement Submission approval process in consultation with the Ministry of Energy
26 and the OEB and will make efforts to complete this process in 2022 (see Exhibit B-1-3 –
27 Minister's Letter Approving the IESO's 2022-2024 Business Plan). A multi-year Business Plan
28 approval, and associated revenue requirement submission, was supported by intervenors in the

- 1 settlement agreement included in the OEB's Decision on the IESO's 2020-2021 Revenue
- 2 Requirement Submission (EB-2020-0230).

IESO STAKEHOLDER ENGAGEMENT

Stakeholder Engagement

Stakeholder engagement is facilitated in accordance with the IESO's engagement principles¹ and the IESO's Stakeholder Engagement Framework (Framework) which is available publicly on the IESO website.² Stakeholder groups are encouraged to be part of the stakeholder engagement process, including but not limited to transmitters, distributors, generators, consumers, energy related businesses and emerging technologies. Representatives from First Nation and Métis communities, as well as regional and local municipalities are also encouraged to participate.

The Framework is aimed at enhancing the IESO's engagement process by:

- Providing greater certainty on the timing of engagement meetings allowing for enhanced preparedness and participation from stakeholders
- Supporting an understanding of linkages between initiatives
- Addressing concerns about stakeholder fatigue with fewer overall engagement meetings
- Supporting a foundation for more comprehensive and integrated updates for the Stakeholder Advisory Committee (SAC) and the IESO Board of Directors

The Framework is built upon a meeting schedule of monthly designated engagement days with time to review materials in advance (typically two weeks), along with feedback windows (typically three weeks). During the engagement days, topics are grouped together where possible to clarify linkages between initiatives and support information sharing.

The Framework was enhanced with the introduction of four new engagement categories based on how stakeholders interact with the IESO in fall 2021. The four categories are forecasting and planning, resource acquisition, operations, and sector evolution. Each of these categories have

¹ IESO Engagement Principles: <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Overview/Engagement-Principles>

² IESO Stakeholder Engagement Framework: <https://www.ieso.ca/Sector-Participants/Engagement-Initiatives/Overview/Stakeholder-Engagement-Framework>

a specific area of focus, and can be seen as being linked as a cycle to recognize how they all work together, as shown in Figure 1 below.

Figure 1 – Engagement Framework Categories



Monthly engagement updates are also used to share the current status and next steps on the IESO's active engagements. The updates include a section on new and upcoming engagements to inform stakeholders of new engagement initiatives as early as possible.

The 2021 IESO Stakeholder and Community engagement survey indicated that 79% of stakeholders report that their experience with IESO engagement has met or exceeded expectations.

Engagement Process

The IESO has established a standard process across all of its active engagements so that stakeholders are aware of what they can expect as part of the process and how and when their feedback will be considered. Steps included in this process are:

- 1 • Launching a new engagement stream with a dedicated engagement page on the IESO
- 2 website
- 3 • Posting a draft engagement plan and schedule for stakeholder feedback
- 4 • Posting meeting materials in advance of an engagement meeting (typically two weeks)
- 5 • Providing notification of the meeting in the IESO's weekly Bulletin
- 6 • Hosting the engagement meeting, and posting archives of online meetings
- 7 • Providing sufficient time (typically three weeks) for the submission of stakeholder
- 8 feedback
- 9 • Posting the submitted stakeholder feedback along with the IESO's response to the
- 10 feedback

11 This process is documented for the 28 active IESO engagements listed below (as of December
12 2021) on their dedicated engagement webpage. In 2021, the IESO held over 100 engagement
13 sessions and events involving close to 7,000 participants. Links are available to all of the IESO's
14 active engagements on the active engagements webpage.³

15 Forecasting and Planning:

- 16 • Formalizing the Integrated Bulk System Planning Process
- 17 • Gas Phase-Out Impact Assessment
- 18 • Regional Planning – Barrie/Innisfil
- 19 • Regional Planning – Chatham-Kent/Lambton/Sarnia
- 20 • Regional Planning – Niagara
- 21 • Regional Planning – North & East of Sudbury
- 22 • Regional Planning – Northwest
- 23 • Regional Planning – Ottawa Area Sub-Region
- 24 • Regional Planning – Parry Sound/Muskoka
- 25 • Regional Planning – Renfrew
- 26 • Regional Planning – Windsor-Essex
- 27 • Transmission Losses

³ IESO Active Engagements Webpage: <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements>

1 Resource Acquisition:

- 2 • Development of an IESO Competitive Transmission Procurement Process
- 3 • Distributed Energy Resources (DER) Market Vision and Design Project
- 4 • Distributed Energy Resources (DER) Potential Study
- 5 • Distributed Energy Resources (DER) Roadmap
- 6 • Enabling Resources Program
- 7 • Hybrid Integration Project
- 8 • Resource Adequacy

9 Operations:

- 10 • Adjustment to Intertie Flow Limits
- 11 • Cost Recovery for Integrating System Changes
- 12 • Improving Accessibility of the Operating Reserve
- 13 • Improving Awareness of System Operating Conditions
- 14 • Market Renewal Program (MRP) - Implementation
- 15 • Updates to IESO Monitoring Requirements: Phasor Data

16 Sector Evolution:

- 17 • Industrial Energy Efficiency Program
- 18 • Innovation and Sector Evolution White Papers
- 19 • IESO York Region Non-Wires Alternatives Demonstration Project

20 **Other Stakeholder Engagement Initiatives**

21 In addition to collecting feedback through the individual active engagements, feedback is also
22 sought through a variety of other mechanisms including the SAC, the IESO Regional Electricity
23 Networks, Summit-Lite Events and outreach at trade shows and conferences.

24 The SAC⁴ consists of representatives from distributors, generators, consumers, transmitters,
25 energy related businesses and services and Ontario communities. Three SAC meetings were

⁴ IESO Stakeholder Advisory Committee Webpage: <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Stakeholder-Advisory-Committee/Meetings-and-Materials>

1 held in 2021 to collect feedback on key initiatives and the IESO's plans and priorities, including
2 the IESO's Business Plan. At the August 2021 SAC meeting⁵ members were taken through an
3 update on the 2022-2024 Business Plan, which indicated that the IESO is focused on continued
4 progress towards the five core strategies identified in 2020, while also mitigating related
5 strategic risks. Key points of discussion included the longer-term perspective on the goal of
6 decarbonization and the IESO's role in achieving that goal. This engagement follows the IESO's
7 standard practice of having an annual discussion with SAC members, and the general public,
8 about the IESO Business Plan and other strategic initiatives.

9 The IESO held a full-day Regional Electricity Network forum in January 2021. The joint morning
10 session was attended by 655 participants and the five separate regional network meetings held
11 in the afternoon were attended by 388 participants. There are five networks across the province
12 – Greater Toronto Area, East Ontario, Northeast Ontario, Northwest Ontario and Southwest
13 Ontario. With over 3,000 members, the networks are an opportunity for community members to
14 hear first-hand about issues or innovations impacting Ontario's electricity sector and to provide
15 input into future electricity planning in their area. An interactive, online community engagement
16 platform – *IESOConnects*⁶ – was established in November 2020 to allow members to keep in
17 touch with the IESO and others in their region, learn about the electricity sector, discuss the
18 local electricity picture, and contribute to broader regional electricity plans. This is
19 complemented by the issuance of dedicated newsletters for each of the networks.

20 Two Summit-Lite events were also held in 2021 to bring together thought leaders and support
21 in-depth conversations with stakeholders on key sector topics. In June, the event focused on
22 innovation, ranging from the advancement of distributed energy resource markets in Ontario
23 and globally, as well as the ongoing role of innovation in providing solutions to meet system
24 needs. In November, the event focused on current trends, drivers and opportunities for various
25 consumer segments among the power sector. Held during the June and November engagement
26 days, these events attracted a total of 663 participants.

⁵ Meeting notes of the August 2021 SAC meeting: <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Stakeholder-Advisory-Committee/Meetings-and-Materials>

⁶ IESO Connects Webpage: <https://www.ieso.ca/en/Get-Involved/Regional-Planning/Electricity-Networks/IESO-Connects-Online-Community-for-Network-Members>

1 Trade shows and conferences are another outreach tool utilized by the IESO to connect with
2 key audiences, build awareness of the IESO and encourage membership in the regional
3 networks and regional planning activities. In 2021, the IESO participated in ten virtual trade
4 shows and conferences which allowed for personal interactions with over 1,000 people.

5 **Indigenous Relations**

6 The IESO routinely undertakes extensive work with Indigenous communities to promote
7 meaningful outcomes and introduced a Corporate Indigenous Policy⁷ to affirm this work and
8 commit the organization to further actions. The IESO Corporate Indigenous Policy also commits
9 the IESO to moving towards a culture and workforce shift by incorporating company-wide
10 cultural and awareness training, increasing opportunities for Indigenous youth and better
11 integrating Indigenous businesses in IESO procurement opportunities. The policy aligns with the
12 IESO's core strategy of advancing sector leadership and its commitment to an affordable and
13 reliable supply of electricity, by demonstrating IESO's leadership in community-led capacity
14 building in the Indigenous energy space.

15 Since the launch of the Corporate Indigenous Policy, the IESO has taken actions to champion
16 priorities outlined in the policy including sponsoring two Indigenous students through the IESO
17 Lighting the Way Award scholarship. IESO's Lighting the Way Award is delivered through
18 Indspire's Building Brighter Futures: Bursaries, Scholarships, and Awards program. The Lighting
19 the Way Award provides two awards per year to Indigenous students in Ontario studying in the
20 fields of engineering, public policy, environmental studies and energy.

21 The IESO hosted its fifth annual First Nations Energy Symposium focusing on empowering First
22 Nation energy leaders in November 2021. The symposium brought together over 100 attendees
23 from First Nation communities and organizations across the province to recognize Indigenous
24 energy successes and the opportunities that are available for communities to achieve their
25 electricity, economic, environmental and social goals.

⁷ IESO Corporate Indigenous Policy: <https://www.ieso.ca/en/Get-Involved/Indigenous-Relations/Corporate-Indigenous-Policy>

Stakeholder Feedback

Stakeholder and community engagement is integral to the IESO's decision-making process and the goal of the process is to provide individuals and organizations with the opportunity to provide input to proposed decisions or changes that affect them. As such, the IESO uses the perspectives brought forward in this process to inform its decision making.

In order to inform stakeholders as early as possible in the engagement process, the IESO provides a forward-looking schedule for upcoming engagements through the SAC engagement updates, and the monthly engagement updates⁸ posted as part of the monthly engagement days. Information is provided on the anticipated launch and timing for new and upcoming engagements so that early input from stakeholders can help plan for and prioritize participation in the IESO's engagements.

The IESO's standard engagement process is to post submitted stakeholder feedback along with the IESO's response to the feedback and how it will be used to inform decision-making. This is done throughout an engagement process, as well as at the conclusion of an engagement. This information is shared in the "IESO Response to Feedback" and the "IESO Final Engagement Summary Report" documents found on the individual engagement webpages. Templates for these documents were developed and posted on the IESO's Stakeholder Engagement Framework webpage⁹ as committed to by the IESO in the IESO's 2020-2021 Revenue Requirement Submission proceeding (EB-2020-0230).

The IESO completed 23 individual engagements in 2021.¹⁰ For each of the completed engagements, a Final Engagement Summary Report was posted to the individual engagement page summarizing the engagement activities and how feedback was considered throughout the process. For each of the closed regional planning engagements, the posted Integrated Regional

⁸ IESO January 2022 Engagement Update: <https://www.ieso.ca/-/media/Files/IESO/Document-Library/engage/Engagement-Updates/ieso-engagement-updates-january-2022.ashx>

⁹ IESO Stakeholder Engagement Framework Webpage: <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Stakeholder-Engagement-Framework>

¹⁰ IESO Completed Engagements Webpage: <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Completed/List>

- 1 Resource Plans include a summary of the engagements undertaken and how feedback was
- 2 incorporated into the development of the plan.

FIVE-YEAR PERFORMANCE MEASURES AND TARGETS

Performance Measurement Framework

The IESO continuously strives to maintain the high levels of performance necessary to deliver on its mandate, as well as execute key strategies, including ensuring cost-effective system reliability, enabling competition, driving business transformation, advancing sector leadership and preparing for the future of the sector.

The IESO has developed a five-year strategic measures and targets monitoring framework to ensure ongoing performance is tracked and aligned to the priorities of the organization. The tracked measures within the framework are intended to support monitoring of performance toward the five-year strategic objectives identified in the IESO's 2022-2024 Business Plan (see Exhibit A-2-2 Attachment 1 – Five-Year Performance Measures and Targets and 2021 Results).

The five-year performance measures and targets allow for measurement of the IESO's performance with regard to service delivery and meeting the needs and expectations of stakeholders over time. The framework also provides for an expanded view of measuring and monitoring reliability and market transparency.

The IESO tracks annual performance against targets, and periodically assesses the measures to ensure they drive performance towards strategic objectives. As part of ongoing monitoring of the effectiveness of performance measures and targets, the IESO may revisit and revise measures to remain aligned with the key strategies of the IESO.

Year-end review of performance against IESO Performance measures and targets

Internal Measures

5-Year Strategic Objectives	5-Year Measure	5-year Strategic Target	2021 Target	2021 Result	2022 Target	2023 Target	2024 Target	2025 Target
Culture & Workforce Transformation	1. Employee engagement - Commitment to the execution of enterprise priorities	Annual employee pulse survey results sustain 4% increased performance.	4%	7%	4%	4%	4%	4%
Culture & Workforce Transformation	2. Organizational Agility - Openness to Change	Annual employee survey results improve each year to a result of 71%.	63%	68%	65%	67%	69%	71%
Culture & Workforce Transformation	3. Operational Efficiency - Percentage of Strategic Initiatives that are completed within only 50% of schedule contingency.	90% of Strategic Initiatives are completed on time.	80%	50%	80%	85%	90%	90%

Internal Measures (Continued)

5-Year Strategic Objectives	5-Year Measure	5-Year Strategic Outcome	2021 Target	2021 Result	2022 Target	2023 Target	2024 Target	2025 Target
Stakeholder Trust	4. Stakeholder Satisfaction – Engagement process	A 5-year target of 84%.	80%	79%	80%	82%	83%	84%
Affordability, Reliability, Sustainability	5. Cost Effectiveness – Forecast accuracy	Have annual forecast error within +/- 2.5% (actual vs. forecast).	+/- 2.25%	2.03%	+/- 2.25%	+/- 2.25%	+/- 2.25%	+/- 2.25%
Affordability, Reliability, Sustainability	6. Cost Effectiveness – Resource balance: Energy Curtailments Index	10% reduction (2% annually) from 2020 base year index value (of 1.81%) to-achieve five-year target of 1.63% and represents the amount of energy curtailments to total energy production annually.	1.77%	1.55%	1.73%	1.70%	1.66%	1.63%

Internal Measures (Continued)

5-Year Strategic Objectives	5-Year Measure	5-Year Strategic Outcome	2021 Target	2021 Result	2022 Target	2023 Target	2024 Target	2025 Target
Affordability, Reliability, Sustainability	7. Cost Effectiveness – Resource balance: Energy Shortage Index	10% reduction (2% annually) from 2020 base year index value (of 0.067%) achieve five year target of 0.060% representing the instances of energy and/or operating reserve shortfall annually.	0.065%	0.058%	0.064%	0.063%	0.061%	0.060%

External Measures

5-Year Strategic Objectives	5-Year Measure	5-Year Strategic Outcome	2021 Target	2021 Result	2022 Target	2023 Target	2024 Target	2025 Target
Affordability, Reliability, Sustainability	8. Reliability – Number of forced outages to resources above 250 MW and the length of time they are out	Measure of probability that thermal facilities greater than 250 MW will be unavailable due to forced outages to thermal fleet below 9.2% annually.	<9.2%	7.3%	<9.2%	<9.2%	<9.2%	<9.2%
Affordability, Reliability, Sustainability	9. Reliability – Number of extended forced outages to transmission facilities above 230 kV and length of time they are out	Forced outages and extensions over four hours in duration to significant transmission elements is below 334 annually which is the five-year historical high.	<334	221	<334	<334	<334	<334

External Measures

5-Year Strategic Objectives	5-Year Measure	5-Year Strategic Outcome	2021 Target	2021 Result	2022 Target	2023 Target	2024 Target	2025 Target
Affordability, Reliability, Sustainability	10. Market Efficiency – Market cost/revenue transparency index	The transparency index increases by 1% (0.2% annual increase) to 16.17% from 2020 base year index value (of 15.17%) and represents the proportion of revenues received by suppliers (or payments from consumers) for electricity in the wholesale market to the total costs of supplying the electricity.	15.37%	24.82%	15.57%	15.77%	15.97%	16.17%



December 9, 2021

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The Honourable Todd Smith
Minister of Energy
77 Grenville St., 10th Floor
Toronto, ON M7A 2C1

Dear Minister Smith:

I am pleased to submit the Independent Electricity System Operator's 2022-2024 Business Plan. Ontario's electricity system is at a pivotal moment with growing electricity supply needs this decade as demand is forecast to increase steadily, generation contracts expire, nuclear refurbishments continuing and the Pickering nuclear plant retiring. It is within this context that we present the IESO's 2022-2024 Business Plan.

This plan outlines the revenue requirements and capital spending needed to address the challenges and needs of the sector. This includes the completion of the Market Renewal Program to evolve and enhance Ontario's electricity market. It also includes the launch of the Resource Adequacy Framework and Enabling Resources Initiative to ensure the necessary resources are in place to meet Ontario's growing system needs. Finally, it includes the resources necessary to achieve the government's policy objectives which the IESO has been asked to support. These investments are critical to maintaining a reliable and affordable electricity system in Ontario.

I look forward to continuing our work with your office and the Ministry of Energy as we implement the initiatives outlined in our business plan.

Sincerely,

Lesley Gallinger
President and Chief Executive Officer

cc: Stephen Rhodes, Deputy Minister of Energy
David Donovan, Chief of Staff to the Minister of Energy
The Hon. Joe Oliver, Chair, IESO Board of Directors
Barbara Anderson, Chief Financial Officer and Vice-President Corporate Services

Business Plan 2022-2024

Independent Electricity System Operator
December 9, 2021

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Letter from the President & CEO

Ontario's electricity system is at a pivotal moment in many ways.

Cyber threats, extreme weather and pandemic recovery are some of the broader changes taking place, shaping the context within which we are operating. More specific to Ontario, we face growing electricity supply needs this decade as demand is forecast to increase steadily, generation contracts expire, nuclear refurbishments continue and the Pickering nuclear plant retires.

Despite these challenges, or in some cases because of them, there are also many opportunities. As our supply needs grow, there is an opportunity to do better – to secure the resources we need more cost-effectively through competition, and with more flexibility to adapt to changing conditions through shorter commitment periods than in years past.

Technological advancements are also creating opportunities. Businesses and communities are meeting more of their own energy needs using solar panels, energy storage, and demand management tools, among other sources. This is contributing to economic development, providing businesses with new sources of revenue, and helping communities achieve their sustainability goals. Emerging technologies are also creating more competition in our provincial electricity markets, driving down costs.

As Ontario's Independent Electricity System Operator, it is our job to integrate all of these changes and ensure that electricity remains reliable and affordable for years to come.

In addition to sustaining our core business, investments are needed in several areas to help us prepare for the future.

One area is the Market Renewal Program. As we near the 20-year anniversary of the opening of Ontario's wholesale electricity markets, work is underway to implement redesigned markets that will be more efficient and better suited for the worlds of today and tomorrow. Our current market was designed for a different time, with far fewer participants and resource types. Since then, coal has been phased out, renewables have entered the market, consumers are providing demand response, conserving energy is making an impact and technologies like energy storage are taking root.

Over \$20 billion now flows through our markets each year. What were once small inefficiencies have grown in magnitude, and by correcting them through our market redesign, we will save \$800 million over 10 years. These are bottom-line savings that take into account \$178 million in amortized costs to implement, making this a clear winner for Ontario ratepayers.

As we implement fundamental changes to our markets, we are also focused on securing the resources needed to maintain a reliable supply of electricity this decade. With many generation contracts expiring, we have an opportunity to recommit them more cost-efficiently.

Over this business planning period, the IESO anticipates issuing a Request for Proposals (RFP) for up to 750 megawatts (MW) in early 2022, for three-year commitment periods with optional two-year extensions, and a longer-term RFP for at least 1,000 MW in late 2022. We will secure only the resources we are certain we need, with annual capacity auctions enabling us to respond to changing circumstances and secure the remainder of what is needed.

This multipronged approach, which continues the move toward more frequent procurements with shorter commitment periods, will provide flexibility to adapt to changing conditions and help facilitate participation from new technologies in the years ahead. By doing this competitively, we will reduce costs for Ontario ratepayers.

To drive greater cost-effectiveness, we are also focused on enabling more resources to participate in our markets. With so much innovation happening across the sector, and technology costs coming down, our focus is on small and targeted investments, leveraging partnerships where possible, to help ensure our electricity system is prepared to reliably integrate these emerging technologies into our markets.

We are also conscious of the work done by communities to take care of their own energy needs, which is blurring the lines between the provincial and local grids. The IESO is collaborating with communities on a number of fronts to help them meet local sustainability and economic development goals and contribute to the reliability and resilience of the grid.

In the coming years, the IESO will also undertake several new initiatives in support of government policy that help to address system needs and customer preferences. These projects span a number of areas and include developing an achievable pathway to zero emissions in Ontario's electricity system, taking steps toward creating a market for clean energy credits, re-contracting some small hydro and biomass generation facilities, and assessing the feasibility of several project proposals submitted to the government.

Additional resources have been identified in this plan in order to develop these projects up to the point of implementation. As these projects move forward, the IESO would in future plans assess what support would be needed to take them through to completion. In addition to electricity system benefits, these initiatives will also help achieve other policy objectives such as economic development. The scope and magnitude of this new work will require some additional resources with expertise in a number of areas, including research and analysis, modelling and simulations, system operations, contract management and other critical functions.

Lastly, investments are required in our people and processes. After years of deferring certain upgrades to our infrastructure, targeted investments are needed in aging IT assets and tools to maintain sustainable operations, and to prepare for the renewed electricity markets going live at the end of 2023.

And, as for our people, I am personally committed to ensuring our workplace supports equity, diversity and inclusion. Consequently, we will continue to engage employees and re-assess how we are progressing. We owe this to our staff, and we know a safe, respectful and supportive work environment is essential to attracting the talent we need to carry out our important mandate.

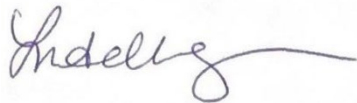
The pandemic has caused many organizations across many industries to take stock. As we prepare for the changes that will take place in Ontario's electricity system over the next few years, we see a clear path forward that will help us keep the grid reliable and operate cost-effectively. This is not a path we walk alone, and we will continue to work transparently with industry stakeholders, communities, First Nations and Métis, and others to prepare for the future, and ensure that our electricity service continues to meet the needs of all Ontarians.

It is within this context that we present the IESO's 2022-2024 Business Plan. This plan outlines the revenue requirements and capital spending needed to address the challenges facing the sector, and to take advantage of opportunities to drive down costs and keep our system reliable.

For the past five years, we've absorbed \$14 million of inflation and collective agreement impacts by deferring investments and finding efficiencies. This helped us keep our revenue requirements essentially flat during this time, with a reduction to our requirements in 2020 in response to the pandemic.

While the IESO continues to carefully review all expenditures and will find efficiencies where possible, investments are needed. To fully enable the sector of the future, we must invest in the people, tools and processes that underpin the reliable and cost-effective provision of electricity in the province. As a result, the IESO is proposing increases to its budget to ensure it can continue to meet Ontarians' expectations of an efficient – and resilient – electricity system.

This includes a revenue requirement of \$201.5 million in 2022, \$204.0 million in 2023, and \$209.3 million in 2024, translating to increases of 5.1%, 1.2%, 2.6%, respectively. For the average residential electricity bill, this translates to an increase of 2.3 cents per month over the 2022-2024 planning period, or 27 cents per year.

A handwritten signature in blue ink, appearing to read 'Lesley Gallinger', with a long horizontal flourish extending to the right.

Lesley Gallinger

President and CEO, IESO

2022-2024 Business Plan: IESO Priorities

A reliable, affordable and sustainable supply of electricity is one of the prerequisites of 21st century living. Whether it's used to power heavy equipment, home electronics or transportation systems, electricity has never been more important to Ontarians and their quality of life. Businesses, institutions, communities and residents depend on it being available at all times.

Operating Ontario's power system and administering its wholesale electricity markets is an important responsibility, but in a more integrated and complex world characterized by engaged consumers, decentralized resources and emerging technologies, the task has become increasingly challenging. It requires foresight and analytical capability, highly sophisticated systems and tools, as well as fully engaged employees with the skills and expertise to manage the changes while maintaining a laser-sharp focus on delivering value. In addition to some of our core functions, like operating the grid and administering the wholesale markets, our revenue requirements will go toward the following priorities over the 2022-2024 Business Plan period.

Planning for the Future

Power system planning is fundamental to maintaining a reliable electricity system. It's important that we have the right resources in the right places to meet demand for electricity. As we move into 2022 and beyond, the environment in which we operate is expected to continue changing rapidly. Effective planning requires us to examine demand trends, supply options and system needs up to 20 years in the future, integrating these changes into the decisions we make to keep the grid reliable and affordable.

All levels of government – federal, provincial and municipal – are collectively taking steps to manage and mitigate the impacts of environmental changes. Changes in customer preferences, emerging technologies, opportunities for electrification and other factors are expected to impact supply and demand in the years ahead. In addition, power systems everywhere are becoming more decentralized, with communities taking a larger role in meeting their own energy needs. This is blurring the lines between the provincial grid and local distribution networks, and adding to the complexity of power system planning.

The IESO's power system planners strive to provide highly credible forecasts and assessments through our core products, which include the Annual Planning Outlook, quarterly Reliability Outlooks and other products. Models are key to achieving this objective, but so too are data and technology research. As technology continues to evolve, we will invest in the most up-to-date research in order to incorporate this information into our forecasts and make it available to the sector to inform stakeholders' operations.

To support these efforts, the IESO will replace the existing Long-Term Demand Forecast tools which have reached end of life and update the end-use load profiles used to develop the long-term forecasts. These tools are essential to support the planning processes that forecast system needs and provide infrastructure investment advice for the next 20 years.

On a regional level, Ontario has 21 electricity planning regions, each with unique needs and priorities. Through our ongoing regional planning efforts, we consider conservation, generation, transmission and distribution, as well as non-wires-based innovative resources to determine the best options to meet these needs. Regional planning is a continual process with plans developed for a 20-year outlook, but evaluated every five years at minimum. We will continue to work closely with sector partners, municipal officials, local business owners and residents to ensure communities have a safe, reliable, affordable and sustainable supply of electricity for years to come.

Resource Adequacy

After more than a decade of strong supply, Ontario is now entering a period of emerging electricity system needs – most immediately and significantly in the system’s ability to meet peak capacity needs and additionally in the system’s ability to meet energy needs towards the end of the decade. These needs are driven by increasing demand, the retirement of the Pickering Nuclear Generating Station, the refurbishment of other nuclear generating units, as well as expiring contracts for existing facilities.

Over the past decade, Ontario’s electricity system has become more diverse and dynamic, and system needs have changed substantially, necessitating changes in the way we secure resources to meet them. The new Resource Adequacy framework is building on past procurement practices and aims to balance the need for certainty for investors with the IESO’s need to adjust to changing system needs that are expected to continue to evolve. The goal is to maximize competition to the greatest extent possible, secure resources based on transparent system needs, and introduce more flexibility with shorter commitment lengths for resources so that we can best match supply to those system needs. Evolving our resource adequacy approach ensures that we can deliver ratepayer savings by reducing total system costs over time.

Focusing on system needs in a transparent manner is a cornerstone of this new framework, alongside competition. Together these will be key in delivering value to ratepayers as it drives sector participants to be as effective, efficient and innovative as possible to respond to system needs. Procuring more frequently for shorter commitment terms means that resources will need to be competitive and efficient, not just at a single point in time but throughout the life of the asset and thereby providing ongoing value to ratepayers. By implementing flexible and competitive procurements, and acquiring our needed resources in a transparent manner, we will be taking important steps to ensure Ontario’s power system is as right-sized as possible.

The IESO’s 2020 Annual Planning Outlook shows that over 10 gigawatts (GW) of generation contracts are expiring by 2030, representing approximately \$1 billion in annual costs to acquire. The value of implementing competitive processes to secure supply resources has been demonstrated by IESO reports (i.e., the 2017 Market Renewal Benefits Case), IESO experience with the Demand Response and Capacity Auctions and experience in US jurisdictions.

To that end, the IESO is initiating the first in a series of medium-term RFPs in late 2021 for up to 750 MW, with a three-year commitment period beginning in 2026. A longer-term RFP with a commitment period of at least seven years is expected to launch in late 2022 for at least 1,000 MW. These procurements will acquire the resources necessary to meet system needs that we have forecasted over this period. The annual capacity auctions are an efficient tool for resources to bridge between procurement periods, while also enabling us to respond to changing circumstances.

Enabling Resources

In parallel with Resource Adequacy initiatives, the IESO has launched the Enabling Resources Program – an integrated set of projects to enable more resources to provide electricity system services that they are technically capable of providing but currently cannot, or only partially, provide under current market architecture.

Increasing the diversity of resources that can participate in the markets will deliver some important benefits: increasing competition that drives affordability; providing new revenue opportunities for Ontario businesses; and giving the IESO some additional tools to meet reliability needs this decade and beyond.

In recent years, tangible progress has been made on enabling resources and a foundation has been laid for future integration through research, pilots, and partnerships. The IESO has identified several opportunities to enable new and existing resources to provide required power system services. These include expanding participation in the capacity, energy and operating reserve markets; reducing the barriers to participation by energy storage resources; designing and implementing a market participation model for hybrid generation/storage for generation and storage resources; enhancing demand response participation and advancing the integration of distributed energy resources (DERs) into market models and tools; and other related work.

With finite resources, the IESO must carefully consider if, how, and when it implements identified opportunities to maximize the value of ratepayer investments and ensure the timely delivery of critical operations and projects. Over the next few years, we plan to take a staged approach to manage the work required to enable each resource type. This work will establish market participation models for hybrids, storage and DERs to be in place to meet future reliability needs and enable strong competition in Resource Adequacy procurements.

Enabling greater participation in Ontario's electricity markets is critical as it ensures that resources can provide maximum value to the system while minimizing inefficiencies. The IESO has continually strived to make changes to its participation models as our supply mix evolved and new resources emerged. For example, the original participation model for intermittent facilities enabled them to inject energy into the grid; however, as the volume of intermittent resources grew substantially, it highlighted key inefficiencies of this participation model and increased out-of-market actions that had to be taken to manage the change in supply mix.

The IESO's 2013 Renewables Integration Initiative enhanced the participation model by improving visibility of these resources, as well as the IESO's ability to forecast and dispatch them. This increased the overall effectiveness of the fleet, minimized out-of-market actions, and increased market efficiency and ratepayer savings. The Enabling Resources program continues this work. Its goal is to ensure that we have efficient participation models to derive value from all of our resources. The work will be done in conjunction with the Resource Adequacy initiatives to provide alignment and foster competition, when and where needed.

Enablement activities may include pilots, programs or changes to market design. The greatest value opportunities to leverage existing resources to meet system needs emerging in 2026 include the work on hybrids, DERs, storage and "fast" demand response, a service that requires a quicker response to signals from the IESO. Some of the enabling work is well underway, with full implementation of the various initiatives scheduled for 2022-2025 or as resources become available. While this

market/system integration work is consistent with integration requirements already mandated for American system operators by the Federal Energy Regulatory Commission, the IESO will undertake a cost-benefit analysis to assess which changes deliver the highest value to the system. Based on the current Enabling Resources work plan schedule, capital expenditures for design and implementation would begin to be incurred in the later second half of 2023.

Market Renewal Program

Through the Market Renewal Program – the most significant update since the electricity markets were designed in the late 1990s – the IESO is working on enhancements to create significant cost-efficiencies for Ontario’s energy consumers by redesigning electricity markets to correct inefficiencies and encourage greater competition. The program is expected to deliver approximately \$800 million in net benefits over the first 10 years following the program’s in-service date. The cost of around \$178 million will be amortized and is beginning to be recovered within this business planning period.

Most of the benefits – that extend to the system, the sector and ultimately consumers – are the result of aligning price and dispatch; reducing the need for out-of-market payments; addressing instances and causes of gaming; providing better information to incent system investments where they are needed most; building the foundation to enable future markets; and enabling greater competition between resources.

Significant progress has been made to date with the completion of the high-level design in 2019 and the detailed design in 2021. The focus now is on the implementation phase, and the work to ensure both the IESO and market participants are fully prepared for the launch of the renewed markets, targeted for Q4 2023. Activities include development of market rules, market manuals and internal business documentation, as well as IT solution development, testing, training and readiness activities. The IESO continues to work transparently across a variety of forums with stakeholders to ensure market renewal will deliver solutions that work for the sector and for consumers alike.

Driving Business Transformation

To ensure Ontario’s electricity grid and market continue to function reliably, the most important investment we make is in our people. The increasing complexity of the sector has reinforced the need to attract and retain a highly skilled workforce. A key part of this is ensuring equity, diversity and inclusion across our workforce. A survey of our staff revealed that, despite our efforts to create a supportive workplace where everyone feels safe and motivated to deliver peak performance, we can do better.

Therefore, we will continue to engage with staff and invest in training programs to create a better environment – an environment where talent is rewarded, people of all backgrounds are united in purpose, and everyone is treated with respect. Workforce research has shown that the happier and safer employees feel, the more likely it is that they will be productive, feel comfortable challenging the status quo, suggest new solutions, and feel fully invested in their work. Innovative thinking is a priority across the electricity sector, and the steps we’re taking will help drive positive change and position the IESO to deliver on our objectives.

In addition to our people, effective processes and tools are required to carry out our mandate. Complex IT programs and tools enable us to perform essential tasks that include forecasting

demand, dispatching resources and monitoring the grid for cyber threats. After years of deferring investments, many of the IESO's IT systems are near or at their end of life. Some of these upgrades will be made to control room systems to support the integration of emerging resources, and to improve situational awareness. In the coming years, we will continue to update or replace many of these key IT systems that help us maintain the reliability of the grid.

Settling the market, for example, is a critical function that requires sophisticated software. And after several years of ad-hoc changes and updates to solve specific business problems, replacing our settlement system has become urgent. Over \$20 billion in transactions occur each year through Ontario's wholesale electricity markets and it's imperative that these transactions be settled accurately. This mission-critical project will also address market re-design needs associated with implementation of the Market Renewal Program and ensure our systems meet current and future business needs.

Reinforcing the Resilience and Integrity of the Grid

Protecting the IESO grid against threats and vulnerabilities remains a high priority, both in the physical and cyber realms. All activities aimed at ensuring the reliability of the power system (e.g., long-term planning, operational planning, real-time operations, business continuity, emergency preparedness) consider a range of extreme events, including environmental changes as well as cyber threats.

Anticipating extreme weather scenarios has been part of the IESO's operational planning for many years. By considering these scenarios in depth, and by coordinating closely with other system operators across North America, we've been able to develop procedures and instructions for real-time operations with two goals: first, to ensure safe operations of the system when extreme events are expected; and second, to deal with any potential fallout of extreme events once they happen.

Given the interconnectedness of the North American power system – sometimes referred to as the world's largest machine – it's imperative that we know what's going on in other parts of the grid, and understand the nature of the challenges that are arising. For this reason, we continue to participate, monitor and implement actions recommended by the North American Electric Reliability Corporation and the Federal Energy Regulatory Commission.

After the Texas extreme cold weather event in February 2021, we initiated a new resilience review with a focus on extreme weather events. Preliminary results indicate that the IESO and the IESO-controlled grid are well prepared for extreme weather. We are working to finalize an extreme weather resilience work-plan that considers a variety of risks and mitigation options.

On the cybersecurity front, the IESO has made investments into advance threat detection and prevention technology to strengthen its core cybersecurity posture. This has been achieved through investments in intrusion prevention systems, web filtering technology and enterprise antivirus systems. These important investments continue to mitigate cybersecurity strategic risks and have been accommodated within our existing operating budget. The technologies continue to be fine-tuned to adapt to emerging cyber threats with the potential to impact the IESO's operations.

Our cybersecurity program continues to focus on expanding the IESO Lighthouse program membership and increasing the value delivery around situational awareness and information sharing as a service for members within Ontario's electricity sector. This includes near real-time incident

detection capability and the development of developing cybersecurity training and resources for the sector, strengthening our collective cyber posture.

As cybersecurity events, and ransomware attacks in particular, continue to increase across the sector, the IESO is also focused on bolstering its cyber incident response capability. These initiatives include developing cyber incident response playbooks and conducting regular tabletop exercises to practice the execution of these playbooks in an effort to reduce the potential impact and accelerate the resolution timelines.

Powering Change in First Nations Communities

The IESO works closely with Indigenous communities and organizations on projects that deliver economic, environmental and social benefits. For more than a decade, we've worked closely with them through a variety of channels and vehicles, including regional and bulk planning, energy-efficiency programming and the Indigenous Energy Support Programs. To ensure alignment with community-identified needs, interests and priorities, we engage regularly to ensure their ideas and recommendations are considered throughout our planning and decision-making processes.

Over the past few years, Indigenous communities and organizations across Ontario have become more actively involved in how they meet their energy needs. To meet objectives related to sustainability and self-sufficiency, a growing number have chosen to develop renewable resources and implement innovative solutions such as microgrids that combine small-scale local generation with storage and flexible control systems. The IESO has been able to provide some financial and technical support for these projects.

Our efforts in recent years have focused on capacity building as a way to ensure Indigenous communities and organizations have the knowledge and skills required to participate more fully and derive greater financial benefits from their efforts. On an annual basis, we launch a new intake of the Energy Support Programs and look for opportunities to improve program alignment with the needs of Indigenous communities and organizations. To maintain an ongoing dialogue and support capacity building, the IESO also hosts the First Nations Energy Symposium and Métis Nation of Ontario workshop.

The IESO also offers a suite of energy-efficiency programs for Indigenous customers on- and off-reserve, enabling them to reduce their consumption and the associated costs. Over the years, we've solicited feedback and updated the programs regularly to reflect recommendations for improvement. Going forward, we will continue to support the design and delivery of targeted energy-efficiency programs, including the launch of the new First Nation Community Buildings Retrofit Program and the expanded Remote First Nation Energy Efficiency Program, which enable communities and organizations to achieve their energy-efficiency objectives.

We continue to build on the principles outlined in our Corporate Indigenous Policy, which is focused on building the capacity of Indigenous peoples and communities and creating opportunities in support of fair and equitable participation in the electricity sector. To do so, we have established outreach plans that identify meaningful engagement opportunities for communities and that seek to build new strategic relationships, leveraging the momentum created by launching the policy in late 2020.

We also support the implementation of IESO's Equity, Diversity and Inclusion action plan, including updates to the Indigenous cultural awareness training for IESO staff, the establishment of the IESO Lighting the Way Award scholarship, and internal co-op positions for Indigenous youth. Formalizing an inclusive corporate procurement process will also create new opportunities for Indigenous-owned companies to earn revenue in the energy sector.

Engaging with Communities and Industry Stakeholders

Effective engagement with market participants and other industry stakeholders as well as communities has always been of paramount importance to the IESO. The input and feedback we receive plays a critical role in our decision-making processes and ensures we make fair and balanced decisions that consider multiple perspectives. As participation and interest in the electricity sector broadens, so too must our engagement efforts. Online platforms will continue to help us expand our reach, while recording and posting meetings online is allowing stakeholders and community members to listen and watch at their own convenience.

When it comes to electricity planning, understanding what's important to communities, businesses and regions is critical. Every region of the province has unique characteristics and energy needs, which the IESO must understand and consider. For this reason, we've launched IESO Connects (www.iesoconnects.ca), an online community engagement hub that enables regional electricity network members to follow developments and contribute their ideas and perspectives. It will remain an important engagement mechanism going forward, enabling active dialogue in a targeted and cost-effective manner.

The IESO has a critical role to play in ensuring market participants understand market and system operations, and know how to participate. Market participant training has always been important, but never more than now as we approach implementation of the renewed electricity markets, and as new and innovative companies continue entering the market. For the convenience of our participants and to reduce the costs associated with in-person training, we've been transitioning our training online. We're focused on developing technical videos and short Quick Takes that enable market participants to learn about tools and processes at a time that works for them.

Energy Efficiency

At less than two cents per kilowatt-hour, energy efficiency is Ontario's most cost-effective resource. It's also one of the most important contributors to ensuring Ontarians have the electricity they require – at a fair and affordable price. Energy efficiency plays an important part in meeting system needs at local, regional and province-wide levels. Efforts required to carry out this program are funded through the global adjustment mechanism rather than the IESO usage fee.

In 2021 the IESO celebrated 10 years of delivering energy-efficiency programming under the Save on Energy brand. Since Save on Energy was first introduced in 2011, over 250,000 Ontario electricity consumers have participated. Over the years, these programs have been available for all sectors, including residential, industrial, commercial and institutional customers as well as First Nations and income-qualified customers. Collectively, their efforts have resulted in nearly 16 TWh of electricity savings – enough to power 1.7 million homes for one year.

Ontarians have proven that energy efficiency can deliver strong results. It can reduce energy costs, improve operating processes and systems, enhance overall occupant comfort and lower total demand on the power system. The savings from Save on Energy programs are factored into the planning of Ontario's future energy needs, and are integral in helping Ontario businesses reduce operating costs and remain competitive in the global marketplace, especially as they recover from the impacts COVID-19.

The IESO is now working under the 2021-2024 Conservation and Demand Management (CDM) Framework, which focuses on cost-effectively meeting the needs of electricity consumers and Ontario's electricity system through the delivery of programs and opportunities to enable electricity consumers to improve the energy efficiency of their homes, businesses and facilities. With a budget of \$692 million, the current suite of programs is forecasted to achieve 440 MW of peak demand savings and 2.7 TWh of energy savings. As part of the current framework, local initiatives will also be developed to deliver CDM savings in targeted areas of the province with identified system needs. The local initiatives will use competitive mechanisms, such as open procurements. This approach will enable a broad range of participants to propose CDM programs and opportunities encouraging competition, innovation, cost savings and customer-driven solutions.

Supporting Decarbonization and Government Policy Objectives

Electricity plays a critical role in the province's economic and social wellbeing. A reliable, affordable and sustainable supply of electricity can fuel community growth, support job creation, stimulate economic development and facilitate decarbonization efforts in other sectors. The work of the IESO will continue to support these government policy objectives, especially as Ontario emerges from the COVID-19 pandemic.

In late 2020 and early 2021, a number of Ontario municipalities passed resolutions to phase out the province's gas-fired power plants by 2030. To determine whether this was feasible, the IESO undertook extensive analysis, which resulted in a Gas Phase-Out Impact Assessment that was released in October 2021.

Although the study showed that this date was not feasible without blackouts and substantial increases to customer bills, this work has furthered our shared understanding of Ontario's clean grid advantage. At 94 per cent emissions free in 2020, Ontario has the one of the lowest emitting electricity systems in North America, if not the world.

After the gas study was released, the Minister of Energy asked the IESO to evaluate a moratorium on procuring new natural gas generating stations and to develop a pathway to zero emissions in the electricity sector. This IESO will provide this additional analysis by November 2022.

Gas-fired generation plays an important role in the operation of the system by providing flexibility, particularly during times of peak demand. Reimagining and reorienting the grid to account for the phase-out of natural gas generation would be a highly complex undertaking. To do so, we would need to procure and integrate replacement supply with different operating characteristics, identify and assess the transmission infrastructure requirements to support the new supply, and determine ways in which local supply could contribute more actively to the system's real-time needs.

The analytical work required to determine the best path forward will necessitate effort from subject matter experts across the IESO. Properly assessing the operational, environmental and financial implications of a zero-emissions grid will be critical, and the work will not be done in isolation. Just as the gas phase-out study was informed by input from stakeholders and community feedback, the IESO will continue working with the sector – including businesses, academics, municipalities and other organizations in the broader electrification space – to explore the best approach to leverage the electricity sector to support decarbonization in Ontario. This effort is currently structured to support the development of a proposed pathway, but as yet does not account for the resources needed for implementation.

With just three per cent of all carbon emissions in the province currently coming from the electricity sector, there is the potential to reduce emissions across the broader economy by supporting electrification in other sectors with significantly higher emissions profiles. We are committed to supporting electrification and decarbonization and will be taking a deeper look at electrification potential and impacts in 2022.

Separately, the Minister of Energy has also asked the IESO to take steps toward creating a market for clean energy credits, re-contracting with some small hydro and biomass generation facilities, assessing the feasibility of several project proposals submitted to the government. Here, IESO work will also only encompass the assessment phases required before any project execution takes place.

In addition to electricity system benefits, these initiatives will also help achieve other policy objectives, such as economic development and job creation. The scope and magnitude of this new work will require some additional resources with expertise in a number of specific areas. These include research and analysis, modelling and simulations, system operations, contract management, communications, settlements, finance and other critical functions.

Financial Overview

The 2022-2024 Business Plan provides an overview of the resources required to maintain the high levels of performance necessary for the IESO to deliver on its core responsibilities, as well as to execute key strategies. These strategies include ensuring cost-effective system reliability, enabling competition, driving business transformation, advancing sector leadership and preparing for the future of the sector.

The IESO has maintained its revenue requirements at similar levels since 2017, absorbing \$14 million of inflation and collective agreement impacts by deferring investments in processes, tools and workspaces, and by finding efficiencies. However, after five years of holding funding requirements flat, the IESO now needs to move forward on key initiatives that are critical to maintaining its core operations, to continue modernizing Ontario's electricity sector, and to address various government initiatives including a pathway to zero emissions in the electricity sector.

While the IESO continues to carefully review all expenditures and will find efficiencies where possible, investments are now needed for initiatives in support of the future of the sector and in the people, tools and processes that underpin the reliable and cost-effective provision of electricity in the province. The IESO is therefore proposing increases to its revenue requirement of 5.1%, 1.2%, 2.6% over the three-year planning period. For the average residential electricity bill, this translates to an increase of 2.3 cents per month over the 2022-2024 planning period, or 27 cents per year.

In the 2022-2024 Business Plan, the IESO is proposing to:

- Maintain existing costs to run the business and complete existing initiatives, consistent with the approved 2021 budget.
- Complete the \$178 million Market Renewal Program investment by end of 2023, at which time the new market will begin to generate \$800 million in ratepayer savings over a 10-year span, a 3.5 benefit-to-cost ratio. The program investment will be amortized over a 20-year period, starting in late 2023.
- Embark on a large-scale effort to acquire resources to meet expected energy shortfalls later this decade, following a period of adequate supply, by implementing a competitive resource acquisition strategy for short-, medium- and long-term capacity needs and capacity auction enhancements.
- Ensure reliability over the long term through initiatives to enable existing and emerging resources such as storage, hybrid integration and demand response to compete in the market and help meet supply needs.
- Upgrade aging planning and operations tools that have been deferred for multiple years.

- Undertake several new initiatives to ensure reliability and government policy priorities are met, including: taking steps toward creating a market for clean energy credits, re-contracting some biomass generation and small hydroelectric facilities, assessing barriers to energy storage, and advancing several Unsolicited Project Proposals to the next phase of the framework. Develop a pathway to zero emissions in Ontario's electricity sector through a phase-out of gas generating facilities.
- The resource request in this plan for new initiatives and the zero emissions pathway will support the IESO's work on the assessment and development of these projects. This work will also help determine what additional resources would be needed to implement these projects and would be included in subsequent business plans.

In 2022, the IESO will start preparing for the new functions and services that the Market Renewal Program will introduce when it goes into service, and will undertake a number of initiatives to ensure reliability needs are met and resources that are important to other government policies remain in service, as well as to respond to growing interest in decarbonization. Operating costs for 2023 include the continuation of initiatives started in 2022, increase preparedness for post-Market Renewal Program implementation, and investments in core operations to upgrade tools and maintain critical functions required for the IESO to deliver on its mandate. 2024 is a step-change year for the IESO, driven by beginning to recover the Market Renewal Program investments through amortization and the impacts of operating the new market.

Further, the organization continues work to identify potential operating efficiencies within the 2022-2024 planning period. Internally, the IESO will drive business transformation by implementing a workplace strategy aimed at enhancing its culture and people practices to enhance performance, and by establishing a technology and data roadmap to enable better analytics, achieve new efficiencies and deliver value to the sector.

In order to support business and workforce transformation the IESO continues to examine its office space needs in support of introducing a hybrid work model and to recognize the evolving role the office plays in supporting employees and delivering the IESO's services; should this examination result in additional investments net of related savings, the IESO will bring it forward in the next business plan.

For 2022, the IESO anticipates an average of 827 full-time equivalent employees to deliver on core electricity system responsibilities and government new initiatives, as well as to support the Market Renewal Program. After rigorous review, core operations staffing levels will increase in 2022 to ensure delivery and execution of time-sensitive initiatives that are critical to meet Ontario's electricity goals, with other additions related to MRP support. In 2023, a number of strategic positions are added to support key initiatives (including the Market Renewal Program). Staffing levels will be reduced in 2024 after the Market Renewal Program and the Replacement of Settlement System project have gone into service, with certain program resources returning to core functions.

As part of its mandate, the IESO operates several programs that are funded from other sources and are not included in this business plan and these are: the smart metering entity, market rule enforcement and education, and energy-efficiency programs.

The IESO has approval from the Ontario Energy Board to maintain an operating reserve of \$10 million, to manage cost or revenue variances from budgets, as well as changes to the external

environment that impact the IESO and may not be within its control or reasonably foreseeable, a practice adopted by similar sector organizations. Given the scope and complexity of its mandate, the IESO recognizes the potential for additional unplanned work activities that may be material in scope and are beyond the control of management.

The IESO's operating reserve balance was drawn down in 2019 due to an accounting policy change and is currently at \$1.3 million. The IESO has deferred including additional revenue requirement in its budget to restore the \$10 million operating reserve in order to mitigate the impact of cost increases on market participants. The IESO is able to manage this risk, and any operating deficits in the near term, through its credit facility, and will look to restore its balance over time through retention of any operating surpluses, while it is committed to continuing to look for efficiencies to create capacity to support rebuilding of the operating reserve.

Detailed Financials

The following table outlines 2022-2024 business plan operating revenues and expenses:

Pro Forma Statement of Operations For the Year Ended December 31

(\$ Millions)	2021 Budget	2022 Budget	2023 Budget	2024 Budget
Revenue				
IESO Usage Fee	191.8	201.5	204.0	209.3
Total Revenue	191.8	201.5	204.0	209.3
Expenses				
Baseline Expenses	171.5	172.8	175.0	178.2
<i>Year over year variance</i>	-	0.7%	1.3%	1.8%
MRP Post-go-live	-	0.5	2.7	4.0
Resource Adequacy	-	1.7	1.9	1.3
Enabling Resources	-	0.4	0.6	0.5
Other initiatives	-	4.6	2.8	2.2
Pathway to zero emissions	-	1.3	-	-
Operating Expenses inclusive of Initiatives	171.5	181.3	183.0	186.2
Amortization	19.2	20.0	23.3	30.0
Net Interest	(2.5)	(5.0)	(7.2)	(7.8)
Market Renewal Program	3.6	5.2	4.9	0.9
Total Expenses	191.8	201.5	204.0	209.3
<i>Year over year variance</i>	-	5.1%	1.2%	2.6%
Operating Surplus/(Deficit)	-	-	-	-

Capital

As in previous years, the business planning process establishes an appropriate capital envelope for core operating initiatives over the business planning timeframe, with commitments approved individually, on an ongoing basis. The capital implementation stage of the Market Renewal Program, which began in 2018, will be concluded by the end of the planning period.

For 2022, in addition to delivering a number of core business projects which allow the IESO to maintain critical services, improve efficiency and meet regulatory compliance obligations, the IESO is continuing to deliver a significant number of strategic initiatives with the aim of: driving business transformation (with projects such as the Replacement of Settlement Systems, Data Excellence Program and Human Resource Workforce Planning and Analytics Project); ensuring system reliability (with projects such as the Resource Adequacy Program and Dynamic Limits in Real-Time Project) and enabling competition and advancing sector leadership through addressing Market Surveillance Panel recommendations.

Through its core business projects, the IESO will continue to ensure reliability by upgrading and replacing core applications, infrastructure and cyber security tools. In 2022, core business projects include a refresh of the Transmission Rights Auction platform, introduction of a Network Performance Management and Diagnostic Solutions and the completion of the SCADA/Energy Management System (EMS) Upgrade, to name a few. The IESO is also investing in a Market Analysis and Simulation Toolset to ensure availability of a tool to monitor, correct, improve or alter market design or operations over the day-ahead, pre-dispatch and real-time periods following the introduction of the Market Renewal Program.

The Market Renewal Program capital costs for 2022-2024 in the table below are the latest estimate of program spending and are in alignment with the revised schedule and in-service date approved by the IESO board in March 2021.

Project details and associated descriptions are included in Appendix 3.

Total Capital Envelope

Capital (\$ Millions)	2021 Budget	2022 Budget	2023 Budget	2024 Budget
Core Operations Initiatives	32.6	30.0	28.8	28.2
Market Renewal Program	44.6	41.2	33.6	1.9
Total Capital Envelope	77.2	71.2	62.4	30.1

Full-Time Equivalent (FTE) Staffing

In 2022, the average baseline FTEs decline slightly below 2021 levels due to staff attrition. Additional resources to support all of IESO's initiatives results in increasing core operations FTEs by about 17 average FTEs compared to 2021. Additionally, MRP implementation support is driving the increase of MRP program FTEs by 16 in 2022. Core operations FTE levels in 2023 increase to 724, mainly due to ramp-up of staff required to prepare for the new market functions/services, in order to develop processes, undertake analysis, assist with fixes, improvements and sector readiness, and eventually operate the new market. In 2024, core operations FTE levels decline to 741, driven by completion of the Replacement of Settlement System project.

Staffing levels required to support the Market Renewal Program implementation will reach 97 FTE in 2022, and are expected to increase slightly in 2023 for operations testing activities. In 2024 some staff are retained to provide market participants and internal staff with training, complete internal documentation, make tool changes post go-live and ensure that a framework is in place to measure the benefits post go-live.

Average FTEs

Full-Time Equivalents (FTEs)	2021 Budget	2022 Budget	2023 Budget	2024 Budget
Baseline	713	706	716	705
MRP Post-go live	-	3	18	21
Resource Adequacy	-	3	4	4
Enabling Resources	-	1	2	2
Other initiatives	-	10	11	9
Pathway to zero emissions	-	7	-	-
Core Operations	713	730	751	741
Market Renewal Program	81	97	101	10
Total FTEs	794	827	852	751

Market Renewal Financials

As of 2021, the Market Renewal Program has entered the final phase of the initiative: implementation. This phase of work will ensure both the IESO and market participants are prepared for the launch of the renewed market, targeted for Q4 2023.

Market Renewal Program Baseline Schedule, Budget Update and Funding

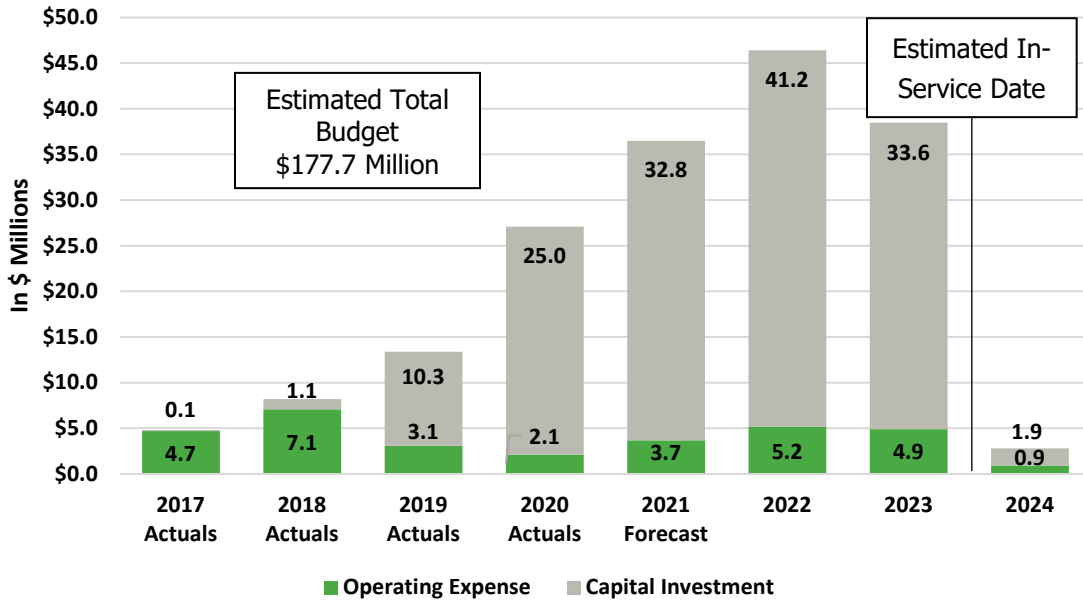
The business case for the Market Renewal Program was approved by the IESO Board in October 2019. The IESO's transition from detailed design to implementation provided a natural review point of the schedule, budget and risks – a common practice in the management of large-scale projects. In March 2021, the IESO Board approved revised program funding and schedule, including a new in-service date of November 2023, with six months of schedule contingency. The updated cost estimate for the delivery of Market Renewal is \$177.7 million, including contingency, which remains within the estimated range approved in the business case. With the final detailed designed documents published, the focus is now on codifying these designs into rules, manuals, processes and tools as part of the implementation phase.

The capital activities for Market Renewal will include solution development deliverables and testing, which will require contracting external vendors as well as broad support from across the organization, including a significant complement of IT resources, while managing the inter-related nature of other significant IESO initiatives. Market Renewal activities funded through operating costs include the development of market rules and related stakeholder activities, change management planning and coordination, and updates to internal and external manuals.

In 2024, the IESO will require funding post go-live to deliver market participant support and training, complete internal document updates, and start project closure activities while maintaining a capital budget for additional vendor support and internal IT costs for tool changes identified after the in-service date.

The annual Market Renewal Program project costs from 2022-2024 are consistent with the Board-approved revised schedule and in-service date and funding, with some adjustments in timing and dollars between years.

Projected Market Renewal Costing



Appendix 1 – IESO Performance Management – Measures and Targets

The IESO's performance management program provides an important level of oversight for the organization and its stakeholders, and helps to ensure accountability and course correction, as needed.

The IESO has established forward-looking, five-year performance measures and targets that align with strategy to drive action and progress toward the achievement of the organization's overall mandate and strategic objectives. As this Business Plan is intended to operationalize the execution of the IESO's strategy, these measures and targets reflect the desired outcome at the end of the five-year strategic planning period and align with our core strategies: Ensure System Reliability, Enable Competition, Advance Sector Leadership, and Drive Business Transformation.

5-year Strategic Objectives

Culture & Workforce Transformation

Measures	5-year Strategic Target
Employee engagement - Commitment to the execution of enterprise priorities	Annual employee pulse survey results sustain 4% increased performance.
Organizational Agility - Openness to Change	Annual employee survey results improve each year to a result of 71%.
Operational Efficiency - Percentage of Strategic Initiatives that are completed on time	90% of Strategic Initiatives are completed on time.

Stakeholder Trust

Measures	5-year Strategic Target
Stakeholder Satisfaction - Engagement process	A 5-year target of 84%.

Reliability, Affordability & Sustainability

Measures	5-year Strategic Target
Cost Effectiveness - Forecast accuracy	Have annual forecast error within +/- 2.5% (actual vs. forecast).
Cost Effectiveness - Resource balance: Energy Curtailments to total production	10% improvement to 'right size' the system and achieve resource adequacy and effectiveness of meeting energy and ancillary services needs for Ontario.
Cost Effectiveness - Resource balance: annual energy / operating reserve shortage frequency	10% improvement to 'right size' the system and achieve resource adequacy and effectiveness of meeting energy and ancillary services needs for Ontario.
Reliability - Number of forced outages to thermal resource fleet above 250 MW	Measure of probability that thermal facilities greater than 250 MW will be unavailable due to forced outages to thermal fleet below 9.2% annually.
Reliability - Number of extended forced outages to transmission facilities above 230 kV	Forced outages and extensions to outages over four hours in duration to significant transmission elements is below 334 annually which is the five-year historical high.
Market Efficiency - Market cost/revenue transparency index	The transparency index increases by 1% and represents the proportion of revenues received by suppliers (or payments from consumers) for electricity in the wholesale market to the total costs of supplying the electricity.

Appendix 2 – Enterprise Risk Management

At the IESO, risk management is an integrated discipline that supports informed decision-making throughout the organization. We recognize the pivotal role it plays in balancing strategic planning with business execution and compliance. This facilitates informed decision-making and a conscious evaluation of the upside opportunity and downside aspect of risk.

Our integrated approach to managing risk recognizes the need for clear, timely direction and support from our Board of Directors and senior, business unit and functional management.

Our starting point for managing risk is our strategic planning process, from which relevant external and internal threats and opportunities are derived and key risks are identified. Risks and opportunities are identified by observing, analyzing and anticipating trends along with macroeconomic, industry-specific, regional and local developments. Senior management assesses the risks to achieving our strategic objectives, and incorporates measures into corporate and operating plans to mitigate these risks if they exceed our target risk levels.

The IESO uses a risk management ranking methodology to assess the key risks specific to our achieving our strategic and business plan objectives. Our top strategic risks, aligned with the IESO's strategic objectives and their associated residual risk assessment, are as follows:

Stakeholder Trust Strategic Risks

Risk: Stakeholder Acceptance. Stakeholder acceptance of the IESO's resource adequacy mechanisms.

Risk Assessment: Critical

Risk Mitigation Approach

To competitively acquire capacity to meet short-, mid-, and long-term electricity system needs, we are in a multi-year process of implementing a Resource Adequacy Framework. Regular and proactive engagement with our many stakeholders to identify and address their concerns is being undertaken. We proactively communicate long-term value opportunities associated with the Resource Adequacy Framework and continue to enhance the transparency of our acquisition decisions.

Risk: Planning Credibility. Stakeholder support for the IESO's determined acquisition quantities.

Risk Assessment: High

Risk Mitigation Approach

The IESO must balance a number of considerations as it acquires future resources. A perceived lack of credibility could undermine these efforts. New planning tools such as the Annual Acquisition Report enable the IESO to translate the statements of need in the Annual Planning Outlook into real acquisition targets. These, in turn, provide stakeholders with much-needed insights into opportunities for existing and emerging resources. Further efforts to finalize a new bulk planning process are underway as well as undertaking an update to our energy modelling and demand forecast tools, which will provide more transparency to stakeholders on how needs are set.

Affordability, Reliability, Sustainability Strategic Risks

Risk: Near-Term Reliability. Undersupply of system demand.

Risk Assessment: Medium

Risk Mitigation Approach

Ensuring near-term reliability is a core operational function of the IESO as the Provincial reliability coordinator. Adverse changes affecting demand or limiting available sources of capacity, energy or ancillary services as well as force majeure incidents can lead to undersupply scenarios. Real-time planning operations ensures that the wholesale market functions effectively and in a cost-efficient manner with adequate supply in the near term. Planning outlooks are being evolved to provide a more comprehensive view of system needs. We continuously update operating practices to mitigate potential shortfalls against near-term demand. We will continue to publish bulk and regional plans, update energy modelling and forecast tools and execute the annual capacity auction.

Risk: Long-Term Reliability. Oversupply of generation capacity.

Risk Assessment: Medium

Risk Mitigation Approach

To meet demand over the long term requires capital investment decisions by generators. We are working to ensure that planning tools and planning information regarding demand, resource mix and transmission capacity are current. To support accurate planning information, projects are underway to improve the energy modelling and demand forecast tools. Request for proposal work is underway to begin designing and mapping out a work-plan for the mid-term procurement to be launched later this year to replace capacity and energy (up to 750 MW) otherwise unavailable for existing off-contract resources.

Risk: Market Competitiveness. Competitive wholesale markets.

Risk Assessment: High

Risk Mitigation Approach

Increased market power directly leads to efficiency losses in the market. The Market Renewal Program will provide open, fair, non-discriminatory competitive opportunities for participants to help meet evolving system needs. The implementation of the Resource Adequacy framework supports the use of a variety of competitive mechanisms limit market power. Additionally, our Market Assessment and Compliance Division provides support and protection against anti-competitive practices through the application of various investigative and enforcement powers.

Risk: Cybersecurity. Information security and data governance.

Risk Assessment: High

Risk Mitigation Approach

Cybersecurity incidents may have an adverse impact on IESO's operations, employee safety, and reputation. Our overall approach is to promote the culture of cybersecurity awareness through policies, training, improving incident response capabilities and communications. The implementation of targeted solutions will help us to better identify and mitigate malicious threat actors from launching a successful attack. We will continue to enhance our threat intelligence capabilities and upgrade our network architecture, data management and security controls.

Risk: Cyber Security. Successful cyber attack on Ontario's grid reliability.

Risk Assessment: Medium

Risk Mitigation Approach

Cyber attacks targeting critical infrastructure on the IESO-administered grid are on the rise. A holistic view and understanding of market participants' cybersecurity postures and program objectives is required to develop an informed and coordinated approach to cyber resiliency for the Ontario electricity sector. We have implemented and continue to expand our Lighthouse program; a voluntary situational awareness and information-sharing initiative. We are developing an IESO Playbook for Cyber/Operations activity coordination to manage cyber events with reliability impact potential and improving overall emergency preparedness through Ontario's Electricity Emergency Plan.

Risk: Regulatory Change. A regulatory decision is made that impedes the ability of the IESO to enhance competition.

Risk Assessment: Medium

Risk Mitigation Approach

While the Ontario Energy Board (OEB) is typically aligned with IESO direction for achieving a more competitive electricity market, in making decisions, the OEB will give significant weight to past decisions which may impede market competition. The IESO will seek to engage the OEB in support of a coordination framework to enable ongoing education and strengthen the understanding of the foundational Market Renewal Program (MRP) or wider market or grid-operation changes.

Risk: Extreme Weather. An extreme weather event significantly damages generation or transmission assets.

Risk Assessment: Medium

Risk Mitigation Approach

Electricity supply can be negatively impacted by damage caused from extreme weather events namely, temperature, wind, fire, rain and flooding. We have a set of counter measures to mitigate impacts of extreme weather including proactive monitoring of weather conditions and advancing the resiliency framework with specific focus on extreme weather events while updating the Ontario Resource and Transmission Assessment Criteria (ORTAC). We have commenced multi-year projects to implement new platforms and tools to plan for a more resilient system that can withstand extreme weather conditions.

Risk: Information Technology System Failure. Critical information technology system failure impacting control room operations.

Risk Assessment: Medium

Risk Mitigation Approach

Failure of a critical information/operational technology system impacting the control room would have immediate effects on the ability to effectively manage the operation of the IESO's bulk electricity grid operations. The IESO's information technology division has centralized responsibility for management of all of the IESO's information and operational technology systems and is working to define a refreshed information technology strategy and initiatives plan. Additionally, the implementation of an information technology service management tool and process refresh will provide an enhanced view for the IESO to manage critical failures that have the potential to cause disruptions to control room operations.

Culture and Workforce Transformation Strategic Risks

Risk: Advancing Enterprise Priorities. Program and enterprise priority delivery.

Risk Assessment: High

Risk Mitigation Approach

Delivering business plan initiatives is central to meeting the IESO's strategic objectives. Mitigating this risk will involve prudent, risk-informed understanding of the trade-offs required to achieve desirable outcomes. Our executive leadership team supported by a refreshed strategy, up-to-date risk information and sound project portfolio management practices will help achieve the priorities defined in the business plan.

Appendix 3 – Capital Spending

Summary for 2022-2024 capital spending

Change Initiatives/Projects (\$ Millions)	2022 Plan	2023 Plan	2024 Plan
Centralized Alarm Management System Replacement	0.8	-	-
Replacement of the Settlement Systems	7.0	4.4	0.5
SCADA/Energy Management System (EMS) Upgrade	1.4	-	-
Data Excellence Program	0.7	1.0	-
Wide Area Visualization Environment (WAVE) - Phase 2	0.6	0.4	0.2
Enabling Resources Program	-	-	2.5
Addressing Market Surveillance Panel (MSP) Recommendations	0.5	0.9	0.5
Dynamic Limits in Real-Time	2.0	1.3	0.1
Network Performance Monitoring and Diagnostic (NPMD) Solution	2.8	-	-
Antivirus Replacement	2.3	0.1	-
Resource Adequacy	2.0	-	-
Market Analysis and Simulation Toolset (MAST)	2.0	2.2	-
Long-Term Demand Forecast Tool Replacement	0.8	1.0	-
Core Network Refresh	0.5	2.3	-
PMU Integration - Phase 3	0.3	1.0	2.0
Data Historian Expansion and Upgrade	1.0	-	-
Transmission Rights Auction (TRA) Platform Refresh	1.0	-	-
Enterprise Resource Planning (ERP)	-	2.0	4.2
Windows Infrastructure Refresh	-	2.0	-
Firewall Refresh	-	1.5	1.0
Advanced Malware Refresh	-	1.5	1.5
Meter Data Management System Replacement	-	1.0	5.5
Aruba Introspect Refresh	-	-	3.0
Capital (\$1 million and above)	25.7	22.6	21.0
Other Initiatives/Projects (Less than \$1 million)	4.3	6.2	7.2
Total Without Market Renewal Program	30.0	28.8	28.2
Market Renewal Program	41.2	33.6	1.9
Total Including Market Renewal Program	71.2	62.4	30.1

2022-2024 Capital Plan Details

Project Name	Project Description
Centralized Alarm Management System (CAMS) Replacement	The CAMS project will ensure IESO operators can continue to manage alarms and events that are important indicators of change by implementing a solution in place of software that will no longer be supported by the vendor.
Replacement of the Settlement Systems	In replacing settlement systems that have been in operation since market opening in 2002, this project will address market re-design needs associated with implementation of the Market Renewal Program and enable systems to meet current and future business needs. In 2020, the IESO settled approximately \$20B in the IESO-Administered Markets, Ministry of Energy supported programs, and Global Adjustment through the settlement systems.
Supervisory Control and Data Acquisition (SCADA) / Energy Management System (EMS) Upgrade	This project will upgrade the SCADA/EMS, the primary system operators use to monitor and manage the IESO-controlled grid. The resulting improvements will enable custom applications to run on the latest version of the vendor's software and improve the ability of energy storage resources to become integrated suppliers of regulation services.
Data Excellence Program	To help harness the full value of IESO data, this program establishes an evolved data management and analytics framework to support IESO business needs, and enhance third-party access to data and information. Data governance policies and tools (data catalogue), an updated data warehouse strategy and supporting applications for high-value use cases and a centre of excellence for advanced machine learning applications are in the scope of the program roadmap.
Wide Area Visualization Environment (WAVE) - Phase 2	This project will improve situational awareness and maintain ongoing compliance with NERC IRO standards by expanding modelling to neighbouring power systems (NYISO, PJM and Hydro-Quebec), improving the IESO's ability to monitor and respond to real-time conditions that may affect the IESO-controlled grid.
Enabling Resources Program	Through the program the IESO will prioritize and undertake the work required to increase the number of resources (e.g., hybrids, storage) that can participate in the IESO markets to deliver energy, capacity and ancillary services in order to increase options for reliability and competition to drive affordability.

Project Name	Project Description
Addressing Market Surveillance Panel (MSP) Recommendations	A portfolio of initiatives to develop, evolve and address inefficiencies in the electricity market in response to observations by the MSP and other stakeholders.
Dynamic Limits in Real-Time (DLRT)	In enabling the continuous assessment of real-time grid conditions, the DLRT Project will significantly improve the utilization of Ontario's transmission system, resulting in market and system operations efficiencies, and increased system security and resilience.
Network Performance Monitoring and Diagnostic (NPMD) Solution	<p>The IESO's Core and Data Centre networks provide the backbone of the IESO's network infrastructure connecting all systems and locations in a robust and reliable high performance network. The NPMD solution will provide the capabilities to monitor network devices, analyze network packets for enhanced visibility, reducing troubleshooting effort and time to resolution and predictive failure analysis.</p> <p>This project builds on the foundation that was put in place with the acquisition and configuration of the Network Taps hardware that captures and centralizes network traffic.</p>
Antivirus Replacement	The current antivirus solution which was commissioned in 2018 will no longer be supported beyond March 2022. The current vendor is moving to a cloud-based service offering only, which will not meet the current NERC Critical Infrastructure Protection (CIP) standards. This project will replace the current antivirus solution with a new on-premises solution that will maintain the IESO's security posture and continue to meet the NERC CIP requirements.
Resource Adequacy	As part of its commitment to transition to the long-term use of competitive mechanisms to meet Ontario's resource adequacy needs, the IESO is working with stakeholders to implement the Resource Adequacy framework to develop and execute mechanisms, such as the Capacity Auction and Requests for Proposals to procure capacity in three distinct time frames (short-, medium- and long-term).
Market Analysis and Simulation Toolset (MAST)	As the Market Renewal Program (MRP) is introducing wholesale market changes, current tools to monitor, assess and analyze the new market will be insufficient. MAST will deploy a common assessment tool environment that can be utilized in multiple business processes that will monitor, correct, improve or alter market design or operations over the day-ahead, pre-dispatch and real-time periods. The new tools are required after MRP go-live.

Project Name	Project Description
Long-Term Demand Forecast Tool Replacement	This project will replace the existing Long-Term Demand Forecast tools which have reached end of life and update the end-use load profiles used to develop the long-term forecasts. These tools are essential to support the planning processes that forecast system needs and provide infrastructure investment advice for the next 20 years.
Core Network Refresh	The IESO's Core and Data Centre networks provide the backbone of the IESO's network infrastructure, connecting all systems and locations in a robust and reliable high-performance network. The existing Core and Data Centre infrastructure needs to be refreshed as it is approaching the end of manufacturer support.
PMU Integration - Phase 3	<p>Phasor Measurement Units (PMUs) can continuously deliver high-quality, time-synchronized real-time power system data at a high frequency (30-60 samples per second). Obtaining PMU data from across Ontario will improve real-time monitoring of the IESO-controlled grid; obtaining PMU data from other jurisdictions will improve wide-area view; and both will improve the IESO's overall situational awareness. PMUs also provide the IESO the ability to diagnose incidents and to more efficiently comply with several NERC reliability standards.</p> <p>Building on the earlier phases of this work, Phase 3 will integrate PMU data into the IESO's operations support tools and services, as well as live information into the Control Room.</p>
Data Historian Expansion and Upgrade	<p>The Data Historian is a real-time application that is currently used by the IESO for data collection, historicizing, finding, analyzing, delivering, and visualizing telemetry data from process control systems to assist in the operation of the IESO-Controlled Grid.</p> <p>The current version of the Data Historian is no longer supported by the vendor. This project will upgrade Historian and its desktop clients to the latest software release and provide sufficient capacity to support additional data points that are required to accommodate the additional data introduced by the WAVE Phase 2 project.</p>
Transmission Rights Auction Platform Refresh	The IESO uses the Transmission Rights Auction (TRA) tool to administer the monthly Transmission Rights Market. The underlying technology (i.e., the platform) has reached end of life and is unable to support further enhancements to the TRA tool. This project will update the TRA platform, improve efficiency for support staff and introduce some high-value enhancements identified in the recent Transmission Rights Market Review

Project Name	Project Description
	performed by the IESO in response to a Market Surveillance Panel recommendation.
Enterprise Resource Planning (ERP)	The IESO's current financial applications and accounting ledgers are composed of several segregated systems (and tools) that interface together to provide comprehensive records for the IESO. The IESO must conduct a refresh of at least the accounting ledgers as these systems will become obsolete once the vendor's support ceases within the next few years. Through this project the IESO will replace the accounting ledgers and various other segregated systems (and tools) that interface together with the ledgers as part of more comprehensive and efficient system.
Windows Infrastructure Refresh	The current version of Microsoft Windows Server operating system is nearing end-of-life at which time Microsoft no longer provides support for the product, including critical security patches. This project will move us to the latest supported version of the Windows operating system and refresh the underlying hardware.
Firewall Refresh	The existing IESO firewalls which provide access control to critical parts of the network such as the NERC Electronic Security Perimeter (ESP) and DMZ are nearing the end of vendor support and need to be upgraded. This project seeks to build on the strengths of the existing security architecture by upgrading the key security controls at the firewall perimeter of IESO's data network and allow the IESO to take advantage of features which are used to reduce the risk of evolving cyber attacks and ensure mitigation of security concerns related to the industry.
Advanced Malware Refresh	The existing Advanced Malware appliances are nearing end of vendor support. This refresh project will upgrade the aging network threat prevention infrastructure and seeks to build on the strengths of the existing security architecture by upgrading the key security controls at the perimeter of the IESO's data network. Advanced malware protection complements the existing traditional security controls such as firewalls, intrusion prevention systems and endpoint protection by using advanced detection capabilities based on current threats.
Meter Data Management System Replacement	The current Meter Data Management solution that supports the IESO settlement processes is currently deployed on an application that does not have an upgrade path. As a result the IESO will need to invest in replacing the application when it reaches end of life.

Project Name	Project Description
Aruba Introspect Refresh	Aruba Introspect is a cybersecurity tool used to detect and monitor anomalies on user workstations and laptops. The tool is being discontinued and will no longer supported by the vendor. The solution will need to be replaced with a vendor-supported solution in order to ensure the effectiveness of the IESO's cybersecurity posture.

System Operator

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Ministry of Energy

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Ministère de l'Énergie

Bureau du ministre

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MC-994-2022-105

February 3, 2022

Ms Lesley Gallinger
President and CEO
Independent Electricity System Operator
1600—120 Adelaide Street West
Toronto ON M5H 1T1

Dear Ms Gallinger:

I am writing to provide my concurrence of Independent Electricity System Operator's (IESO) 2022-2024 consolidated business plan ("Consolidated Business Plan"), resubmitted on December 9, 2021, and to outline my expectations for the IESO's next business plan.

I first want to thank you and the team at the IESO for your tireless work throughout the pandemic. Our electricity system is an essential service and the team at the IESO has been working day and night to keep the lights on during this trying time. On behalf of the people of Ontario I want to express our gratitude for your efforts.

The IESO also has an important role in reducing electricity system costs for electricity customers in Ontario. This aligns with our government's focus on affordability for energy consumers and putting Ontario families and businesses first. The Province supports the IESO's role in facilitating a well-functioning, reliable and clean electricity sector in Ontario. The best way to protect ratepayers is to ensure Ontario appropriately and intelligently plans for future needs.

I am pleased that the business plan reflects a reasonable revenue requirement without compromising the IESO's ability to deliver on its mandate to ensure the reliability of Ontario's electricity system. I know that the IESO will work hard to implement the strategic initiatives outlined in the business plan.

Government Expectations for the IESO's Next Business Plan

I expect the IESO will submit its next business plan in September 2022 and will work with the Ministry during its ongoing development.

.../cont'd

-2-

The IESO should always act in the best interests of Ontarians by being efficient, effective and providing value for money to electricity customers. I expect the next business plan will elaborate on how it meets these government priorities:

- a) Competitiveness, Sustainability and Expenditure Management
- b) Transparency and Accountability
- c) Risk Management
- d) Workforce Management
- e) Data Collection
- f) Digital Delivery and Customer Service
- g) Diversity and Inclusion
- h) COVID-19 Recovery

Ministry staff will provide details of the expectations in this regard.

In addition to these government-wide priorities, I expect the IESO business plan to provide updates on:

1. Progress with market renewal, electricity planning, the development of a competitive framework for electricity resource procurement and the development of a competitive transmission procurement process.
2. Progress with execution on government priority initiatives discussed in the Consolidated Business Plan, including those outlined in my letters to the IESO dated October 7, 2021 and November 10, 2021.
3. Progress on addressing barriers to the full participation of energy storage and enabling existing resources to provide services in the IESO-administered markets which they cannot, or cannot fully, currently provide.
4. Mid-term review of the 2021-2024 electricity conservation and demand management program framework to consider updated electricity system and customer needs.
5. Cybersecurity, climate resilience and the integrity of the grid.
6. Collective bargaining and alignment with broader government priorities on broader public sector compensation.

I recognize that work to implement a new three-year concurrent approvals process for the IESO's business plans is ongoing. I am supportive of these efforts. I understand the new approvals process would potentially be implemented for the IESO's next business plan to be submitted in 2022.

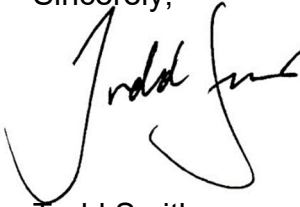
This letter constitutes my approval of the Consolidated Business Plan and the budget for 2022 in accordance with my authority under subsection 24(2) of the *Electricity Act*, 1998 and as provided under the current MOU between the IESO and the Ministry dated May 15, 2017.

.../cont'd

-3-

Thank you for the Consolidated Business Plan and for the good work of the IESO and its staff. Please accept my best wishes.

Sincerely,

A handwritten signature in black ink, appearing to read "Todd Smith", with a long horizontal stroke extending to the right.

Todd Smith
Minister

c: Joe Oliver, Chair, Board of Directors, IESO
Stephen Rhodes, Deputy Minister of Energy
David Donovan, Chief of Staff to the Minister of Energy
Dominic Roszak, Deputy Chief of Staff and Director of Stakeholder Relations,
Minister's Office, Ministry of Energy
Karen Moore, Assistant Deputy Minister, Ministry of Energy

1 **2021 ANNUAL REPORT AND AUDITED FINANCIAL STATEMENTS**

2 **TO BE FILED AT A LATER DATE**

REVENUE REQUIREMENT AND USAGE FEE METHODOLOGY

The IESO's revenue requirement is a fixed amount approved by the OEB. The IESO usage fees are established using the revenue requirement and a forecast of withdrawals from the IESO-Controlled Grid, embedded generation and exports. The IESO develops its proposed revenue requirement, and calculates its usage fees, both domestic and export, by following the steps below.

Business Planning Cycle

The Business Plan establishes the IESO's proposed revenue requirement. The annual business planning cycle begins with an operating environment assessment that identifies key business drivers and industry trends. The IESO takes these inputs and moves into the strategic planning phase. The strategic planning phase involves a review and validation of existing strategy to confirm its continued relevance, or a refresh of the strategy to take into account changes in the business or industry environment. The strategic planning phase has a five year outlook that establishes the IESO's key strategies, strategic objectives, and priority initiatives, which are found in the 2022-2024 Business Plan (Business Plan).

Once the strategy has been confirmed, the IESO then moves into the divisional planning phase. Divisional planning incorporates both ongoing core requirements of business units, as well as new and incremental initiatives. Divisional planning considers staffing requirements for the business units, funding for operations and for capital projects, and ensures alignment with key strategies and strategic objectives. Following divisional planning, the IESO develops the three year operating and capital budgets which are included in the Business Plan and submitted to the Minister of Energy for approval.

Revenue Requirement

The IESO is requesting a 2022 revenue requirement of \$201.5 million, compared to \$191.8 million in 2021, that will allow the IESO to invest in the people, tools and processes that underpin the reliable and cost-effective provision of electricity in the province and will ensure that Ontarians' expectations of an efficient and resilient electricity system continue to be met. The IESO's revenue requirement is provided in Table 1 below.

Table 1: IESO's Revenue Requirements (\$ millions)

	2021 OEB Approved	2022 Budget
Revenue Requirement	191.8	201.5

Charge Determinants

The domestic usage fee is calculated using the most recent IESO forecast of withdrawals for use in Ontario, less estimated losses, plus generation embedded in local distribution networks.

The export usage fee is calculated using the most recent forecast of exports. Line losses are split between export and domestic customers based on their proportion of the total forecast energy volumes. The domestic forecast for the line losses calculation does not include generation from embedded generation as energy from embedded generation is not transmitted through the IESO-Controlled Grid and, as such, does not yield transmission losses.

See Exhibit C-1-1 Attachment 1 – Load and Forecast Volumes, for inputs used to calculate the usage fee.

Cost Allocation Model and Calculation of the Usage Fees

The final step is the calculation of the domestic and export usage fees based on the inputs noted above. The IESO's OEB approved fees for domestic and export customers are calculated for the IESO by Elenchus using a model developed in 2016 and approved through the IESO's Revenue Requirement Submission proceedings to allocate costs between these two customer classes. This allocation assigns the costs to the appropriate customer class based on functional categories (business unit and department).

To calculate the 2022 usage fee, the IESO requested Elenchus to rerun its model using the Business Plan and energy forecast as described above.

See Exhibit C-2-1 – 2022 Revenue Requirement and Usage Fees, for additional information on the 2022 usage fee.

2021 Review of Cost Allocation Model

In the OEB's Decision and Order in EB-2020-0230, the OEB approved the settlement proposal in which the IESO made the following commitment related to conducting a review of the cost allocation model:

"The IESO will conduct a review of the cost allocation model that is used to derive the IESO's Usage Fees and file the results of this review, including any proposed changes, in the IESO's next Revenue Requirement Submission."

Elenchus conducted a review of the cost allocation model in 2021 to ensure continued alignment with regulatory principles and practices, and to evaluate the alignment of the IESO's current organizational structure with the charge allocators used in the model (see Exhibit G-1-1 Attachment 5 – IESO Cost Allocation Methodology Review). The report describes the methodology used in the cost allocation model, changes to the model since it was created in 2016, and the allocators used for each IESO business unit. Elenchus reviewed the overall methodology and selection of allocators. The primary consideration in developing the methodology was adhering to the cost allocation principle of assigning costs on the basis of cost causality. Elenchus's review concluded that the IESO's cost allocation and usage fee methodology remained reasonable.

Risks

The IESO's forecasts of its revenues and operating expenses include risks associated with forecasting uncertainty (e.g. exchange rate, change in total demand, COVID-19 pandemic). The IESO's expenses and revenues are forecast based on both the experience of IESO staff and the best information available when the Business Plan was developed. The Business Plan was submitted to the Minister on December 9, 2021 and approved by the Minister on February 3, 2022. The IESO strives to reduce uncertainty in the inputs in order to make the resulting Business Plan as robust as possible. As the Business Plan is being developed, some of the potential risks to the IESO may be anticipated but not quantifiable, while others are simply not known.

- 1 Along with the risks to the revenue requirement noted above, the IESO also faces a number of
- 2 key strategic and operational risks in achieving the organization's strategic objectives. For a list
- 3 of these key risks, see Exhibit B-1-2 – 2022-2024 Business Plan.

2022 REVENUE REQUIREMENT AND USAGE FEES SUBMISSION

2022 Revenue Requirement

As outlined in Exhibit C-1-1 – Revenue Requirement and Usage Fee Methodology, the IESO calculates its usage fee by determining its revenue requirement and then applying the charge determinants. The IESO's 2022 revenue requirement is based on the 2022-2024 Business Plan (Business Plan) approved by the Minister of Energy. In the Business Plan, the IESO proposes a 2022 revenue requirement of \$201.5 million. See Table 1 below:

Table 1: IESO's 2021 Revenue Requirement (\$ millions)

	2021 OEB Approved	2022 Budget
Revenue Requirement	191.8	201.5

The IESO's proposed 2022 revenue requirement is described in Exhibit B-1-2 – 2022-2024 Business Plan, Exhibit D-1-1 – OM&A Overview and Exhibit D-1-2 – Business Unit Detail, and attachments.

Charge Determinants (domestic and export usage fees)

The domestic usage fee is calculated using the most recent forecast of withdrawals in 2022 for use in Ontario, less estimated losses, plus generation embedded in local distribution networks. The export usage fee is calculated using the most recent forecast of exports in 2022, less estimated losses. The calculation of line losses is split between export and domestic customers based on their proportion of the total 2022 forecast energy volume, as shown in Table 2 below. The domestic forecast for the line losses calculation does not include embedded generation as energy from embedded generation is not transmitted through the IESO-Controlled Grid and, as such, does not yield transmission losses.

Table 2: Forecast of 2022 Losses per Customer Class

	Demand, not including losses (TWh)	Total energy volumes, not including losses (TWh)	Proportion of total energy volumes	Total losses (TWh)	Resulting associated losses (TWh)
Domestic	135.0	150.9	89.5%	3.0	2.7
Export	15.9		10.5%		0.3

Total 2022 transmission losses are forecast to be 3.0 TWh. Domestic customers are allocated 89.5% of these losses, which amounts to 2.7 TWh, and export customers are allocated 10.5%, which amounts to 0.3 TWh.

The IESO proposes to calculate the two usage fees using the energy volumes as shown in Table 3 below.

Table 3: Calculation of Associated Energy Volumes for 2022 Usage Fees

	Domestic (TWh)	Export (TWh)
Demand forecast	135.0	15.9
Embedded generation	7.1	
Domestic transmission losses	-2.7	
Exports transmission losses		-0.3
Energy Volumes	139.4	15.6
Total Energy Volumes	155.0	

Calculation of the Usage Fees

The IESO's OEB approved fees for domestic and export customers were calculated for the IESO by Elenchus Research Associates Inc. (Elenchus) using a model that allocates costs between the domestic and export customer classes. This model was reviewed in 2021 as described in Exhibit C-1-1 Revenue Requirement and Usage Fee Methodology. The Elenchus model calculated the domestic and export usage fees as shown in Table 4 below:

Table 4: 2022 IESO domestic and export usage fees as calculated by Elenchus

	Usage Fee
Domestic	\$1.3329/MWh
Export	\$1.0126/MWh

Implementation of the 2022 Usage Fees

On November 23, 2021, the IESO filed a letter with the OEB to request that the IESO's 2021 usage fees be made interim from January 1, 2022 until the end of the month in which the IESO receives OEB approval of its 2022 usage fees. On December 2, 2021, the IESO received OEB approval that the 2021 usage fees will be in effect as interim fees until final 2022 usage fees are approved by the OEB.

The IESO requests approval of a domestic usage fee of \$1.3329/MWh and export usage fee of \$1.0126/MWh to be paid commencing January 1, 2022. Once OEB approval of the IESO's 2022 usage fees, the IESO proposes to charge (or rebate) market participants the difference between the 2022 IESO usage fees approved by the OEB and the interim usage fees they paid on the approved effective date, if any, based on their proportionate quantity of energy withdrawn until the end of the month in which OEB approval is received for the 2022 usage fees. Any such charges (or rebates) will be provided in the next billing cycle following the month in which OEB approval is received.

OTHER FUNDING AND FEES

Reliable Integration Fee

As set out in Exhibit A-1-2 – 2022 Submission, the IESO is requesting approval to charge proponents a fee for the activities the IESO undertakes to reliably integrate new or modified facilities to the IESO-Controlled Grid (ICG).

When new facilities are connected to the ICG, or existing facilities are modified, the IESO performs work initiated by the proponents to ensure the operability and reliability of the ICG are maintained. This work includes connection assessments and work to ensure reliable integration:

- Connection Assessments: Assess the potential impact of a new or modified facility through System Impact Assessments (SIAs) and optional Technical Feasibility Studies (TFSs). Planned connection of new facilities and modifications to existing facilities must be assessed to identify and mitigate any potential adverse effect on the reliability of the integrated power system.
 - The IESO currently undertakes this work for a connection applicant on a cost recovery basis as outlined in the Market Rules.
- Reliable Integration: Ensure that facilities meet prescribed requirements and update the IESO's systems, processes and procedures to reliably integrate those new or modified facilities.
 - The costs associated with these activities are currently socialized through the IESO's usage fees (i.e., not charged directly to individual proponents).

The IESO is seeking to expand its cost recovery activities and requests approval to charge a Reliable Integration fee at an hourly rate to proponents for the activities to reliably integrate new or modified facilities. The fee is proposed to be based on the average hourly cost of IESO labour plus overhead recovery of \$145 per hour and would be calculated based on the number of hours taken to perform the reliable integration activities. The IESO's fee proposal is consistent with the fee charged for SIAs and optional TFSs.

Examples of Reliable Integration activities include:

- 1 • Ensuring that the “as built” data set supplied by the proponent is complete.
- 2 • Confirming that the SIA findings and requirements for connection that were derived
- 3 using “as planned” data are still valid for the “as built” data, and addressing any
- 4 differences.
- 5 • Validating the performance of the new or modified facility, and its associated computer
- 6 models, meet applicable requirements and integrating those models into the IESO’s
- 7 system models that are used for planning and operations of the ICG.
- 8 • Updating existing system operating limits (SOLs) or deriving new SOLs to account for
- 9 the presence and operation of the new or modified facility.
- 10 • Integrating the new or modified facility into the IESO’s market systems, including
- 11 registration of a new market or program participant, or making modifications to the
- 12 registration of an existing market or program participant.

13 The IESO’s objective for this cost recovery proposal is to reduce cross-subsidization by
14 identifying and recovering the costs directly attributable to a proponent seeking to reliably
15 integrate its new or modified facilities into the ICG.

16 In making this request, similar to its other cost recovery activities, the IESO was guided by the
17 principle of cost causality, where the proponent that triggers the costs is directly charged for
18 those costs. The IESO considered the materiality of costs, confirming that the administrative
19 burden of charging the costs would not be greater than the costs recovered from the
20 proponent.

21 The IESO focused on transparency and has made efforts to ensure that proponents have clarity
22 on how the costs they are incurring are calculated and will be charged to them. As part of the
23 development of this proposal, the IESO conducted a stakeholder engagement session on July
24 22, 2021, under the name “Cost Recovery for Integrating System Changes” that 39
25 stakeholders attended. Following the stakeholder engagement session, the IESO invited
26 stakeholders to provide comments and feedback on the materials. Stakeholders submitted
27 questions on whether activities related to the Market Renewal Program are within the purview
28 of this proposal, and how the quality of information provided to the IESO relates to the costs of
29 integrating system changes. The IESO received written feedback from two stakeholders,
30 Ontario Power Generation and the Power Workers Union. Feedback was provided on invoice

1 timing, the application of fees for various types of activities (e.g., fixed rate vs. hourly rate),
2 and any special considerations to be made for proponents. The IESO's materials, feedback of
3 stakeholders and the IESO's response to that feedback are available on the IESO's website.¹
4 Integration costs vary significantly with the size of the facility and the complexity of its
5 connection. Similar to the forecast for the Connection Assessment fee, the recovery of these
6 IESO costs is variable and dictated by the scope and number of market participant requests.
7 However, the IESO anticipates the costs recovered for the Reliable Integration fee would be
8 consistent with the amounts recovered by its Connection Assessment fees. Implementation of
9 this change is expected to be phased-in during late 2022 or early 2023 following OEB approval
10 of the fee and the required updates to the Market Manuals.

¹ Cost Recovery for Integrating System Changes Engagement Webpage: <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Cost-Recovery-for-Integrating-System-Changes>

OM&A OVERVIEW

OM&A Overview

The IESO's operating budget funds business units and initiatives that ensure the reliability of Ontario's power system, through the operation of the electricity grid, governance of the electricity markets, preparedness for the future availability of electricity when and where it is needed, and helping inform decisions that will be critical to shape the future of the sector.

The IESO has maintained its revenue requirements at similar levels since 2017, absorbing \$14 million of inflation and collective agreement impacts by deferring investments in processes, tools and workspaces, and by finding efficiencies. The IESO now needs to move forward on key initiatives that are critical to maintaining its core operations, to continue modernizing Ontario's electricity sector, and to address various government initiatives including a pathway to decarbonization in the electricity sector.

The IESO continues to carefully review all expenditures and will find efficiencies where possible. Investments are needed for initiatives in support of the future of the sector and in the people, tools and processes that underpin the reliable and cost-effective provision of electricity in the province. The IESO business unit budgets and their associated work are set out in Exhibit D-1-2 – OM&A Business Unit Detail. The OM&A amounts for 2021 and 2022 are provided in Table 1 below.

Table 1: OM&A Costs 2021-2022 (\$ Millions)

2021 OEB Approved	2021 Actual	2022 Budget
175.2	174.3	186.5

The main drivers for the year over year variances are discussed below and can be found in Exhibit D-1-1 Attachment 2 – OM&A Cost Driver Table (Appendix 2-JB).

2021 Actual vs 2021 OEB Approved Budget

OM&A expenses in 2021 were \$0.8 million below the OEB approved budget, driven by \$1.2 million savings from lower telecommunications spend as work from home conditions continued and from computer services contract savings; \$0.9 million lower than planned consulting spend, a better than planned exchange rate for the Canadian dollar resulting in \$0.7 million savings

from North American Electric Reliability Corporation (NERC) and Northeast Power Coordinating Council (NPCC) membership costs; and \$0.6 million lower external support requirements for the Market Renewal Program (MRP) market rule amendments. These savings were partially offset by \$1.4 million in one-time employee costs (severance, overtime, increased liability from lower vacation usage); \$1.4 million for unplanned legal and consulting costs related to key initiatives; and \$0.4 million from higher employee benefit costs.

Table 2: 2021 OM&A Expenses

(\$ Millions)	2021
OEB Approved OM&A Expenses	175.2
Other one-time employee costs	1.4
Legal and consulting costs on key initiatives (unsolicited proposals, Resource Adequacy)	1.4
Higher employee benefits costs	0.4
Telecommunications, computer services/hardware/software savings	(1.2)
Various lower consulting spends	(0.9)
Favourable foreign exchange impact on NERC/NPCC membership costs	(0.7)
MRP lower external support for market rule amendments	(0.6)
Various other	(0.7)
Actual OM&A Expenses	174.3

2022 Budget vs 2021 Actual

The 2022 budgeted OM&A expenses of \$186.5 million, represent an increase of \$12.2 million from the 2021 actual results, mainly driven by \$7.2 million incremental expenses for initiatives critical to drive the transformation of Ontario's electricity sector, and to address various government initiatives including a pathway to decarbonization in the electricity sector; \$3.1 million in collective agreement escalations; \$2.2 million for various consulting and stakeholder engagement activities; an additional \$1.9 million in support of MRP work to enable a more competitive electricity marketplace and market rule and manual amendments; technology

related expenses increasing by \$1.4 million mostly related to contract price escalations; and \$1.7 million of various other items including foreign exchange impact and overhead cost recovery. These increases will partially be offset through \$4.0 million reduction of employee benefits costs, mostly driven by an actuarial update of pension liability; and \$1.3 million of one-time costs in 2021 not included in the 2022 budget.

Table 3: 2022 OM&A Expenses

(\$ Millions)	2022 Budget
Opening OM&A Expenses	174.3
Incremental costs to support key initiatives:	7.2
<i>MRP Post-go-live</i>	<i>0.5</i>
<i>Resource Adequacy</i>	<i>1.3</i>
<i>Enabling Resources</i>	<i>0.4</i>
<i>Other initiatives</i>	<i>3.7</i>
<i>Pathways to decarbonization</i>	<i>1.3</i>
Collective agreements/escalations	3.1
Various legal, audit and consulting requirements	2.2
MRP support for market rule amendments, manuals and change management	1.9
Telecommunications/computer services/Hardware/Software costs escalations	1.4
Increase in foreign exchange driving higher NERC/NPCC membership fees	0.3
Higher actual overhead cost allocation in 2021 than planned for 2022	0.2
Decreased costs of employee benefits	(4.0)
Other one-time employee costs	(1.3)
Various other	1.3
2022 Budget OM&A Expenses	186.5

Key Initiatives

The key initiatives described below involve effort from multiple business units across the IESO. Business units that are primarily responsible for key initiatives are identified in Exhibit D-1-2 – OM&A Business Unit Detail.

MRP Post-go-live

In 2022, the IESO will start preparing for the new functions (e.g. Day Ahead Market, preparing settlement ready data, facility and participant registration, network models) and services that will be added when the Market Renewal Program (MRP) is completed and placed into service. These new functions will require more oversight, enforcement activities, fixes, and the development of new tools and processes. The budget for 2022 includes additional headcount to support the new functionalities and services as these resources need to be onboarded early for training ahead of the implementation of the renewed markets.

Resource Adequacy

The Resource Adequacy framework includes a series of Minister of Energy (Minister) directed procurement initiatives¹ designed to maximize competition, secure resources based on system needs, and introduce more flexibility. The IESO initiated a medium-term Request for Proposals (RFP) in early 2022 for up to 750 MW, with a three-year commitment period beginning in 2024-2026. A longer-term RFP with a commitment period of at least seven years is expected to launch in late 2022 for at least 1,000 MW. These procurements will acquire the resources necessary to meet system needs that the IESO has forecasted beginning in 2026. The IESO will also continue to evolve and run the annual capacity auction. The budget for 2022 includes resources for additional staff, legal and technical consultants, as well as for undertaking the design and execution of procurement mechanisms.

¹ Minister of Energy January 28, 2022 Directive, "Minister Issues Directive on Procurement of Electricity Resources": <https://www.ieso.ca/-/media/Files/IESO/Document-Library/corporate/ministerial-directives/Letter-from-the-Minister-of-Energy-20220128.ashx>.

1 Enabling Resources

2 The Enabling Resources program is an integrated set of projects to enable more resources to
3 provide electricity system services that they are technically capable of providing but currently
4 cannot, or only partially, provide under current market architecture. This work will establish
5 market participation models for hybrids, storage and DERs to be in place to meet future
6 reliability needs and enable strong competition in Resource Adequacy procurements. The
7 budget for 2022 includes resources for additional staff, and technical consultants to focus
8 initially on completing a hybrid design vision to give potential proponents sufficient information
9 for the 2022 long-term RFP.

10 Other Initiatives

11 The Minister has asked the IESO to undertake several new initiatives to ensure reliability and
12 government policy priorities are met, including: taking steps toward creating a market for clean
13 energy credits², re-contracting with some small hydro and biomass generation facilities,
14 assessing barriers to energy storage, and evaluating the feasibility of several project proposals
15 submitted to the government (unsolicited proposals).³ The budget for 2022 includes resources
16 for additional staff, technical consultants and legal services necessary to support the reviews,
17 design, stakeholdering and contracting.

18 Pathways to Decarbonization

19 The Minister has asked the IESO to evaluate a moratorium on procuring new natural gas
20 generating stations and to develop a pathway to decarbonization in the electricity sector.⁴ The
21 IESO will provide this additional analysis by November 2022. This effort is currently structured
22 to support the development of a proposed pathway, but does not account for the resources

² Minister of Energy January 26, 2022 letter "IESO To Report On The Design Of A Provincial Clean Energy Credit Registry", <https://www.ieso.ca/-/media/Files/IESO/Document-Library/corporate/ministerial-directives/Letter-from-the-Minister-of-Energy-20220126.ashx>

³ Minister of Energy November 10, 2021 letter "Minister of Energy Outlines Further IESO Actions to Address Resource Adequacy": <https://www.ieso.ca/-/media/Files/IESO/Document-Library/corporate/ministerial-directives/Letter-from-the-Minister-of-Energy-MC-994-2021-717.ashx>

⁴ Minister of Energy October 7, 2021 letter "Minister Issues Letter to IESO Regarding the Future of Natural Gas Generation": <https://www.ieso.ca/-/media/Files/IESO/Document-Library/corporate/ministerial-directives/Letter-from-Minister-Gas-Phase-Out-Impact-Assessment.ashx>

- 1 needed for implementation. The budget for 2022 includes resources for additional staff and
- 2 technical consultants to undertake the analysis, design and stakeholder engagement necessary
- 3 to develop a plan to phase-out gas generation in a cost-effective and reliable way for Ontarians.

OM&A BUSINESS UNIT DETAIL

The IESO is expected to deliver its mandate through work conducted by the business units described below in this exhibit (see also Exhibit D-1-1 Attachment 3 – OM&A Business Unit Table (Appendix 2-JC)).

Table 1: Summary of OM&A for Business Units

IESO Business Unit (\$ millions)	2021 Budget*	2021 Actual	2022 Budget
Markets & Reliability	36.2	36.0	35.9
Planning, Conservation and Resource Adequacy	18.5	18.9	21.8
Corporate Relations, Stakeholder Engagement and Innovation	12.7	12.9	15.0
Information and Technology Services	43.1	40.9	43.3
Legal Resources and Corporate Governance	24.3	25.6	28.2
Market Assessment and Compliance Division	1.3	1.3	1.3
Chief Executive Office	3.1	3.0	3.1
Corporate Services	26.3	26.5	26.5
Human Resources	4.5	4.9	5.0
Corporate Adjustment	1.6	1.5	1.2
Market Renewal Program	3.6	3.0	5.2
Total OM&A Expenses	175.2	174.3	186.5

*Restated to reflect organizational changes implemented in Q4-2021: the Planning, Acquisitions and Operations business unit was split between the Markets & Reliability, and Planning and Conservation & Resource Adequacy business units; and the Energy Efficiency division was transferred from the Policy, Engagement & Innovation business unit to the Planning, Conservation & Resource Adequacy business unit, prompting a change in naming of the original business unit to Corporate Relations, Stakeholder Engagement and Innovation; and the NERC Membership costs were transferred from the Corporate Relations, Stakeholder Engagement and Innovation to the Legal Resources and Corporate Governance business unit (see Exhibit D-1-2 Attachment 1 – Organizational Charts).

Markets & Reliability (M&R)

M&R is responsible for the reliable and efficient operation of the Ontario power system and the administration of Ontario's real-time wholesale electricity market, including near-term planning, market development, assessments of connections to the grid, leading the sector emergency preparedness and response, and publishing the Annual Acquisition Report.

IESO Business Unit (\$ millions)	2021 Budget*	2021 Actual	2022 Budget
Markets & Reliability	36.2	36.0	35.9

2021 actual results were \$0.2 million lower than budget, mainly due to a delay in Market Surveillance Panel recommendations work (\$0.5 million), and various lower consulting spend (\$0.3 million) offset by \$0.6 million of one-time employee costs (overtime and severance).

M&R's budgeted costs are \$35.9 million in 2022, this is aligned to 2021 actual results, as the impact of \$1.2 million of incremental resources to support key initiatives (Pathways to decarbonization and MRP Post-go-live) is offset by further transfer of resources to the Planning, Conservation and Resource Adequacy business unit to improve the alignment of functions (\$0.7 million), and one-time 2021 employee costs not budgeted to repeat (\$0.6 million).

Planning, Conservation and Resource Adequacy (PCRA)

PCRA is responsible for the IESO's forward looking reliability efforts, including power system planning, publishing the Annual Planning Outlook, resource procurement, and energy efficiency programs.

IESO Business Unit (\$ millions)	2021 Budget*	2021 Actual	2022 Budget
Planning, Conservation and Resource Adequacy	18.5	18.9	21.8

The increase of \$0.4 million in 2021 compared to budget is primarily driven by one-time employee costs.

PCRA's budgeted costs are \$21.8 million in 2022. This is \$2.9 million higher than 2021 actual results mainly driven by \$2.6 million incremental resources in support of key initiatives (Pathways to decarbonization, unsolicited proposals, Resource Adequacy) and the transfer in of resources from the M&R business unit (\$0.7 million); partially offset by \$0.4 million of one-time 2021 employee costs not budgeted to repeat.

Corporate Relations, Stakeholder Engagement and Innovation (CRSEI)

CRSEI is responsible for stakeholder and community engagement, government affairs, communications, Indigenous relations, innovation, and the implementation of effective energy policy.

IESO Business Unit (\$ millions)	2021 Budget*	2021 Actual	2022 Budget
Corporate Relations, Stakeholder Engagement and Innovation	12.7	12.9	15.0

In 2021, CRSEI spending was \$0.2 million higher than budget, primarily due to \$0.4 million spending on research and analysis related to distributed energy resources, and \$0.2 million in various other expenses, partially offset by \$0.4 million saving from delay in hiring staff for the Vice-President's office.

CRSEI's budgeted costs are \$15.0 million in 2022, which is \$2.1 million higher than 2021 mainly due to \$1.7 million in incremental resources in support of key initiatives (Enabling Resources, creating a market for clean energy credits, pathways to decarbonization, and updating a storage study requested by the Minister of Energy) and the full year impact of new hires in the Vice-President's office (\$0.4 million).

Information and Technology Services (I&TS)

The I&TS group provides for information technology solutions & strategies, and cybersecurity management.

IESO Business Unit (\$ millions)	2021 Budget	2021 Actual	2022 Budget
Information and Technology Services	43.1	40.9	43.3

The I&TS 2021 results are \$2.2 million lower than budget mainly due to attrition and slower hirings to backfill vacancies driven by labor market conditions and hardware and software contract renegotiations resulting in costs savings.

The 2022 budgeted costs are \$43.3 million, an increase of \$2.4 million compared to 2021 due to hirings to fill vacancies and incremental telecommunication, support and maintenance costs, in addition to \$0.2 million to support the Enabling Resources program.

Legal, Resource and Corporate Governance (LRCG)

LRCG is responsible for legal services, support for the IESO Board of Directors, contract management, maintenance of Market Rules and regulatory affairs.

IESO Business Unit (\$ millions)	2021 Budget*	2021 Actual	2022 Budget
Legal Resources and Corporate Governance	24.3	25.6	28.2

2021 LRCG spending was \$1.3 million higher than budget mainly due to \$1.1 million of resources to support unplanned unsolicited proposals (Lake Erie Connector and Oneida Battery Park project), \$0.3 million in support of Resource Adequacy that was not anticipated in the budget, and \$0.6 million of various other expenses; partially offset by \$0.7 million in savings from the favourable foreign exchange on North American Electric Reliability Corporation (NERC) and Northeast Power Coordinating Council (NPCC) membership fees.

LRCG's 2022 budgeted costs are \$28.2 million, an increase of \$2.6 million compared to 2021, mainly due to \$1.4 million incremental legal resources and services in support of key initiatives (unsolicited proposals, pathways to decarbonization, creating a market for clean energy credits, biomass generation procurement and small hydro programs), \$0.8 million for higher employee matter and litigation activity, and \$0.4 million to support contract management compliance and negotiations. The 2022 budget also includes \$0.9 million of OEB fees based on the historical allocation to the IESO (see Exhibit D-1-1 Attachment 3 – OM&A Business Unit Table (Appendix 2-JC)).

Market Assessment and Compliance Division (MACD)

MACD is accountable for enforcement of Market Rules and NERC reliability standards, compliance guidance, rule interpretations & enforcement guidelines, support for the Market Surveillance Panel (MSP).

IESO Business Unit (\$ millions)	2021 Budget	2021 Actual	2022 Budget
Market Assessment and Compliance Division	1.3	1.3	1.3

2021 MACD expenses were in line with the 2021 budget and are maintained at same levels for the 2022 budget.

Chief Executive Office (CEO)

The CEO is comprised of the President and Chief Executive Officer and staff and Internal Audit, which is responsible for bringing a systematic, disciplined approach to evaluating and improving the effectiveness of controls at the enterprise and process levels to help the IESO achieve its objectives.

IESO Business Unit (\$ millions)	2021 Budget	2021 Actual	2022 Budget
Chief Executive Office	3.1	3.0	3.1

Actual 2021 and budgeted 2022 expenses are essentially flat year over year.

Corporate Services (CS)

CS is responsible for financial planning and analysis, corporate controllership, treasury and pension operations, market settlements, project management, organizational procurement and facilities management. About one third of the spending of this group is related to IESO's office lease agreements, maintenance, insurance and property taxes.

IESO Business Unit (\$ millions)	2021 Budget	2021 Actual	2022 Budget
Corporate Services	26.3	26.5	26.5

2021 expenses were \$0.2 million higher than budget due to higher than planned insurance costs and one-time employee costs; partially offset by delays in the office footprint reconfiguration project and other operating and administrative savings.

CS's budgeted costs are \$26.5 million in 2022, which is consistent with 2021 as collective agreement escalations and increased insurance costs are offset by management of vacancies and discretionary expenses. In 2022, the Risk, Performance & Resilience function is being reported as a separate function from the Corporate Finance division as this function has taken on more responsibilities to ensure the success of IESO's strategy implementation (see Exhibit D-1-1 Attachment 3 – OM&A Business Unit Table (Appendix 2-JC)).

Human Resources (HR)

HR is responsible for talent acquisition, learning and development, performance management, succession planning, compensation and benefits, employee and labour relations.

IESO Business Unit (\$ millions)	2021 Budget	2021 Actual	2022 Budget
Human Resources	4.5	4.9	5.0

HR's 2021 results were \$0.4 million higher than budget due to unplanned expenses in support of work on equity, diversity and inclusion and conducting the non-executive total remuneration benchmarking study.

The 2022 budgeted costs are \$5.0 million, which is in line with prior year spending, as impact from escalations and incremental resources in support of key business priorities is projected to be offset through management of vacancies and hiring lags.

Corporate Adjustments

Corporate Adjustments is mainly comprised of the annual amortization of the accumulated deficit resulting from the Public Sector Accounting Standards (PSAS) transition item corresponding to change in pension and other-post employment benefits; partially offset by the overhead cost recovery from other funding sources.

IESO Business Unit (\$ millions)	2021 Budget	2021 Actual	2022 Budget
Corporate Adjustment	1.6	1.5	1.2

2021 Corporate Adjustments expenses were in line with the 2021 budget.

The 2022 budget of \$1.2 million is lower than 2021 by \$0.3 million mainly driven by a write-off of a portion of an asset under construction not planned to be repeated.

Market Renewal Program (MRP)

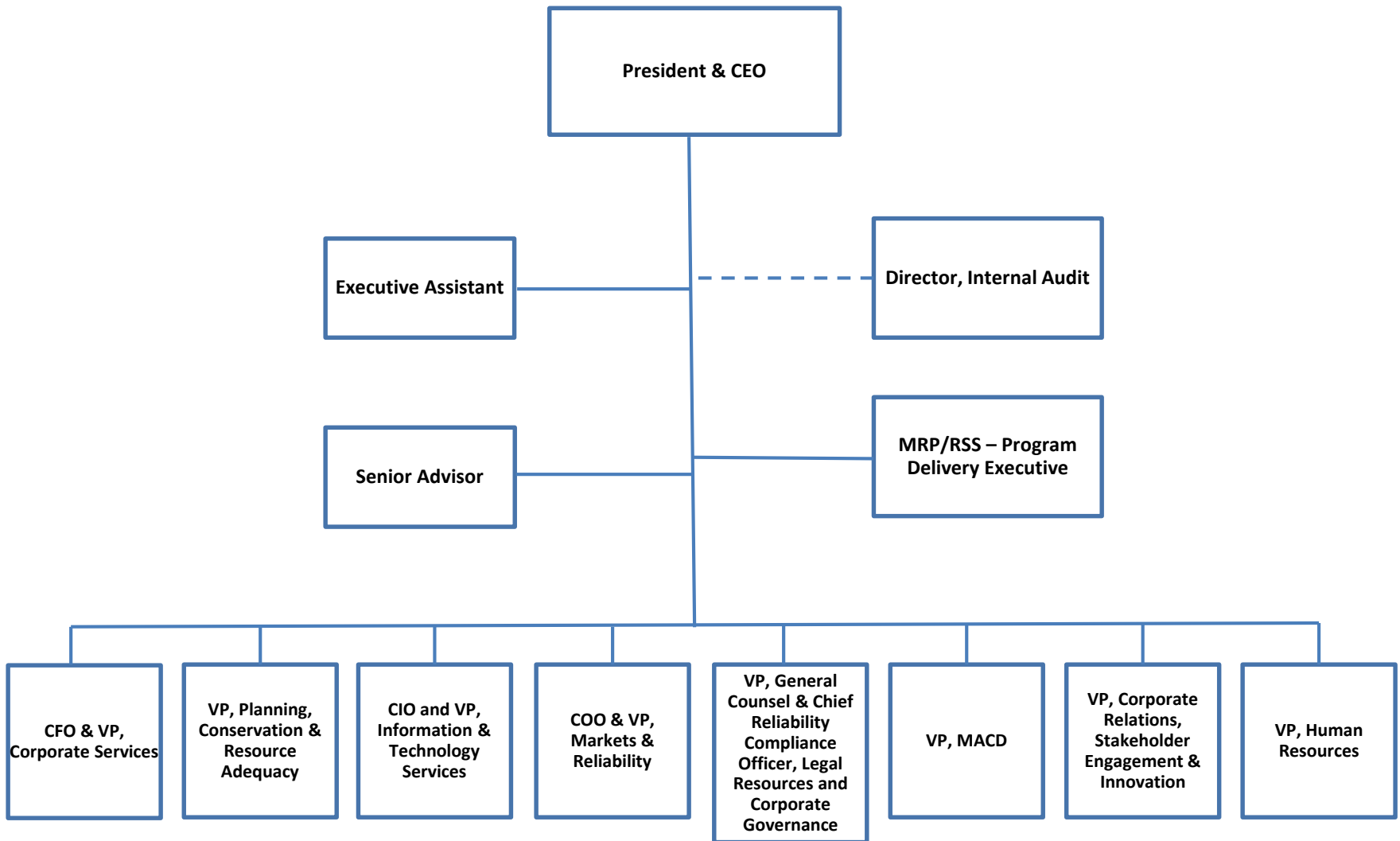
MRP represents a set of enhancements to Ontario's electricity market design, to address known issues with the existing market design and deliver ratepayer value by meeting system needs more cost-effectively. MRP is about improving the way electricity is priced, scheduled and procured in order to meet Ontario's current and future electricity needs reliably, transparently, efficiently and at lowest cost.

IESO Business Unit (\$ millions)	2021 Budget	2021 Actual	2022 Budget
Market Renewal	3.6	3.0	5.2

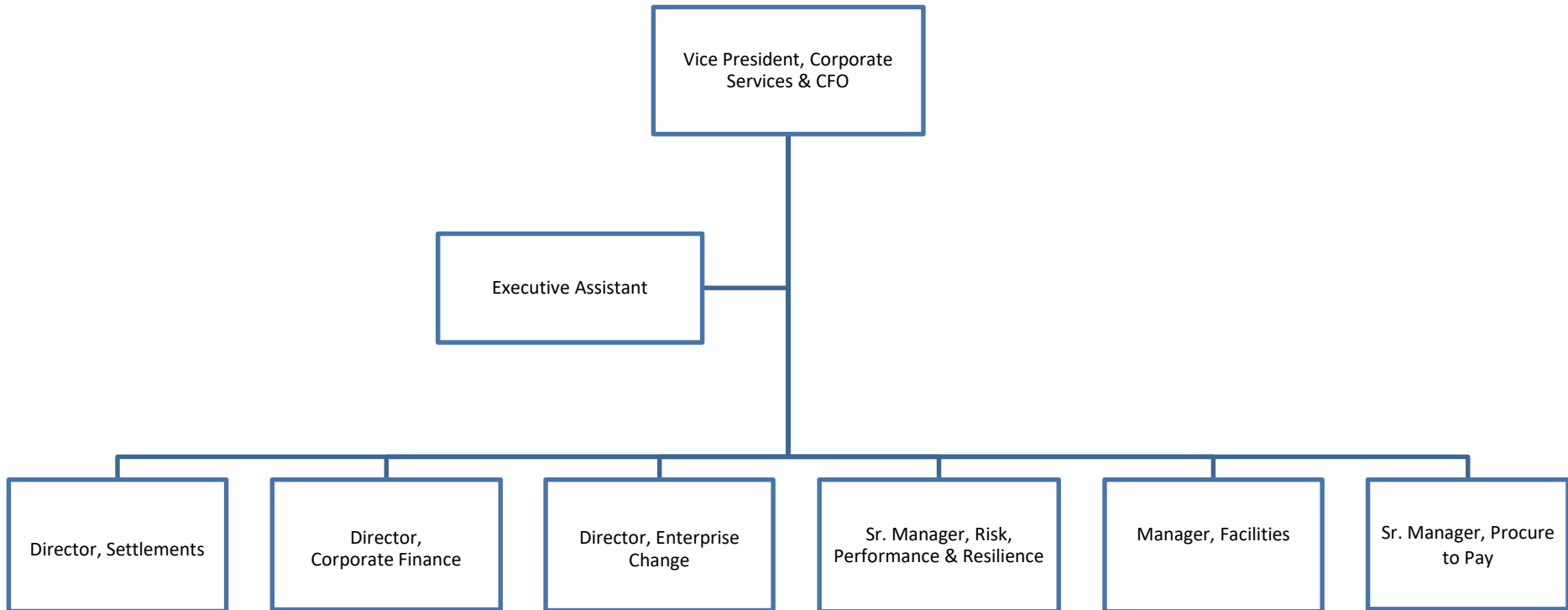
Compared to 2021 budget, MRP results in 2021 were lower by \$0.6 million driven by lower external support required for Market Rule amendments.

- 1 MRP's budgeted costs are \$5.2 million in 2022, consistent with the approved MRP Business
- 2 Case. For additional information on MRP spending, see Exhibit G-2-1 – Market Renewal Program
- 3 Cost Report.

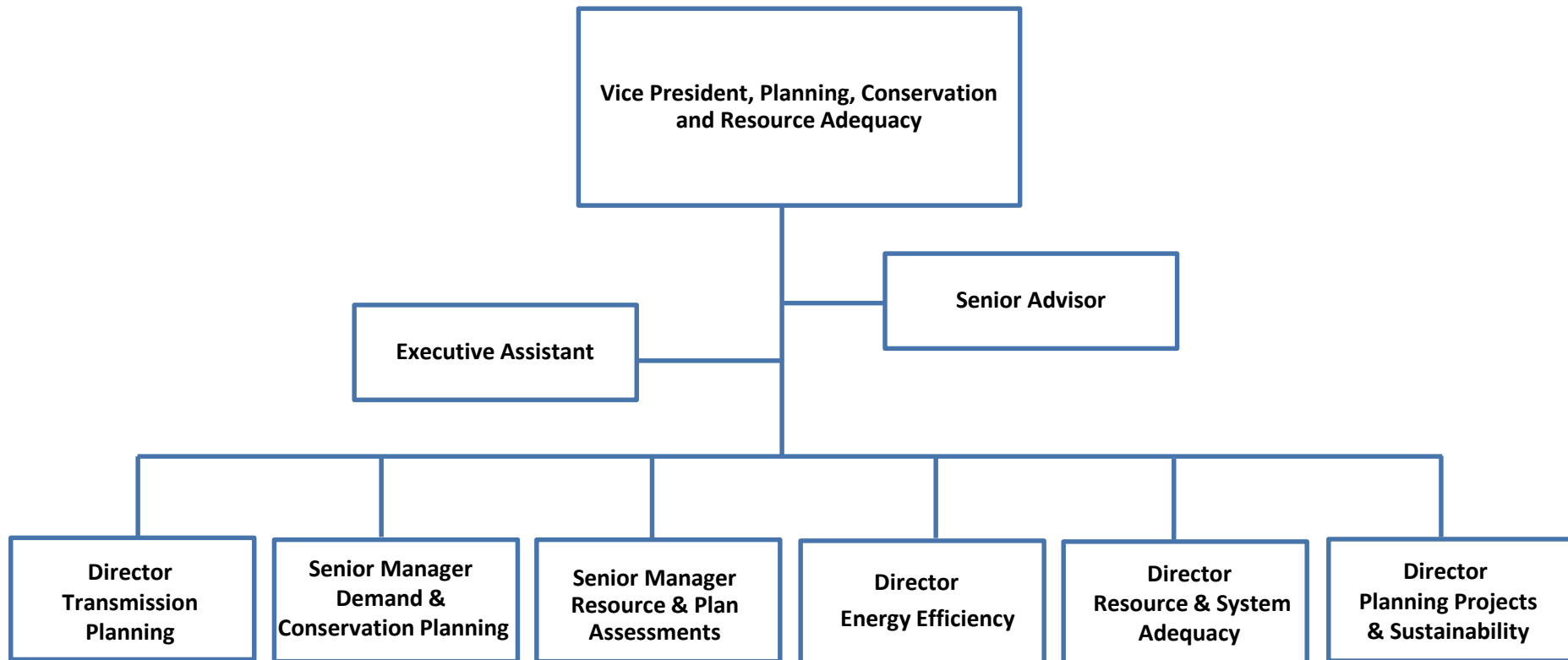
IESO



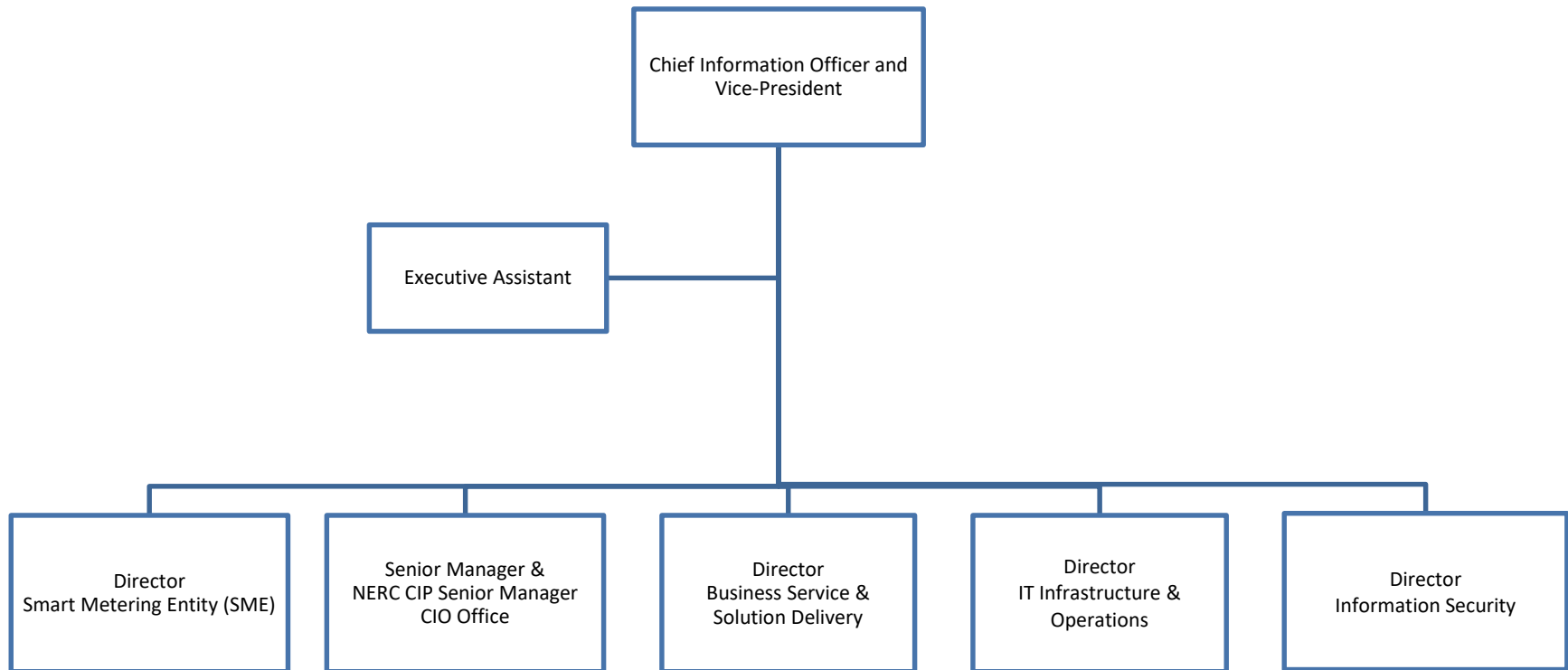
CORPORATE SERVICES



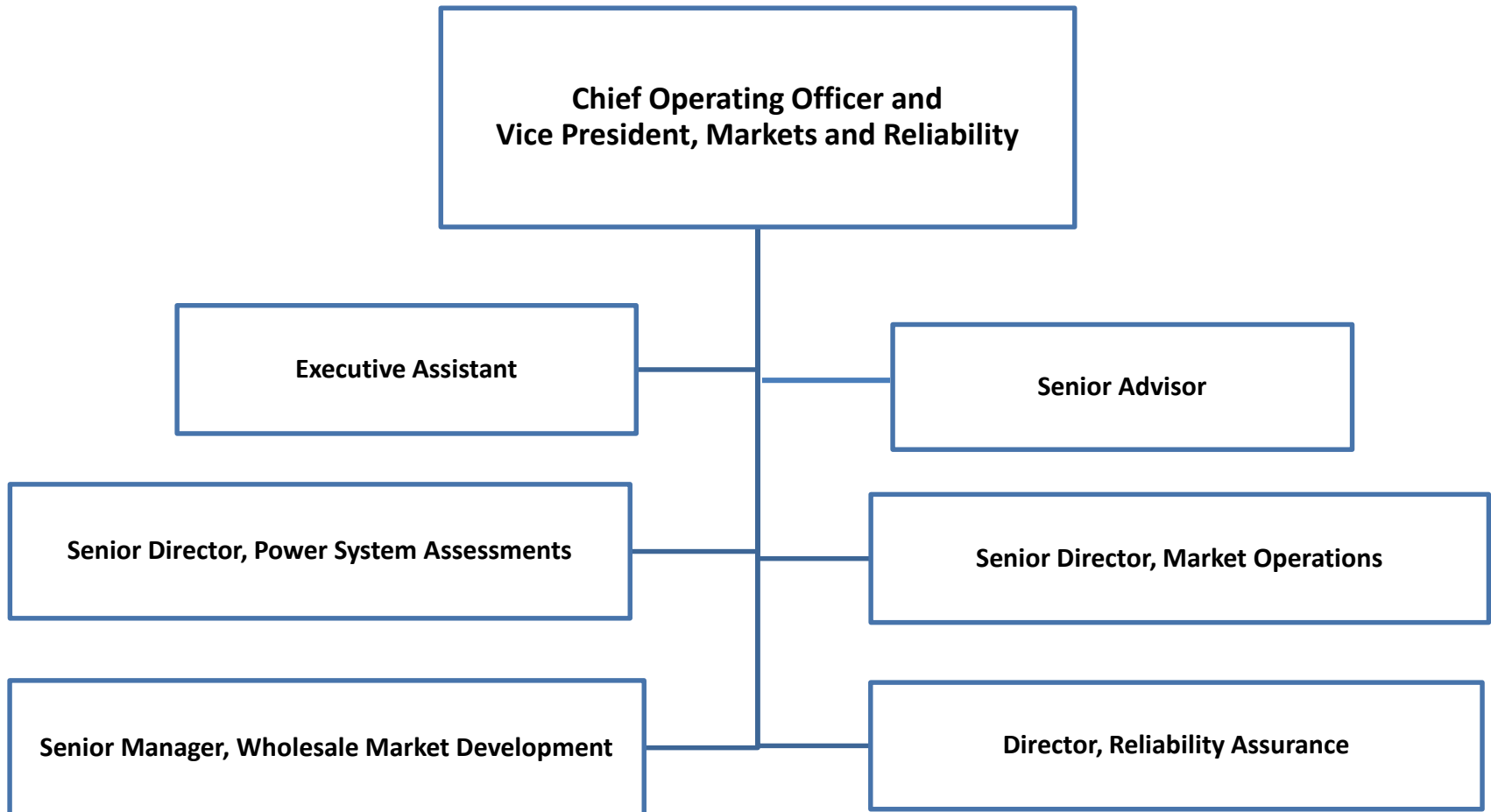
PLANNING, CONSERVATION & RESOURCE ADEQUACY



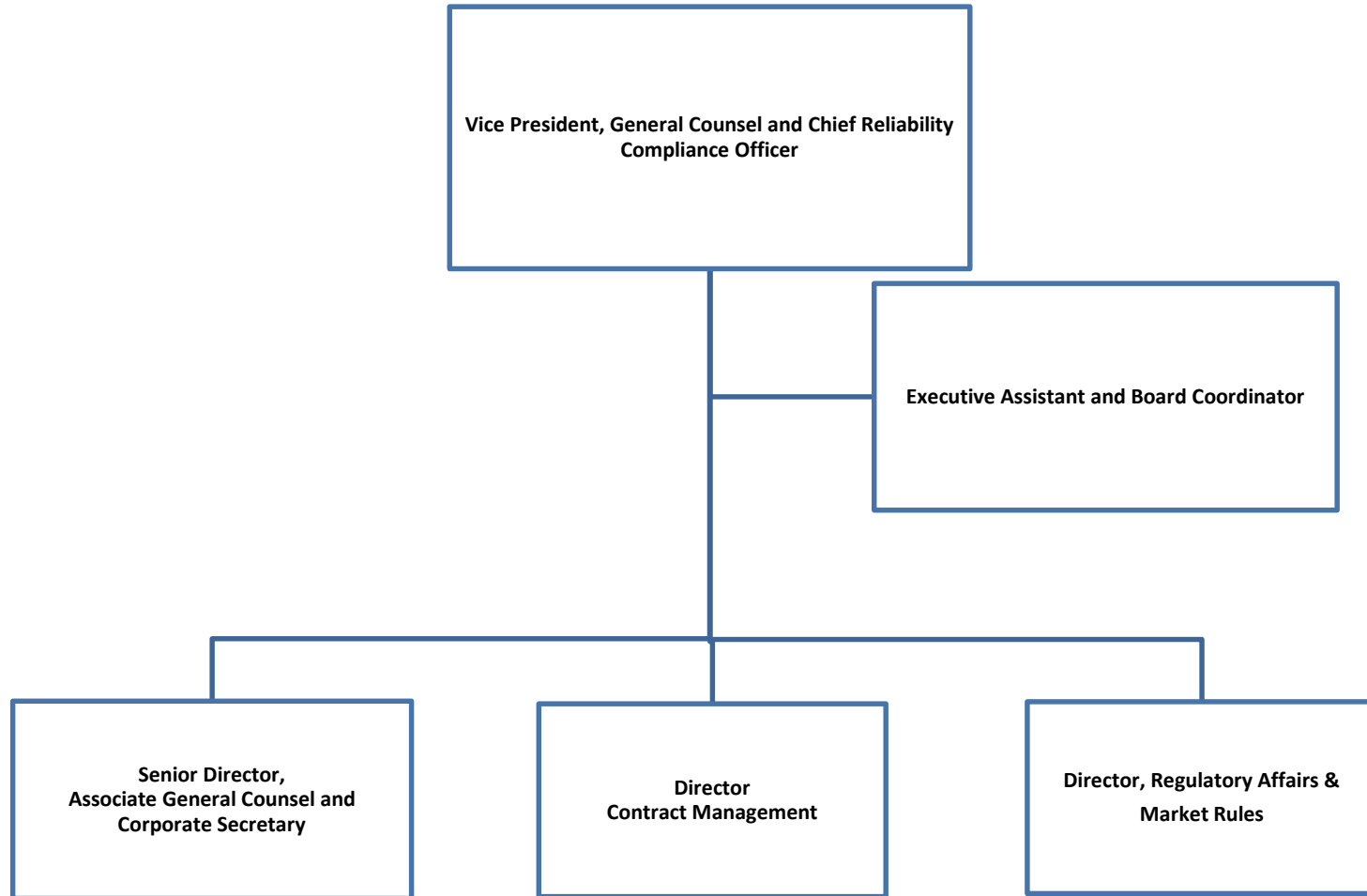
INFORMATION & TECHNOLOGY SERVICES



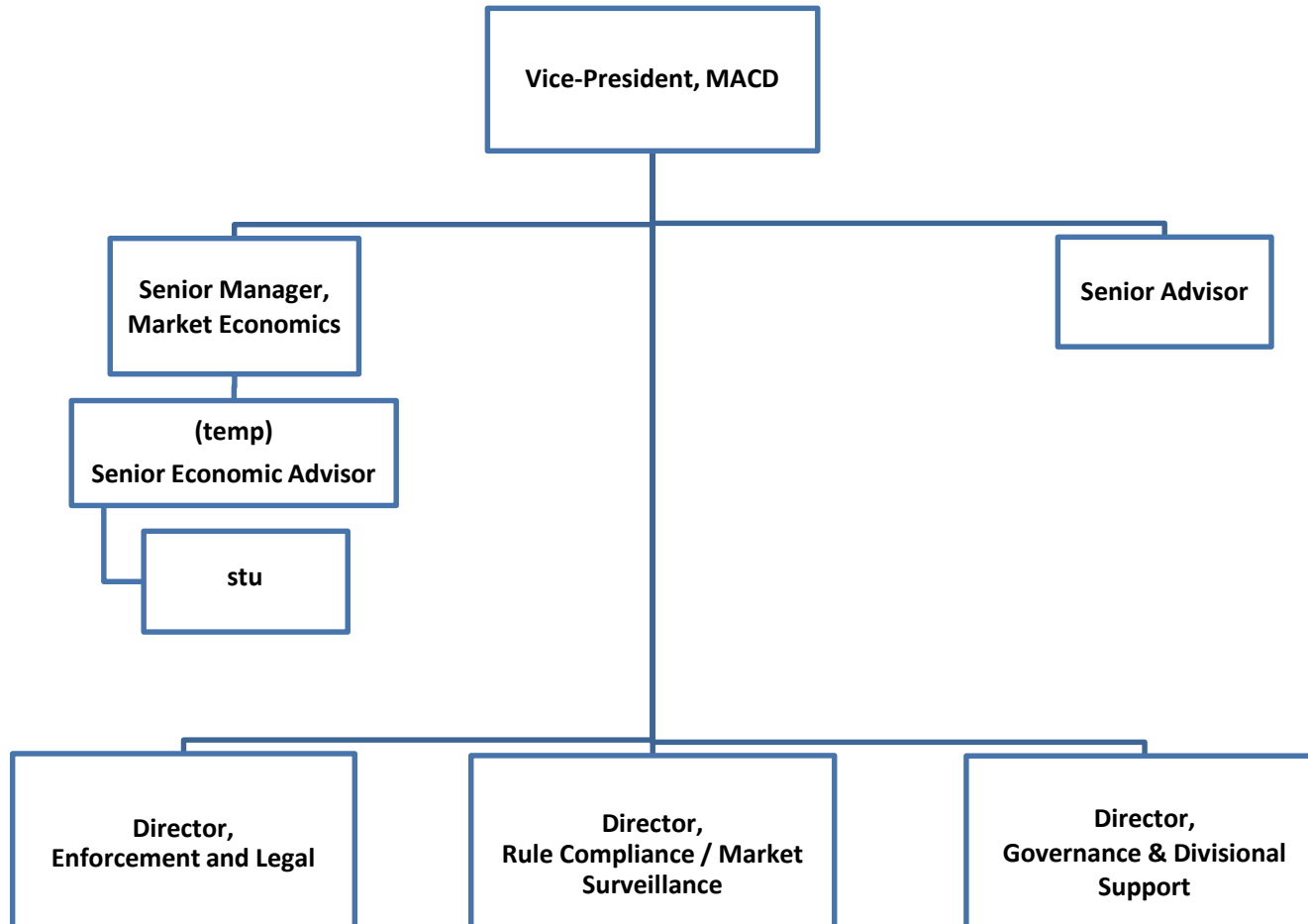
MARKETS AND RELIABILITY



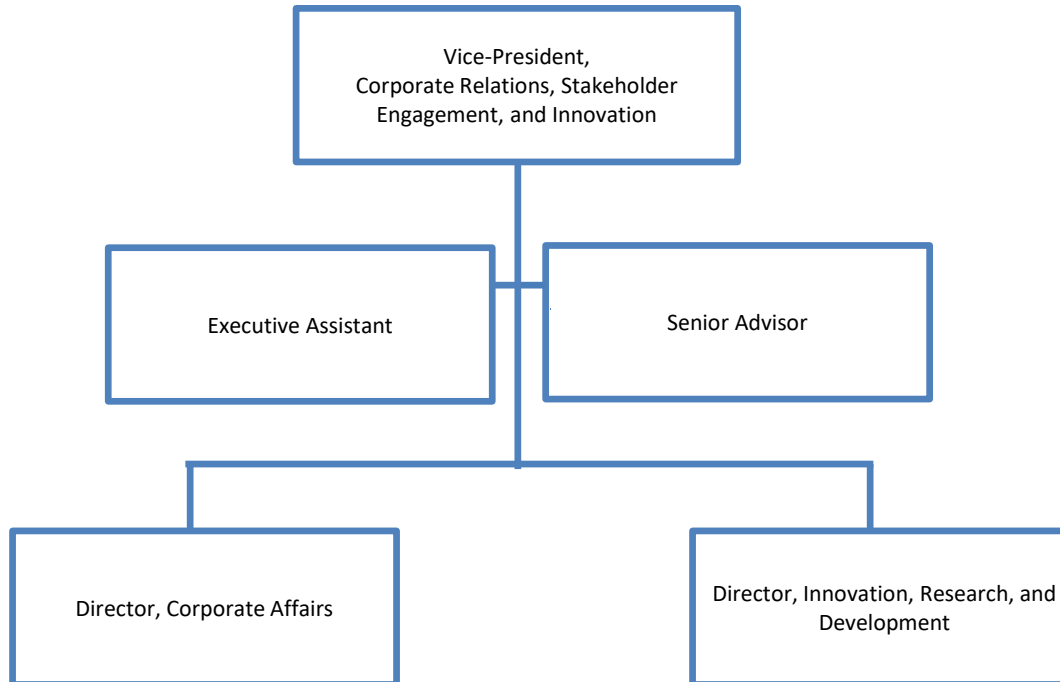
LEGAL RESOURCES AND CORPORATE GOVERNANCE



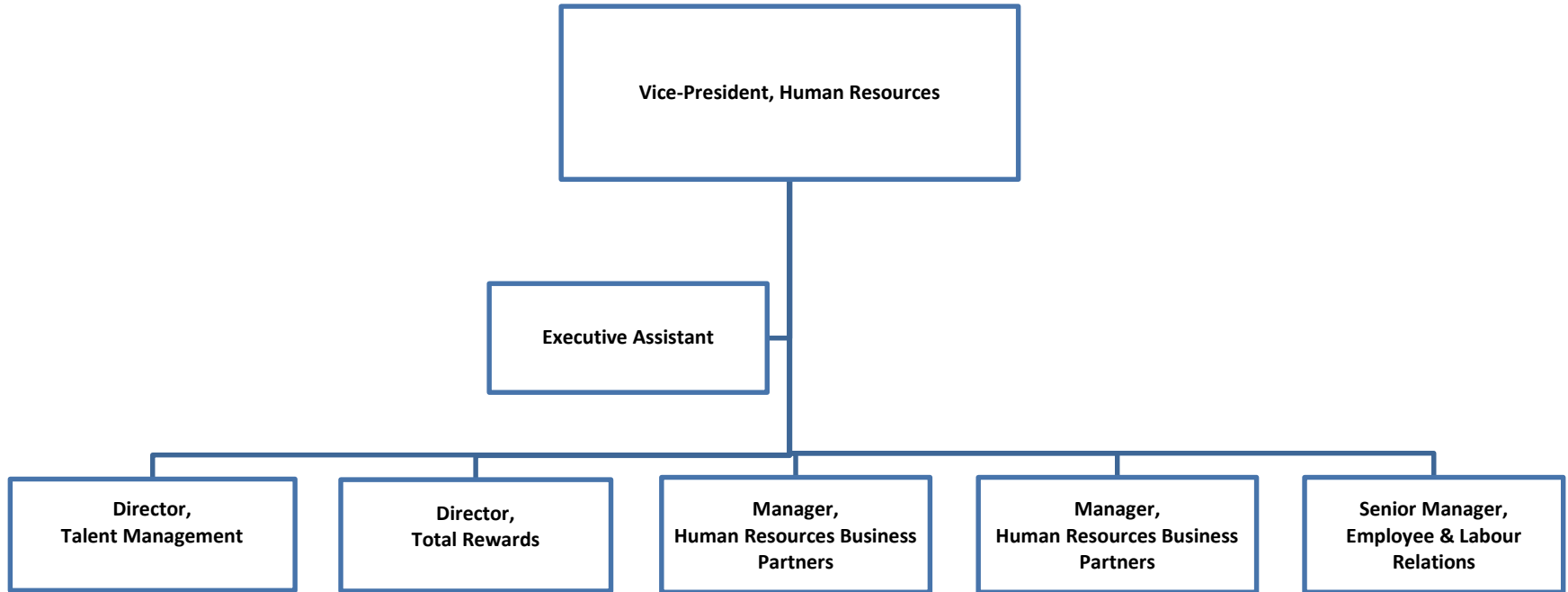
MARKET ASSESSMENT AND COMPLIANCE DIVISION



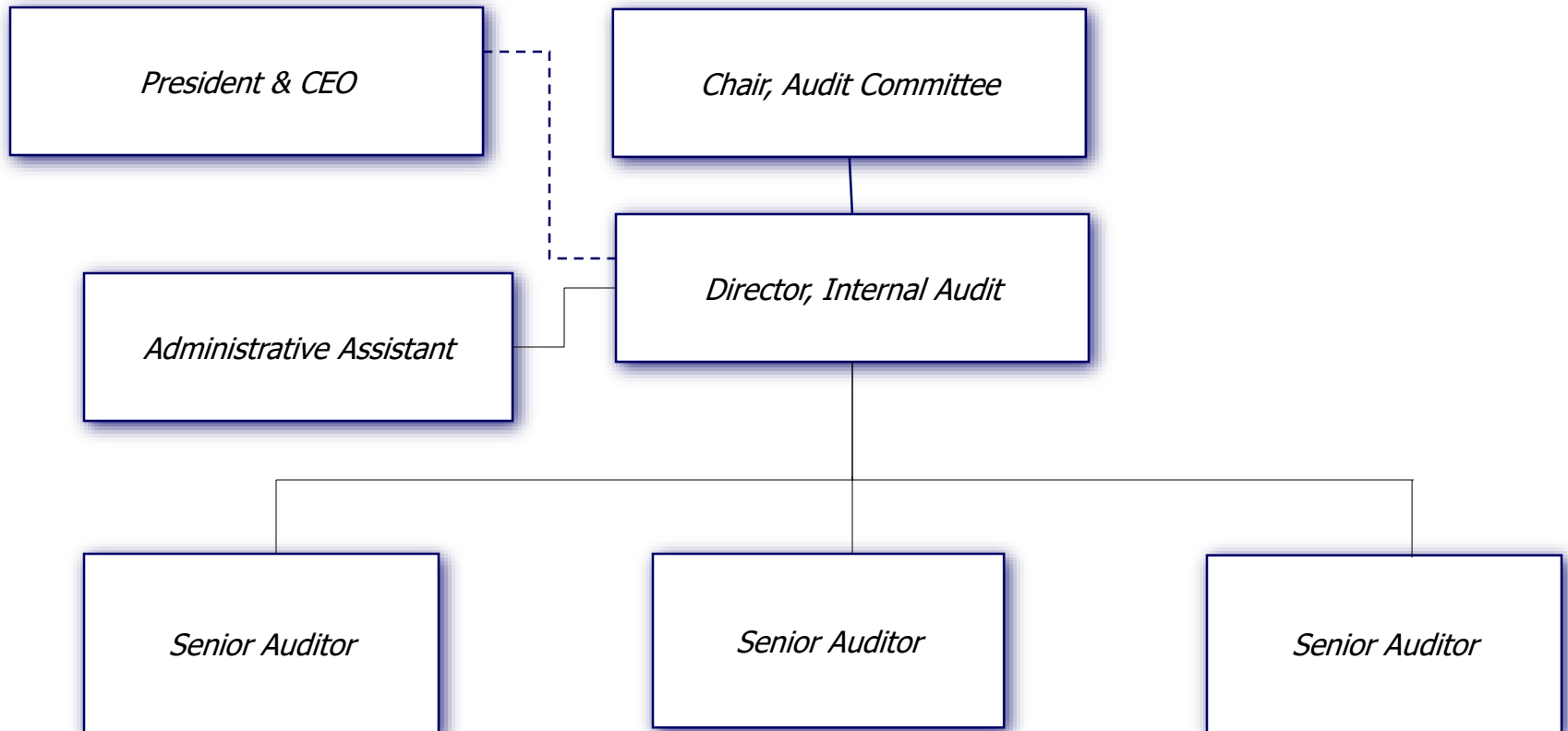
CORPORATE RELATIONS, STAKEHOLDER ENGAGEMENT & INNOVATION



HUMAN RESOURCES



Internal Audit Organization



STAFFING AND COMPENSATION

Staffing and Compensation

The 2021 average full-time equivalent employees (FTEs) of 774 was below budget levels due to staff attrition which was higher than budgeted. This staff attrition was prompted by labor market conditions related to the newly introduced hybrid work model and vaccination policy for IESO employees whereby the introduction of these policies contributed to an increase in voluntary attrition and retirements. For 2022, the IESO anticipates an average of 827 FTEs to deliver on initiatives that are critical to maintaining its core operations, to continue modernizing Ontario's electricity sector, and to address various government initiatives including a pathway to decarbonization in the electricity sector, as well as to support the Market Renewal Program (MRP). Core operations staffing levels will increase in 2022 by about 37 average FTEs compared to 2021 to ensure delivery and execution of time-sensitive key initiatives. Additionally, MRP implementation support is driving a 16 FTE increase in 2022.

Table 1: Staffing and Operating Compensation Expenses

	2021 Budget	2021 Actual	2022 Budget
Average Number of Employees (Capital and Operating expenses FTEs)			
Executive	7	7	8
Management	127	147	144
Non-Management Regular	596	570	585
Non-Management Temporary	64	51	90
Total	794	774	827
Operating expenses figures below are in \$ millions			
Total Compensation (Salary, Wages & Benefits)			
Executive and Board	4.5	4.4	4.7
Management	25.6	29.5	28.9
Non-Management Regular	89.8	88.1	89.2
Non-Management Temporary	5.4	4.9	6.7
Total	125.3	126.9	129.5

(see Exhibit D-1-3 Attachment 1 – Employee Costs (Appendix 2-K))

The increase of \$1.6 million in 2021 compensation operating expenses compared to the budget was mainly driven by unexpected expenses associated with severance, benefits and ongoing COVID-19 pandemic impacts (overtime to cover absenteeism and lower staff vacation usage).

Compensation and benefits expenses in the 2022 budget are 2% or \$2.5 million higher than 2021, due to additional FTEs required to support key business priorities (\$4.8 million), and collective agreement escalation impact (\$3.0 million). These increases are mostly offset by a pension liability actuarial update (\$4.0 million) and other lower compensation costs (\$1.3 million – mostly related to non-reoccurring 2021 severance and overtime expenses).

The IESO's attrition rate included in 2022 budget assumptions was based on the historical average of 3%, this was the rate before the increase in 2021 to an average of about 6%. The budget also includes vacancy timing adjustments such as provisions for a higher internal hiring rate and hiring lags to minimize the impact of additional resource requirements.

Employee benefits, as an expense category, are related to health and dental benefit coverage, pension plan expenses, and other (non-pension) post-employment and post-retirement benefit expenses (OPEB). 2021 actual benefit costs were approximately 37% of salary and wages, consistent with the 2021 budget assumption, and for 2022 budget this rate is projected at 31% of salary and wages. The reduction in costs in the 2022 budget reflects the IESO's actuarial provider assumption for retirement benefits plans (Registered Pension Plan, Supplemental Employee Retirement Plan and other post-employment and post-retirement benefits).

Report on Total Remuneration

In the OEB's Decision and Order in EB-2020-0230, the OEB approved the settlement proposal in which the IESO made the following commitments related to the public availability of planning data:

1. *"File an updated compensation study."*

The updated study is included at Exhibit D-1-3 Attachment 3 – Non-Executive Total Remuneration Review.

2. *"Report on progress made towards reaching the 50th percentile in total compensation."*

Mercer Canada Limited ("Mercer") was engaged to assist the IESO in conducting a Total Remuneration review for non-executives. The results from the review show positive movement towards the 50th percentile since the IESO's last review in 2018. When comparing the IESO roles to the energy sector, the IESO has improved its position as it relates to Total Remuneration by 2%. In 2018, the IESO was positioned 11% over market (50th percentile) and in 2021 is now 9% over market.

3. *"Provide a forward-looking itemized plan identifying how the IESO proposes to make progress towards reaching the 50th percentile for total compensation including incremental steps taken, or planned to be taken."*

Table 2 below provides a summary of the current and planned initiatives and negotiated changes that continue to make progress towards reaching the 50th percentile for total remuneration.

Table 2: Ongoing and Planned Efforts to Make Progress towards the 50th Percentile for Total Remuneration

Target Area	Ongoing or Planned Effort
Compensation	<p>Reduction in number of Society employees compensated above revised salary range maximum</p> <p>Through attrition, the number of Society employees paid above Step 10 of the collective agreement pay schedule, is reducing. Since January 1, 2021, 18 of 39 (46%) Society employees that have left the IESO (voluntary or involuntary) have been employees with salary rates above Step 10. Once a Society employee leaves the organization, the job is replaced with an employee with salary in line with the current pay schedule (Step 1 – Step 10).</p> <p>New Hire compensation is based on years of relevant experience. Savings will vary based on the salary rate of the exiting employee and that of the individual replacing them.</p>
Compensation	<p>Cap economic annual increases</p> <p>Bill 124 titled "<i>Protecting a Sustainable Public Sector for Future Generations Act, 2019</i>", places a 1% cap on across-the-board</p>

	<p>economic increases upon expiry of any Collective Agreements, for a three-year moderation period.</p> <p>The Power Worker’s Union (PWU) Collective Agreement expired as of April 1, 2020. Through collective bargaining, the PWU salary increases were set at 1% for the April 1, 2020 to March 31, 2021 period (one-year contract). The IESO is currently in negotiations for the contract beginning April 1 2021.</p> <p>Society’s Collective Agreement expired as of December 31, 2021. The IESO and Society engaged in collective bargaining in 2021 which resulted in an arbitrated settlement of a 1% economic salary increase for 2022. The terms of the Collective Agreement are in place for 2022 and will expire as of December 31, 2022.</p>
Compensation	<p>Guidelines and oversight</p> <p>Negotiated salaries follow a predetermined set of guidelines and best practice principles. These guidelines restrict the amount of compensation that can be applied to the various requests for consideration (new hires, promotions). See Exhibit D-1-3 Attachment 2 – IESO Compensation Guides for additional information.</p>
Compensation	<p>Benchmarking surveys</p> <p>Continue to conduct compensation benchmarking surveys every 2-3 years to ensure alignment with the energy sector and the 50th percentile for non-executive total remuneration. The IESO has conducted and provided a copy of the 2022 Non-Executive Total Remuneration Review. As noted in the summary, the results from the review show positive movement towards the 50th percentile since the IESO’s last review in 2018. When comparing the IESO roles to the energy sector, the IESO has improved its position as it relates to total remuneration by 2%.</p>
Pension	<p>Negotiated plan changes, not yet implemented, that will have a positive impact on future cost containment</p> <ul style="list-style-type: none"> Effective March 31, 2025 the undiscounted early retirement rule for PWU and Society will change to reflect the Rule of 85 (age & service) from the Rule of 82. This will ensure employees have to contribute to their pensions for a longer period of time, reducing the cost burden on the IESO.

	<ul style="list-style-type: none"> Effective March 31, 2025 an averaging period of 60 months, rather than 36 months, will determine pensionable earnings for both PWU and Society.
Pension	<p>The following implemented plan provisions are amendments that continue to have a positive impact on future cost containment/sharing.</p> <ul style="list-style-type: none"> Effective September 1, 2017 the non-represented/Management employee pension contributions were increased to the current 9% up to the Year's Maximum Pensionable Earnings (YMPE) covered by the Canadian Pension Plan (CPP) and 11% above the YMPE. This increase in "employee" pension contributions in turn decreases the required employer contributions. Effective January 1, 2007 plan provisions were amended for non-represented/Management members hired on or after that date to the following: <ul style="list-style-type: none"> Averaging period of 60 months rather than 36 months for pensionable earnings; Indexation of benefits in payment of 75% of the increase in CPI with no carry forward rather than 100% of CPI with carry forward provisions; Benefits are not indexed in the deferral period for members who terminate employment prior to pension commencement eligibility; Unreduced retirement at 90 age-plus-service points rather than 84 age-plus-service points. This will ensure Management employees have to contribute to their pensions for a longer period of time, reducing the cost burden on the IESO. Effective January 1, 2017 the plan was amended to extend the changes above (60 month averaging period for earnings, 75% indexation and 90-point unreduced retirement date) to all non-represented/Management members for benefits earned for service on and after January 1, 2017. Effective Jan 1, 2020 the PWU employee pension contributions increased to 9% up to the Year's Maximum Pensionable Earnings (YMPE) covered by CPP and 11% above the YMPE aligning PWU contributions with non-represented/Management employees' pension contributions. This increase in employee

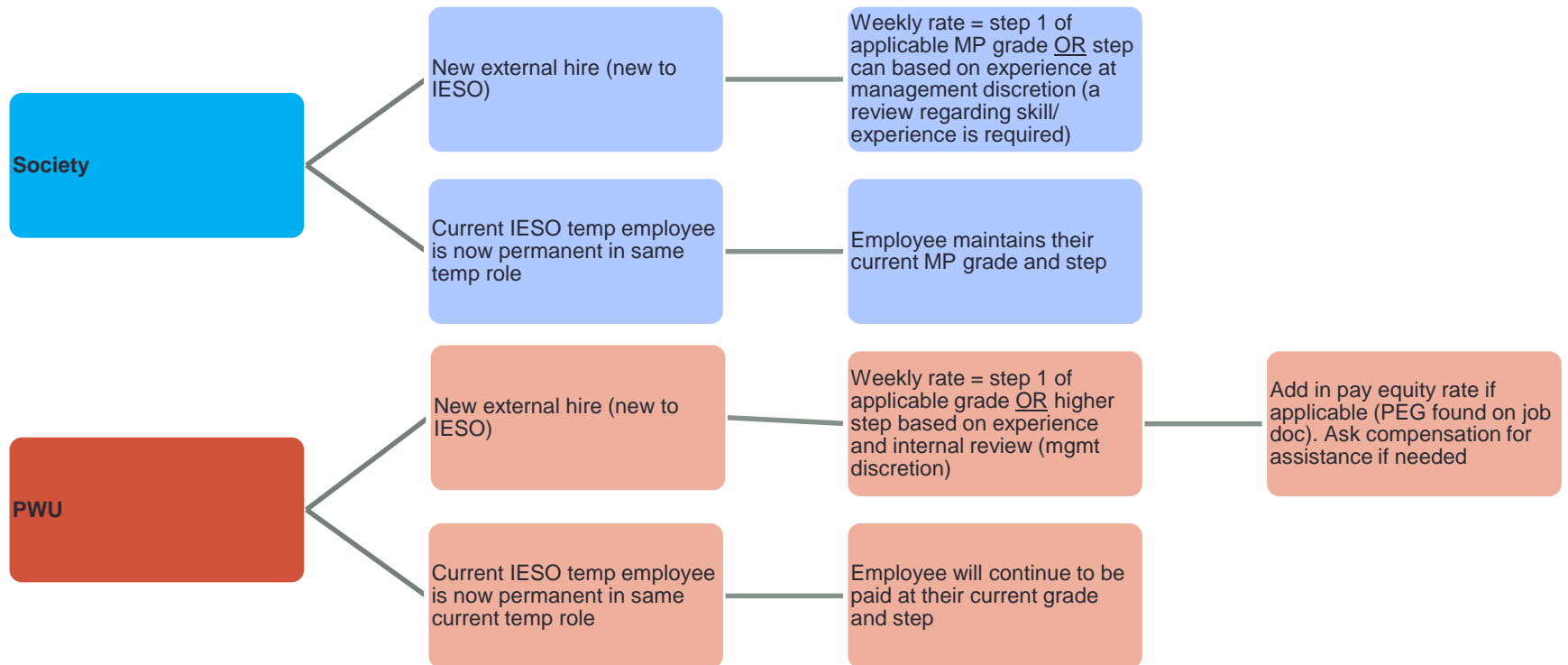
	pension contributions in turn decreases the required employer contributions.
Pension	<p>Ongoing Collective Agreement negotiation items – These pension items continue to be included as bargaining items in collective bargaining</p> <ul style="list-style-type: none"> • Society employee pension plan contributions equal to 9% up to the Year's Maximum Pensionable Earnings (YMPE) covered by CPP and 11% above the YMPE to align with PWU and non-represented/Management pension contributions. This increase in employee pension contributions would in turn decrease the required employer contributions. • Integration of new CPP Bridge formula to reflect CPP enhancement that will fully come into effect as of Jan 1, 2025. • Decrease indexing to 75% on the pension plan for both PWU and Society to align with Management. • Increasing employee pension contributions and cost-saving pension plan proposals will be tabled by the IESO as part of future collective bargaining. • Note: In the absence of a negotiated agreement between the Society and IESO, the Parties are bound to an arbitration process.
Benefits	<p>Recent negotiated benefits changes</p> <p>Society Collective Agreement – Interest Arbitration Award (Jan 1, 2019 – Dec 31, 2021)</p> <ul style="list-style-type: none"> • Eligibility for post-retirement benefits increased from 7 years' service to 10 years' service (to align with Management and PWU). • Eye exam reduction from annual to biennial coverage.
Benefits	<p>Ongoing Collective Agreement negotiation items – These benefit items continue to be included as bargaining items.</p> <p>Plan Design changes to reduce future benefit costs</p> <ul style="list-style-type: none"> • Decrease Long Term Disability (LTD) indexing to 75% for all employees (align with pension indexing). • Change the "Own Occupation vs. Any Occupation" definition of disability for LTD.
Benefits	Remarketing of the IESO Group Insurance Benefit – 2022

	<ul style="list-style-type: none"> Negotiate cost savings strategies through insurance remarketing.
Benefits	<p>Implementation of preventative measures in support of employee wellness</p> <ul style="list-style-type: none"> Provide employees and leaders with Centre for Addition and Mental Health (CAMH) led training on managing mental health Provide Employee and Family Assistance Program (EFAP) services as well as online wellness video library/education/tools that support health and wellness Through a dedicated page on the IESO intranet site, provide resources on wellness and mental health. This page is regularly updated and promoted throughout the IESO.
Culture and Values	<p>Continue to focus on initiatives that support engagement, productivity and help retain and attract a diverse workforce</p> <ul style="list-style-type: none"> Ongoing embedding of the IESO Values Ongoing recognition of employee accomplishments through the Employee Recognition Program Ongoing embedding of the Learning and Development Framework Ongoing focus on the action plan in support of the Equity, Diversity and Inclusion Strategy Labour Relations Strategy that continues to recognize the principles of aligning total remuneration to the 50th percentile

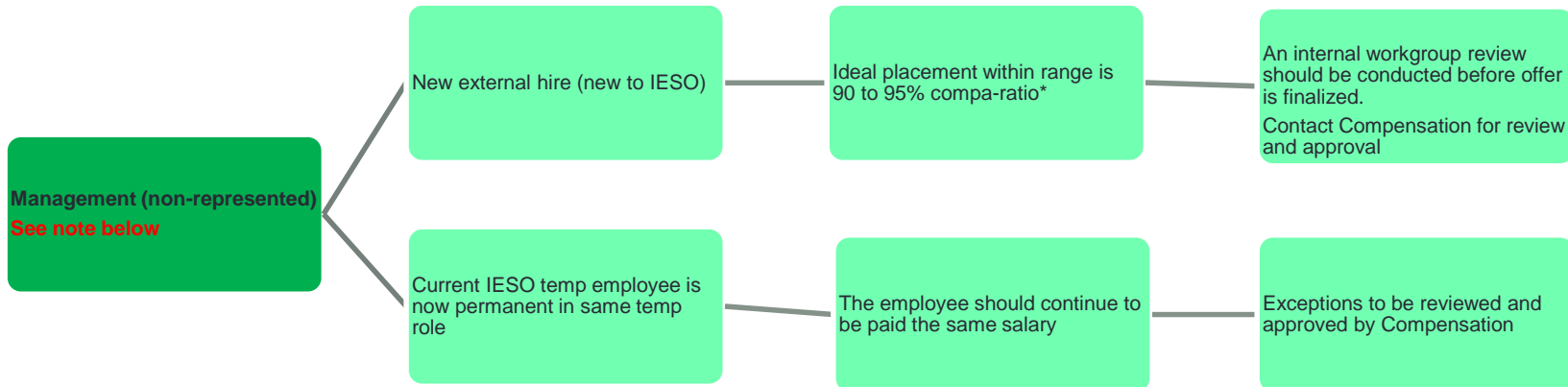
IESO COMPENSATION GUIDELINES

- **Management (non-represented)**
- **Society**
- **PWU**

External New Hires and Conversions from Temp to Permanent (same role) - Society & PWU -



External New Hires and Conversions from Temp to Permanent (same role) - Management -



Important note regarding rounding

Once the weekly rate has been calculated by dividing the annual salary by 52 and rounding to the nearest penny, it is important to multiply that rate once again by 52 to determine if the result is greater or less than the annual salary stated in the offer letter. If the resulting annual salary is less than that stated in the offer letter, a penny should be added to the weekly rate. This will ensure that the annual salary amount is equal or greater than that stated in the offer letter

Example:

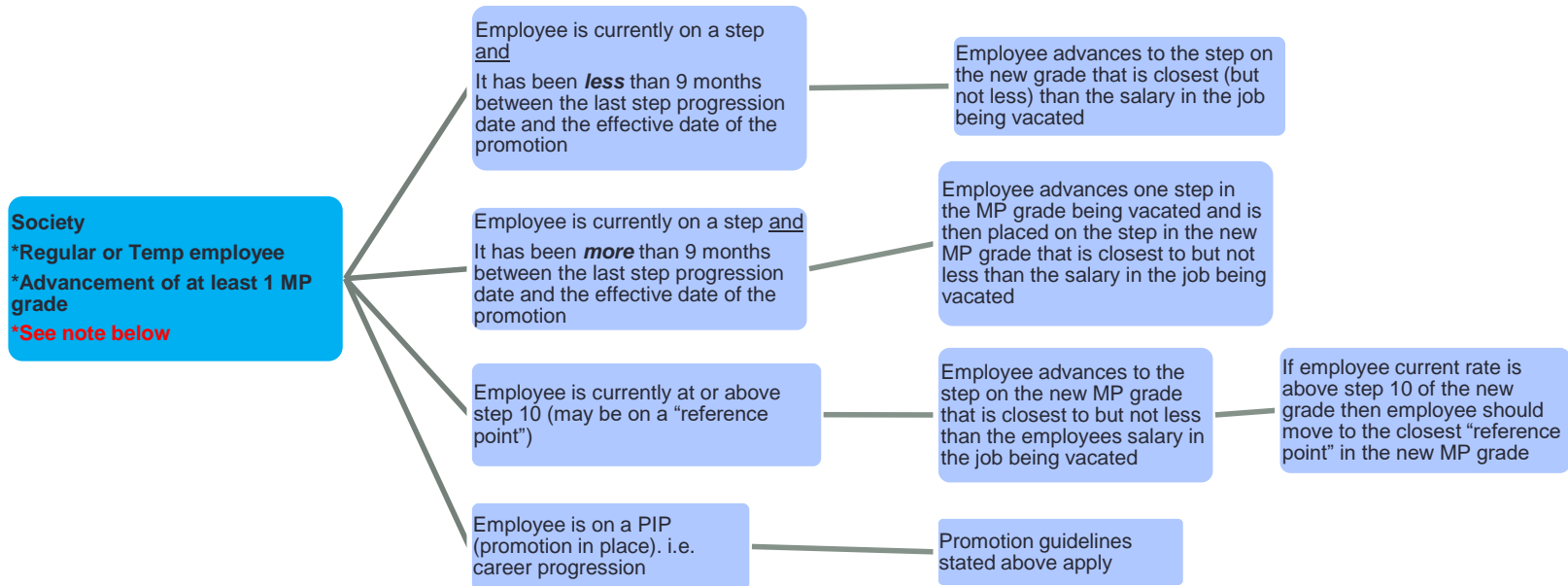
The employee offer letter states that the annual salary = \$125,600. When the salary is divided by 52 to determine the weekly rate it equals \$2415.384. Using rounding rules this would now equal \$2415.38 weekly

Issue = since the employee's weekly rate is entered in SFs, the annual salary amount may be greater or less than what is stated in the offer. This is a result of rounding.

In the example above - \$2415.38 weekly multiplied by 52 weeks = \$125,599.76. This is now less than the annual salary stated in the offer letter. Therefore a penny should be added to the weekly rate (\$2415.39) and multiplied by 52. Result is now \$125,600.28.

Promotions

- Society -



NEW! 3% Rule

If the above promotion results in a base salary increase of less than 3.00%, the following shall apply:

(a) Employees on the Step Schedule (steps 1 through 10) at the Time of Promotion

The employee shall receive a 3.00% salary increase and will be placed off-schedule.

On the employee's first progression date following the promotion, the employee will be placed on the step in the new position that is closest to but not less than the employee's off-schedule salary. Where such placement on-schedule results in the employee receiving a salary increase of less than 1.35%, the employee will be advanced to the next highest step.

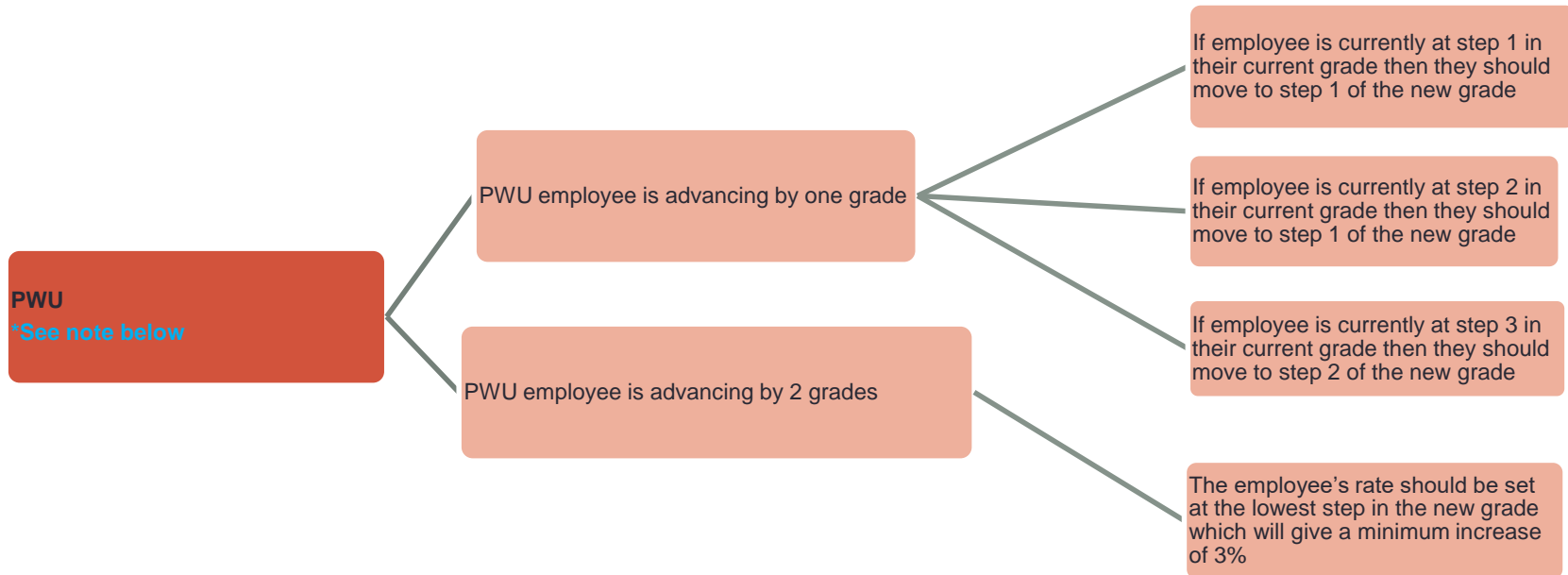
(b) Employees on a Reference Point (101 to 115) at the Time of Promotion

The employee shall receive a 3.00% salary increase to their base rate in the lower-rated position and then placed on the reference point in the higher-rated position that is equal to or greater than the employee's base salary in the lower-rated position plus the 3.00% increase.

Where a 3.00% increase results in the employee being placed on the step schedule, the promotion treatment in (a) applies.

(c) Progression date will change based on anniversary date of new position

Promotions - PWU -



NEW! 3% Rule

If the above promotion results in a base salary increase of less than 3.00%, the following shall apply:

The employee shall receive a 3.00% salary increase and will be placed off-schedule. This interim rate will continue in effect until the next pay anniversary date at which time the employee will resume his/her place on the current salary schedule. This rate will be the next step in the salary grade which guarantees an increase of at least one and one half percent (1.5%) from the interim rate.

Promotions - Management -

**Management
(non-represented)**
See note below

Typically 5-10% increase
and target placement in
new Band is 90 – 95%
compa-ratio*

Contact Compensation
for review and approval
(internal equity review is
required)

Important note regarding rounding

Once the weekly rate has been calculated by dividing the annual salary by 52 and rounding to the nearest penny, it is important to multiply that rate once again by 52 to determine if the result is greater or less than the annual salary stated in the offer letter. If the resulting annual salary is less than that stated in the offer letter, a penny should be added to the weekly rate. This will ensure that the annual salary amount is equal or greater than that stated in the offer letter

Example:

The employee offer letter states that the annual salary = \$125,600. When the salary is divided by 52 to determine the weekly rate it equals \$2415.384. Using rounding rules this would now equal \$2415.38 weekly

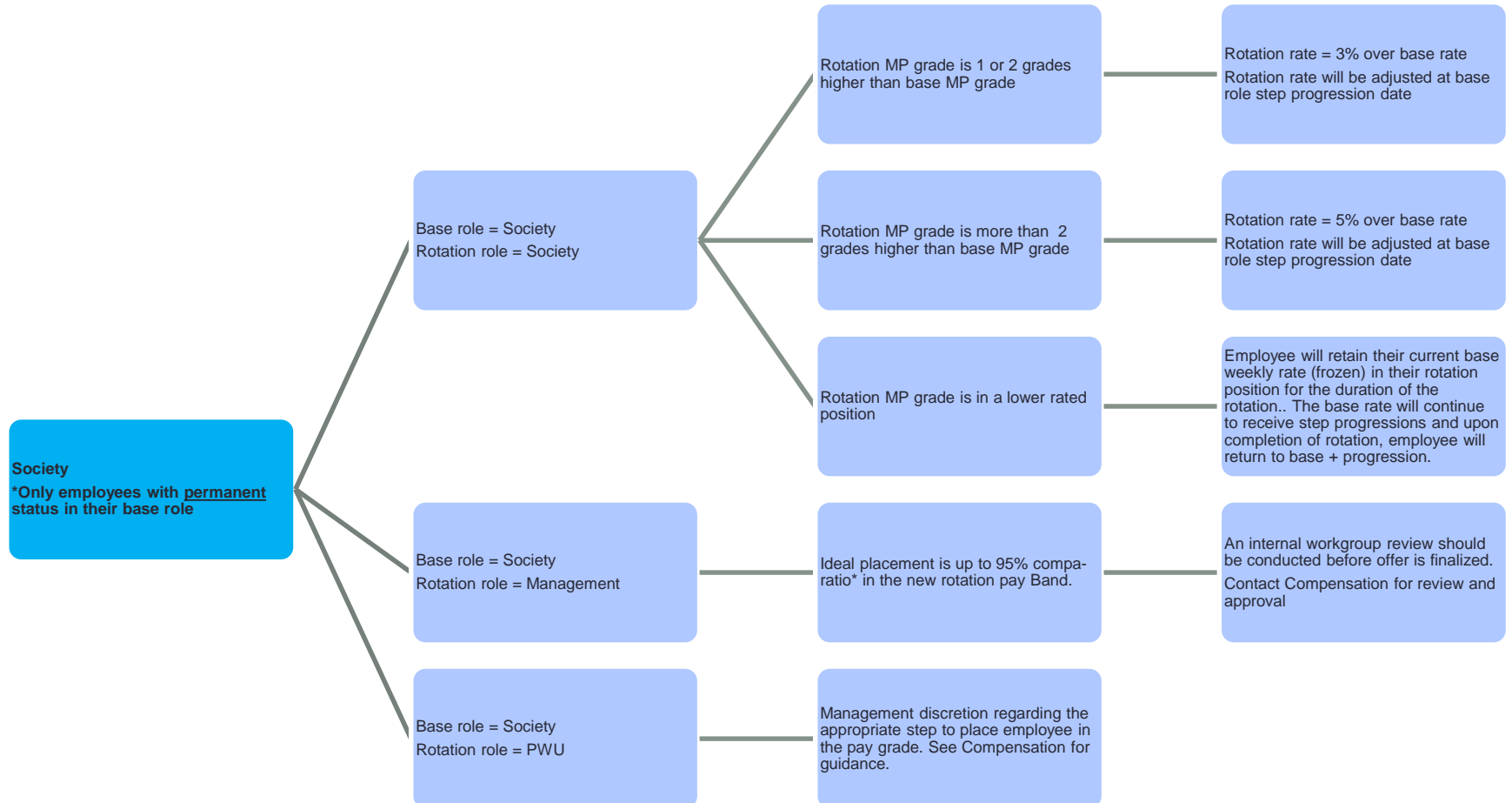
Issue = since the employee's weekly rate is entered in SFs, the annual salary amount may be greater or less than what is stated in the offer. This is a result of rounding.

In the example above - \$2415.38 weekly multiplied by 52 weeks = \$125,599.76. This is now less than the annual salary stated in the offer letter.

Therefore a penny should be added to the weekly rate (\$2415.39) and multiplied by 52. Result is now \$125,600.28.

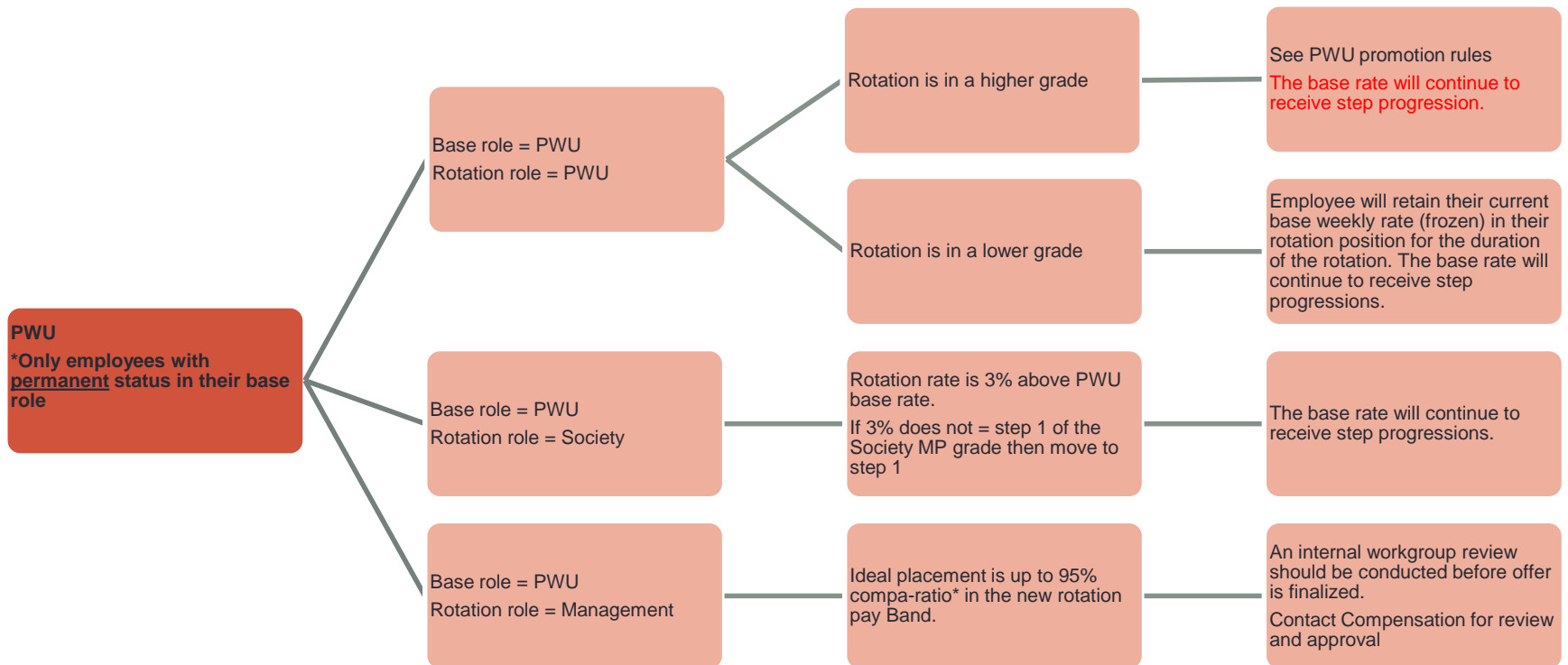
Rotations (temporary assignments)

- Society -



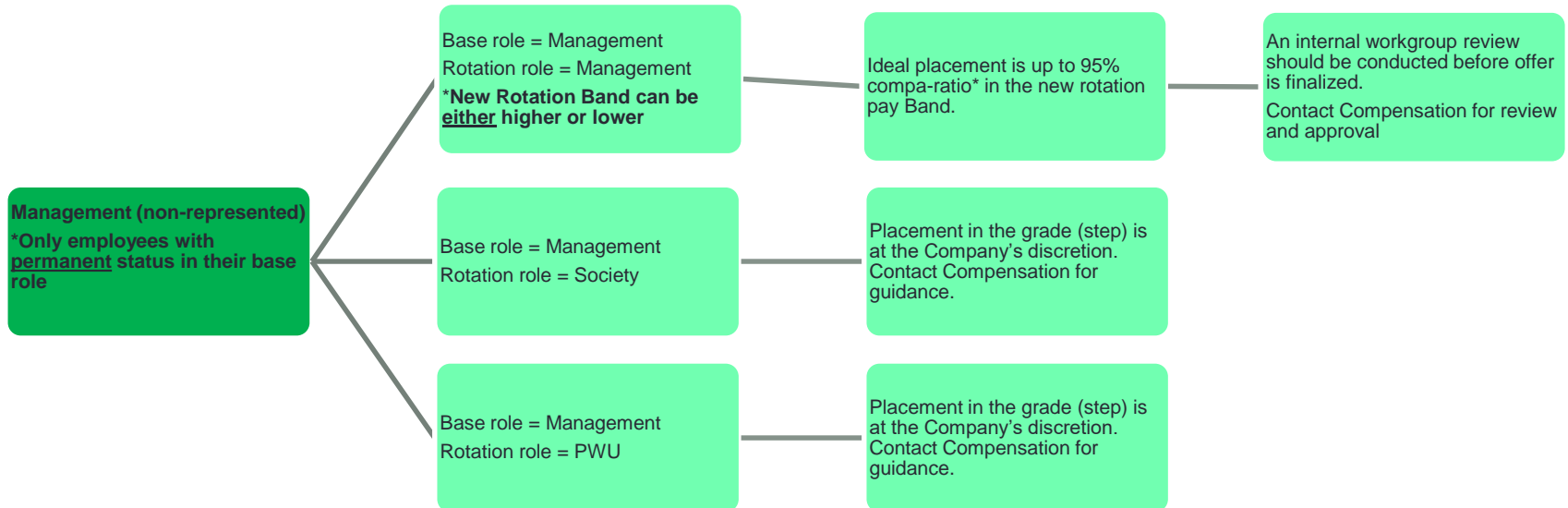
*compa-ratio = salary divided by Band midpoint

Rotations (temporary assignments) - PWU -



*compa-ratio = salary divided by Band midpoint

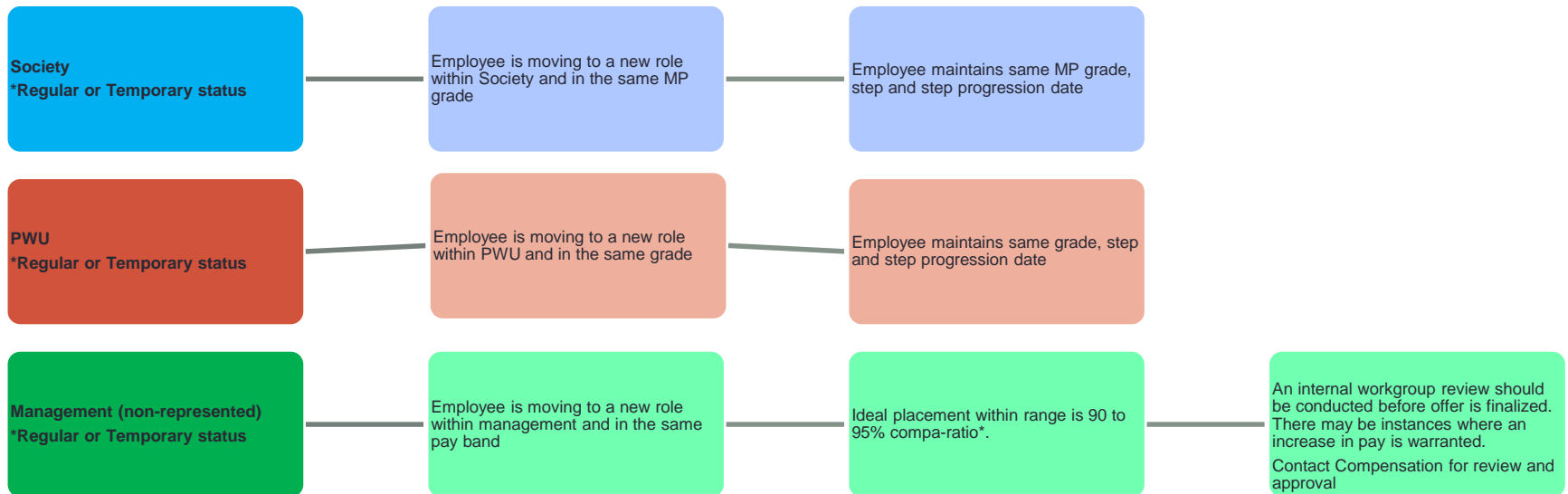
Rotations (temporary assignments) - Management -



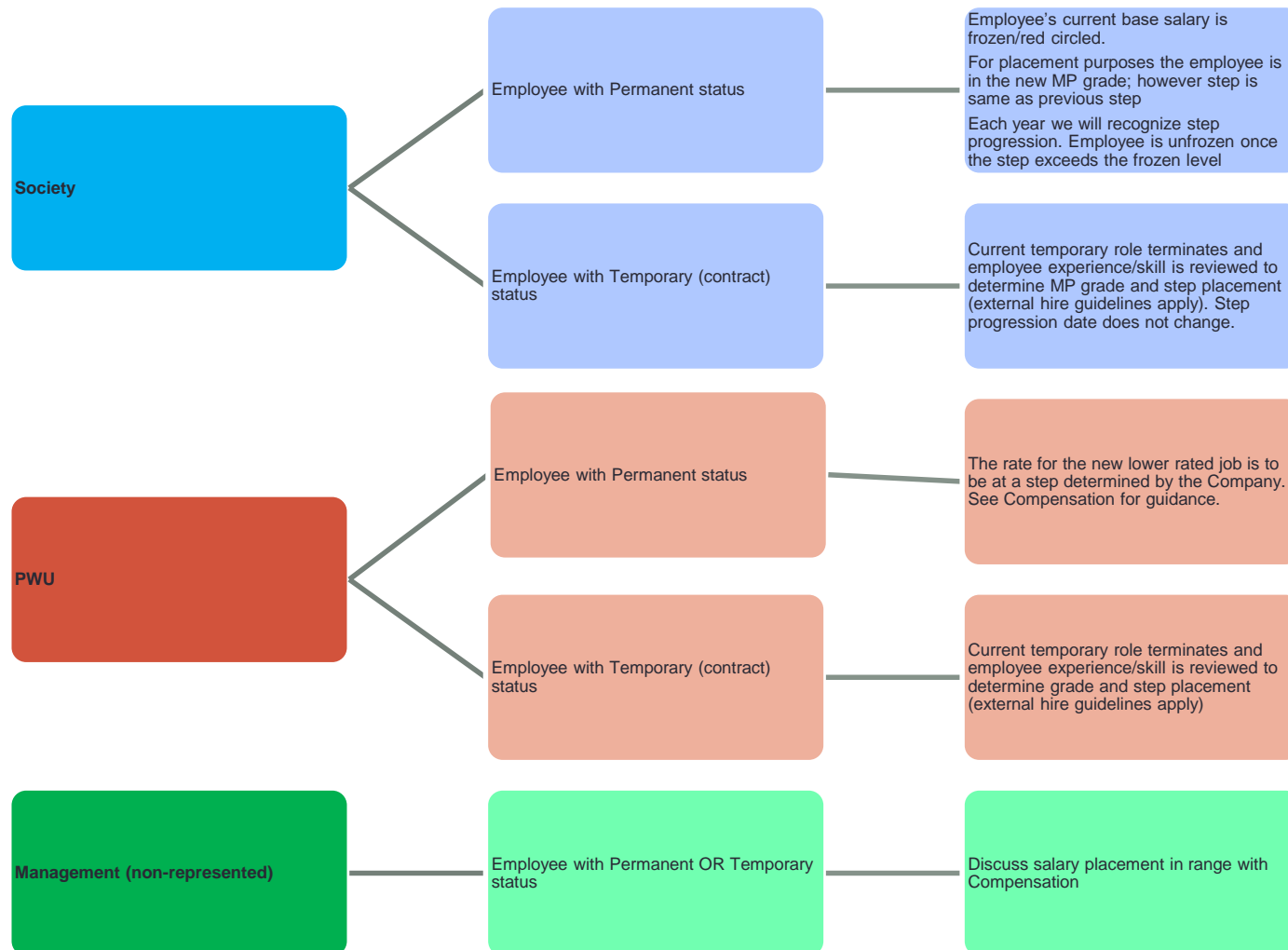
*compa-ratio = salary divided by Band midpoint

Lateral Move

- All Jurisdictions -

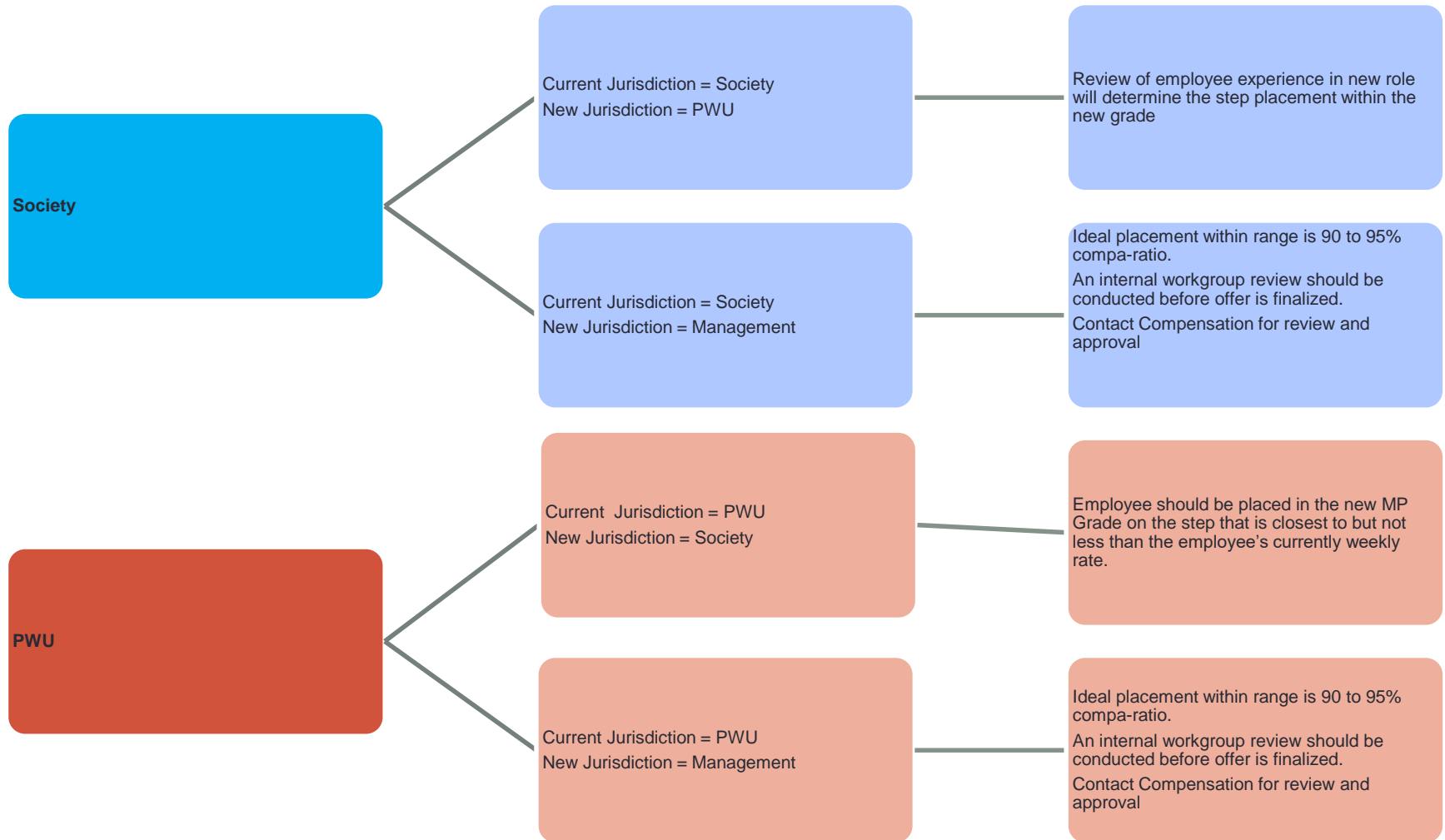


Demotions (moving into a role at a lower grade/band) - All Jurisdictions -



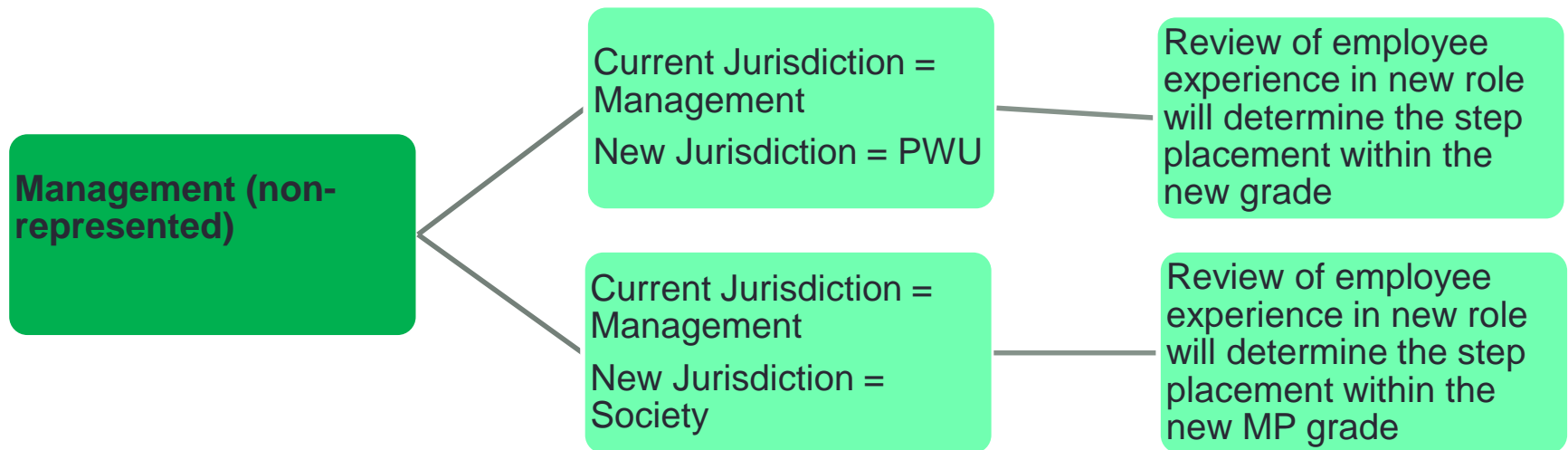
Jurisdictional Moves

- Society & PWU -



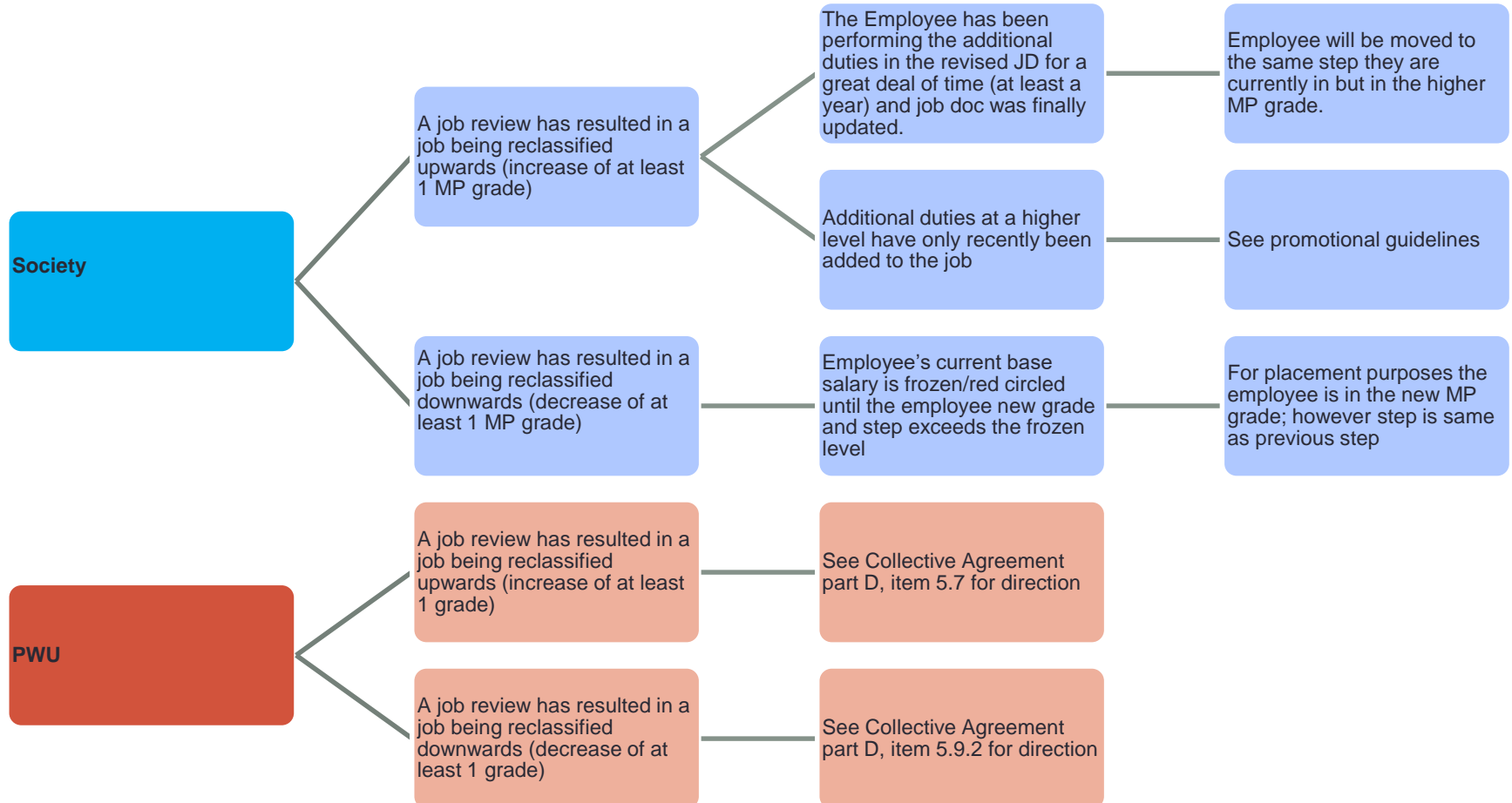
Jurisdictional Moves

- Management -



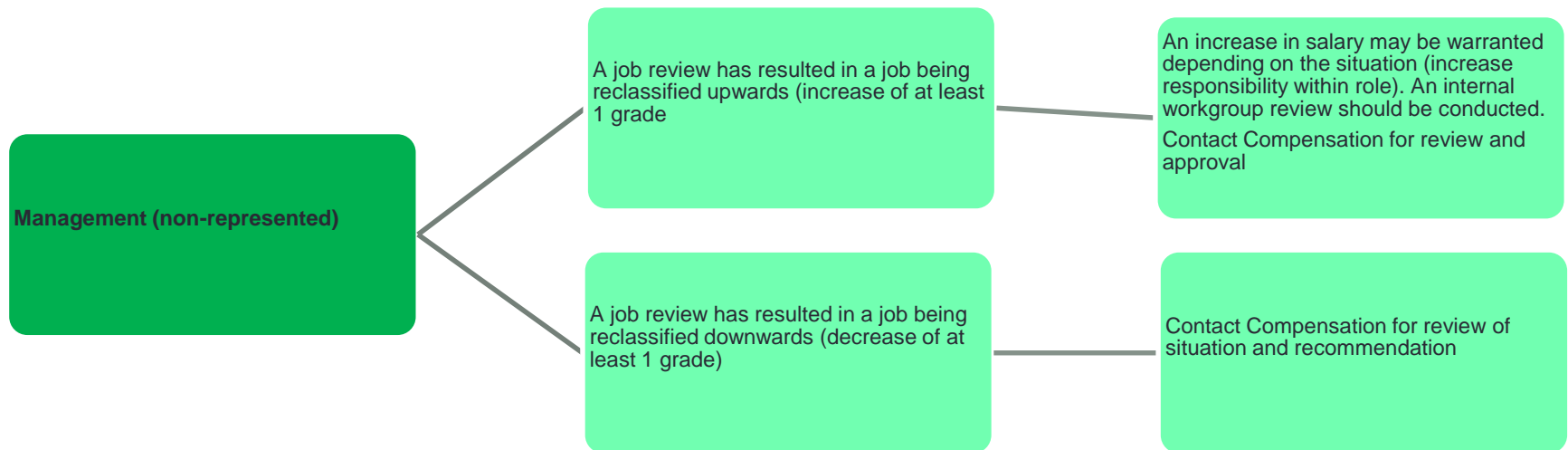
Job Reclassification (due to JE)

- Society -



Job Reclassification (due to JE)

- Management -





welcome to brighter

NON-EXECUTIVE TOTAL REMUNERATION REVIEW

Independent Electricity System Operator

18 February 2022



INTRODUCTION AND EXECUTIVE SUMMARY

Mercer Canada Limited (“Mercer”) has been engaged by the Independent Electricity System Operator (“IESO”) to assist the IESO in conducting a Total Remuneration review for non-executives within the IESO. The purpose of this review is to provide an independent, market-based assessment of the market positioning of the IESO’s non-executive total remuneration that includes base salary, active employee benefits, post-retirement benefits and pensions relative to the markets the IESO competes with for talent. The IESO employee groups considered include non-executive management / non-union, as well as those positions represented by the Power Workers’ Union (“PWU”) and the Society of United Professionals (“the Society”, or “SOC”).

EXECUTIVE SUMMARY

This review approach is consistent with Mercer’s standard market benchmarking methodologies, and relies on compensation, pension and benefits practices information provided by the Independent Electricity System Operator, in addition to Mercer’s proprietary compensation databases and market research. Market comparisons are made to a group of peer organizations, selected by Mercer and confirmed by the IESO, which are representative of the energy, broader public and private sectors the IESO competes with for talent.

In conducting the compensation analysis, Mercer worked with the IESO to identify benchmark positions to compare to market that represent a valid cross sample of the organization’s functions and levels. The breadth of benchmark positions selected is within the range of 50% to 75% of employees considered best practice when benchmarking on an organization basis. The benchmarking includes positions that represent approximately 53% of employees at the IESO.

Mercer considers compensation levels to be within a “competitive range” if they fall within 10% of the target market positioning on a position-by-position basis (where you have a smaller sample size and higher variability in observations) and 5% on an overall organization basis (where you have a larger sample size and smaller variability in observations) when compared to target positioning (e.g., the 50th percentile).

The IESO’s total cash compensation (considering salaries and market short-term incentives), on an aggregate organization basis, is positioned within the market competitive range (i.e. within +/-5% of the market 50th percentile) for the energy and public sectors. The energy sector reflects organizations that are the most similar to the IESO considering the relative roles, responsibilities and required industry knowledge for their positions, and the comparability of the IESO’s operations. The IESO is positioned 10% above the market 50th percentile relative to the private sector peer group and 4% above the public sector peer group. Above-market positioning relative to the private sector peer group is driven by bargaining unit rates; management total cash compensation is within a market competitive range.

On an overall organization basis, the IESO’s total remuneration, including the value of all cash compensation, benefit and pension plans is positioned 9%, 11% and 24% above the



market 50th percentile for the energy, public and private sector peer groups respectively. Positioning above the 50th percentile on a total remuneration basis is primarily a result of the high employer provided value of pension plans in place at the IESO for PWU and the Society represented jobs. Management jobs are positioned within a market competitive range relative to the energy sector, but above a market competitive range relative to the public and private sector.

METHODOLOGY

Mercer worked with the IESO to determine the appropriate markets for comparison given the organizations they compete with for talent (i.e., organizations that the IESO might reasonably recruit employees from or lose employees to). Three specific peer groups were identified for the purposes of the total remuneration review:

- **Energy Sector Peer Group**
 - Reflects select regulated Canadian organizations in the energy sector. Findings reflect data from a proprietary custom survey and Mercer Total Compensation Survey (“MTCS”) that includes energy industry-specific roles, and data from Mercer’s Benchmark Database (“MBD”) that includes general industry roles in the energy sector
 - Organizations were selected considering the comparability of their operations and relative size of revenues when compared to the IESO, resulting in a peer group primarily consisting of other market operators, energy utilities and local distribution companies
- **Broader Public & Public Energy Sector Peer Group (“Public Sector”)**
 - Reflects select Canadian public sector organizations from Mercer’s Benchmark Database that the IESO competes with for talent, with an emphasis on public sector organizations within Ontario. It includes public sector energy organizations from the energy sector peer group.
- **Private & Private Energy Sector Peer Group (“Private Sector”)**
 - Reflects select Canadian private sector organizations from Mercer’s Benchmark Database that the IESO competes with for talent, with an emphasis on private sector organizations within the Greater Toronto Area. It includes private sector energy organizations from the energy sector peer group.
 - Organizations were selected considering the immediate geographical talent market for the IESO (i.e., the Greater Toronto Area) with an emphasis on financial services and engineering organizations that have workforces with a high concentration of IT Roles, cyber-security, data-analytics, business analyst, project managers, electrical engineers, environmental engineers, financial professionals and legal professionals.



A sample of the IESO's jobs across all grades was benchmarked against equivalent roles within organizations from the defined peer groups. Equivalence was determined on the basis of overlaps in responsibilities between the IESO and survey position descriptions.

- A mixture of 32 non-union, including professional and management, and represented jobs at the IESO were matched to equivalent custom survey jobs and levels in the energy sector peer group, as these positions are generally energy industry-specific in their responsibilities
- 87 non-union, including professional and management, and represented jobs at the IESO were matched to equivalent survey jobs and levels in all three peer groups, as these positions are generally non-energy industry specific in their nature and exist across industries

Mercer's benchmarking objective with this review is to map a reasonable sample of the IESO's positions that best represent the total employee population across the different non-executive job levels in the organization. With this approach, our analysis includes 70 of the 158 (44%) management and professional employees and 394 of the 712 (55%) bargaining unit employees to make up 53% of the total population considered in-scope for this review. Mercer believes this to be a statistically reliable and representative sample for assessing the competitive levels of total remuneration for the IESO's employees. Findings are weighted based on the number of IESO incumbents in each benchmark job.

For the retirement and benefits program review, Mercer benchmarked the IESO against the energy, private and public sector peer groups for organizations available in the Mercer Plan Design databases considering their relative **employer provided value** ("EPV"). Relative value analysis focuses only on the plan design as it sets all other cost drivers at a common level and is more consistent when comparing the value of the benefit programs of several organizations.

We note how benchmarking Total Value (TV) compares to Employer Provided Value (EPV) for the benefits analysis:



The relative value benchmarking results are presented as a percentage of base salary using base salary and bonus information. Plans for all comparator organizations have been valued using a set of consistent workforce profiles appropriate for the level of work of the position.

All compensation data are reflective of the most recently available data as of April 1, 2021, and are aged to reflect April 1, 2022 compensation levels, based on sector.

A list of terms referenced in this report and their definitions can be found in Appendix D.



SUMMARY OF FINDINGS

Our commentary describes the competitiveness of the IESO's base salary, short-term incentive, total cash compensation and total remuneration relative to the 50th percentile of the respective market. Based on Mercer's compensation practices and policy research, the majority of organizations target compensation at the 50th percentile of their competitive market, which balances fiduciary and cost considerations with the need to attract and retain talent. Mercer considers the IESO to be within the competitive range if they fall within 10% of the target market positioning on a position-by-position basis and 5% on the overall organization basis.

The table below presents the IESO's **base salaries**, **target total cash compensation ("TTC")** and **total remuneration ("TREM")** at an aggregate level, compared to the market 50th percentile across the three comparator markets:

Above Comparator Market (>5%) **Within Comparator Market (±5%)** **Below Comparator Market (<5%)**

Compensation values are stated in CAD \$000s		IESO			ENERGY SECTOR			PUBLIC SECTOR			PRIVATE SECTOR		
Group	Grade	Salary ¹	TTC ²	TREM ³	Base Salary	TTC	TREM	Base Salary	TTC	TREM	Base Salary	TTC	TREM
MGT	MANAGEMENT TOTAL	\$162	\$162	\$203	\$146 10%	\$166 -2%	\$199 2%	\$143 13%	\$159 2%	\$191 6%	\$134 20%	\$152 6%	\$181 13%
SOC	SOCIETY TOTAL	\$132	\$132	\$174	\$118 12%	\$129 3%	\$156 11%	\$118 12%	\$126 5%	\$154 13%	\$110 21%	\$119 11%	\$138 26%
PWU	PWU TOTAL	\$92	\$92	\$123	\$80 16%	\$82 12%	\$102 20%	\$73 25%	\$75 23%	\$94 31%	\$67 36%	\$71 30%	\$84 46%
OVERALL		\$134	\$134	\$175	\$120 11%	\$132 1%	\$160 9%	\$120 12%	\$129 4%	\$157 11%	\$111 20%	\$122 10%	\$141 24%

(1) Reflects salary structure job rates, which consider target compensation for a fully competent employee. Typically the midpoint or endpoint of a range.

(2) Reflects IESO salary structure job rates as the IESO does not provide short-term incentives. In the market, it includes salaries plus target short-term incentives, if provided.

(3) Total remuneration ("TREM") reflects target total cash compensation plus the value of long-term incentives (if provided), pensions, active benefits and post-retirement benefits.

*Detailed findings by grade and employee group are presented in **Appendix C**.*

Cash Compensation

The IESO's **base salaries**, on an aggregate organization basis, are above the energy, public and private sectors, across the non-unionized, PWU, and Society jobs.

The IESO **does not provide short-term incentives** to non-executives. However, short-term incentives are commonly offered in the IESO's market for talent. On an aggregate basis, across the three peer groups, **short-term incentive** levels are highest amongst non-unionized jobs in the energy sector and private sector peer groups. Short-term incentives are lower for unionized jobs, though still prevalent across all peer groups.

The IESO's **total cash compensation** levels, on an aggregate organization basis, are within the competitive range for the energy and public sector peer groups. Non-unionized jobs are positioned within a competitive range relative to the 50th percentile against the energy and [A business of Marsh McLennan](#)



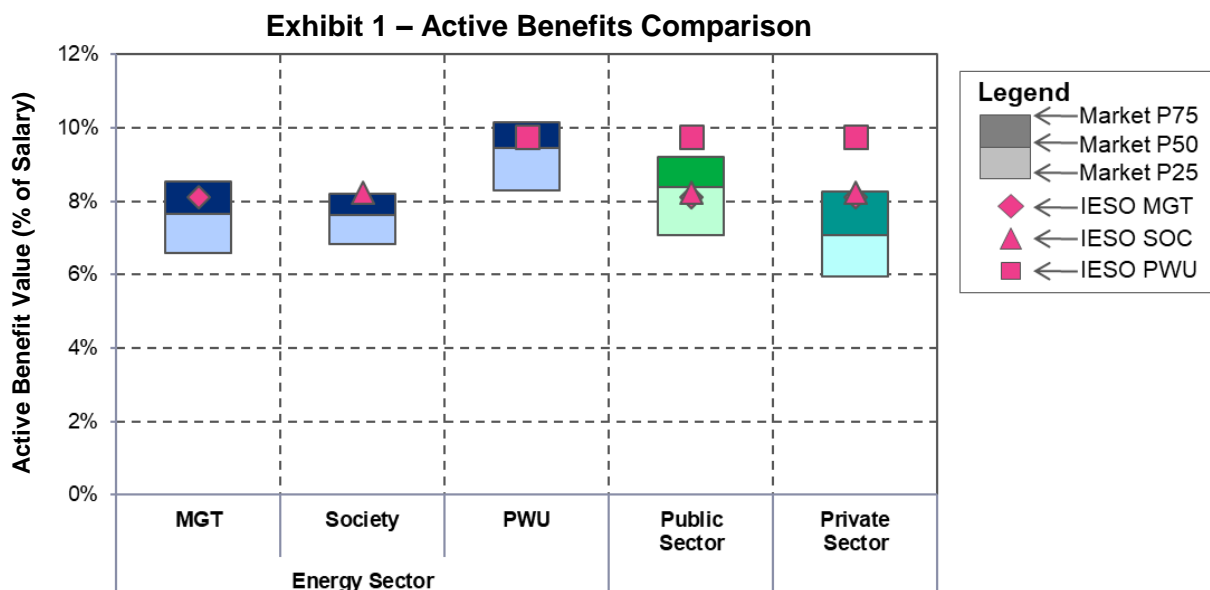
public sector peer groups. Similarly, Society jobs are positioned within the market competitive range for the energy and public sectors, and 11% above the private sector peer group. The PWU group is positioned significantly above a market competitive range across all three markets.

Total Remuneration

Overall, the IESO's compensation program, on a **total remuneration** basis, is positioned 9%, 11% and 24% above the market 50th percentile for the energy, public and private sector peer groups. IESO's positioning above the 50th percentile on a **total remuneration** basis is primarily the result of the higher employer-provided value of pension plans in place at the IESO for PWU and Society represented jobs. The IESO's non-represented jobs are positioned closer to market median, compared to the represented group, at 2%, 6%, and 13% above the energy, public, and private sector peer groups respectively.

Active Benefits

The chart below presents the IESO's **active benefits (Exhibit 1)** value for each employee group considering employer-provided value, compared to the market across the three peer groups. Market results for the private and public sector has been combined to reflect all data due to the absence of the PWU and Society unions in some of these markets.

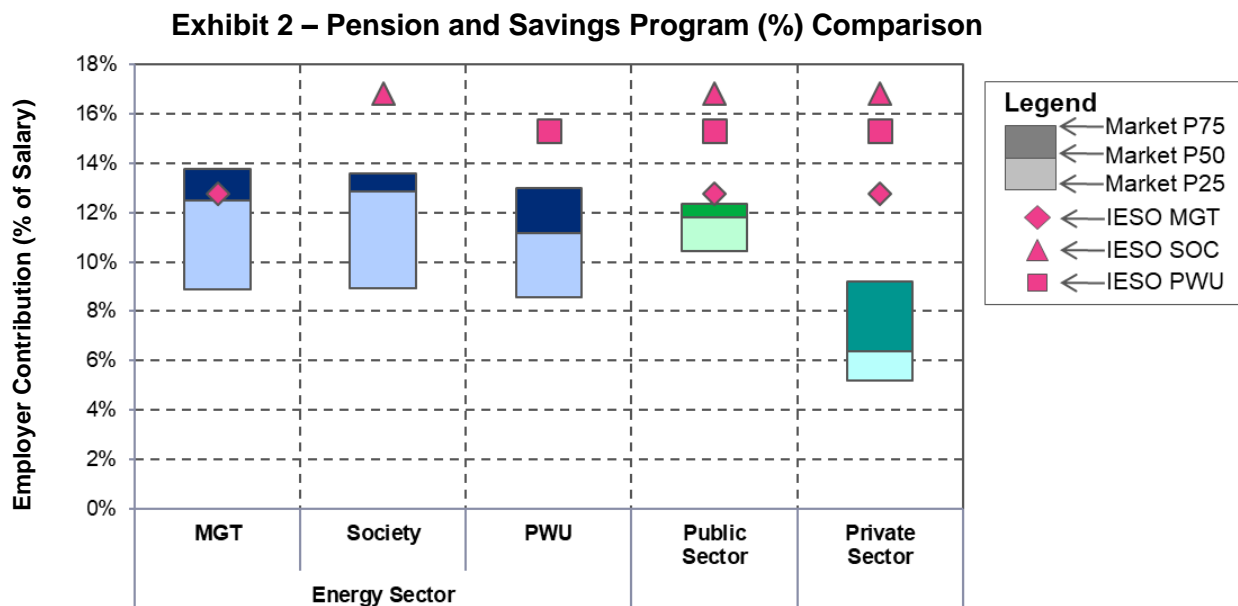


When compared to the energy sector peer group, the IESO is generally within 1% of the market 50th percentile considering the overall value of active benefits (including life insurance, accidental death and dismemberment, short-term disability, long-term disability, health, dental and health-care spending accounts) across all employee groups. The IESO's Society and non-represented jobs are positioned near the median of the public sector peer group, and the upper quartile of the private sector peer group. The PWU group is above the 75th percentile in both the public and private sector peer groups.



Pension and Savings Programs

The following chart shows the IESO's **pension** value for each employee group considering employer-provided value (**Exhibit 2**). The market results for the private and public sectors have been consolidated to reflect all data, due to the lack of union presence (PWU and Society) in some of these markets.



The IESO's pension arrangements for the PWU and Society bargaining units reflect the legacy defined benefits Ontario Hydro plan, with an introduction of cost sharing and increase to employee contributions. The IESO's pension arrangements for the PWU and Society bargaining units are above the market 75th percentile of the **employer provided value** in all three comparator groups.

In comparison, the IESO's pension arrangement for the management group reflects a 50% cost sharing plan. The IESO is positioned near the market 50th percentile in the energy peer group, competitive with the 75th percentile of the public sector and above the 75th percentile of private sector peer groups. Many comparators in the private sector provide a defined contribution plan.



Appendix A

The following companies comprise the **energy peer group** used for the purposes of the review:

Energy Sector Comparator Companies	
1) Alberta Electric System Operator	14) FortisBC
2) Alectra	15) Hydro One
3) Altalink	16) Hydro Ottawa
4) ATCO Ltd.	17) Hydro-Québec
5) BC Hydro	18) London Hydro
6) Bruce Power	19) Nalcor Energy
7) Electrical Safety Authority	20) Oakville Hydro
8) Elexicon	21) Ontario Energy Board
9) Emera, Inc.	22) Ontario Power Generation
10) Enbridge	23) SaskEnergy
11) ENMAX Corporation	24) SaskPower
12) EPCOR Utilities, Inc.	25) Toronto Hydro Corporation
13) FortisAlberta	

The following companies comprise the **Broader Public & Public Energy peer group** used in the review:

Broader Public & Public Energy Sector Comparator Companies	
1) Alberta Electric System Operator^	20) Metrolinx
2) Alectra^	21) Nalcor Energy^
3) BC Hydro^	22) Oakville Hydro^
4) Bruce Power^	23) OMERS Administration Corporation
5) Canada Post Corporation	24) Ontario Energy Board^
6) Canadian Air Transport Security Authority	25) Ontario Hospital Association
7) Canadian Broadcasting Corporation	26) Ontario Lottery and Gaming Corporation
8) Canadian Nuclear Laboratories	27) Ontario Medical Association
9) Electrical Safety Authority^	28) Ontario Power Generation^
10) Elexicon^	29) Ontario Public Service
11) ENMAX Corporation^	30) Ontario Teachers' Pension Plan
12) EPCOR Utilities, Inc.^	31) SaskEnergy^
13) Export Development Canada	32) SaskPower^
14) Greater Toronto Airports Authority	33) Technical Standards and Safety Authority
15) Healthcare of Ontario Pension Plan	34) Toronto Hydro^
16) Hydro Ottawa^	35) Treasury Board of Canada Secretariat
17) Hydro-Québec^	36) Workplace Safety & Insurance Board
18) Infrastructure Health & Safety Association	37) WorkSafeBC
19) London Hydro^	

(^) Supplemental public sector companies from the Energy peer group



The following companies comprise the **Private Sector & Private Energy peer group** used in the review:

Private Sector & Private Energy Sector Comparator Companies	
1) 3M Canada Company	23) Golder Associates Corporation (GAC) - Golder Associates, Ltd. (GAL)
2) Accenture, Inc. Canada	24) Hatch Ltd.
3) Aecon Group, Inc.	25) HH Angus & Associates, Ltd.
4) Aggreko Canada, Inc.	26) Hydro One^
5) Altalink^	27) JMP Solutions, Inc.
6) ATCO Ltd.^	28) Kiewit Construction Services, ULC
7) Bantrel Co.	29) Manulife Financial Corp.
8) Bombardier Transport Canada, Inc.	30) MTE Consultants Inc.
9) Bosch Rexroth Canada Corp.	31) NovAtel, Inc.
10) Canadian Imperial Bank of Commerce	32) Peter Kiewit Sons, ULC
11) Capital Power Corporation	33) Rockwell Automation
12) Electrical & Systems Advanced Control, Inc. (ESAC)	34) RV Anderson Associates Limited
13) Emera, Inc.^	35) Saipem Canada
14) Emerson Automation Solutions	36) Siemens Canada Limited
15) Enbridge Inc.^	37) Smith and Andersen Consulting Engineering
16) Fortis Alberta^	38) Stantec, Inc.
17) Fortis BC^	39) Sun Life Financial, Inc.
18) FundSERV, Inc.	40) Tatham Engineering Limited
19) Ganotec, Inc.	41) TD Bank Group
20) GE Corporate	42) The Bank of Nova Scotia
21) GEI Consultants, Inc.	43) WorleyParsons Canada Services, Ltd.
22) General Motors of Canada	

(^) Supplemental private sector companies from the Energy peer group



Appendix B

Mercer worked closely with the IESO to select jobs that best represent the total employee population across the different job levels in the organization. The following 40 non-represented jobs were included within the scope of the review:

IESO Job Title	Grade	IESO Job Title	Grade
1) Asso Gnrl Counsel Dir Lgl Resources & Corp Scrtry	Band 3A	21) Sr Manager Infrastructure	Band 4
2) Director, Planning	Band 3A	22) Sr Manager IT Operations	Band 4
3) Director Enforcement & Legal	Band 3B	23) Engineering Manager, Power Systems	Band 5A
4) Director Information Security	Band 3B	24) Human Resources Business Partner ("HRBP")	Band 5A
5) Director Internal Audit	Band 3B	25) Legal Counsel 2	Band 5A
6) Director IT Operations	Band 3B	26) Manager Change Management Adoption & Benefits Realization	Band 5A
7) Director Talent Management	Band 3B	27) Manager Finance & Accounting	Band 5A
8) Director Total Rewards	Band 3B	28) Manager Financial Resource Planning & Analysis	Band 5A
9) Director, Contract Management	Band 3B	29) Manager Government Affairs	Band 5A
10) Director, Finance & Corporate Controller	Band 3B	30) Manager HRIS	Band 5A
11) Director, Market Operations	Band 3B	31) Manager Internal Communications	Band 5A
12) Senior Counsel I	Band 4	32) Manager Reporting & Economic Analysis	Band 5A
13) Senior Counsel II Enforcement & Legal Unit MACD	Band 4	33) Manager Talent Acquisition	Band 5A
14) Senior Counsel Legal Group Lead	Band 4	34) Manager, Operations Planning	Band 5A
15) Senior Legal Counsel	Band 4	35) Senior Manager, Transmission	Band 5A
16) Senior Manager Business Services	Band 4	36) Senior Project & Portfolio Manager	Band 5A
17) Senior Manager Engagement and Indigenous Relations	Band 4	37) Legal Counsel 1	Band 5B
18) Sr Counsel Legal & FOI Grp Lead & Pvcy Officer	Band 4	38) HRIS Specialist Talent Management and Analytics	Band 6A
19) Sr Manager Communications	Band 4	39) Human Resources Advisor	Band 6A
20) Sr Manager Employee & Labour Relations	Band 4	40) Talent Acquisition Associate	Band 6B

The following 79 represented jobs were included within the scope of the review:

IESO Job Title	Union	Grade	IESO Job title	Union	Grade
1) Regional Maintainer, Electrical	PWU	1	41) Advisor Financial Planning & Analysis	SOC	MP4
2) Journeyperson, Site Maintainer	PWU	3	42) Advisor Government Affairs	SOC	MP4
3) Administrative Assistant	PWU	58	43) Advisor IT Policy and Compliance	SOC	MP4
4) Security Guard	PWU	59	44) Advisor Market Development	SOC	MP4
5) Training Coordinator	PWU	59	45) Advisor Regulatory Affairs	SOC	MP4
6) Finance Clerk	PWU	60	46) Advisor Stakeholder Engagement	SOC	MP4
7) Senior Computer & LAN Services Technician	PWU	60	47) Advisor Training	SOC	MP4
8) Pay Services Associate	PWU	61	48) Business Analysis Specialist	SOC	MP4
9) Inventory Technician	PWU	62	49) Compliance Officer Conservation	SOC	MP4
10) Facilities Services Coordinator	PWU	63	50) Engineer, Revenue Metering	SOC	MP4
11) Network Administration Technician	PWU	63	51) Planner	SOC	MP4
12) Service & Helpdesk Support Analyst	PWU	63	52) Power System Engineer	SOC	MP4



IESO Job Title	Union	Grade	IESO Job title	Union	Grade
13) Senior Engineering Technologist	PWU	64	53) Procurement Specialist	SOC	MP4
14) Eng. Supervisor, Revenue Metering	SOC	MP6	54) Program Advisor	SOC	MP4
15) Lead Enterprise Architect	SOC	MP6	55) Specialist Information Security	SOC	MP4
16) Lead I&TS	SOC	MP6	56) Specialist Systems	SOC	MP4
17) Supervisor Comms. and Web Strategy	SOC	MP6	57) Specialist Systems Analysis	SOC	MP4
18) Supervisor Contract Management	SOC	MP6	58) Specialist, Project Support	SOC	MP4
19) Supervisor Customer Relations	SOC	MP6	59) Specialist, Solutions	SOC	MP4
20) Supervisor Market Development	SOC	MP6	60) System Operator	SOC	MP4
21) Supervisor Media Rlns and Edit. Svcs	SOC	MP6	61) Project Officer	SOC	MP3
22) Supervisor Project Management	SOC	MP6	62) Project Scheduler	SOC	MP3
23) Supervisor Quality Assurance	SOC	MP6	63) Senior Analyst, Contracts	SOC	MP3
24) Supervisor QA and Data Governance	SOC	MP6	64) Senior Project Analyst	SOC	MP3
25) Supervisor Stakeholder Engagement	SOC	MP6	65) Sr Analyst Applications	SOC	MP3
26) Supervisor, Settlements	SOC	MP6	66) Sr Analyst Contract Management	SOC	MP3
27) Change Mgmt. & Ben. Realization Lead	SOC	MP5	67) Sr Analyst Reporting	SOC	MP3
28) Lead Data Scientist	SOC	MP5	68) Analyst Communication Services	SOC	MP2
29) Senior Analyst, Compliance	SOC	MP5	69) Analyst I&TS Support	SOC	MP2
30) Senior Planner	SOC	MP5	70) Analyst Internal Communications	SOC	MP2
31) Senior Power System Engineer	SOC	MP5	71) Analyst, Settlements	SOC	MP2
32) Senior Project Manager	SOC	MP5	72) Analyst, Solutions	SOC	MP2
33) Senior System Operator	SOC	MP5	73) Assistant System Operator	SOC	MP2
34) Senior Technical Officer Conservation	SOC	MP5	74) Data Scientist	SOC	MP2
35) Sr Advisor Communication	SOC	MP5	75) Financial Analyst Accounts Payable	SOC	MP2
36) Sr Advisor Corp. and Regulatory Affairs	SOC	MP5	76) Financial Analyst Corporate Accounting	SOC	MP2
37) Sr Advisor Internal Engagement	SOC	MP5	77) Financial Analyst Payroll	SOC	MP2
38) Sr Advisor Regulatory Affairs	SOC	MP5	78) Power System Analyst	SOC	MP2
39) Sr Specialist System Analysis	SOC	MP5	79) Procurement Analyst	SOC	MP2
40) Advisor Communications	SOC	MP4			



Appendix C

The table below presents the detailed findings, at an employee group and aggregate level, for the IESO in comparison to the market 50th percentile across the three comparator markets:

Above Comparator Market (>5%) **Within Comparator Market (±5%)** **Below Comparator Market (<5%)**

Compensation values are stated in CAD \$000s

Group	Grade	IESO			ENERGY SECTOR			PUBLIC SECTOR			PRIVATE SECTOR		
		Salary ¹	TTC ²	TREM ³	Base Salary	TTC	TREM	Base Salary	TTC	TREM	Base Salary	TTC	TREM
MGT ⁴	Band 3	\$218	\$218	\$271	\$177 23%	\$219 -1%	\$263 3%	\$165 32%	\$201 9%	\$239 14%	\$174 25%	\$203 8%	\$256 6%
	Band 4	\$169	\$169	\$212	\$153 10%	\$165 3%	\$198 7%	\$150 13%	\$163 4%	\$197 8%	\$141 19%	\$160 6%	\$181 17%
	Band 5	\$144	\$144	\$183	\$142 2%	\$159 -9%	\$190 -4%	\$142 2%	\$153 -6%	\$186 -2%	\$127 13%	\$142 1%	\$169 8%
	Band 6	\$92	\$92	\$120	\$84 9%	\$90 2%	\$110 9%	\$77 20%	\$81 14%	\$101 19%	\$71 30%	\$75 23%	\$88 36%
	MANAGEMENT TOTAL	\$162	\$162	\$203	\$146 10%	\$166 -2%	\$199 2%	\$143 13%	\$159 2%	\$191 6%	\$134 20%	\$152 6%	\$181 13%
SOC	MP6	\$152	\$152	\$198	\$139 9%	\$150 1%	\$181 9%	\$133 14%	\$144 5%	\$175 13%	\$114 34%	\$129 18%	\$154 28%
	MP5	\$142	\$142	\$186	\$132 8%	\$138 3%	\$167 11%	\$122 17%	\$133 7%	\$162 15%	\$126 13%	\$138 3%	\$159 17%
	MP4	\$134	\$134	\$175	\$116 16%	\$126 6%	\$153 15%	\$116 15%	\$123 9%	\$150 17%	\$114 17%	\$125 7%	\$143 22%
	MP3	\$125	\$125	\$165	\$104 20%	\$117 8%	\$141 17%	\$106 18%	\$113 11%	\$138 19%	\$94 33%	\$100 26%	\$115 44%
	MP2	\$118	\$118	\$155	\$108 9%	\$126 -7%	\$153 2%	\$120 -2%	\$126 -6%	\$153 1%	\$87 34%	\$94 25%	\$109 42%
	SOCIETY TOTAL	\$132	\$132	\$174	\$118 12%	\$129 3%	\$156 11%	\$118 12%	\$126 5%	\$154 13%	\$110 21%	\$119 11%	\$138 26%
PWU ⁵	PWU TOTAL	\$92	\$92	\$123	\$80 16%	\$82 12%	\$102 20%	\$73 25%	\$75 23%	\$94 31%	\$67 36%	\$71 30%	\$84 46%
OVERALL		\$134	\$134	\$175	\$120 11%	\$132 1%	\$160 9%	\$120 12%	\$129 4%	\$157 11%	\$111 20%	\$122 10%	\$141 24%

(1) Reflects salary structure job rates, which consider target compensation for a fully competent employee. Typically the midpoint or endpoint of a range.

(2) Reflects IESO salary structure job rates as the IESO does not provide short-term incentives. In the market, it includes salaries plus target short-term incentives, if provided.

(3) Total remuneration "TREM" reflects target total cash compensation plus the value of long-term incentives (if provided), pensions, active benefits and post-retirement benefits.

(4) Band 3 reflects aggregate findings of bands 3A & 3B, Band 5 reflects aggregate findings for bands 5A and 5B. Band 6 reflects aggregate findings for band 6A and 6B.

(5) PWU market findings are shown in aggregate to minimize grade-by-grade variations resulting from a higher number of grades and lower number of jobs.

Note: Figures are rounded to the nearest thousand (dollars) or percent. Percentages represent IESO incumbent weighted averages to better reflect the labour cost basis at the IESO



Appendix D – TERMS AND DEFINITIONS

Definitions for terms used throughout this report are below:

- **Base Salary**
 - Annual rate of fixed compensation (base salary). If an hourly rate was reported, Mercer annualized the value by multiplying the standard number of work hours per week by 52 weeks per year. If a weekly rate was reported, Mercer annualized the value by multiplying by 52 weeks per year
- **Short-Term Incentives**
 - Reflects the value of annual incentive awards (e.g., yearly bonus). Includes the value of performance based lump sum payments or profit sharing plans where provided
- **Target Total Cash Compensation (TTC)**
 - Reflects the combined value of base salaries and short-term incentives (e.g., annual total cash compensation)
- **Long-Term Incentive**
 - Reflects grant-date value of equity and long-term cash plan values, including shares, stock options, etc.
- **Active Benefits**
 - Reflects the employer paid value of benefits offered to employees, including life insurance, accidental death and dismemberment, short-term disability, long-term disability, health, dental and health-care spending accounts
- **Pension**
 - Reflects the employer paid value of retirement programs offered to employees
- **Total Remuneration (TREM)**
 - Reflects the combined value of total cash compensation, long-term incentives, active benefits, post-retirement benefits and pensions
- **25th Percentile (P25)**
 - Twenty-five percent of observations are less than this amount
- **50th Percentile (P50) or Median**
 - Fifty percent of observations are less than this amount, fifty percent are more
- **75th Percentile (P75)**
 - Seventy-five percent of observations are less than this amount

CORPORATE POLICY ON PROCUREMENT

The IESO's procurement policy is provided at Exhibit D-1-4 Attachment 1 – IESO Procurement Policy. This policy provides direction for the purchase of goods and/or services and its objective is to ensure that the IESO acquires the goods and services required to meet its business needs in the most economical and efficient manner. A number of principles inform the policy such as, but not limited to, value for money, vendor access, transparency and fairness, responsible management and an open and competitive procurement process. The IESO confirms that all procurement has been consistent with the stated procurement policy.

All vendors who are engaged to provide goods or services to the IESO are required to comply with the IESO's procurement policy.

Procurement Policy

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Category: Finance

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1.0 Purpose

This policy provides direction for the purchase of goods and/or services on behalf of the IESO in accordance with all applicable law, regulation, directives and trade agreements.

The objective of this policy is to ensure that the IESO acquires the goods and/or services required to meet its business needs in the most economical and efficient manner through Procurement processes that conform to the following principles:

(a) Value for money:

- Goods and/or services are to be procured only after consideration of IESO-wide business requirements, alternatives, timing, supply strategy, and Procurement method;
- An Open Competitive Procurement process should be used to the greatest extent possible.

(b) Vendor access, transparency and fairness:

- Access for qualified Vendors to compete for IESO business must be fair and the procurement process must be conducted in a transparent manner, providing equal treatment to Vendors;
- Conflicts of interest, both real and perceived, are to be avoided during the Procurement process and the ensuing contract is managed in accordance with IESO policies; and
- Relationships that result in continuous reliance on a particular Vendor for a particular kind of work must not be created.

(c) Responsible management:

- Goods and/or services procured by the IESO must be responsibly and effectively managed.

(d) Geographic Neutrality and Reciprocal Non-Discrimination:

- Vendors have equal access to compete for IESO business regardless of their location.

Terms that are defined under Definitions of this Policy are capitalized where they appear throughout the body of the document.

2.0 Scope

2.1 Application and Exceptions

This policy applies to the planning and acquisition of all goods and/or services procured by the IESO, including the Procurement of goods and/or services in support of Contracts under the *Electricity Act, 1998*, regardless of value, with the following exceptions:

- (a) External legal services, support for legal services, services of expert witnesses or factual witnesses used in court or legal proceedings;
- (b) Financial services respecting the management of IESO financial assets and liabilities (i.e. treasury, lending and banking services)¹;
- (c) Advertising space and media buy, except as further outlined in Appendix D: Additional Procurement Considerations Checklist;
- (d) Realty, including acquisition or rental of land, existing buildings, or other immovable property or the rights thereon;
- (e) Utilities;
- (f) Reimbursable employee expenses provided such purchases are made in accordance with the IESO's Business Expense Standard;
- (g) Educational courses that are:
 - Required for maintaining professional designations;
 - Offered by accredited post-secondary institutions; or
 - Industry conferences, courses, and seminars that are not customized, developed, or arranged specifically for IESO staff.
- (h) Contracts for goods and/or services between IESO and another government, government department, agency or Ministry;
- (i) Goods and/or services from philanthropic institutions or non-profit organizations; and
- (j) Services related to employee pension benefits.

2.2 Out of Scope

This policy does not apply to the following:

¹ Canadian Free Trade Agreement, Chapter Five - Government Procurement.

- (a) Contracts authorized or required under the *Electricity Act, 1998* or any regulations or directives made thereto, as amended, including without limitation, electricity supply or capacity, including supply or capacity to be generated using alternative energy sources and renewable energy sources; the management of electricity demand, including the reduction or conservation in electricity demand; generation; storage; transmission; distribution; and load-management infrastructure;
- (b) The operation and maintenance of the IESO-controlled grid and operating the IESO-administered markets, as described in the *Electricity Act, 1998*, including, but not limited to actions taken to amend, administer or enforce the market rules;
- (c) Measures that will manage electricity demand or result in the improved management of electricity demand on an on-going or emergency basis, including:
 - Contracts between the IESO and any standards authorities relating to the reliability of the integrated power system (e.g. NERC, NERP);
 - Enforcing criteria and standards relating to the integrated power system;
 - Settlements and payments under a contract authorized by the *Electricity Act, 1998* and with respect to payments provided for under the *Ontario Energy Board Act, 1998* (including contribution and funding agreements); and
 - Ontario Energy Board and other regulatory fees pursuant to the *Electricity Act, 1998*.

3.0 Policy Statements

3.1 Governance

This policy complies with the following, including, as required:

- (a) *Electricity Act, 1998*, S.O. 1998, c. 15 Schedule A and any applicable regulations;
- (b) *Ontario Energy Board Act, 1998*, S.O. 1998, c. 15, Sched. B and any applicable regulations;
- (c) *Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, c. F.31 and any applicable regulations;
- (d) *Accessibility for Ontarians with Disabilities Act, 2005*, S.O. 2005, c. 11 and any applicable regulations;
- (e) The Ontario Public Service (OPS) Procurement Directive (December 2014) as an “Other Included Entity”, and associated Interim Measures (March 2019);
- (f) The Canadian Free Trade Agreement (CFTA) as a “procuring entity”; and

(g) Management Board of Cabinet (MBC) Travel, Meals and Hospitality Expense Directive.

3.2 Policy Exemptions

The IESO, as an Other Included Entity, must receive prior Management Board of Cabinet (MBC) approval when seeking an Exemption from the mandatory sections of the *Ontario Public Service Procurement Directive* that apply to the IESO. Any such Exemptions must then be reflected in the IESO's Memorandum of Understanding.

In some cases, the Procurement of goods and/or services that are subject to the *Ontario Public Sector Procurement Directive* are exempted from the associated *Interim Measures (March 2019)*, including:

- (a) Goods and/or services valued at less than \$25,000;
- (b) Goods and/or services that are directly related to the delivery of electricity or the delivery of electricity systems";
- (c) Goods and/or services where IESO has specifically requested an Exemption that has been granted by Government; and/or
- (d) Procurements related to construction.

From time to time, the IESO may be directed, in writing, to undertake a Procurement process or enter into a Contract, including non-competitive methods, through a letter of direction from the Government or other written direction or minute endorsed by the Management Board of Cabinet or such other Ministry within the Government having authority to direct IESO. To the extent that those written directions and/or instruments contain specific instructions about the Procurement process or Vendor to be selected, those instructions shall supersede the applicable provisions and operation of this policy.

4.0 Responsibilities

4.1 Policy Owner

The CEO appoints the Chief Financial Officer (CFO) as owner of this Policy and as recorded in the Master Policy. The owner is the sole approver of this Policy.

4.2 Policy Steward

The Policy owner may delegate day-to-day responsibility for one or more aspects of a Policy, possibly including implementation, periodic review, or compliance to a Policy steward.

The Policy owner delegates the Senior Manager, Procure-to-Pay as the steward of this Policy and as recorded in the Master Policy.

5.0 Planning

Procurement planning is an integral part of the procurement process in identifying potential supply sources, procurement methods, as well as, what and when approvals are needed.

The Business Unit shall ensure that sufficient Procurement planning is conducted to support the IESO's business requirements and ensure that sufficient time is allowed to complete the Procurement process.²

The Business Unit and the Procurement Unit will undertake Procurement planning on an annual basis, in line with business planning, in order to:

- (a) Identify goods and/or services needed to meet the IESO's business requirements;
- (b) Identify opportunities to aggregate spending or combine Procurements to support enterprise-wide purchasing; and
- (c) Determine the appropriate resourcing plan, timing and Procurement method.

The Business Unit will engage with the Procurement Unit on no less than a quarterly basis to confirm the status of planned Procurements, and identify Procurements that were not planned during the annual planning process.

Business Units may be required to reprioritize procurement needs to accommodate unplanned procurement activity.

² OPS Procurement Directive, Section 8.2.

5.1 Conducting Market Research

The IESO may engage in formal and/or informal market research activities prior to initiating a Procurement, as further described in Appendix I: Guidelines for Conducting Market Research .

5.2 Unsolicited Research Proposals

The IESO may accept unsolicited research proposals where the IESO's interests would not be better served by conducting a Competitive Procurement process for a project and may be used as a first good and/or service for a pilot if the following parameters are met:

- Used for a planned activity (e.g., a pilot or demonstration project) and not for wide-scale Procurement;
- Used for the purpose of trying a new or innovative solution;
- The planned activity will be followed by an evaluation on its effectiveness and suitability for continued/expanded use that will be documented; and
- All required approvals have been obtained.

The Procurement Unit must be consulted and approval must be sought prior to entering into a Contract. All such agreements must be documented. Subsequent purchases, including continued or expanded use of these services must be procured through a competitive process in accordance with this policy.

5.3 Establishing Contract Term

The Business Unit, with the guidance of the Procurement Unit, must identify the Contract Term for every Procurement.

Extension options should always be included where there is a real or perceived risk of exceeding the initial term. A Contract Term that is extended beyond the terms set out in the original Procurement Document is considered Non-Competitive and must be supported by an Allowable Exception, as further detailed in [Appendix F: Allowable Exceptions to Competitive Procurement](#)

If the Procurement relates to goods and/or services that fall within the scope of the Interim Measures, the Contract Term may not exceed two (2) years, unless the Procurement is issued under a Government VOR Arrangement, in which case the Contract Term may align with that Government VOR Arrangement.

If the Procurement relates to goods and/or services that are exempted from the Interim Measures, the Contract Term will be determined at the IESO's discretion.

Where the IESO is establishing its own VOR Agreement, the Contract Term is subject to the following additional requirements³:

- (a) For a Contract Term of more than three (3) years, the Request for Vendors of Record (RVOR) must be posted annually to allow for the possibility of new Vendors to qualify;
- (b) VOR's with a Contract Term of (3) years or less is only required to be posted once and may not be extended.

5.4 Establishing the Total Procurement Value

The Business Unit must prepare an estimate of the Total Procurement Value for every Procurement, with the exception of Requests for Vendors of Record where a Second Stage Competition will establish a Total Procurement Value.

The Procurement Unit will use the Total Procurement Value to inform the appropriate Procurement method and Approving Authority under the OAR.

The Total Procurement Value must include all costs associated with entering into a Contract (collectively, the "Costs"), including, but not limited to:

- (a) The price or cost of the goods and/or services;
- (b) One-time costs such as site preparation, delivery, installation and documentation;
- (c) Ongoing operating costs including training, accommodation, licenses, support and maintenance;
- (d) Applicable duties, premiums, fees, commissions, disposition costs, allowable price escalations and interest;
- (e) Options to extend or renew the Contract;
- (f) Direct payments by the IESO to the Vendor(s);
- (g) Indirect payments by third parties to the Vendor(s);

³ Canadian Free Trade Agreement, Chapter Five - Government Procurement.

- (h) Any contingency values for unforeseen circumstances, including price impacts resulting from internal or external delays; and
- (i) Any Conferred Value.⁴

Where an individual project involves multiple related Procurements (such as design and build, phased projects, or maintenance and support services), the project's estimated Total Procurement Value is determined by the cumulative value of all related Procurements, including, any potential Contract renewals or extensions.

Business Units are encouraged to include a contingency budget for the purpose of managing Total Procurement Value Increases.

5.4.1 No Splitting

A Business Unit undertaking Procurement at the IESO must not take any action to reduce the estimated Total Procurement Value for the purpose of avoiding any requirements of this policy or the OAR (such as subdividing projects, Procurements, or Contracts and awarding multiple consecutive Contracts to the same Vendor).

The award of multiple consecutive Contracts to the same Vendor may only be made where each project is unique and the Procurement of those projects are awarded a Contract in accordance with this policy. For clarity, subdivision of a single scope of goods and/or services across multiple Procurements or Contracts is only permitted where approval for the Total Procurement Value is disclosed and sought in the first instance.

5.4.2 Increases to the Total Procurement Value

When the Total Procurement Value increases prior to issuing a Procurement document, the following applies:

- (a) Business Units must ensure they have obtained the Approving Authority in respect of the increased TPV for the Procurement; and

⁴ OPS Procurement Directive, Section 8.3.

- (b) The Procurement Unit must determine if an alternate Procurement method must be used as a result of the increase in Total Procurement Value.

When the Total Procurement Value increases after a Contract has been entered into, the Procurement Unit will assess the impact and may determine that re-Procurement of the goods and/or services is necessary depending on:

- The amount of the Total Procurement Value increase relative to the original Total Procurement Value;
- The reason for the increase;
- Whether the increase causes the revised Total Procurement Value to exceed the threshold for the original Approving Authority; and
- Whether the increased Total Procurement Value would result in a different Procurement method than the one originally used.

Amendments to the scope of goods and/or services outlined in a Contract may be permissible if the additional scope is related to or is follow-on to the services provided for in the Contract and the need for such related or follow-on additional scope was not reasonably foreseeable at the time of the Procurement.

Business Units must ensure they have obtained the approval from the Approving Authority for the increased Total Procurement Value prior to the commencement of any service or delivery of any goods. This is especially important when an increase causes the Total Procurement Value to exceed the threshold of the original Approving Authority or Procurement method. Approved Total Procurement Value increases must be documented and changes in Total Procurement Value must be reflected through a Contract Amendment, if required.

Total Procurement Value increases shall not be permitted where a Vendor under an existing Contract is requested to:

- (a) Provide additional goods and/or services that are:
- Entirely unrelated to;
 - Not a follow-on good and/or service; and
 - Not explicitly contemplated within the original scope of goods and/or services outlined in the Contract.

- (b) Retain another third party sub-contractor on behalf of the IESO for a scope of goods and/or services that is:
- Entirely unrelated to;
 - Not a follow-on good and/or service; and
 - Not explicitly contemplated within the original scope of goods and/or services outlined in the Contract.

5.4.3 Follow-on Agreements

A Follow-On Agreement is one that follows and is related to an already completed Agreement. Follow-On Agreements allow the IESO to structure a Procurement into several smaller portions for reasons of complexity, size, uncertainty or improved management control.

Follow-On Agreements are permitted only where an Open Competitive Procurement or VOR Arrangement has been used to select a Vendor.

Prior to entering into a Follow-On Agreement, the following activities must have taken place:

- (a) appropriate approval has been obtained prior to entering the original Contract;
- (b) the Approving Authority has been based on the Total Procurement Value of all of the work in the original Contract and the Follow-On Agreements;
- (c) the terms of the original Contract were fulfilled and Vendor performance was satisfactory;
- (d) the appropriate procurement method was used for the original Contract such as through a VOR Arrangement or an Open Competitive Procurement; and
- (e) the Procurement documents for the original work disclosed the total potential scope of work to be completed.

5.4.4 Separation of Design and Build in Procurement Process

Additional requirements for Procurements that involve design and build phases are outlined in [Appendix D: Additional Procurement Considerations Checklist](#) of this document. Note that if the 'design' is undertaken without including the 'build' in the Procurement, any Vendor engaged in the design phase may not participate in the subsequent build phase.

5.4.5 Drafting Requirements

All Procurements must be in writing and must include sufficient details concerning the Response requirements to enable the fair and transparent comparison of responses. A checklist of requirements is outlined in [Appendix C: Procurement Document Requirements Checklist](#) of this document.

5.4.6 Determining the Type of Procurement Document

The Procurement Unit is responsible for determining the most appropriate type of Procurement document to use based on the needs of the Business Unit.

The types of Procurement documents that IESO uses include, but are not limited to:

- (a) Request for Information (RFI) – used for market research only, to elicit industry information on particular products and/or services from the Vendor community, as further described in Appendix I: Guidelines for Conducting Market Research ;
- (b) Request for Proposal (RFP) – used when seeking a solutions-based proposal to meet business needs, usually for the provision of professional services and/or complex products;
- (c) Request for Quotation (RFQ) – used when seeking quotations for a fully defined scope of work, or for purchasing goods and/or services where the evaluation criteria is simple and/or only based on price;
- (d) Request for Vendors of Record (RVOR) - used to develop a short-list of qualified Vendors to enter into VOR Agreements for specific categories of work or to provide specific types of goods and/or services;
- (e) Request for Vendor Qualification (RFVQ) – used to request technical information and evidence of financial stability and goods and/or or service in order to pre-qualify or short list Vendors. An RFVQ may also be used to pre-qualify Vendors to respond to a particular RFP or RFQ; and
- (f) Request for Services (RFS) – used during a Second Stage Competition to request submissions from one or more pre-qualified Vendors.

5.5 Obtaining Approvals

Business Units are required to seek the guidance of the Procurement Unit before engaging a Vendor in any manner that would result in a binding Contract or that may provide a Vendor

with an unfair advantage when responding to a Procurement opportunity. For certainty, Business Units must consult with the Procurement Unit before directly engaging in any Non-Competitive Procurement activity to ensure that it aligns with this policy or any Allowable Exceptions.

The Business Unit will prepare an estimated Total Procurement Value and seek approvals from the Approving Authority in writing before:

- (a) Commencing a Procurement (including any Non-Competitive Procurement or competitive Procurement that establishes or uses a VOR Agreement); and
- (b) Executing a Contract procured pursuant to an IESO Procurement process (including any Contract that was procured pursuant to a Second Stage Competition under a VOR Agreement).

The Approving Authority will be determined by the OAR, as amended from time to time. Agreements that do not commit the IESO to any financial obligations, such as a parent agreement for a VOR Arrangement, may be authorized by the Vice President. For certainty, the Approving Authority for any Statements of Work resulting from a Second Stage Competition will be determined by the OAR.

Note that, as per the OAR, the Non-Competitive Procurement of Consulting Services may, depending on the Total Procurement Value, require additional approvals from both the Deputy Minister and Minister; the Management Board of Cabinet and the Treasury Board. Business Units must ensure they consult the OAR and the Procurement Unit to ensure compliance. The Business Unit will work with the Procurement Unit to determine any additional approvals or reviews that are required prior to initiating the Procurement, including, as necessary, Executive Leadership for Procurement and the Business Unit, or their delegate(s).

Additional approvals or reviews may be required, including but not limited to:

- (a) Contracting outside of the IESO's collective agreement;
- (b) Stakeholder committees;
- (c) Where the Procurement relates to legal services, the Procurement must also be approved by the Vice President, Legal & Corporate Governance or their delegate; and
- (d) Where the Procurement relates to information systems, IT, information provisioning services, IT Consulting Services, hardware and business equipment, the Procurement must also be

approved by the Vice President, Information & Technology Services and Chief Information Officer or their delegate;

- (e) Where the Procurement is for the provision of external audit services or for services to be performed by the IESO's External Auditor, the Procurement unit must be consulted. A Procurement for external audit services must be carried out in accordance with Section 6.4.8 of [Appendix D: Additional Procurement Requirements Consideration Checklist](#).

Procurement documents may require review by Legal Services prior to issuance, including but not limited to where:

- (a) The method for obtaining submissions may create Procurement process obligations on the IESO (for example, Invitations to Tender and Non-Negotiated formats);
- (b) The IESO may be collecting personal information to ensure the IESO meets its obligations under the *Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, c. F.31;
- (c) Where there are deviations requested to previously approved standard terms and conditions contained in Procurement documents and/or Contracts;
- (d) Where, in the opinion of the Procurement Unit, there is a risk or complexity in the Procurement method; or
- (e) Where the expected Total Procurement Value would substantially increase the inherent risk of the Procurement process, at the sole determination of the Procurement Unit.

5.6 Conducting a Procurement

5.6.1 Determining the Procurement Method

The Procurement Unit will determine the appropriate Procurement method(s) and will provide one or more options to the Business Unit, including:

- (a) Invitational Competitive Procurement;
- (b) Open Competitive Procurement;
- (c) Vendor of Record Arrangement;
- (d) Non-Competitive Procurement; or
- (e) Such other Procurement methods, as determined by the Procurement Unit, that are consistent with the provisions of this policy and, for certainty, applicable law.

The Procurement method will depend on the type of service (Consulting, Non-Consulting or goods) and the Total Procurement Value. Together with the Procurement Unit, the Business Unit will determine if the goods and/or services being procured are Consulting or Non-consulting as defined in this Policy. The minimum Procurement Method thresholds are set out in [Appendix B: Procurement Methods & Thresholds](#).

5.6.2 Competitive Procurements

Competitive Procurement methods are conducted either in an Open Competitive or an Invitational Competitive manner:

- (a) Open Competitive is accomplished through a public posting of the Procurement.
- (b) An Invitational Competitive Procurement may proceed as follows:
 - By way of a direct invitation to identified Vendors; or,
 - By way of a VOR Agreement, in which an Open Competitive pre-qualification or establishment of a source list of Vendors precedes either a Second Stage Competition or a rotational award of Contracts to pre-qualified Vendors.

A Procurement for goods and/or Non-Consulting Services less than \$25,000 procured in accordance with this policy shall, for the purposes of this policy, be treated as if it had been competitively procured.

5.6.3 Using Vendor of Record Arrangements

The IESO must use Government VOR Arrangements where available and appropriate. The Procurement Unit is responsible for reviewing the guidelines for each Government VOR Arrangement to assess the availability, applicability and appropriateness of a Government VOR Arrangement.

Where no Government VOR Arrangement is available or appropriate, the IESO may choose to establish its own VOR Agreement in accordance with the requirements set out below:

- (a) VOR Agreements must be established through an Open Competitive Procurement and should be established considering the potential application of scope of goods and/or services across the IESO and should not specifically identify any Business Unit. VOR Agreements are encouraged where regular ad-hoc goods and/or services or repeat purchases are required;
- (b) Procurement documents establishing a VOR Agreement must clearly outline:

- That only Vendors who ultimately enter into a VOR Agreement with the IESO will receive invitations to provide the goods and/or services that are the subject of the VOR Agreement;
 - The length of the Contract Term of the VOR Agreement;
 - The method for terminating the VOR Agreement where the Contract Term of the VOR Agreement is undefined;
 - The process by which Vendors will be qualified, including:
 - The criteria that will be used to select Vendors of Record;
 - The frequency by which new Vendors may be pre-qualified (e.g. on an annual basis if the Contract Term exceeds three years).
 - The process and methodology by which unique assignments will be awarded, usually through a Second Stage Competition or Rostering process, including any limitation on the number of Vendors that may be invited to participate in a Second Stage Competition and the method under which those Vendors will be identified;
 - The pricing structure, including any allowable set or negotiable fee increases (e.g. in line with Consumer Price Index, or other).
- (c) IESO must enter into a Contract with each successful Vendor selected through the RVOR Procurement process;
- (d) A Statement of Work must be executed in consultation with the Procurement Unit for each Second Stage Competition or Rostering award and must be filed with the VOR Agreement;
- (e) Second Stage Competition or Rostering requirements are as follows:
- The Business Unit must seek guidance from the Procurement Unit prior to engaging Vendors of Record;
 - For VOR Agreements where there are multiple Vendors, IESO must engage in a further Second Stage Competition or use the established Rostering process to ensure that the best value for money is obtained;
 - The Second Stage Competition must be managed in accordance with the process outlined in the original Procurement document;
 - Approval must be obtained in accordance with the OAR prior to initiating the Second Stage Competition. The Approving Authority is based on the estimated Total Procurement Value of the Procurement being conducted under the Second Stage Competition;

- The IESO will issue a written Procurement document as a part of a Second Stage Competition. The Procurement document must include appropriate selection criteria, an evaluation process, and the type of Contract to be used, as applicable;
- When selecting Vendors through Rostering, such selection will be made in accordance with the applicable VOR Guide or in consultation with the Procurement Unit where no VOR Guide exists; and
- The Procurement Unit is responsible for verifying that the proposed pricing in the Second Stage Competition does not exceed the maximum price set out in the applicable VOR Agreement.

5.6.4 Non-Competitive Procurements⁵

Non-Competitive Procurements occur when:

- (a) IESO directly awards a Contract to a single Vendor with a Total Procurement Value greater than \$0 for Consulting Services and \$25,000 or greater for goods and Non-Consulting Services without a competition; or,
- (b) The terms of a Contract are amended for the addition of scope, time and/or value that is material in nature and that was not contemplated in the original Procurement and Contract.

A competitive process should be the standard method for acquiring goods and/or services. The onus is on the Business Unit to justify any decision to award a Contract outside of a competitive process, and seek the appropriate approvals prior to engaging a Vendor.

Non-Competitive Procurements are only allowed when:

- (a) An Allowable Exception to competition is available, as identified in [Appendix F: Allowable Exceptions to Competitive Procurement](#);
- (b) Pre-approval to proceed with a Non-Competitive Procurement has been obtained from the Procurement Unit and the Approving Authority, prior to and engaging any Vendor(s) and/or making any commitments on behalf of the IESO;
- (c) The Contract is not being awarded to a Vendor who has previously been awarded the same Contract non-competitively;

⁵ OPS Procurement Directive, Sections 4.4.4, 4.4.6 and 8.6.

- (d) A negotiation strategy has been considered and documented, where appropriate, to ensure value for money; and,
- (e) The Vendor has not been previously retained to advise on or to develop the technical specifications of the required goods and/or services that are the subject of the Procurement, as further described in [Appendix D: Additional Procurement Considerations Checklist](#).

The need for compatibility with existing goods and/or services is not sufficient to justify a Non-Competitive Procurement unless it is clear that there is only one Vendor capable of offering compatible goods and/or services. Other potential Vendors should be given the opportunity to meet compatibility requirements through a competitive Procurement.

A decision to bypass a competitive Procurement cannot be justified based on a presumption that no other Vendor would be competitive. That presumption needs to be tested through a competitive Procurement.

Non-Competitive Procurements without an approved Allowable Exception are non-compliant with this policy and will be reported to the IESO's Audit Committee and the Ministry through the IESO's annual attestation process. For certainty, the IESO should not engage in Procurement practices that are not in compliance with this policy.

5.6.5 Establishing Response Times

The IESO must provide sufficient time for Vendors to prepare and submit Responses in view of all relevant factors such as, but not limited to, time needed by the Vendor to properly disseminate the information, complexity, risk, seasonality, and best practices within the relevant industry.⁶

The IESO will use the following Response times:

- (a) For Procurements with a Total Procurement Value of less than \$100,000, or that are conducted through a VOR Agreement, the IESO will provide Vendors with sufficient time to respond, as described above;

⁶ OPS Procurement Directive, Section 5.4.

- (b) A minimum of 15 calendar days will be provided for all Procurements that are not conducted through a VOR Agreement and have a Total Procurement Value between \$100,000 and \$548,699;
- (c) A minimum of 30 calendar days will be provided for all Procurements that are not conducted through a VOR Agreement and have a Total Procurement Value greater than or equal to \$548,700; and
- (d) Additional time to respond should be provided where the Procurement is complex or high profile in nature.

Any exception to the noted Response times must be approved by the CFO, or their delegate.

5.6.6 Electronic Tendering

Open Competitive Procurements and Requests for Information (RFI) will be posted on a recognized electronic tendering system, as identified by the Procurement Unit.

5.6.7 The Use of Fairness Monitors

The IESO may choose to use external Fairness Monitors for Procurements that:

- (a) Are complex in either the scope of the Procurement or the methodology of the Procurement process; and/or
- (b) Are for the renewal or re-Procurement of goods and/or services where the incumbent may have, or may be perceived to have, an unfair advantage.

Where applicable, a Fairness Monitor should be retained before the commencement of the Procurement and the issuance of a Procurement document. Business Units must consult with the Procurement Unit prior to engaging a Fairness Monitor to ensure the appropriate management of such arrangements, in a fair and unbiased manner.

Recommendations and reports from the retained Fairness Monitor must be submitted directly to the IESO's Director of Internal Audit.

5.6.8 The Use of Non-Disclosure Agreements

The IESO may use confidentiality or non-disclosure agreements during a Procurement process, as follows:

- (a) Prior to undertaking any Procurement of goods and/or or services that may result in the disclosure of information that is confidential or personal, the Business Unit will conduct a risk assessment on the disclosure of that information to the general public;
- (b) Any information that is to be disclosed must comply with applicable legislation and IESO's policies, processes, and procedures concerning personal and confidential information;
- (c) Where the disclosure of IESO confidential or personal information is necessary to ensure the success of a Procurement, the IESO will enter into a confidentiality or non-disclosure agreement with any prospective Vendors prior to the disclosure of confidential or personal information; and
- (d) Wherever possible, personal or confidential information should be separated from the body of the Procurement document and set out as a separate schedule or if it is embedded in a Procurement document but the confidential or personal information is not needed for the Procurement, it should be redacted.

5.6.9 Communication with Vendors during a Procurement Process

Communications between Vendors and IESO's employees, agents, directors or contractors related to a Procurement process must be avoided at all times. Vendors must be directed to the contact person(s) identified in the Procurement documents in order to:

- (a) Maintain the integrity of the Procurement process;
- (b) Ensure that all Vendors are provided with consistent information; and
- (c) Ensure that the information given does not change the intended meaning of the Procurement document or any part therein. Failure to comply may result in Vendor disqualification.

5.6.10 Issuing Additional Information during the Procurement Process

Any additional information that clarifies or modifies the Procurement documents must be provided in the same manner as the originally issued Procurement document via an addendum.

Addenda, including responses to question and answer periods, must be issued within a reasonable amount of time prior to the deadline for Response to the Procurement document to allow sufficient time for a Vendor to address the content of the addenda in its Response.

Addenda that are issued after the disclosed deadline to issue addenda must also include an appropriate and reasonable extension to the submission deadline as is necessary for the Vendor to address the changes to the Procurement documents.

Procurement documents must make clear that any amendments to the Procurement documents shall only be made by addendum. Information supplied to Vendors through general notices, written responses to questions, requests for information, or other communications that are separate from the Procurement documents shall not constitute part of the Procurement documents.

All Procurements should provide sufficient time for Vendors to ask questions for clarification regarding the Procurement documents, evaluation criteria and contractual requirements. During the question and answer period of the Procurement:

- (a) It is presumed that the answer to a question posed by any particular Vendor should be communicated to all Vendors participating in the applicable Procurement process, unless a determination is otherwise made by the IESO that the question posed is commercially confidential to the Vendor;
- (b) Where a Vendor asserts that a question it is posing is commercially confidential in nature, then:
 - Where the IESO agrees that the question is commercially confidential, the response to such question will only be communicated to that Vendor;
 - Where the IESO determines that the question is not commercially confidential, then the Vendor shall be provided the opportunity to withdraw the question and either no response shall be given; or, if in the IESO's determination, the question and response is materially relevant to the Procurement, the IESO shall have the discretion to issue a response or communication to all Vendors on the substance of the question without specifically identifying the Vendor who asked it; or
 - The Vendor may agree to reclassify or revise the question so it is not considered commercially confidential, allowing a response to be given to all Vendors.

The IESO shall retain the discretion to determine whether a question is commercially confidential in nature and requires a commercially confidential response, whether or not the Vendor identified its question as being general or commercially confidential in nature.

5.7 Evaluation

5.7.1 Evaluation Criteria

The IESO will establish evaluation criteria as follows:

- (a) Evaluation criteria should be developed in consideration of the Procurement method and the principles set out in this policy;
- (b) Business Units should consult with the Procurement Unit to ensure that Mandatory Requirements are used only where absolutely necessary and not for the purposes of limiting or restricting the number of qualified submissions to be reviewed;
- (c) Evaluation criteria must not be developed in a way that creates hidden evaluation measures and the IESO shall not cause disclosed evaluation criteria to be further divided into undisclosed scoring sub-categories;
- (d) Evaluation criteria should take into account price, quality, quantity, delivery, servicing, experience, financial capacity of the Vendor, and any other criteria directly related to the individual Procurement;
- (e) Price submissions must be requested in separate electronic files from all other submission documents, and the evaluation of price must be undertaken by the Procurement Unit after the completion of the evaluation of the Mandatory Requirements and any other rated criteria, unless otherwise specified in the Procurement documents;
- (f) The IESO should not request information from Vendors that will not be evaluated or affect the evaluation process; and
- (g) Where a VOR Arrangement has been established, the IESO should not include evaluation criteria in a Second Stage Competition that was already evaluated during the initial VOR Arrangement evaluation, with the exception of price.

The IESO must fully disclose in the Procurement documents the evaluation criteria to be used in assessing a Vendors' Response. A full disclosure of the evaluation criteria includes, but is not limited to:

- A clear articulation of any Mandatory Requirements;
- A clear articulation of rated criteria, including all weighting and sub-weightings, where applicable;

- Descriptions of any short-listing processes, including, any required Minimum Thresholds for rated criteria and the tie-breaking mechanism that will be used;
- The role and weighting of reference checks and, if applicable, oral interviews, site visits, demonstrations, alternative strategies or solutions, and value-added services; and
- Descriptions of the pricing evaluation methodology, including the use of mathematical formulas that will be used to determine pricing for specific volumes and/or service levels or to calculate scoring.

Where IESO supports the proposal of alternative strategies or solutions, the Procurement document must expressly request alternative solutions and describe how alternatives will be considered in the evaluation process.

5.7.2 Evaluation Process

Responses must be evaluated in accordance with the evaluation process, criteria, rating and methodology set out in the Procurement document.

Where only one Vendor has submitted an eligible Response to a Procurement process, the Evaluation Committee must evaluate that Response in accordance with the evaluation process disclosed in the Procurement document to ensure that the Response meets the requirements of the Procurement.

Working with the Business Unit, the Procurement Unit will establish the evaluation framework for each Procurement in accordance with this policy. The evaluation framework will act as a guideline for how a Procurement will be evaluated and those participating in the evaluation are expected to comply with the evaluation framework. The evaluation framework may be an informal communication with the Evaluation Committee or may be provided in a formal guideline document. The degree to which the contents of an evaluation framework are disclosed, if at all, as part of the Procurement documents, shall remain at IESO's discretion. Evaluation decisions will be reached in accordance with the process outlined in the evaluation framework.

Individuals participating in the evaluation of Responses to a Procurement process must declare any potential or actual Conflict(s) of Interest. If potential or actual Conflicts of Interest are declared, written approval must be obtained from Legal Services to remain on the evaluation team.

Where a Vendor is disqualified for non-compliance with a Mandatory Requirement or fails to meet a Minimum Threshold (if any) as set out in the Procurement document, no further evaluation of that Vendors' Response will take place.

Following the evaluation process, the IESO may select only the highest ranked Response(s) that have met all Mandatory Requirements and/or Minimum Thresholds. Unless otherwise specified in the Procurement documents, in the event of a tie, the Response with the highest technical score will be deemed to be the highest ranked Response. Unless expressly stated in the Procurement documents, the IESO must not consider alternative products, specifications or solutions proposed by a Vendor.

5.7.3 Evaluation Committees & Sub-Committees

The responsibility of the Evaluation Committee is to ensure that the evaluation process is conducted in accordance with the evaluation framework, including reviewing and approving the evaluation framework, overseeing the activities of all participants associated with the evaluation process, and ensuring that all required due diligence necessary to carry out the evaluation process has been conducted.

No member of an Evaluation Committee may disclose any contents of the evaluation process except where necessary to escalate above the level of authority granted to an Evaluation Committee. In such cases, confidential information should not be disclosed except:

- (a) Where there is any occurrence of wrongdoing or other actions or omissions, which if not disclosed, could compromise the integrity and fairness of the evaluation process;
- (b) Where information obtained in the course of the evaluation process could represent a material enterprise-wide risk to the IESO outside of the context of the Procurement; or
- (c) In the event that the Evaluation Committee is at an impasse and requires the input or guidance of a higher authority within the IESO in order to resolve such impasse.

In all such cases, communication may only be made through and facilitated by the Procurement Unit.

In some Procurements, the evaluation requirements or contractual requirements may be sufficiently complex to warrant subdividing the Evaluation Committee into sub-committees. Each sub-committee will be responsible for evaluating the relevant information as it relates to their expertise (e.g. project management approach, financial or technical analysis, etc.).

5.7.4 Subject Matter Experts

Subject matter experts are those participants in an evaluation process who have particular expertise with respect to certain content contained within the submissions and may be called upon to assist the Evaluation Committee.

Subject matter experts may provide reports to support Evaluation Committee members in their scoring of Responses or to identify failures on the part of a Vendor to meet Rated Criteria which should be addressed during the negotiation period. This may include, but is not limited to, specific technical assessments for which the Evaluation Committee does not possess the subject matter expertise to adequately evaluate the Responses.

5.7.5 Vendor Performance

IESO may, consistent with the principles set out in this policy, including consideration of the public interest, value for money and responsible management, take into consideration a Vendor's past performance in the evaluation of a Procurement process provided that IESO has demonstrated due regard to the following factors:

- (a) the objectivity of the methodology for rating the past performance of a Vendor, and to what degree the past performance is relevant to the scored evaluation criteria in the Procurement;
- (b) the transparency and disclosure of a pre-established Vendor performance monitoring system or program that is fair, well documented, unbiased, free of conflict of interest, and specifically identifies (with supporting details) the failures of performance of a Vendor;
- (c) the ability of the performance monitoring system to maintain a fair process for Vendors who have never contracted with IESO;
- (d) the situations in which the Vendor performance monitoring system or program applies to an individual, as opposed to a firm or team; and
- (e) the general fairness and due process afforded to Vendors in the administration of the Vendor performance monitoring system or program.

The presence or lack thereof of a Vendor performance program does not prevent or preclude IESO from including evaluation criteria in a Procurement that takes into consideration past performance or other reference checking based on past experience, provided that such criteria satisfies the requirements of evaluation criteria generally set out in this policy.

5.7.6 Award Notifications

Vendors must be promptly informed of contract award decisions. Notification to a Vendor whose Response is rejected or disqualified should be made directly to the Vendor within a reasonable time after the decision to reject or disqualify has been made by IESO and must cite the reasons for rejection or disqualification.

Within 72 calendar days of awarding any Contract on behalf of the IESO with a Total Procurement Value of \$500,000 or greater, a notice of award must be published on a publicly accessible website (such website to be determined by the Procurement Unit as appropriate to the Procurement method) and must remain readily accessible for a reasonable period of time. The notice must include:

- (a) A description of the goods and/or services procured;
- (b) The name and address of the IESO;
- (c) The name and address of the successful Vendor;
- (d) The value of the awarded Contract; and
- (e) The date of the award.⁷

In the case of Contracts awarded on a time and material basis, the value of the awarded Contract shall be the approved Total Procurement Value.

A notice of award is not required for goods and/or services acquired through a Non-Competitive Procurement regarding matters of a confidential or privileged nature.

5.7.7 Vendor Debriefings

For all Procurements with an estimated Total Procurement Value greater than \$500,000, the IESO shall offer debriefings upon request from a Vendor and will inform all unsuccessful Vendors who

⁷ Canadian Free Trade Agreement, Chapter Five - Government Procurement

participated in the Procurement of the option to request a debriefing session. Vendor debriefings may be scheduled only after the Contract between the Preferred Vendor(s) and the IESO have been executed, or the shortlisting of Vendors following a Vendor of record Procurement process.⁸

For Procurements valued at \$500,000 or less, debriefings will be held or delivered at IESO's discretion. The Procurement documents should clearly state whether debriefings will be offered and, if so, the timeline within which a Vendor must request a debriefing in order to be eligible to receive such debriefing. The method of debriefing will be determined and delivered at IESO's discretion.

In conducting debriefings, the Procurement Unit may only:

- (a) Provide a general overview of the evaluation process as set out in the Procurement document;
- (b) Provide the name of the successful Vendor;
- (c) Discuss the strengths and weaknesses of the Vendor's submission in relation to the specific evaluation criteria and the Vendor's evaluated score. If more than price is evaluated, the IESO may provide the Vendor's evaluation score and their ranking relative to others without disclosing the actual ranking of other Vendors;
- (d) Provide suggestions on how the Vendor may improve future submissions;
- (e) Receive feedback from the Vendor on current Procurement processes/practices; and
- (f) Address specific questions and issues raised by the Vendor in relation to its submission.

The Procurement Unit may not disclose information concerning other Vendor, other than as specified above. If a Vendor makes such a request, they must be advised that a formal Freedom of Information (FOI) request can be submitted to the IESO's Privacy Office. During a debriefing, the Procurement Unit must not respond to any questions that are unrelated to the Procurement process and must note such questions as being out of scope in accordance with the debriefing process outlined in the Procurement documents.

⁸ Canadian Free Trade Agreement, Chapter Five - Government Procurement

The process of debriefing ensures that the Procurement process adheres to the principles of this policy. The purpose of a debriefing session is to give the unsuccessful Vendors an opportunity to receive feedback on the strengths and areas for improvement of their submissions.

5.8 Entering into a Contract

The following steps are required when entering into a Contract:

- (a) A Contract must be signed by all parties before the provision of goods and/or services commences. If only a Purchase Order will be issued, it must be issued before the provision of goods and/or services commences, as further described in Appendix H: Purchase Requisition and Purchase Order Requirements;
- (b) The Contract must be finalized using the form of Contract that was disclosed with the Procurement document, if any;
- (c) The Contract Term, including and any options to extend, must align with the term that was set out in the Procurement document;
- (d) The Contract must clearly state the financial commitments of the engagement, including permitted price increases as set out in the Procurement documents and any contract ceiling price;
- (e) Where a negotiated Contract is not required to be executed at the close of a Procurement process, the Purchase Order will form the binding agreement between the IESO and the Vendor and will be accompanied by the IESO's standard Contract terms and conditions;
- (f) All non-standard Contracts must be submitted to Legal Services for review prior to execution, regardless of the dollar value or the length of term of the Contract. This includes third party Contracts and any deviations to previously approved clauses to IESO Contracts and commercial terms; and
- (g) When executing a Contract, the IESO should obtain the Vendor's signature prior to seeking the signature of the Approving Authority.

5.9 Contract Management

The Business Unit is responsible for the management of the Contract, in accordance with [Appendix G: Contract Management](#).

5.10 Providing Vendor References

Employees may provide personal references in respect of Vendors that are factual, accurate, fair, pertinent, and verifiable; however, it must be clear that the comments made are in their personal capacity and are not those of the IESO. Employees cannot give personal references on IESO letterhead or otherwise suggest that they are given on behalf of the IESO.

5.11 Complaint Process

Vendor complaints regarding the IESO's Procurement process(es) must be submitted to the Procurement Unit to be managed in accordance with applicable laws.

6.0 Appendices

6.1 Appendix A: Procurement Document Retention Requirements

The Procurement Unit shall ensure that all Procurement decisions and decision-making processes are recorded to account for and support the reconstruction of facts related to a Procurement, including but not limited to:

- (a) Retaining Procurement records in compliance with the IESO's records management policies and processes;
- (b) Establishing a file naming convention that will permit related Procurement documents to be associated with each other; and
- (c) Managing Procurement documentation to ensure that the IESO is able to respond to any requests for information, Vendor inquiries, debriefing requests, audits and/or legal challenges in a relevant, reliable, comprehensive and timely fashion.

The Procurement Unit shall retain the following documentation related to the Procurement process:

- (a) A copy of the Procurement justification or business case, as applicable;
- (b) Information regarding all relevant Vendor consultations, market research and any RFI's undertaken in the development of the Procurement business case and/or Procurement documents;
- (c) Evidence that all required approvals were obtained;
- (d) Copies of all Procurement documents used to qualify and select a Vendor, including, as applicable, all correspondence received and provided during a Procurement process and all addenda issued with the Procurement documents;
- (e) A VOR Guide describing the terms of use, where applicable;
- (f) Where the Procurement was conducted through a VOR Agreement, information regarding the Second Stage Competition used to select the successful Vendor(s), if applicable;
- (g) Copies of all advertisements of Procurement documents;
- (h) Information relating to compliance with the *Accessibility for Ontarians with Disabilities Act, 2005*, where applicable;
- (i) Copies of all Responses to Procurement documents, including Conflict of Interest declarations and registration forms;

- (j) Information regarding any issues that arose during the Procurement process, including all correspondence related to any complaints or disputes;
- (k) All records of evaluation, kept in accordance with applicable law and recordkeeping policies of the Evaluation Committee and its members. The records of evaluation include, but are not limited to:
 - Individual scoring notes and individual evaluator worksheets;
 - Consolidated notes, scores and all other evaluation records, including presentations prepared for the purposes of obtaining approval of evaluation results;
 - Presentations materials prepared by Vendors and notes taken by evaluators where an interview process is included in the evaluation process;
 - All decisions of any Evaluation Committee, as convened in accordance with the evaluation framework for the Procurement;
 - Information regarding all Vendor debriefings, including documentation of the Vendor's request for a debrief, where applicable;
 - Copies of all award letters, notices and posted announcements;
 - Copies of the Contract(s), including executed Contracts and proof of communication of Contracts to the Vendor including where the form of Contract is a Purchase Order;
 - Information regarding all changes or negotiations to the terms and conditions of the Contract;
 - Information regarding any risk assessments performed (such as cybersecurity risk, privacy risks and financial risk) and any resulting recommendations, where applicable;
 - Information regarding all disputes or complaints from Vendors regarding the Procurement; and
 - Contractor security screening decisions, where applicable.
- (l) Any other relevant documentation as identified.

6.2 Appendix B: Procurement Methods & Thresholds

The Procurement method will be determined by the Procurement Unit based on several factors, including the minimum requirements as set out below. In the case of an invitational competitive procurement, where the IESO is unable to identify the minimum number of Vendors required to be invited as specified below, an Open Competitive Procurement must take place.

Procurement Type	Total Procurement Value	Procurement Method
Consulting Services	\$0 - \$100,000	Invitational to a minimum of three (3) Vendors.
	\$100,001 and greater	Open Competitive Procurement.
Goods & Non-Consulting Services	\$0 - \$25,000	Invitational to a minimum of one (1) Vendor.
	\$25,001 - \$200,000	Invitational to a minimum of three (3) Vendors.
	\$200,001 and greater	Open Competitive Procurement.
Establishing a VOR Agreement	Any value	Open Competitive Procurement.
Second Stage Competition to a VOR	Less than \$25,000	A minimum of 1 or more Vendors.
	\$25,000 - \$249,999	A minimum of 3 or more Vendors (or all qualified Vendors if there are less than then numbers specified).
	\$250,000 - \$599,999	A minimum of 5 or more Vendors (or all qualified Vendors if there are less than then numbers specified).
	\$600,000 and above	All qualified Vendors.
Requests for Information (RFI)	All RFIs must be posted publically on an electronic tendering site in accordance with this policy.	
Non-competitive	In accordance with this Policy and with prior approval from the Procurement Unit and the Approving Authority.	

6.3 Appendix C: Procurement Document Requirements Checklist

All Procurement opportunities must be communicated in writing and include sufficient details concerning the Response requirements to enable the fair and transparent comparison of Responses. For clarity, the Procurement of goods and/or services may not be made through verbal requests for quotations or proposals.

The Procurement documents must contain all material information relevant to the Procurement, including the following, where applicable:

- (a) A complete description of the goods and/or services, including the nature, and any optional components that are being priced separately;
- (b) The quantity or estimated quantity where the quantity of goods and/or services is unknown;
- (c) Any requirements to be fulfilled, including any technical specifications, requirements for servicing or warranty, transition costs (if applicable), applicable conformity assessment certification, plans, drawings or instructional materials. For these specifications:
 - Generic and non-brand-specific requirements should always be used when possible. In such cases the specifications should include information with respect to minimum performance requirements; and
 - In any case where references to particular trademarks or trade names, patents, copyrights, designs, type, specific origin, producer or supplier are made, the Procurement documents must allow for equivalents.
- (d) Any conditions for participation, specifically any Mandatory Requirements, including a list of information and documents that Vendors are required to submit in connection with the conditions for participation in any Procurement process;
- (e) A clear description of the evaluation criteria and process to be used in assessing Responses, including the weighting and, if applicable, sub-weighting of all criteria and any Minimum Threshold requirements;
- (f) Clear submission instructions;
- (g) If applicable, a description of the process that will be used to seek clarification and/or allow the correction of unintentional errors in Vendor submissions after the submission deadline;
- (h) The Contract Term (which includes all extension and/or renewal options);
- (i) The framework under which price increases will be permitted, including, without limitation, the frequency of the price increases, allowable amounts of increases and any benchmarks that will be used to confirm the price increases, as applicable;

- (j) Any dates for the delivery of goods or the supply of services, which must take into account such factors as the complexity of the Procurement, the extent of subcontracting anticipated and the realistic time required for production, de-stocking and transport of goods from the point of supply or for supply of services;
- (k) The timeline for the Procurement process, including posting date, deadlines for submitting questions and posting Addenda and the closing date; and
- (l) Any other applicable requirements as set out in [Appendix D: Additional Procurement Considerations Checklist](#) and [Appendix E: Additional Requirements for IT Procurements](#).

In the case of a Procurement document to establish a VOR Agreement, the Procurement document will also include:

- (a) A description of how purchases will be made under the VOR Agreement;
- (b) The criteria that will be used to evaluate submissions;
- (c) A statement that only the Vendors engaged in the VOR Agreement will receive further notices of Procurements under the VOR Agreement;
- (d) The Contract Term of the VOR Agreement, including the frequency that the VOR Agreement will be re-opened for new submissions (if applicable). If there is no Contract Term for the VOR Agreement, the Procurement document must also indicate the method by which notice will be given of the termination of the VOR Agreement; and
- (e) If applicable, any limitation on the number of Vendors that will be permitted to participate in the Second Stage Competition and the criteria for selecting the limited number of Vendors.

The Procurement documents will exclude:

- (a) Conditions for participation that are not essential to ensuring that a Vendor has the legal and financial capacities and the commercial and technical abilities to provide the goods and/or services;
- (b) Any criteria designed to favour Vendors from a particular location (province, territory, region) or goods and/or services of a particular geographic location (excluding, where applicable, requirements within Canada);
- (c) Any requirement to have prior experience with the IESO or within Ontario; and
- (d) Any requirement or feature that could unfairly create an advantage for certain Vendors.

6.4 Appendix D: Additional Procurement Considerations Checklist

6.4.1 Business Unit Obligations

The Business Unit must communicate the impact of any of the following additional considerations to the Procurement Unit when undertaking a Procurement.

6.4.2 Protection of Personal and Sensitive Information

Prior to undertaking any Procurement of goods and/or services that may result in the collection, use or disclosure of personal information, the Business Unit will obtain legal advice as to whether the collection, use and disclosure is compliant with applicable legislation. The Business Unit may be required to conduct a privacy impact assessment. Any information that is to be collected, used and disclosed must comply with applicable privacy legislation and the applicable IESO privacy policies, processes and procedures.⁹

6.4.3 Consulting Services Contracts¹⁰

Effective September 1, 2020 and in accordance with Appendix B of the OPS Procurement Directive, all Consulting services contracts, regardless of the Total Procurement Value, must provide a cost for each deliverable provided by the Consultant, with the exception of the development of a qualified Vendor of Record list.

New VOR Agreements may use per hour or per diem rates which will be used to determine the costs of deliverables that are defined in a second-stage competition.

6.4.4 Design & Build Procurements

For Procurements that involve design and build phases, the IESO should either:

- (a) Conduct a single Procurement with the build phase being subject to the successful completion of the design phase; or
- (b) Conduct separate Procurements for the design and build phases.

Where the Business Unit determines it is appropriate to conduct a single Procurement, whereby the same Vendor would provide both design and build services, the Business Unit must validate

⁹ OPS Procurement Directive, Section 8.14 (mandatory).

¹⁰ OPS Procurement Directive, Appendix B, Section 5 (mandatory)

the satisfactory completion of the design phase before proceeding with the build phase. The Business Unit must clearly define the criteria by which satisfactory completion will be measured. The Procurement Unit must ensure that the Procurement documents, especially the Agreement, clearly outline the measurement criteria.

Where the Procurement of design and build phases will be conducted separately, the Procurements are subject to the following requirements:

- (a) Any Vendor engaged in the design phase of the Procurement may not participate in the subsequent build phase of the Procurement. This must be clearly disclosed in both Procurement documents; and
- (b) The Business Unit is responsible for informing the Procurement Unit of any subsequent or future Procurements that may involve the design services being procured.

6.4.5 Independent Contractors

Contracts with Independent Contractors who are not former IESO employees are subject to a maximum contiguous term of 36 months (including any extensions) based on 6000 hours (2000 hours per year). Prior approval by the CFO or their delegate is required for any such Contract that extends beyond 36 months (6000 hours).

Individual Independent Contractors who are not incorporated will be issued a T4A slip in compliance with the IESO's obligations to Canada Revenue Agency requirements and such requirements must be communicated to the Individual Independent Contractor and included in the Contract terms and conditions, as appropriate.

Former Employees who retired or were eligible for retirement but were terminated and either withdrew some or all of their pension benefits and/or received a severance package:

- (a) Will not be sourced through a Non-Competitive Procurement; and
- (b) Are not eligible to be awarded a Procurement opportunity for a minimum period of six months following the date of their retirement or termination of employment or final severance payment (whichever comes later) from the IESO.

In either case, the Contract will be subject to a maximum term of eighteen months, following which the Independent Contractor will not be eligible to participate in another IESO Procurement process until a further six month waiting period has elapsed.

6.4.6 Collective Agreements

Procurements may be subject to specific terms or conditions within the IESO's collective agreements with the Society of Energy Professionals and the Power Workers Union, as are amended from time to time. This may include, but is not limited to Contracting Out Notifications or Purchased Services Agreements. In these cases, Business Units are responsible for consulting with the IESO's Human Resources Department prior to commencing a Procurement.

6.4.7 Expense Reimbursement

Contracts must only allow for the reimbursement of expenses in accordance with the *OPS Travel, Meal and Hospitality Expense Directive*, as amended from time to time. The IESO will not reimburse expenses that are specifically excluded, including but not limited to food (meals, snacks and beverages), hospitality and incidentals.

6.4.8 External Audit Services and the IESO's External Auditor

The Procurement Unit must be consulted when engaging a Vendor to conduct audit services or when engaging the IESO's External Auditor to perform any services, regardless of the Total Procurement Value. All non-audit services to be performed by the IESO's External Auditors must be reviewed and approved by the Audit Committee before such work is commenced.

The independence required of an External Auditor is predicated on three principles: (a) an auditor cannot function in the role of management; (b) an auditor cannot audit their own work; and (c) an auditor cannot serve in an advocacy role for the IESO (the "Auditor Principles"). The IESO's External Auditor may only provide the services listed below:

- (a) Audit and review of financial statements;
- (b) Annual audit of the design and operating effectiveness of internal controls over financial reporting;
- (c) Prospectus work;
- (d) Audit of pension plans;

- (e) Special audits on control procedures;
- (f) Accounting research and advice;
- (g) Due diligence on mergers and acquisitions;
- (h) Tax compliance and Consulting Services; and
- (i) Other services not specifically prohibited in the following sections.

The IESO's External Auditor cannot provide any of the following services:

- (a) Bookkeeping services or other services related to accounting records or financial statements;
- (b) Financial information systems design and implementation;
- (c) Appraisal or valuation services, fairness opinions, or contribution-in-kind reports;
- (d) Actuarial services;
- (e) Outsourced internal audit services that conflict with the Auditor Principles of independence listed above;
- (f) Management functions;
- (g) Human resources functions;
- (h) Broker-dealer, investment advisor or investment banking services;
- (i) Legal services;
- (j) Expert witness services unrelated to the audit;
- (k) Consulting Services that conflict with the Auditor Principles listed above;
- (l) Recommend aggressive or confidential tax transactions; and
- (m) Personal tax services to persons in financial reporting oversight roles.

6.4.9 Contractor Security Screening

Contractor security clearance may be required for Vendors selected to provide goods and/or services to the IESO. At the start of any Procurement process, Business Units must complete a contractor security risk assessment to assess the nature of Contract risks involved and determine the need, if any, and level of contractor security screening involved. Where contractor security clearance is required, it is the obligation of the Business Unit to ensure that clearance is received.

6.4.10 Additional Considerations for Advertising, Public and Media Relations and Creative Communication Services

In determining the appropriate Procurement method and approvals for the Procurement of advertising, public and media relations, and creative communication services, Business Units must consult with the Procurement Unit and consideration must be given to the estimated Total Procurement Value of the services, including fees paid to the agency for its creative work and coordination, as well as the costs of production, including third-party costs.

A Contract with a Vendor for such services must include a provision that, when third-party production services are to be acquired by the Vendor, the Vendor must carry out a competitive process that adheres to the requirements of this Policy. The provision should outline the expectations and requirements for conducting the competitive process, including but not limited to, value thresholds, record retention, and IESO approval requirements.

6.4.11 IESO Code of Conduct

When procuring goods and/or services, the Procurement Unit must ensure that a copy of the current Code of Conduct must be made available to Vendors in accordance with the Procurement documents, as compliance with the Code of Conduct is a condition of association with the IESO for its business partners, consultants and contractors.

6.4.12 Related Party Transactions

When procuring goods and/or services, any Contracts and subsequent financial transactions that are awarded to Related Parties must be disclosed on the IESO's financial statements and such awards must be reported by the Procurement Unit to the CFO or his/her delegate prior to the execution of any such Contracts.

6.4.13 Accessibility Obligations

The Procurement Unit must ensure that IESO complies with the *Accessibility for Ontarians with Disabilities Act, 2005, S.O. 2005, c. 11 (AODA)* and its regulations, as well as related IESO policies when procuring goods and/or services.¹¹

The IESO must incorporate accessibility criteria and features into its Procurement processes,

¹¹ OPS Procurement Directive, Section 8.13 (mandatory)

except where it is not practicable to do so. Where applicable, Procurement documents must specify the desired accessibility standards to be met and the related submission requirements, and provide guidelines for the evaluation of proposals in respect of those requirements.

6.4.14 Additional Considerations for Legacy Contracts

Additional review and consideration may be required for Procurement activities affecting Contracts that were procured by a predecessor IESO entity using the predecessor entity's procurement policies and processes, and which continue to be administered by the IESO. Examples may include the administration of existing VOR Agreements, and Contract Amendments. Legacy Contracts will be reviewed on a case-by-case basis.

6.5 Appendix E: Additional Requirements for IT Procurements

In addition to the requirements outlined in [Appendix C: Procurement Document Requirements Checklist](#) and in [Appendix D: Additional Procurement Considerations Checklist](#), Business Units must also include the following considerations for IT Procurements, where applicable:

6.5.1 Cybersecurity

Prior to undertaking any Procurement of goods and/or services that may involve i) access to IESO systems or data, ii) software or application development services, iii), installation or use of new software or cloud based services; the Business Unit will discuss their requirements with IESO's Information Security team. Information Security may be required to perform a formal evaluation and/or conduct a risk assessment on the requirements in order to determine the impact and necessary requirements related to the Procurement. Procurement activities must adhere to IESO Information Security policies, standards, processes, and procedures.

6.5.2 Quality Assurance

Prior to undertaking any Procurement of IT related goods and/or services; the Business Unit will discuss their requirements with IESO's Quality Assurance Business Unit. The Quality Assurance Business Unit may provide requirements and/or considerations for the Business Unit to include in Procurement activities.

6.5.3 Commercial-Off-The-Shelf (COTS) Software & Related Services

Commercial-Off-The-Shelf (COTS) Software Related Services includes, but is not limited to, maintenance, technical support services, installation, training, configuration and implementation services but excluding Consulting Services, equipment and hardware.¹²

In consultation with the Procurement Unit, it may be determined that the most effective method of selecting a type of COTS Software is to undertake a COTS Evaluation, rather than a call for proposals. In a COTS Evaluation, requirements must be documented in functional terms and evaluations should examine the fit of potentially suitable software to meet those functional requirements. The software product that meets the documented functional requirements and has the lowest evaluated Cost is the preferred product. All relevant Costs and benefits must be considered to determine the Total Procurement Value.

The COTS Evaluation is only related to the process of evaluating broad software solutions to identify a preferred solution that will meet the needs of the IESO's business requirements. A COTS Evaluation may not be used for:

- (a) The purchase or acquisition of a COTS solution where multiple resellers or distributors exist; or
- (b) The purchase of professional services for the integration, implementation, configuration or other related services associated with or required for the COTS solution.

Once a COTS solution has been identified through the COTS Evaluation process, the IESO must first determine if a Government VOR Arrangement or Volume Licensing Agreement (VLA) is available for the preferred solution. Where a COTS product is available through a government VLA, the IESO may award the Contract directly, subject to the requirements of the VLA. Where the preferred solution is not available through a Government VOR Arrangement or VLA, the IESO may leverage an existing IESO VOR, if available; otherwise, a Competitive Procurement process must be used to engage resellers and/or direct sellers.

Where the Procurement Unit determines that a COTS Evaluation is appropriate and the Business Unit elects to proceed with the evaluation, they must:

- (a) Engage the Procurement Unit prior to conducting any evaluations, demonstrations or discussions with potential Vendors;

¹² OPS Procurement Directive, Section 10.

- (b) Evaluate all potential software solutions against the same criteria and maintain records to support this evaluation; and
- (c) Complete a COTS Evaluation memo, outlining the evaluation process, requirements and selection justification. The COTS Evaluation memo must be reviewed by the Procurement Unit and approved by the Approving Authority listed under the OAR and the CFO prior to entering into a Contract.

6.5.4 Volume Licensing Agreements¹³

Some Volume Licensing Agreements (VLAs) have been established with certain COTS product Vendors to enable the IESO to take advantage of discounts and the opportunity to license COTS products under common negotiated terms. Prior to using a VLA, the Procurement Unit must review and follow the VLA guidelines, terms and conditions including, but not limited to, reporting and audit requirements set out by the Government.

IESO must note that since VLAs have not been established using an open competition process, they are not considered a substitute for competition. IESO may be required to seek non-competitive approvals, as appropriate, for Procurements of COTS software and related services using a VLA.

6.5.5 Maintenance and Support

The Business Unit must consider the acquisition of maintenance and/or support over the estimated useful life of the IT installation as part of the Total Procurement Value and either include it in the Procurement for the software, or procure it separately, where necessary and appropriate. Splitting or sub-dividing of maintenance and support services for the purposes of avoiding the requirements of this policy is not allowed. IT Contracts must include appropriate contractual provisions for maintenance and support services for the estimated useful life of the IT installation.

For already installed software or hardware, where maintenance and/or support was not included in the Procurement approval or where maintenance and/or support services will expire, IESO must seek the appropriate Procurement approvals for the balance of the intended installation period or next anniversary of the installation when maintenance and/or support will be required.

¹³ OPS Procurement Directive, Section 4.3.1

6.6 Appendix F: Allowable Exceptions to Competitive Procurement

The Allowable Exceptions are as follows¹⁴:

- (a) Where there is an absence of Responses to a competitive Procurement process that has been conducted in compliance with this policy, including where:
 - No Responses submitted;
 - No submissions to the Procurement met the Mandatory Requirements or Minimum Thresholds of the Procurement; or
 - The submitted Responses were collusive. Procurements directly awarded under this exception must include the same requirements of the original Procurement.
- (b) Where only one Vendor is able to meet the requirements and no reasonable alternative or substitute goods and/or services exist for one or more of the following reasons:
 - To ensure compatibility with existing products or goods and/or services. Compatibility with existing products or goods and/or services may not be allowable if the reason for compatibility is the result of one or more previous Non-Competitive Procurements;
 - The protection of copyright, patent rights, or other exclusive rights or to maintain specialized products that must be maintained by the manufacturer or its representatives; or
 - The supply of goods and/or services is controlled by a Vendor that is a statutory monopoly.
- (c) For work to be performed on property by a contractor according to provisions of a warranty or guarantee held in respect of the property or original work;
- (d) For work to be performed on or about a leased building or portions thereof that may be performed only by the lessor;
- (e) For the Procurement of (electronic) subscriptions to newspapers, magazines or other periodicals;
- (f) For the Procurement of original works of art;
- (g) For additional deliveries by the original Vendor of goods and/or services that were not included in the initial Procurement where a change of Vendor:
 - Cannot be made for economic or technical reasons such as requirements of interchangeability or interoperability with existing equipment, software, services or installations procured under the initial Procurement; and

¹⁴ OPS Procurement Directive, Section 4.4.4.2

- Would cause significant inconvenience or substantial duplication of Costs for the IESO.¹⁵
- (h) Where a situation of urgency exists brought about by events unforeseeable by the IESO and the goods and/or services cannot be obtained by means of a competitive Procurement process. A situation of urgency does not occur where the IESO has failed to allow sufficient time to conduct a competitive process;
- (i) For the purchase of goods and/or services on a commodity market;
- (j) For the Procurement of a prototype or a first goods and/or services to be developed in the course of research, experiment, study or original development but not for any subsequent purchases;
- (k) For purchases made under exceptionally advantageous circumstances that only arise in the very short term in the case of unusual disposals such as liquidation, bankruptcy or receivership, but not for routine purchases from regular Vendors;
- (l) Where goods, Consulting or Non-Consulting Services regarding matters of a confidential or privileged nature are to be purchased and the disclosure of those matters through a competitive Procurement process could reasonably be expected to compromise IESO's confidentiality, result in the waiver of privilege, cause economic disruption or otherwise be contrary to the public interest; and
- (m) For a Contract to be awarded to the winner of a design contest provided that (i) the contest has been organized in a manner that is consistent with the principles of this policy; and, (ii) the participants are judged by an independent jury with a view to a design contract being awarded to a winner.

¹⁵ Canadian Free Trade Agreement, Chapter Five - Government Procurement

6.7 Appendix G: Contract Management

The Business Unit is responsible for the management of the Contract, including but not limited to the following:

- (a) Submitting the Purchase Requisition(s) to the Procurement Unit through the Online Financial Management System within 5 business days of contract execution or within 5 days of notice to Award where the Purchase Order forms the Contract, in accordance with [Appendix H: Purchase Requisition and Purchase Order Requirements](#).

Managing the financial commitments of the Contract, ensuring that:

- (a) Payments are approved in accordance with the provisions of the Contract and are done so in a timely manner through the IESO's financial management tool;
- (b) Payments for applicable expenses are in accordance with the Management Board of Cabinet Travel, Meal and Hospitality Expenses Directive, as amended from time to time; and
- (c) Over-payments are identified to Accounts Payable for recovery.

Ensuring Vendor compliance against the delivery of the goods and/or services in accordance with the terms and conditions set out in the executed Contract, including but not limited to scope of work and milestone management and Vendor performance.

Requesting Contract Amendments in a timely manner, including but not limited to:

- (a) Identifying any change requests to the scope, term or deliverables and working with the Procurement Unit to assess any impacts on Costs, terms, and, if applicable, determining whether such changes require non-competitive justification or re-Procurement;
- (b) Initiating requests for amendments or for the execution of extension options through the Procurement Unit at least one month in advance of expiry;
- (c) Submitting timely revisions to the Purchase Order through the Online Financial Management System to ensure that the Approving Authority is in place prior to the changes taking effect; and
- (d) Ensuring that the delivery of goods and/or services do not continue beyond the expiration date of a Contract without an approved Contract Amendment executed through the Procurement Unit.

6.8 Appendix H: Purchase Requisition & Purchase Order Requirements

6.8.1 Purchase Requisition vs. Purchase Order

Purchase Requisition means a request for approval to initiate a Purchase Order for the purchase of goods and/or services through the IESO's Online Financial Management System.

Purchase Order means an authorized record for the purchase of goods and/or services issued by the IESO to a Vendor issued from the IESO's Online Financial Management System.

6.8.2 When you need a Purchase Order:

- (a) A Purchase Order is required for all Consulting Services purchases, regardless of the Total Procurement Value;
- (b) A Purchase Order is required for all goods and Non-Consulting Services with a Total Procurement Value greater than or equal to \$25,000;
- (c) A Purchase Order is required for goods and Non-Consulting Services with a Total Procurement Value less than \$25,000, where:
 - A stand-alone Contract is required;
 - A Contracting Out Notification (CON) or Purchased Services Agreement (PSA) is required; and/or,
 - The goods and/or services are related to software, hardware and business equipment greater than \$10,000 (Purchases of this nature must be initiated by IT Services);
- (d) A Purchase Order will not be issued until all the appropriate approvals have been obtained under the OAR.

6.8.3 Purchase Requisition Requirements:

The Purchase Requisition must include all relevant details of the purchase, including but not limited to:

- (a) A brief description of the goods and/or services to be provided, including whether they are goods, Consulting Services or Non-Consulting Services;
- (b) The Procurement method used (Invitational or Open Competition or Non-Competitive);
- (c) The Contract Term, including any options to extend or renew the Contract;

- (d) The Total Procurement Value;
- (e) The amount payable to the Vendor for the delivery of those goods and/or services;
- (f) Any timelines or deadlines for providing the goods and/or services;
- (g) A copy of the proposal, quotation or submission from the Vendor, including, as appropriate, documentation to support adherence to the provisions of this policy;
- (h) Where applicable, a copy of the executed Contract; and
- (i) Any other instructions or information related to the purchase or delivery of the goods and/or services.

6.9 Appendix I: Guidelines for Conducting Market Research

6.9.1 What is market research as it relates to Procurement?

Market research is the process of gathering information through independent research and/or Vendor consultation in advance of a Procurement process to:

- (a) Identify potential Vendors that provide or sell the desired goods and/or services;
- (b) Find out if there are products that have the capability or functionality to achieve the business objective;
- (c) Discover characteristics or functions that are available that may be incorporated into a specification; and
- (d) Acquire high-level budget estimates that may be used in establishing a Total Procurement Value, to improve accuracy and secure funding approval, as further described in Section 6.9.5 of this Appendix).

6.9.2 When is market research appropriate?

Market research and/or Vendor consultation is only appropriate prior to the initiation of a competitive Procurement. Once the IESO has initiated a competitive Procurement process, communication with Vendors is only permitted through the Procurement Unit, in line with this policy and with the terms and conditions set out in the Procurement document (i.e. RFP, etc.).

6.9.3 What market research methods are available?

Depending on the goal of the consultation, the IESO may engage in the following types of market research activities: *(a comparison of these activities is presented in Table 1 of this Appendix)*

- (a) Conduct informal market research where high level and generic needs are communicated to Vendors through preliminary discussions for the sole purpose of gathering pricing information or high level information on available goods and/or services to improve planning and budgetary activities. This type of research may also include internet research, generic email enquiries, trade shows, white paper reviews, etc. and does not require the assistance of the Procurement Unit provided that they are conducted in line with the IESO Procurement Policy and this Appendix);
- (b) Issue a Request for Information (RFI) to gather detailed information and feedback from a broad base of Vendors. This may include outlining a potential requirement and requesting feedback on Vendor capabilities and suggestions on how a subsequent Procurement may be

structured. These must be written documents that are publically posted on the IESO's e-tendering site via the Procurement Unit, soliciting written Responses from the marketplace;

- (c) Issue a draft Request for Proposal (RFP) when a detailed Procurement document is available and the intention is to gather feedback on the details of a Procurement need, approach and general documentation. These must also be written documents that are publically posted on the IESO's e-tendering site via the Procurement Unit, soliciting written Responses from the marketplace.

6.9.4 What are the “rules of engagement” when it comes to informal market research?

The Business Unit is responsible for ensuring that any market research activities that are undertaken directly, without the Procurement Unit, are conducted in line with the IESO Procurement Policy, maintaining the principles of fairness and transparency and:

- (a) Provides no advantage to any Vendor, by ensuring that:
 - All Vendors are provided with the same information within a similar timeframe;
 - Information provided to Vendors does not unnecessarily reveal IESO's requirements and/or needs to the extent that it could create an advantage to any one Vendor; and,
 - Market research findings do not result in any bias nor the development of any requirements that could perceivably favour any particular potential Vendor or group of Vendors.
- (b) Creates no obligation or commitment between the IESO and any Vendor during the consultation or market research phase;
- (c) Clearly communicates to Vendors that market research is not a substitute for a competitive Procurement and that the engagement is not intended to result in Vendors expending significant cost or effort; and
- (d) Any free trials of software or online subscription services are not be implemented without first engaging with Information & Technology Services and Legal to the extent there are any associated agreements, including “click-through” agreements.

6.9.5 What information can IESO gather on pricing ahead of a procurement process?

- (a) IESO may obtain high level budget estimates, including:
 - Standard price lists that the Vendor publishes broadly;
 - Discount volume thresholds and rates; and/or,
 - General hourly rate ranges for specific services or skill sets (i.e. labour rates, etc.).

- (b) When seeking information on volume discount levels, it is important not to reveal the IESO's volume needs; instead, ask "what break-points exist for volume purchases." Note that each Vendor may have their own ranges for discounts (e.g. 0-99, 100-249, 250-999, etc.);
- (c) Encourage Vendors to quote commercial rates that any customer would expect to receive at the specified volume discount levels and dissuade them from simply quoting list prices, which tend to be far higher than real-world commercial prices.. This will improve budget accuracy; and
- (d) Market research should not result in formalized quotes or proposals from a Vendor or multiple Vendors. Formal quotations must be sought through a competitive Procurement process.

6.9.6 What to consider before conducting market research

Before approaching the market for information, Business Units should consider the following:

- (a) The objective of the research – i.e. whether it is to determine what products or services exist, or to aid in developing budget estimates;
- (b) Which market or segment of the market place is being targeted;
- (c) The number of Vendors to be engaged noting that the number should be proportionate to the number of potential Vendors in the market. This will help to ensure that the process is not overburdened by speaking to every conceivable potential Vendor, but is broad enough to capture a wide array of information;
- (d) How much time and effort will be spent on market research, including understanding critical deadlines for sourcing the goods and/or services;
- (e) The method for conducting the market research; and
- (f) Confidentiality – the Business Unit is responsible for ensuring that:
 - The commercial confidentiality of any information received during discussions with Vendors is protected and maintained; and
 - Appropriate Non-Disclosure Agreements are in place to protect the IESO's confidentiality and security (note that these should only be used in circumstances where the disclosure of IESO information is critical to the discussions and must be administered through the Procurement Unit).

6.9.7 Comparing market research methods

Table 1: Market Research Methods – General Overview

	RFI/Draft RFP	Informal Market Research
Conducted in line with the principles of this policy.	Yes	Yes
Used to gather information or to test a scope of work or approach.	Yes	No
Used to gather high level pricing information for budgeting purposes.	Yes	Yes
May disclose specific details of the IESO's requirements or specifications.	Yes	No
Issued publically on IESO's e-tendering site.	Yes	No
Vendor Responses must be submitted in writing.	Yes	No
Does not result in an obligation or commitment.	Yes	Yes
Does not create any advantage for any Vendor.	Yes	Yes
May replace a competitive process.	No	No
Used as a condition of participating in a competitive procurement.	No	No

7.0 Definitions

Unless otherwise defined in this policy, the following definitions have the following meanings:

Allowable Exception means specific situations set out in this policy where the use of a Non-Competitive Procurement process is allowable for the Procurement of goods, Consulting, or Non-Consulting Services, provided that prior approval is received in accordance with the Approving Authorities specified in the OAR.¹⁶

Approving Authority means the individual authorized to approve transactions with financial consequence. The authority is delegated by the IESO Board of Directors through the Organizational Authority Register (OAR) based on both dollar value and the specific nature of the transaction.

Business Unit refers to the department or functional area within the IESO that has requested and initiated a Procurement.

Commercial-Off-The-Shelf (COTS) Evaluation means an internal evaluation process of COTS products based on a pre-defined set of criteria to identify a preferred software solution. This evaluation process requires a formal document (“memo”) outlining the business rationale, process, and recommendation to be approved by the Approving Authority prior to engaging a Vendor for the provision of a Commercial-Off-the-Shelf Software or software package. A competitive procurement must follow a COTS Evaluation where multiple resellers and/or distributors of the preferred product exist, except where a Government Volume Licensing Agreement (VLA) is available for use.

Conferred Value includes, but is not limited to:

- (a) The exchange of goods and/or services by the IESO in return for other goods and/or services.
- (b) Revenue generating opportunities.
- (c) Partnership Agreements with non-profit organizations¹⁷.

Conflict of Interest occurs when personal interests interfere with, or may appear to interfere with, an individuals’ primary business loyalty to the IESO, as further described in the IESO Code of Conduct.

Consulting Services means the provision of expertise or strategic advice by specially trained and qualified professionals for the purpose of providing recommendations to the IESO for decision-making, including activities relating to critical and/or commercial analysis, the formulation and/or implementation of recommendations relevant to the IESO’s business. This includes:

¹⁶ OPS Procurement Directive, Section 10.

¹⁷ OPS Procurement Directive, Section 8.3.

- (a) Management consulting (e.g., helping management improve their performance, primarily through the analysis of existing problems and development of plans for improvement. This includes organizational change management assistance and strategy development);
- (b) Information Technology consulting (e.g., advisory services that help clients assess different technology strategies, including aligning their technology strategy with their business or process strategy);
- (c) Technical consulting (e.g., activities related to actuarial science, appraisal, community planning, health sciences, interior design, realty, social sciences);
- (d) Research and development (e.g., investigative study for the purpose of increasing the available store of knowledge and/or information on particular subject);
- (e) Policy consulting (e.g., advisory services to provide policy options, analysis and evaluation);
- (f) Communication consulting (e.g., the provision of strategy and advice in conveying information through various channels and media):
- For clarity, Consulting Services do not include services in which the physical component of an activity would predominate: for example, services for the operation and maintenance of a facility or plant; water-testing services; exploratory drilling services; surveying; temporary help services; training/education instructors; employee placement; auditing services; and aerial photography;
- Consulting Services also do not include any licensed professional services provided by medical doctors, dentists, nurses, pharmacists, veterinarians, engineers, land surveyors, architects, accountants, lawyers and notaries in their regulated capacities.¹⁸

Contract means the formal written document that will be entered into between the IESO and successful Vendor(s) at the end of the Procurement process.¹⁹ A Contract may be either a Purchase Order or a Contract signed by both parties.

Contract Amendment means an alteration or change to an existing Contract by way of formal written documentation, which may include a change to the term (including leveraging extension options), value or scope of the Contract, made by mutual agreement between both the Vendor and the IESO.

Contract Term means the total length of time a Contract may be in effect, including any exclusions provided for in the contract.

¹⁸ OPS Procurement Directive, Sections 4.1.1 and 10.

¹⁹ OPS Procurement Directive, Section 10.

Contracting Out Notification means a notification provided to the Society of United Professionals that the IESO proposes, or in the case of emergencies, decides, to contract out work within the jurisdiction of the bargaining unit.²⁰

Costs has the meaning set out in Section 5.4 of this document.

Evaluation Committee means the group of individuals that are responsible for evaluating Vendor submissions following a competitive Procurement in line with the process set out in the solicitation document.

Exemption means an exclusion from a specific requirement of this policy, provided that prior approval is obtained from the Approving Authority as set out in this policy and the OAR.²¹

External Auditor means an independent third party engaged in a regulated capacity to complete audit services for the IESO.

Fairness Monitor means an independent and impartial third party engaged by the IESO to monitor whether the Procurement process was carried out in accordance with the Procurement documents and to ensure that the Procurement practices are transparent, objective, impartial and fair.

Follow-On Agreement means a Contract that follows and is related to an already completed Contract.

Former Employee means a former employee of the IESO or its predecessor organizations, which for greater certainty, includes the Ontario Power Authority.

Government means the Government of Ontario.

Government Vendor of Record or VOR Arrangement means a Procurement arrangement established by the Ministry of Government & Consumer Services that authorizes one or more qualified Vendors to provide goods and/or services for a defined time period that the IESO may use to source goods and/or services under the terms and conditions established for Provincially Funded Organizations.

Independent Contractor means a self-employed person who provides certain services under a Contract and is not under the control, guidance or influence of the IESO.

Information Technology or IT means the equipment, software, services and processes used to create, store, process, communicate and manage information.²²

²⁰ Collective Agreement between IESO and the Society of Energy Professionals, January 1, 2013-December 31, 2014, as amended, Article 65.

²¹ OPS Procurement Directive, Section 10.

²² OPS Procurement Directive, Sections 6.1 and 10.

Interim Measures means the Interim Measures enacted on March 18, 2019 as related to the “Ontario Public Service Procurement Directive.”

Invitational Competitive Procurement means a Procurement method of inviting a minimum of three (3) Vendors to respond in writing to a request by the IESO for the supply of goods, Non-Consulting or Consulting Services.²³

Mandatory Requirements means evaluation criteria included in a Procurement document that must be met by all Vendors and is verified on a pass or fail basis.

Minimum Threshold means a minimum required score that an evaluated proposal must meet in order to proceed to the next stage(s) of the evaluation process, usually requiring the Vendor to meet a minimum technical score before proceeding to price evaluation.

Non-Competitive Procurement means a Contract awarded outside of a competitive process.

Non-Consulting Services means the provision of services that do not provide expert or strategic advice for consideration and decision-making, but rather deliver a tangible product/service that results in a tactical or operational outcome.

OAR means the IESO’s Organizational Authority Register, as amended from time to time.

Online Financial Management System means the IESO’s electronic financial management tool. For the purpose of this policy, the electronic financial management tool specifically relates to the tool used for the management and issuance of Purchase Orders.

Ontario Public Service or OPS Procurement Directive means the Management Board of Cabinet Procurement Directive dated December 2014, and as amended from time to time.

Open Competitive Procurement means a Procurement that is open to all in accordance with its terms and includes publicly posted Procurement document(s) outlining the opportunity.

Other Included Entity means the status accorded to the IESO under the OPS Procurement Directive, as confirmed by the Memorandum of Understanding.

Privacy Office means the IESO’s Business Unit responsible for receiving and responding to Freedom of Information requests and can be contacted at:

Independent Electricity System Operator
Attention: Privacy Office
120 Adelaide Street West, Suite 1600
Toronto, ON M5H 1T1
Phone: 416-969-6277
Fax: 416-969-6383
email: privacy@ieso.ca

²³ OPS Procurement Directive, Section 10.

Procurement means the act of obtaining goods and/or services per this policy.

Procurement Unit refers to the functional business area responsible for providing centralized Procurement services to enable the acquisition of goods and/or services at the IESO.

Purchase Order means an authorized record for the purchase of goods and/or services issued by the IESO to a Vendor issued from the IESO's Online Financial Management system.

Purchase Requisition means a request for approval to initiate a Purchase Order for the purchase of goods and/or services through the IESO's Online Financial Management system.

Purchased Services Agreement means an agreement between the IESO and the Power Workers Union to use purchased services for work which may be within the jurisdiction of the bargaining unit.²⁴

Related Party (or Related Parties) means an entity or an individual (person) that is related to the IESO that possesses an element of control (whether complete, common or shared) or influence of the IESO and/or key personnel (including Board Members or close family members of key personnel). Contracts between the IESO and a Related Party, such as a Contract for the board member's company or affiliated company to deliver services to the IESO must be disclosed on the IESO's financial statements.

Request for Information or RFI means a market research Procurement document that is used to elicit industry information on particular goods and/or services from the Vendor community.

Request for Proposal or RFP means a Procurement document that requests Vendors to supply solutions for the delivery of a product or service or to provide alternative options for solutions.

Request for Quotation or RFQ means a Procurement document that requests Vendors to provide goods and/or services where the scope is fully defined and where the selection is typically based on price or simple evaluation criteria.

Request for Services or RFS means a Procurement document used during the Second Stage Competition to request submissions from one or more Vendors listed on a VOR Agreement.

Request for Vendor Qualification or RFVQ means a Procurement document used to request technical information and evidence of financial stability and product or service suitability from Vendors in order to pre-qualify or short list Vendors to provide specific types of goods and/or services.

Request for Vendors of Record or RVOR means a Procurement document used to develop a short-list of qualified Vendors to enter into a VOR Agreement for specific categories of work or to provide specific types of goods and/or services.

²⁴ Collective Agreement between the IESO and Power Workers Union, Canadian Union of Public Employees (CLC), Local 1000, April 1-2014-March 31, 2017, Article 12.

Responses means Copies of all responses, submissions, proposals, questions and answers received in response to Procurement documents, including conflict of interest declarations and registration forms.

Rostering means the use of a pre-defined process for selecting a Vendor of Record in connection with a VOR Agreement that does not require a Second Stage Competition. The Rostering method may include, but is not limited to, unit pricing, successive order selection, or rotation.

Second Stage Competition means an Invitational Competitive Procurement issued to qualified Vendors of Record.

Statement of Work means a written document that sets out the scope of work under a Contract or that sets out an agreement to provide goods or services under a VOR Agreement. A Statement of Work must be agreed to by both parties to a Contract.

Total Procurement Value means all costs and conferred value associated with a contractual relationship with a third party. Where a project involves multiple related procurements, the project's Procurement Value would be determined by cumulative value of each related Procurement.

Vendor means a person or company offering goods and/or services for sale.

Vendors of Record means those Vendors that have entered into a VOR Agreement.

VOR Agreement means a Vendor of record Procurement arrangement that authorizes one or more qualified Vendors to provide goods and/or services for a defined time period on pre-negotiated terms and conditions.

VOR Guide means a user guide that provides users with information about a VOR Agreement such as Vendor contact information, pricing, specific requirements, details pertaining to the Second Stage Competition or Rostering process, or any other such information as may be necessary for the management of the VOR Agreement.

Volume Licensing Agreement (VLA) means a software licensing program that software publishers provide to large customers, offering significant price discounts and common business and legal terms and conditions. VLAs are not VOR Arrangements and have not been established competitively.

8.0 Approval

8.1 Policy Owner and Approver

8.1.1 **Name:** Barbara Anderson

8.1.2 **Organizational Position:** Vice President Corporate Services & Chief
Financial Officer **Date Approved:** September 1, 2019

Schedule A: Baseline

Revision History

Rev. #	Reason for Revision	Revision Author	Date
01	Initial Release		September 10, 2019
1.1	Revision to incorporate changes to the OPS Procurement Directive Interim Measures	Megan Filey	September 1, 2020
1.2	Revision to approval authority for exceptions to posting timelines	Megan Filey	October 19, 2020

References

Document Title	Document ID
Ontario Public Service Procurement Directive	
Canadian Free Trade Agreement	
Electricity Act, 1998	
Ontario Energy Board Act, 1998	
Travel, Meals and Hospitality Expenses Directive	
IIESO Code of Conduct	IIESO_COC_0001 v11.0
IIESO's Organizational Authority Register (OAR)	

Related Documents

Document Title	Document ID
Procure Goods & Services Process Specification	PRCS-45

DocID: PLCY-14 Version: 1.2
Effective Date: October 19, 2020

Document Title	Document ID
Issue Goods & Services Purchase Order	PRCS-46
Amend Goods & Services Purchase Agreement	PRCS-47

INTEREST AND INVESTMENT INCOME

Table 1 below reflects the components that make up net interest expense from 2021 to 2022.

Table 1: Net Interest Expense from 2021 to 2022

Net Interest Expense (\$ millions)	2021 Budget	2021 Actual	2022 Budget
Interest OEFC/Credit Facility	1.5	1.4	1.8
Capitalized Interest	(0.8)	(0.9)	(1.4)
Financing Charges	0.3	0.1	0.2
Short Term Investment Income	(2.1)	(2.1)	(2.2)
Long Term Investment Income	(1.3)	(3.7)	(3.3)
Total	(2.5)	(5.2)	(5.0)

Interest OEFC/Credit Facility

The IESO has an existing note payable and credit facility with the Ontario Electricity Financial Corporation (OEFC) which is used to fund capital expenditures approved by the OEB. The interest and debt cost of capital expenditures is then collected through the IESO usage fee once the capital asset is in service and amortized. In 2021, the interest expense on this debt was \$1.4 million and the 2022 budget assumes an increase to \$1.8 million as the IESO accesses debt to continue to fund the Market Renewal Program (MRP) and other projects included in the increased 2022 capital budget.

Capitalized Interest

As per IESO capitalization guidelines, all capital project interest expense is capitalized until the particular project is put in service. Capitalized interest in 2021 was in line with the budget amount. Capitalized interest is projected to increase in 2022 in accordance with the continued investment in long-term capital projects, specifically MRP.

Financing Charges

Financing charges are an aggregated cost of all the transaction and account maintenance fees.

Short-Term Investment Income

Short-term investment income is a combination of market interest income and corporate interest income. Market interest income is the amount of interest earned on funds passing through the IESO wholesale market in accordance with the Market Rules and corporate interest income is the amount of interest earned on IESO short-term money market investments.

In 2021, the IESO earned \$2.1 million in short-term investment income which is in line with the budget. In 2022, short-term investment income is projected to slightly increase as the IESO has forecasted an increase in the overnight interest rate in the second half of 2022, based on announcements made by the Bank of Canada.

Long-Term Investment Income

The long-term investment income is earned on a balanced portfolio of pooled funds. These funds are used to support the IESO's supplemental employee retirement plan and other IESO general solvency needs. In 2021, income earned on the IESO's long-term investments exceeded the budget by \$2.4 million due to better-than-expected market performance despite the COVID-19 pandemic. The 2022 long-term investment income budget was developed with the assumption of market conditions similar to what was experienced in 2021.

ASSET MANAGEMENT PROCESS OVERVIEW

Introduction

The IESO's IT systems must be maintained and updated on a regular basis to sustain reliability, performance, availability requirements, add capacity, and keep pace with information security improvements. The classes of assets and their lifecycle details include:

- **Hardware:** Servers, network switches, desktops, etc. have a specific life expectancy when purchased. After the specified life expectancy of the hardware is reached, vendor support costs increase, failure rates increase, and the availability of spare parts decreases.
- **Software:** Software encompasses everything from specific in-house developed tools, to major commercial products, to different operating systems and databases. All new proprietary software is regularly updated by the vendors to address any defects, add new features, and address information security requirements. Eventually, for a variety of commercial reasons, vendors discontinue support for older versions of a product and new releases and "patches" are no longer provided; depending on the software and where it sits within the IESO security architecture, the loss of up-to-date security patches is a major consideration in its replacement. Use of unsupported, yet stable versions of software would require the IESO to mitigate any defects or vulnerabilities identified and to do so without support from the vendor.

Managing Hardware Asset Lifecycle

Hardware lifecycle management is the process of assessing and planning for the overall design, roll-out and maintenance of IT infrastructure. The IESO understands that lifecycle management is important to consider before the first component is ever purchased and as such considers the ongoing maintenance and future replacement of hardware assets early on in the process.

Planning of hardware assets and their respective lifecycle timelines drives future project activities and is necessary to maintain IT infrastructure. The approach to this planning includes:

- Forecasting the replacement of hardware at the end of its normal lifecycle (every 4–5 years).

- 1 • Forecasting expansion and/or replacement of hardware based on expected data growth
2 and/or computing power consumption needs.
- 3 • Minimizing impacts to the business and gaining efficiencies in implementation by
4 continuing to assess hardware condition and aligning hardware replacements with key
5 business solution changes.
- 6 • Monitoring operational statistics and third-party support availability to determine what
7 hardware can be taken beyond its normal lifecycle (if required).

8 This approach ensures that the IESO minimizes the potential for technical debt (i.e. the number
9 of aging systems with minimal or no support) and levels of forecast spend for hardware
10 replacements.

11 Hardware assets are typically forecast for replacement after 4–5 years of service life but can be
12 extended based on the following criteria:

- 13 • The business solution that leverages the infrastructure is planned to be
14 upgraded/refreshed/replaced within 1-2 years (and so hardware replacements will
15 coincide with that work for efficiencies).
- 16 • The operational statistics of the hardware are such that minimal outages and/or
17 technical issues have been experienced within the last 12-24 months.
- 18 • Third party support is available for the hardware at a reasonable cost (such as firmware
19 upgrades, security patch releases and part replacements).

20 **Managing Software Asset Lifecycle**

21 Software lifecycle management is the process of assessing and planning for the overall design,
22 roll-out and maintenance of software. The IESO understands that lifecycle management is
23 important to consider when deploying new solutions as the activities associated with lifecycle
24 management of software are a significant factor in the total cost of ownership of the software.

25 Part of this process involves the planning and documenting of software assets and their
26 respective lifecycle timelines. The process also drives future project activities that are necessary
27 to maintain the software. The approach to this planning includes:

- 28 • Planning the appropriate timelines for upgrading the software to the latest software
29 release as well as deciding when it would be appropriate to replace the software.

Timelines are based on many factors including: stability of the software; the speed at which the vendor delivers product enhancements; effort and cost to transition to another vendor and the availability of competitive products. Timing for upgrades can be between 1–5 year intervals while replacement timing can be between 5-20 years.

- Alignment with supporting infrastructure software (operating systems, application server software and libraries and database management software) vendor support dates.
- Alignment with supporting hardware lifecycles.
- Alignment with business change. This is particularly appropriate when replacing the software.

This approach ensures that the IESO minimizes the risk to the business, that the software services required to operate the business remain operational and that cyber vulnerabilities can be mitigated in a timely manner.

For valid business reasons, planned upgrades/replacements of software may be deferred beyond optimal timelines. Rationale for deferral includes:

- To accommodate a planned business change which will be making changes to the software.
- Making trade offs between the technology debt risks and business improvement opportunities within the project portfolio.
- To coordinate hardware and software upgrades, to accomplish both upgrades more effectively.

Prioritization of Asset Investments and Inclusion in the Capital Portfolio

The results of the above assessments are an input into the annual business planning cycle and the development of the capital project portfolio (see Exhibit E-2-1 – Capital Budget Overview and Progress on Capital Projects). The asset investments (upgrades or replacements) are considered in conjunction with other proposed initiatives that are required to drive business transformation, meet regulatory requirements or advance the IESO's strategic objectives. Through the prioritization exercise the IESO assesses the resource requirements (capital, operating expense and staff levels) to achieve these investments and makes appropriate risk

1 informed trade-offs to ensure the IESO develops a balanced portfolio that addresses various
2 priorities.

3 For the 2022-2024 Business Plan, the following upgrade or replacement projects have been
4 included in the capital portfolio for 2022 (see Exhibit E-2-1 – Capital Budget Overview and
5 Progress on Capital Projects):

- 6 • Centralized Alarm Management System (CAMS) Replacement
- 7 • Replacement of the Settlement Systems
- 8 • Supervisory Control and Data Acquisition/Energy Management System (SCADA/EMS)
9 Upgrade
- 10 • Antivirus Replacement
- 11 • Long-Term Demand Forecast Tool Replacement
- 12 • Core Network Refresh
- 13 • Data Historian Expansion and Upgrade
- 14 • Transmission Rights Auction (TRA) Platform Refresh

15 See Exhibit E-1-2 – Capital Expenditure Planning Process Overview, for more detail related to
16 how the IESO develops its capital plan.

CAPITAL EXPENDITURE PLANNING PROCESS OVERVIEW

Introduction

As part of IESO's annual business planning cycle, business units identify initiatives that they plan to undertake to maintain service, meet or maintain compliance with regulatory requirements, or advance corporate strategic priorities. This includes initiatives to manage and invest in assets (see Exhibit E-1-1 – Asset Management Process Overview).

Project and Portfolio Management Approach

For initiatives requiring capital investments, business units outline the reasons for undertaking the initiative, its alignment with the organization's core strategies, and an estimate of costs, timelines and resource requirements to deliver the initiative. This information is used to assess the project against a set of criteria as well as the associated timing and capital needs of the rest of the business. This information is presented to a cross-functional Project Portfolio Management Team (PPMT) that discusses the merits and relative priority of the new proposed initiatives and recommends a project portfolio which:

- Balances the various needs of the organization and stakeholders.
- Reflects the resource capacity of the organization to support change above day-to-day operational activities.

Most of the IESO's projects are multi-year initiatives and, as such, annual project portfolios are made up of both new initiatives and in-flight projects (see Exhibit E-2-1 – Capital Budget Overview and Progress on Capital Projects). The project portfolio establishes the capital envelope and operating expense budget to advance these projects over the business planning timeframe. The project portfolio is managed within the approved capital envelope with commitments approved individually on an ongoing basis. Although many of the projects span multiple years, the IESO works within the approved capital expenditure envelope for each calendar year.

The IESO closely monitors each of the individual projects within the portfolio and uses the PPMT to assess and adjust the specific projects in the portfolio as appropriate to meet

evolving needs. This could include adding and withdrawing projects as well as advancing and deferring projects.

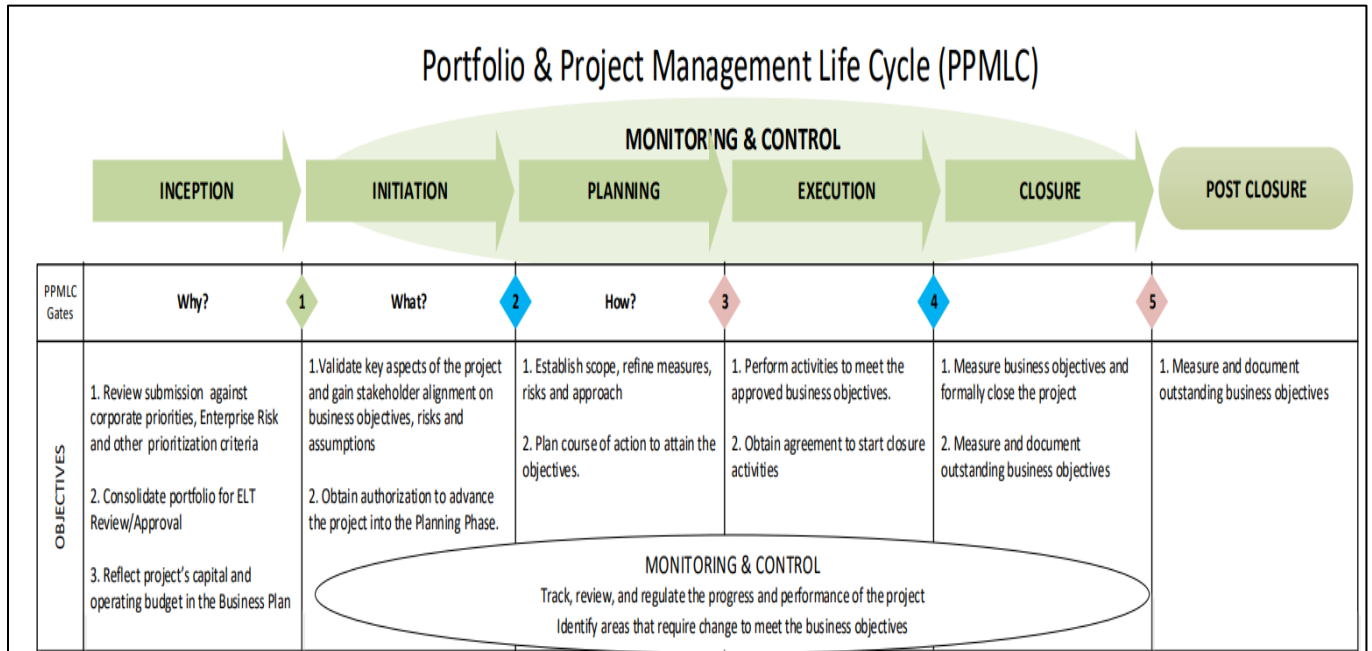
IESO Portfolio and Project Management Lifecycle

The IESO prioritizes, governs and delivers enterprise change through a portfolio and project management lifecycle (PPMLC) approach. This approach ensures that projects are appropriately prioritized, governed, achieve objectives and realize benefits. The PPMLC developed by the IESO aligns with industry best practice and provides a streamlined, scalable set of processes that strike an appropriate balance between control and flexibility.

The IESO's PPMLC consists of the following phases:

- Inception
- Initiation
- Planning
- Execution
- Closure
- Post Closure

1 **Figure 1: Portfolio and Project Management Life Cycle**



2

3 During the inception phase, the IESO assesses project submissions against a set of criteria,
4 which consider: strategic objectives, mitigation of strategic risk, business value and
5 deliverability. The IESO then scores, ranks and prioritizes the projects accordingly. After
6 assessing the resource needs for each of the projects and considering IESO's resource
7 capacity to support these enterprise projects, the IESO establishes an annual project portfolio.
8 This exercise is performed annually as part of business planning and establishes an
9 appropriate capital envelope for each year within the business planning outlook. At this stage
10 of the project lifecycle, project estimates are "order of magnitude" estimates, reflecting a
11 higher level of uncertainty.

12 During the initiation phase of each project, key aspects of the project are validated including
13 cost and schedule estimates, business objectives, risks and assumptions prior to entering the
14 planning phase. In determining the categorization of the project costs, the IESO adheres to
15 Canadian Public Sector Accounting Standards for Tangible Capital Assets. At this point, cost
16 and time estimates are refined but could still be in the order of +/- 50%. Throughout the
17 project phases, the IESO continues monitoring and control activities to identify areas that may
18 require changes in order to achieve business objectives. Prior to the execution phase, the

1 IESO further refines the costs and schedule of the project. At this point, cost and schedule
2 estimates are typically in the order of +/- 20%.

3 Actual cost and schedule performance is measured against approved values during the project
4 closure phase along with the reason for variances. Verification that the business objectives
5 have been achieved and lessons learned are also captured during this phase. The post closure
6 phase is utilized whenever business objectives cannot be verified until some time after project
7 closure. This allows the measurement of business objectives to happen following project
8 completion.

CAPITAL BUDGET OVERVIEW AND PROGRESS ON CAPITAL PROJECTS

The capital expenditure planning process, outlined in Exhibit E-1-2 – Capital Expenditure Planning Process Overview, establishes a capital envelope for capital projects with commitments approved by the IESO individually on an ongoing basis. Although many of the projects span multiple years, the IESO works within the OEB approved capital expenditure envelope for each calendar year and prioritizes projects to support IESO’s core strategies and to maintain the current capabilities of the business.

Table 1: Summary of 2021 Capital Results

Summary of 2021 IESO Capital Portfolio	2021 OEB Approved	2021 Actual	2021 Variance
Market Renewal Program Energy Stream (MRP)	\$36.0M	\$24.0M	(\$12.0M)
IESO Core Project Portfolio	\$32.6M	\$26.3M	(\$6.3M)
Total	\$68.6M	\$50.3M	(\$18.3M)

The IESO received OEB approval for a 2021 capital budget of \$68.6 million, which was made up of \$32.6 million for core operations and \$36.0 million for MRP. Actual 2021 total capital expenditure was \$50.3 million, largely attributable to \$12 million lower MRP spend (see Exhibit G-2-1 – Market Renewal Program Cost Report) and delays in the initiation of a number of larger projects and vendor progress towards milestones. Working within the overall approved capital envelope, the IESO allocated available funds to smaller core capital projects.

2022 Capital Budget

For 2022, in addition to delivering a number of core business projects which will allow the IESO to maintain critical services, improve efficiency and meet regulatory compliance obligations, the IESO is continuing to deliver a significant number of strategic initiatives with the aim of: driving business transformation (with projects such as the Replacement of Settlement Systems, Data Excellence Program and Human Resource Workforce Planning and Analytics Project); ensuring

1 system reliability (with projects such as the Resource Adequacy Program and Dynamic Limits in
2 Real-Time Project) and enabling competition and advancing sector leadership through
3 addressing Market Surveillance Panel recommendations.

4 Through its core business projects, the IESO will continue to ensure reliability by upgrading and
5 replacing core applications, infrastructure and cybersecurity tools.

6 Table 2 below summarizes the IESO's capital projects in 2021 and 2022. See Appendix 3 of
7 Exhibit B-1-2 – IESO Business Plan 2022-2024 for descriptions of the capital projects.

8 **Table 2: Summary of IESO Capital Projects (In \$ millions)**

Change Initiatives/ Projects	2021 Budget	2021 Actual	2021 Variance	Variance Reason	2022 Budget	Status
Dispatch Data Management Systems Refresh	0.1	0.4	0.3	Increase in spending due to a vendor change request and additional testing	-	Closed
External Identity Management (Portal)	0.3	0.7	0.4	Increase in spending due to additional time and vendor costs to address technical issues identified during the production cutover	-	In-flight- Execution
Data Warehouse	0.5	0.1	(0.4)	Underspend due to delay in project initiation and subsequent execution of Statement of Work for Consultants	-	In-flight- Execution

Capacity Auction	0.1	(0.1)	(0.2)	Capital spend of \$0.2M in 2021 was offset by the need to expense as OM&A \$0.3M for work that was initially capitalized earlier in the project	-	Closed
Replacement of the Settlement Systems	8.8	9.3	0.5	Increase in spending due to advancement of work originally planned for 2022	7.0	In-flight-Execution
Supervisory Control and Data Acquisition/ Energy Management System (SCADA/EMS) Upgrade	5.6	3.9	(1.7)	Underspend due to vendor delays in achieving some of the project milestones. Payments delayed to 2022	1.4	In-flight-Execution
Data Excellence Program	1.3	0.4	(0.8)	Underspend due to changes in program scope, approach and timing resulting in the rebaselining of the program budget and postponement of some of the capital expenditures planned for 2021	0.7	In-flight-Execution
Enabling Resources (to Deliver on Capacity /	0.5	-	(0.5)	Underspend due to changes in program approach and	-	In-Flight-Initiation

Participate in Markets)				timing resulting in activities not being capitalized as initially expected		
Addressing Market Surveillance Panel (MSP) Recommendations	1.8	0.1	(1.7)	Underspend due to undertaking less work than originally anticipated and deferring other work to 2023 and 2024	0.5	In-flight-Execution
Dynamic Limits in Real-Time (DLRT)	1.1	0.04	(1.06)	Underspend due to delays in project initiation	2.0	In-flight-Planning
Resource Adequacy (New Capacity/Resource Acquisition Initiatives)	1.0	0.2	(0.8)	Underspend due to delays in project initiation	2.0	In-flight - Planning
Wide Area Visualization Environment (WAVE) -2	1.2	0.8	(0.4)	Underspend due to vendor delays on the SCADA/EMS Upgrade project delays for which this project is dependent	0.6	In-flight-Execution
Centralized Alarm Management System Replacement	2.5	3.1	0.6	Increase in spending is in line with refined cost estimates developed during initiation and planning activities	0.8	In-flight-Execution
Market Analysis and Simulation Toolset (MAST)	-	-	-		2.0	In-flight - Initiation

Long Term Demand Forecast Tool Replacement	-	-	-		0.8	Not initiated - Plan to start in 2022
Core Network Refresh	-	-	-		0.5	Not initiated - Plan to start in 2022
Transmission Rights Auction (TRA) Platform Refresh	-	-	-		1.0	Not initiated - Plan to start in 2022
Data Historian Expansion and Upgrade	-	-	-		1.0	Not initiated - Plan to start in 2022
Antivirus Replacement	-	0.01	0.01	Advanced initiation and planning to 2021 to meet urgent business needs	2.3	In-flight-Planning
PMU Integration - Phase 3	-	-	-		0.3	Not initiated - Plan to start in 2022
Network Performance Monitoring and Diagnostic	-	-	-		2.8	In-flight-Planning
Other Initiatives/Projects (Less than \$1 million)	7.8	7.5	(0.3)	Underspend due to some projects starting later than expected, scope reduction and the refinement of project cost estimates	4.3	In-flight

Total Core IESO Capital Portfolio	\$32.6	\$26.3	(6.3)		30.0	
Market Renewal Program (MRP)	\$36.0	\$24.0	(12.0)	See Exhibit G-2-1 – MRP Cost Report	41.2	In-flight
Total Capital Including MRP	\$68.6	\$50.3	(18.3)		71.2	

Material Capital Projects

The IESO reports business case information on material capital projects with total project costs that exceed \$4 million. The IESO has listed material capital projects that are planned over the business planning timeframe and whose total capital budget is in excess of the \$4 million materiality threshold in Table 4 below.

Table 3: Material Capital Projects

Material Capital Projects (\$ Millions)	2021 OEB Approved	2021 Actual	2022 Budget
MRP	\$36.0M	\$24.0M	\$41.2M
Replacement of Settlement Systems	\$8.8M	\$9.3M	\$7.0M
SCADA/EMS Upgrade	\$5.6M	\$3.9M	\$1.4M
Capacity Auction	\$0.1M	(\$0.1M)	-
CAMS Replacement	\$2.5M	\$3.1M	\$0.8M
DLRT	\$1.0M	-	\$2.0M
MAST	-	-	\$2.0M
Total Material Capital Projects	\$54.0M	\$40.2M	\$54.4M

Project charters for the 2022 material capital projects can be found in the exhibits referenced below:

- 1 • Dynamic Limits in Real-Time (DLRT) (see Exhibit E-2-1 Attachment 2 – Project Charter
- 2 (DLRT)).
- 3 • Market Analysis and Simulation Toolset (MAST) (see Exhibit E-2-1 Attachment 3 –
- 4 Project Charter (MAST)).
- 5 For additional information on the Market Renewal Program see Exhibit G-2-1 – Market Renewal
- 6 Program Cost Report.

Project Charter for: Dynamic Limits in Real-Time (DLRT)

Document ID:	██████	Author(s):	██████ ██████ ██████
Issue:	1.0	Sponsor:	██████
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1 Executive Summary

The Dynamic Limits in Real-Time (DLRT) project is a significant step forward in ensuring the reliability of the province's power system, and delivers foundational change in how transmission limits are determined and used to operate the grid.

The project deploys capabilities to continuously evaluate the security of the grid and provides timely and precise information to our operators, even following unforeseen events. These capabilities will enable the IESO to continue to meet its regulatory obligations in light of evolving reliability requirements, enhance the resiliency of the grid, and provide improved market outcomes. The incremental costs are more than offset by the benefits, given its potential to achieve significant market savings, which, at the minimum, are \$1.5 million every year following completion of the project.

Reliability and resiliency: The IESO has a mandate to ensure the reliability of the province's power system, which includes operating within the capabilities of its equipment (i.e. ratings), in order to prevent equipment damage, and to protect staff and the public. While our mandate is not new, we are seeing a trend within the industry whereby manufacturers and asset owners are "tightening" equipment ratings – including allowed operating voltages. ██████████

As a result, the IESO is currently in a position where it must acquire new capabilities to assess and monitor the system with respect to these new criteria, or be non-compliant with our Market Rule obligations. This project implements a cost-effective solution to assess and monitor post-contingency voltage levels in real-time, and protect equipment from over-voltages.

Market Efficiency: Dynamically-determined real-time stability limits will often allow for increased power transfers on the grid because they take into account actual system conditions, as opposed to the off-line calculated limits in use today. Off-line calculated limits need to rely on conservative assumptions to account for the variety of conditions that may exist over the

period for which they will be in use. As a result, real-time stability limits improve the utilization of the existing transmission system and increase market efficiency such that the efficiency benefit generates a positive, yet conservative, net present value for this project in excess of \$1.7 million in just the first four years of in-service operations of DLRT.

Process efficiency: Deploying real-time stability limit derivation capability will lay the foundation for gains in efficiency for process work related to providing back-office engineering support to the Control Room and for development of mid-term and short-term operating limits.

Requested Approval:

This project continues the natural progression of the online limit derivation platform (OLLD), which is part of a long-standing strategy to enhance system reliability and maximize the use of the transmission system. The OLLD platform was first established in 2008 and has been continually refined in pursuit of this long-standing strategy. This project formalizes the next significant step in this progression, evolving the tools that are used in the back-office, and extending those tools into the Control Room.

The DLRT Project is the first of two projects planned for implementing and integrating the DLRT platform with real-time security and market systems. Both projects provide significant benefits, with the first project being necessary pre-requisite for achieving the benefits of the second project. It is not necessary to initiate the second project to realize the full benefits of the first project.

The first project, which is the subject of this Charter, builds out the DLRT platform and deploys real-time voltage monitoring and stability limits in parallel with static, off-line limits into Control Room system operations. The subsequent project, if approved in the future, is expected to provide capabilities to automatically input dynamically-calculated real-time stability limits into the security monitoring and the market tools, including Real-Time Market (RTM) and the Day Ahead Market (DAM).

The DLRT Project was included in 2021 approved project portfolio with an allocated capital cost of \$4.2M over four years.

The overall DLRT Project budget is \$5.1M of which \$4.6M is capital and includes a contingency of \$1.2M which reflects an estimation accuracy of +/- 30%.

Overall, the DLRT Project is expected to take 45 months to complete which includes 12 months of contingency to account for scheduling uncertainties.

The table below shows the anticipated expenditure over the period of the project.

Year	2021	2022	2023	2024	Total
Capital (Incl. Contingency)	\$337,884	\$2,351,410	\$1,662,634	\$249,920	\$4,601,848
Operating (Incl. Contingency)	\$218,999	\$139,960	\$92,440	\$28,004	\$479,403
Total	\$556,883	\$2,491,370	\$1,755,074	\$277,924	\$5,081,251

Subsequent version of the Project Charter (PC v2) will be issued after planning and detailed design to reflect refined cost and time estimates.

2 Business Objectives and Measures

1. Comply with regulatory requirements by providing the capability to assess and monitor post-contingency voltage levels on the transmission system in real-time.
2. Enhance the reliability and resiliency of the IESO-controlled grid by significantly improving the timeliness of stability operating limits with respect to varying real-time system conditions.
3. Improve the utilization of the IESO-controlled grid resulting in \$1.5M annual market benefit through reduced costs to ratepayers.
4. Add new capabilities for determining and manually implementing dynamic limits in real-time, while maintaining current staffing levels within M&R.

Ref #	Business Objective	Procedure for Measures (identify how the performance will be measured)	Measured when and by whom?
1	3	<p>Market benefit</p> <p>Applying real-time limits to the real-time market, operating reserve market, and security monitoring tools results in an annualized benefit of \$1.5M.</p> <p>Improvements are applied at Control Room System Operator discretion in order to remove binding constraints within the real-time and operating reserve markets in real-time operations.</p>	<p>WHEN:</p> <p>Fourteen months post project closure</p> <p>BY WHOM:</p> <p>Senior Manager Engineering Studies,</p> <p>Senior Manager System Operations effectiveness,</p>

Ref #	Business Objective	Procedure for Measures (identify how the performance will be measured)	Measured when and by whom?
		This measure is a post-operations comparison between legacy off-line limits () and real-time limits, with an assessment performed by Market Analysis to determine the net benefit to the market as a result of the limit improvements (i.e. as a result of real-time limits having been used in place of pre-determined limits).	Supervisor Market Analysis
2	1	<p>Assessment and monitoring of post-contingency voltage criteria exceedances on the real-time transmission system</p> <p>Capabilities are developed, and successfully tested, for assessing real-time post-contingency voltages for all 115kV, 230kV, and 500kV buses on the ICG, with regards to all respected contingencies.</p> <p>The Real-Time post-contingency voltage assessments are performed at least once every 15 minutes, and are provided to Control Room Operators and made available to back-office support staff (MF&I).</p> <p>These capabilities are sufficient to meet the IESO's market rule obligation to monitor and inform actions to respect voltage ratings established by asset owners as stipulated in the Market Rules.</p>	<p>WHEN: Before go-live</p> <p>BY WHOM: Senior Manager Engineering Studies, Senior Manager System Operations, Senior Manager Market Forecasts & Integration</p>
3	2	<p>Timely determination and communication of real-time stability limits and supporting information</p> <p>Real-Time stability limits are automatically determined and communicated into the Control Room () at least once every 15 minutes.</p> <p>Operations Staff have the capability to initiate stability assessments on-demand, with these assessments targeted to specific areas of identified</p>	<p>WHEN: Two months post project closure</p> <p>BY WHOM: Senior Manager System Operations,</p>

Ref #	Business Objective	Procedure for Measures (identify how the performance will be measured)	Measured when and by whom?
		<p>concern (i.e. target system interface). On-demand assessments are performed immediately following the request, and take no longer than 15 minutes¹ to complete following the initial request.</p> <p>Real-Time limits are provided to Operations Staff with supporting information (such as limiting contingency and critical limit sensitivities) and are presented in a format that is easy to understand and helps facilitate actions to be taken on the grid.</p>	
4	4	<p>Supporting the Real-Time Limit Platform</p> <p>Integrate support for the real-time limits into existing business processes, including the development of a new support role within Operations for the platform.</p> <p>This new role is staffed by means of efficiencies gained within PSA and Market Operations. (i.e. net-zero impact to head-count within M&F).</p>	<p>WHEN:</p> <p>Six months post project closure</p> <p>BY WHOM:</p> <p>Senior Manager Engineering Studies,</p> <p>Senior Manager Market Forecasts & Integration</p> <p>Senior Manager Performance, Applications and Integration</p>

2.1 Benefits Expected

This initiative directly supports multiple core corporate strategies, including:

- A. Ensuring cost-effective system reliability – The project achieves compliance with Market Rules and enhances system reliability and resiliency, and at an incremental cost that is more than offset by its potential to achieve market savings, which, at the minimum, are

¹ This compares to many hours to obtain new limits from off-shift engineering staff today.

\$1.5 million² every year following completion. Indications are that this figure could be much higher, considering that the analysis performed was for only 6 constraining transmission interfaces out of 60+ in Ontario, and considered only a portion of efficiencies to be gained in the Real-Time and Operating Reserve markets.

- B. Driving business transformation to meet the needs of an evolving industry and business environment – Deploying real-time stability limit derivation capability will provide the foundation for future improvements in efficiency for process work related to providing back-office engineering support to Control Room and for development of mid-term and short-term operating limits. Real-time limits have significant potential to reduce process work related to providing mid-term and near-term limits (via automation), and will enable a new and valuable data stream for use by the business in identifying and leveraging relationships between power system stability and conditions on the ICG.

These efficiencies are achieved following the subsequent project which integrates real-time limits with the market tools.

- C. Enabling competition – Real-time calculated limits are generally higher than offline-calculated limits, and will therefore reduce or relieve the constraints which restrict the flow of energy across the transmission system. This will result in better alignment between locational prices in the upcoming single schedule market, which will improve competition between market participants;
- D. Advancing sector leadership – This project deploys a specialized approach to validating limits output by the DLRT platform, enabling real-time limits to be implemented without the need for a complement of on-shift engineers within the Control Room, and yielding benefits in terms of work process efficiency for producing mid-term and short-term limit assessments. This is an innovative approach which involves “remembering” previously determined operating limits and corresponding system conditions, and using these to inform and validate future limit assessments.

This project helps to address multiple strategic enterprise risks, including:

² As determined from a joint Engineering Projects and Market Analysis investigation into potential market savings following DLRT completion, and considering MRP deployment. This investigation considered 2019 demand and supply conditions and a subset of stability limited interfaces [REDACTED] modelled with and without expected DLRT improvements using [REDACTED]. The investigation also considered potential savings in Operating Reserve market due to improved [REDACTED] interface. The investigation yielded total benefits up to \$3M, but this has been reduced to \$1.5M considering that, at this stage of development (i.e. following this project), improvements are input into the market tools manually and at Operator discretion.

1. An extreme weather event significantly damages generation or transmission assets:

Implementing real-time limits will position the IESO to more effectively respond following grid contingencies, such as by enabling more timely re-preparation of the system and more secure and optimized operating limits that are derived within minutes, as compared to hours in today's environment. This will reduce the impact to rate-payers and to market participants.

2. A critical bulk electricity system reliability outage is triggered by actions arising from distribution connected resources for which the IESO lacked visibility over:

Implementing real-time limits will position the IESO to more effectively respond following contingencies, improving our capability to withstand and adapt to unmonitored threats.

3 Project Overview

3.1 Project Scope

The project builds out the DLRT platform and deploys real-time stability limits in parallel with static limits in system operations, with the objectives of achieving compliance with the market rules, enhancing situational awareness, system security and resiliency, and improving grid utilization. In addition, it will address the IESO's operational need for monitoring post-contingency voltage levels on the transmission system.

The project includes two major deliverables:

- **"DSA Enhancement"** enhances the real-time stability limit toolset such that it is capable of effectively determining real-time stability limits.
- **"Limit Validation & Dashboard"** implements a new process and supporting solutions for validating real-time stability limits; and also procures interactive tools and capabilities for communicating real-time stability limits and supporting information into the Control Room.



Figure 1 – High-level overview of DLRT scope of deliverables

3.2 High Level Assessment of Impacted Business Processes, Systems and Governing Documents

3.2.1 Processes

1. [REDACTED]
 - a. [REDACTED]
2. [REDACTED]
 - a. [REDACTED]
3. [REDACTED]
 - a. [REDACTED]
[REDACTED]
[REDACTED]

4. [REDACTED]
 - a. [REDACTED]
5. [REDACTED]
 - a. [REDACTED]
[REDACTED]

3.2.2 Systems

- [REDACTED]
 - [REDACTED]
 - [REDACTED]
- [REDACTED]
 - [REDACTED]
 - [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

3.2.3 Governing Documents

Changes to procedures and processes to be identified in Planning phase.

3.3 Out of Scope

- [REDACTED]
[REDACTED]
[REDACTED]
- [REDACTED]

³ Undocumented activities supporting both Plan Operations and DSTO

⁴ Including "Address Issue with Participant"

3.1 Overall Project Timeline

The project was initiated in March 2021 after the kickoff meeting, and is planned to complete following deployment of Limit Validation and Dashboard platform into production and closure phase by January 2025 including 12 months of contingency to account for scheduling uncertainties

The project consists of two main delivery streams: “DSA Enhancement” and “Limit Validation & Dashboard Platform. Planning phase activities will be started after project kick off and will enter into requirement gathering and design stage after the approval of the project charter (version 1.0) for both delivery streams. The Planning Phase will be completed in two stages with an Integrated Project Plan being developed and approved before moving into the Execution Phases for each component (DSA Enhancements and Limit Validation and Dashboard Platform). The overall Planning Phase is expected to complete after “Limit Validation & Dashboard Platform” procurement completion and project charter V2.0 approval.

Execution phase for “DSA Enhancement” delivery will be started in parallel with procurement activity for “Limit Validation & Dashboard Platform” delivery.

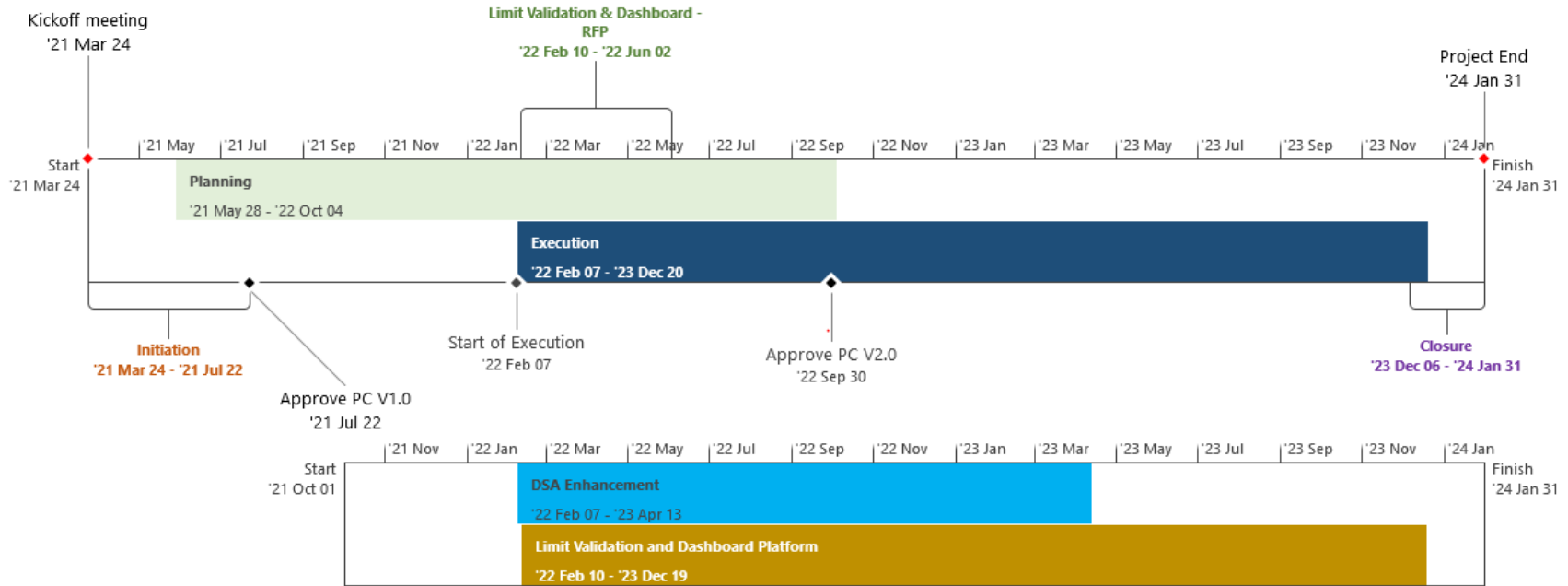


Figure 2 –Project schedule overview

3.2 Overall Project Cost

The overall project budget is \$5.1M includes a contingency of \$1.2M which reflects an estimation accuracy of +/- 30%.

The table below shows the anticipated expenditure over the period of the project.

Year	2021	2022	2023	2024	Total
Capital	\$160,884	\$1,997,410	\$1,308,634	\$72,920	\$3,539,848
Capital (Contingency)					\$1,062,000
Total Capital (Include Contingency)					\$4,601,848
Operating	\$200,499	\$102,960	\$55,440	\$9,504	\$368,403
Operating (Contingency)					\$111,000
Total Operating (Include Contingency)					\$479,403
Total (Include Contingency)					\$5,081,251

3.3 Key Resource Needs

High level key resources required for this project are listed below:

- Project Manager
- Business Analyst
- Solution Architect
- Technical Analyst (CTS)
- Infrastructure and Network - SME
- Information Security - SME
- QA Lead
- Engineering Projects - SME
- Control Room - SME
- Market Forecasts & Integration - SME
- Real Time Applications - SME
- Market Analysis – SME
- Procurement Specialist

Resource Type	2021	2022	2023	2024	Average
Project Manager	0.7	0.6	0.6	0.1	0.5
Business Analyst	0.3	0.2	0		0.2
Corporate Technology Solutions -SME	0.2	0.4	0.4		0.3

Resource Type	2021	2022	2023	2024	Average
Engineering Projects - SME	1	1	1		1
Infosec - SME	0.1	0.1	0		0.1
Infrastructure & Telecom SME	0.3	0.2	0.1		0.2
IT Operations Management	0	0.1	0		0.1
Market Forecasts & Integration - SME	0.1	0.1	0.2		0.2
BSSD - PAO - SME	0.2	0.5	0.5		0.4
Performance Validation & Modelling - SME	0.2	0.1	0.1		0.2
Procure to Pay -SME	0.1	0.2	0		0.1
Quality Assurance - SME	0.2	0.4	0.3		0.3
Real Time Applications - SME	0.2	0.3	0.4		0.3
Control Room - SME	0.1	0.1	0.2		0.2
Solution Architect	0.4	0.3	0.1		0.3
Total (Average FTE)	0.3	0.4	0.3	0.1	0.3

3.4 Planning Phase

The planning phase includes the following activities:

- Integrated Project Plan
- Business Requirements Package
- Architecture Solution Definition and Technical Design
- Acquiring solution (Limit Validation & Dashboard)
- Refining the cost and time estimates
- Development and approval of Project Charter V2.0

3.5 Execution Phase

The execution phase includes the following activities:

- Update impacted process and procedures
- Acquiring Solution for DSA Enhancement
- Develop, Implement, Test and Transition to production
- Documentation
- User Training

4 Key Stakeholders

Key stakeholders are identified in Table 1.

Table 1 Key Stakeholder list

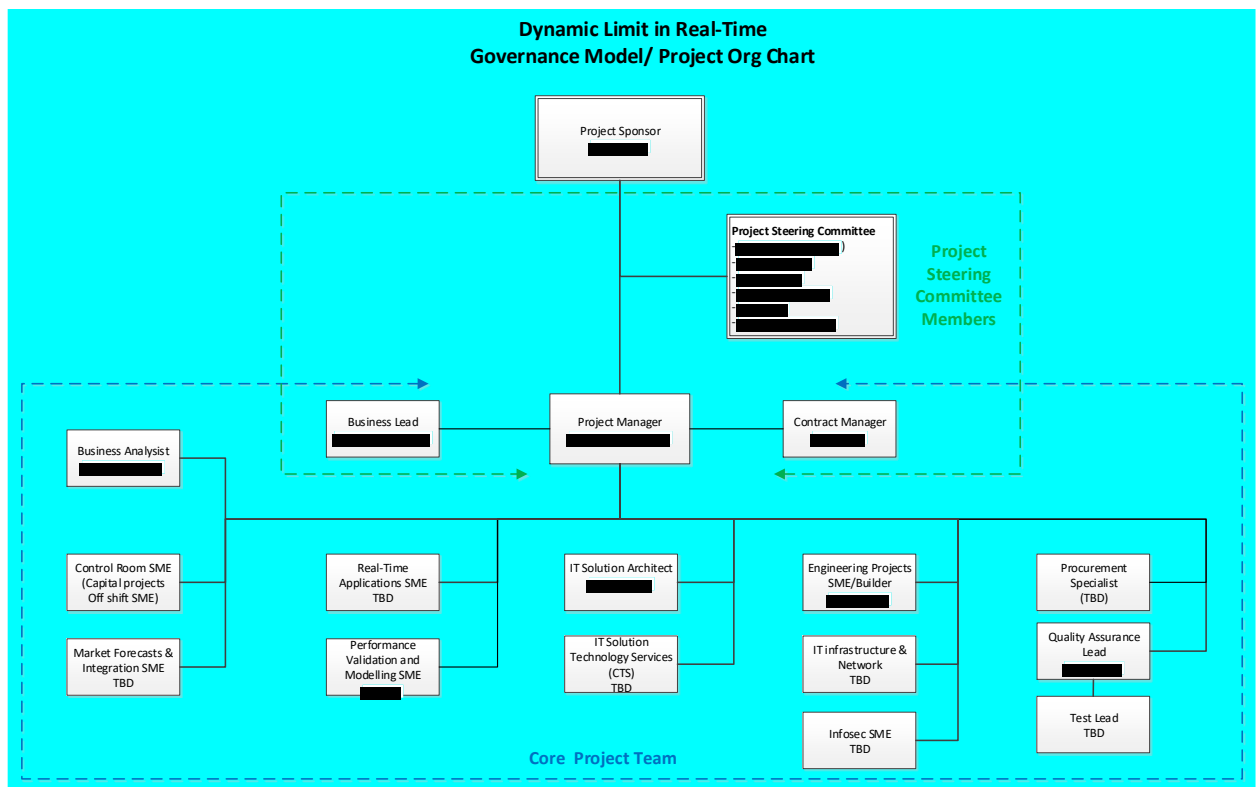
Stakeholder	Stakeholder Role	Process	How They Are Affected or How They Are Participating
Control Room System Operations M&R / Market Operations	End user Manager: Process Owner, Resource manager Builder	Direct Short-Term Operations (including activities Operate System Reliably and Recover from System Disturbance and Operate IESO Administered Markets (IAM))	<ul style="list-style-type: none"> • Direct users of the DLRT Platform—particularly the real-time dashboard interface for retrieving results and initiating studies. • Provide test cases • Provide business requirements • Participate in testing
Market Forecasts and Integration M&R / Market Operations)	Customer/Manager: Process Owner, Resource manager Builder	Plan Operations activities: Assess Outage	<ul style="list-style-type: none"> • Updated tools and procedures for MF&I outage assessment studies • New tools and procedures • Provide business requirements • Provide test cases • Participate in testing
Real-Time Applications (M&R / PSA)	Customer/Manager: Process Owner Resource manager Builder	Maintain Combined Network Model	<ul style="list-style-type: none"> • Combined Model as direct input to DLRT platform • DLRT platform to provide feedback into Combined Model improvements • Provide business requirements • Provide test cases • Participate in testing
Power System Limits / Engineering Studies (M&R / PSA)	Customer/Manager: Process Owner, Resource manager	Derive Mid-Term Limits	<ul style="list-style-type: none"> • Changes in SCO scope to support DLRT

Stakeholder	Stakeholder Role	Process	How They Are Affected or How They Are Participating
	Builder	Activity Derive Deployment Limits (Plan Operations)	<ul style="list-style-type: none"> Feedback from DLRT to impact SCO development
I&TS – (BSSD Solutions Design, BSSD PAO, Corporate Technology Solutions, Infrastructure, Information Security, IT Operations)	Builder Subject Matter Experts Consultation Enterprise Architecture	Operate Technology Resolve IT Incident Resolve IT Problem SDLC	<ul style="list-style-type: none"> Provide solution architecture design, solution integration services, vendor evaluation, etc. Ensure alignment with architecture, including standards and practices of the solution Provide application support and administration Update manuals and procedures Software security assessment, penetration Provide IT Operation requirements, test cases, and testers.
Engineering Projects (Engineering Studies)	Builder Subject Matter Experts		<ul style="list-style-type: none"> Provide business requirements Developing DSA scenarios Provide test cases
I&TS – BSSD - Quality Assurance team	Consultation		<ul style="list-style-type: none"> Develop test plans Provide support with planning and execution of testing activities
Procurement	Procurement	Procurement	<ul style="list-style-type: none"> Provide input for procurement strategy Prepare and issue procurement

Stakeholder	Stakeholder Role	Process	How They Are Affected or How They Are Participating
			documents and contracts.
Market Analysis (PA&O / MD&PR)	Consultation		<ul style="list-style-type: none"> Measure Business Objective post project closure

5 Project Governance Structure

This document defines the high level approach and plan for the project. Complete details will be included in the Project Plan.



6 Delivery Approach

6.1 Development Life Cycle

The project employs the Solution Development Life Cycle (SDLC). Each delivery stream produces business needs and requirements and solution blueprints for its deliverables prior to beginning their implementation. This approach will help ensure that the project has the capability to maneuver, as needed, to meet evolving expectations of the business and of end-users.

6.2 Planning Phase

During the planning phase, business needs requirements and design are captured from key stakeholders and formulated for both delivery streams. This approach will aid in development of the Integrated Project Plan, and ensures that all stakeholder input is captured early.

6.3 Buy and Build

New functionality is acquired using a combination of buy and build.

This includes enhancements to existing solutions by vendor change request (VCR), and includes procurement of specialized software. When procuring, the project will endeavor to use off-the-shelf software with minimal customization, to the extent feasible.

6.4 Modular Development

Platform development is modular, meaning that all major components should interface using common protocols. This ensures that modules can be enhanced or swapped out as needed to extend or enhance the platform following project closure, and avoids creating dependencies on specific IESO tools and/or platforms.

7 Assumptions, Constraints and Potential Risks

7.1 Project Assumptions

- No testing automation will be included in the scope of this project. However, given the initial assessment of the new tools, there is possibility to automate the health check for the DLRT tools (some scripting might be possible for DSA).

- [REDACTED]
[REDACTED]
[REDACTED]

- DLRT project does not have any technical dependency to MRP project. Any integration with day-ahead, pre-dispatch, and real-time market systems developed by MRP will happen post-MRP go-live.
- [REDACTED]
- The project does not anticipate impacting market rules or market manuals.
- The project will recommend changes to the organizational structure of PSA and Market Operations to support the platform and take advantage of its functionality, but implementation of such changes are left to the respective business units.

7.2 Project Constraints

N/A

7.3 Potential Project Risks and Mitigation Actions

The following table outlines project risks known to date that have a high or critical inherent risk level and identifies mitigation actions planned or taken in order to reduce the risk level to an acceptable level (Target Risk Level).

Table 2: Risk Summary

Risk ID	Risk Description	Inherent Risk Level	Control Action	Control Action Implemented ⁵ (Yes/No)	Residual Risk Level ⁶	Target Risk Level
R001	Introduction of new technical capabilities (Limit validation , Dashboard, DB) currently not used by the IESO, will delay the Limit Validation & Dashboard delivery	High	1) Use demo/proof of concept during procurement 2) Build Time contingency to the project 3) Release the time	1) No 2) Yes 3)No	Medium	Low

⁵ Status of implemented Control Actions

⁶ The residual risk level reflects the current level of risk, based on status of control action implemented.

Risk ID	Risk Description	Inherent Risk Level	Control Action	Control Action Implemented ⁵ (Yes/No)	Residual Risk Level ⁶	Target Risk Level
			contingency required			
R002	Introduction of new Business capabilities(Limit validation , Dashboard, DB) currently not used by the IESO, will delay the Limit Validation & Dashboard delivery	Critical	1) CRO and Engineers trained to use new tools 2) Process Stewards accepted new process using new tools 3) Early engagement of the CRO and communicate changes and collect the inputs on a continual basis 4) Build Time contingency to the project 5) Release the time contingency required	1) No 2) No 3) No 4) Yes 5) No	High	Low
R003	DLRT requirements may not be achievable without modifying the OSL Platform functionalities	High	1) Perform gap analysis of current OSL platform functionalities during planning phase 2) Revise the project scope, cost and schedule based on gap analysis and final design and include it in subsequent version of the PC (PCv2) 3) Include cost &	1) No 2)No 3) Yes 4) No	Medium	Insignifi cant

Risk ID	Risk Description	Inherent Risk Level	Control Action	Control Action Implemented ⁵ (Yes/No)	Residual Risk Level ⁶	Target Risk Level
			time contingency to the project 4) Release the time & cost contingency required			
R005	Key vendors are unable to deliver tool enhancements within project timelines	Critical	1) Coordination with vendors as part of the VCR and SOW approval process 2) Incorporate time component in to the SOW or VCR to provide incentive for the vendor to deliver on time (option) 3) Include project contingency (time and cost) 4) Release the time & cost contingency required	1) No 2) No 3) Yes 4) No	High	Insignificant
R006	Key internal stakeholders are slow or resistant to integrate new technologies and processes delivered by the project.	Critical	1) Early engagement of all stakeholders and communicate changes and collect the inputs on a continual basis 2) Post stage 1 of the project includes a "break-in" period for key stakeholders to become familiar and confident with the tool. 3) Part of the project team will sit in with the Operators within the Control Room for a period of time	1) No 2) No 3) No 4) No	Critical	Low

Risk ID	Risk Description	Inherent Risk Level	Control Action	Control Action Implemented ⁵ (Yes/No)	Residual Risk Level ⁶	Target Risk Level
			following launch, in order to provide additional training and support. 4) Dedicated training session with impacted stakeholders			
R012	Expanded model from WAVE Phase 2 project has materially adverse impact on performance of the DLRT platform (DSA)	High	1) DLRT team will have input in WAVE Phase 2 testing. Testing considers performance impact of expanded model onto real-time limit processing. 2) Consult with vendors to resolve the performance issues. 3) Extend the project execution to resolve the performance issues 4) Use Change Management to accommodate performance improvement 5) Include additional cost contingency in PC v2 (if required)	1) No 2) No 3) No 4) No 5) No	High	Low
R014	SDLC process is new to the IESO and may lead to learning curves for project members that can impact the schedule.	Critical	1) Incorporate the SDLC process into initial Project Plan 2) Include additional schedule contingency to manage the uncertainty 3) Keep project team	1) Yes 2) Yes 3) No	Medium	Insignificant

Risk ID	Risk Description	Inherent Risk Level	Control Action	Control Action Implemented ⁵ (Yes/No)	Residual Risk Level ⁶	Target Risk Level
			engaged in SDLC activities and explain processes that are new.			

Note: The project team will maintain a comprehensive risk log which will include a complete list of project risks including those with a medium or low risk level. New or modified risks and mitigation plans will be highlighted to the Project Sponsor and Project Steering Committee members via monthly progress reporting.

8 Change Controls

Changes in the project that will impact/exceed tolerance levels for objectives, time and cost will be managed through the formal Project Change Management Process resulting in the Project Exception Report. The Project Exception Report (if approved) will result in the re-baselining of the project. Refer to the Project Exception Procedure for reference and additional details.

Appendix A: NPV Analysis and Cash Flow



Appendix B: Alternative Analysis

Identified Alternatives Summary

Alternative 1 – Do Nothing (Not Recommended)

Do not implement post-contingency voltage monitoring into the Control Room, and maintain existing processes and tools in use for deriving operating limits in the mid-term (██████) and operations planning time-frames (██████).

Benefits Realized:

- No realization of business objectives.

Risks:

- Do not achieve compliance with Market Rule obligation to monitor and take actions to respect ratings established by asset owners. Not taking steps to respecting these ratings could also result in damage to the transmission owner's assets, or bring harm to their staff or the general public.
- Not implementing Post-Contingency High-Voltage Monitoring capabilities would run the risk of Hydro One taking unilateral action to remove affected equipment from the grid without IESO foreknowledge or consent – resulting in potential for significant impact to system reliability across the broader bulk power system
- An extreme weather event significantly damages generation or transmission assets, and we do not have the capabilities to respond in a timely manner, resulting in significant impact to ratepayers and/or market participants.
- IESO Operations continues to rely on human judgement and existing manual processes to re-prepare the system following grid contingencies, resulting in unnecessary rate-payer and market participant impact, and greater risk to the security and reliability of the power system.
- The IESO continues to lack a tool based strategy to address potential for gaps within the operating plan inherent with offline derived limits, resulting in greater risk for local or widespread system and customer impact.
- A critical bulk electricity system reliability outage is triggered by actions arising from distribution connected resources for which the IESO lacked visibility over. We do not have capabilities to effectively respond and adapt.
- No savings are achieved within IESO Administered Markets (IAM).
- Do not improve utilization of the existing transmission system.

Alternative 2 – DLRT project (Recommended)

Deploy Dynamic Limits into the IESO's real-time operations environment.

Benefits Realized:

- Achieve compliance with Market Rule obligation to monitor and take actions to respect ratings established by asset owners.
- Cost effective reliability: IESO Administered Markets (IAM) savings of \$1.5M per year.
- The IESO is positioned to more effectively respond following grid contingencies, including extreme weather events, by enabling more timely re-preparation of the system and more secure and optimized operating limits that are derived within minutes, as compared to hours in today's environment. This reduces the impact to rate-payers and to market participants.
- Improved monitoring of post-contingency voltage levels and grid stability, and enhanced capabilities to respond to changing grid conditions, resulting in enhanced system security, reliability, and resiliency.
- Future work process savings, considering shift of offline limit assessment work from Power System Limits and MF&I Operations Planning into Real-Time Operations.
- Establishes the foundational toolset necessary for integration into the IAM in subsequent project.

Risks:

- Unanticipated complexities involved in maintaining the newly deployed capabilities for real-time voltage monitoring and limits.

NPV:

- Net present value over 4-years of operation: \$1.7M

Alternative 3 – Implement Post-Contingency High-Voltage Monitoring only

Develop the tools necessary to provide post-contingency high voltage monitoring to the Control Room.

Benefits Realized:

- Improved monitoring of post-contingency voltage levels resulting in enhanced system reliability.
- Achieves compliance with Market Rule obligation to monitor and take actions to respect ratings established by asset owners.

Risks:

- An extreme weather event significantly damages generation or transmission assets, and we do not have capabilities to respond in a timely manner, resulting in significant impact to ratepayers and/or market participants.
- IESO Operations continues to rely on human judgement and existing manual processes to re-prepare the system following grid contingencies, resulting in unnecessary rate-payer and market participant impact, and greater risk to the security and reliability of the power system.
- The IESO continues to lack a tool based strategy to address potential for gaps within the operating plan inherent with offline derived limits, resulting in greater risk for local or widespread system and customer impact.
- A critical bulk electricity system reliability outage is triggered by actions arising from distribution connected resources for which the IESO lacked visibility over. We do not have capabilities to effectively respond and adapt.
- Not cost-effective: significant expenditure is still required for enhancing the toolset, and there are no achievable market benefits.
- Additional 1 FTE resources are required to support the new high-voltage monitoring functionality, without any benefit to efficiency of existing work processes.

NPV:

- Net present value over 4-years of operation: \$(- 4.4M)

Appraisal of Alternatives

<i>Ref #</i>	<i>Alternative</i>	<i>NPV</i>	<i>Achievement of Business Objectives</i>	<i>Risk</i>	<i>Consideration</i>
1	<i>Do Nothing</i>	0	- No business objectives are met	<p>Critical risk:</p> <ul style="list-style-type: none"> - Non-compliant with market rules - We do not have the capabilities to respond in a timely manner following severe weather events, resulting in potential for significant impact to ratepayers and/or market participants - Lack of tools to effectively respond and adapt following contingencies which come as a result of an unmonitored threat. 	<i>Not recommended</i>
2	<i>This project</i>	+\$1.7M (with additional savings in future projects)	<ul style="list-style-type: none"> - Achieve all business objectives - Compliance with Market Rule obligation to monitor and take actions to respect ratings established by asset owners - Enhance reliability and resiliency - Increase market efficiency - Add new capabilities for determining and manually implementing dynamic limits 	<p>Low risk:</p> <ul style="list-style-type: none"> - Minor impact to one business objective is possible as a result of unanticipated complexity 	<i>Recommended</i>
3	<i>Implement high-voltage</i>	\$(-4.4M)	Achieves only one business objective:	<p>Critical risk:</p> <ul style="list-style-type: none"> - We do not have the capabilities to respond in a 	<i>Not-recommended</i>

<i>Ref #</i>	<i>Alternative</i>	<i>NPV</i>	<i>Achievement of Business Objectives</i>	<i>Risk</i>	<i>Consideration</i>
	<i>monitoring in EMS</i>		<ul style="list-style-type: none"> - Compliance with Market Rule obligation to monitor and take actions to respect ratings established by asset owners. 	<ul style="list-style-type: none"> timely manner following severe weather events, resulting in potential for significant impact to ratepayers and/or market participants - Lack of tools to effectively respond and adapt following contingencies which come as a result of an unmonitored threat. 	

Appendix C: Project Cost Worksheet

Dynamic Limits in Real-Time (DLRT)		
Project Charter		
Code	Project Capital Expenses	PC V1.0 Approved Budget
	Total Internal Labor	\$ 1,143,700
Mutiple	IESO Labour	\$ 1,143,648
	Total Contract/Computer Services	\$ 1,615,700
74000	Computer Services/Software	\$ 1,615,700
	Total Hardware and Building Services	\$ 671,000
74500	Computer Equipment	\$ 671,000
	Total Miscellaneous	\$ 109,500
87000	Interest	\$ 109,500
	Subtotal Capital Budget without Contingency	\$ 3,539,900
	Contingency	\$ 1,062,000
	Total Capital Budget with Contingency	\$ 4,601,900
Code	Project Operating Expenses	PC V1.0 Approved Budget
	Total Internal Labor	\$ 368,500
Mutiple	IESO Labour	\$ 368,403
	Total Contract/Computer Services	\$ -
	Total Hardware and Building Services	\$ -
	Total Miscellaneous	\$ -
	Subtotal Operating Budget without Contingency	\$ 368,500
	Contingency	\$ 111,000
	Total Operating Budget with Contingency	\$ 479,500
	Subtotal Capital and Operating Budget without Contingency	\$ 3,908,400
	Contingency (capital + operating)	\$ 1,173,000
	Total Capital and Operating Budget with Contingency	\$ 5,081,400

Document Control

Note: * indicates which roles will be required to approve in [REDACTED] workflow, however, document will be reviewed by all other roles identified.

Authors:

Prepared By	Role
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[REDACTED]	Business Analyst

Project Management Adherence Review:

Reviewed By	Role
[REDACTED]	PMO Project Support

Financial Review:

Reviewed By	Role
[REDACTED]	VP –Corporate Services & CFO

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[REDACTED]	Manager, Corporate Technology Solutions
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Reviewed By	Role
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██████████	Supervisor, Procure to Pay
██████████	Procurement Specialist
██████████	Supervisor, Quality Assurance
██████████	Lead Enterprise Architect
██████████	Supervisor, Market Analysis
██████████	Director Business Service & Solution Delivery; Project Steering Committee Member
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██████████	Senior Manager, System Operations; Project Steering Committee Member
██████████	Senior Manager, Market Forecasts & Integration; Project Steering Committee Member
██████████	Director, Finance, Corporate Controller & Treasury; Project Steering Committee Member
██████████	Senior Manager, Performance, Applications and Integration; Project Steering Committee Member
██████████	Senior Director, Power System Assessments; Project Sponsor*

Approvals:

Approved By	Role
██████████	President & CEO*

Distribution List

Name	Organization
██████████	IESO
PMO	IESO
Finance	IESO

Document Change History

Issue	Reason for Issue	Date
1.0	Initial version of the DLRT Project Charter (PC v1.0)	22 July, 2021

References

Document Title	Document ID
Project Intake Document	██████████
Project Roles and Responsibilities	██████████

Related Documents

Document Title	Document ID
Integrated Project Plan	██████████

– End of Document –

Project Charter for: Market Analysis and Simulation Toolset (MAST)

Document ID:	██████	Author(s):	████████████████████ ████████████████████
Issue:	1.0	Sponsor:	████████████████████
Effective Date:	February 7, 2022	Project ID:	████

1 Executive Summary

This project will replace the existing market assessment and simulation tools used by the IESO, given these legacy tools will become obsolete once the Market Renewal Program (MRP) goes live. This project will allow the IESO to fulfill its responsibility to operate and monitor an efficient wholesale electricity market (“market”). Existing energy market analysis and simulation tools have been developed over the past two decades using end user developed solutions replicating a simplified version of the current wholesale energy market. These tools will be incapable of analyzing the new market which consists of much more advanced optimization and hundreds of locational prices for the day-ahead market and real-time market, instead of a single Hourly Ontario Energy Price (HOEP) solely for the real-time market based on very few optimization constraints. While the tools delivered by MRP will provide some assessment capabilities, they have been deemed insufficient to meet the need for advanced analysis and simulation of the new market to ensure it is working as intended and deliver the expected benefits that justify the project.

This project is critical to realize the anticipated benefits of the renewed market as unintended outcomes resulting from inefficient market schedules or perverse financial incentives via counter-intuitive market prices or design gaps that are not currently identified will greatly diminish the benefits of MRP and have a negative impact on the stakeholder perception of market operations. In the 20 years of administering the existing market, the monitoring and analysis of the market using simulation tools have resulted savings to the ratepayer of well over several hundred million dollars. Such tools have allowed the IESO to analyze market outcomes found to be irrational, stifle competition, provide unwarranted windfall gains, or economically inefficient. Going forward the IESO must have the tools to assess the effectiveness of MRP to identify potential solutions to address unintended outcomes and inefficiencies. The MAST project is designed to provide the IESO with this critical functionality. This initiative directly supports IESO core corporate strategies of:

- **Drive Business Transformation:** This project will give the IESO the required tools to effectively monitor the newly-implemented electricity market design, analyze its

outcomes, and support the evolution of that market through the assessment of new market development initiatives.

- **Ensure Cost Effective System Reliability:** A well-functioning energy market is economically efficient and aids to achieving reliable outcomes. This project will ensure that the IESO has the ability to more efficiently anticipate and resolve market outcomes that could threaten system reliability such as insufficient resource commitment, infeasible dispatch, or other unintended outcomes of the MRP market design.
- **Enable Competition:** This project will enable competition by providing the means to identify inefficiencies and barriers to competition and participation for both existing and new resources.

The MAST Project was included in the 2021 approved project portfolio and is included in the IESO's 2022-2024 Business Plan. A total expenditure of \$6.8M is required to complete the project of which \$6.4M is capital. The project budget includes a contingency of \$1.5M which reflects an estimation accuracy of +/- 40%. On-going support and maintenance cost post project go live is estimated at \$650K.

The project is expected to take 36 months to complete with an additional 12 months of contingency to account for scheduling uncertainties given the dependency on MRPs schedule¹.

The table below shows the anticipated expenditure over the period of the project.

Year	2021	2022	2023	2024	Contingency	Total
Capital	\$20,000	\$400,000	\$2,500,000	\$1,980,000	\$1,500,000	\$6,400,000
Operating	\$40,000	\$80,000	\$80,000	\$80,000	\$120,000	\$400,000
Total	\$60,000	\$480,000	\$2,580,000	\$2,060,000	\$1,620,000	\$6,800,000

Project Charter Approval Process

To improve cost controls and allow for progressive elaboration, the project's budget and schedule will be released through a staged approval process. The first version of the project charter will request approval of the funds and schedule required to complete the Planning phase only. During Planning phase, the project will refine the business objectives and measures, develop detailed requirements, solution design documents, engage in initial procurement activities and improve cost and schedule estimate accuracy. The first version of the MAST

¹ The project is dependent on the completion of vendor Factory Acceptance Testing for MRP before this main vendor effort to support MAST can proceed. It is anticipated that the vendor cannot work in parallel with MAST and deliver the core MRP market solutions.

project charter will be approved by the Project Sponsor who is also the OAR authority for the Planning Phase budget.

At the end of Planning phase, a second version of the project charter will be produced requesting approval for of the overall project budget and schedule required to successfully deliver the solution and complete the project. The second version of the MAST project charter will be approved by the CEO in accordance-with the OAR.

At this time, we are seeking approval of version #1 of the project charter which is requesting \$450K of capital (including \$50K of contingency) and 12 months (including 2 months of contingency) in order to refine the cost and time estimates which will be reflected in subsequent versions of the Project Charter. As MAST will build upon the base assessment capability to be delivered with MRP (of which is proprietary in nature), this upfront effort will allow the project team to define the solution design that will achieve the business requirements and determine the solution changes (application and infrastructure) needed.

2 Business Objectives and Measures

1. Maintain our regulatory obligation to support the monitoring and investigative mandate of the Ontario Energy Board's Market Surveillance Panel by simulating market results with assumptions on market design and participant behaviour.
2. Sustain the ability and have more advanced capability that matches sophistication of the new market to monitor the performance of the IESO-administered markets and identify anomalous/unintended outcomes and the exercise or abuse of market power.
3. Provide the capability to simulate scenarios to measure benefits realization and to identify potential unintended market outcomes from implemented market initiatives.
4. Provide the capability to represent and simulate efficiency and reliability benefits of possible new market design features, and impacts from sector policy changes after Market Renewal Program goes in-service
5. Improve the quality and consistency of analysis results between Markets and Reliability and Market Assessment & Compliance Division (MACD) by moving to a common IT supported toolset while maintaining separation of function between the two groups.

Ref #	Business Objective	Procedure for Measures (identify how the performance will be measured)	Measured when and by whom?
-------	--------------------	--	-------------------------------

1	1	Tool-set provides capability to perform 3 market assessments to allow the Market Assessment Unit (MAU) to meet the analytical and reporting requirements to produce Market Surveillance Panel Monitoring Report.	When: Initiate within 6-months post implementation. Whom: Senior Manager, Market Surveillance
2	2	Tool-set provides the same capability to perform 3 market assessments of historical market outcomes as those provided by status quo tools for the purposes of monitoring market performance ([REDACTED] [REDACTED] [REDACTED]).	When: Initiate within 6-months post implementation. Whom: Conducted by Senior Manager, Wholesale Market Development
3	3	Tool-set is able to perform 3 simulations from day-ahead market to pre-dispatch, and from pre-dispatch to real-time that represent a hypothetical change in market participant behaviour and/or implementation of a market initiative.	When: Initiate within 6-months post implementation. Whom: Conducted by Senior Manager, Wholesale Market Development and Senior Manager, Market Surveillance

4	4	<p>Simulation toolset is capable of calculating 1-set of measurements related to capturing efficiency and reliability benefits:</p> <ul style="list-style-type: none"> • production costs, • dispatch results, • objective function values, and <p>producer and consumer surplus</p>	<p>When: At project completion.</p> <p>Whom: Conducted by Senior Manager, Wholesale Market Development and Senior Manager, Market Surveillance</p>
5	5	<p>Verify that Markets and Reliability, Market Analysis, and Market Assessment Unit to have access to MAST and are able to produce the same outcome with the same inputs and under market design assumptions without impacting each other's work.</p> <p>Verify that Market Analysis staff are not able to view or modify simulations being performed or constructed by MAU staff, and vice versa.</p> <p>Market Analysis and MAU staff are able to concurrently access and perform independent simulations within the simulation environment.</p>	<p>When: At project completion.</p> <p>Whom: Conducted by Senior Manager, Wholesale Market Development and Senior Manager, Market Surveillance</p>

2.1 Benefits Expected

The development of MAST will yield the following benefits:

- Savings to the ratepayer of well over several hundred million dollars (see Appendix D: Benefits from the Use of Existing Simulation Tools for historical examples of savings generated)
- Improved quality (accuracy) and detail (resolution) of results used for wholesale market monitoring, analysis and reporting;
- Increased efficiency in conducting wholesale market monitoring and analysis;
- Provide functionality that Operations and potentially other business units can use for analysis that is currently unavailable but sought after (e.g. Real-Time Assessments will use MAST to improve parameters used for power system modeling that will result in savings for the ratepayer);
- Reduced/elimination of effort to develop and maintain End User Computing (EUC) tools allowing Markets & Reliability, and MACD staff to focus on and achieve business unit objectives;
- Removal of barriers between business units using different tools and use of time assessing and comparing results; and
- Improved controls compared to the limited access controls used by the existing suite of EUC tools

3 Project Overview

3.1 Project Scope

- Development of vendor SOW to participate in detailed requirement & design
- Procurement & integration of Market Analysis & Simulation Toolset (MAST) solution
- Procurement & installation of storage infrastructure
- Procurement & installation of database infrastructure
- Procurement & installation of application infrastructure
- Determination of data retention requirements to ensure only relevant period of data is maintained

3.2 High Level Assessment of Impacted Business Processes, Systems and Governing Documents

3.2.1 Processes

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

3.2.2 Systems

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

- [REDACTED]

3.2.3 Governing Documents

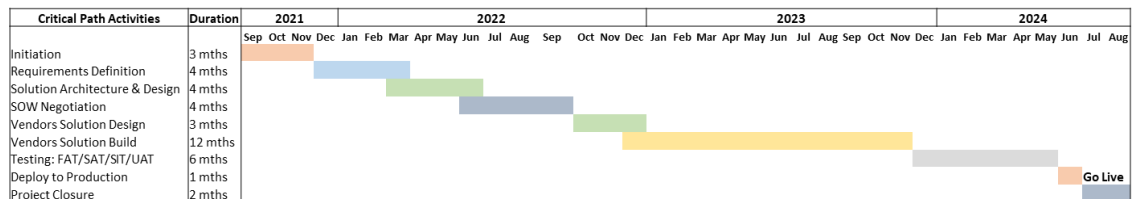
- Internal Manual 2: Operations, Part 2.31: Operational Assessment Procedures

3.3 Out of Scope

- Market Power Mitigation assessment and Economic Operating Point (EOP) Optimization Tool functionality (to be delivered by MRP)
- Other Market Information System (MIS) enhancements
- Ex Post functionality

3.4 Overall Project Timeline

The project is expected to take 36 months to complete without the use of contingency. An additional 12 months of contingency will be required to account for project risk and uncertainties.



3.5 Cost

The project is expected to cost \$6.6M of which \$6.4M is capital (including \$1.5M of contingency). The chart below provides a breakdown of expected expenditure by year.

Year	2021	2022	2023	2024	Contingency	Total
Capital	\$20,000	\$400,000	\$2,500,000	\$1,980,000	\$1,500,000	\$6,400,000
Operating	\$40,000	\$80,000	\$80,000	\$80,000	\$120,000	\$400,000
Total	\$60,000	\$480,000	\$2,580,000	\$2,060,000	\$1,620,000	\$6,800,000

On-going support and maintenance cost post project go live is estimated at \$450K solution support and \$200K for infrastructure licenses.

3.6 Key Resource Needs

Resource Type	2021	2022	2023	2024
PMO - Project Manager	0.4	0.4	0.3	0.2
EC - Business Analyst	0.4	0.4	0.2	0.2
IT SME - PAO (Contract Manager)	0.1	0.1	0.1	0.1
MACD - SME	0.1	0.1	0.1	0.1
MACD - SME	0.4	0.4	0.4	0.4
Market Analysis - SME	0.1	0.1	0.1	0.1
Market Analysis - SME	0.4	0.4	0.25	0.25
Market Analysis - SME	0.4	0.4	0.25	0.25
Procure to Pay - SME	0.1	0.2	0.1	
Procure to Pay - SME	0.1	0.2		
Operations Assessment - SME	0.2	0.2	0.15	0.15
Solution Architecture	0.15	0.15	0.15	0.15
Test Lead	0.1	0.3	0.3	0.3
INF - Network & Telecom SME		0.15	0.15	
CTS - SME		0.15	0.15	

3.7 Planning Phase

Project Phase	Time Estimate			Cost Estimate				
	Duration	Contingency	Total Duration	Capital	Contingency	Operating Expense	Contingency	Total Cost (incl. Contingency)
Planning	10	2	12	\$400K	\$50K	\$70K	\$10K	\$530K

3.7.1 Resources

Resource Type	2021	2022
PMO - Project Manager	0.4	0.4
EC - Business Analyst	0.4	0.4
IT SME - PAO (Contract Manager)	0.1	0.1
MACD – SME	0.1	0.1
MACD – SME	0.4	0.4
Market Analysis - SME	0.1	0.1
Market Analysis - SME	0.4	0.4
Market Analysis - SME	0.4	0.4
Procure to Pay - SME	0.1	0.2
Procure to Pay - SME	0.1	0.2
Operations Assessment - SME	0.2	0.2
Solution Architecture	0.15	0.15
Test Lead	0.1	0.3
INF - Network & Telecom SME		0.15
CTS – SME		0.15

4 Key Stakeholders

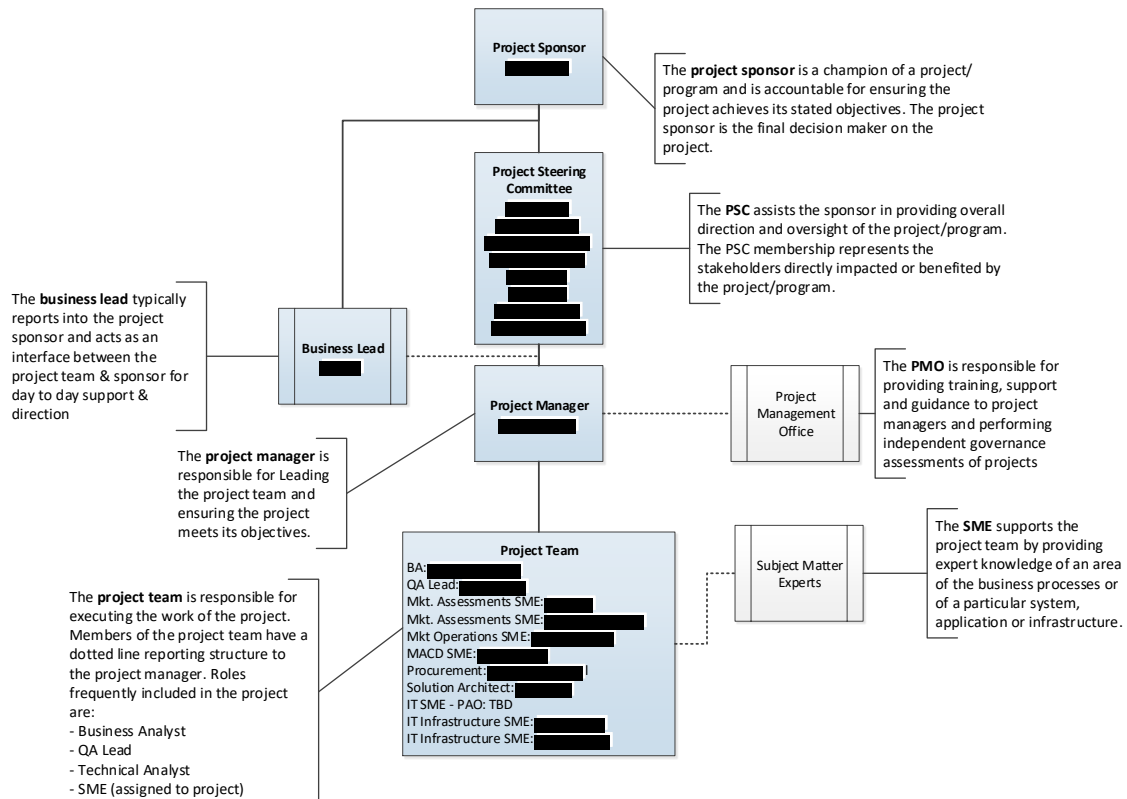
Table 1. Key Stakeholder list

Stakeholder	Stakeholder Role	How They Are Affected or How They Are Participating
Market Development Department	Customer	Potential changes or enhancements to business processes, tools and documentations as a result of this project.
Market Assessment & Compliance Division	Customer	Potential changes or enhancements to business processes, tools and documentations as a result of this project.
Performance Application and Integrations	Customer	Potential changes or enhancements to business processes, tools and documentations as a result of this project.
Director, Corporate Finance	Manager	Owner of business processes related corporate finance. A member of the steering committee.

Stakeholder	Stakeholder Role	How They Are Affected or How They Are Participating
Sr. Manager, Market Development	Manager	Owner of business processes related to market development & design. A member of the steering committee.
Director, Market Assessment & Compliance Division	Manager	Owner of business processes related to ensuring compliance. A member of the steering committee.
Director, Business Services & Solution Delivery	Manager	Owner of business processes and solutions related to IT applications. A member of the steering committee.
Director, IT Operations	Manager	Owner of business processes and solutions related to IT Infrastructure. A member of the steering committee.
MRP Program Delivery Executive	Manager	Responsible for the delivery of Market Renewal Program. A member of the steering committee
Operational Effectiveness	Builder	Market Operations Subject Matter Experts - a core member of the project team; provides requirements and is required for testing.
Market Assessment	Builder	Market Assessments Subject Matter Experts - a core member of the project team; provides requirements and is required for testing.
MACD - Market Assessment Unit	Builder	MACD Subject Matter Experts - a core member of the project team; provides requirements and is required for testing.
IT Operations	Builder	Responsible for the monitoring and support of the IT Infrastructure.
ITS – Business Service & Solution Delivery – PAO	Builder	Provide solution architecture and integration expertise, support vendor evaluation, etc.
ITS – Business Service & Solution Delivery – Solution Architecture	Builder	Provide solution architecture design, solution integration expertise, vendor evaluation, etc. Create documentation
ITS – Business Service & Solution Delivery – Quality Assurance	Builder	QA Lead - Identifies QA needs; reviews requirements, specifications and technical design documents for change initiatives for testability; and assists with test planning. Test Lead – Assists the project team to plan, monitor and control testing activities and tasks.
Procure to Pay	Builder	Procurement Subject Matter Expert – Provide input for procurement strategy. Prepare and issue procurement.
Enterprise Change – Project Management	Builder	Project Manager – Manages each phase of the project (initiation, planning, risk management, status reporting, etc.).

Stakeholder	Stakeholder Role	How They Are Affected or How They Are Participating
Office and Business Analysis Services		Business Analyst – Facilitates, elicits and secures approval for business objectives, performance measures, business process and information design, and requirements.

5 Project Governance Structure



6 Delivery Approach

This project will be delivered as per the Portfolio Project Management Life Cycle (PPMLC) and Solution Delivery Life Cycle (SDLC) processes. The detailed approach with steps for delivery will be defined in the Integrated Project Plan document.

Vendor services will be procured to assist the IESO in developing requirements documentation and detailed solution design.

7 Assumptions, Constraints and Potential Risks

7.1 Project Assumptions

- [REDACTED]
- MAST can leverage the existing vendor Master Services Agreement (MSA)
- Integration and user interface development will be covered under the existing vendor MSA

7.2 Project Constraints

- MAST will be resource constrained by MRP vendors and MRP SME availability, MRP project work will be prioritized requiring MAST to use contingency in the event of schedule conflicts
- Due to support of MRP, the vendor recommends waiting until MRP enters Factory Acceptance Testing before engaging them for solution development
- Completion of the MAST solution will be dependent on the successful delivery of MRP's Study Environment

7.3 Potential Project Risks and Mitigation Actions

The following table outlines project risks known to date that have a high or critical inherent risk level and identifies mitigation actions planned or taken in order to reduce the risk level to an acceptable level.

Table 2: Risk Summary

Risk ID	Risk Description	Inherent Risk Level	Mitigation Tasks	Mitigation Tasks Implemented (Yes/No)	Mitigated Risk Level
#1	Procurement and negotiation with vendor is unsuccessful because tool development is infeasible at expected cost/timeline or presents a significant risk to MRP timeline.	Critical	Engage vendor to participate in requirements definition and detailed design in order to provide schedule, cost and resource constraints estimates earlier in the planning phase. This will	No	High

Risk ID	Risk Description	Inherent Risk Level	Mitigation Tasks	Mitigation Tasks Implemented (Yes/No)	Mitigated Risk Level
			allow the project team to perform alternative analysis for other potential solutions in the event procurement and negotiation is unsuccessful.		
#2	Prioritization of MRP deliverables results in key internal or external SMEs becoming unavailable to support the delivery of the MAST solution for extended periods of time leading to significant schedule delays.	Critical	MRP is the organization's first priority and the MAST project accepts the risk of having critical resource constraints with MRP. The project will add schedule and cost contingency to its approved schedule and budget to address these risks if they materialize.	No	High
#3	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
#4	The MAST solution is dependent on the successful build of the DSO and Study Environment. Any delays in these two deliverables will likely result in a schedule delay to MAST.	High	The MAST project will add schedule and cost contingency to address any potential delays in MRP's schedule that impact dependent systems.	No	High

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Note: The project team will maintain a comprehensive risk log which will include a complete list of project risks including those with a medium or low risk level. New or modified risks and mitigation plans will be highlighted to the Project Sponsor and Project Steering Committee members via monthly progress reporting.

8 Change Controls

Changes in the project that will impact/exceed tolerance levels for objectives, time and cost will be managed through the formal Project Change Management Process resulting in the Project Exception Report. The Project Exception Report (if approved) will result in the re-baselining of the project. Refer to the Project Exception Procedure for reference and additional details.

Appendix A: NPV Analysis and Cash Flow

Appraisal of alternatives and NPV will be completed in the subsequent version of the project charter.

Appendix B: Alternative Analysis

Identified Alternatives Summary

Alternative 1 – Do Nothing (Not Viable)

The experience with the current market was for each department to build End User Computing (EUC) tools that have been supported by their respective staff, such as Market Analysis staff. As the current market is less complex with one uniform price, EUC tools is sufficient. The new market will require the ability to fully analyze a constrained market with prices for each market participant for different settlement time frames (I.e. day-ahead and real-time). This complexity and sophistication cannot be built using EUC tools alone.

For example, one large change between today's market and MRP that significantly increases EUC complexity is the creation of a Single Schedule Market; i.e. the use of scheduling pass results in the pricing pass which cannot be modelled using internally developed End User Computing tools.

Alternative 2 – Implement MAST Solution (Recommended)

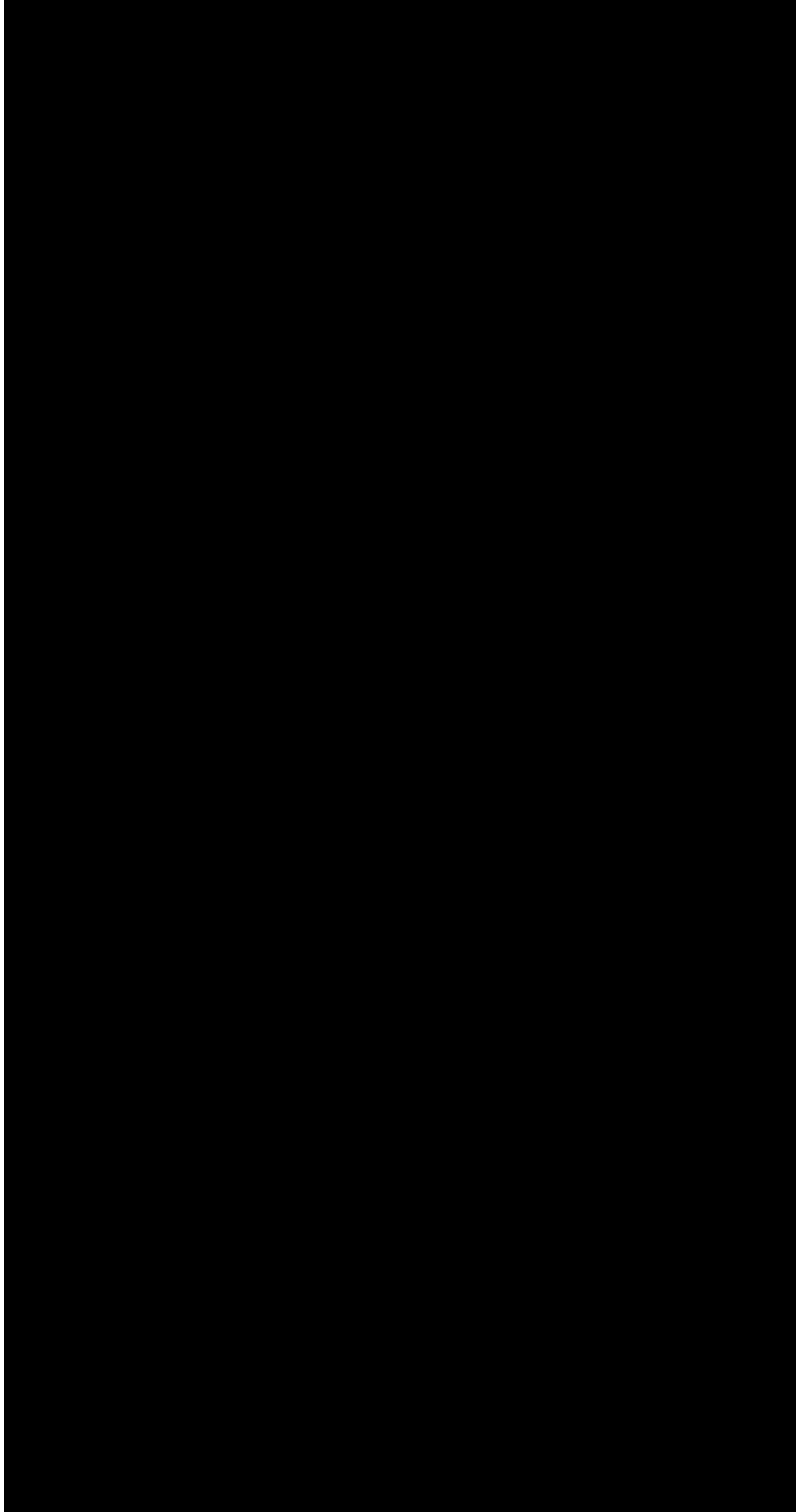
The recommended option is to engage the current vendor to augment the functionality of the DSO Study Environment delivered by the Market Renewal Program. The DSO Study Environment has base functionality suitable for Operational Assessments (OA) and Market Power Mitigation (MPM) teams at the IESO. The MAST solution will add additional functionality that includes the ability to see and manipulate the underlying mathematical objective functions, inputs and constraints in an offline environment.

Secondary vendor(s) may be used for user interface development and integration with the DSO study environment capability.

Appraisal of Alternatives

Appraisal of alternatives and NPV will be completed in the subsequent version of the project charter once the requirements with the vendor are validated.

Appendix C: Project Cost Worksheet



Appendix D: Benefits from the Use of Existing Simulation Tools

In the 20 years of administering the existing market, the monitoring and analysis of the market using simulation tools have resulted savings to the ratepayer of well over several hundred million dollars.

Without the use of the existing simulation tools, market initiatives implemented to eliminate irrational market outcomes, improve efficiency, augment competition, and remove unwarranted windfall gains would not have been justified. The table below lists examples of market initiatives that resulted in millions of dollars of ratepayer savings.

Market Initiative	Estimated Ratepayer Savings To-Date
Ramp rate reduction from 12x to 3x	\$40+ millions of CMSC payment reductions
Enhanced Day-Ahead Commitment Program	\$100+ millions of savings in resource commitment costs
Renewal Integration Initiative to require variable generation dispatchability	\$50+ millions of savings from reduced nuclear manoeuvres
Export bid and floor price rules	\$10+ millions of CMSC payment reductions
Flexibility Operating Reserve	\$10+ millions of savings from reduced manual commitments of resources to meet flexibility needs

Document Control

Note: * indicates which roles will be required to approve in [REDACTED] workflow, however, document will be reviewed by all other roles identified.

Authors:

Prepared By	Role
[REDACTED]	Project Manager*
[REDACTED]	Business Analyst*

Project Management Adherence Review:

Reviewed By	Role
[REDACTED]	PMO Project Support

Financial Review:

Reviewed By	Role
[REDACTED]	Director, Corporate Finance, PSC Member
[REDACTED]	VP –Corporate Services & CFO (If applicable)

Content Reviewers:

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[REDACTED]	Manager, Change Delivery
[REDACTED]	Director, Enterprise Change
[REDACTED]	Manager, Business Analysis Services
[REDACTED]	Cybersecurity
[REDACTED]	Procurement

Reviewed By	Role
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Approvals:

Approved By	Role
██████████	Project Sponsor and PSC Chair*

Distribution List

Name	Organization
██████████	IESO
PMO	IESO
Finance	IESO

Document Change History

Issue	Reason for Issue	Date
1.0	Initial release	February 7, 2022

References

Document Title	Document ID
Project Intake Document	██████
Project Roles and Responsibilities	██████

Related Documents

Document Title	Document ID
Integrated Project Plan	████

– End of Document –

GROSS ASSETS AND AMORTIZATION

The IESO's gross assets reflect tangible capital assets recorded at cost, including all amounts directly attributable to the acquisition, construction, development or betterment of the asset.

The IESO capitalizes applicable interest as part of the cost of tangible capital assets.

Asset additions represent assets under construction that are placed in service during the budget period, including some capital projects listed in Appendix 3 of the 2022-2024 Business Plan (see Exhibit B-1-2 – 2022-2024 Business Plan), in accordance with their expected in-service date.

Assets under construction generally relates to the cost of physical facilities, information technology hardware and software, and includes amounts paid to vendors, internal and external labour, consultants and interest related to funds borrowed to finance the project. Costs relating to assets under construction are transferred to tangible capital assets when the asset under construction is deemed to be ready for use.

The capital cost of tangible capital assets in service is amortized on a straight-line basis over an asset's estimated service life. The estimated service lives of tangible capital assets are subject to periodic review (see Exhibit E-1-1 – Asset Management Process Overview). The effects of changes in the estimated lives are amortized on a prospective basis. Amortization of new asset additions is also according to assigned service lives and the in-service date available during business plan development. The in-service dates are determined as part of the Capital Expenditure Planning Process (see Exhibit E-1-2 – Capital Expenditure Planning Process Overview).

Any gains and losses on sales or premature retirements of tangible capital assets are charged to operations. There were no gains or losses on retirement of tangible assets in 2021 and there are none in the 2022 budget.

Amortization Expense

The 2022-2024 Business Plan amortization is based on a projection of ongoing amortization of existing assets budgeted to be completed as of January 1, 2022 and the projected amortization

1 of new asset additions after January 1, 2022 in accordance to the projected in-service dates
2 and service life determined during the capital expenditure planning process.

3 The budgeted average service life of existing assets, as reflected in Exhibit E-3-1 Attachment 1
4 – Service Life Comparison and Amortization Expense, is in line with the 2021 average, while the
5 average service life of new assets is higher than 2021 due to the expectation that major capital
6 projects, or portions of them, will be placed into service towards the end of 2022 (e.g.
7 Supervisory Control and Data Acquisition/Energy Management System (SCADA/EMS),
8 Centralized Alarm Management System (CAMS), and a portion of the Replacement of
9 Settlement Systems project).

10 The 2021 amortization expense is \$17.1 million for existing assets and \$1.4 million associated
11 with new assets placed into service throughout the year. The 2022 amortization budget is \$20.0
12 million, comprised of \$16.0 million for existing assets, reflecting \$1.1 million of assets reaching
13 their end of service life, and \$4.0 million for new assets coming into service.

FORECAST VARIANCE DEFERRAL ACCOUNT

The IESO's operating reserve is used to fund operations in the event of revenue shortfalls or unanticipated expenditures. The balance of the operating reserve is recorded in the Forecast Variance Deferral Account (FVDA).

The IESO's revenue requirement is a fixed amount approved by the OEB with IESO usage fees determined based on a forecast of withdrawals from the IESO-Controlled Grid, embedded generation and exports. While the IESO provides a forecast of these withdrawals, a variance between the forecast withdrawals and actual withdrawals is to be expected. Therefore, it is also expected that there will be some variance between actual revenues and expenses and the OEB-approved revenue requirement. This variance is reflected as either a deficit or surplus in the IESO's core operation financial results. Surplus variances are collected in the IESO's operating reserve and recorded in the FVDA. Deficit variances draw on the operating reserve and are similarly recorded in the FVDA.

In the OEB's 2019 Decision on the IESO's 2019 Revenue Requirement Submission, the IESO received approval to retain an operating reserve of \$10 million. The OEB concluded that a period of stability was appropriate and ordered that the level of the operating reserve would not be reviewed again for five years unless there was a material change to the IESO's operations. The IESO's practice is to seek OEB approval to return any surplus in excess of the reserve threshold of \$10 million to market participants.

Balance of the Forecast Variance Deferral Account

As of January 1, 2021, the FVDA had a balance of \$1.3 million and in 2021, the IESO's core operations were in a surplus position of \$7.4 million mainly driven by \$3.2 million from higher than expected demand volume that resulted from a heat wave over the summer months, \$2.7 million increase in net interest related to better than expected long term investments performance associated with a strong equity market, \$0.6 million of underspend on the Market Renewal Program, and \$0.7 million lower amortization expense due to delays in capital projects completion, resulting in an \$8.7 million total balance as of January 1, 2022.

The table below provides the historical balances and operating variances in the FVDA:

Table 1: 2021 -2022 Balances and Transactions in the FVDA

Operating Reserve Balance	2021 Budget	2021 Actual	2022 Budget
Opening Balance	1.3	1.3	8.7
Surplus (Deficit)	0	7.4	0.0
Closing Balance	1.3	8.7	8.7
OEB Approved Balance	10.0	10.0	10.0

Operating Reserve Recovery

The balance of the FVDA as at December 31, 2021 is \$8.7 million, \$1.3 million below the OEB approved funding level of \$10 million. In order to reduce the burden on rate payers, the IESO has not included any additional revenue requirement in 2022 to recover the remaining operating reserve amount.

Given the scope and complexity of its mandate, the IESO recognizes the potential for additional unplanned events that may be material in scope and cost. When costs exceed the current level of the operating reserve the IESO has to fund these costs by either reducing invested funds or increasing borrowings, both of which have net interest impacts that negatively affect market participants. The IESO is confident, however, that the FVDA balance of \$8.7 million will afford it the ability to manage operational challenges that may arise in the short term to minimize the impact on market participants until such time as the \$10 million operating reserve can be restored.

Public Sector Accounting Standards (PSAS) Transition Item

In the OEB Staff submission on the settlement proposal for the IESO's 2020-2021 Revenue Requirement Submission proceeding (EB-2020-0230, OEB Staff questioned "*why certain amounts are included in the FVDA as period charges in 2018, instead of grouping all amounts with those recorded in the PSAS Transition Item – Accumulated Deficit account, which is recovered over a long-term period.*"

Certain amounts for the PSAS Transition Item are included in the FVDA as period charges in 2018 instead of grouping all amounts with those recorded in the PSAS Transition Item –

1 Accumulated Deficit account due to the requirements under Canadian public sector accounting
2 standards (PSAS).

3 As a result of the Auditor General's recommendation that the IESO change its discount rate to
4 'cost of borrowing' in calculating the cost of its pension and other post-employment benefit
5 (OPEB) expenses, the IESO incurred a total increase to its liability up to December 31, 2017 of
6 \$31.3 million. The breakdown of the \$31.3 million is as follows:

- 7 • \$17.9 million that is calculated as prior period expenses (at the transition date of
8 January 1, 2010); and
- 9 • \$13.4 million that is calculated as a current period expense (subsequent to the transition
10 date of January 1, 2010 up until December 31, 2017)

11 The \$17.9 million of prior period expenses is the result of retroactive application of the discount
12 rate change at the transition date of January 1, 2010. This amount was added to the PSAS
13 Transition Item – Accumulated Deficit account (accumulated deficit) as at December 31, 2018
14 since it is related to adopting PSAS with a transition date of January 1, 2010. The adoption of
15 PSAS was accounted for by a retroactive application with a restatement of prior periods subject
16 to the requirements in Section PS 2125 (First-time Adoption by Government Organizations).
17 This amount will be recovered through the FVDA, amortized over the 2020 Estimated Average
18 Remaining Service Life (EARSL) of employees which represents the average remaining years of
19 service for active employees in a pension plan. This is the most appropriate method to recover
20 such expenses under PSAS. In accounting, the EARSL is used as the period over which
21 unamortized net actuarial gains and losses are amortized into pension expense.

22 The \$13.4 million is a current period expense and therefore reflected in the FVDA in the current
23 period (fiscal year 2018). The reason this was not grouped in the PSAS Transition Item –
24 Accumulated Deficit account was because this amount is the additional expenses as a result of
25 using 'cost of borrowing' subsequent to adopting PSAS on the transition date of January 1,
26 2010. Therefore, this is required to be calculated as a current period expense under PSAS as it
27 is not a result of Section PS 2125 (First-time Adoption by Government Organizations).

SUMMARY OF RESPONSES TO OEB DECISIONS

This exhibit includes specific reference to prior OEB decisions and/or settlement agreements that committed the IESO to provide information or undertake specific studies, analysis or engagements.

Table 1: Summary of IESO Responses to OEB Decisions

Source of Commitment	Commitment	IESO Response
EB-2018-0143 Settlement Agreement	To increase transparency and accountability, the IESO agreed to include a status report on certain recommendations to the IESO included in Chapter 3 of the Auditor General's 2017 Annual Report related to market oversight and cybersecurity (Attachment 1 to the Settlement Agreement). The IESO agreed to file an updated status report in the same format with the OEB each year in its revenue requirement submission or by June 1st, whichever is earlier, until one year after all recommendations have been addressed.	See Exhibit G-2-2 – Annual Status Report on 2017 Auditor General Report Recommendations.
EB-2020-0230 Settlement Agreement	With respect to the IESO's planning activities, the IESO commits to increasing the public availability of planning data.	See Exhibit G-1-1 Attachment 1 – Summary of Increased Public Availability of Planning Data.
EB-2020-0230 Settlement Agreement	With respect to the IESO's stakeholder engagement practices, the IESO will update its stakeholder engagement framework to clarify its practice of communicating decisions, the rationale for each decision and how input was taken into account in each decision.	The IESO has updated the engagement principles of the stakeholder engagement framework to clarify its practice of communicating decisions, the rationale for the decision, and how input was taken into account in the decision. See Engagement Principle 6 "Communicate Outcomes" on the Engagement Principles

Source of Commitment	Commitment	IESO Response
		webpage, here: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagement-Principles .
EB-2020-0230 Settlement Agreement	<p>In addition, the IESO will develop two standardized documents for use in the IESO's stakeholder engagement process to facilitate communication of the IESO's decision-making to stakeholders and the public:</p> <ul style="list-style-type: none"> • The first standardized document will be used during the stakeholder engagement process, and will summarize how IESO is taking stakeholder input into account, and if input is not being taken into account, why it is not being taken into account. • The second standardized document will be used at the end of the stakeholder engagement process and will summarize (i) the IESO's decisions, and (ii) the rationale for decisions. 	<ul style="list-style-type: none"> • A template form to be used during the stakeholder engagement process, and which summarizes stakeholder feedback submissions with written responses from IESO, has been posted to the IESO website, here: https://www.ieso.ca/-/media/Files/IESO/Document-Library/Stakeholder-Engagement-Framework/IESO-template-response-to-feedback.ashx. • A template form to be used at the end of the stakeholder engagement process, and which includes a summary of discussions and engagement activities that took place throughout the engagement as well as the outcomes, has been posted to the IESO website, here: https://www.ieso.ca/-/media/Files/IESO/Document-Library/Stakeholder-Engagement-Framework/IESO-template-final-engagement-summary-report.ashx.

Source of Commitment	Commitment	IESO Response
EB-2020-0230 Settlement Agreement	The IESO will file evidence in the next Revenue Requirement Submission outlining the accomplishments to date and will provide a 3-year work plan related to innovation initiatives and costs.	<p>See Exhibit G-1-1 Attachment 2 – Innovation Work Plan.</p> <p>Note that the IESO does not use activity-based accounting. The IESO has identified the applicable OM&A costs for the Innovation, Research and Development (IRD) group which undertakes the specified work as part of their core business, where capital expenditure has been budgeted for identified work and where costs are funded outside of the IESO’s budget.</p>
EB-2020-0230 Settlement Agreement	The IESO will update the IESO Grid Innovation Fund, Conservation Fund and Technology Development Fund Project Portfolio spreadsheet referenced in Footnote 3 of Schedule 2 – 1.0 AMPCO 6 and post it publicly on its website.	<p>The IESO has updated the IESO Grid Innovation Fund, Conservation Fund and Technology Development Fund Project Portfolio spreadsheet on the IESO’s website, here: https://www.ieso.ca/-/media/Files/IESO/Document-Library/funding/Grid-Innovation-Fund/GIF-Portfolio-2021.ashx.</p> <p>Note this spreadsheet is now titled “GIF Portfolio”.</p>
EB-2020-0230 Settlement Agreement	The IESO agrees to post publicly on its website all independent third-party evaluations of its Grid Innovation Fund as described in the IESO’s April 24, 2019 memorandum to the IESO Stakeholder Advisory Committee (SAC) entitled IESO’s Grid	<p>All third-party evaluations of the Grid Innovation Fund are posted on the IESO website, here: https://www.ieso.ca/-/media/Files/IESO/Document-Library/funding/Grid-Innovation-Fund/GIF-Portfolio-2021.ashx</p>

Source of Commitment	Commitment	IESO Response
	Innovation Fund: supporting the implementation of the 2019-2021 Innovation Roadmap Work plan.	Library/funding/Grid-Innovation-Fund/IESO-GIF-Projects-Evaluation-Report.ashx .
EB-2020-0230 Settlement Agreement	With respect to internal audits, the IESO will provide the following information in the next Revenue Requirement Submission, in line with the findings of the OEB in its Motion Decision in EB-2013-0326, dated July 24, 2014: The details of the subject matter of the Audit Reports, the recommendations, the action(s) taken as a result of each recommendation, and the status of the implementation of that action. The information should be clear and comprehensive.	See Exhibit G-1-1 Attachment 3 – Details of Internal Audit Reports.
EB-2020-0230 Settlement Agreement	With respect to the IESO's insurance, the IESO will provide in the next Revenue Requirement Submission general descriptions of the types of insurance the IESO has and the costs of each type of insurance, subject to confidentiality obligations.	<p>The IESO has the following types of insurance:</p> <ol style="list-style-type: none"> 1. Property, Directors & Officers (D&O), Auto, Fiduciary, Crime, Terrorism, other (and including all insurance-related fees) – estimated expense: \$450,000. 2. Liability (including General Liability and Professional Liability) – estimated expense: \$1,163,000. <p>Notes:</p> <ul style="list-style-type: none"> • IESO's liability coverage includes commercial general liability and professional liability. In general terms (excluding run-offs for prior policies that included professional liability coverage),

Source of Commitment	Commitment	IESO Response
		the professional liability coverage applies with respect to acts, errors or omissions if and to the extent these constitute or allegedly constitute gross negligence or recklessness or willful misconduct.
EB-2020-0230 Settlement Agreement	With respect to Market Surveillance Panel (MSP) recommendations, the IESO will file in the next Revenue Requirement Submission the latest OEB Annual Status Update and will link the MSP recommendations to spending in that Revenue Requirement Submission.	See Exhibit G-1-1 Attachment 4 – OEB Annual Update on MSP Recommendations. Note that the IESO does not use activity-based accounting. The IESO has identified those business units that undertake work as part of their core business to address MSP recommendations and linked each recommendation to business unit expenditures. Where capital expenditure has been budgeted to address a specific MSP recommendation, this has also been identified.
EB-2020-0230 Settlement Agreement	As part of the Package Settlement, the IESO will conduct a review of the cost allocation model that is used to derive the IESO's Usage Fees and file the results of this review, including any proposed changes, in the IESO's next Revenue Requirement Submission.	See Exhibit C-1-1 – Revenue Requirement and Usage Fee Methodology, and Exhibit G-1-1 Attachment 5 – IESO Cost Allocation Methodology Review.
EB-2020-0230 Settlement Agreement	As part of the Package Settlement, the Parties have agreed to defer consideration of the proposed fee of up to \$50,000 per submission for electricity supply and capacity procurements,	On February 22, 2022, the IESO filed a letter with the Ontario Energy Board (OEB) with respect to section 3.1 of the Ontario Energy

Source of Commitment	Commitment	IESO Response
	<p>including ancillary services, until after the IESO has developed a more detailed procurement fee setting framework and completed its related stakeholder engagement efforts. Deferring consideration of the proposed fee at this time will allow the IESO to conduct additional stakeholder engagement and develop a more detailed procurement fee setting framework, while also maintaining the schedule for acquiring capacity through related procurements. These procurements will acquire the capacity needed to meet system needs as identified in the IESO's 2021 Annual Acquisition Report. The procurement fees are a means of supporting an efficient and effective procurement process. Consultation on these procurements is already underway.</p> <p>The IESO agrees that in developing a more detailed procurement fee setting framework, it will consider, among any other relevant factors, the following:</p> <ul style="list-style-type: none"> • Impacts to competition • Eligibility of existing vs new-build facilities • Capability of proponents • Encouraging serious proposals • Expected project size; and • IESO costs to administer the procurement. <p>The IESO commits to update the evidence with the results of the stakeholder engagement. The additional evidence filed with</p>	<p>Board's (OEB) Decision and Order EB-2020-0230 (Board Decision) regarding Issue 3.1 – Registration Fees.</p> <p>In this letter the IESO informed the OEB and intervenors of its decision to withdraw its request for OEB approval to charge registration fees of up to \$50,000 per proposal for electricity supply and capacity procurements, including ancillary services.</p> <p>As described in this letter, and per the settlement agreement, the IESO also conducted additional stakeholder engagement on a more detailed fee setting framework, including information on the cost of past IESO procurements and the fees collected. The stakeholder engagement was announced via an email bulletin sent to all IESO subscribers on November 4, 2021. The IESO held the stakeholder consultation session on November 23, 2021. The materials described above were also filed with the letter.</p>

Source of Commitment	Commitment	IESO Response
	respect to this issue will include available information on the cost of past procurements and the related fees collected.	
EB-2020-0230 Settlement Agreement	The IESO agrees to file a more detailed breakdown of MRP OM&A spending in any future Revenue Requirement Submission that contains MRP OM&A spending.	See Table 6 in Exhibit G-2-1 – Market Renewal Program Cost Report.
EB-2020-0230 Settlement Agreement	With respect to market participant readiness, the IESO agrees that it will provide its plan for market participant readiness publicly by the end of 2021.	The Market Participant Readiness plan has been posted to the IESO website, here: https://www.ieso.ca/-/media/Files/IESO/Document-Library/engage/imrm/imrm-20211216-market-participant-readiness-plan.ashx .
EB-2020-0230 Settlement Agreement	The IESO agrees that the reporting requirements set out in the 2019 OEB decision (EB-2019-0002) continue to apply, with the exception of the MRP Business Case.	The reporting requirements set out in the 2019 OEB Decision and Order (EB-2019-0002) include the filing of a baseline budget and schedule for each year of MRP, including Cost Performance Index (CPI) and Schedule Performance Index (SPI) metrics against the baseline budget and schedule. The baseline budget for MRP, including CPI and SPI metrics are included in Exhibit G-2-1 – Market Renewal Program Cost Report. The baseline schedule for MRP is included in Exhibit G-2-1 Attachment 1 – MRP Baseline Schedule.
EB-2020-0230 Settlement Agreement	The IESO agrees, in the next Revenue Requirement Submission, to file an updated compensation study	See Exhibit D-1-3 Attachment 3 – Non-Executive Total Remuneration Review.
EB-2020-0230 Settlement Agreement	Report on progress made towards reaching the 50th percentile for total compensation	See Exhibit D-1-3 – Staffing and Compensation.

Source of Commitment	Commitment	IESO Response
EB-2020-0230 Settlement Agreement	Provide a forward-looking itemized plan identifying how the IESO proposes to make progress towards reaching the 50th percentile for total compensation including incremental steps taken, or planned to be taken	See Table 2 in Exhibit D-1-3 – Staffing and Compensation.

SUMMARY OF INCREASED PUBLIC AVAILABILITY OF PLANNING DATA

Introduction

In the OEB's Decision and Order in EB-2020-0230, the OEB approved the settlement proposal in which the IESO made the following commitment related to the public availability of planning data:

"With respect to the IESO's planning activities, the IESO commits to increasing the public availability of planning data."

Past IESO bulk planning reports have generally contained the following information (typically shared in pdf form via tables or graphics):

- Load data (forecast methodology, seasonal yearly peak load)
- Needs identification (transmission interfaces limits, planning criteria, overall magnitude of need in select years, need date)
- Options development and analysis (cost assumptions)
- Solutions/principles for decision-making

To further increase transparency of how planning decisions are made, the IESO has included more information in user-friendly formats in its recently released Need for Bulk System Reinforcements West of London report and appendices.¹ This revised approach provides certain data in Excel (e.g. peak demand forecasts) which improves the usability. The IESO has also made additional information available where it is applicable to the need and recommendations being communicated, such as hourly need characterization, hourly load forecasts, hourly historical load information and further information on methodologies/assumptions. The categories of information the IESO produced for the West of London report is specified in Table 1 below.

¹ IESO Need for Bulk System Reinforcements West of London Report: https://www.ieso.ca/-/media/Files/IESO/Document-Library/regional-planning/southwest-ontario/WOL_Bulk_Report_Final_20210923.ashx

- 1 The IESO will continue to work with stakeholders on bulk system studies, and the technical
- 2 working group(s) for regional planning, as required, to meet its existing responsibilities, and
- 3 identify the information, data and applicable sharing formats that support transparent and
- 4 efficient bulk and regional planning.

5 **Table 1: West of London Information Sharing Summary**

Category	Format	Description of Data
Planning Assessment Criteria	PDF, in report	Technical requirements and standards used to determine needs
Load Forecast	PDF, in report	Methodology and sensitivities/known drivers
Load Forecast	PDF, in report	Total West of London annual coincident low, reference, and high scenarios for summer and winter
Load Forecast	PDF, in report	Annual station peak forecasts, by region
Load Forecast	PDF, in report	Annual greenhouse peak forecasts
Load Forecast	PDF, in report	Peak segmentation assumptions for West of London stations with greenhouse load
Load Forecast	Excel	Forecast West of London greenhouse hourly load profiles (2021, 2035)
Load Forecast	Excel	Forecast West of London total hourly load profiles (2021,2035)
Load Forecast	Excel	Historical hourly station load profiles (2019)
Interface Data	PDF, in report	Capacity need methodology, interface definition, limits, and driving issues
Interface Data	Excel	Hourly capacity need, no reinforcements/recommendations (2028,2035)
Interface Data	Excel	Hourly capacity need, with near-term recommendations (2028,2035)
Interface Data	Excel	Hourly capacity need, with near- and long-term recommendations (2028,2035)
Analysis of Alternatives	PDF, in report	Assessment criteria and principles for decision-making
Economic Assessment Assumptions	PDF, in report	Assumptions used in the analysis and evaluation of options



Innovation Work Plan

Purpose of this document

In the OEB's Decision and Order in EB-2020-0230, the OEB approved the settlement proposal in which the IESO made the following commitment related to innovation:

"The IESO will file evidence in the next Revenue Requirement Submission outlining the accomplishments to date and will provide a 3-year work plan related to innovation initiatives and costs."

Purpose: To outline accomplishments to date (2018-2021) and provide a 3-year work plan related to IESO innovation initiatives and costs.

Overview

The IESO is committed to facilitating innovation that will be critical to ensuring today's needs are met, while anticipating and planning for the electricity system of the future.

The IESO's Corporate Relations, Stakeholder Engagement and Innovation (CRSEI) business unit includes Innovation, Research and Development (IRD). The activities identified in this work plan have been undertaken by IRD; additional business units are involved where required.

Innovation Accomplishments

Research and White Papers

Completed Initiative/Project	Description
White Paper: Exploring Expanded DER Participation in the IESO-Administered Markets Part I – Conceptual Models for DER Participation	This white paper examines how the IESO can seize the tremendous potential of distributed energy resources (DERs). More information: https://www.ieso.ca/en/Get-Involved/Innovation/White-papers
White Paper: Exploring Expanded DER Participation in the IESO-Administered Markets Part II – Options To Enhance DER Participation	This white paper examines how Ontario can leverage the substantial existing and ongoing investments in distributed resources in the province, and what the IESO can do to unlock this value and established the foundations for the IESO's current DER Market Vision project. More information: https://www.ieso.ca/en/Get-Involved/Innovation/White-papers
White Paper: Non-Wires Alternatives Using Energy and Capacity Markets	With the value DERs offer at both the distribution and transmission levels improving, using them as non-wires alternatives is becoming an increasingly attractive proposition. This white paper sets out the research and analysis that informed the design of the local energy market in the IESO's York Region Non-Wires Alternatives Demonstration Project. More information: https://www.ieso.ca/en/Get-Involved/Innovation/White-papers
White Paper: Development of a Transmission-Distribution Interoperability Framework	In examining two potential transmission-interoperability models, this paper illustrates the types of trade-offs between alternative approaches and establishes a foundation for decision-making. This white paper sets out the research and analysis that informed the design of the transmission-distribution operational coordination protocols in IESO's York Region Non-Wires Alternatives Demonstration Project. More information: https://www.ieso.ca/en/Get-Involved/Innovation/White-papers
White Paper: Consumer Preferences, Choices and Behaviours Impacting Electricity Supply and Demand	To inform its decision-making about how best to integrate distributed energy resources and to prepare for changing energy use patterns, the IESO conducted a broad-based survey of consumer electricity preferences and behaviours. More information: https://www.ieso.ca/en/Get-Involved/Innovation/White-papers

Innovation Accomplishments cont.

Research and White Papers

Completed Initiative/Project	Description
Alternative Technologies For Regulation (ATR) Program - Phase 3 - Fast Regulation Service Experiments at two energy storage facilities originally procured under the Alternative Technologies For Regulation Program in 2013	Involved the use of the Minto Flywheel (2MW/0.5MWh flywheel energy storage resource) and the Amphora battery energy storage facility (3.96 MW / 2.63 MWh Li-ion) to provide fast regulation service where the facility responds to raw Area Control Error (ACE) rather than a less volatile filtered ACE. Fast regulation has been developed as a cost-effective alternative to traditional regulation in other wholesale markets and the purpose of this research is to inform a potential future product here in Ontario. More information: see section 2.8 "Regulation Service" at https://www.ieso.ca/-/media/Files/IESO/Document-Library/engage/esag/esag-20200915-long-term-design-vision.ashx
ATR Program - Phase 3 - Synthetic Inertia Service Experiments	The Amphora facility (3.96 MW / 2.63 MWh Li-ion) in Strathroy, ON was used to pilot Synthetic Inertia Service (SIS) during 2021. Results from the pilot have indicated that the facility can respond to grid disturbances and effectively provide synthetic inertia with a response time of about 400-1000 milliseconds. The pilot also indicated where further improvements to this service might be made, should it someday be integrated into the Ontario electricity market. More information: https://www.ieso.ca/corporate-ieso/media/news-releases/2015/11/ieso-selects-new-energy-storage-projects
ATR Program - Phase 4 - Hybrid solar + storage experiments at the first hybrid storage research facility in the IESO-administered markets	ATR Phase 4 involves the pairing of a 2MW/0.5MWh flywheel energy storage resource located in Minto, ON with on-site solar (50kW) generation for the conduct of renewable smoothing experiments. Later stages will involve similar experiments with wind energy. These experiments will explore the economic and reliability value propositions that hybrid storage resources bring to stabilizing renewable energy output and inform potential wholesale market changes that may be needed. More information: https://www.ieso.ca/en/Powering-Tomorrow/2021/Ontarios-first-hybrid-storage-facility-is-here

Innovation Accomplishments cont.

Demonstration and Evaluation Projects

Completed Initiative/Project	Description
IESO's York Region Non-Wires Alternatives Demonstration Project Phase 1	<p>The IESO, with \$5M support from Natural Resources Canada, is undertaking a demonstration in York Region to explore market-based approaches to secure energy and capacity services from DERs for local and system level needs, while coordinating across the electricity system. This project will inform the development of protocols for the coordinated operation of DERs by the IESO, Local Distribution Companies (LDCs) and DER owners/operators, which will be key to ensuring reliability as the IESO implements new DER aggregation models in the wholesale markets and LDCs increasingly look to DERs to address local reliability challenges. The demonstration secured 10 MW and 15 MW of DER capacity through auctions for its first and second operational periods, respectively. Significant interest was seen from local participants, with more than 30 MW registering for each period. Each auction cleared substantially below the maximum clearing price demonstrating the potential for DERs to cost effectively defer investment transmission and/or distribution infrastructure in the right circumstances. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/IESO-York-Region-Non-Wires-Alternatives-Demonstration-Project</p>
Energy Efficiency (EE) Auction	<p>To complement existing incentive-based programs, the IESO has piloted an auction-based mechanism for procuring energy efficiency. The energy efficiency auction pilot has secured 7.4 MW of peak demand reductions for the winter of 2022/23 and 6.6 MW for the summer of 2023. The auction acquired peak demand reduction at an average cost of \$34.20/kW year for the winter season and \$38.72/kW year for the summer season, significantly less than the target average levelized demand cost for the 2021-2024 CDM Framework's business programs of \$155/kW year. Auction clearing prices indicate that EE auctions can commit energy and demand savings at competitive prices. The IESO will continue to monitor how offers will translate to delivered savings, how the EE Auction will interact with province-wide CDM programs and leverage learnings from the pilot to inform future procurement planning decisions. More information: https://www.ieso.ca/en/Sector-Participants/Market-Operations/Markets-and-Related-Programs/Energy-Efficiency-Auction-Pilot</p>

Innovation Accomplishments

Capital Projects and Process Improvements

Completed Initiative/Project	Description
Storage Design Project	The Storage Design Project introduced foundational participation models for electricity storage in Ontario's wholesale electricity markets and developed a Long-Term Design Vision that outlines a vision for how energy storage resources would participate in IESO's administered markets over the long term. This project resulted in Ontario's first wholesale market rules for energy storage coming into effect in February 2021 and energy storage clearing the capacity auction during its first eligible auction in December 2020 and again in December 2021 (providing evidence of how increased competition supports affordability). More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Completed/Energy-Storage-Advisory-Group
Demand Response Working Group (DRWG)	The DRWG was launched in 2014 as a forum for the IESO to engage with stakeholders on the evolution of Demand Response (DR) from a contracted resource into the energy market, as well as to inform the development of pilots and the DR Auction stakeholder engagement. Following the completion of the first Demand Response Auction, the IESO established a new focus for the DRWG to an open membership forum with an enduring advisory role. DRWG stakeholders provided advice to the IESO to support the evolution of DR in the IESO-Administered Markets. The IESO concluded the DRWG in 2021. More information: https://www.ieso.ca/drwg
Distributed Energy Resources (DER) Roadmap	The DER Roadmap engagement established IESO objectives, initiatives and timing for DER integration. The Roadmap was developed with stakeholder input and considered other key IESO initiatives (e.g. Resource Adequacy and Enabling Resources Program). The Roadmap clearly articulates the IESO's actions for integrating DERs and can also be used as a tool to help ensure coordination across the sector. The IESO completed the DER Roadmap in 2021 and will report periodically to stakeholders on progress made thereafter. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Distributed-Energy-Resources-Roadmap
Enabling Resources Program Work Plan	The Enabling Resources Program produced an integrated plan that will outline the sequencing, timing and scope of activities to be undertaken by the IESO to enable existing electricity resources to provide electricity system services in the renewed Ontario wholesale market that they cannot, or cannot fully, currently provide. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Enabling-Resources-Program

Innovation Accomplishments

Partnerships and Capability Building

Completed Initiative/Project	Description
Grid Innovation Fund (GIF) Projects	<p>The GIF advances innovative opportunities to achieve electricity bill savings for Ontario ratepayers by funding projects that either enable customers to better manage their energy consumption or that reduce the costs associated with maintaining reliable operation of the province's grid. The Fund supports projects that validate the performance and business case of promising new technologies, practices, and services. The Fund also supports projects that identify and mitigate market barriers, or otherwise accelerate the adoption of competitive cost-effective energy solutions. Since 2018 the IESO has invested over \$24 million in 38 GIF projects, with a combined total project value of \$61 million including 3rd party contributions. More information including projects funded can be found at: https://www.ieso.ca/en/Get-Involved/Funding-Programs/Grid-Innovation-Fund/Overview</p>

3 Year Innovation Work Plan (2022-2024)

The innovation initiatives that the IESO will undertake over the next 3 years are outlined in the following slides.

3 Year Work Plan Details

Initiative/Project Name	Brief Description	Completion Date	Cost
Hybrid Integration Project	Part of the Enabling Resources program, the Hybrid Integration Project engagement launched in April 2021, and has identified two foundational market participation models for hybrid resources. The IESO seeks to implement these models by Q2 2025 to facilitate participation in future Resource Adequacy procurements. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Hybrid-Integration-Project	Conceptual Design complete. High Level Market Design July 2022. Vision for enduring models complete November 2022; Implementation targeted for completion by Q2, 2025.	See IRD section of Exhibit D-1-2 – Business Unit Detail See Enabling Resources to Deliver on Capacity / Participate in Markets project in Exhibit E-1-2 – Capital Budget Overview and Progress on Capital Projects
Storage Operational Enhancements	Part of the Enabling Resources program, the IESO has identified and scoped two operational enhancements for storage resources. The Automatic Approval of State-of-Charge project will allow storage resources to revise capability due to state-of-charge limitations within the mandatory window without requiring manual approval by the IESO control room, which will help manage control room workload (and support reliable operation of the grid).	July 2025	See IRD section of Exhibit D-1-2 – Business Unit Detail See Enabling Resources to Deliver on Capacity / Participate in Markets project in Exhibit E-1-2 – Capital Budget Overview and Progress on Capital Projects

3 Year Work Plan Details cont.

Initiative/Project Name	Brief Description	Completion Date	Cost (if applicable)
Distributed Energy Resource (DER) Market Vision and Design Project (MVDP)	Part of the Enabling Resources program, the DER MVDP is separated into two key phases; the first, the DER Market Vision Project (MVP) will explore new, “foundational” participation models for DER integration into wholesale markets and will identify the criteria for more sophisticated models that will form the basis of future DER integration efforts. The second phase, the DER Market Design Project will design and implement the foundational participation models from the MVP. This work is aligned with the work being undertaken by system operators in the US in accordance with the Federal Energy Regulatory Commission order 2222 to enable DERs >100kW to participate in energy, capacity and ancillary service markets at the wholesale level. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Distributed-Energy-Resources-Market-Vision-and-Design-Project	Phase 1 to be completed by Q1, 2023. Phase 2 to be completed by Q2, 2026.	See IRD section of Exhibit D-1-2 – Business Unit Detail See Enabling Resources to Deliver on Capacity / Participate in Markets project in Exhibit E-1-2 – Capital Budget Overview and Progress on Capital Projects
White Paper: Applications of Artificial Intelligence (AI), Machine Learning and other Advanced Technology in the Electricity Sector	Part of the IESO's Innovation and Sector Evolution White Paper Series. The objective is to better understand the state of AI insofar as its current state of deployment and potential future use in the electricity sector. This will help inform the IESO on future strategy to exploit the potential of this technology and help understand the aspirational goals of market participants with respect to AI-based interactions with IESO-Administered Markets and programs. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Innovation-and-Sector-Evolution-White-Paper-Series	Q4, 2022	See IRD section of Exhibit D-1-2 – Business Unit Detail

3 Year Work Plan Details cont.

Initiative/Project Name	Brief Description	Completion Date	Cost (if applicable)
Distributed Energy Resources (DER) Potential Study	The primary objectives of the study are to determine the types and volumes of DERs that exist and can be expected to emerge in Ontario over a 10-year timeframe. The study will also identify the potential for these resources to provide wholesale electricity services. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/DER-Potential-Study	Q2, 2022	See IRD section of Exhibit D-1-2 – Business Unit Detail
IESO's York Region Non-Wires Alternatives Demonstration Project Phase 2	The IESO, with support from Natural Resources Canada, is undertaking a demonstration in York Region to explore market-based approaches to secure energy and capacity services from DERs for local needs, while coordinating across the electricity system. While phase 1 of the demonstration (the first commitment period running from May 2021 through October 2021) has concluded, the second commitment period is set to run from May 2022 through October 2022 and includes participation from a new set of participants. The IESO will report publicly on lessons learned based on both phases following project completion. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/IESO-York-Region-Non-Wires-Alternatives-Demonstration-Project	Phase 1 complete. Phase 2 and project reporting by Q1, 2023	This project is funded by the GIF and NRCan, and not from the IESO's budget. Project value of \$11M total with \$6M from the GIF and \$5M from NRCan.

3 Year Work Plan Details cont.

Initiative/Project Name	Brief Description	Completion Date	Cost (if applicable)
OEB/IESO Joint Engagement on DER Integration	OEB/IESO will introduce a draft list of cross-cutting issues where the OEB/IESO are collaborating, including potential areas for enhanced collaboration for stakeholder input. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Distributed-Energy-Resources-Roadmap	Bi-annual stakeholder sessions continue throughout 2022-24 period.	See IRD section of Exhibit D-1-2 – Business Unit Detail
Joint IESO/OEB Targeted Call using GIF and OEB's Innovation Sandbox	The IESO GIF and the OEB Innovation Sandbox held a joint, targeted call in 2021 for submissions to support research and demonstration projects that have the potential to provide value to consumers and the grid and will be assessing outcomes and lessons learned from each project. More information: https://www.ieso.ca/en/Get-Involved/Funding-Programs/Grid-Innovation-Fund/Targeted-Call-for-Proposals	Projects selected and contracted March 2022; The maximum GIF project length is 36 months.	This project is funded by the GIF and not from the IESO's budget. Total of \$9.5 million funding available
Update to 2018 Study on Energy Storage in Ontario	To help inform future decisions on energy storage technologies, the IESO will work with the Ministry of Energy and the OEB to provide an update on the implementation status of solutions for the barriers to storage identified in the study. Where barriers continue to exist, the IESO will provide an overview of how these barriers are being addressed. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Completed/Energy-Storage-Advisory-Group	March 2022	See IRD section of Exhibit D-1-2 – Business Unit Detail

3 Year Work Plan Details cont.

Initiative/Project Name	Brief Description	Completion Date	Cost (if applicable)
Clean Energy Credit Registry/Market	The Ministry of Energy has asked the IESO to assess options for the establishment and ongoing operation and management of a registry to support the creation and/or recognition, trading and valuation, and the retirement of clean energy credits within Ontario. Government direction on what option(s) to implement will shape subsequent steps for this initiative. More information: https://ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Clean-Energy-Credits	Report back due July 2022	See IRD section of Exhibit D-1-2 – Business Unit Detail
Interruptible Rate Pilot	The Ministry of Energy has asked the IESO to develop an interruptible rate pilot. The pilot would address stakeholder feedback received during the 2019 Industrial Consultation specific to the challenges of identifying and responding to peak demand events while participating in the Industrial Conservation Initiative. https://www.ontariocanada.com/registry/view.do?postingId=39687&language=en	Timing to be determined	Cost to be determined, if applicable
ATR Program - Phase 4 - Hybrid wind + storage experiments	Over the course of 2022/23 the IESO will continue its research program at the Minto Hybrid Storage facility with a view to conduct renewable experiments involving storage and wind power. More information: https://www.ieso.ca/en/Powering-Tomorrow/2021/Ontarios-first-hybrid-storage-facility-is-here	Q3, 2023	This project is funded by an Ancillary Services agreement not from the IESO's budget

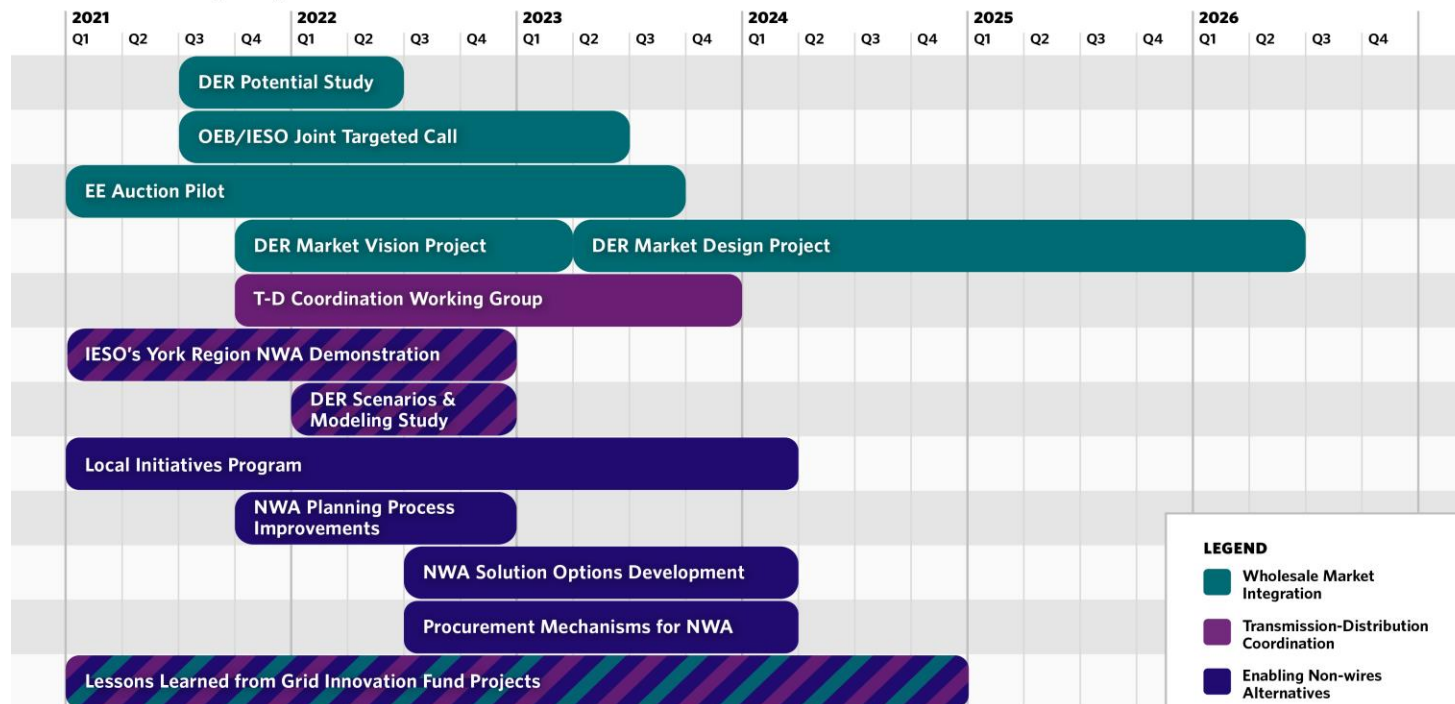
3 Year Work Plan Details cont.

Initiative/Project Name	Brief Description	Completion Date	Cost (if applicable)
Virtual Hydrogen Hybrid Field Project	Initial exploratory work to develop a field experiment involving the pairing of hydrogen production with renewable facility operations to smooth overall output. Initial phase involves development of a novel regulation signal and securing funding partners to conduct future field research experiments.	Q2, 2023	See IRD section of Exhibit D-1-2 – Business Unit Detail
Transmission-Distribution Coordination Working Group (TDWG)	The TDWG will develop conceptual coordination protocol(s) that detail the communications among the IESO, LDCs, and DER participants in the IESO-Administered Markets in support of the new DER aggregation models that the IESO has committed to put in place by 2026. More information: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Transmission-Distribution-Coordination-Working-Group	Initial scope to be completed by Q1, 2023 in alignment with DER MVDP timelines.	See IRD section of Exhibit D-1-2 – Business Unit Detail

Appendix

3 Year DER Roadmap Work Plan

DER Roadmap Projects Timeline



All timelines are presented as draft subject to change based on finalization of the Enabling Resources Program (ERP)

LEGEND

- Wholesale Market Integration
- Transmission-Distribution Coordination
- Enabling Non-wires Alternatives

DETAILS OF INTERNAL AUDIT REPORTS

In the OEB's Decision and Order in EB-2020-0230, the OEB approved the settlement proposal in which the IESO made the following commitment related to internal audits:

"With respect to internal audits, the IESO will provide the following information in the next Revenue Requirement Submission, in line with the findings of the OEB in its Motion Decision in EB-2013-0326, dated July 24, 2014: The details of the subject matter of the Audit Reports, the recommendations, the action(s) taken as a result of each recommendation, and the status of the implementation of that action. The information should be clear and comprehensive."

Table 1 below includes the committed information for internal audits conducted in 2021.

Table 1: Details of Internal Audit Reports

Audit Report Subject Area & Objective	Recommendations	Management Response	Status and Expected Completion Date
Corporate Performance Measures (CPM) review: Annual review of the CPMs to provide input on the content and structure of the CPMs and validate the progress to target.	No recommendations identified.	No recommendations identified.	
Payroll: Provided reasonable assurance that the	1. Human Resources and Finance to review and update processes owned by them. Where needed, consult with Enterprise Change, Information	1. Management will review governing documents to remove outdated materials and create new material as appropriate, and ensure that	1. In process (Q2 2022)

Audit Report Subject Area & Objective	Recommendations	Management Response	Status and Expected Completion Date
controls over the payroll process were managed effectively, efficiently and without error or fraud.	Governance Risk Management. Ensure that all governing documents comply with corporate standards and include a risk assessment. Finance to document fraud testing procedures. Information Governance review the Governing Documents spreadsheet to ensure that it is up-to-date and reviews are conducted in a timely manner.	documents are reviewed on a 24-month cycle.	
<p>Entity Level Controls:</p> <p>The purpose of the review was to assess the design of the IESO's entity-level controls, including all Committee of Sponsoring Organizations of the Treadway Commission (COSO) principles, to ensure the appropriate tone in the organization to influence employees in the conduct of their activities and carrying out their control responsibilities.</p>	<ol style="list-style-type: none"> 1. The IESO Board of Directors has skill gaps related to IT systems; Cyber Security; or Risk Management (i.e. ERM, Internal Controls) experience; consider another targeted Board recruitment process. 2. There is an opportunity to periodically engage an independent third-party to review the IESO Board of Directors' performance. 3. Organizational structure is reviewed on an ad hoc basis at the IESO and has not been reviewed since the arrival of the previous CEO. There is an opportunity to introduce a framework for regular review. 	<ol style="list-style-type: none"> 1. Management to communicate the need for cyber, IT and risk expertise to the Minister of Energy. 2. Management agrees to periodically engage a third party to conduct a review of IESO Board of Directors' performance. 3. Organisational structure reviewed in Q3 with plan to retain a consultant to review in 2022. 4. To be addressed as part of the IESO's organizational structure review. 5. Use existing performance management tools, which can be supplemented by unique business unit metrics as appropriate. 	<ol style="list-style-type: none"> 1. Complete 2. In process (Q2 2022) 3. In process (2022) 4. In process (2022) 5. In process (2022)

Audit Report Subject Area & Objective	Recommendations	Management Response	Status and Expected Completion Date
	<ol style="list-style-type: none"> 4. There is an opportunity to clearly define the expectations and authorities of Directors. 5. An organizational strategy/expectation for monitoring employee productivity and efficiency should be developed to support performance management and business planning. 	Organizational structure review expected to provide insight on efficiency.	
<p>Conservation Program Settlement:</p> <p>Provided reasonable assurance that internal controls are adequately designed and operating effectively over the resource contracts settlement processes at the IESO related to conservation and demand management (CDM) programs.</p>	<ol style="list-style-type: none"> 1. Utilize the Contract Manager module in the Lawson Financial System to centrally store and manage contracts including performance (energy savings) and costs related to each contract. 2. Set a direction for when exceptions to the contractual terms occur and assign staff at appropriate level of authority to record and approve waivers. 3. Use the contract manager functionality of the Lawson Financial System to populate audit findings from each contract. These audit findings should be assigned to the appropriate contract manager and tracked to ensure corrective actions have been taken in a timely manner. 	<ol style="list-style-type: none"> 1. Project to be commenced to centralise program delivery information from 2011 to present in a location accessible to all relevant members of the team. 2. Create a framework for management of waivers/exceptions across all programs with the designated level of authority for approval defined for each tier of risk. 3. Management will document the audit follow-up process to ensure that corrective actions are being taken by the contract manager in a timely manner. 4. Management to consolidate conservation settlement in one financial system. Finance will assist the Conservation business unit to draw upon the correct data points in 	<ol style="list-style-type: none"> 1. In process (Q1 2022) 2. In process (Q1 2022) 3. In process (Q4 2022) 4. In process (Q4 2022) 5. In process (Q3 2022) 6. In process (Q4 2022) 7. In process (Q4 2022)

Audit Report Subject Area & Objective	Recommendations	Management Response	Status and Expected Completion Date
	<p>4. Process payments from a single financial system to allow for proper recording and tracking of conservation program costs in an efficient manner. Also, appropriate recording of conservation costs will allow for accurate reporting.</p> <p>5. All business led IT Tools should be catalogued, and a risk assessment be performed in accordance with the IESO's IT policy to ensure data which is relied upon to settle conservation contracts is accurate and available when needed.</p> <p>6. Work with Human Resources to review and update the job descriptions to ensure these are specific to the team they are working on, and communicate the job documents to respective staff.</p> <p>7.1. Ensure that the business process catalogue is updated to capture the relevant processes and develop a high-level process flow diagram;</p> <p>7.2. Consult with Business Analysis team in Enterprise Change group to develop process specifications and models as</p>	<p>order for the business unit to conduct full reconciliations.</p> <p>5. Project will be undertaken to catalogue tools and ensure they are stored in an appropriate location.</p> <p>6. Management will work with Human Resources on any corporate initiative to update job documents.</p> <p>7. Management began the documentation process in 2019 and will continue to work on it while using a risk-based approach.</p>	

Audit Report Subject Area & Objective	Recommendations	Management Response	Status and Expected Completion Date
	<p>per the IESO process documentation standards and templates; and</p> <p>7.3. Leveraging the information contained in documented processes, develop training tools to educate and cross train staff to reduce single source dependency.</p>		
<p>Project Management:</p> <p>Provided reasonable assurance that the controls over the project management process ensure that the process was managed effectively, efficiently and without error.</p>	<p>1.1. Enhance the project risk assessment process by standardizing project risk statements and mitigation actions that are similar within projects by type and size;</p> <p>1.2. Work with Enterprise Risk Management group to ensure the project risk assessment process is aligned with the Enterprise Risk Management process and to ensure that project risks are elevated at the enterprise level as applicable;</p> <p>1.3. Maintain evidence that risk responses and mitigation efforts are reviewed and updated in a timely manner by the respective stakeholders; and</p> <p>1.4. Bring additional profile of critical and high residual risks at Project Steering Committee and project team meetings to ensure that team members are</p>	<p>1.1. Management plans to develop standard risk statements and develop protocols to ensure logs are reviewed.</p> <p>1.2. Management to work with project managers to ensure project schedule is available to all project members.</p> <p>1.3. and 1.4 Management to reinforce with project managers the importance to have timely engagement with project stakeholders on risk matters.</p> <p>2. Management will work with Project Managers in order to reinforce the need to maintain the project schedules in PDF format.</p> <p>3. Management will reinforce with the project team members the importance of early identification</p>	<p>1.1. In process (Q1 2022)</p> <p>1.2. In process (Q1 2022)</p> <p>1.3. In process (Q1 2022)</p> <p>2. In process (Q1 2022)</p> <p>3. In process (Q1 2022)</p> <p>4. In process (Q1 2022)</p> <p>5. 2023</p> <p>6.1. In process (Q1 2022)</p> <p>6.2. In process (Q1 2022)</p> <p>6.3. In process (Q1 2022)</p>

Audit Report Subject Area & Objective	Recommendations	Management Response	Status and Expected Completion Date
	<p>aware of existing and emerging key project risks and how they are being managed.</p> <p>2. The project schedule should be available in the project repository, in a consistent spot, saved in both Microsoft project and PDF format.</p> <p>3. Management should continue to develop and implement a stakeholder engagement process.</p> <p>4. Use an automation tool to manage resources at the corporate level including allocation to projects. Project managers should seek confirmation from resource managers that they have reviewed the resource allocation file and whether or not changes to allocated resources are required.</p> <p>5. Acquire a project management tool to streamline the project tracking, monitoring and reporting process.</p> <p>6.1. Determine if and when project steering committees are necessary, and if necessary, what an appropriate meeting cadence is for each project type;</p>	<p>and engagement of key stakeholders and the need to maintain a current list of stakeholders as the project continues.</p> <p>4. Management to explore a more robust resource allocation management tool, and in the meantime continue to work with resource managers to ensure current Excel tool is accurate.</p> <p>5. Management to explore replacement of multiple tools with a single tool, to undertake a project to replace the current tools.</p> <p>6.1. Management will reinforce with project managers that they have discretion to cancel meetings if no issues to discuss; and</p> <p>6.2. Remind Project Steering Committee members of the importance of active participation in meetings.</p> <p>6.3. Management will continue to coach staff to leverage effective meetings, facilitation and other leadership soft skills more effectively by providing timely feedback. Where these skills need further development</p>	

Audit Report Subject Area & Objective	Recommendations	Management Response	Status and Expected Completion Date
	<p>6.2. Review the Project Roles and Responsibilities document outlining the role of a Project Steering Committee member and revise it to further clarify meeting etiquette of members;</p> <p>6.3. Further develop the soft skills of project managers to ensure that they effectively engage all Project Steering Committee members and ensure effective collaboration.</p>	<p>Management will provide additional training opportunities either as a team or individually.</p>	
<p>Pre-construction development cost reimbursement (PCDC):</p> <p>Provided reasonable assurance that controls were operating as designed over the PCDC reimbursement process so that the process was managed effectively, efficiently and without error or fraud.</p>	<p>No recommendations identified.</p>	<p>No recommendations identified.</p>	
<p>Transmission Rights (TR) Auction:</p>	<p>1. Consider limiting access to bids during auction periods (48-hour period) on need only basis and/or tracking who has accessed the bids during the</p>	<p>1. Management to put in place a process to track if anyone had access to the tool during the auction and</p>	<p>1. Complete 2. Complete</p>

Audit Report Subject Area & Objective	Recommendations	Management Response	Status and Expected Completion Date
<p>Provided reasonable assurance that the governance framework and controls are in place to ensure that the TR market is performing as designed.</p>	<p>auctions. Document the current practice of routing all communication with TR Market Participants through Customer Relations.</p> <p>2. Market & Technology Integration should develop and implement a cross-check process to ensure the accuracy of the market clearing price and bid allocation</p>	<p>manage communications with TR Market Participants.</p> <p>2. Introduce process of regular cross-checks to ensure accuracy of market clearing price and bid allocation.</p>	
<p>Generation contract settlement:</p> <p>Provided reasonable assurance that the internal controls are adequately designed and operating effectively for controls over the resource contracts settlement processes at the IESO.</p>	<p>1.1. Monitor the adjustments to previous settlement amounts as these occur on a regular basis and determine the root cause to prevent future occurrences.</p> <p>1.2. Acquire an information technology solution to automate the generation contract settlement process, including calculation, recording and reporting of electricity generation costs to mitigate the potential for errors from manual process and improve efficiency within the settlement process.</p> <p>2. Articulate the requirements for transfer of all Excel models for settlement processing to Microsoft Teams.</p>	<p>1.1. Management to investigate possibility of migrating the settlement process to an automated IT tool.</p> <p>1.2. Management to explore automated process as part of above and including these processes in a single tool to avoid need for manual reconciliation.</p> <p>2. Management to work with IT to ensure all files are migrated to Teams by end of year.</p>	<p>1.1. In process (Q2 2022)</p> <p>1.2. In process (Q2 2022)</p> <p>2. In process (Q2 2022)</p>
<p>Inputs to the Network Model build (NMB):</p>	<p>1. Management should consider what additional data may be useful to track, and then begin to analyze data on NMB late change requests (e.g. source,</p>	<p>1. Management will track and analyze late requests.</p>	<p>1. Complete</p> <p>2. Complete</p> <p>3. Complete</p>

Audit Report Subject Area & Objective	Recommendations	Management Response	Status and Expected Completion Date
<p>The purpose of the engagement was to ensure that the inputs to the Day-Ahead Calculation Engine (DACE) are the product of well controlled processes.</p>	<p>reason, amount of incremental effort to implement late request) and to identify root causes to determine if there are strategies to address them.</p> <p>2. Given the impact of NMB late change requests all relevant impacted groups should approve the request, and the process documentation should be updated to ensure the Manager and/or their alternate(s) are supportive of the change, and this approval should be documented.</p> <p>3. The NMB Change Request System should be risk assessed to comply with the organization's IT Policy. The business process owner will need to ensure that appropriate controls have been implemented to comply with the risk assessment results.</p>	<p>2. Management to update process to ensure all relevant managers approve the changes.</p> <p>3. Management will undertake necessary steps.</p>	

IESO Annual Update to the Ontario Energy Board on Actions Taken to Address Market Surveillance Panel Recommendations (Period from January 2017 – December 2021)

IESO Licence Obligation under Section 6.2 Part (e)

Provide the Board, on or before the end of each calendar year, with the status of actions taken by the Licensee further to all recommendations addressed to the Licensee in any report issued by the Market Surveillance Panel in that year and the preceding four calendar years to the extent that they remain outstanding and, where no action has been taken in relation to a recommendation, the rationale for not taking action. The Licensee's response to recommendations in any report issued by the Market Surveillance Panel within 30 days of the end of the calendar year will be included in the succeeding report.

Report	Rec Number	Recommendation	IESO 2021 Update to the OEB	Link to Spending in the 2022 Revenue Requirement Submission
May 8, 2017	3-1	The IESO should take steps to ensure that dispatchable loads are only compensated for the amount of Operating Reserve (OR) they were capable of providing in real-time. More fundamentally, the IESO should explore options for ensuring unavailable OR is not	<p>The IESO launched a formal project in January 2021 to implement the changes proposed in the Improving Accessibility of Operating Reserve (OR) stakeholder engagement, including a proposed OR settlement claw-back for inaccessible OR.</p> <p>In June, stakeholders submitted feedback to the IESO on the proposed changes. The IESO responded to stakeholder feedback on Aug 24, 2021 and has</p>	<p>This recommendation involves a number of IESO business units, but is led by the IESO's Markets & Reliability business unit (see Markets & Reliability section in Exhibit D-1-2 – OM&A Business Unit Detail).</p> <p>The IESO has budgeted \$88 thousand of capital expenditure to address this</p>

Report	Rec Number	Recommendation	IESO 2021 Update to the OEB	Link to Spending in the 2022 Revenue Requirement Submission
		scheduled in the first instance.	<p>moved the Market Rules through the Technical Panel process. The next step is to seek a vote at the Technical Panel to recommend that the IESO Board approve the Market Rules. The IESO expects to implement the proposed OR settlement claw-back for inaccessible OR in 2022.</p> <p>For further details on this initiative, please refer to the IESO's Improving Accessibility of Operating Reserve stakeholder engagement webpage.</p>	<p>recommendation in the Improving Accessibility of Operating Reserve project. The Improving Accessibility of Operating Reserve project is a sub-project under the Addressing Market Surveillance Panel (MSP) Recommendations project (see Exhibit E-2-1 – Capital Budget Overview and Progress on Capital Projects).</p>
May 8, 2017	3-2	The IESO should revise the methodology used to set the intertie failure charge to include the congestion rents that an intertie trader avoids when it fails a scheduled transaction for reasons within its control.	The Market Surveillance Panel's recommendation to revise the intertie failure charge seeks to mitigate the impact that failed intertie transactions have on Financial Transmission Rights (FTR) funding. As part of the Market Renewal Program (MRP), the IESO will modify the treatment of Financial Transmission Rights (FTR) such that they will be settled against the Day-Ahead Market (DAM) results instead of the current practice of settling against the results of the real-time market. This solution should address the MSP's concern as it will decouple the settlement	This recommendation is being addressed through the Market Renewal Program (see Exhibit G-2-1 – Market Renewal Program Cost Report).

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			of FTR (in the DAM) from the costs for failed transactions (in the real-time market) thereby removing the incentive to fail real-time export transactions in order to capture transmission rights payments.	
May 8, 2017	4-1(A)	The IESO should revise the manner in which it allocates disbursements from the Transmission Rights Clearing Account such that disbursements are proportionate to transmission service charges paid over the relevant accrual period.	<p>The IESO has implemented Market Rule changes to address this recommendation.</p> <p>The Market Rule amendment changing the Transmission Rights Clearing Account disbursement methodology to be based on the proportion of transmission service charges paid, as recommended by the Market Surveillance Panel, became effective on May 1, 2021 for the May 2021 disbursement.</p>	There is no proposed spending in 2022 related to addressing this recommendation.
May 8, 2017	4-1(B)	The IESO should not disburse any further funds from the Transmission Rights Clearing Account until such time that Recommendation 4-1(A) has been addressed.	<p>The IESO has implemented Market Rule changes to address this recommendation.</p> <p>The Market Rule amendment changing the Transmission Rights Clearing Account disbursement methodology to be based on the proportion of transmission service charges paid, as recommended by the Market Surveillance Panel, became effective on May 1, 2021 for the May 2021 disbursement.</p>	There is no proposed spending in 2022 related to addressing this recommendation.

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			For clarity, the IESO kept making disbursements until the rule changes came into effect in order to avoid unduly harming market participants.	
May 8, 2017	4-2	The IESO should reassess the value provided by the capacity procured through its Demand Response auction in light of Ontario's surplus capacity conditions, as well as the stated preference of the government and the IESO (through its Market Renewal initiative) for technology-neutral procurement at least cost.	The Demand Response Auction has evolved into the Capacity Auction to support technology-neutral procurements of capacity resources by including participation of other resources.	There is no proposed spending in 2022 related to addressing this recommendation.
March 22, 2018	3-1	The Independent Electricity System Operator should implement rules that allow it to recover Congestion Management Settlement Credit (CMSC) payments made to dispatchable loads when those payments are	The IESO has implemented Market Rule changes to allow for the claw back of Congestion Management Settlement Credit (CMSC) payments made to dispatchable loads due to SEAL (safety, equipment, applicable law) reasons. This is in alignment with the CMSC claw back rules for dispatchable generators. The	There is no proposed spending in 2022 related to addressing this recommendation.

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		the result of an operational constraint arising from conditions at the dispatchable load's facility. The IESO should also examine whether the scope of the current provisions that allow it to recover CMSC payments from generators in relation to SEAL (safety, equipment and applicable law) related constraints should be expanded to cover any other operational constraints arising from conditions at the generator's facility.	changes (MR-00447-R00) became effective on April 6, 2021. Additionally, under the renewed market post Market Renewal, facilities will not be eligible for make-whole payments due to an operational constraint arising from conditions at the facility.	
March 22, 2018	4-1	The Independent Electricity System Operator should set the replacement bid price to \$0/MWh, or slightly negative, when it calculates constrained-on Congestion Management Settlement Credit payments for exports bid at negative prices.	The IESO is concerned that a higher replacement bid price floor for calculating Congestion Management Settlement Credit (CMSC), as suggested by this recommendation, may deter traders from submitting export bids below \$0/MWh on any intertie due to the risk of being constrained-on which would impose unnecessary losses on traders and deter trading. This could result in both a	The IESO's Markets & Reliability business unit monitors the market uplift charges related to this recommendation in order to monitor the materiality of this issue (see Markets & Reliability section in Exhibit D-1-2 – OM&A Business Unit Detail).

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			reduction in the effectiveness of a valuable system tool during surplus conditions and possibly higher costs to ratepayers.	
			The IESO continues to monitor the materiality of the issue raised by the Market Surveillance Panel. The amount of uplift charges related to the recommendation remains low at less than \$70,000 in total from 2016 to September 2021.	
			The IESO does not intend to pursue this recommendation any further.	
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March 22, 2018	4-2(A)	The Independent Electricity System Operator's Board of Directors should revise the materiality threshold value such that operating reserve payments are clawed back when a market participant fails to fully respond to its operating reserve activation.	The settlement claw-back proposed in the Improving Accessibility of Operating Reserve stakeholder engagement (refer to IESO's response to Recommendation 3-1 of May 2017 MSP report) is expected to help address the availability of operating reserve (OR) prior to activation. By contrast, this MSP recommendation relates to concerns after OR is activated. The materiality of these concerns will be impacted by the success of the IESO's efforts to address the upstream OR accessibility concerns.	There is no proposed spending in 2022 related to addressing this recommendation.

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			<p>The proposed change in the aforementioned stakeholder engagement is expected to not only improve the OR accessibility but also incent OR providers to offer their actual OR capability which in turn may reduce the materiality of non-compliance with OR activations.</p> <p>This is why the IESO is proposing to address the MSP's recommendations on the materiality threshold (4-2(A)) and Operating Reserve Energy Shortfall Fraction (ORES-F) claw-back calculation (4-2(B)) one year after the proposed change to improve OR accessibility take effect. The IESO expects that one year will be a sufficient period to evaluate the effectiveness of proposed change on OR accessibility and OR activation performance.</p>	
March 22, 2018	4-2(B)	When a market participant fails to fully respond to an operating reserve activation, the Independent Electricity System Operator should calculate the claw	The settlement claw-back proposed in the Improving Accessibility of Operating Reserve stakeholder engagement (refer to IESO's response to Recommendation 3-1 of May 2017 MSP report) is expected to help address the availability of	

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		back based on the ratio of the energy not provided in response to the activation relative to the energy required by the activation.	<p>operating reserve (OR) prior to activation. By contrast, this MSP recommendation relates to concerns after OR is activated. The materiality of these concerns will be impacted by the success of the IESO's efforts to address the upstream OR accessibility concerns.</p> <p>The proposed change in the aforementioned stakeholder engagement is expected to not only improve the OR accessibility but also incent OR providers to offer their actual OR capability which in turn may reduce the materiality of non-compliance with OR activations.</p> <p>This is why the IESO is proposing to address the MSP's recommendations on the materiality threshold (4-2(A)) and Operating Reserve Energy Shortfall Fraction (ORES-F) claw-back calculation (4-2(B)) one year after the proposed change to improve OR accessibility take effect. The IESO expects that one year will be a sufficient period to evaluate the effectiveness of proposed change on OR accessibility and OR activation performance.</p>	

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April 29, 2019	3-1(A)	The IESO should formalize the process by which it determines when to disable and re-enable the variable forecasting tool, and should communicate that process to market participants to increase transparency.	In December 2019, the IESO amended Market Manuals to include that the IESO will issue an advisory notice when the tool is disabled/re-enabled and the circumstances under which the IESO may disable the forecast.	There is no proposed spending in 2022 related to addressing this recommendation.
April 29, 2019	3-1(B)	When a variable generator is on mandatory dispatch and the forecasting tool is disabled, the IESO should set the generator's unconstrained schedule at its forecasted output rather than its maximum offered capacity.	The IESO implemented a tool change in October 2020. Variable generators receiving mandatory dispatch will have their market schedules set to their 5-minute forecast even when the 5-minute variable generation forecast tool has been disabled.	There is no proposed spending in 2022 related to addressing this recommendation.
December 19, 2019	2-1	The IESO should consider ways and means of deterring the Operating Reserve nodal price chasing behaviour.	<p>The IESO shares the Market Surveillance Panel's (MSP) concern that a market participant is being compensated more than internal resources for the same Operating Reserve (OR) service.</p> <p>IESO analysis has determined the "root cause" of the issue to be the different timeframes for scheduling OR from</p>	There is no proposed spending in 2022 related to addressing this recommendation.

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			<p>imports (hour-ahead) vs internal supply (every five minutes in real-time). This market design can lead to instances where OR from imports are scheduled in pre-dispatch even if lower cost supply offers were available in real-time. Aligning the scheduling timeframe for OR imports with internally supplied OR on a 5-minute basis would level the playing field and address the root cause. The IESO has identified a market improvement project to schedule OR imports on a 5-minute basis.</p> <p>Due to existing priorities to address other MSP recommendations (OR Accessibility) and the focus on the Market Renewal Program (MRP), this recommendation is on hold. The IESO will revisit this recommendation once the changes proposed as part of the Improving Accessibility of Operating Reserve stakeholder engagement have been implemented.</p>	
December 19, 2019	2-2	The IESO should ensure its procedure for determining an outage when	The IESO agrees with the MSP's recommendation and acknowledged the Transmission Rights (TR) payments made	There is no proposed spending in 2022 related to

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		administering Transmission Rights aligns with the Market Rules.	<p>during outages may not be aligned with existing Market Rules.</p> <p>The IESO held a public webinar in March 2020 to identify this issue to stakeholders and discuss next steps. An interim, manual solution was implemented in April 2020 to stop the improper payments to TR holders. An enduring, automated solution was implemented in October 2020.</p>	addressing this recommendation.
December 19, 2019	3-1(A)	A) The Panel recommends that - when implementing changes to the market - the IESO audit the pre-deployment testing process to ensure that sufficient controls are in place to identify errors and unintended consequences.	<p>Internal Audit has completed its review of the IESO's pre-implementation testing. The results of this review were presented to the Audit Committee of the IESO Board on March 8, 2021.</p> <p>Overall, the audit noted that an enhanced quality assurance program is well positioned to provide independent quality assurance for current approved projects. Internal Audit made 4 medium and 1 low risk observations in the review. IESO Management and Internal Audit have agreed on actions plans to address all observations, which are expected to be implemented by the end of 2021.</p>	There is no proposed spending in 2022 related to addressing this recommendation.

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December 19, 2019	3-1(B)	B) The Panel recommends that, as soon as possible after the IESO detects an error or unintended consequence that significantly impacts the wholesale electricity market, it publicly discloses details of the error or unintended consequence, the impact on the market and the actions taken or to be taken to address the matter.	<p>The IESO has completed the enhancement and formalization of its process for reporting significant anomalous market events, including materiality thresholds, to the public. The enhanced process includes provisions for publicly disclosing the details of the error, an assessment of the error from a market impact perspective, and actions taken to address the error, when materiality thresholds have been met and when approval to disclose has been given by the IESO Board of Directors.</p> <p>This process was finalized in Q2 2021.</p>	There is no proposed spending in 2022 related to addressing this recommendation.
July 16, 2020	3-2	In order to provide more consistent market outcomes, the IESO should give further consideration to improving how the need for additional system flexibility is addressed, such as specifying the conditions that require intervention and scheduling the required amount of spinning reserve explicitly in the normal OR	The IESO continues to track industry best practices to address flexibility and monitor the effectiveness of the existing solution. Since May 24, 2018, the IESO has been explicitly increasing operating reserve (OR) requirements in the current OR market when the need for flexibility arises. OR is scheduled in the market on an economic basis and is co-optimized with energy. In comparison to the previous IESO practice of manually committing resources for flexibility, scheduling additional OR provides a transparent signal to the market when	There is no proposed spending in 2022 related to addressing this recommendation.

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		<p>market. Although it is acknowledged that no industry standard exists to address flexibility, alternative solutions should also be considered to ensure the most suitable approach is used.</p>	<p>there is a flexibility need anticipated and ensures this need is addressed on an economic basis through a market-based solution.</p> <p>The IESO agrees with the MSP that it is important to consider improvements to the existing solution and to assess alternative solutions. The IESO has completed a preliminary review of the existing solution which included reassessing the criteria utilized for increasing OR for flexibility. As a result of this review, the IESO found areas in its internal procedure where more clarity around the conditions that necessitate additional flexibility services can be specified. The internal procedure has been updated and implemented by the IESO.</p> <p>The IESO also agrees with the MSP on the need to do a more fulsome review of the existing solution and is planning on conducting that review after the implementation of the Market Renewal Program (MRP). The IESO has decided to conduct this more fulsome review after the implementation of MRP due to the</p>	

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			significant improvements being made to the OR market through MRP that will further increase the transparency and efficiency of the existing OR flexibility solution; including better optimization in the pre-dispatch timeframe should resources need to be economically committed for flexibility. The IESO will perform the more fulsome review one year after the implementation of MRP in order to fully assess the impacts of these improvements on the existing OR flexibility solution.	
December 10, 2020	2-1	The IESO should eliminate the payment for start-up costs for second and subsequent RT-GCG runs in a day. Alternatively, when a generation unit has participated in the RT-GCG program once during a day, the IESO should consider ways to have the generation unit compensated on the basis of the lesser of the second and subsequent submitted	The IESO agrees that two-shifting generation facilities could be inefficient in certain circumstances. However, eliminating all second start guarantees could deter efficient starts from coming to market. Multi-hour optimization of three-part offers is necessary to verify the efficiency of second starts. As part of the Market Renewal Program (MRP), the IESO will be introducing multi-hour optimization of three-part offers (energy, start up, and speed-no-load) across the day-ahead, pre-dispatch, and real-time timeframes. Multi-hour optimization of	This recommendation is being addressed through the Market Renewal Program (see Exhibit G-2-1 – Market Renewal Program Cost Report).

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		start-up costs or the estimated cost of keeping the generation unit online between RT-GCG runs.	three-part offers will only schedule generation facilities for two starts in the same day when it is economically efficient to do so. The IESO does not intend to take any additional actions to change the current Real-Time Generation Cost Guarantee (RT-GCG) program design in advance of MRP. The IESO will continue to conduct audits associated with the RT-GCG program.	
December 10, 2020	2-2	The IESO should conduct an audit of RT-GCG cost submissions in situations when a generation unit has a second RT-GCG run within three hours of its first RT-GCG run and the submitted costs of the second run are equal to or higher than the submitted costs of the first run.	The IESO routinely audits the Real-Time Generation Cost Guarantee (RT-GCG) program and has been carrying out such audits since 2011. Consistent with the MSP's recommendation, the IESO's audits consider submitted costs and the circumstances of each RT-GCG start, including when a generation facility has a second start within three hours of its first start.	The IESO's routine audits of the RT-GCG program are carried out by the Market Assessment and Compliance Division (MACD) (see the MACD section in Exhibit D-1-2 – OM&A Business Unit Detail).
December 10, 2020	2-3	The IESO should treat SAR activations in much the same way as it treats	The current approach to pricing Simultaneous Activation Reserve (SAR) imports has been included in the Market Renewal Program (MRP) detailed design	There is no proposed spending in 2022 related to addressing this recommendation.

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		emergency imports; namely, by adding demand back in to the unconstrained schedule.	(see section 3.8.9.2 of the Grid and Market Operations Integration Detailed Design for further information) and stakeholders were given the opportunity to provide input on this approach. In addition, the IESO has assessed the materiality of SAR imports to be low both in terms of frequency of activation and impact on the Hourly Ontario Energy Price (HOEP). With SAR event pricing recently addressed through MRP and the materiality assessed as low, the IESO does not intend to pursue this recommendation any further at this time.	
December 10, 2020	3-1	The IESO should produce a report that probabilistically assesses the level of economic (i.e. non-firm) imports that would be appropriate to assume in their various resource adequacy studies for each year in the planning timeframe, with stakeholder input, using the Northeast Power Coordinating Council	Through the Reliability Standards Review stakeholder engagement, the IESO reviewed assumptions related to compliance with Northeast Power Coordinating Council (NPCC) resource adequacy standards (NPCC "Directory 1"), including assumptions for non-firm imports. Through this engagement, the IESO proposed a methodology to determine an appropriate assumption for non-firm imports which takes into account the NPCC Review of	There is no proposed spending in 2022 related to addressing this recommendation.

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		Review of Interconnection Assistance Reliability Benefits study as a reference.	<p>Interconnection Assistance Reliability Benefits study. The Reliability Standards Review concluded on April 9, 2021.</p> <p>The stakeholdered methodology to determine an appropriate assumption for non-firm imports will be included in the assessments for the 2021 Annual Planning Outlook (APO).</p>	
December 10, 2020	3-2	The IESO should better align the assumptions used in planning documents on an ongoing basis or explain in detail the reason for remaining differences, with quantities. This should address, at a minimum, differences in economic import assumptions and different weather scenarios that lead to different capacity need outcomes.	<p>The IESO agrees with the MSP on the need to align assumptions used in planning documents.</p> <p>Assumptions and methodologies used for weather forecasts, embedded generation, and non-firm imports will be included in the 2021 Annual Planning Outlook (APO) and the 2022 Reliability Outlook (RO). Differences in assumptions across these reports will be quantified in the associated methodology documents. The 2021 APO is expected to be published in Q4 2021 and the 2022 RO is expected to be published in Q2 2022.</p>	This recommendation is being worked on primarily by the IESO's Planning, Conservation and Resource Adequacy (PCRA) business unit (see PCRA section in Exhibit D-1-2 – OM&A Business Unit Detail).
December 10, 2020	3-3	The IESO should examine and report on potential improvements to its	The IESO agrees with the MSP on the need for transparent and clear communications for planning and procurement processes. Through the	This recommendation is being worked on primarily by the IESO's Planning, Conservation and Resource

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		<p>communications with stakeholders regarding the process(es) used to assess the need for and procure resources to meet future capacity needs. The IESO should also provide greater clarity regarding the documents used to inform those procurements and how any auction or procurement targets are set. In particular:</p> <ul style="list-style-type: none"> • the IESO should publish the analysis and methodology for the Reliability Assurance concept, which appears to be the basis for procuring capacity for the Capacity Auction scheduled for the winter of 2020/21; and • the IESO should explain the purpose of the Reliability Outlook, including a clear indication of which sections of that report may be used for 	<p>Resource Adequacy engagement, the IESO is working with stakeholders to develop a resource adequacy framework that will enable competitive solutions to meet system needs.</p> <p>The IESO will specify which processes and documents will be used to identify system needs, the methods used to translate those needs into procurement targets, and which processes will be used to procure resources. The IESO can confirm that:</p> <ul style="list-style-type: none"> • The Annual Planning Outlook (APO) assesses system needs and includes a description of the methodologies used to assess system needs. The 2021 APO is expected to be published in Q4 2021. • The Annual Acquisition Report (AAR) translates those needs into procurement targets, and serves as the primary source for procurement decisions. The 2022 AAR is expected to be published in Q2 2022. <p>The Reliability Outlook is not used to inform procurements targets. While the</p>	<p>Adequacy (PCRA) and Markets & Reliability business units (see PCRA and Markets & Reliability sections in Exhibit D-1-2 – OM&A Business Unit Detail).</p>

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		outage planning, which sections (if any) may be used to inform procurements, and which sections have been included for informational purposes only.	<p>Reliability Outlook can assist market participants in assessing outage plans, Market Manual 7.3 is the document that governs the outage assessment process. The purpose of the Reliability Outlook is specified within the Reliability Outlook itself and includes:</p> <ul style="list-style-type: none"> • Advising market participants of the resource and transmission reliability of the Ontario electricity system • Assessing potentially adverse conditions that might be avoided by adjusting or coordinating maintenance plans for generation and transmission equipment <p>Reporting on initiatives being implemented to improve reliability within this time frame</p>	
December 10, 2020	3-4	The IESO should periodically make available clear descriptions of the range of potential resources that may need to be procured, including the volume (MW), timelines,	The IESO agrees with the MSP on the need for transparent and clear communications for planning and procurement processes. The Annual Planning Outlook (APO) assesses system needs and includes a description of the methodologies used to assess system	This recommendation is being worked on primarily by the IESO's Planning, Conservation and Resource Adequacy (PCRA) and Markets & Reliability business units (see PCRA and Markets & Reliability

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		any required characteristics other than capacity (e.g. energy, ramp, etc.) and expected procurement mechanism (e.g. through capacity auctions, and/or alternative mechanisms) as part of its communication of future capacity needs in reports such as the Annual Planning Outlook.	needs. The 2021 APO is expected to be published in Q4 2021. The Annual Acquisition Report (AAR) translates those needs into procurement targets, and serves as the primary source for procurement decisions. The AAR will include descriptions of resources to be procured, including the volume (MW), timelines, any required characteristics other than capacity, and expected procurement mechanism. The 2022 AAR is expected to be published in Q2 2022.	sections in Exhibit D-1-2 – OM&A Business Unit Detail).
December 10, 2020	3-5	The IESO should signal its confidence in different planning assumptions by publishing the uncertainty values associated with relevant assumptions and elements used to calculate the capacity need, including at a minimum a range of economic imports and a range of possible demand forecasts based on underlying economic drivers.	Through the Reliability Standards Review engagement, the IESO developed a stakeholdered methodology to determine an appropriate assumption for non-firm imports which will be included in the 2021 Annual Planning Outlook (APO). The 2021 APO is expected to be published in Q4 2021. In order to address uncertainties impacting electricity demand, the IESO builds consideration for load forecast uncertainty into the APO. Assumptions are explained in the APO, and are	This recommendation is being worked on primarily by the IESO's Planning, Conservation and Resource Adequacy (PCRA) and Markets & Reliability business units (see PCRA and Markets & Reliability sections in Exhibit D-1-2 – OM&A Business Unit Detail).

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			<p>supported through accompanying methodology documents and data tables. The IESO expects to continue this practice.</p> <p>Further, through the Resource Adequacy Engagement, stakeholders and the IESO have recognized a need for an acquisition report that clearly states the IESO's procurement need in the form of the Annual Acquisition Report (AAR). The AAR supplements the IESO's efforts to publicly acknowledge uncertainty in planning assumptions by considering the inherent uncertainties within those assumptions as it translates needs into procurement targets. The 2022 AAR is expected to be published in Q2 2022.</p>	
December 10, 2020	3-6	<p>The IESO should examine and report on potential improvements to its stakeholder engagements regarding the methods and assumptions used to develop capacity needs. Specific consideration should be given to a</p>	<p>The IESO continues to review the MSP's recommendation. The IESO's review is not expected to conclude in advance of the Ministry of Energy's review of the long-term energy planning framework.</p> <p>The Ministry's review may result in changes that inform the governance and decision-making related to the IESO's</p>	

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		periodic streamlined process to review the case for procuring existing or new resources that involves stakeholders and is overseen by an objective third party.	planning and resource acquisition activities.	
September 2, 2021	3-1	The IESO should develop structural solutions for Capacity Auction resource performance failures, with an emphasis on stronger penalties. In general terms, penalties should work together with a Qualified Capacity process to ensure that capacity payments net of penalties reflect each resource's ability to deliver capacity when dispatched.	<p>The IESO agrees with the MSP's recommendation and has proposed and a stakeholdered a design for a capacity qualification process and an enhanced performance assessment framework for all Capacity Auction resources (including Hourly Demand Response) where past performance will directly impact future qualified capacity and participant revenues.</p> <p>The proposed enhancements will provide a financial incentive for resources to improve performance, much stronger financial consequences for poor performance, and ensure capacity payments net of penalties reflect a resource's ability to deliver capacity when dispatched.</p> <p>The capacity qualification process will have two components (1) availability de-rates, and (2) performance adjustment</p>	This recommendation is being worked on primarily by the IESO's Planning, Conservation and Resource Adequacy (PCRA) business unit (see PCRA section in Exhibit D-1-2 – OM&A Business Unit Detail).

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			<p>factors. Based on internal assessments and stakeholder feedback, the IESO is proposing that performance adjustment factors should be based on 'go forward' performance from the 2022 Auction (rather than the 2021 Auction). This will ensure that performance baselines are being assessed with the new enhancements to the performance assessment framework in effect (e.g. tighter deadbands and higher availability charges).</p> <p>The draft design document, which outlines the capacity qualification methodology and enhanced performance assessment framework, can be found in the October 21, 2021 session of the Resource Adequacy Engagement: IESO Resource Adequacy Engagement. Design, development and implementation of these changes are targeted for the December 2022 Capacity Auction.</p>	
September 2, 2021	3-2	For all Capacity Auction resources, the IESO should adjust penalties and payments such that there are no financial incentives to submit Capacity Auction	The IESO agrees with the MSP's recommendation and has proposed and a stakeholdered a design for a capacity qualification process and an enhanced performance assessment framework for all Capacity Auction resources (including Hourly Demand Response) where past	This recommendation is being worked on primarily by the IESO's Planning, Conservation and Resource Adequacy (PCRA) business unit (see PCRA section in

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		offers that exceed expected capabilities.	<p>performance will directly impact future qualified capacity and participant revenues.</p> <p>Enhancements to the performance assessment framework include: performance testing to capability (rather than bids), tightening performance deadbands for hourly demand response resources, introducing higher penalties for failure to perform at times of system need and determining performance adjustment factors to the future capacity qualification of an individual resource based on performance during a capacity test activation starting with the 2022 Auction.</p> <p>These enhancements are expected to work together with the capacity qualification process (as described in response to recommendation September 2021 (3-1)) to improve performance from resources acquired through the auction and to ensure resources only offer their expected capability into the Capacity Auction.</p> <p>The draft design document, which outlines the capacity qualification</p>	Exhibit D-1-2 – OM&A Business Unit Detail).

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		methodology and enhanced performance assessment framework, can be found in the October 21, 2021 session of the Resource Adequacy Engagement: IESO Resource Adequacy Engagement. Design, development and implementation of these changes are targeted for the December 2022 Capacity Auction.		
September 2, 2021	3-3	The IESO should immediately cease reimbursements to gas generators of carbon cost payments.	The Real-Time Generation Cost Guarantee (RT-GCG) program ensures that non-quick start generators are available to meet reliability in real-time. The RT-GCG Program is not a full cost-recovery program. The objective of the program is to provide eligible generators recovery of certain incremental fuel, operating, and maintenance costs incurred as a result of starting up and ramping to minimum loading point, to the extent those costs are not recovered through market revenues. Carbon costs are an additional operating cost incurred by generators during the start-up period and the IESO considers recovery of these costs to be consistent with the program's methodology, and appropriately reimbursed.	This recommendation is being addressed through the Market Renewal Program (see Exhibit G-2-1 – Market Renewal Program Cost Report).

Report	Rec Number	Recommendation	IESO 2021 Update to the OEB	Link to Spending in the 2022 Revenue Requirement Submission
<p>In the short term, the RT-GCG program will continue to reimburse carbon costs to ensure reliability consistent with the current program design as set out in 2017. In the future, the Market Renewal Program (MRP) will introduce the enhanced real-time unit commitment process which will facilitate enhanced competition between generators based on their all-in costs, including carbon costs. MRP is expected to be in service by November 2023.</p>				
September 2, 2021	3-4	<p>If the IESO insists on reimbursement of carbon cost payments, they should develop a methodology that preserves the incentives of the carbon price. Any reimbursement should amount to a small percentage of the carbon cost payments imposed by the carbon pricing system. Only facilities that have paid an annual carbon cost charge should qualify for</p>	<p>The Real-Time Generation Cost-Guarantee (RT-GCG) program's current carbon cost recovery methodology is designed to accurately reflect the eligible carbon costs incurred by generators. This methodology takes into account the heat rate of thermal generators by assessing the fuel consumed and energy produced specific to startup operations. With further carbon costs potentially incurred during the full run of a facility, an incentive to reduce emissions intensity and resulting carbon costs remains. The IESO also notes that based on the current</p>	<p>This recommendation is being addressed through the Market Renewal Program (see Exhibit G-2-1 – Market Renewal Program Cost Report).</p>

Report	Rec Number	Recommendation	IESO 2021 Update to the OEB	Link to Spending in the 2022 Revenue Requirement Submission
		the carbon cost reimbursement.	<p>emissions intensity benchmark and the dispatch patterns and efficiency of Ontario's gas fleet, all eligible RT-GCG participants are expected to incur an annual carbon charge.</p> <p>As noted in response to recommendation 3-3 from the Market Surveillance Panel's September 2021 report, in the short term, the RT-GCG program will continue to reimburse carbon costs to ensure reliability consistent with the current program design as set out in 2017. In the future, the Market Renewal Program (MRP) will introduce the enhanced real-time unit commitment process which will facilitate enhanced competition between generators based on their all-in costs, including carbon costs. MRP is expected to be in service by November 2023.</p>	
September 2, 2021	3-5	If the IESO does reimburse gas generators for carbon cost payments, the total annual reimbursement from the IESO should be made public to improve transparency, beginning	The IESO agrees with the MSP's recommendation and will publish the total annual reimbursement for carbon costs under the Real-Time Generation Cost Guarantee (RT-GCG) on the IESO's Market Assessment web page.	This recommendation is being worked on primarily by the IESO's Corporate Relations, Stakeholder Engagement and Innovation (CRSEI) business unit (see CRSEI section in Exhibit D-1-

Report	Rec Number	Recommendation	IESO 2021 Update to the OEB	Link to Spending in the 2022 Revenue Requirement Submission
		with the total reimbursement to gas generators for 2019 that was made in 2021.		2 – OM&A Business Unit Detail).
September 2, 2021	3-6	The IESO should issue a Request for Proposals in all possible cases where it intends to secure a resource to meet an identified system need that cannot be addressed by existing competitive mechanisms (e.g. Capacity Auction).	<p>The IESO agrees with the MSP's recommendation. Competitive mechanisms are preferred, in cases where it is possible to design and execute a competitive mechanism with a reasonable likelihood for a successful outcome. In accordance with the IESO's Resource Adequacy Framework, the IESO intends to use competitive mechanisms to meet identified system needs whenever possible. A competitive process may not be possible where addressing an urgent need to maintain reliability and:</p> <ul style="list-style-type: none"> • Only one capable supplier exists; • There is insufficient time or benefit to administer an effective competitive mechanism; and/or • Ratepayers would incur additional costs with no benefit, and potentially incur higher costs, compared to a non-competitive mechanism. 	This recommendation is being worked on primarily by the IESO's Planning, Conservation and Resource Adequacy (PCRA) and Markets & Reliability business units (see PCRA and Markets & Reliability sections in Exhibit D-1-2 – OM&A Business Unit Detail).

Report	Rec Number	Recommendation	IESO 2021 Update to the OEB	Link to Spending in the 2022 Revenue Requirement Submission
			<p>There may be instances where a competitive process is not possible, as the IESO has outlined in the 2021 Annual Acquisition Report, and the IESO would expect to secure a better outcome for ratepayers in these cases by entering into bilateral negotiations.</p> <p>The IESO expects to share additional information with stakeholders on the use of competitive procurement mechanisms designed to meet identified system needs in the 2022 Annual Acquisition Report (AAR). The 2022 AAR is expected to be published in Q2 2022.</p>	
September 2, 2021	3-7	In advance of full implementation of the IESO’s Resource Adequacy Framework, when non-competitive procurements may be required, information should be published that clearly states why a non-competitive procurement was necessary, what effort was made to encourage	The IESO agrees with the MSP’s recommendation. For planned non-competitive procurements designed to meet system needs, the Annual Acquisition Report (AAR) sets out the need being addressed and the proposed solution, the negotiating party, and the justification for a non-competitive procurement. The IESO expects to share additional information with stakeholders on the use of non-competitive procurement mechanisms designed to	This recommendation is being worked on primarily by the IESO’s Planning, Conservation and Resource Adequacy (PCRA) and Markets & Reliability business units (see PCRA and Markets & Reliability sections in Exhibit D-1-2 – OM&A Business Unit Detail).

Report	Rec Number	Recommendation	IESO 2021 Update to the OEB	Link to Spending in the 2022 Revenue Requirement Submission
		competition, specific details for both the need and the proposed solution (e.g. amount of annual Unforced Capacity and location), and whether additional actions are necessary if the proposed solution provides more, or less, than what is required.	<p>meet system needs in the 2022 AAR. The 2022 AAR is expected to be published in Q2 2022.</p> <p>With regard to efforts made to encourage competition, the IESO is taking a holistic approach across a series of reports and activities. By publishing reliability needs in the Annual Planning Outlook (APO), bulk and regional plans, and the AAR, the IESO aims to transparently identify what system needs exist now and in the future and the steps being taken to address them. This information should inform existing and potential market participants who are interested in opportunities to compete to address system needs. Further, the IESO is also aligning the contract terms of non-competitive procurements with the timing of future competitive mechanisms in order to allow for greater competition going forward.</p> <p>The IESO also publishes details on system needs and whether additional actions are necessary if proposed solutions provide more or less than what is required within the applicable bulk and</p>	

Report	Rec Number	Recommendation	IESO 2021 Update to the OEB	Link to Spending in the 2022 Revenue Requirement Submission
			<p>regional plans, and in the APO. For example, details on the system needs met by the Lennox GS were captured in the 2020 APO, and details on the system need to be met by Brighton Beach GS were included in the Need for Bulk System Reinforcements West of London planning report. This report describes specific details of the need and solution required to maintain reliability in that area over the near-term, considering all technically feasible options within the timelines required. The report also describes additional actions (i.e. transmission reinforcements) that are necessary to ensure reliability over the mid- to long-term, which can enable greater competition in the future.</p> <p>In addition, in carrying out planning for the bulk system, the IESO intends to provide stakeholders with early indication of system issues, and clarify the rationale for decisions regarding the choice of solution approaches – whether competitive, non-competitive, or requiring further integrated planning by way of a bulk study. This information will be</p>	

Report	Rec Number	Recommendation	IESO 2021 Update to the OEB	Link to Spending in the 2022 Revenue Requirement Submission
			captured in the APO, which will in turn inform the AAR.	
September 2, 2021	3-8	To facilitate the inclusion of projects with broader public benefits in competitive procurement processes, the IESO should separate non-electricity system costs and benefits from the electricity system cost-benefit analysis and publish the results.	<p>The IESO is aware that some facilities or projects may provide public benefits beyond those related to the electricity system. Through the operationalization of the Resource Adequacy Framework via the Annual Acquisition Report and subsequent procurement activities, the IESO is shifting the procurement focus from a resource-centric to a system-centric approach, where eligible facilities compete to provide the electricity services needed to maintain a reliable electricity system. The identified needs, ensuing procurements, and ultimately procurement outcomes will help to transparently identify the benefits and costs to provide these electricity services.</p> <p>However, accounting for any other non-electricity benefits that may materialize from a procurement, outside of the IESO's objects, is not part of the IESO's mandate. Other public benefits are best assessed and published by the appropriate branch of Government, who</p>	This recommendation is being worked on primarily by the IESO's Planning, Conservation and Resource Adequacy (PCRA) and Markets & Reliability business units (see PCRA and Markets & Reliability sections in Exhibit D-1-2 – OM&A Business Unit Detail).

Report	Rec Number	Recommendation	IESO 2021 Update to the OEB	Link to Spending in the 2022 Revenue Requirement Submission
			<p>can assign a value to the public benefit, and determine how much of the cost of that benefit should be attributed to electricity ratepayers. In these instances, the Government is best positioned to provide policy direction to the IESO in cases where these non-electricity benefits are to be factored into electricity system decisions.</p> <p>With regard to bilateral arrangements, including those that are part of the Ministry of Energy's Unsolicited Proposal assessment process specifically, the IESO would be unable to publish the results of its assessments as these contain third-party confidential information. Furthermore, as part of the Unsolicited Proposal process, this information is provided as confidential advice to government. Information on the project valuation framework used by the IESO to assess a broad range of projects, including Unsolicited Proposals, is available on the IESO's website.</p>	



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IESO Cost Allocation Methodology Review

**Report prepared by
Elenchus Research Associates Inc.**

February 18, 2022

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1 INTRODUCTION

Following the merger of the Independent Electricity System Operator (“IESO”) and the Ontario Power Authority (“OPA”) effective January 1, 2015, the combined entity engaged Elenchus Research Associates Inc. (“Elenchus”) to review the design of the IESO and OPA usage fees.

Elenchus developed a Combined Entity Cost Allocation Model based on the OEB’s Cost Allocation Model for Distributors to allocate the combined entity’s revenue requirement to two customer “classes”: Domestic energy volumes and Export energy volumes.

Prior to the merger, the IESO charged its usage fee to both domestic and export energy volumes based on gross load. The OPA charged its usage fee only to domestic volumes based on net load.

Elenchus’s analysis and recommendations were summarized in the study *Cost Allocation and Rate Design for the 2016 IESO Usage Fee*¹ (“2016 Study”), which was filed as an attachment to the IESO’s 2016 Revenue Requirement Submission (EB-2015-0275).

The 2016 Study considered three cost allocation and rate design issues:

- The methodology to allocate costs between Domestic and Export;
- Whether customers should be billed based on gross or net load; and
- Whether there should be different Domestic and Export usage fees or a common usage fee.

The 2016 Study describes the recommended methodology to allocate the combined entity’s costs to the Domestic and Export classes based on cost causality. The newly combined IESO continued to use gross load billing as it had prior to the merger.

The Combined Entity Cost Allocation Model indicated that a common usage fee would result in revenue-to-cost ratios between 80% and 120% for each class. The IESO initially proposed a common usage fee for Domestic and Export customers, however, this

¹ EB-2015-0275, Exhibit B, Tab 1, Schedule 1, Attachment 1

proposal was revised following recommendations by the OEB to charge separate usage fees. The separate usage fees are set such that the revenue-to-cost ratio for each class is 100%.

The cost allocation methodology, gross load billing determinant, and separate usage fees were accepted by the OEB.² This overall cost allocation and rate design methodology has subsequently been applied in each IESO Revenue Requirement Submission since the merger.³

This report describes the methodology used in the Combined Entity Cost Allocation Model, which has been renamed the IESO Cost Allocation Model, changes to the model since the 2016 Study, and the allocators used for each department. Elenchus has also reviewed the overall methodology and selection of allocators.

As described in Section 2, the IESO's costs are functionalized by department and business unit. Since 2016 the IESO has renamed and restructured its departments and business units so corresponding changes have been made to the Combined Entity Cost Allocation Model. Section 3 of this report describes the changes that have been made to the Combined Entity Cost Allocation Model since the 2016 Report.

Section 4 provides an overview of the updated (2022) IESO Cost Allocation Model methodology. Conclusions are provided in Section 5.

2 OVERVIEW OF THE IESO COST ALLOCATION MODEL

The cost allocation model that Elenchus developed for the IESO is based on the principle of cost causality and follows the traditional three steps of a cost allocation methodology: functionalization, categorization (or classification), and allocation. The costs recovered by IESO in its usage fees align with the costs included in the Administrative and General expenses and General Plant as described in the National Association of Regulatory

² EB-2015-0275 Decision and Order dated December 29, 2016.

³ EB-2017-0150 Decision and Order dated December 14, 2017, EB-2018-0143 Decision and Order dated October 25, 2018, EB-2019-0002 Decision and Order dated December 5, 2019, and EB-2020-0230 Decision and Order dated November 18, 2021

Commissioners' ("NARUC") *Electric Utility Cost Allocation Manual* ("NARUC Manual"). The NARUC manual describes a methodology to allocate General Plant expenses:⁴

One approach to the functionalization, classification, and allocation of general plant is to assign the total dollar investment on the same basis as the sum of the allocated investments in production, transmission and distribution plant. This type of allocation rests on the theory that general plant supports the other plant functions.

A similar methodology is described for Administrative and General expenses:⁵

One methodology, the two-factor approach, allocates the administrative and general expense accounts on the basis of the sum of other operating and maintenance expenses (excluding fuel and purchased power).

The NARUC Manual also describes more detailed methodologies that similarly require either production, transmission, and distribution costs or operations and maintenance costs to derive appropriate allocators.

As prevailing methodologies for allocating Administrative and General expenses are not feasible for an entity such as the IESO that does not perform generating, transmission, or distribution functions, an alternate methodology that is conceptually consistent was developed to allocate the IESO's costs among its customers.

Based on discussions with IESO staff to determine the activities performed by all departments, Elenchus undertook a functional-categorization of the IESO's revenue requirement based on how each identified function is performed for (i) the exclusive benefit of domestic customers, (ii) the exclusive benefit of export customers, or (iii) for the benefit of both domestic and export customers.

The functionally-classified costs are allocated to two "customer classes", or types of service: domestic and export. These classes are analogous to the customer classes served by distributors in that they are easily identifiable and they "cause", or benefit from,

⁴ *Electric Utility Cost Allocation Manual*, National Association of Regulatory Commissioners, January 1992, page 105

⁵ *Ibid*, page 106

the transmission system and therefore the activities/services of the IESO in different ways. For purposes of determining cost causality, the domestic class can be thought of as the in-province end-use customers who ultimately pay the IESO usage fee that is embedded in their monthly bills.

2.1 FUNCTIONAL-CATEGORIZATION

Elenchus determined that the IESO's expenses can be functionally-categorized by business unit and department.⁶ Using this approach, the IESO's accounting data can be incorporated directly into the cost allocation model. Departments are functionally-categorized based on the function they perform so that costs can be allocated based on the classes that cause those costs to be incurred.

The following eight business units typically account for 80%-90% of the IESO's costs:

- Markets & Reliability
- Planning, Conservation and Resource Adequacy
- Corporate Relations, Stakeholder Engagement and Innovation
- Information and Technology Services
- Legal Resources and Corporate Governance
- Corporate Services
- Market Assessment and Compliance Division ("MACD")
- Market Renewal

The remaining costs that require allocators to be identified for cost allocation purposes:

- CEO (Office, Audit)
- Human Resources
- Others (General, Amortization, Interest)

⁶ The IESO is structured first by business unit, then by department such that each department falls within a business unit.

Each department within each business unit was identified as a separate functional-category. Descriptions of the functions performed by each department are provided below, along with the allocator used for allocating its costs. The allocators are described in Section 3.

2.2 ALLOCATION

Allocation is the final step in any cost allocation model. It is the step that assigns costs to customer classes on the basis of the cost causality principle. In the case of the IESO, costs (functional-categories) are caused by domestic and/or export customers. The selection of the allocator that best reflects cost causality in each case is a matter of judgement. The following describes the rationale for the allocators used in the IESO Cost Allocation Model.

Shared expenses relate to functions that are necessary to serve both domestic and export customers, including the operation of the market and overall operation of the IESO. These expenses are essentially fixed and are required regardless of throughput. However, the size of the business units is influenced by the scale of the overall electricity market in Ontario. Further, it is reasonable to view the benefit that is derived by participants in the market as being proportionate to the volume of energy transmitted. For that reason, where a service is used by all customers the cost is normally considered to be energy related and costs are allocated on the basis of TWhs. Additionally, the IESO has assessed that the cost and effort devoted to certain non-energy related functions are aligned with each class's relative share of TWh. This treatment is applied to the General Counsel and Market Rules & Regulatory Affairs departments.

Usage fees are calculated as allocated costs divided by each class's TWh, so an allocation on the basis of TWh effectively assigns equal cost causality to a Domestic TWh and an Export TWh.

Some IESO functions exist primarily or exclusively for the benefit of domestic customers. All of the costs of these functions are allocated to domestic customers. These include functions such as the planning departments, Energy Efficiency, and Corporate Affairs.

The IESO does not undertake any activities solely for the benefit of export customers.

Activities dedicated to domestic customers are activities that would not be required if the transmission system were used only to wheel power into, out of, or through the province. Hence, the activities are caused by, or benefit, only the domestic customers. For example, resource planning is undertaken in accordance with government policy and is therefore considered to be “caused” by in-province (i.e., domestic) consumers. These activities may generate indirect benefits for export customers, but no consideration is given to export customers and their ability to enjoy the benefit of these activities.

The costs related to North American Electric Reliability Corporation (“NERC”) membership are caused in large part, but not exclusively, to maintain Ontario’s import-export capability. Exports have historically exceeded imports, however, imports are essential for reliability as well as to reduce total cost of supply. These costs are allocated on a 50:50 basis to export and domestic customers.

The cost of functional-categories that support the rest of the organization are allocated to the classes in the same proportion as the costs of the direct functional-categories are allocated (i.e., Other O&A). The Other O&A allocator can be considered a composite allocator derived by costs allocated by TWh, Domestic, and 50:50. This allocation is used for the CEO Office, Information and Technology Services, and certain departments within other business units.

The Markets & Reliability unit, Corporate Relations, Stakeholder Engagement and Innovation unit, Information and Technology Services unit, Legal Resources and Corporate Governance unit, and Corporate Services unit each have a VP Office. The costs of each VP Office are allocated in proportion to the allocation of departments within the business unit.

3 CHANGES TO THE IESO COST ALLOCATION MODEL

This section describes the changes made to the IESO Cost Allocation Model since 2016. When a department has been renamed or moved to a different business unit it maintained the same allocator. When a new department is introduced or existing departments are

split or merged, Elenchus and the IESO jointly determine the appropriate allocator to apply within the model. The changes described below are relative to methodology described in the 2016 Study.

3.1 2017 MODEL

The “Market Renewal Division” was added as an additional account. Market Renewal is allocated by volumes (TWh).

3.2 2018 MODEL

The IESO's underwent an organizational realignment in late 2017 which took effect in the 2018 model. There were changes to business units, but the departments were mostly unchanged. The IESO Cost Allocation Model allocates costs at the department level so the realignment of departments within business units did not materially impact the allocation of costs.

A few departments within the previous Market and Resource Development business unit merged into a single Markets & Procurement department. At Elenchus' request, the IESO split this department into Markets & Procurement: Markets and Markets & Procurement: Procurement to maintain separate TWh and Domestic allocators.

The IESO also recommended changes to two allocators in 2018:

- The “Operations Change Initiatives” allocator was changed from TWh, to O&A. The department was also renamed “Enterprise Change”
- The “Corporate Controller” allocator was changed from TWh to O&A

The IESO assessed that the department functions are similar to the functions included within Corporate Services, which is allocated by O&A. Elenchus agreed and implemented the changes. TWh volumes are a significant driver of the O&A composite allocator so the allocation between Domestic and Export is similar for the two allocators and the resulting impact of the changes was minimal.

3.3 2019 MODEL

A new department “Information Security” was added to the IT Services business unit. Information Security is allocated by O&A, which is the allocator applied to all departments within IT Services.

3.4 2021 MODEL

“Capacity Market Design” was added as a new department within the Planning, Acquisition and Operations unit. Capacity Market Design is allocated to Domestic (DOM) because the capacity market is designed to serve the domestic market.

There was a minor restructure of the departments within IT Services business unit, but all departments continue to be allocated with the O&A allocator.

The IESO moved the NERC membership from the CEO Office to the Policy, Engagement & Innovation unit. Typically, the costs of the departments within a business unit influence the composite allocator which is used to allocate each business unit’s VP Office expenses. However, the NERC Membership costs do not influence the costs incurred by, and services provided by, the Policy, Engagement & Innovation VP. Elenchus considered this to be an accounting change rather than an operational change, so the allocation of the NERC Membership is excluded from the derivation of the Policy, Engagement & Innovation allocator.

3.5 2022 METHODOLOGY⁷

The Planning, Acquisition and Operations business unit and the departments within the unit were split into the Markets & Reliability unit and the Planning, Conservation and Resource Adequacy unit. The Markets & Reliability unit includes the Power System Assessments and Market Operations department, the Markets & Procurement: Markets

⁷ This subsection describes changes to the IESO’s cost allocation methodology. The associated model has not been prepared as of the date of this report.

sub-department (which is now a standalone Wholesale Market Development department), and a new Reliability Assurance department.

Energy Efficiency moved from the Policy, Engagement and Innovation unit to Planning, Conservation and Resource Adequacy.

The Corporate & Regulatory Affairs department has been changed to Corporate Affairs. Regulatory affairs activities are now fully within the Market Rules & Regulatory Affairs department, which is allocated by relative energy volumes (TWh). First Nations & Metis Relations activities are now included within Corporate Affairs. Additionally, the Corporate Affairs department is responsible for stakeholder and community engagement, government affairs, and communications. The allocator for Corporate Affairs has changed from relative energy volumes to 100% domestic as the activities within this department are caused by, or are the benefit to, entities within the province.

Finance & Treasure is renamed as Corporate Finance, and Procurement is renamed Procure to Pay. There is no impact from these changes.

The cost of the NERC Membership (now NERC and NCPP Membership) moved from the Policy, Engagement & Innovation unit to the Legal Resources and Corporate Governance unit. Following the same principle applied when the NERC Membership moved in the 2021 model, the NERC Membership does not influence the allocation of Legal Resources and Corporate Governance VP Office costs.

4 OVERVIEW OF IESO DEPARTMENTS AND ALLOCATORS

This section describes each IESO department and the allocator applied to each department as of 2022. The allocators listed below have been reviewed by Elenchus and represent its opinion of the most appropriate allocators to apply to each department.

4.1 CHIEF EXECUTIVE OFFICER

CEO Office

The CEO's Office provides overall management of the IESO.

Allocation method: Total Other O&A

Internal Audit

Internal Audit provides independent, objective assurance and consulting services designed to add value and improve the IESO operations. Internal Audit contributes towards the accomplishment of the IESO objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control and governance processes throughout the organization

Allocation method: Total Other O&A

4.2 MARKETS & RELIABILITY

Vice President Office

The VP's Office provides overall management of the business unit.

Allocation method: Sum of allocated costs of the departments

Power System Assessments

Power System Assessments provides a large variety of power system analysis services, most notably the operating security limits used in all operational timeframes. System Performance also develops and maintains the online and offline system models and tools used in power system analysis studies.

Allocation method: Domestic and export in proportion to energy (TWh)

Market Operations

Market Operations is responsible for the operational planning and assessment functions, managing the short-term operation of Ontario's competitive wholesale electricity market, and directing the operation of the IESO-controlled grid.

Allocation method: Domestic and export in proportion to energy (TWh)

Wholesale Market Development

Wholesale Market Development is responsible for the development of the IESO administered markets and supports the advancement of sector policies that promote the IESO's market principles. IESO-administered markets include participation from dispatchable and non-dispatchable generation and loads, as well as traders importing and exporting power on interties. The primary focus of the group is to improve the ability of the IESO administered markets to deliver system reliability efficiently, by encouraging competition, innovation and enabling informed decisions by all participants through transparent and efficient price signals. The group works with internal and external stakeholders in the development of potential changes and through the market rule amendment process that governs market design and participation. The group also provides quantitative analysis and research that supports market development and other sector policy initiatives.

Allocation method: Domestic and export in proportion to energy (TWh)

Reliability Assurance

Reliability Assurance is responsible to meet the IESO's NERC and NPCC reliability standard obligation for mid to long-term reliability assessments. This includes demand forecasts, resource adequacy assessments and performing system-wide transmission assessments. Although these activities relate directly to NERC and NPCC membership requirements, they also ensure overall system reliability for domestic customers.

Allocation method: Domestic and export in proportion to energy (TWh)

4.3 PLANNING, CONSERVATION AND RESOURCE ADEQUACY

Resource Planning

The Resource Planning group is responsible in Ontario for developing integrated power system plans to meet the projected electricity service requirements for Ontario customers at both the regional and provincial levels. Its plans provide advice to the government to help develop the Long-Term Energy Plan and to guide program and capital investment

decisions for new initiatives in the market, transmission, conservation and supply resources. The group focuses on the supply aspects of the plan and the integration of market, conservation, supply and transmission considerations to meet Ontario electricity needs. The Resource Planning group works closely with other areas of the IESO to develop and implement initiatives.

Allocation method: Domestic class only

Transmission Planning

The responsibilities of the transmission planning group include regional integrated planning, bulk transmission planning, associated community and stakeholder outreaches and providing support to procurements undertaken by the IESO through performing assessments and testing of connections availability. While the work of transmission planning can benefit all customer groups, especially work on or that directly benefits interconnections, it is primarily performed to benefit Ontario consumers.

Allocation method: Domestic class only

Resource & System Adequacy

This business unit works with stakeholders to develop a resource adequacy framework with mechanisms to procure capacity in three distinct time frames (short, medium and long term). In addition to facilitating competition, this work aims to balance supplier, ratepayer and IESO risks, reduce costs, and provide business planning certainty. This group is responsible for the development and procurement of resources required to ensure the adequacy of the electricity system, this includes Capacity Development & Integration, Capacity Auction & Ancillary Services, Resource Acquisition and Transmission & Supply Acquisition.

Allocation method: Domestic class only

Energy Efficiency

Energy Efficiency develops estimates of electricity demand and conservation resources for the near, mid and long term. Demand and conservation estimates provide context for the development of supply and transmission plans, support regional planning and support

the development of demand management programs. Near term forecasts support the development of the 18 Month Outlook.

Allocation method: Domestic class only

4.4 CORPORATE RELATIONS, STAKEHOLDER ENGAGEMENT AND INNOVATION

Vice President Office

The VP's Office provides overall management of the business unit.

Allocation method: Sum of allocated costs of the departments

Corporate Affairs

The Corporate Affairs group is responsible for stakeholder and community engagement, government affairs, communications, and indigenous relations.

Government Affairs is responsible for managing the relationship with the provincial government, for issues management, and managing relationships with municipal governments. Communications is responsible for media relations, employee communications, editorial services, executive speeches and presentations, French translation, the IESO's corporate websites, and social media accounts.

Engagement and Indigenous Relations is responsible for the IESO's stakeholder and community engagement, the stakeholder engagement framework, and management of the Stakeholder Advisory Committee.

Engagement and Indigenous Relations is also responsible for developing and maintaining the IESO's relationship with First Nations and Métis communities across the province. The IESO works to support the participation of Indigenous communities in renewable energy through targeted incentives and initiatives.

The IESO also works to raise awareness and encourage Indigenous community participation in IESO procurement processes, funding programs, and regional and long-term energy planning initiatives. At times, the group is responsible for carrying out the

procedural aspects of any duty to consult with First Nations and Métis communities as identified by the Crown.

Allocation method: Domestic class only

Innovation, Research & Development

The Innovation, Research & Development group is responsible for functions crossing the IESO. The group is responsible for facilitating innovation and sector evolution by supporting, leading, or participating in initiatives that will increase the reliability or cost-effectiveness of the electricity system through its Innovation Roadmap, including supporting innovation through the Grid Innovation Fund.

Allocation method: Domestic class only

4.5 INFORMATION AND TECHNOLOGY SERVICES

Information and Technology Services supports the IESO's existing business applications and infrastructure, provides internal customer service relating to the IESO's IT systems, and develops solutions to respond to changing business needs. All departments provide broad-based support to all other IESO business units and departments.

This business unit includes the following departments:

- Vice President Office
- Chief Information Officer ("CIO") Office
- Information Security
- Business Services & Solution Delivery
- IT Infrastructure & Operations

Allocation method: Total Other O&A

4.6 LEGAL RESOURCES AND CORPORATE GOVERNANCE

Vice President Office

The VP's Office provides overall management of the business unit.

Allocation method: Sum of allocated costs of the departments

General Counsel

The Legal Services group (General Counsel) provides legal advice and guidance on a full range of legal matters including: compliance with all relevant laws and market rules, dispute resolution/litigation support, development & management of contracts, procurement processes for the full range of IESO activities, including conservation programs and generation supply procurements, the development of market rules and programs. It also provides governance and logistical support for the Board of Directors to ensure effective and timely decision making, and manages requests to the organization under the Freedom of Information and Protection of Privacy Act.

Allocation method: Domestic and export in proportion to energy (TWh)

Market Rules & Regulatory Affairs

The Market Rules & Regulatory Affairs group is responsible for monitoring ongoing issues and managing IESO applications to/filings with multiple bodies, including the Ontario Energy Board (OEB), the National Energy Board (NEB), the North American Electric Reliability Corporation (NERC), the U.S. Federal Energy Regulatory Commissions (FERC) and the Northeast Power Coordinating Council (NPCC). This group manages the IESO's revenue requirement submission with the OEB, as well as the IESO's participation in applications before, and any rules, standard, policies, or codes proposed by, the regulatory bodies listed above. The group develops amendments to the market rules on an ongoing basis, in consultation with internal IESO business units and external stakeholders. The Market Rules, which are approved by the IESO Board of Directors, govern the IESO-controlled grid and IESO-administered markets. Market manuals and procedures, approved by IESO management, provide more detailed descriptions of the requirements for various activities specified in the Market Rules, and include the forms

and agreements required by market participants. OEB assessment fees are included with this department.

Allocation method: Domestic and export in proportion to energy (TWh)

Board

The Legal Services group (Board) provides governance and logistical support for the Board of Directors to ensure effective and timely decision making.

Allocation method: Domestic and export in proportion to energy (TWh)

NERC and NPCC Membership

The Electricity Act sets the IESO's objectives including Object 6 (d) which requires participation in the development by any standards authority of criteria and standards relating to the reliability of the integrated power system. The Act defines a "standards authority" as NERC or any successor thereof, or any other agency designated by regulation that approves standards or criteria applicable in and outside Ontario for the reliability of transmission systems. NPCC is a regional electric reliability council under NERC's authority. The cost of the NERC and NPCC membership is treated as a department for cost allocation purposes.

Allocation method: 50:50 split between domestic and export

Contract Management

The Contract Management group is responsible for managing contracts resulting from the IESO's electricity supply procurements, as well as demand-side management and load management initiatives. This group is responsible for the fulfillment of the IESO's obligations under these contracts, including financial settlement, enforcement of supplier's obligations under these procurement contracts, data collection, analysis and reporting on the contracts.

Allocation method: Domestic class only

4.7 CORPORATE SERVICES

Vice President Office

The VP's Office provides overall management of the business unit.

Allocation method: Sum of allocated costs of the departments

Corporate Finance

Corporate Finance manages and is responsible for asset stewardship, controls and transaction processing; supports decision making and strategy development through leading budgeting and business planning, providing timely and quality analysis and special purpose reports (e.g., Board of Directors, Province of Ontario); manages and is responsible for the IESO's overall treasury related activities (liquidity, debt), the external insurance risk programs, the IESO markets' credit risk framework, and the IESO pension plan's investments. The activities carried out by the Corporate Finance relate to ensuring appropriate controls exist and are implemented to validate the IESO's management of public funds. The functional responsibilities for this group are as follows:

- transaction processing, accounting and financial reporting for both the Corporation and the Market;
- tax compliance and reporting;
- monitoring and review of internal controls, as applicable;
- payroll;
- treasury; and
- financial planning and analysis.

Allocation method: Total Other O&A

Procure to Pay

Procure to Pay offers strategic procurement advice in line with IESO requirements of a fair, open and transparent process for both the IESO and qualified vendors.

Allocation method: Total Other O&A

Settlements

IESO settlements oversees and reconciles funds from the electricity market by collecting funds from buyers; transferring funds to sellers; collecting transmission tariffs; as well as settling the transmission rights market.

Allocation method: Domestic and export in proportion to energy (TWh)

Enterprise Change

Enterprise Change is a project management office leading and supporting change initiatives impacting the business unit and liaising with other business units on capital programs and business planning.

Allocation method: Total Other O&A

Facilities

Facilities manages the operation and maintenance of IESO's owned and rented facilities.

Allocation method: Total Other O&A

4.8 MARKET ASSESSMENT AND COMPLIANCE DIVISION

The Market Assessment & Compliance Division (MACD) is responsible for investigating and determining whether market participants are compliant with the IESO market rules. MACD oversees activities and conduct in the electricity market through monitoring for anomalous outcomes and the investigation of potential breaches of the rules, which include North American reliability standards. MACD conducts enforcement of the rules in order to foster compliance and deter non-compliance. Market participants who breach the market rules may be subject to sanctions if appropriate. In addition, MACD performs audits and other reviews that can lead to the recovery of payments received by market participants. MACD also works with other IESO business units on market participant communications, education and training to promote compliance. Through its work to improve compliance with the market rules and reliability standards MACD's work benefits all market participants and end use customers.

Allocation method: Domestic and export in proportion to energy (TWh)

4.9 MARKET RENEWAL

Market Renewal represents a set of enhancements to Ontario's electricity market design, to address known issues with the existing market design and deliver ratepayer value by meeting system needs more cost-effectively. The Market Renewal group is responsible for improving the way electricity is priced, scheduled and procured in order to meet Ontario's current and future electricity needs reliably, transparently, efficiently and at lowest cost.

Allocation method: Domestic and export in proportion to energy (TWh)

4.10 HUMAN RESOURCES

The Human Resources group provides leadership, systems, policies and processes to achieve the organizational goals of attracting, developing, engaging and retaining skilled individuals.

The Human Resources group provides ongoing and effective support for recruitment and selection, performance management, conflict facilitation, labour relations, resolution of legal and employee relations issues, and employee communications.

Working with senior management assists with the implementation of actions to increase individual, group and organizational effectiveness, such as learning and development initiatives, career planning, talent review and succession management planning, and group effectiveness facilitation.

Allocation method: Total Other O&A

4.11 OTHER

General

The General category includes the amortization of accumulated deficits resulting from the Public Sector Accounting Standards (PSAS) transition item and other post-employment benefits, as well as overhead cost recovery.

Allocation method: Total Other O&A

Amortization

Amortization is the standard expensing of all capital assets. IESO assets and amortization are not tracked by department; hence, they cannot be functionally-classified in detail. Elenchus notes that the pre-merged (December January 1, 2015) asset balances show that 94% of the total assets were former IESO assets. Former IESO assets would be allocated on the basis of TWh.

Allocation method: Domestic and export in proportion to energy (TWh)

Interest

The IESO revenue requirement does not include a weighted average cost of capital applied to rate base. Interest included in the IESO's revenue requirement is actual interest on net funding required to finance capital investments and working capital, net of accumulated surplus and other sources of funding.

Allocation method: Domestic and export in proportion to energy (TWh)

5 CONCLUSION

The primary consideration of Elenchus in developing the methodology was adhering to the cost allocation principle of assigning cost on the basis of cost causality. Cost causality has remained the primary principle applied throughout annual updates to the IESO Cost Allocation Model and this review.

Elenchus recognizes that the allocation of Administrative and General costs is a matter of judgement and alternative methodologies or allocator selections are not necessarily unreasonable. Nevertheless, Elenchus continues to view the IESO cost allocation and rate design methodology as reasonable.

MARKET RENEWAL PROGRAM COST REPORT

The Market Renewal Program (MRP) Cost Report is a separate cost centre related specifically to spending that was established through the IESO's 2017 Revenue Requirement Submission. The MRP will address known issues with the existing market design and deliver significant ratepayer value by meeting system needs more cost-effectively. MRP is about improving the way electricity is priced and scheduled in order to meet Ontario's electricity needs reliably, transparently, efficiently and at lowest cost.

Summary of Activities

Since posting the final high-level design documents in August 2019 and completing the final Detailed Design documents in January of 2021, the IESO has shifted its focus, both internally and with its stakeholder community, to developing the specific changes and details required to implement MRP in the IESO-Administered Market.

Implementation

The IESO is currently codifying the Detailed Designs into rules, manuals, processes and tools as part of the implementation phase. The implementation phase includes critical steps including: building and finalizing the business requirements and internal manuals for the IESO, developing and issuing vendor requirements for building IT systems, and, the section most visible to stakeholders, the finalization of Market Rules and Market Manuals. The IESO has developed the first batch of MRP Market Rules and Market Manuals, which addresses market entry and prudential security, for stakeholder review. This first batch of rules was provisionally recommended by the IESO's Technical Panel in April 2021. The IESO has also developed the MRP Market Rules and Market Manuals for Market Power Mitigation for stakeholder and Technical Panel review.

In February 2022, the IESO posted the batch of Market Rules related to the calculation engines for stakeholder review and will also be developing the Market Rules and Market Manuals related to settlements for stakeholder review in Q3 2022.

Given the interconnected nature of the suite of MRP Market Rules, the IESO will not be seeking a formal recommendation from the Technical Panel until all of the Market Rules (5 batches in total) have been completed and reviewed by stakeholders.

Further, the IESO is engaging stakeholders on planning and preparing for the technical aspects of the changes Market Renewal will bring, including training, testing, and market trials.

Market Participant Readiness

Recognizing the importance of change management and adoption through the Market Renewal journey, the IESO is also working on Market Participant Readiness activities. This work builds upon the Detailed Design chapters that outlined the primary concepts and the changes that Market Participants can expect from the renewed market, including the market design, process changes and the new data flows that will be required.

Throughout the latter half of 2021, a cross-section of market participants volunteered to provide their advice and input on testing and training activities, which has guided the planning and approach used for Market Participant Readiness. Materials for this Technical Advisory Group are posted on the MRP implementation webpage.

This engagement effort has led to the creation of a Market Participant Readiness Plan that has been posted for stakeholder review and advice on the MRP implementation webpage.¹ This plan outlines the key approach and timelines for Market Participant Readiness activities, and will form the foundation of the specific tactical planning that is being created to support market participants through the Market Renewal transition.

Response to OEB Decisions

In the OEB's Decision and Order in EB-2020-0230, the OEB approved the settlement proposal in which the IESO agreed to the following:

1. *"The IESO agrees that the reporting requirements set out in the 2019 OEB Decision (EB-2019-0002) continue to apply, with the exception of the MRP Business Case."*

¹ <https://www.ieso.ca/en/Market-Renewal/Stakeholder-Engagements/Implementation-Engagement-Market-Rules-and-Market-Manuals>

1 The reporting requirements set out in the 2019 OEB Decision and Order (EB-2019-0002)
2 include the filing of a baseline budget and schedule for each year of MRP, including Cost
3 Performance Index (CPI) and Schedule Performance Index (SPI) metrics against the
4 baseline budget and schedule. The baseline budget for MRP, CPI and SPI metrics are
5 included in this exhibit. The baseline schedule for MRP is included in Exhibit G-2-1
6 Attachment 1 – MRP Baseline Schedule.

7
8 2. *"The IESO agrees to file a more detailed breakdown of MRP OM&A spending in any*
9 *future Revenue Requirement Submission that contains MRP OM&A spending."*

10
11 A more detailed breakdown of MRP OM&A spending is included in Table 6 of this exhibit.

12
13 3. *"With respect to market participant readiness, the IESO agrees that it will provide its*
14 *plan for market participant readiness publicly by the end of 2021."*

15
16 The Market Participant Readiness Plan has been posted publicly for stakeholder review
17 and advice on the MRP webpage.²

18 **Baseline Schedule and Budget**

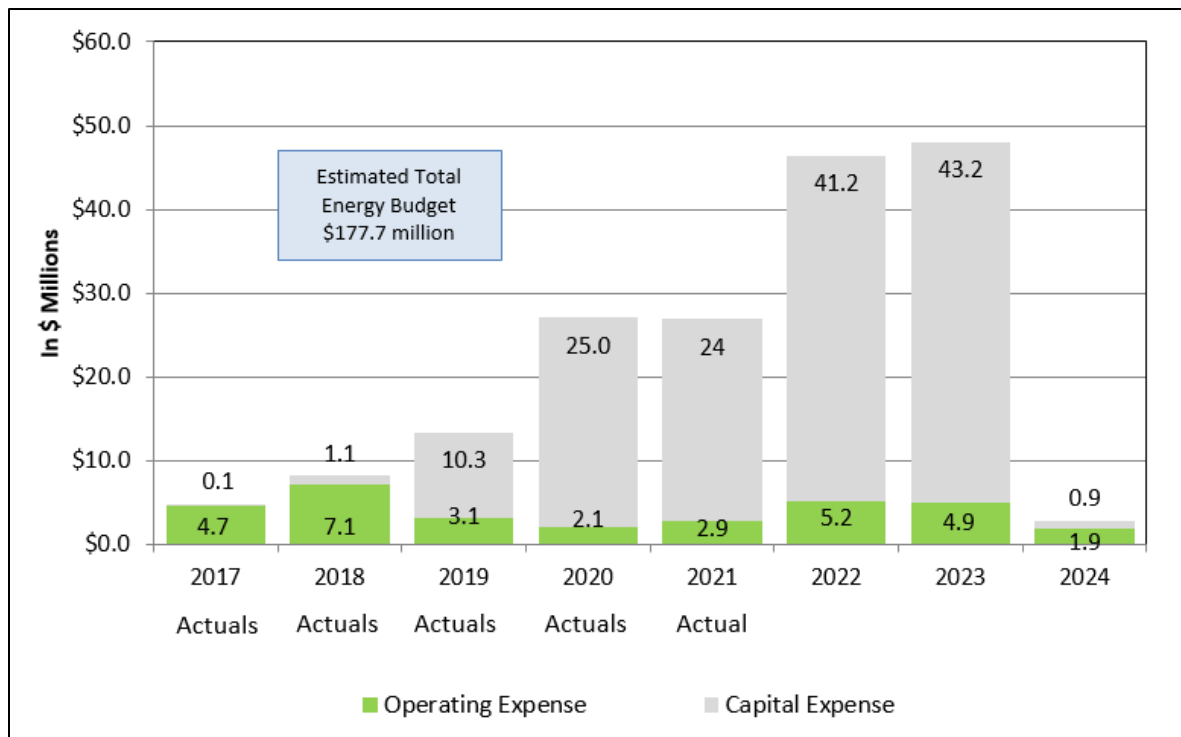
19 The IESO Board approved a revised budget and schedule in March 2021, including a go-live
20 date of November 2023 plus six months of contingency. This baseline schedule incorporates
21 lessons learned from the high-level and detailed-design phases of the project, makes best use
22 of existing resources, while delivering a high-quality program.

23 The baseline schedule in Exhibit G-2-1 Attachment 1 - MRP Baseline Schedule, reflects planned
24 implementation activities for 2022 through to the go-live date of the renewed market. The
25 schedule provides a summary of the major pieces of work for the balance of the project.
26 Underpinning this schedule are detailed activities carried out by individuals or groups on a
27 monthly, weekly, or daily basis as applicable.

² <https://www.ieso.ca/-/media/Files/IESO/Document-Library/engage/imrm/imrm-20211216-market-participant-readiness-plan.ashx>

1 The cost estimate for the delivery of MRP is \$177.7 million, which is within the projections from
2 the MRP Business Case (a range of \$151 million to \$194 million). Please see Table 1 below.

3 **Table 1: Cost Estimate for MRP**



4
5 The baseline budget associated with the baseline schedule is outlined in Table 2 below. The
6 budget is divided by operating and capital costs. These costs are broken down into the main
7 cost categories of expenditure.

8 After the deployment of MRP, the IESO will incur costs to deliver market participant support and
9 training, complete internal document updates, and start project closure activities while
10 maintaining a capital budget for additional vendor support and internal IT costs for tool changes
11 identified after the in-service date.

Table 2: MRP Baseline Budget by Operating and Capital Expenses

(\$ millions)	2022 Budget	2023 Budget	2024 Budget
Operating Expenses			
Compensation & Benefits	3.9	3.6	0.7
Professional & Consulting	1.2	1.6	0.2
Operating & Administration	0.1	0.1	-
Total Operating Expenses	5.2	5.3	0.9
Capital Expenses			
Compensation & Benefits	12.7	13.9	0.9
Professional & Consulting	4.1	3.0	-
Operating & Administration	20.3	17.9	1.0
Interest	0.9	1.2	-
Contingency	3.2	6.8	-
Total Capital Expenses	41.2	42.8	1.9
Total MRP Expenses	46.4	48.1	2.8

2021 Budget and Actual Operating Expenses and Capital Expenses

Table 3: 2021 Operating Results

(\$ millions)	2021 OEB Approved	2021 Actual	2021 Variance
Compensation & Benefits	2.6	2.4	(0.2)
Professional & Consulting	0.9	0.5	(0.4)
Operating & Administration	0.1	0.1	-
Total Operating Expenses	3.6	3.0	(0.6)

2021 operating expenses were \$0.6 million lower than budgeted. The overall decrease in spending was a result of a reduced need for external legal support for market rule and internal market manual drafting.

Table 4: 2021 Capital Results

(\$ Millions)	2021 OEB Approved	2021 Actual	2021 Variance
Compensation & Benefits	13.3	11.8	(1.5)
Professional & Consulting	4.1	1.2	(2.9)
Operating & Administration	14.1	10.5	(3.6)
Interest	1.0	0.5	(0.5)
Subtotal	32.5	24.0	(8.5)
Contingency	3.5	-	(3.5)
Total Capital Expenses	36.0	24.0	(12.0)

2021 capital expenses were \$12.0 million lower than budgeted due to a set of variances, including:

- Delays in gathering business and vendor requirements, which has resulted in the deferral of internal and external IT implementation costs;
- Reduced contractor costs;
- Lower corporate financing rates resulting in lower interest expense; and
- Unused contingency.

Performance Reporting

The baseline schedule and budget represent the planned cost and schedule of the project and are used as a standard against which actual performance is measured. The IESO reports on CPI and SPI, against the MRP baseline budget and schedule. A value of 1.0 indicates that the cost and/or schedule is tracking to baseline plan. A SPI under 1.0 indicates that the project is behind schedule while a CPI under 1.0 indicates the project is overspent.

Below is the annual CPI and SPI for the MRP work performed in 2020 and 2021, which is evaluated against the budget and schedule included in the business case for the detailed design phase. The baseline schedule and budget will apply to future CPI and SPI reporting.

Table 5: CPI and SPI for 2020 and 2021

	2020	2021
CPI	0.90	1.14
SPI	0.86	0.82

MRP, as a complex and interdependent project, has a Schedule Performance Index (SPI) which is below target, as the project had to reprioritize some work to accelerate vendor requirements gathering, which impacted dependency tasks. The IESO expects that adjustments to timelines will be needed as the project moves closer to in-service. The IESO is working to finalize the delivery schedule informed by our vendors, stakeholder input, and consideration of the impact on other dependent initiatives, and will re-engage with stakeholders in a timely manner when further information is available

2022 Budget Operating Expense and Capital Expenses

Table 6: 2022 Operating Budget

(\$ millions)	2022 Budget
Market Rules & Market Manuals	
Compensation & Benefits	2.5
External Legal support	0.9
Internal Documents & Manuals	
Compensation & Benefits	0.8
Change Management and Training	
Compensation and Benefits	0.6
Contract Services - Training materials	0.2
Generator Contract Review support	0.1
Operating & Administration	0.1
Total Operating Expenses	5.2

Operating activities reflected in the planning period include Market Rule and Market Manual drafting, change management activities, training and documentation. The operating budget cost of this work is expected to be \$5.2 million in 2022.

Table 7: 2022 Capital Budget

(\$ millions)	2022 Budget
Compensation & Benefits	12.7
Professional & Consulting	4.1
Operating & Administration	20.3
Interest	0.9
Contingency	3.2
Total Capital Expenses	41.2

Capital activities reflected in the planning period include the completion of business requirements, vendor costs for the dispatch scheduling and optimization tool as well as other solution development deliverables (reflected in Operating & Administration). The capital budget cost of this work is expected to be \$41.2 million in 2022, including contingency.

Staffing Levels

The MRP staffing requirements include both incremental MRP core resources as well as MRP support resources from the IESO's core operations. A description of each of these resources is provided below.

- MRP core resources are resources assigned directly to the MRP, either through rotations from the IESO's core operations or external hires on temporary contracts.
- MRP support resources are resources within the IESO's core operations whose roles include supporting market development initiatives corporate wide, such as information and technology services, legal, finance, and human resources.

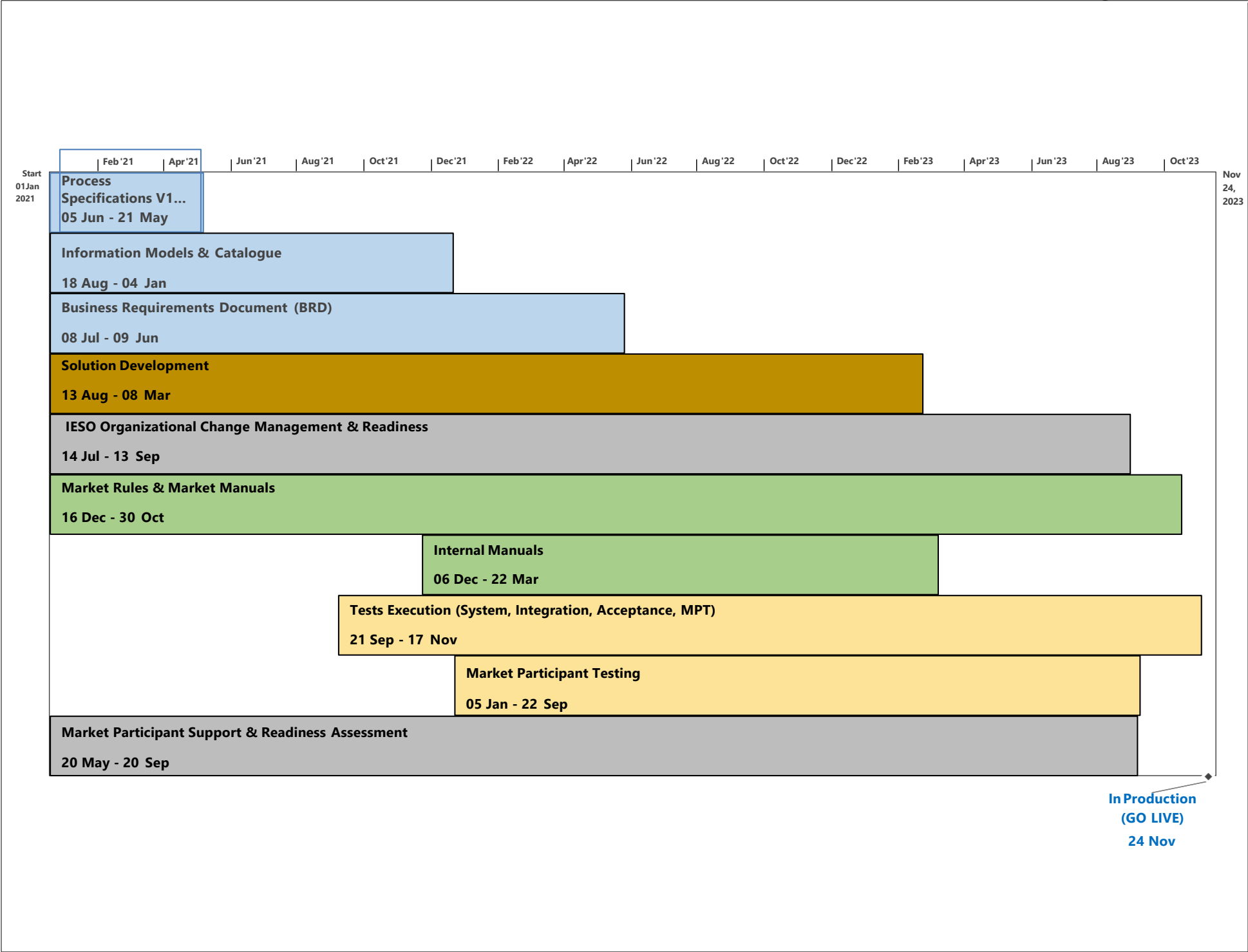
Table 8: 2021 - 2022 Full Time Equivalents

MRP FTEs	2021 Budget	2021 Actual	2022 Budget
Regular	45	35	42
Temporary	7	14	10
MRP Core FTEs	52	49	52
MRP Support FTEs	42	32	45
MRP FTEs Total	94	81	97

1 The 2022 budget reflects the core resources and support resources that are needed to deliver
2 on the planned work.

3 **Project Governance**

4 Governance of the MRP is provided by the IESO Board who approve business objectives and an
5 envelope for schedule and budget. An Executive Steering Committee (ESC), comprised of the
6 IESO Executive Leadership Team, works within this envelope to provide strategic direction to
7 the project team and approve scope and delivery strategy. The ESC and the project team are
8 supported by an advisory group comprised of senior leaders throughout the organization who
9 provide guidance and direction for the successful delivery of the program.



ANNUAL STATUS REPORT ON 2017 AUDITOR GENERAL REPORT RECOMMENDATIONS

In its Settlement Proposal to the 2018 Revenue Requirement Submission (EB-2018-0143), the IESO agreed to include a status report on certain recommendations to the IESO included in Chapter 3 of the Auditor General's 2017 Annual Report related to market oversight and cybersecurity. This was done to increase transparency and accountability. The Settlement Proposal states: "*The IESO agrees to file an updated status report in the same format with the OEB each year in its revenue requirement submission or by June 1st, whichever is earlier, until one year after all recommendations have been addressed.*" Below is the status. Please note that this exhibit has not changed since the IESO's 2020-2021 Revenue Requirement Submission (EB-2021-0230).

No.	Auditor's Recommendation	IESO Accepting Recommendation (In-Full / In-Part / Not at All)	Status of Implementation	Expected Date of Completion	IESO Explanatory Notes
1 Part (1)	To ensure that ratepayers' interests are protected and that recommendations made by the Ontario Energy Board Market Surveillance Panel to improve market rules are addressed, we recommend that the Independent Electricity System Operator (IESO): <ul style="list-style-type: none"> Implement the Ontario Energy Board Market Surveillance Panel's (OEB Panel) 	In-Full	In Process of Being Implemented OAGO's 2017 VFM report references a suite of OEB Panel recommendations related to both the Real-Time Generation Cost Guarantee (RT-GCG) (referred to as the Standby Cost Recovery Program in the OAGO Report) and Congestion Management Settlement Credits (CMSC) payments (referred to as the Lost Profit Recovery Program in the OAGO Report) in arriving at this recommendation. As identified in the OAGO's 2019 follow up report on the 2017 VFM Report, the IESO has made progress on some of the OEB Panel's recommendations related to the RT-GCG and CMSC payments.	The Market Renewal Program is expected to be in service in November 2023.	

	recommendations in an effective and timely way;		The RT-GCG program and CMSC payments will be eliminated as part of the IESO's Market Renewal Program (MRP).		
1 Part (2)	<p>To ensure that ratepayers' interests are protected and that recommendations made by the Ontario Energy Board Market Surveillance Panel to improve market rules are addressed, we recommend that the Independent Electricity System Operator (IESO):</p> <ul style="list-style-type: none"> Where the OEB Panel submits a report to the Independent Electricity System Operator that contains recommendations relating to the misuse, abuse or possible abuse of market power, the IESO should use its authority to amend the market rule immediately and submit it to the Ontario Energy Board for its review. 	In-Full	<p>Since the OAGO report was published in December 2017, the IESO has not received a recommendation from the OEB Panel that identifies the misuse, abuse or possible abuse of market power.</p> <p>In the event that a recommendation of this nature was made by the OEB Panel, the Independent Electricity System Operator (IESO) has taken a number of steps to ensure that recommendations are considered and implemented in an effective and timely fashion. These steps include:</p> <ul style="list-style-type: none"> Providing a public response from the IESO's President and CEO to new OEB Panel recommendations within 30 days of the publication of the recommendations. Providing the Ontario Energy Board (OEB) with an annual update on the status of actions taken to address recommendations made in the last five years (per a condition of the IESO's OEB license) and publishing the update to the IESO's website. <p>These processes ensure the IESO has appropriate controls and accountabilities in place to respond effectively and in a timely way to OEB panel recommendations and to report on progress in addressing recommendations to the appropriate oversight bodies.</p>	This recommendation is no longer applicable.	<ul style="list-style-type: none"> The IESO has identified this recommendation as "No Longer Applicable" to the Auditor General due to: The MSP not having made a recommendation relating to the misuse, abuse or possible abuse of market power since the OAGO report was published; and The IESO having implemented processes (as described in the "status of implementation") to ensure any such future recommendations are considered and implemented in an effective and timely fashion.
6	To ensure that ratepayers are not charged for unnecessary costs, we	In-Full	<p>In Process of being implemented.</p> <p>The Independent Electricity System Operator (IESO) is making fundamental changes to the</p>	MRP is expected to be in service in November 2023.	

	<p>recommend that, if the Independent Electricity System Operator does not cancel the Standby Cost Recovery Program, it fully implement the Ontario Energy Board Market Surveillance Panel's (OEB Panel) recommendations and not reimburse generators for operating and maintenance costs under the Program.</p>		<p>wholesale electricity markets through the Market Renewal Program (MRP to improve how we supply, schedule and price electricity to meet Ontario's future needs.</p> <p>As part of MRP, the IESO is eliminating the Real-Time Generation Cost Guarantee (RT-GCG) (referred to as the Standby Cost Recovery Program in the OAGO Report) and implementing an Enhanced Real-Time Unit Commitment (ERUC) process.</p> <p>Instead of compensating generators based on pre-approved costs, ERUC will make use of three-part offer optimization to help ensure that lower cost resources are committed ahead of higher cost options to meet reliability needs.</p> <p>The IESO has completed the Detailed Design for MRP and is engaging stakeholders in developing the associated rules, manuals, processes and tools to implement the renewed energy markets.</p>		
7	<p>To ensure that ratepayers are not charged for unnecessary costs associated with the Lost Profit Recovery Program, we recommend that the Independent Electricity System Operator (IESO) implement the recommendations of the Ontario Energy Board Market Surveillance Panel (OEB Panel) regarding this Program.</p>	In-Full	<p>In Process of Being Implemented</p> <p>The Independent Electricity System Operator (IESO) is making fundamental changes to the wholesale electricity markets through the Market Renewal Program (MRP) to improve how we supply, schedule and price electricity to meet Ontario's future needs.</p> <p>These changes include replacing Ontario's current two schedule market with a Single Schedule Market (SSM). The SSM will eliminate the Congestion Management Settlement Credits (CMSC) payments (referred to as the Lost Profit Recovery Program in the OAGO Report).</p>	MRP is expected to be in service in November 2023.	

			The IESO has completed the Detailed Design for MRP and is engaging stakeholders in developing the associated rules, manuals, processes and tools to implement the renewed energy markets.		
17	<p>To reduce the cybersecurity risk of the Independent Electricity System Operator (IESO), we recommend that:</p> <ul style="list-style-type: none"> the IESO establish an external vendor cybersecurity policy; and the cybersecurity team conduct a regular assessment of the security risk that external vendors pose to the IESO. 	In-Full	<p>In Process of Being Implemented</p> <p>The IESO established a formal policy relating to external vendor procurement and revised its procurement process documentation to include a cybersecurity risk assessment (see PRCS-45). In other words, a cyber security vendor risk assessment is triggered throughout the IESO's procurement process.</p> <p>The IESO's Security Standard was updated to reflect the policy of performing cybersecurity evaluations on all cloud vendors, who represent higher cyber risks to IESO relative to hardware and software vendors.</p> <p>The Security Standard update also includes provisions to manage external vendor cyber security risks to comply with North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection Supply Chain risk standards.</p>	<p>Integrate NERC CIP-13 Supply Chain Risk Management scope into existing IESO cyber vendor risk assessment process</p> <p>Implemented July 2020</p> <p>Risk rank list of IESO non-cloud software vendors to be included in assessment scope</p> <p>Implemented December 2020</p>	