EB-2019-0002
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 2019 and the fees it proposes to charge during the fiscal year 2019.

SUBMISSION FOR REVIEW

1. The Independent Electricity System Operator ("IESO") submitted its 2019-2021 Business Plan to the Minister of Energy, Northern Development and Mines ("Minister") for approval pursuant to section 24 (1) of the *Electricity Act, 1998* as amended ("Act") and the IESO received a letter from the Minister approving the Business Plan.

2. The IESO hereby submits to the Ontario Energy Board ("OEB") its proposed 2019 expenditure and revenue requirements and the fees it proposes to charge in 2019 (the "2019 Revenue Requirement Submission" or "Submission") for review and approval pursuant to subsection 25 (1) of the Act.

3. The IESO proposes a 2019 net revenue requirement of $190.8 million, the same level as in 2018 and 2017.

4. The current IESO usage fees of $1.2402/MWh for domestic customers and $1.0115/MWh for export customers were made interim effective January 1, 2019 by a December 18, 2018 OEB Decision on Interim Fees (EB-2018-0143). The IESO proposes usage fees for the same customer classes approved by the OEB in EB-2018-0143, of

$1.227/MWh for domestic customers and $1.0125/MWh for export customers effective January 1, 2019. Domestic customers include all withdrawals for consumption in Ontario and embedded generation.

5. Pursuant to subsection 25 (1) of the Act, the IESO is seeking the following approvals from the OEB:

   a) Approval of the proposed IESO usage fees of $1.227/MWh for domestic customers (including embedded generation) and $1.0125 MWh for export customers to be paid commencing January 1, 2019.

   b) Approval of its proposed 2019 capital expenditure envelope of $55.3 million for capital projects.

   c) Approval to charge (or rebate) market participants the difference between the 2019 IESO usage fees approved by the OEB and the interim usage fee they paid, if any, based on their proportionate quantity of energy withdrawn until the end of the month in which OEB approval is received for the 2019 usage fees. Any such charges (or rebates) will be provided in the next billing cycle following the month in which OEB approval is received.

   d) Approval to rely on and use the information provided to the IESO by 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.

   e) Approval of the proposed 2019 net revenue requirement of $190.8 million.

f) Approval to retain $10 million as an operating reserve in the Forecast Variance Deferral Account ("FVDA").

g) Approval to rebate the year-end balance in the FVDA above the requested $10 million operating reserve. The IESO will rebate the surplus to market participants proportionate to the fees collected in 2018. The rebates will be provided in the next billing cycle following the month in which OEB approval is received.

h) Approval to continue to charge registration fees of up to $10,000 per proposal for electricity supply and capacity procurements, including ancillary services.

i) Approval to continue charging $1,000 for the IESO's market participation application fee.

j) All necessary interim orders, orders and directions, pursuant to the *Ontario Energy OEB Act, 1998* and the OEB's Rules of Practice and Procedure, as may be necessary in relation to this Submission and execution of the approvals requested in the IESO's 2019-2021 Business Plan.

6. The IESO proposes that the OEB review of the Submission proceed by way of a written hearing.

7. The IESO intends to submit its 2018 Audited Financial Statements, as well as any supplementary evidence, to the Board and all intervenors once they become available.

8. 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 Submission, with a view to an early settlement and disposition of this proceeding.

9. The IESO requests that 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:

a)	The Independent Electricity System Operator	Ms. Miriam Heinz Advisor, Regulatory Affairs
	Courier Address:	120 Adelaide Street West, Suite 1600 Toronto, ON, M5H 1T1
	Telephone: Fax: Email:	416 969-6045 416 969-6383 Regulatoryaffairs@ieso.ca
b)	Aird & Berlis LLP	Mr. Fred D. Cass Counsel
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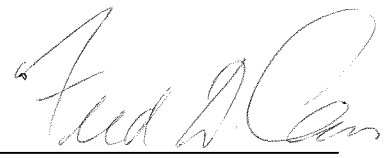
DATED at Toronto, Ontario, this January 28, 2019

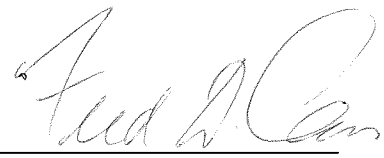
INDEPENDENT ELECTRICITY SYSTEM OPERATOR



by its counsel in this proceeding
Fred D. Cass

DATED at Toronto, Ontario, this January 28, 2019

INDEPENDENT ELECTRICITY SYSTEM OPERATOR



by its counsel in this proceeding
Fred D. Cass

INDEPENDENT ELECTRICITY SYSTEM OPERATOR
2019 REVENUE REQUIREMENT SUBMISSION (EB-2019-0002)

EXHIBIT LIST

Exhibit	Tab	Schedule	Description
A – ADMINISTRATION			
A	**1**	**1**	Submission
A	**1**	**2**	Exhibit List
A	**2**	**1**	IESO's Letter to the Minister Requesting Approval of the 2019-2021 Business Plan – September 4, 2018
A	**2**	**2**	2019-2021 Business Plan – September 4, 2018
A	**2**	**3**	Minister's Letter Approving the IESO's 2019-2021 Business Plan – December 11, 2018
A	**3**	**1**	2018 Audited Financial Statements
B – REVENUE REQUIREMENT, FEES AND DEFERRAL AND VARIANCE ACCOUNTS			
B	**1**	**1**	2019 Revenue Requirement and Usage Fee Methodology
B	**2**	**1**	2019 Registration and Application Fees, Forecast Variance Deferral Account and Capital Expenses
B	**3**	**1**	2018 Estimated Year-End Financials, Surplus and Staffing Attachment 1 - Appendix 2-AA (capital projects) Attachment 2 - Appendix 2-JB (OM&A cost drivers) Attachment 3 - Appendix 2-JC (OM&A programs) Attachment 4 - Appendix 2-K (employee costs)
C – EVIDENCE RESPONDING TO OEB DECISIONS AND SETTLEMENT PROPOSAL			
C	**1**	**1**	IESO Regulatory Scorecard Attachment 1 - IESO's 2019 Regulatory Scorecard
C	**2**	**1**	Market Renewal Program Cost Report

Exhibit	Tab	Schedule	**Description**
			Attachment 1 - Baseline MRP Schedules and Budget
C	**3**	**1**	Cost Allocation Study
C	**4**	**1**	Total Compensation Study Attachment 1 - Non-Executive Total Remuneration Review
C	**5**	**1**	Transmission Losses
C	**6**	**1**	Annual Status Report on 2017 Auditor General's Report Recommendations

Sent via email

ieso
Connecting Today.
Powering Tomorrow.

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September 4, 2018

The Honourable Greg Rickford
Minister of Energy, Northern Development and Mines,
and Minister of Indigenous Affairs
900 Bay St., 4th Floor
Hearst Block
Toronto, ON M7A 2E1

Re: IESO 2019-2021 Business Plan

Dear Minister Rickford:

I am pleased to submit the Independent Electricity System Operator (IESO)'s proposed 2019-2021 Business Plan. This document provides context on the priorities we're focusing on to enhance the reliability and efficiency of the province's power grid, administer electricity markets, and ensure power is available to and affordable for all Ontarians.

With rapid change continuing to be the hallmark of the electricity sector, defining our future success depends on our ability to achieve these objectives in the most cost-effective manner possible. In keeping with this focus on providing value for every dollar spent, the IESO is committed to delivering on its core responsibilities, while making the investments today that will result in longer-term benefits for both market participants and consumers.

Our commitment to sound financial management, even as we make the significant investments required to deliver on market renewal, cybersecurity and other priorities, means we are not seeking an increase to our revenue requirement for 2019. This is the same approach we took last year.

I look forward to working with you, as we deliver on our mandate, while ensuring that respect for ratepayers and a focus on operating efficiency continues to guide everything we do.

Please do not hesitate to contact me should you wish to discuss any aspect of the IESO's proposed 2019-2021 Business Plan.

Sincerely,

Peter Gregg
President and Chief Executive Officer

Peter Gregg
President and CEO
peter.gregg@ieso.ca
t 416.969.6007

Attach.

cc: Stephen Rhodes, Deputy Minister
Nina Chiarelli, Chief of Staff (Acting), Minister's Office
Tim O'Neill, Chair, IESO

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Business Plan 2019–2021

Independent Electricity System Operator

SEPTEMBER 4, 2018

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Powering Tomorrow.

Contents

Letter from the President & CEO and Chairman of the Board

The Independent Electricity System Operator (IESO)'s proposed 2019-2021 Business Plan provides context on the priorities we're focusing on to enhance the reliability and efficiency of the province's power grid, deliver a more efficient market, plan for the future, and ensure power is available to and affordable for all Ontarians.

With rapid change continuing to be the hallmark of the electricity sector, defining our future success depends on our ability not just to achieve these objectives, but to do so in the most cost-effective manner possible. In keeping with this focus on providing value for every dollar spent, the IESO is committed to delivering on its core responsibilities, while making the investments today that will result in significant benefits for both market participants and consumers over the longer term. Our market renewal program (MRP), which aims to meet system and participant needs at lowest cost, is a perfect example.

At its core, market renewal is about improving how electricity is scheduled and dispatched, and how we acquire resources, to reduce overall system costs. In 2019, with the finalization of the high-level designs for each of the MRP's four initiatives, we'll mark a major milestone on the road to implementation of a stable, robust market that will help us manage future change more effectively.

The plan also outlines how our investments in cybersecurity, innovation, long-term planning and engagement will help position Ontario as both a leader in grid reliability and performance and an important voice on issues shaping the broader electricity sector.

Our commitment to sound financial management, even as we make the significant investments required to deliver on these initiatives, means we are holding our revenue requirement for 2019 at the same levels as 2018 and 2017. For 2019, the IESO's proposed core operating expenses are $190.8 million, which will be funded by usage fee revenues. Capital projects in 2019 to facilitate the delivery of core business functions are expected to be $17.3 million, with a further $38 million allocated to fund the next stage of the MRP.

We look forward to working with you, as we deliver on our mandate, while ensuring that respect for ratepayers and an unswerving focus on reliability and efficiency continues to guide everything we do.

Peter Gregg
President and Chief Executive Officer

Tim O'Neill
Chairman of the Board

Executive Summary

Maintaining the reliability of Ontario's bulk electricity system is at the core of the IESO's mandate and what the IESO will remain focused on over the 2019-21 Business Planning period. In doing so, the IESO will need to effectively manage new and emerging threats, such as cybersecurity, and facilitate the reliable integration of new, more decentralized electricity resources. As always, we will continue this work in ways that recognize the negative impact of electricity cost increases on Ontario ratepayers.

As such, the IESO is proposing to hold its revenue requirement for 2019 at 2017 levels, the second consecutive year that we will not seek any increase. In doing so, we will explore opportunities to reduce our costs without compromising our commitment to reliability.

However, we are not content with holding the line on electricity costs. A big part of our efforts over the next few years is aimed at reducing future electricity costs for customers.

While the IESO's revenue requirements account for only one per cent of the average residential bill, our unique position at the centre of the province's electricity market, provides us with an opportunity to identify and generate significant efficiencies across the sector.

The IESO's market renewal program is designed to not only make today's electricity market more efficient, but to create more than $3 billion in savings for customers over a 10-year period with the potential to reach as high as $5.2 billion.

The Business Plan provides more details on the IESO's proposed initiatives over the next three years and our commitment to hold our 2019 revenue requirement flat.

Introduction

The Independent Electricity System Operator (IESO) is a not-for-profit corporation responsible for ensuring the reliability and efficiency of the province's power grid, today and into the future. This includes operating the grid 24 hours a day, 365 days a year, administering Ontario's electricity markets, and conducting comprehensive long-term planning and procurement to ensure power is available when Ontarians need it. As a trusted source of data, the IESO supplies the information and reports that sector participants, communities and policy-makers count on to better inform their decision-making.

How we keep the lights on across Ontario is changing. The traditional one-way, top-down model is being replaced by a much more decentralized and dynamic electricity system – and the IESO is at the forefront of this transformation, informing public policy and collaborating with stakeholders to turn today's challenges into tomorrow's opportunities.

Today, we're helping more stakeholders participate in meaningful ways, by giving more businesses, communities and residents a voice in how we meet the evolving demands of our sector. We're shaping how emerging technologies and a changing supply mix will create opportunities for new and existing market participants. We're improving our planning process to better address the growing complexities of operating the system and enable more informed decision-making and investments. Central to this work is our continuing focus on building a more innovative, competitive market – one that addresses inefficiencies, lowers costs, and helps ensure the province is prepared to meet future electricity needs, even as the sector continues to evolve.

Doing more with less: delivering value at the lowest cost

With its broad-reaching responsibilities, the IESO is uniquely positioned to recommend and implement changes that reflect our respect for ratepayers and attention to operating efficiency, while achieving significant cost savings across the sector. We have kept our core revenue requirements at the same levels since 2011, representing about 1 cent/KWh for the average residential consumer in Ontario. An increase to our fees and combined revenue requirement occurred with the launch of the Market Renewal Program (MRP) in 2017, a multi-year initiative representing the most significant suite of reforms since the market was designed in the late 1990s. As the MRP moves from design to implementation in the early 2020s, the yearly projected savings to ratepayers as a result of the efficiency gains will exceed the total current operating costs of the IESO.

Organizational focus

This is a pivotal time for the electricity sector. To capitalize on the changes that are underway, the IESO is evaluating all aspects of its business, with a view to making incremental investments now that are expected to reap major dividends down the road.

This includes having the right people in the right place focusing on the right objectives. Through our diverse and highly skilled Board of Directors and employee base, the IESO will continue to deliver value to Ontarians for years to come.

The IESO's broad mandate includes long-term planning, market and system operations and oversight, research into innovative solutions, stakeholder engagement and alignment of energy efficiency with system needs. To better position the organization to deliver on its mandate, in 2018 the IESO completed a corporate realignment aimed at building a stronger, more cohesive organization focused on a common purpose.

In addition to their core responsibilities, each of the six members of the executive leadership team reporting to the CEO will be accountable for achieving specific strategic objectives and performance measures that reflect the growing focus on building a strong foundation to support the ongoing evolution of the sector. These range from developing an enterprise-level data integration strategy, and positioning the IESO as a thought leader in cybersecurity, to implementing major process improvements and enabling innovation across the organization.

Summary of priority initiatives and resource requirements

The IESO's Business Plan provides an overview of the organization's priority initiatives and associated resourcing requirements needed to deliver on core responsibilities, as well as the investments required now to enable longer-term benefits for both the sector and consumers. These additional activities include:

- Advancing the Market Renewal Program to deliver a competitive and efficient market, which, over a 10-year period, is expected to achieve an average of $3.4 billion in savings (see pages 8 and 11)
- Creating an innovation roadmap to enhance system reliability and drive down costs for an ever-changing sector in collaboration with industry partners (see page 9)
- Enhancing our cybersecurity program to address the increasing complexity and growing threat of cyberattacks (see page 7)
- Building the infrastructure required to enable approved third parties to access data from the Smart Metering Entity (SME)'s meter data management repository (MDM/R) (see page 10)
- Introducing more transparency into our planning processes by providing updated information to the market and regularly engaging with stakeholders to enable them to make more informed decisions and investments (see pages 6-7)
- Implementing changes to better align energy-efficiency programs with system and consumer needs and transition to the market in the future (see page 10)

Even with the significant investments that are required to deliver on these and other initiatives that will result in long-term benefits for Ontario's energy sector, the IESO intends to hold its revenue requirement for 2019 at the levels approved for 2018 and 2017. This commitment to sound fiscal management means that the IESO will continue to provide real benefits to consumers, stakeholders and market participants, while meeting the challenges associated with maintaining the same revenue requirement for the third consecutive year. These include managing the cost increases resulting from collective agreement escalations and our ongoing focus on system reliability, as well as substantial investments in cybersecurity to support the change in our license requirements, and in the Market Renewal Program.

For 2019, the IESO's proposed core operating expenses are $190.8 million, which will be funded by usage fees.

In 2019, the IESO is planning a capital envelope of $17.3 million to facilitate the delivery of corporate priorities associated with its core business. An investment of $38 million in capital costs is required to fund the next stage of the Market Renewal Program. Further details on the overall capital program are included in Appendix 3.

More detailed information about the IESO's proposed budgets for the planning period is available in the Financial Overview section (see page 13).

The IESO has assessed its key areas of risk in relation to strategic areas of focus, developed mitigation plans to support the organization's efforts to deliver on its mandate and implemented a robust risk framework to continue to identify and manage risk. More information on the IESO's key risks and how they will be addressed during the planning period is available in Appendix 2.

The IESO has also established corporate performance measures, which assess progress toward the achievement of its mandate and strategic objectives. In 2019, the business will continue to align these measures with the priorities for each of the IESO's five areas of focus: Reliability and Resilience; Corporate Agility and Effectiveness; Sector Leader – Purposeful Engagement; Innovation; and Cost Efficiency. More information on the IESO's Corporate Performance Management Program for the planning period is found in Appendix 1.

Enhancing System Reliability and Resilience

To meet reliability needs effectively, we are updating our planning processes to align with market renewal initiatives and timelines and to reflect future market design.

Continuing to power Ontario's businesses, homes and communities reliably – and recover in the event of a disruption – starts with standards. Under Ontario's reliability framework, the IESO complies with the standards established by the North American Electric Reliability Corporation and Northeast Power Coordinating Council's criteria, and enforces them through market rules. The IESO is actively involved in the ongoing development of the standards and criteria of each of these bodies, and supports their efforts to create a reliable electrical grid throughout North America.

Improving the IESO's planning processes

Adhering to the sector's most stringent compliance requirements depends on maintaining a robust and coordinated planning process. While the IESO balances the supply of and demand for electricity on a second-by-second basis, ensuring reliability in the longer term is more complex – and takes into account factors that affect the supply-demand balance, current and longer-term resource requirements, as well as economic trends and sector uncertainties.

Historical energy consumption patterns are changing. In the last decade, changes in the economy, savings from energy efficiency and demand management, embedded generation and the expanded Industrial Conservation Initiative have more than offset any increases resulting from population growth and economic expansion.

Reliability standards, based on projected demand, drive the total amount of electricity generation capacity to meet the system's needs, but significant changes to the supply mix are on the horizon. These include the schedule for retiring or refurbishing existing nuclear facilities, and the expiration of contracts with current generating stations, all of which call for heightened market intelligence to manage risks and inform future outlooks on system adequacy.

With new capacity expected to be required as early as 2023, the introduction of an incremental capacity auction – a key part of the work currently being undertaken by the IESO's Market Renewal Program – will be core to meeting future needs. When the market is redesigned, improved price signals will provide a clearer picture of what and where services are needed, and help drive decisions that ensure reliability.

Broadening the adequacy outlook

With the capacity to deliver energy when and where it's most needed, new technologies like energy storage are poised to play a larger role in enhancing the reliability and resilience of the IESO-controlled grid.

During phase one of the IESO's energy storage procurement, seven of 11 participating facilities joined the electricity market, with the remaining four expected to be connected by the end of 2018. While providing ancillary services to the grid, phase one facilities are expected to yield valuable learnings in areas ranging from the mitigation of surplus baseload generation, to the capabilities of fully dispatchable energy storage facilities in the wholesale market.

Our planning processes will be focusing on transparently outlining different system needs, including energy, capacity and ancillary services to support our market mechanisms to meet needs in a cost-effective

manner. In addition, the IESO has to forecast the growth of distributed energy resources with a view to ensuring we can integrate them into the operation of the system.

As part of our commitment to transparency, starting in 2019 the IESO will supplement existing planning publications with an annual planning outlook. Designed to broaden understanding of resource adequacy over a 20-year planning horizon, this document will outline system needs that help enable stakeholders to make informed decisions and investments.

Addressing regional planning needs

Ensuring reliability is also a priority at the regional level. Introduced in 2013, the existing regional planning process is currently being reviewed to ensure it integrates effectively with other planning initiatives, and considers both transmission facility end-of-life and cost-effective alternatives to transmission and distribution infrastructure to meet regional needs.

The review will explore how the existing planning process considers cost-effective alternatives to transmission and distribution infrastructure solutions, such as energy efficiency and demand management and distributed energy resources, as well as possible linkages to current and future electricity markets. In 2019, following the release of an interim report to summarize key findings, the IESO will produce a final report outlining recommendations and identifying supporting legislation that may be required to implement them.

As part of the IESO's planning process, at least once every five years, each of our 21 regions undergoes a rigorous reliability evaluation that includes a needs and scoping assessment, followed by community and stakeholder engagement. These assessments may result in an integrated regional resource plan (IRRP) that outlines specific priorities and actions for the near, medium and long term. In 2019, our focus will be on ensuring IRRPs for the Windsor-Essex, Toronto, GTA North, Burlington-Nanticoke and Greater Ottawa regions, are on track for completion within prescribed timelines.

Investing in cybersecurity to protect the grid

While regular reliability assessments and effective planning are fundamental to reliability, ensuring we can continue to provide Ontarians with the electricity they depend on every day requires us to protect the province's grid from cyberattacks.

That's why the IESO takes a continuous-improvement approach to protecting its data by constantly enhancing our critical information systems, and ensuring cybersecurity risk management is being addressed and integrated at every level and in every business unit.

Expanding and collaborating on cyber defence has been key to our reliability planning. However, our efforts to play a leadership role in the sector have grown since the IESO established the Ontario electricity sector's first executive briefing on cybersecurity in 2015.

Today, as well as bringing together our sector counterparts and the world's leading cybersecurity policy experts to identify emerging trends and collaborate on best practices to address them, we are the first system operator in North America to have accountability for providing cybersecurity-related services to the broader electricity sector. To that end, the IESO is currently working with the federal and provincial governments, including regulators, to contribute to the development of strategies and policies that focus on the reliability, security and privacy of Ontario's interconnected power system.

In addition to facilitating a central collaboration hub for cybersecurity best practices, in December 2018, the IESO is set to launch of a security operations centre – a major milestone in the evolution of the organization's cybersecurity program. The centre will provide new real-time cybersecurity situational awareness capabilities and the 24/7 cybersecurity monitoring required to improve incident detection and response to the threats that face our electricity infrastructure and the organizations that operate it.

Meeting Tomorrow's Needs Cost Effectively

A combination of open, competitive markets and prices that signal where and when services have the greatest value will drive down costs, while setting a strong foundation for innovative approaches to meet system needs

Executing with excellence is the foundation of the IESO's success, whether building consumer and sector confidence in our operations and planning, or exploring how innovation can cost effectively meet changing demands on the grid. Finding efficiencies in the way we do business and delivering reliability at the lowest cost is an enterprise-wide priority. It's also the driving force behind the IESO's Market Renewal Program (MRP) which, over a 10-year period, is expected to deliver an average of $3.4 billion in efficiency savings, most of which will flow to Ontario's consumers.

Driving efficiencies through market renewal key to cost savings

Market renewal is a collaborative effort to lay the foundation for a made-in-Ontario electricity market of the future. In resolving long-standing market design issues, the MRP will improve the way electricity resources are acquired and scheduled to deliver power to consumers at the lowest cost. In the longer term, the program will prepare us to manage change and benefit from innovation in a rapidly evolving industry, while building on the unique, positive attributes of the existing system.

To achieve these outcomes, the MRP will:

- Replace the current two-schedule market with a **single schedule market** that will address current misalignments between price and dispatch, and eliminate the resulting settlement complexities that have prevented other improvements, including the day-ahead market, from being implemented
- Reduce the cost of scheduling and dispatching resources to meet demand as it changes from the day-ahead market to real time through the **enhanced real-time unit commitment** project
- Introduce a **day-ahead market** that will provide greater operational certainty to the IESO and greater financial certainty to market participants, which lowers the cost of producing electricity and ensures we commit only the resources required to meet system needs
- Improve the way Ontario acquires the resources to meet longer-term supply needs by implementing an **incremental capacity auction** that will drive down costs by enabling all resources to compete to supply what the system needs

Engaging with stakeholders in preparation for the high-level design (HLD) documents was the primary focus in 2018. Market renewal will result in the largest changes to the electricity market since its opening in 2002, and will continue to require broad sector participation to inform the final design. In 2018, the release of HLD recommendations for all three initiatives in the energy work stream – single schedule market, day-ahead market and the enhanced real-time unit commitment – will mark a significant milestone on the road to full implementation. The draft HLD document for the incremental capacity auction will follow in 2019.

In advance of the launch of the incremental capacity auction – one of the core initiatives of the Market Renewal Program – the IESO continues to meet system needs through the ongoing management of generation and storage contracts. As of December 31, 2017, generation contracts, which include natural gas, wind, solar, hydroelectric, biomass and nuclear, range in size from microFIT contracts of less than 10 kilowatts to the Bruce Power nuclear contract, which secures 6,300 MW of supply.

As of December 31, 2017, the IESO was managing more than 31,200 contracts that account for more than 27,650 MW of generation. These include contracts for approximately 26,800 microFIT projects (representing 234 MW) and 4,130 Feed-in-Tariff or FIT projects (representing 4,800 MW). The majority of those contracts are in operation with over 1,310 projects (or 2,780 MW) under development. Renewable energy projects account for 43 per cent of contracted capacity (50 per cent wind, 21 per cent hydro, 25 per cent solar, 4 per cent bioenergy), with natural gas at 34 per cent. In July 2018, the IESO began terminating 751 contracts for electricity generation projects in the early stage of development, a move that is estimated to save ratepayers about $790 million without any adverse impact on the reliability of Ontario's electricity system.

Roadmap set to build innovation into the way we do business

To help drive the evolution and cost-effectiveness of the province's electricity sector, the IESO is also working on an innovation roadmap and associated work plan, which are expected to be finalized in 2019. With the energy sector continuing to transform, the IESO's investment in innovation will contribute to the assessment of potential future scenarios for the electricity and broader energy sector in the province, and help identify potential roles for other organizations.

After exploring opportunities and establishing priorities in consultation with the industry, the IESO will create a multi-year plan to address shared goals for research and development to support grid modernization. The plan will include work streams that support future-state goals in the near, medium and longer term, and address improvement opportunities in a variety of areas, including technology, policy, interoperability and operational integration. Once complete, the roadmap will coordinate IESO and sector efforts to exploit new avenues for funding and risk-sharing, leverage the best practices implemented in other jurisdictions, and use the resulting insights to broaden the market and increase competition.

Expanding opportunities for newer technologies to compete is central to the IESO's innovation and efficiency agenda. Because energy storage can deliver multiple capabilities – both as a load and a generator – supporting further integration of these resources into the electricity system is essential to sector innovation and modernization. To that end, in April 2018 the IESO established an Energy Storage Advisory Group to address obstacles that restrict the ability of energy storage facilities to compete with other resources.

The IESO's focus on paving the way for storage resources to play a larger role in IESO-administered markets also aligns with policy goals south of the border, where the U.S. Federal Energy Regulatory Commission has issued new requirements to level the playing field. Under Order 841, released earlier

this year, U.S. system operators must establish participation models and market rules that recognize the physical and operational characteristics of electric storage resources. In the absence of similar requirements in Ontario, the IESO is committed to proactively tackling the barriers within its control to take advantage of resources that are often less expensive and easier to deploy and that provide a faster and more accurate response to market signals.

Third-party access to smart meter data: providing value for clients and ratepayers

Leveraging the full value of the data collected and managed by the Smart Metering Entity (SME)'s meter data management repository (MDM/R) will also be critical to promoting innovation and driving down system costs. With almost five million smart meters installed in homes and small businesses across the province, giving authorized third parties access to de-identified data is expected to create value in areas ranging from system planning and policy development to the creation of products and services that support the potential of big data.

Since completing extensive collaboration involving local distribution companies, gas utilities, the Ontario Energy Board (OEB), Ministry of Energy, Electricity Distributors Association, the province's Information and Privacy Commissioner and an external privacy consultant, the IESO (as the SME for Ontario) has been focused on developing a comprehensive third-party access implementation plan that helps create new value, while adhering to confidentiality and privacy requirements.

To be delivered to the OEB by the end of 2018, the plan will outline the proposed tools, processes and procedures that will enable the SME to accept and process data requests, as well as a monetization model that will be beneficial for both data clients and ratepayers. After undergoing a rigorous screening process, clients are expected to use the data to inform research and development, technology, training and continuous service improvement. Any surplus funds – above and beyond those levied for cost recovery – will be credited to ratepayers.

Better aligning energy efficiency and demand management with system and customer needs

Energy-efficiency and demand-management programs are demonstrating that they can be an effective and competitive resource to help meet system needs. From 2015 through to mid-June 2018, the IESO and local distribution companies have helped Ontario's residential and business consumers reduce electricity consumption by 5.4 TWh.

Distribution-connected consumers saved 4.8 TWh and transmission-connected consumers 0.6 TWh respectively. Overall, energy-efficiency program costs came in at just under 3 cents/kilowatt-hour, considerably less than the threshold of less than 4 cents/kilowatt-hour. At the same time, the IESO will continue to look for ways to reduce the costs associated with such programs.

With the understanding that energy efficiency is a resource that can reduce demand and benefit ratepayers, the IESO is working more closely with planners to ensure that such programs are maximizing system value, that future targets are aligned with system need, and with a renewed focus on being more customer-centric. Any changes in programs will also need to ensure a focus on ratepayer value and reflect the shift to a more competitive, less prescriptive performance model that pays for verified energy savings achieved, regardless of source.

Over time, with the implementation of the IESO's Market Renewal Program and building on experience to date, we will continue to explore how energy efficiency may one day participate in incremental capacity auctions, where it can compete with other resources to meet system needs at lowest cost.

Leading Through Engagement

Working with diverse stakeholders – from policy-makers, regulators and academic institutions, to market participants and local, regional and provincial planning groups – we leverage our independence and position as a trusted resource to inform decision-making.

Engagement has been part of our DNA – and our business model – since the IESO's inception in 1999. The transformation of the electricity system and resulting changes to the way Ontarians produce and consume energy is requiring us to engage with more stakeholders, more often and on more issues. As a result, we are broadening our relationships to better inform decision-making and sector innovation and refining our processes to ensure participants understand how we are using their feedback. As part of its commitment to be a leader in grid reliability and system performance, the IESO is also continuing to participate in and drive broader discussion of issues affecting sector participants – both in Ontario and beyond our borders.

Transforming the market

Given the high-stakes nature of the IESO's market renewal activities, which will fundamentally transform the foundation of Ontario's $17-billion annual electricity market, a comprehensive engagement strategy for the Market Renewal Program (MRP) has been a priority from day one. Stakeholders – including suppliers, consumers, emerging technologies, demand-side resources and others – are providing valuable feedback on design options and improving our decision-making.

To date, the IESO has held over 50 market renewal stakeholder engagement and Market Renewal Working Group meetings and discussed more than 170 decisions within 19 design elements. With the release in 2018 and 2019 of high-level designs (HLDs) for each of the energy and capacity initiatives, engagements with stakeholders will shift into high gear. The goal: to ensure stakeholders have an opportunity to provide meaningful input into HLDs and on the detailed-design phase of the project in preparation for full implementation.

Expanding relationships to inform and be informed on sector needs

Better aligning First Nations and Métis energy support programs with community needs and interests is an ongoing goal – and engagement is at the heart of the IESO's efforts to help these two groups build capacity for their communities.

To supplement regular engagement activities, the IESO held its first Indigenous Community Energy Symposium in October 2017. Learnings from that session – and from First Nations and Métis conferences planned for October and November 2018 – will be used to evolve existing programs aimed at helping these communities move toward a more secure energy future.

Enabling informed decision-making is also the catalyst behind activities to support a number of outcomes for delivery in 2019. These include engagements on:

- Reforms to the regional planning process, including an assessment of the effectiveness of existing engagement channels, and obstacles to the implementation of cost-effective alternatives to transmission and distribution infrastructure solutions
- The removal of barriers to the integration of storage resources into the wholesale electricity market – with a focus on those within the IESO's control
- The creation of a competitive transmission procurement and selection process, including timelines, qualification requirements and bid evaluation criteria
- A review of the governance and decision-making structure to incorporate considerations arising from market renewal initiatives, and more broadly IESO processes and oversight on market rules and manuals, as well as the dispute resolution process
- An implementation plan that provides approved third parties with access to de-identified meter data available in the province's Meter Data Management/Repository (MDM/R)
- The technical criteria used to assess customer reliability and supply security in order to identify and evaluate options for local area enhancements

An authoritative source of information, an independent voice

As a not-for-profit corporation with an independent Board of Directors, the IESO has no financial stake in the industry, ensuring its independence both financially and as a contributor to ongoing dialogue and evolution of the system. This makes the IESO well positioned to drive the transformation of high-profile programs – including the redesign of the electricity market, cybersecurity and innovation – throughout the province's electricity sector.

The IESO is also a trusted source of data. We provide near-term forecasts on reliability through our *18-Month Outlook*, release planning reports on the province's 21 electrical regions, and forecast needs all the way out to 20 years. We make available up-to-the-minute and projected information on supply, demand and price, and produce weekly reports on system adequacy and other aspects of Ontario's electricity sector – all of which help market participants, associations and governments inform their own planning.

The IESO's unique vantage point on the power system and its role as an authoritative source of information is also critical to enhancing its reputation as a sector leader. In addition to establishing the Energy Transformation Network of Ontario (originally the Smart Grid Forum), the IESO belongs to the ISO/RTO Council, working with other members to build a smarter and more efficient grid to serve the North American power market and its consumers. Our executive leadership team is regularly invited to share its perspectives and best practices with industry leaders and regulators – for example, the IESO's CEO was invited to speak at the U.S. Federal Energy Regulatory Commission's annual technical conference on reliability in 2018.

Financial Overview

The 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 electricity system responsibilities, as well as to execute key programs, including innovation, cybersecurity and market renewal initiatives. The IESO intends to hold its revenue requirement for 2019 at 2018 approved budget levels. Funding levels for the balance of the planning period will be in line with inflation, one of Canada's key economic indicators. Further, the organization continues work to identify potential operating efficiencies within the planning period.

Funded by IESO usage fees, the revenue requirement for 2019 is $190.8 million, which is at the same level as 2018 and 2017.

The organization has successfully met the challenge of incorporating significant investments that are required to deliver on its mandate with long-term benefits for Ontario's energy sector, while efficiently managing the related cost pressures to continue to operate at the same level of funding since 2017.

A key focus for the IESO will continue to be cybersecurity. Over the past two years the IESO has invested substantially in its cybersecurity technology. Recently, the IESO has expanded its accountability to include providing cybersecurity-related services to the broader electricity sector. The current business plan includes resources to establish best practices in cybersecurity operations, including implementation of a 24/7 security operations centre.

Increases in compensation and benefits costs are a key expense component that is closely managed. Annual compensation escalations due to collective agreements represent a key cost driver in the current business plan that is partially mitigated by other cost efficiencies resulting from an ongoing focus on internal infrastructure enhancements.

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

For 2019, the IESO anticipates an average headcount of 726 to deliver its core electricity system responsibilities while continuing the implementation of its strategic initiatives. The Market Renewal Program will require an average headcount of 125 as the program advances to the detailed design stage. This brings the total average headcount requirement for the IESO to 851 in 2019.

Detailed Financials

The following table outlines operating revenues and expenses over the business planning period.

Pro Forma Statement of Operations
For the Year Ended December 31
(in Millions of Canadian Dollars)

($ Millions)	2018 Budget	2018 Forecast	2019 Budget	2020 Budget	2021 Budget
Revenue					
IESO Usage Fee	190.8	187.9	190.8	194.9	199.0
Total Revenue	**190.8**	**187.9**	**190.8**	**194.9**	**199.0**
Expenses					
Compensation & Benefits	110.3	111.8	113.4	116.2	119.5
Professional & Consulting Fees	16.9	15.2	15.7	16.3	16.2
Operating & Administration	36.6	36.3	37.5	38.3	41.9
Operating Expenses	**163.8**	**163.3**	**166.6**	**170.8**	**177.6**
Amortization	17.7	19.1	18.4	19.0	20.2
Net Interest	(3.4)	(5.4)	(5.9)	(7.1)	(8.4)
Total Core Operations	**178.1**	**177.0**	**179.1**	**182.7**	**189.4**
Market Renewal	12.7	14.9	11.7	12.2	9.6
Total Expenses	**190.8**	**191.9**	**190.8**	**194.9**	**199.0**
Operating Surplus/(Deficit)	–	(4.0)	–	–	–
Accumulated Operating Surplus	6.0	2.0	6.0	6.0	6.0

The forecasted operating deficit for 2018 is expected to reverse upon approval of the IESO's 2018 usage fee rates and ongoing expense management in the second half of the year. As a result, management expects 2018 total revenues and expenses to be in line with the budget.

Capital

The IESO regularly prioritizes capital initiatives. The business planning process establishes an appropriate capital envelope for core operating initiatives with commitments approved individually on an ongoing basis. This practice is consistent with prior years. The Market Renewal Program began its capital implementation stage in late 2018, and will continue its efforts well into 2021. The table below provides a summary of the total capital spending required in this plan. Project details and associated descriptions are included within Appendix 3.

Capital ($ Millions)	2018 Budget	2018 Forecast	2019 Budget	2020 Budget	2021 Budget
Core Operations Initiatives	22.6	15.4	17.3	20.3	17.9
Market Renewal	4.0	1.2	38.0	43.3	40.8
Total Capital Envelope	**26.6**	**16.6**	**55.3**	**63.6**	**58.7**

Staffing

Total average FTEs are expected to increase in the 2019–2021 planning period due to temporary resourcing required to support the Market Renewal Program and additional resources in core operations to support the IESO's planning, corporate and information technology services and cybersecurity initiatives. The additional resources will gradually be filled in latter 2018 and continue into 2019. Additional resources in core operations are offset by the allocation of resources to market rule enforcement, market education and energy-efficiency programs, which do not impact this business plan.

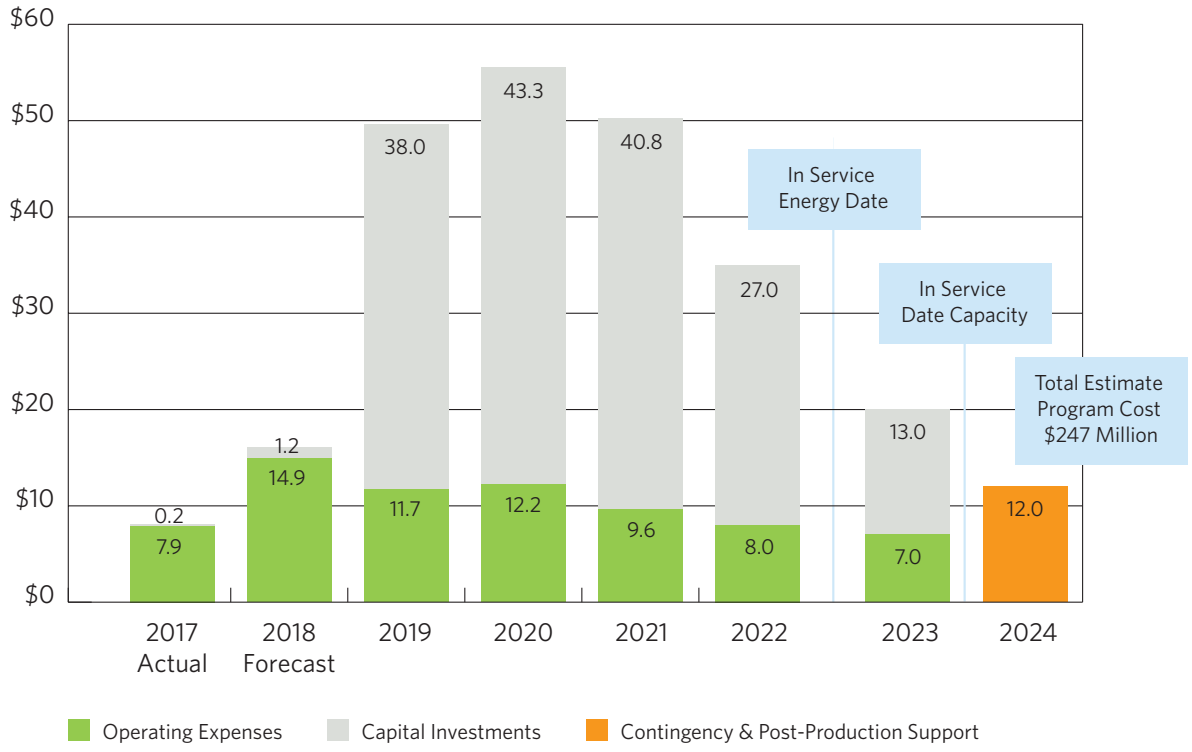
Full Time Equivalents	2018 Budget Avg FTEs	2018 Forecast Avg FTEs	2018 Forecast Dec 31st Headcount	2019 Budget Avg FTEs	2020 Budget Avg FTEs	2021 Budget Avg FTEs
Core Operations	688	664	722	717	716	716
Market Renewal	43	61	86	125	125	125
Total FTEs	**731**	**725**	**808**	**842**	**841**	**841**

**2018 forecast average FTEs reflect 2018 vacancies, while forecast Dec 31, 2018 headcount reflects anticipated hires later in 2018. 2019 FTEs are budgeted on an annual average basis.*

Market Renewal Program Financials

In 2019, the Market Renewal Program will be entering the detailed design phase for both the energy and capacity work streams of the program, which are classified as capital spending. The timing of this milestone is slightly later than projected in the 2018 plan due to challenges in adding resources to the program. The current total program budget is estimated at $247 million, with further budget refinement expected upon completion of the business case at the end of 2019. The increased total budget estimate is due to the addition of work to enable participation in future markets, as well as legal and consulting support for the development of market rules and additional resources.

Projected Market Renewal Costing



(Note: Budget estimates are used for 2022-2024 and will be further refined at the completion of the Business Case)

The projected 2018 operating costs for market renewal are $14.9 million, compared to a budget of $12.7 million. Resourcing for the program continues to be a challenge and has resulted in later completion of high-level design for the capacity work stream. The focus on high-level design in 2018 has resulted in a shift to more operating costs in the near term instead of the planned capital work late in the year. Timelines have now been revised with the high-level design for the energy work stream completed in late 2018 and the capacity work stream in 2019. The 2018 projected capital costs for market renewal are $1.2 million, compared to a budget of $4.0 million.

The total cost for the program from its inception to the end of 2018 is $22.8 million in operating expenses and $1.4 million in capital expenses.

In 2019, market renewal costs will be predominantly classified as capital expenses, as the program plans to start the detailed designs related to the energy and capacity work streams. The capital budget for the program in 2019 is $38.0 million. Operating expenses to support the program include the completion of high-level designs for the capacity work stream, work to enable participation in future markets, market rule amendments and program governance and administration. The operating budget for the program in 2019 is $11.7 million.

The program will draw support from additional internal and external resources as well as from other IESO corporate support functions.

Appendix 1: CPM – 2019 Measures and Targets

To support the effective execution of the IESO's strategy and, in particular, the priority initiatives laid out in this plan, the IESO's corporate performance management (CPM) program provides an important level of oversight for the organization and its stakeholders and helps to ensure accountability.

Measures and annual targets are developed collaboratively, with input from the Stakeholder Advisory Committee, and communicate key, strategic areas of action for the organization to continuously evaluate and focus its efforts, and drive performance accordingly. The CPM program was the focus of significant internal and external stakeholder consultations in 2018 to enhance its value and relevance for the business and the public.

The measures and targets for 2019 have been defined as part of an overall CPM framework to align with the IESO's strategic themes of *Reliability and Resiliency, Corporate Agility and Effectiveness, Sector Leader – Purposeful Engagement, Innovation, and Cost Efficiency*. The 2019 targets were developed to be outcome-oriented, while seeking to meet the SMART criteria (*specific, measureable, achievable, relevant and timely*) of measurement balanced by:

- Quantitative vs. qualitative
- Activity-based aspects that support a longer term strategic outcome
- Developmental vs. mission critical
- Strategic vs. operational
- Current vs. future oriented
- Within the IESO's influence vs. outside its control

IESO Corporate Performance Management: 2019 Measures and Targets

Themes	Strategic Outcomes	Performance Priorities	Corporate Measures	Annual Corporate Targets
Reliability and Resiliency	An integrated electricity system that is reliable, resilient and secure in a period of accelerating change	• Enhance grid reliability and resiliency for Ontario through: – Proactive response to system events – Training and simulation exercises – Active communication – Advocacy to evolve NERC/NPCC compliance and enforcement • Establish cybersecurity leadership in the sector and improve system resiliency with a focus on: – Situational awareness – Collaboration – Information exchange – Cyber defense	1. Electricity System Reliability 2. Electricity System Resiliency	1.1 Zero violations of NERC high risk factor reliability requirements within the IESO's control 1.2 Integrated Regional Resource Plans for the Windsor-Essex, Toronto, GTA North, Burlington-Nanticoke and Greater Ottawa regions are completed or on track to be completed within the timelines prescribed by the OEB's regional planning process 2.1 Achievement of 2019 cybersecurity milestones

Themes	Strategic Outcomes	Performance Priorities	Corporate Measures	Annual Corporate Targets
Corporate Agility and Effectiveness	A talented, diverse and empowered workforce that has the flexibility to respond to internal and external customer needs	• Galvanize the organization around a shared IESO identity that empowers and engages employees by: – Breaking down silos – Fostering a positive IES*One* culture – Enhancing leadership capabilities • Execute an effective and scalable governance structure for project oversight to enable more timely delivery of the project portfolio • Use IESO resources effectively and efficiently to meet the needs of customers today and in the future	3. Employee Engagement 4. Project Management 5. Financial Management	3.1 Achievement of the sub-indices of the engagement survey scores related to collaboration, an inclusive culture and enhanced leadership capabilities 4.1 Implement an effective and scalable governance structure for project delivery by end of Q2 2019 and 90% of all high-ranked projects advance into the initiation phase within three months of ranking 5.1 2019 priorities are achieved within +/- 5% of the IESO's approved budget
Sector Leader – Purposeful Engagement	A long-term energy perspective for IESO initiatives that delivers independent and informed energy policy advice	• Engage stakeholders in a targeted and purposeful manner to contribute to the development of effective energy policy • Be a thought leader in energy policy and market development	6. Stakeholder Engagement 7. Electricity System Planning	6.1 2% improvement in satisfaction with the stakeholder engagement process is reported, compared to the 2018 customer satisfaction survey result 7.1 Complete bulk electricity system report by end of Q3 and publish to inform investment and long-term energy plans in Ontario

Themes	Strategic Outcomes	Performance Priorities	Corporate Measures	Annual Corporate Targets
Innovation	Integration of acquired sector innovation expertise into our operations, planning and advice	• Identify, understand and remove barriers to emerging technologies, new business models and increased competition in the electricity sector in support of cost-efficiencies and enhanced reliability for the electricity system	8. Innovation	8.1 Implementation of the emerging technology, research and development plan for electricity sector innovation for work streams, including distributed energy resources, storage and data access, resource efficiency (e.g., automation, artificial intelligence) and achieve milestones identified for 2019
Cost Efficiency	Best cost resource acquisition to efficiently manage IESO-administered markets in an evolving sector	• Improve the way electricity is priced, scheduled and procured, including renewing the market to generate a projected net present benefit value of $3-5 billion • Achieve 2020 energy-efficiency targets while leading province-wide efforts • Maximize and broaden the use and value of smart meter data products	9. Renewal 10. Resource Acquisition 11. Data Availability	9.1 Market Renewal Program (MRP) cost performance index (CPI) and schedule performance index (SPI) year-end accumulated averages are each above 0.9 9.2 Develop the MRP business case by end of 2019 that considers the following high-level designs: – Single schedule market – Day-ahead market – Enhanced real-time unit commitment – Incremental capacity auction 10.1 The 2015-2020 conservation energy savings target is contracted within 4 cents/kWh 11.1 Develop an integrated enterprise level data strategy by end of 2019

Appendix 2: Key 2019 Risks

The IESO's established enterprise risk management (ERM) framework is in place to identify, assess and manage risks that the IESO faces in achieving the organization's strategic objectives as demonstrated through the effective execution of its 2019 - 2021 Business Plan.

In 2018, the IESO reassessed its ERM program to ensure stronger alignment with the strategic and business plan in order to support decision-making in key areas within the business, as well as ensure continuous monitoring of its operating environment for early identification of emerging risks.

The IESO formally assesses risks to the business annually and has identified seven key risks in relation to the areas of strategic focus. Mitigation plans have been defined and are in place for the 2019 key risks. The IESO's Executive Leadership Team and senior management representatives from each of the organization's business units are leveraged for their subject matter expertise to support the effective assessment of risks and to report on the execution of mitigation plans.

Focus Areas	Key Risks
Reliability and Resiliency	A significant cybersecurity event occurs that disrupts the operation of the IESO – including reliable grid operations and efficient market operations – for extended periods of time
Reliability and Resiliency	A significant cybersecurity event occurs that disrupts the operation of the IESO – including reliable grid operations and efficient market operations – for extended periods of time
Reliability and Resiliency	Failure of critical Control Room tools challenges our ability to effectively manage grid reliability and market operations
Cost Efficiency	The Market Renewal Program is adversely affected by system dependencies, and/or a lack of resources with market design and implementation expertise
Corporate Agility and Effectiveness	Current workforce capabilities, capacity and allocation do not support the IESO's ability to effectively execute its mission, strategy and expanding responsibilities
Sector Leader – Purposeful Engagement	Insufficient support from key stakeholders and communities impedes the IESO's ability to effectively pursue key initiatives
Sector Leader – Purposeful Engagement	Change in provincial energy policy impacts IESO initiatives and programs, government directives and sector structure

Appendix 3: IESO Capital Spending

Summary of 2019 – 2021 Capital Spending

Change Initiatives/Projects ($ Millions)	2019 Plan	2020 Plan	2021 Plan
Operations Readiness Initiatives (ORI Program)	0.3		
Wallboard Refresh	2.0		
Infrastructure Refresh	2.6	3.0	3.0
Replacement of the Settlement Systems	1.5	3.0	6.0
FIT & microFIT Tool Redevelopment and Integration Project	0.2		
Aspen Refresh Project	0.2		
IESO Simulator Project – Phase 2	0.3		
Wide Area View	0.5	2.5	0.5
PMU Phase 3	1.0	2.5	0.5
Oracle 12c Technical Refresh	1.4		
Tier1 Storage Refresh project	0.1	1.0	
SCADA/EMS Replacement		3.5	6.0
Control Room Upgrade	1.5		
IT Service Management (ITSM)	0.2	0.5	0.3
Dispatch Data Management System (DDMS) Refresh	0.7	1.5	1.0
Access Switches		1.0	
Capital ($1 million & above)	**12.5**	**18.5**	**17.3**
Other Initiatives / Projects (Less than $1 million)	4.8	1.8	0.6
Total w/o Market Renewal Program	**38.0**	**43.3**	**40.8**
Market Renewal Program (MRP)	4.0	34.0	48.0
Total Capital including MRP	**55.3**	**63.6**	**58.7**

2019–2021 Capital Plan Details

Project Name	Project Description
ORI Program	A holistic review of all the processes and tools in Operations in order to sustain the level of services to meet reliability standards with the efficient use of resources.
Wallboard Refresh	This project will replace control room wallboards that have reached end of life at both the Clarkson and Backup Operating Centres.
Infrastructure Refresh	This includes a number of miscellaneous building services, software license renewals and procurement of hardware.
Replacement of the Settlement Systems	Given the age of the systems, the evolution of the market since 2002, expected market redesign through the Market Renewal Program and the changing scope of IESO settlements arising from the merger of predecessor organizations, the current settlement systems are being replaced to ensure they can meet current and future business needs.
FIT & microFIT Tool Redevelopment and Integration Project	The FIT and microFIT Tool Redevelopment and Integration Project will integrate the contract management functions of both the FIT and microFIT programs.
Aspen Refresh Project	As the IESO's corporate fileserver, Aspen is the repository for much of IESO's business information. As part of this project, the underlying hardware and software for Aspen will be replaced, and the data migrated to the new fileserver.
Access Switches	Replace existing network access switches.
IESO Simulator Project – Phase 2	The IESO Simulator Project – Phase 2 will allow us to fully integrate Energy Management System (EMS) security applications into the simulation environment, improving our ability to simulate more realistic power system conditions.
Wide Area View	This project will achieve improved situational awareness and maintain compliance with NERC IRO standards by: 1) Expanding the IESO's power system detailed network model to include neighbouring RC areas; 2) Enabling appropriate contingency monitoring in areas outside of Ontario that impact operating limits within the province; 3) Providing control room operators with timely information and instructions to respond to monitored external events.
PMU Integration – Phase 3	This project will provide time based power system information (PMU data) from the Ontario grid and neighbouring jurisdictions to the IESO, address reputational risks and possible regulatory requirements, allow enhanced offline analysis tools, facilitate demonstration of compliance with a number of NERC reliability standards, and allow expansion to real-time deployment in the control room after further consideration.

Project Name	Project Description
Tier 1 Storage Refresh Project	Replacement of the IESO's existing Tier 1 storage platform, which provides the substantial disk storage required by many of the critical applications and databases used at IESO, with a new platform.
Oracle 12c Technical Refresh	The Oracle Real Application Cluster (RAC) 11g database service supports a number of the IESO's mission critical applications. This project will move our database service to a supported Oracle platform, in response to Oracle's decision to end premier support for the current in-use version.
SCADA/EMS Replacement	This project will review our energy management and data acquisition requirements to establish a platform that provides the control room and back office staff with the tools necessary to monitor and manage power system reliability.
Dispatch Data Management System (DDMS) Refresh	This project will move the Dispatch Data Management System (DDMS) to a vendor-supported hardware and software platform and introduce a number of upgrades to address reliability and performance concerns and enhance functionality of the current DDMS.
IT Service Management (ITSM)	This program that will be responsible for two key organizational deliverables: 1. Reviewing, updating and enhancing the processes and tools used for IT Service Management (ITSM) 2. Enhancing and consolidating the IESO Helpdesk functions.
Control Room Upgrade	This project will replace a number of end-of-life assets – specifically monitors, desks, lighting, wallboard and carpeting – within the IESO Clarkson control room to to improve efficiency and enable the human performance improvements identified as part of the Operations Readiness Initiative (ORI).

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Ontario

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MC-994-2018-98

Mr. Peter Gregg
President and CEO
Independent Electricity System Operator (IESO)
1600–120 Adelaide Street West
Toronto ON M5H 1T1

Dear Mr. Gregg:

Thank you for submitting the IESO proposed 2019-21 Business Plan (Plan) for my approval.

The Ministry has reviewed the Plan. I am satisfied that the Plan has taken into account the requirements set out in our Memorandum of Understanding. I am also satisfied that the 2019 budget and related activities set out in the Plan reflect the appropriate scope and resourcing to advance the Market Renewal Project, Cybersecurity as well as meeting the responsibilities of the IESO's core mandate.

I expect future Market Renewal Project resourcing beyond 2019 will be further reassessed in future business plans and in the IESO's proposed expenditure and revenue requirements submitted to the Ontario Energy Board. I hope that the IESO will continue to focus on operating efficiency and ensuring maximum value for ratepayers.

This letter constitutes my approval of the Plan in accordance with my authority under subsection 24(2) of the *Electricity Act, 1998.*

I look forward to working with the IESO on the opportunities that lie ahead.

Sincerely,

The Honourable Greg Rickford
Minister of Energy, Northern Development and Mines

c: Tim O'Neill, Chair, IESO
Stephen Rhodes, Deputy Minister of Energy
Carolyn Calwell, ADM, Strategic Network & Agency Policy, Ministry of Energy

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2018 AUDITED FINANCIAL STATEMENTS

TO BE FILED AT A LATER DATE

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2019 REVENUE REQUIREMENT AND USAGE FEE METHODOLOGY

Methodology for Calculating the IESO's 2019 Usage Fee

2019 Net Revenue Requirement

The first step required to calculate the IESO's 2019 proposed usage fee is to determine the net revenue required. The IESO intends to hold its net revenue requirement at the levels approved in 2018 and 2017. The IESO's operating costs are forecasted at $190.8 million as provided in Table 1 below.

Table 1: IESO's 2019 Revenue Requirement ($ millions)

Revenue Requirement Calculation for IESO Usage Fee	
($ million)	**2019**
Operating costs	190.8
2019 Net Revenue Requirement	**190.8**

Operating Costs

The IESO requests approval of its net revenue requirement of $190.8 million for 2019. The IESO's proposed 2019 revenue requirement is described more fully in the 2019-2021 Business Plan (Exhibit A-2-2). On December 11, 2018, the President & CEO of the IESO received a letter from the Minister of Energy, Northern Development and Mines (the "Minister") approving the Business Plan, which is included in this application at Exhibit A-2-3.

Steps to fulfill section 25(1) of the Electricity Act, 1998

As part of Issue 2.2 of the approved 2018 Settlement Proposal (EB-2018-0143) ("the Package Settlement") the IESO agreed to do all it reasonably could to file its revenue requirement submission in accordance with the timing set out in section 25(1) of the *Electricity Act, 1998* ("Act"). With this submission, the IESO has filed its application three months earlier than the filing of its 2018 Revenue Requirement Submission. The IESO expects that this application will be dispensed with prior to the time that the IESO will file its 2020-2022 Business Plan with the Minister.

In furtherance of its commitment in the Package Settlement, the IESO is investigating the potential for a multi-year revenue requirement submission to assist with meeting the timing prescribed in section 25(1) of the Act.

IESO Revenue Adjustments

In addition to the usage fees, the Ontario Energy Board ("OEB") approved the following registration fees in the IESO's 2018 Revenue Requirement Submission:

- Registration fees of up to $10,000 per proposal for electricity supply and capacity procurements, including ancillary services,
- The application fee of $1,000 per application for market participants.

The IESO is seeking approval to continue with these registration fees in 2019. The IESO forecasts that it will receive negligible revenues through registration fees in 2019.

Charge Determinants

The domestic usage fee is calculated using the most recent IESO 18-month forecast of withdrawals in 2019 for use in Ontario, less estimated losses, plus generation embedded in local distribution networks; which is a proxy for the Allocated Quantity of Energy Withdrawn ("AQEW"). The export usage fee will be calculated using the most recent IESO

18-month forecast of exports in 2019, less estimated losses; which is a proxy for the Scheduled Quantity of Energy Withdrawn ("SQEW"). Line losses will be split between export and domestic customers based on their proportion of the total 2019 forecast energy volumes. The calculation is shown in Table 2 below. The domestic forecast for this 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.

Table 2: Forecast 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	134.8	153.9	87.6%	3.0	2.6
Export	19.1		12.4%		0.4

Total 2019 transmission losses are forecast at 3.0 TWh. Domestic customers will be allocated 87.6% of these losses, which amounts to 2.6 TWh, and export customers will be allocated 12.4%, which amounts to 0.4 TWh.

The IESO therefore 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 2019 IESO Usage Fees

	2019 – Domestic (TWh)	2019 – Export (TWh)
18 Month Outlook demand forecast	134.8	19.1
Embedded generation	7.8	
Domestic transmission losses	-2.6	
Exports transmission losses		-0.4
Energy Volumes	**140.0**	**18.7**
Total Energy Volumes	**158.7**	

Calculation of the Usage Fees

The next step is the calculation of the domestic and export usage fees. The IESO's OEB-approved fees for domestic and export customers for the past three years were calculated for the IESO by Elenchus using a model developed and approved through the 2016 Revenue Requirement Submission proceeding (EB-2015-0275) to allocate costs between these two customer classes. To calculate the 2019 usage fees, the IESO requested Elenchus to rerun its model using 2019 business unit budgets and energy as described above. With these inputs, the Elenchus model calculated the domestic and export usage fees as shown in Table 4 below:

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

	2019 Usage Fee
Domestic	$1.227/MWh
Export	$1.0125/MWh

Implementation of the 2019 Usage Fees

On October 25, 2018, the OEB issued its decision approving the IESO's 2018 domestic and export usage fees of $1.2402/MWh for domestic customers and $1.0115/MWh for export customers. The approved domestic and export usage fees were made interim effective for January 1, 2019 by way of OEB's Decision on Interim Fees issued on December 18, 2018. The IESO proposes to continue to charge both interim usage fees to the same pools of market participants the OEB approved in EB-2018-0143 until the end of the month in which OEB approval is received for the 2019 usage fees.

The IESO requests approval of a domestic usage fee of 1.227/MWh and export usage fee of 1.0125/MWh to be paid commencing January 1, 2019. Once OEB approval of the IESO's 2019 domestic and export fees is received, the IESO proposes to charge (or rebate) market participants the difference between the 2019 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 2019 usage fees. Any such charges (or rebates) will be provided in the next billing cycle following the month in which OEB approval is received.

Work performed by IESO but not funded through its fees

Green Ontario Fund

The IESO had supported the Green Ontario Fund, which was referred to as the Ontario Climate Change Solutions Deployment Corporation a provincial crown corporation, by providing staff to perform work on its behalf. The Green Ontario Fund has been cancelled and applications were no longer accepted beyond September 30, 2018. In 2019, the IESO will be supporting the Green Ontario Fund as it draws its operations to a close.

Cost Allocation Study

As part of its 2017 Revenue Requirement Submission (EB-2017-0150), the IESO procured BDR North America Inc. ("BDR") to undertake a cost allocation study on the charges associated with staff and services the IESO provides to third parties. The report was completed and filed as part of the IESO's 2018 Revenue Requirement Submission. The report concluded that any work conducted by the IESO in support of its function as the Smart Metering Entity ("SME") should be fully allocated to the SME.

In addition, through the Package Settlement the IESO agreed to apply the same cost allocation principles used for the SME to the Market Assessment and Compliance Division's enforcement ("MACD Enforcement") activities. While these activities were not included in the BDR Report, it was agreed that they are of a similar type of non-fees funded activity of the IESO. Therefore, costs the IESO incurs for work and staff time in support of MACD Enforcement will be charged to MACD Enforcement in the same manner as such work is done to support the SME is charged to the SME.

The IESO's 2019 Operating Reserve

In the Package Settlement, the IESO agreed to an operating reserve of $6 million for 2018[1]. This amount represents 3% of the IESO's revenue requirement. This operating reserve level was originally reduced from its 2016 $10 million level through the 2017 Package Settlement (EB-2017-0150) to reflect a reduction of $4 million of the MRP operational budget. The offsetting reduction in the operating reserve to account for the 2017 MRP operational budget was approved as appropriate at that time.

[1] EB-2018-0143, OEB Decision and Order, October 25, 2018

In response to potential volatility in spending driven by changes in the volume of activities and the external environment, the IESO is seeking approval to retain an operating reserve of $10 million in 2019. The operating reserve is maintained in order to address cost or revenue variances from forecasts that are not always within the control of management nor reasonably foreseeable, a practice that is aligned with the practices of other similar sector organizations. The proposed $10 million operating reserve is approximately 5% of the IESO's proposed 2019 net revenue requirement. For comparison, the OEB maintains an operating reserve which equals 20% of the OEB's current annual funding requirement of approximately $43 million in 2018. As the IESO looks forward to the remainder of 2019, the IESO believes that $10 million will be a reasonable and adequate reserve against the uncertainties referred to below.

The primary objective of maintaining an operating reserve is to fund operations in the event of revenue shortfalls or unanticipated expenditures. As in past years, the operating reserve will be retained in the IESO's Forecast Variance Deferral Account ("FVDA").

Given the scope and complexity of the IESO's mandate, the IESO recognizes the potential for additional unplanned work activities that may be material in scope and are beyond the control of management. This potential work is described below under the heading, Risks.

Risks

The IESO forecasts of its revenues and operating expenses include inherent risks associated with forecasting uncertainty (e.g. exchange rate, change in total demand). 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 2019-2021 Business Plan was submitted to the Minister on September 2, 2018 and approved by the Minister on

December 11, 2018. 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.

The IESO faces a number of key strategic and operational risks in achieving the organization's strategic objectives as demonstrated through the effective execution of its 2019-2021 Business Plan including:

- A significant cybersecurity event;
- The breadth and pace of change of Ontario's evolving energy sector;
- Failure of critical Control Room tools;
- Market Renewal Program risks including system dependencies and a lack of required market design and implementation expertise;
- Current workforce capabilities, capacity and allocation;
- Insufficient support from key stakeholders and communities;
- Change in provincial energy policy.

Please refer to Appendix 2 of the IESO's 2019-2021 Business Plan at Exhibit A-2-2 for a complete description of the key risks.

2019 REGISTRATION AND APPLICATION FEES, FORECAST VARIANCE DEFERRAL ACCOUNT AND CAPITAL EXPENSES

2019 Registration and Application Fees

The OEB approved the following registration fees in the IESO's 2018 Revenue Requirement Submission:

- Registration fees of up to $10,000 per proposal for electricity supply and capacity procurements, including ancillary services;
- The application fee of $1,000 per application for market participants.

The IESO seeks approval to continue to charge the above fees. The IESO forecasts that it will receive negligible revenues through these registration fees in 2019.

The Forecast Variance Deferral Account

In its 2018 Revenue Requirement Submission, the IESO sought, and the Board approved, the continuation of the Forecast Variance Deferral Account ("FVDA").

The IESO requests approval to continue to use the FVDA. The IESO's revenue requirement is a fixed amount approved by the OEB with the 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, there is inherently a variance between the forecast withdrawals and actual withdrawals. Similarly, it is to be expected that there will generally be some variance between actual revenues and expenses and the OEB-approved revenue requirement. The IESO proposes to continue to track these variances through the FVDA.

Operating Reserve

As part of the approved 2017 Package Settlement, under Issue 4.1, $4.0 million was rebated out of the $10 million 2016 operating reserve to account for a reduction in the 2017 Market Renewal Program operational budget. In 2018, the operating reserve balance of $6 million amount was approved in the EB-2018-0143 OEB Decision and Order. Given the scope and complexity of the IESO's mandate, the IESO recognizes the potential for additional unplanned work activities that are beyond the control of management. The IESO is seeking approval to increase the operating reserve back to its approved 2016 operating reserve level of $10 million as set out further in Exhibit B-1-1.

Capital Expenses

The IESO is seeking approval of its proposed 2019 capital expenditure envelope of $55.3 million for capital projects, inclusive of $38 million for the MRP. A summary of capital spending and associated project descriptions is included in Appendix 3 of the IESO's approved 2019–2021 Business Plan at Exhibit A-2-2. The forecasted 2019 capital envelope for Core Operations and MRP compared to 2017 and 2018 budgeted envelope and actual is shown in Table 4 below:

Table 4: 2019 Capital Envelope compared to 2017 and 2018

Capital ($ millions)	2017 Envelope	2017 Actuals	2018 Envelope	2018 Estimate*	2019 Envelope
Core Operations	25.0	15.4	22.6	14.4	17.3
Market Renewal Program	--	0.2	4.0	1.2	38.0
Total	25.0	15.6	26.6	15.6	55.3

*Finalized 2018 data will be available when the IESO's 2018 Audited Financial Statements are completed.

In 2019, MRP costs will be predominantly classified as capital expenses as the program starts the detailed design related to the energy and capacity work streams. In 2017 and 2018, capital spending levels were lower than planned primarily due to changes in timing of capital projects, the initial stages of development of which are treated as expenses.

In order to improve forecast accuracy, the IESO introduced an enhanced project prioritization process in late 2018, to identify and prioritize the projects that support the IESO's strategic outcomes, while balancing the need to maintain our critical IT systems.

The IESO's portfolio of capital projects found in Appendix 3 of the Business Plan, reflects the IESO's capacity to support enterprise-wide projects while delivering on the MRP. Similar to previous years, the IESO regularly examines its portfolio throughout the year to ensure that it continues to support the IESO's strategic outcomes and make adjustments as required. Specific projects are committed individually throughout the year within the total capital envelope.

The IESO will continue to focus on capital project alignment with its strategic themes as outlined in Appendix 1 of the Business Plan.

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2018 ESTIMATEYEAR-END FINANCIALS, SURPLUS AND STAFFING

Latest Estimate 2018 Financial Results

Table 1 below outlines the IESO's 2018 latest estimate operating results and variances against its 2018 budget. The Market Renewal Program is listed as a separate expense item.

Table 1: 2018 Latest Estimate Operating Expenses compared to 2018 Budget (with Market Renewal Program as separate expense item)

	2018		
($ millions)	**Latest Estimate**	**Budget**	**Variance**
Revenues	194.8	190.8	4.0
Costs			
Operating Costs	175.2	176.5	(1.3)
Amortization	18.8	17.7	1.1
Net Interest	(4.8)	(3.4)	(1.4)
Total Costs	189.2	190.8	(1.6)
Market Renewal Program	15.0	12.7	2.3
Operating Surplus	5.6	(0.0)	5.6
Accumulated Operating Surplus (opening balance)	6.0	6.0	0.0
Proposed Rebates to Market Participants	1.6	0.0	1.6
Accumulated Operating Surplus (closing balance)	10.0	6.0	4.0

Surplus Rebated to Usage Fee Payers

Based on the latest estimates, the 2018 surplus is forecasted to be $5.6 million. The surplus is due to an estimated revenue balance that is $4.0 million higher than planned and total costs $1.6 million lower than planned.

Of the estimated $5.6 million surplus, $4.0 million is proposed to be allocated to the operating reserve to return it to its 2016 level of $10 million.

In 2018, the difference between actual and forecast demand resulted in an additional $4.0 million in revenue collected from domestic customers.

Total costs, excluding MRP, were lower than planned, primarily due to operating cost savings and higher than planned net interest. Operating costs were $3.6 million lower than planned as a result of reduced spending on market enhancement initiatives and consulting support, as well as reduced general administration expenses.

Net interest was $1.4 million higher than planned as a result of higher interest earned on funds passing through the IESO wholesale market.

Staffing

The 2018 full-year average actual headcount is estimated to be 715 staff; 650 regular staff and 65 temporary staff, which is 16 staff below the 2018 budgeted average annual staff levels. As of December 31, 2018, IESO's total headcount is estimated to be 756 staff, including 678 regular staff and 78 temporary staff, which is 3 FTEs above the December 31st budget. Higher than budgeted staffing levels in MRP were offset by Operating headcount vacancies.

The lower than budgeted average regular headcount is mainly due to timing differences in hiring of temporary resources to backfill for staff supporting the MRP.

Table 2: 2018 Latest Estimate Staffing Levels Compared to 2018 Budget

Staff	2018 Average Latest Estimate	2018 Average Budget	Variance	2018 Dec 31st Latest Estimate	2018 Dec 31st Budget	Variance
Operating Headcount						
Regular	599	657	(58)	616	665	(49)
Temporary	54	31	23	64	36	28
Operating Headcount **Total**	**653**	**688**	**(35)**	**680**	**701**	**(21)**
Market Renewal Headcount						
Regular	51	43	8	62	52	10
Temporary	11	-	11	14	-	14
Market Renewal Total*	**62**	**43**	**19**	**76**	**52**	**24**
IESO Total	**715**	**731**	**(16)**	**756**	**753**	**3**

**Note: "The Market Renewal Total" represents incremental MRP headcount, while partial and shared MRP headcounts are counted in their home business unit totals that make up the "Operating Headcount Total".*

Market Renewal Program

The spending in 2018 for the MRP was focused on identifying and acquiring resources to support and complete the high-level design activities. Table 3 below outlines the MRP's 2018 actual results and variances against the 2018 budget. At the program level, MRP was underspent by $0.4 million or 3% in 2018. Operating results were $2.3 million above budget, while capital results were $2.7 million under budget. This variance corresponds to the delayed completion of work stream high level designs. Only detailed design work for the Single Schedule Market was started in 2018. More details can be found in the MRP Cost Report in Exhibit C-2-1.

Table 3: 2018 Market Renewal Program Results

	2018		
($ millions)	**Latest Estimate**	**Budget**	**Variance**
Operating Results			
Compensation & Benefits	9.2	7.4	(1.8)
Professional & Consulting	5.0	4.1	(0.9)
Operating & Administration	0.8	1.2	0.4
Total Operating Costs	**15.0**	**12.7**	**(2.3)**
Capital Results			
Compensation & Benefits	0.3	1.9	1.6
Professional & Consulting	0.3	1.4	1.1
Operating & Administration	0.7	0.7	-
Total Capital Costs	**1.3**	**4.0**	**2.7**
Program Results			
Compensation & Benefits	9.5	9.3	(0.2)
Professional & Consulting	5.3	5.5	0.2
Operating & Administration	1.5	1.9	0.4
Total Program Results	**16.3**	**16.7**	**0.4**

Four Standard Financial Reporting Forms

As per the OEB-approved Package Settlement for the IESO's 2017 Revenue Requirement Submission (EB-2017-0150), the four standard financial reporting forms have been filed as attachments to this exhibit as follows:

- Attachment 1 - Appendix 2-AA (Capital Projects)
- Attachment 2 - Appendix 2-JB (Operations and Administration Cost Drivers)
- Attachment 3 - Appendix 2-JC (Operations and Administration Programs)
- Attachment 4 - Appendix 2-K (Employee Costs)

APPENDIX 2-AA CAPITAL PROJECTS

Capital Projects Table (Note 1)

Change Initiatives/Projects (in millions)	2018 Estimate	2019 Plan	2020 Plan	2021 Plan
MIS Upgrade	1.3	-	-	-
Data Centre Capacity Management	1.7	-	-	-
Operations Readiness Initiatives (ORI Initiatives)	2.0	0.3	-	-
Wallboard Refresh	1.8	2.0	-	-
Infrastructure Refresh	1.1	2.6	3.0	3.0
Replacement of Settlement Systems	-	1.5	3.0	6.0
FIT & microFIT Tool Redevelopment and Integration Project	0.8	0.2	-	-
Aspen Refresh Project	0.6	0.2	-	-
IESO Simulator Project – Phase 2	0.2	0.3	-	-
Wide Area View	0.2	0.5	2.5	0.5
PMU Phase 3	-	1.0	2.5	0.5
Oracle 12c Technical Refresh	-	1.4	-	-
Tier 1 Storage Refresh	-	0.1	1.0	
SCADA/EMS Replacement	-	-	3.5	6.0
Control Room Upgrade	-	1.5	-	-
IT Service Management (ITSM)	-	0.2	0.5	0.3
Dispatch Data Management System (DDMS) Refresh	-	0.7	1.5	1.0
Access Switches	-	-	1.0	-
Capital ($1M & above)	**9.7**	**12.5**	**18.5**	**17.3**
Other Capital Initiatives/Projects	4.7	4.8	1.8	0.6
Core Operations Capital	**14.4**	**17.3**	**20.3**	**17.9**
Market Renewal Program (MRP)	1.2	38.0	43.3	40.8
Total Capital including Market Renewal	**15.6**	**55.3**	**63.6**	**58.7**

Note 1: The Change Initiatives/Projects reflects the IESO 2019-2021 Business Plan (Exhibit A-2-2), with the 2018 estimates updated with more recent values.

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APPENDIX 2-JB COST DRIVERS

Appendix 2-JB
Cost Drivers Table

(in thousands)	2018 Latest Estimate	2019 Budget
Previous Year Actual	**183,297**	**189,196**
Compensation & Benefits	3,264	- 684
Professional & Consulting Fees	1,247	1,802
Operating & Administration	1,632	1,998
Amortization	621	- 425
Interest	- 865	- 1,084
Total Actual/Application Year Budget	**189,196**	**190,803**

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APPENDIX 2-JC OM&A PROGRAMS

Appendix 2-JC
Operating Tables Table

(in $ millions)		2018 Latest Estimate	2018 Budget	2019 Budget
CEO		**7.9**	**7.7**	**7.7**
	CEO Office	6.5	6.0	6.3
	Internal Audit	1.4	1.6	1.5
Planning, Acquisition and Operations		**40.8**	**46.2**	**44.2**
	VP Office	1.2	1.8	0.7
	Power System Assessments	14.1	14.9	15.1
	Resource Planning	4.3	4.3	4.8
	Transmission Planning	3.6	4.2	4.9
	Market Operations	14.7	16.1	15.7
	Markets & Procurement	2.8	5.0	3.0
Policy, Engagement and Innovation		**20.6**	**22.1**	**24.5**
	VP Office	1.0	0.5	0.8
	Energy Efficiency	4.7	4.1	4.4
	Alliances and Marketing	2.9	2.9	3.4
	Corporate & Indigenous Relations	6.9	8.0	8.4
	Policy Innovation	2.9	3.9	4.7
	Regulatory Affairs	2.2	2.8	2.8
Information and Technology Services		**39.9**	**39.7**	**41.8**
	VP Office	1.3	1.1	0.6
	Organizational Governance Support	1.6	1.3	1.9
	Information Security	3.5	3.9	5.5
	Business Solutions	16.0	15.3	16.7
	Technology Services	17.5	18.1	17.2
Legal Resources and Corporate Governance		**15.4**	**15.3**	**14.1**
	VP Office	1.1	1.1	1.3
	General Counsel	5.9	5.3	5.0
	Board	0.7	0.7	0.7
	Contract Management	7.8	8.2	7.0
Corporate Services		**24.8**	**23.8**	**24.4**
	VP Office	0.9	0.4	0.5
	Finance & Treasury	3.5	3.5	3.7
	Procurement	1.5	1.6	1.5
	Financial Planning and Analysis	1.6	1.5	1.5
	Settlements	5.2	5.4	5.4
	Enterprise Change	3.7	2.7	2.8
	Facilities	8.4	8.7	9.0
Human Resources		**5.1**	**5.1**	**5.0**
Market Assessment and Compliance Division		**1.6**	**1.9**	**2.0**
Market Renewal		**15.0**	**12.7**	**11.7**
Corporate Adjustments		**18.1**	**16.3**	**15.3**
	General	4.1	2.0	2.8
	Amortization	18.8	17.7	18.4
	Interest	- 4.8	- 3.4	- 5.9
Total		**189.2**	**190.8**	**190.8**

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APPENDIX 2-K EMPLOYEE COSTS

Appendix 2-K				
Employee Costs				
	2017 Actual	**2018 Latest Estimate**	**2018 Budget**	**2019 Budget**
Number of Employees (FTEs)				
Executive	7	7	6	7
Management	107	118	118	132
Non-Management Regular	534	528	575	633
Non-Management Temporary	53	62	32	71
Total	701	714	731	842
All figures below are in $ millions				
Total Salary and Wages				
Executive and Board	3.2	3.4	2.8	3.4
Management	14.9	17.7	18.6	17.4
Non-Management Regular	62.0	59.6	63.1	63.8
Non-Management Temporary	6.2	8.1	4.0	5.2
Total	86.3	88.9	88.5	89.8
Total Benefits				
Executive	0.9	0.9	0.7	0.9
Management	5.5	6.1	6.1	5.8
Non-Management Regular	22.5	22.5	21.9	21.8
Non-Management Temporary	1.0	1.0	0.5	0.7
Total	29.9	30.6	29.2	29.1
Total Compensation (Salary, Wages & Benefits)				
Executive and Board	4.1	4.3	3.5	4.2
Management	20.4	23.8	24.7	23.2
Non-Management Regular	84.5	82.2	85.0	85.7
Non-Management Temporary	7.2	9.1	4.5	5.8
Total	116.2	119.5	117.7	118.9

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IESO REGULATORY SCORECARD

The IESO's 2019 Regulatory Scorecard ("Scorecard") is included as Attachment 1 to this exhibit. The Scorecard has been updated to reflect 2018 actual values for each of the measures, as well as 2019 targets.

The IESO continues to be supportive of a Scorecard to assist the OEB in its decision - making process when reviewing the IESO's proposed expenditure and revenue requirements. As experience with the Scorecard is gained, the IESO would seek direction from the OEB on which measures the OEB finds useful for its decision-making process. If there are measures in the IESO's Scorecard that the OEB does not find useful in its review of the IESO's proposed revenue requirements and expenditure, the IESO respectfully submits that these measures be removed from the IESO's Scorecard and that no further reporting on these measures be required.

The IESO has made an effort to set 2019 targets that are realistic and attainable. As the IESO gains experience with the Scorecard and the measures evolve, the IESO will continue to refine the targets in future years.

Stakeholder Satisfaction Measure

For the purposes of the Scorecard the current measure for stakeholder satisfaction is based on a basket of metrics for several stakeholder categories including overall stakeholder satisfaction, satisfaction with the engagement process, relevance of the engagement and perceived IESO commitment to engagement. The IESO is proposing to replace the current measure with a more focused measure: meeting or exceeding stakeholder expectations of their engagement with the IESO. For 2019, the target will be to maintain the 2018 score, i.e. at least 80% of stakeholders indicate that their experience with IESO's engagement meets or

exceeds their expectations. Historical results for this measure, which are available from previous year surveys, are also provided in the Scorecard.

New Operational Effectiveness Measure

As per the obligation set out in Issue 5.1 of the 2018 Package Settlement, the IESO has proposed a new metric specifically related to its market assessment and compliance activities which is included in the attached 2019 Scorecard. The new measure fulfills the commitment set out in the 2018 Package Settlement and underlines the IESO's commitment to its role in governing and monitoring the market. The IESO performs risk based assessment of market events and then triages these events for further action. In 2019, the IESO will target 80% of the highest impact market events are triaged within 14 days of observation, ensuring highest impact market events are addressed in a timely manner.

Market Renewal Program Measure

As described in Exhibit C-2-1 "Market Renewal Program Cost Report", the IESO filed baseline MRP schedules and a budget with the OEB on January 2, 2019. The baseline schedules allow the IESO to track performance measures such as Schedule Performance Index ("SPI") and Cost Performance Index ("CPI") on a going-forward basis starting January 1, 2019. The target listed in the Scorecard for 2019 is +/- 5% of total budget, 0.95 to 1.05 for CPI, and 0.9 to 1.1 for SPI.

MARKET RENEWAL PROGRAM COST REPORT

The Market Renewal Program ("MRP") Cost Report is a separate cost centre related specifically to MRP spending that was established through the IESO's 2017 Revenue Requirement Submission.

As part of the approval of the 2018 Package Settlement the IESO filed its baseline MRP schedules and budget with the OEB on January 2, 2019. The baseline MRP schedules and budget are provided as Attachment 1 to this exhibit.

The Market Renewal Program

The IESO's MRP represents the most ambitious set of enhancements to Ontario's electricity market design since market opening in 2002. The MRP will address known issues with the existing market design and will deliver ratepayer value by meeting system needs more cost-effectively. Market renewal is about improving the way electricity is priced, scheduled and procured in order to meet Ontario's current and future electricity needs reliably, transparently, and efficiently.

In 2019, the MRP will be entering the detailed design phase for both the Energy and Capacity work streams of the program. The current total program budget is estimated at $247 million, with further budget refinement expected upon completion of the business case at the end of 2019. The total budget estimate captures additional work to enable participation in future markets, as well as legal and consulting support for the development of market rules and additional design elements.

The MRP was formalized as a project in the IESO's 2017-2019 Business Plan and significant progress has been made on the initiative since that time. The program includes four initiatives that will continue in 2019 and beyond.

Table 1: MRP Work Streams and Initiatives

MRP Work Stream	Initiatives
Energy	• Single Schedule Market • Day-Ahead Market • Enhanced Real-time Unit Commitment
Capacity	• Incremental Capacity Auction

- **Single Schedule Market**

  The IESO is working with stakeholders to design and develop a single schedule market ("SSM") to replace the existing two schedule system. This initiative is a key foundational element of the IESO's MRP and will help ensure that the system will send transparent price signals to meet different system needs. The SSM will substantially reduce out of market payments associated with congestion management settlement credits.

- **Day-Ahead Market**

  The IESO is working with stakeholders to design and develop a financially-binding Day-Ahead Market ("DAM"). A Day-Ahead Market will provide market participants with price certainty ahead of real-time and increase operational certainty for both market participants and the IESO.

- **Enhanced Real-time Unit Commitment**

  The IESO is working with stakeholders to design and develop an Enhanced Real-Time Unit Commitment ("ERUC") program. An ERUC program will improve the efficiency of unit commitments in the intra-day timeframe by considering all resource costs in commitment decisions and reduce out of market payments associated with the current real-time generator cost guarantee program. An ERUC program will also improve commitment decisions overall by optimizing over multiple hours rather than solving for each hour independently.

- **Incremental Capacity Auction**

  The IESO is working with stakeholders to design and develop an Incremental Capacity Auction ("ICA"). The ICA initiative will develop an enduring market-based mechanism that will secure incremental capacity to help ensure Ontario's reliability needs are met cost effectively. Developing an ICA is a key element of the IESO's MRP.

In 2018, the primary focus of the MRP was the development of a High-Level Design ("HLD") for each initiative within the program. Throughout this process the IESO engaged with stakeholders to ensure their perspectives were considered in the design of Ontario's future electricity markets. In September, the IESO published the draft HLD for the SSM. In December, draft HLDs for the DAM and ERUC initiatives were published. Over the course of 2018, the IESO also presented many of the key design decisions that will be included in the HLD for the ICA. A draft version of the ICA HLD is targeted for publication prior to the end of Q2 2019.

In 2019, a number of milestones are expected to be achieved for the MRP. Stakeholder feedback on each of the draft HLDs will be reviewed and the documents will be finalized, closing the HLD phase of the program. The detailed design phase of the program will be launched, signaling a change of focus from a higher-level framework for the design to a more in-depth exploration of the tools and processes that will need to evolve and examining the extent of market rule and manual changes.

The IESO will also develop a business case for the MRP. In 2017, a benefits case for the program was published, providing an early assessment of the potential benefits of the program. With the completion of the HLD phase of the MRP, the IESO will be in a position to produce a business case which more closely reflects the market design that will be implemented in Ontario. The business case will be provided to the IESO Board of Directors for approval in Q3 2019 and to stakeholders thereafter.

At the program level, the focus in 2019 includes more detailed planning for detail design and implementation, as well as monitoring and controlling the execution of the 2019 detailed design activities, as further described below.

Engaging Stakeholders

In order to develop HLDs for the MRP initiatives, the IESO has engaged regularly with stakeholders throughout 2017 and 2018 across a number of forums.

Engagement on the decisions within the Energy work stream HLDs has occurred primarily at stakeholder engagement meetings for each of the initiatives. For example, in 2018, the IESO hosted eight engagement meetings for each of the SSM, DAM, and ERUC. Average participation for these meetings ranged from 55 to 60 stakeholders per session. Similarly,

design discussions for the Capacity work stream primarily occurred at the ICA stakeholder engagement with six stakeholder engagement meetings held over the course of 2018.

The focused design work was supported by active engagement from stakeholders on related topics and issues at a variety of additional forums including:

- The Market Renewal Working Group ("MRWG") – a select group of stakeholders tasked with providing strategic advice to the IESO on the MRP, and;
- The Non-Emitting Resource Subcommittee ("NERSC") – a subcommittee of the MRWG focused on identifying potential barriers to participation and potential market outcomes under Ontario's future electricity market design.

In 2019, the IESO will continue to engage with stakeholders throughout the detailed design phase. For the ICA, remaining design decisions will be presented to stakeholders in the spring of 2019. For the Energy work stream, engagement will now occur through one single initiative that will encompass multiple design forums focused on specific elements of detailed design that cut across the three Energy initiatives. The MRWG will be replaced with a new Market Development Advisory Group ("MDAG"), whose scope will be broader than the MRP. The MDAG will support the IESO's efforts to evolve the Ontario electricity market, beyond the MRP, to cost-effectively ensure reliability in the near and longer terms. A schedule of all activities, engagement and work with stakeholders, including the activities of the MRWG, is available on the IESO's website[1].

[1] http://www.ieso.ca/en/sector-participants/market-renewal/overview-of-market-renewal

Cost and Performance Reporting

In order to meet the requirements of the MRP cost and performance reporting described by the OEB in its EB-2017-0150 Decision, the budget for 2018 and beyond will be reported at the work stream level.

A. 2018 MRP Budget and Actual Operating and Capital Costs

Table 2 below outlines the MRP's 2018 actual results and variances against the 2018 budget. At the program level, MRP was underspent by $0.4 million or 3% in 2018. Operating results were $2.3 million above budget, while capital results were $2.7 million under budget. This variance corresponds to the delayed completion of the HLDs. The planned capitalization of costs associated with detailed design were then pushed back accordingly. Only the detailed design work for the SSM initiative was started in 2018.

Table 2: MRP results for 2018

Cost Category	2018 Forecast	2018 Budget	2018 Variance
Compensation & Benefits	9.2	7.4	1.8
Professional & Consulting	5.0	4.1	0.9
Operating & Administration	0.8	1.2	(0.4)
Operating Results	**15.0**	**12.7**	**2.3**
Compensation & Benefits	0.3	1.9	(1.6)
Professional & Consulting	0.3	1.4	(1.1)
Operating & Administration	0.7	0.7	-
Capital Results	**1.3**	**4.0**	**(2.7)**
Compensation & Benefits	9.5	9.3	0.2
Professional & Consulting	5.3	5.5	(0.2)
Operating & Administration	1.5	1.9	(0.4)
Total Results	**16.3**	**16.7**	**(0.4)**

Detailed variance explanation by work stream will be provided below.

Energy Work Stream

Table 3 below outlines the results for the Energy work stream in 2018. The forecasted spending on the Energy work stream was under budget by $1.2 million. Operating results are $0.1 million below budget as less consultant support was required to complete HLD in 2018. The variance was offset by additional staff required to meet the HLD timelines. Capital spending in 2018 was $1.1 million below budget as only the SSM initiative started detailed design work in 2018. The detailed design work for ERUC and DAM has begun and will continue in 2019.

Table 3: Energy Work Stream results for 2018

Cost Category	2018 Forecast	2018 Budget	2018 Variance
Compensation & Benefits	3.4	2.9	0.5
Professional & Consulting	1.4	2.0	(0.6)
Operating & Administration	0.1	0.1	-
Operating Results	**4.9**	**5.0**	**(0.1)**
Compensation & Benefits	0.3	1.2	(0.9)
Professional & Consulting	0.3	0.5	(0.2)
Operating & Administration	-	-	-
Capital Results	**0.6**	**1.7**	**(1.1)**
Compensation & Benefits	3.7	4.1	(0.4)
Professional & Consulting	1.7	2.5	(0.8)
Operating & Administration	0.1	0.1	-
Total Results	**5.5**	**6.7**	**(1.2)**

Capacity Work Stream

Table 4 below outlines the results for the Capacity work stream in 2018. The forecasted spending on the Capacity work stream was over budget by $0.7 million. Operating results were $2.3 million over budget while capital results are $1.6 million under budget. This

corresponds to the time and effort required to develop the HLDs throughout 2018 and pushing into 2019 – later than originally planned when the 2018-2020 Business Plan was developed in mid-2017. Accordingly, the planned capitalization of costs associated with detailed design were pushed back. None of the $1.6 million in budgeted capital spending was incurred in 2018, but is expected to start in 2019 with the completion of HLD.

Table 4: Capacity Work Stream results for 2018

Cost Category	2018 Forecast	2018 Budget	2018 Variance
Compensation & Benefits	3.4	2.0	1.4
Professional & Consulting	1.8	0.8	1.0
Operating & Administration	-	0.1	(0.1)
Operating Results	**5.2**	**2.9**	**2.3**
Compensation & Benefits	-	0.7	(0.7)
Professional & Consulting	-	0.9	(0.9)
Operating & Administration	-	-	0.0
Capital Results	**-**	**1.6**	**(1.6)**
Compensation & Benefits	3.4	2.7	0.7
Professional & Consulting	1.8	1.7	0.1
Operating & Administration	-	0.1	(0.1)
Total Results	**5.2**	**4.5**	**0.7**

Operability Work Stream

In the 2018 budget there was $0.7 million allocated to an operability work stream which included more frequent intertie scheduling. It was determined in early 2018 that this work will be pursued outside of the program, with the $0.7 million operating budget being reallocated to other activities within the program.

General Work Stream

Table 5 below outlines the results for the General work stream in 2018. The forecasted spending on the General work stream was over budget by $0.8 million. Operating results were $0.8 million above budget due to additional work to analyze how non-emitting resources might participate in future markets along with additional costs for legal support. Capital results in 2018 related to the MRP team relocation were on budget at $0.7 million, which includes the cost of additional office space required for the MRP team.

Table 5: General Work Stream results for 2018

Cost Category	2018 Forecast	2018 Budget	2018 Variance
Compensation & Benefits	2.4	2.2	0.2
Professional & Consulting	1.8	0.9	0.9
Operating & Administration	0.7	1.0	(0.3)
Operating Results	**4.9**	**4.1**	**0.8**
Compensation & Benefits	-	-	-
Professional & Consulting	-	-	-
Operating & Administration	0.7	0.7	-
Capital Results	**0.7**	**0.7**	**-**
Compensation & Benefits	2.4	2.2	0.2
Professional & Consulting	1.8	0.9	0.9
Operating & Administration	1.4	1.7	(0.3)
Total Results	**5.6**	**4.8**	**0.8**

B. 2019 MRP Budget Operating and Capital Costs by Work Stream

The total budget for the MRP in 2019 is $11.7 million in operating expenses, and $38.0 million in capital expenses, as per Table 6 below:

Table 6: 2019 Market Renewal Program Operating and Capital Budget

Cost Category	2019 Budget
Compensation & Benefits	5.7
Professional & Consulting	4.8
Operating & Administration	1.2
Operating Total	**11.7**
Compensation & Benefits	17.1
Professional & Consulting	7.1
Operating & Administration	13.8
Capital Total	**38.0**
Compensation & Benefits	22.8
Professional & Consulting	11.9
Operating & Administration	15.0
Program Total	**49.7**

The 2019 MRP operating budget by work stream is described in Table 7 below:

Table 7: 2019 MRP Operating Budget by Work Stream

Work Stream	Cost Category	2019 Budget
Energy	Compensation & Benefits	0.9
Energy	Professional & Consulting	1.3
Energy	Operating & Administration	0.1
Energy	**Energy Total**	**2.3**
Capacity	Compensation & Benefits	3.5
Capacity	Professional & Consulting	1.1
Capacity	Operating & Administration	0.2
Capacity	**Capacity Total**	**4.8**
General	Compensation & Benefits	1.3
General	Professional & Consulting	2.4
General	Operating & Administration	0.9
General	**General Total**	**4.6**
Program	Compensation & Benefits	5.7
Program	Professional & Consulting	4.8
Program	Operating & Administration	1.2

Program	**Program Total**	**11.7**

The 2019 MRP capital budget by work stream is described in Table 8 below:

Table 8: 2019 MRP Capital Budget by Work Stream

Work Stream	Cost Category	2019 Budget
Energy	Compensation & Benefits	10.0
Energy	Professional & Consulting	4.3
Energy	Operating & Administration	12.4
Energy	**Energy Total**	**26.7**
Capacity	Compensation & Benefits	7.0
Capacity	Professional & Consulting	2.8
Capacity	Operating & Administration	1.5
Capacity	**Capacity Total**	**11.3**
Program	Compensation & Benefits	17.0
Program	Professional & Consulting	7.1
Program	Operating & Administration	13.9
Program	**Program Total**	**38.0**

Annual and Projected Final Project Costs

The current total program budget is estimated at $247 million, with further budget refinement expected with the completion of the business case in Q4 2019. The increased total budget compared to earlier estimates reflects additional definition to the program scope through the development of the HLDs and the associated additional program planning work that has been completed.

Table 9: 2019 MRP Annual and Projected Final Project Costs

		2017	2018	2019	2020	2021	2022	2023	2024	Total
Work Stream	Cost Category	Actual	Estimate	Business Plan			Budget*	Budget*	Budget*	Program
Energy	Operating	3.2	4.8	2.4	5.4	2.1				
Energy	Capital	-	0.6	26.7	28.1	25.7				
Energy	**Total**	**3.2**	**5.4**	**29.1**	**33.5**	**27.8**	**-**	**-**	**-**	
Capacity	Operating	1.6	5.2	4.7	1.5	2.2				
Capacity	Capital	-	-	11.3	15.2	15.1				
Capacity	**Total**	**1.6**	**5.2**	**16.0**	**16.7**	**17.3**	**-**	**-**	**-**	
General	Operating	3.1	4.9	4.6	5.3	5.3				
General	Capital	0.2	0.7	-	-	-				
General	**Total**	**3.3**	**5.6**	**4.6**	**5.3**	**5.3**	**-**	**-**	**-**	
MRP	Operating	7.9	14.9	11.7	12.2	9.6	8.0	7.0		
MRP	Capital	0.2	1.3	38.0	43.3	40.8	27.0	13.0		
MRP	**Total**	**8.1**	**16.2**	**49.7**	**55.5**	**50.4**	**35.0**	**20.0**	**12.0**	**246.9**

* Budget estimates are used for 2022 – 2024 and will be further refined after completion of the Business Case.

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 various market development initiatives corporate wide, or are support function resources within core operations that are supporting the MRP, such as stakeholder engagement, communications, legal, market rules, finance, HR, and various other subject matter experts.

MRP resources for 2018 are shown in Table 10 below. Additional resources were added to the program in order to complete HLD within the current schedule, causing the staffing variance.

Table 10: 2018 MRP Staffing

Staff	2018 Average: Latest Estimate	2018 Average: Budget	Variance	2018 Dec 31st: Latest Estimate	2018 Dec 31st: Budget	Variance
MRP Incremental Resources						
Regular	51.0	43.0	8.0	62.0	52.0	10.0
Temporary	11.0	0.0	11.0	14.0	0.0	14.0
MRP Incremental Resources Total	**62.0**	**43.0**	**19.0**	**76.0**	**52.0**	**24.0**
MRP Partial Resources Total	**13.0**	**16.0**	**(3.0)**	**16.0**	**16.0**	**0.0**
MRP Resources Total	**75.0**	**59.0**	**16.0**	**92.0**	**68.0**	**24.0**

In 2019, the MRP is continuing its staffing efforts. Incremental staffing in 2019 is shown at the program level in Table 11, and by initiative in Table 12.

Table 11: 2019 MRP Incremental Staffing by Work Stream

	Regular	Temporary	Total
Energy	41.0	14.0	55.0
Capacity	36.0	19.0	55.0
General	11.0	4.0	15.0
Total	**88.0**	**37.0**	**125.0**

Table 12: 2019 MRP Budgeted Resources by Work Stream

	Incremental Resource	Shared Resource	Total
Energy	55.0	10.0	65.0
Capacity	55.0	5.0	60.0
General	15.0	6.0	21.0
Total	**125.0**	**21.0**	**146.0**

Actual and Projected Cost Savings – on an Annual and Cumulative Basis

Business case development has commenced following the publication of the Energy workstream HLDs. With the development of the business case, and approval by the IESO Board of Directors, the IESO will be better able to discuss the MRP's actual and projected cost savings, annually and cumulatively, by work stream. The business case is expected to be completed Q4 2019.

The benefits case, commissioned by the IESO in 2017 and prepared by The Brattle Group, provided a benefit-cost analysis of the MRP that identified significant quantifiable net benefits to Ontario even under the most conservative assumptions. The report outlined the quantifiable impacts of the MRP's workstreams that would yield expected gross efficiency benefits of hundreds of millions of dollars per year, which are projected to continue to increase and accrue in subsequent years. The report stated that the benefits of the MRP will pay back its implementation cost in just over a year and discussed how different market participants can expect to be impacted. The Brattle Group's benefits case is available on the IESO's website[2].

Actual Annual Achievement Against Plan

Comparison of actual annual achievement against plan will be fully enabled in the IESO's 2020 Revenue Requirement Submission through:

- Comparison of budget and actual operating and capital costs by work stream, and;

2 http://www.ieso.ca/-/media/Files/IESO/Document-Library/engage/me/Benefits-Case-Assessment-Market-Renewal-Project-Clean-20170420.pdf?la=en

- Quantification of the project performance measures of Cost Performance Index ("CPI") and Schedule Performance Index ("SPI") (available in the 2020 Revenue Requirement Submission for 2019).

Baseline MRP Schedules and Budget

The IESO's baseline MRP schedules and budget were filed with the OEB on January 2, 2019 to complete the provisions of the 2018 Package Settlement. The baseline schedules and budget represent the planned cost and schedule of the project and are used as a standard against which actual performance is measured.

The baseline MRP schedules and budget form the foundation that will enable the MRP to track performance measures such as CPI and SPI on a go-forward basis, starting January 1, 2019. The IESO will be able to report on annual CPI and SPI for the MRP work performed in 2019, in the 2020 Revenue Requirement Submission.

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January 2, 2019

VIA Email, Courier and RESS

Independent Electricity System Operator
1600-120 Adelaide Street West
Toronto, ON M5H 1T1
t 416.967.7474
www.ieso.ca

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
27th Floor 2300 Yonge Street
Toronto, ON M4P 1E4

Dear Ms. Walli:

Re: Independent Electricity System Operator - 2018 Revenue Requirement Submission
Ontario Energy Board File No.: EB-2018-0143

In accordance with the approved Settlement Proposal in connection with the Independent Electricity System Operator's (IESO) 2018 Revenue Requirement Submission, the IESO agreed to file a baseline Market Renewal Program (MRP) schedule and budget with the OEB no later than January 2, 2019 and to copy all Parties in the EB-2018-0143 proceeding on this filing.

The IESO is hereby filing the baseline MRP schedules and budget in accordance with the Settlement on Issue 6.1, item b in order to fulfill the outstanding condition on which Issue 6.1 was settled. The baseline MRP schedules and budget are provided as Appendix A to this letter.

If you have any questions, please contact me at 905-855-6340 or by email at devon.huber@ieso.ca.

Yours truly,

Devon Huber
Senior Manager, Regulatory Affairs

cc: Mr. Fred Cass, Aird & Berlis (email)
Intervenors to EB-2018-0143 (email)
Case Manager, Ontario Energy Board (email)

Appendix A

EB-2018-0143
ONTARIO ENERGY BOARD

INDEPENDENT ELECTRICITY SYSTEM OPERATOR
2019 MARKET RENEWAL PROGRAM BASELINE SCHEDULES AND BUDGET

Background

The schedules and budget of the Market Renewal Program (MRP) are divided into two work streams – Energy and Capacity. The MRP is structured as multiple initiatives that will continue to evolve as the work streams progress from high level design to a detailed level design. In 2018, the Energy work stream focused on the high level design of the Single Schedule Market (SSM), Day Ahead Market (DAM), and Enhanced Real Time Unit Commitment (ERUC) initiatives, while the Capacity work stream focused on the Incremental Capacity Auction (ICA) initiative.

The IESO's high level design activities culminated with the publication of three high level design documents – one for each of the Energy work stream projects, SSM, DAM, and ERUC. The IESO also focused on the Capacity work stream's high level design activities in 2018, with a completed high level design document for the ICA expected in 2019.

In parallel with high level design activities, the IESO focused on planning activities for the detailed design phase. In 2019, the structure of the Energy work stream is evolving into the detailed design phase. This phase will be structured around the following design elements: Market Participation, Price Formation, Market Power Mitigation, Scheduling and Dispatch, and Market Settlements. As well, the IESO will develop plans for Market Rules, Procurement and Process design. The Capacity work stream's detailed design phase is scheduled to begin in the 2nd quarter of 2019.

Beginning in January 2019, the IESO will monitor and track project performance for both the Capacity and Energy work streams against the established baseline schedules and budget described below. The schedules and budget for the Energy and Capacity work streams will be tracked and will roll up to form the overall MRP schedule and budget.

2019 MRP Baseline Schedules

The IESO has established baseline schedules for the MRP in 2019. The schedule for the Energy work stream in 2019 is provided as **Attachment 1** and the schedule for the Capacity work stream in 2019 is provided as **Attachment 2**. These schedules provide a summary of the major pieces of work that will be undertaken during the 2019 timeframe. Underpinning these schedules are detailed activities carried out by individuals or groups on a monthly, weekly, or daily basis as applicable. These schedules form a time-based plan of what work will be

undertaken and when it will be performed. For 2019, the schedules show that design related activities will be ongoing throughout the year. The specific details for the subsequent implementation phase are not shown as they will not yet be known until the design is completed.

2019 MRP Budget

The budget associated with the 2019 MRP schedules is outlined below:

		2019
Work Stream	**Expense Category**	**Budget**
Energy	Operating	2.4
Energy	Capital	26.7
Energy	**Total**	**29.1**
Capacity	Operating	4.7
Capacity	Capital	11.3
Capacity	**Total**	**16.0**
General	Operating	4.6
General	Capital	-
General	**Total**	**4.6**
MRP	Operating	11.7
MRP	Capital	38.0
MRP	**Total**	**49.7**

The budget is broken down by work stream – Energy and Capacity, along with a category for general, and then further separated into operating and capital expense categories. The general grouping only involves operating expenses, and includes elements associated with overall program and project management (such as cost control, scheduling and risk management), stakeholder engagement and communication activities.

Schedule Performance Index & Cost Performance Index (SPI & CPI)

As described in the IESO's MRP Cost Report within its 2018 Revenue Requirement Submission (EB-2018-0143), the baseline schedules and budget form the foundation that will enable the IESO to begin tracking performance measures such as SPI and CPI beginning January 1, 2019 for both MRP work streams. The SPI and CPI values for the Energy and Capacity work streams as well as a total value for the MRP work performed in 2019 will be reported through the IESO's 2020 Revenue Requirement Submission. The SPI and CPI project performance measures are described below:

1) SPI: a measure of how efficiently the project is using its time, expressed as a ratio of earned value to planned value (SPI = Earned Value / Planned Value). SPI can be used to forecast schedule performance for the remainder of the task. The measure will illustrate how effective the IESO is performing according to its planned schedule.

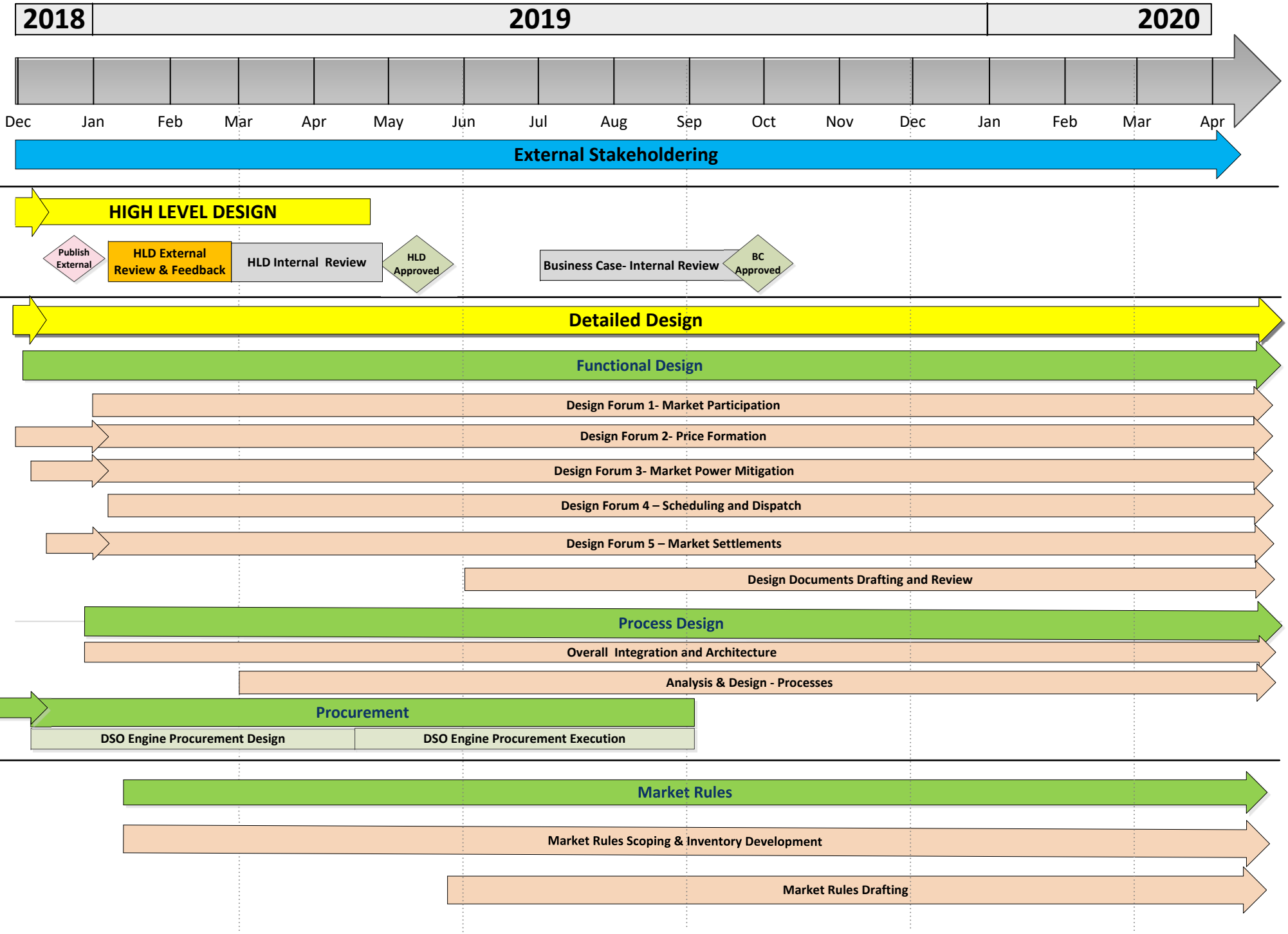
2) CPI: a measure of the cost efficiency of budgeted resources, expressed as a ratio of earned value to actual cost (CPI = Earned Value / Actual Cost). CPI can be used to forecast cost performance for the remainder of the task.

The IESO will be using Earned Value Management as a tool to monitor and track performance. Earned Value Management uses calculations at the detailed activity and task levels of a schedule, and then aggregates that data and rolls it up into metrics for the project. For the MRP, the IESO will be calculating earned value at the work stream level. SPI and CPI will be calculated on a monthly basis for each of the Energy work stream and Capacity work stream to arrive at an annual SPI and CPI for each individual work stream and the overall MRP at the end of 2019.

ATTACHMENT 1

MRP ENERGY WORK STREAM- 2019 SCHEDULE

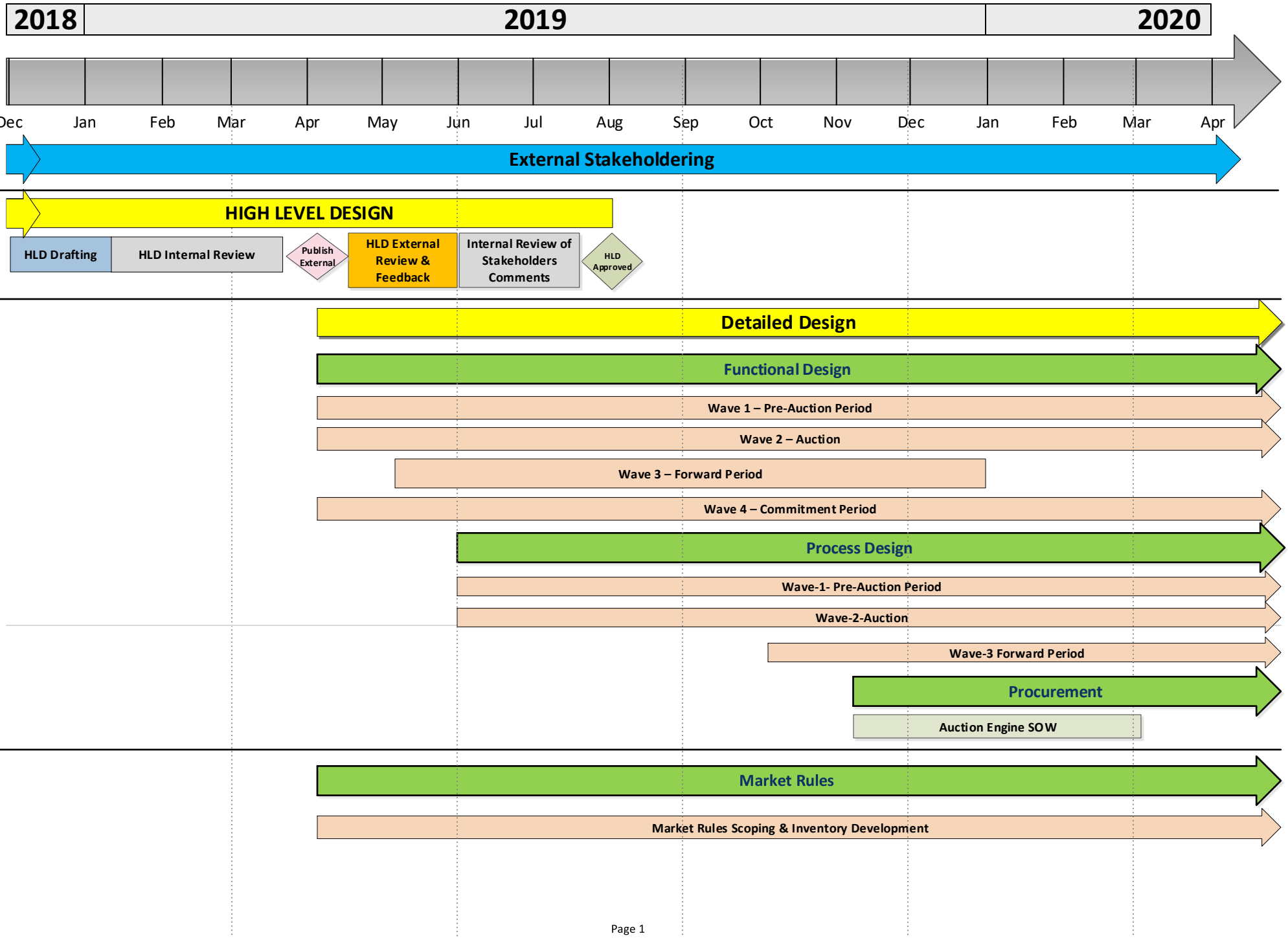
MRP Energy WorkStream-2019 Schedule final.vsd



ATTACHMENT 2

MRP CAPACITY WORK STREAM- 2019 SCHEDULE

MRP Capacity WorkStream-2019 Schedule.vsd



COST ALLOCATION STUDY

In the OEB-approved Package Settlement for the IESO's 2018 Revenue Requirement Submission (EB-2018-0143), under Issue 5.3: Has the IESO adequately explained how the results of the Cost Allocation Study are being implemented, the IESO agreed to:

- *implement the recommendations as described in BDR North America Inc.'s ("BDR") Report on Methodology for the Allocation of Shared Costs to Certain Identified Activities ("BDR Report") in its next revenue requirement submission.*
- *implement the recommendations for all work undertaken by its staff to support or assist the Market Assessment and Compliance Division's enforcement activities ("MACD Enforcement").*
- *provide, in its next revenue requirement submission, the total costs and budgets for the various segments as described in the IESO's Annual Report (IESO Core Operations, Other Government Programs, Smart Metering Entity and Market Sanctions & Payment Adjustments) with a variance analysis. This analysis will be for the period beginning with fiscal year 2016 to the latest period for which information is available.*

The IESO has accepted and implemented BDR's recommendations and has adopted an allocation based methodology on cost causality to non-core functions as recommended by BDR. The costs the IESO incurs for work and staff time in support of MACD Enforcement will be charged to MACD Enforcement in the same manner such work to support the SME is charged to the SME.

Specifically, in 2018 the IESO assigned the SME appropriate allocations of supporting costs, including HR, IT and Payroll. With regards to management time, the IESO has allocated costs associated with senior decision-makers to non-core functions. The IESO has allocated $0.6 million to the Smart Metering Entity and $1.2 million to MACD Enforcement for a total of $1.8 million shown in Table 1 below:

Table 1: Cost Allocation (in $ millions)

	Allocated Costs
Smart Metering Entity	$0.6
MACD Enforcement	$1.2
Total	**$1.8**

The allocated costs were a significant component that allowed the IESO's revenue requirement to remain at its 2018 level, helping offset additional costs pressures from compensation and benefit increases, and cybersecurity program enhancements.

Consistent with the Package Settlement Table 2 below sets out the total costs, budgets and variance for the segments described in the IESO's Annual Report. The IESO's Annual Report provides additional information on the costs and budget of the various segments in the table below.

Costs and Budget of Various Segments as per Annual Report (in $ thousands)

	Revenue			Expense		
	2016 Actuals	2016 Budget	Variance	2016 Actuals	2016 Budget	Variance
Core Operations	194,132	182,131	**12,001**	181,581	182,131	**(550)**
Other Government Programs	0	0	**0**	0	0	**0**
Smart Metering Entity	27,426	32,244	**(4,818)**	27,426	32,244	**(4,818)**
Market Sanctions and Payment Adjustments	3,889	4,341	**(452)**	3,655	4,646	**(991)**

	Revenue			Expense		
	2017 Actuals	2017 Budget	Variance	2017 Actuals	2017 Budget	Variance
Core Operations	178,412	191,364	**(12,952)**	182,411	191,364	**(8,953)**
Other Government Programs	2,696	0	**2,696**	2,696	0	**2,696**
Smart Metering Entity	25,655	31,536	**(5,881)**	24,716	31,536	**(6,820)**
Market Sanctions and Payment Adjustments	3,176	4,219	**(1,043)**	3,261	4,513	**(1,252)**

	Revenue			Expense		
	2018 Latest Estimate	2018 Budget	Variance	2018 Latest Estimate	2018 Budget	Variance
Core Operations	194,800	190,803	**3,997**	189,196	190,803	**(1,607)**
Other Government Programs	265,637	150,449	**115,188**	265,637	150,449	**115,188**
Smart Metering Entity	34,915	34,542	**373**	28,453	31,824	**(3,371)**
Market Sanctions and Payment Adjustments	6,116	7,616	**(1,500)**	6,268	7,921	**(1,653)**

TOTAL COMPENSATION STUDY

In the OEB-approved Settlement Package for the IESO's 2017 Revenue Requirement Submission (EB-2017-0150), under Issue 5.4: Is the IESO's rationale as to why benchmarking is not possible or appropriate acceptable? The IESO agreed to:

- *Conduct a total compensation study, including all components of compensation and benefits, for its represented and non-represented staff, excluding the IESO executives.*
- *Hire a third-party consultant to undertake the study of represented and non-represented staff in 2018 to ensure that the most recent market data is used and will file the study in its 2019 Revenue Requirement Submission.*

Mercer (Canada) Limited ("Mercer") was engaged to undertake a total remuneration review for the IESO's non-executive employees. The final report was provided to the IESO on September 27, 2018. The IESO has filed the report as Attachment 1 to this exhibit.

The IESO employee groups considered in this review included non-executive management (or non-union), as well as those positions represented by the Power Workers' Union and the Society of United Professionals.

Mercer's report provided an independent, market based assessment 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.

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HEALTH WEALTH CAREER

NON-EXECUTIVE TOTAL REMUNERATION REVIEW

27 SEPTEMBER 2018

Independent Electricity System Operator

MAKE TOMORROW, TODAY MERCER

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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 52% 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 sector. 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 5% above the market 50th percentile relative to the private sector peer group and 11% above the public sector peer group due to the overall higher positioning of bargaining unit pay relative to these sectors. Positioning for non-unionized jobs relative to the private sector is 8% below the market 50th percentile due to the absence of short-term incentive award opportunities at the IESO.

On an overall organization basis, the IESO's total remuneration, including the value of all cash compensation, benefit and pension plans is positioned 11%, 22% and 18% 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. Overall, total remuneration for non-represented jobs is positioned within 5% of the market 50th percentile of the private and public sector peer groups. The IESO has made changes to pension plans to increase cost sharing and employee contributions. However, changes to bargaining unit plans are not yet comparable to the significant cost and risk sharing changes other comparator organizations have made to their defined benefits pension plans.

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 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.
  - Where required to provide statistically significant market information for a specific position, the peer group was expanded to include the broader Canadian public sector
- **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.
  - Organizations were selected considering the immediate geographical talent market for the IESO (i.e. the Greater Toronto Area) that includes predominant industries, such as, banking / financing, electrical and digital engineering, professional services and marketing
  - Where required to provide statistically significant market information for a specific position, the peer group is expanded to include the broader Ontario private sector

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 39 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
- 93 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 55 of the 136 (40%) management and professional employees and 353 of the 646 (55%) bargaining unit positions to make up 52% 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.

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 is reflective of the most recently available data as of the completion of the analysis, and is presented effective for 2018.

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	Base ($)[1]	TTC ($)[2]	TREM ($)[3]	BASE SALARY ($)	TTC ($)	TREM ($)	BASE SALARY ($)	TTC ($)	TREM ($)	BASE SALARY ($)	TTC ($)	TREM ($)
MGMT	MANAGEMENT TOTAL	$151	$151	$187	$144 2%	$165 -11%	$197 -7%	$135 10%	$148 0%	$176 5%	$137 10%	$163 -8%	$189 -1%
SOC	SOCIETY TOTAL	$121	$121	$160	$108 11%	$117 3%	$139 15%	$104 17%	$107 12%	$126 27%	$106 15%	$115 6%	$133 22%
PWU[4]	PWU TOTAL	$86	$86	$116	$81 5%	$85 1%	$101 15%	$68 26%	$69 23%	$84 37%	$64 34%	$68 26%	$81 43%
	OVERALL	$122	$122	$160	$111 9%	$121 0%	$144 11%	$105 16%	$109 11%	$130 23%	$107 14%	$117 5%	$136 18%

(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 within a competitive range (i.e. within +/-5% of the market 50th percentile) against the energy sector peer group for non-unionized and PWU roles; positioning for non-unionized jobs increases to 10% above the market 50th percentile relative to the private and public sector peer groups. Represented jobs are positioned between 15% to 34% above the market 50th percentile relative to the public and private sector peer groups. This reflects the impact of the energy industry and representation relative to these sectors.

The IESO **does not provide short-term incentives** to non-executives. However, short-term incentives continue to be offered in the market. 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 sector peer group. Non-unionized jobs are positioned 11% and 8% below the market 50th percentile against the energy sector and private sector, but positioned at the market 50th percentile relative to the public sector peer group. Society and PWU represented jobs are closely aligned with the market 50th percentile of the energy sector.

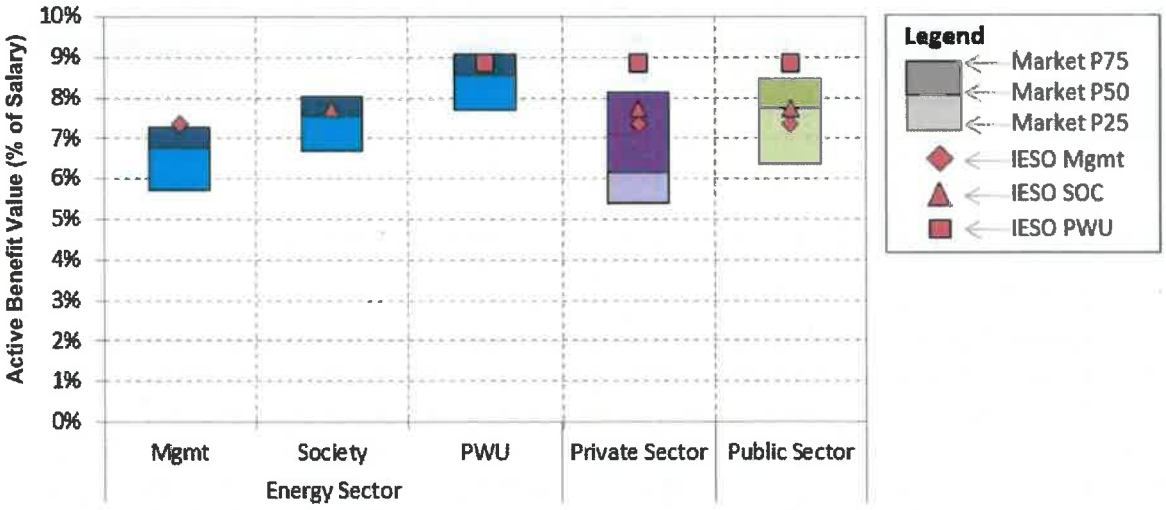
Total Remuneration

Overall, the IESO's compensation program, on a **total remuneration** basis, is positioned 11%, 22% and 18% above the market 50th percentile for the energy, public and private sector peer groups. 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. The non-bargaining group is below the market competitive range of the energy peer group at -7% of the 50th percentile and within the market competitive range of the public and private sector peer groups at 5% and -1% respectively.

Active Benefits

The table below presents the IESO's **active benefits (Table 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.

Table 1 – Active Benefits Comparison



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. When compared to the private and public sector, the IESO provides a top quartile active benefits plan to its PWU employee group.

Pension and Savings Programs

The following tables present the IESO's **pension** value for each employee group considering employer-provided value compared only to those employers that also provide a defined benefit pension **(Table 2)**, and compared to all employers considering the value of defined benefit, defined contribution and savings plans **(Table 3)** 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.

Table 2 – Defined Benefit Pension Only (%) Comparison

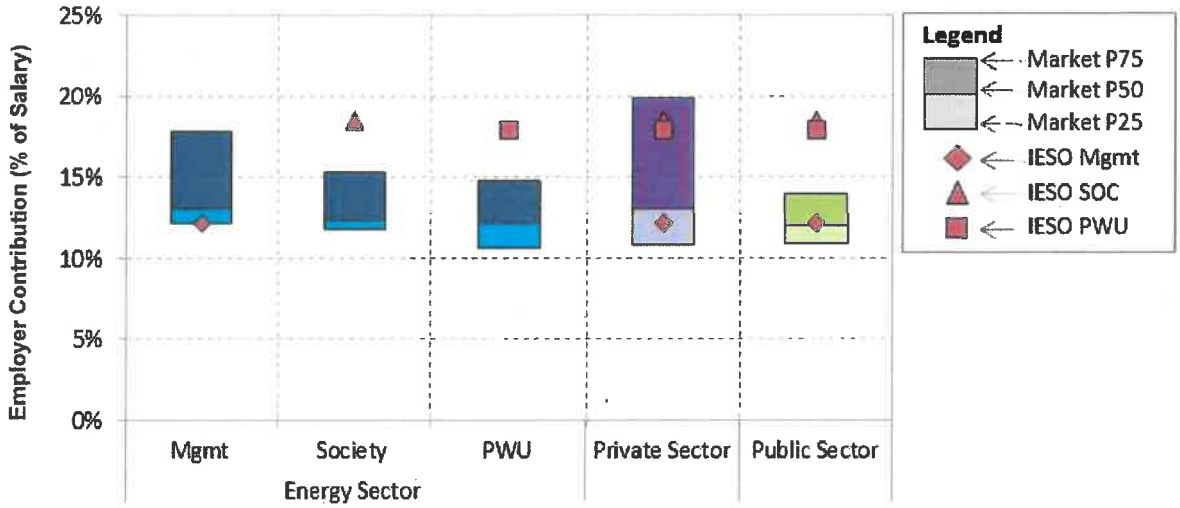
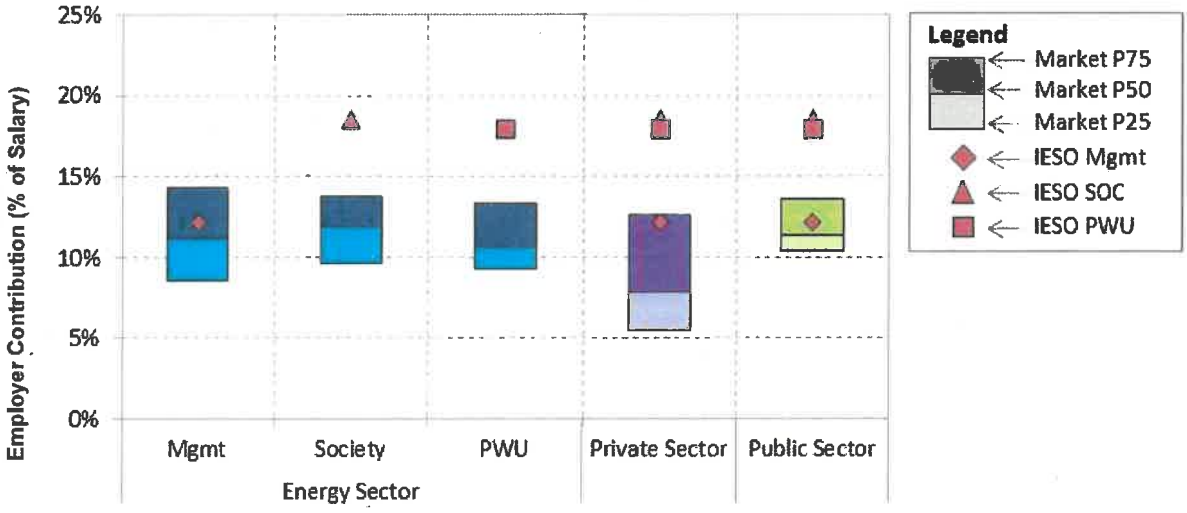


Table 3 – DB and DC Pension and Savings Programs (%) Comparison



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. However, changes to bargaining unit plans are not yet comparable to the significant cost and risk sharing changes other comparator organizations have made to their defined benefits pension plans. As such, the IESO's pension arrangements for the PWU and Society bargaining units are above the market 75th percentile of the **employer provided value** of other defined benefits ("DB") plans among the energy sector and public sector comparator groups. Pension arrangement positioning, for the PWU and Society bargaining units, is between the market 50th and 75th percentile when compared to the private sector.

In comparison, the IESO's pension arrangement for the management group reflects a 50% cost sharing plan; as such, pension arrangement for this non-unionized group is positioned at the market 25th percentile relative to the energy sector, between market 25th and 50th percentile relative to the private sector and at market 50th percentile in comparison to the public sector peer group.

Many of the comparators provide a defined contribution plan. When defined contribution plans are taken into account to determine the overall market, relative positioning increases for the IESO's pension arrangement for all employee groups. Market positioning for the non-represented group pension plan, on an employee provided value basis, increases to between the market 50th and 75th percentile across all comparator groups.

APPENDIX A

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

ENERGY SECTOR COMPARATOR COMPANIES	
1) Alberta Electricity System Operator	13) Hydro-Québec
2) Alectra Inc.	14) London Hydro
3) Altalink	15) Manitoba Hydro
4) ATCO Ltd	16) Nalcor Energy
5) BC Hydro Power & Authority	17) Ontario Energy Board
6) Bruce Power	18) Ontario Power Generation
7) Emera, Inc.	19) SaskPower
8) ENMAX Corporation	20) Toronto Hydro Corporation
9) EPCOR Utilities, Inc.	21) TransAlta Corporation
10) Fortis Alberta	22) TransCanada Corporation
11) Fortis BC - Gas and Electric	23) Veridian Corporation
12) Hydro One Networks Inc	

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

BROADER PUBLIC + PUBLIC ENERGY COMPARATOR COMPANIES	
1) Alberta Electricity System Operator^	15) Ontario Energy Board^
2) Alectra Inc.^	16) Ontario Lottery and Gaming Corporation
3) BC Hydro Power & Authority^	17) Ontario Power Generation^
4) BC Transit	18) Ontario Public Service
5) Canada Post Corporation	19) Ontario Securities Commission
6) Canadian Broadcasting Corporation	20) Ontario Teachers' Pension Plan
7) ENMAX Corporation^	21) SaskPower^
8) EPCOR Utilities, Inc.^	22) Technical Standards and Safety Authority
9) Hydro One Networks Inc^	23) Toronto Hydro Corporation^
10) Hydro-Québec^	24) Treasury Board of Canada Secretariat
11) London Hydro^	25) Veridian Corporation^
12) Manitoba Hydro^	26) VIA Rail Canada
13) Nalcor Energy^	27) Workers Compensation Board (Alberta)
14) National Energy Board	28) Workplace Safety & Insurance Board

(^) 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 COMPARATOR COMPANIES	
1) 3M Canada Company	28) Grass Valley, A Belden Brand
2) AC Nielsen Company Of Canada	29) Hatch, Ltd.
3) Aecon Group, Inc. - Aecon Energy	30) HP, Inc.
4) Altalink^	31) Kiewit Energy Canada Co.
5) Amazon	32) Lockheed Martin Canada, Inc.
6) AMEC NSS, LTD.	33) Moneris Solutions Corporation
7) ATCO Ltd^	34) National Bank of Canada
8) Babcock & Wilcox Power Generation Group Canada Corp.	35) Nav Canada
9) Bank of Montréal	36) NovAtel, Inc.
10) Bombardier Transport Canada, Inc.	37) Oracle Canada, ULC
11) Bosch Rexroth Canada Corp.	38) Philips Electronics, Ltd.
12) Bruce Power^	39) RCM Technologies Canada Corp
13) Canadian Imperial Bank of Commerce	40) Rockwell Automation Canada, Ltd.
14) Capital Power Corporation	41) Royal Bank of Canada
15) Echologics Engineering, Inc.	42) RTDS Technologies, Inc.
16) Emera, Inc.^	43) Samsung Electronics Canada, Inc.
17) Emerson Automation Solutions	44) Stantec, Inc.
18) Enerflex Ltd.	45) Startco Engineering, Ltd.
19) Epson Canada, Ltd.	46) Suncor Energy
20) Federated Co-operative, Ltd. - Co-op Refinery Complex	47) TD Bank Group
21) Fluor Canada, Ltd.	48) Tesla Motors Canada
22) Fortis Alberta^	49) The Bank of Nova Scotia
23) Fortis BC - Gas and Electric^	50) Thomson Reuters Canada, Ltd.
24) FundSERV, Inc.	51) TransAlta Corporation^
25) Ganotec, Inc.	52) TransCanada Corporation^
26) GE Canada	53) WorleyParsons Canada Services, Ltd.
27) General Motors of Canada, Ltd.	

(^) 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 39 non-represented jobs were included within the scope of the review:

IESO JOB TITLE	GRADE	IESO JOB TITLE	GRADE
1) Director Market Operations	Band 3A	21) Sr Mgr Transmission	Band 4
2) Gnrl Counsel Secretary & CRCO	Band 3A	22) Engineering Mgr Power Systems	Band 5A
3) Director Business Solutions	Band 3B	23) Legal Counsel	Band 5A
4) Director Contract Management	Band 3B	24) Legal Counsel 2	Band 5A
5) Director Corp & Comrcl Law Grp	Band 3B	25) Mgr Finance & Accounting	Band 5A
6) Director Crprte & Indgns Rltns	Band 3B	26) Mgr HR Business Partner	Band 5A
7) Director Energy Efficiency	Band 3B	27) Mgr Information & Tech Srvcs	Band 5A
8) Director Finance & Corp Cntrlr	Band 3B	28) Mgr Infrastructure	Band 5A
9) Director Financial Plng & Alys	Band 3B	29) Mgr Learning & Orgl Developmnt	Band 5A
10) Director Human Resources	Band 3B	30) Mgr Market Opns & Forecast Sys	Band 5A
11) Director Treasury & Pension Opns	Band 3B	31) Mgr Operations Planning	Band 5A
12) Senior Legal Counsel	Band 4	32) Mgr Procurement Operations	Band 5A
13) Sr Mgr Cstmr Stkhldr&Cmnty Engmt	Band 4	33) Mgr Rev Mtrg & Stlmts Sys Sprt	Band 5A
14) Sr Mgr Employee & Labour Rltns	Band 4	34) Sr Project & Portfolio Mgr	Band 5A
15) Sr Mgr Meter Data Management	Band 4	35) Human Resources Advisor	Band 5B
16) Sr Mgr Regulatory Affairs	Band 4	36) Mgr Enterprise Risk & Crp Perf	Band 5B
17) Sr Mgr Rule Compliance	Band 4	37) Sprvsr Compensation & Benefits	Band 5B
18) Sr Mgr Talent Acquisition	Band 4	38) Executive Assistant - VP	Band 6B
19) Sr Mgr Technology Support	Band 4	39) HR Associate	Band 6B
20) Sr Mgr Total Rewards	Band 4		

The following 93 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	28-01	48) Advisor Regulatory Affairs	Society	MP4
2) Regional Maintainer Mechanical	PWU	28-01	49) Advisor Risk & Corp Performance	Society	MP4
3) Handyperson	PWU	25-05	50) Advisor Training	Society	MP4
4) IESO Site Maintainer Jrnyperson	PWU	25-03	51) Compliance Officer Conservation	Society	MP4
5) Digital Media Specialist	PWU	20-64	52) Engineer Revenue Metering	Society	MP4
6) Funds Finance Analyst	PWU	20-64	53) Planner	Society	MP4
7) Sr Engineering Technologist	PWU	20-64	54) Power System Engineer	Society	MP4
8) Service & Helpdesk Suppt Anlyt	PWU	20-63	55) Procurement Specialist	Society	MP4
9) Network Administration Tech	PWU	20-62	56) Program Advisor	Society	MP4
10) Pay Services Associate	PWU	20-61	57) Specialist Compliance	Society	MP4
11) Treasury Associate	PWU	20-61	58) Specialist Contracts	Society	MP4
12) Facilities Services Coordinator	PWU	20-60	59) Specialist Data Management	Society	MP4
13) Finance Clerk	PWU	20-60	60) Specialist Information Security	Society	MP4
14) Finance Coordinator	PWU	20-60	61) Specialist Operations Training	Society	MP4
15) Inventory Technician	PWU	20-60	62) Specialist Program Design	Society	MP4
16) Procurement Assistant	PWU	20-60	63) Specialist Project Support	Society	MP4
17) Sr Computer & LAN Services Tech	PWU	20-60	64) Specialist Solutions	Society	MP4
18) Security Guard	PWU	20-59	65) Specialist Systems	Society	MP4
19) Administrative Assistant	PWU	20-58	66) Specialist Web Services	Society	MP4
20) Engineering Sprvsr Revenue Mtrg	Society	MP6	67) System Operator	Society	MP4
21) Sprvsr Business Analysis Srvcs	Society	MP6	68) Tech Officer Conservation	Society	MP4
22) Sprvsr Market Settlements	Society	MP6	69) Project Cost Controller	Society	MP3
23) Sprvsr Media Rlns & Edtrl Svcs	Society	MP6	70) Project Officer	Society	MP3
24) Supervisor Contract Management	Society	MP6	71) Project Scheduler	Society	MP3
25) Supervisor Customer Relations	Society	MP6	72) Senior Analyst Reporting	Society	MP3
26) Supervisor Government Affairs	Society	MP6	73) Sr Analyst Applications	Society	MP3
27) Supervisor Information Mgmt	Society	MP6	74) Sr Analyst Contract Management	Society	MP3
28) Supervisor Market Development	Society	MP6	75) Sr Analyst Contracts	Society	MP3
29) Supervisor Meter Data Mgmt	Society	MP6	76) Sr Analyst Stkhlder Engagement	Society	MP3
30) Supervisor Operational Risk	Society	MP6	77) Analyst Communication Services	Society	MP2
31) Supervisor Project Mgmt Office	Society	MP6	78) Analyst I&TS Support	Society	MP2
32) Supervisor Quality Assurance	Society	MP6	79) Analyst Internal Communications	Society	MP2
33) Sr Advisor Communications	Society	MP5	80) Analyst Marketing	Society	MP2
34) Sr Advisor Regulatory Affairs	Society	MP5	81) Analyst Media Relations	Society	MP2
35) Sr Analyst Compl & Dispute Rsltn	Society	MP5	82) Analyst Reporting	Society	MP2
36) Sr Auditor	Society	MP5	83) Analyst Settlements	Society	MP2
37) Sr Planner	Society	MP5	84) Analyst Solutions	Society	MP2
38) Sr Power System Engineer	Society	MP5	85) Analyst Stakeholder Relations	Society	MP2
39) Sr Specialist Bus Continuity	Society	MP5	86) Analyst Training & Support	Society	MP2

IESO JOB TITLE	UNION	GRADE	IESO JOB TITLE	UNION	GRADE
40) Sr Specialist Operations Trng	Society	MP5	87) Assistant System Operator	Society	MP2
41) Sr Specialist Project Mgmt	Society	MP5	88) Financial Analyst Payroll	Society	MP2
42) Sr Specialist Solutions	Society	MP5	89) Financial Anlys Accts Payable	Society	MP2
43) Sr System Operator	Society	MP5	90) Financial Anlys Corp Accnting	Society	MP2
44) Team Lead Records Management	Society	MP5	91) Planning Analyst	Society	MP2
45) Advisor Communications	Society	MP4	92) Power System Analyst	Society	MP2
46) Advisor Financial Plng & Anlys	Society	MP4	93) Procurement Program Analyst	Society	MP2
47) Advisor Government Affairs	Society	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

		IESO			ENERGY SECTOR			PUBLIC SECTOR			PRIVATE SECTOR		
GROUP	GRADE	Base ($)[1]	TTC ($)[2]	TREM ($)[3]	BASE SALARY ($)	TTC ($)	TREM ($)	BASE SALARY ($)	TTC ($)	TREM ($)	BASE SALARY ($)	TTC ($)	TREM ($)
MGMT	Band 3A	$263	$263	$320	$217 21%	$272 -3%	$355 -10%	$206 28%	$241 9%	$280 14%	$212 24%	$305 -14%	$375 -15%
	Band 3B	$197	$197	$241	$169 16%	$199 -1%	$234 3%	$164 20%	$185 6%	$219 10%	$171 15%	$213 -8%	$249 -3%
	Band 4	$160	$160	$198	$149 8%	$168 -5%	$196 1%	$131 22%	$142 13%	$170 17%	$136 18%	$160 0%	$183 9%
	Band 5A	$133	$133	$166	$142 -6%	$159 -16%	$188 -12%	$136 -2%	$146 -9%	$175 -5%	$133 0%	$150 -11%	$172 -4%
	Band 5B	$118	$118	$148	$139 -15%	$160 -26%	$186 -20%	$101 16%	$109 8%	$131 13%	$105 13%	$124 -5%	$141 5%
	Band 6B	$80	$80	$104	$78 2%	$87 -8%	$103 1%	$68 17%	$75 38%	$90 15%	$70 14%	$72 45%	$85 22%
	MANAGEMENT TOTAL	**$151**	**$151**	**$187**	**$144** **2%**	**$165** **-11%**	**$197** **-7%**	**$135** **10%**	**$148** **0%**	**$176** **5%**	**$137** **10%**	**$163** **-8%**	**$189** **-1%**
SOC	MP6	$142	$142	$187	$120 19%	$129 10%	$153 22%	$115 23%	$123 16%	$146 28%	$115 24%	$124 15%	$144 30%
	MP5	$134	$134	$176	$116 15%	$128 4%	$152 16%	$119 13%	$124 8%	$146 21%	$119 13%	$130 3%	$148 18%
	MP4	$125	$125	$166	$108 16%	$115 9%	$137 21%	$102 23%	$103 21%	$124 34%	$105 19%	$112 12%	$130 28%
	MP3	$103	$103	$138	$106 -3%	$108 -4%	$130 7%	$93 11%	$94 10%	$113 23%	$93 11%	$101 3%	$117 18%
	MP2	$97	$97	$130	$97 0%	$104 -7%	$124 5%	$90 8%	$94 3%	$111 18%	$90 8%	$98 -1%	$115 13%
	SOCIETY TOTAL	**$121**	**$121**	**$160**	**$108** **11%**	**$117** **3%**	**$139** **15%**	**$104** **17%**	**$107** **17%**	**$126** **27%**	**$106** **15%**	**$115** **6%**	**$133** **22%**
PWU[4]	**PWU TOTAL**	**$86**	**$86**	**$116**	**$81** **5%**	**$85** **1%**	**$101** **13%**	**$68** **25%**	**$69** **23%**	**$84** **37%**	**$64** **34%**	**$68** **26%**	**$81** **43%**
	OVERALL	$122	$122	$160	$111 9%	$121 0%	$144 11%	$105 16%	$109 11%	$130 22%	$107 15%	$117 5%	$136 18%

(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) 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 weighted averages to better reflect the distribution of employees

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TRANSMISSION LOSSES

In the OEB-approved 2018 Package Settlement under Issue 5.4: What is the status of the IESO's Transmission Losses Study, the IESO agreed to provide the following information in its 2019 Revenue Requirement Submission:

i. Actual 2018 annual transmission losses as a percent of annual demand;

ii. Actual 2018 transmission losses at the time of system peak demand as a percentage of system peak demand (peak hour);

iii. The wholesale market cost of transmission system energy losses in 2018; and

iv. A document describing the division of responsibilities between Hydro One and the IESO relating to transmission losses (subject to being able to jointly prepare this with Hydro One).

Transmission Losses Information

The costs associated with system-wide transmission line losses are a component of the Net Energy Market Settlement Uplift (charge code 150). The charge covers the difference between the amount paid to suppliers for the commodity and the amount paid by buyers in a given hour. The Net Energy Market Settlement Uplift is the only settlement mechanism in Ontario's wholesale electricity market through which market participants are charged for costs attributed to system-wide transmission losses.

The IESO calculated the losses data above using the difference between system-wide energy injected and imported, and system-wide energy withdrawn and exported during the settlement hour.

The IESO provides transmission losses data according to the commitments from the Package Settlement in Table 1 below. As December 2018 values were not available at the time of filing, December 2017 values were used such that twelve calendar months of transmission losses data is reported.

Table 1: Transmission Losses Data From December 2017 to November 2018

Actual annual transmission losses as a percent of annual demand	1.82%
Actual transmission losses at the time of system peak demand as a percentage of system peak demand (peak hour)	1.54% On September 5, 2018 in Hour Ending 17
Wholesale market cost of transmission system energy losses	$64,491,045.81

IESO and Hydro One Division of Responsibilities Related to Transmission Losses

The IESO worked with Hydro One Networks Inc. ("Hydro One") to describe the division of responsibilities between Hydro One and the IESO relating to transmission losses. The IESO is solely responsible for the day to day market and system operations of the IESO controlled grid, including associated loss mitigation, whereas Hydro One (or the applicable transmitter) is solely responsible for the design and construction of its transmission facilities, including equipment specifications which impact losses.

Both IESO and Hydro One work collaboratively on transmission planning activities. These transmission planning efforts are summarized below and were informed by a report, *Hydro One Transmission Losses* ("the EPRI Report"), that the consulting firm EPRI prepared upon request from Hydro One with support from the IESO.

Transmission Loss Reduction Relating to Planning Activities

Planning of the transmission system is typically conducted at two different levels: bulk planning, and regional planning. The responsibility for the planning of the transmission system in Ontario and the consideration of losses in the planning process, is primarily shared between the IESO and Hydro One.

Bulk planning is largely carried out by the IESO, with support from Hydro One and other asset owners as required. It focuses on the adequacy and reliability of the 500kV and 230kV networks and addresses provincial electricity needs and broader policy direction such as assessing the impact of refurbishment of nuclear facilities or renewable energy policies on the electricity system.

Regional planning follows the Regional Planning Process endorsed by the Ontario Energy Board, and is carried out jointly by the IESO, Hydro One and local distributors. Regional planning looks at each region's unique needs and considers conservation, generation, transmission and distribution, to meet these needs in a cost effective manner. Specifically, regional planning examines the capability of regional transmission systems (115kV or 230kV networks) to deliver electricity to the various communities and transmission supplied industrial customers in a region.

The IESO is required to comply with and enforce applicable reliability requirements of the North American Electric Reliability Corporation ("NERC"), Northeast Power Coordinating Council ("NPCC"), and IESO's Ontario Resource Transmission Assessment Criteria ("ORTAC") while addressing electricity system needs.

The Ontario transmission system design is governed by the planning criteria and standards set out by NERC, NPCC and IESO's ORTAC. These criteria require the system to be designed with sufficient capacity to supply the forecasted peak loads with any one element out of service. As a result of this system redundancy, most transmission facilities are

operating at low load factors during normal operating conditions, as such the ability to mitigate transmission losses is greatly reduced.

For this reason, projects are not pursued solely for the purpose of transmission loss mitigation. However, transmission losses are considered when planning for new infrastructure investments or upgrades to reinforce the transmission system.

An initial step in the planning process involves conducting an assessment to determine transmission system needs. After the needs are identified, various mitigating solutions are developed and further assessed. Once a set of feasible options have been determined, the options are analyzed based on a number of factors such as reliability, feasibility, flexibility, customer preference, and cost effectiveness, including transmission losses. A preferred alternative is then selected as the recommended solution.

After a preferred alternative has been selected, Hydro One (or the applicable transmitter) is responsible for the design, specification, and installation of equipment to implement the recommended solution. During the implementation, Hydro One considers the industry best practices such as: use of lower loss conductors and transformers, conductor bundling, insulator hardware systems to improve corona losses, and insulator assemblies and structure configurations to improve insulation losses, as noted in the EPRI report. In support of Hydro One's design and specification process, the IESO provides forecasted quantities such as future utilization of the new facilities.

Engagement with Stakeholders

Under Issue 5.4 of the Package Settlement, the IESO agreed to engage stakeholders regarding the IESO's transmission losses work. The IESO is in the planning stages of its engagement with stakeholders and expects to launch public engagement in Q2 of 2019. In the near term, the IESO will be reaching out to key stakeholders for pre-engagement consultations to gather feedback on the engagement process – including engagement format and frequency preferences.

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Status Report on Certain Recommendations to the IESO included in Chapter 3 of the Auditor General's 2017 Annual Report

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	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): • Implement the Ontario Energy Board Market Surveillance Panel's (OEB Panel) recommendations in an effective and timely way; and • 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	In-Full	The Independent Electricity System Operator (IESO) will continue to analyze and assess the Ontario Energy Board's (OEB) Market Surveillance Panel (MSP) recommendations and implement recommendations where there is clear and substantiated evidence that changes to Market Rules are required. In some instances, additional analysis is needed to affirm MSP recommendations. In other cases, a decision must be made where it is more cost effective to focus on the enduring solution, such as changes contemplated by the Market Renewal Program, rather than divert scarce resources to implement a short term solution, if there is one. When considering amendments, the IESO must balance the need to ensure the reliability of the electricity network, to consider the impact upon market design, including potential unintended adverse effects, and to assess the ability of the IESO and	On-going	

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	and submit it to the Ontario Energy Board for its review.		market participants to implement the change. The IESO has acted on many recommendations made by the OEB's MSP in the past and has implemented a number of market rule amendments as a result.		
6	To ensure that ratepayers are not charged for unnecessary costs, we 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.	In-Full	The Independent Electricity System Operator (IESO) is making fundamental changes to the electricity market, through the Market Renewal Program, that will include replacing the current real-time generator commitment mechanisms with a more efficient and transparent form of unit commitment. The IESO is currently developing the Enhanced Real-time Unit Commitment project, which will replace the Standby Cost Recovery Program when it goes live, expected in 2022. The IESO will be examining a number of issues in this new program's design, including treatment of costs, and has encouraged the MSP to continue to stay involved in the design and engagement process. The ERUC high-level design document has been	Enhanced real-time unit commitment is targeted for implementation by 2022.	

No.	Auditor's Recommendation	IESO Accepting Recommendation? (In-Full / In-Part / Not at All)	Status of Implementation	Expected Date of Completion	IESO Explanatory Notes
			published for stakeholder review in December 2018.		
7	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.	In-Full	The Independent Electricity System Operator (IESO) is making fundamental changes through the Market Renewal Program that include eliminating the need for CMSC payments by replacing Ontario's current two schedule market with a Single Schedule Market (SSM). While some out-of-market energy payments will continue to exist, the total amount will be greatly reduced with the elimination of CMSC payments. In 2018, the IESO has engaged stakeholders including the OEB Panel to participate in the design of the Single Schedule Market (SSM). The SSM high-level design was published in September 2018 for stakeholder review. In 2019, the IESO will continue to work with stakeholders on the detailed design phase of the SSM.	The SSM is targeted for implementation by 2022.	As noted in a December 2016 report by the Market Surveillance Panel: "many of the most problematic issues associated with the CMSC regime have been brought to an end – in large measure as a result of the Panel having identified these situations, and the IESO having acted to eliminate them." Furthermore, the SSM initiative of Market Renewal will eliminate the Lost Profit Recovery Program.
8	To ensure that the Market Renewal Initiative (Initiative) considers and	In-Part	In December 2017, a member representing low volume consumers	Complete	

No.	Auditor's Recommendation	IESO Accepting Recommendation? (In-Full / In-Part / Not at All)	Status of Implementation	Expected Date of Completion	IESO Explanatory Notes
	protects all ratepayers' interests, we recommend that the Independent Electricity System Operator (IESO): • Immediately prohibit representatives from companies that have been found by the Ontario Energy Board Market Surveillance Panel or the IESO Oversight Division to have misused IESO programs from participating in the Initiative working group; • Establish a minimum number of working group members representing low-power consumers and ensure that those positions are always filled; and • Publicly report in clear language how the results of the Initiative will be in the best interests of all ratepayers.		was added to the Market Renewal Working Group (MRWG). The engagement work plan will continue to be aligned with the IESO engagement principles to gather a wide representation from IESO market participants, sector stakeholders and other stakeholders such as low volume consumers. As market renewal moves into new High Level Design and Detailed Design stages, the IESO engagement plans will provide methods and channels to encourage the representation of low volume consumers in engagement activities. The IESO market renewal webpage explains the key benefits of market renewal for Ontario.		
9	To ensure that the Independent Electricity System Operator (IESO)	In-Full	The Market Assessment and Compliance Division (MACD) has	Complete	

No.	Auditor's Recommendation	IESO Accepting Recommendation? (In-Full / In-Part / Not at All)	Status of Implementation	Expected Date of Completion	IESO Explanatory Notes
	Market Assessment and Compliance Division can conduct proper oversight of the market, we recommend that the IESO: • Assess the resources needed to eliminate its investigation backlog and conduct the large-scale investigations that have proven effective in recovering funds and identifying and sanctioning significant rule violations; and • Attract and retain staff with experience in market rules and expertise in investigation.		sought and received approval to convert six contracted staff to regular (i.e., full-time and non-temporary) status. The IESO also deployed a more targeted recruitment strategy tailored to the expertise required for MACD enforcement work. This strategy has resulted in 10 new hires into MACD in 2018.		
11	To ensure that the Independent Electricity System Operator (IESO) Market Assessment and Compliance Division (Oversight Division) can conduct proper oversight of the market, we recommend that the IESO replace the Oversight Division's computer system as soon as possible.	In-Full	The Market Oversight and Compliance Division (MACD) has procured and been actively using two support systems for its enforcement work, a case management workflow tool, and a litigation support system that enables the analysis and submission of evidence in contested proceedings.	Complete	

No.	Auditor's Recommendation	IESO Accepting Recommendation? (In-Full / In-Part / Not at All)	Status of Implementation	Expected Date of Completion	IESO Explanatory Notes
			Its tools are similar to those used by a variety of sophisticated investigative and adjudicative organizations, such as the Ontario Securities Commission and the Federal Court. The contractor assisting MACD in its use of these tools developed those tools and works with those organizations for the same purposes.		
12	To strengthen the independence of the Independent Electricity System Operator (IESO) Market Assessment and Compliance Division (Oversight Division), we recommend that the IESO change the Oversight Division's reporting structure.	In-Full	Prior to the release of the Auditor's report, the Independent Electricity System Operator (IESO) completed implementing a new reporting structure whereby the Director of the Oversight Division reports directly to the IESO Board of Directors and reports only administratively to the IESO CEO.	Complete	
13	To strengthen its cybersecurity governance, we recommend that the Independent Electricity System Operator (IESO) create a senior-level position for cybersecurity and establish a formal reporting process to both IESO executives and the IESO Board of Directors.	In-Full	Upon the effective start date of the new CIO, the IESO initiated the development process to create a senior-level cybersecurity role. The senior-level cybersecurity role was filled October 2018.	Complete	
14	To ensure there are sufficient	In-Full	The IESO retained the services of a	Complete	

No.	Auditor's Recommendation	IESO Accepting Recommendation? (In-Full / In-Part / Not at All)	Status of Implementation	Expected Date of Completion	IESO Explanatory Notes
	cybersecurity resources in place to respond to cyberattacks, we recommend that the Independent Electricity System Operator (IESO) increase the number of cybersecurity staff to the recommended level of seven and/or engage an external IT cybersecurity vendor to be on standby.		third party vendor to provide additional support to IESO cybersecurity staff by enabling 24/7 operational cybersecurity support. The IESO has also increased the total allotted staff within the cybersecurity team to 8, and have plans to add an additional 3. As well, 5 members of the access management team have been integrated into the security team in 2019, totalling 16. The additional increase for 2019 is to support the IESO's additional license requirements to provide cybersecurity services into the sector.		
15	To reduce cybersecurity risk and to prevent potential costly IT project redesigns, we recommend that the IT department of the Independent Electricity System Operator (IESO) involve its cybersecurity staff in the early stages of all IT projects that could pose cybersecurity risks.	In-Full	The Chief Information Officer (CIO) and incoming senior-level cybersecurity resource will establish effective governance ensuring that security practices are being built-in to the IESO's project management program and individual IT project lifecycles. Integration into the Enterprise Project Management Program has been completed. Cybersecurity has been integrated into Enterprise Project Management function.	Complete	

No.	Auditor's Recommendation	IESO Accepting Recommendation? (In-Full / In-Part / Not at All)	Status of Implementation	Expected Date of Completion	IESO Explanatory Notes
			The IESO will also be developing a best practice guide for the sector on cybersecurity risks in the supply chain. This would be applicable to the vendor supply chain that delivers industrial control system hardware, software, and computing and networking services associated with not only the bulk system operations, but traditional enterprise environments. The IESO best practice guide for supply chain risks was released to the sector on September 19, 2018.		
16	To reduce the cybersecurity risk of the Independent Electricity System Operator (IESO), we recommend that the IESO procure technology that prevents and identifies breaches of confidential information and monitors staff access to confidential information in real time.	In-Full	The Advanced Malware project is closed and the associated technology investments are providing value in identifying and responding to cybersecurity issues, including access to confidential information.	Complete	
17	To reduce the cybersecurity risk of the Independent Electricity System Operator (IESO), we recommend	In-Full	The Independent Electricity System Operator (IESO) is in the process of developing and implementing supply	On-going	The process of holistically addressing supply chain risks will be addressed through the

No.	Auditor's Recommendation	IESO Accepting Recommendation? (In-Full / In-Part / Not at All)	Status of Implementation	Expected Date of Completion	IESO Explanatory Notes
	that: • 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.		chain risk management measures that comply with North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection Supply Chain risk standards, which will also include processes that are responsive to the recommendation. The IESO is expanding its cybersecurity governance framework over the next two to three years to meet the National Institute of Standards and Technology (NIST) Cybersecurity framework that will help assess and mitigate vendor risks to the supply chain. This framework will establish effective security governance around external vendors.		enhancements of the governance framework. IESO external vendor must comply with IESO cybersecurity standards as defined in our standard legal terms. The IESO cybersecurity standards outlined best practice controls for managing risks in vendor's information systems along with the associated data. For 2019, Legal templates have been updated to enable IESO IT security to annually review vendor security risk posture reports.
18	To ensure that backup tapes are adequately protected and available when needed, we recommend that the Independent Electricity System Operator (IESO): • properly encrypt all backup tapes; and • store them in a secure off-site location.	In-Full	The Independent Electricity System Operator (IESO) has eliminated the use of tape-based backups in favour of system and data redundancy across two highly available and redundant data centers.	Complete	

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