AMPCO INTERROGATORY 1

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.0-AMPCO-1

INTERROGATORY

Ref: EB-2020-0230 Exhibit I Tab 1.0 Schedule 2 – 1.0 AMPCO 2 Attachment 1

Attachment 1 summarizes the IESI's Strategy, Business Plan and 2021 Priorities.

a) Please provide an updated summary of the IESO's strategy for 2022.

b) Slide 12 provides an overview of 2021 Enterprise Priorities. Please provide the Top 10 priorities for 2022.

RESPONSE

a) The IESO's 2022 strategy remains the same as submitted in response to Schedule 2 – 1.0 AMPCO 2 in the IESO's 2020/2021 Revenue Requirement Submission (EB-2020-0230).

b) The IESO's 2022 enterprise objectives shown in Table 1 below are a continuation from the 2021 priorities, but now also include the Pathways to Decarbonization work which was directed by the Minister of Energy in October 2021.

Table 1: 2022 IESO Enterprise Objectives

Five-Year Core Strategies	**Enterprise Objectives**
Ensure Cost-Effective System Reliability	•**Market Renewal Energy Program** •**Reliability and cost effectiveness** •**Capacity and resource acquisition** •**Cyber security**
Enable Competition	•**Enable resources** to deliver on capacity / participate in markets
Advance Sector Leadership	•Advance **stakeholder and sector engagement** to establish mutual expectations
Prepare for the Future of the Sector	•**Establish long term plan** for ensuring resource adequacy and enabling resources to participate in electricity markets •**Pathways to decarbonization**

Drive Business Transformation	•Continue **culture shift** •Establish/prioritize **technology and data roadmap** •Determine **office space configuration / evolve way of working**

1

CME INTERROGATORY 1

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.0-CME-1

INTERROGATORY

Ref: Exhibit A, Tab 2, Schedule 1, pp. 1-2 of 8; Exhibit A, Tab 2, Schedule 2, Attachment 1, p. 3 of 6.

At pp. 1-2, The IESO stated that it had introduced an IESO stakeholder engagement process that was enhanced in the fall of 2021. However, the IESO's internal measures show a static goal of 80% stakeholder satisfaction from 2021 to 2022.

a) Does the IESO expect to gain any incremental stakeholder satisfaction from the enhancements implemented in the fall of 2021?

b) If the answer to (a) is yes, why is this not reflected in the IESO's 2022 target?

c) If the answer to (a) is no, why implement the changes if it would not increase stakeholder satisfaction with the engagement process?

RESPONSE

a) The IESO continuously reviews and evolves its stakeholder engagement process to ensure it meets the needs of stakeholders and maximizes opportunities for input into decision-making, and it is expected that these changes will enhance stakeholder satisfaction with the engagement process over time. However, as the transformation of the energy sector continues, the breadth and depth of stakeholders' changes and competing interests continue to emerge. This can also can create new challenges and pressures in maintaining existing targets.

b) Changes in overall satisfaction take time to build, therefore the results will not be seen immediately following the implementation of any changes. This is especially true for the newest IESO stakeholders and communities, such as municipalities and the emerging technology sector participants, that are now beginning to engage with the IESO or expanding their level of engagement and understanding of the sector in general.

c) See response to b).

CME INTERROGATORY 2

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.0-CME-2

INTERROGATORY

Ref: Exhibit A, Tab 2, Schedule 2, Attachment 1, p. 2 of 6

At p. 2, the IESO states that its achieved 50% Strategic Initiatives are completed on time, when it has a 2021 target of 80% and a 5-year target of 90%.

a) To the extent that it is not already part of the evidence, please explain why the IESO's achieve in this regard was significantly below its 2021 target for all of its Strategic Initiatives.

b) In order to achieve the IESO's 5-year strategic target, significantly more Strategic Initiatives will have to be completed on time. What steps, if any, is the IESO proposing for this application period in order to ensure more initiatives are completed on time? Please describe fully.

RESPONSE

a) See response to Schedule 1 – 1.1 OEB STAFF 2(a).

b) No specific additional steps are planned at this time as there is not a common root cause which led to the delayed completion of the two Strategic Initiatives. The IESO will maintain an enhanced focus on the progress of Strategic Initiatives and take proactive steps to ensure on-time completion including reallocation of resources from other projects, if required.

CCMBC INTERROGATORY 1

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1-CCMBC-1

INTERROGATORY

Reference: Exhibit A-1-3, page 4, and Exhibit E-2-1

Preamble*: "Actual 2021 total capital expenditures were $18.3 million lower than budget, largely attributable to $12 million lower MRP expenses and delays in the initiation of a number of larger projects and in vendor progress towards milestones (see Exhibit E-2-1 – Capital Budget Overview and Progress on Capital Projects)."*

a) Is the IESO concerned about the delays in the initiation of a number of larger capital projects? Please explain your answer.

b) What is the IESO doing to bring the capital projects that are behind schedule back on schedule?

c) Does the IESO expect that it will be able to complete the projects on schedule? Please explain your answer.

RESPONSE

a) The IESO develops an annual capital plan that both drives core strategies and maintains critical business services and supporting systems. The timing of these projects is based on both business need and the availability of resources (budget and people). There is some flexibility in project initiation so some variation is not a concern. The IESO continues to monitor the project portfolio throughout the year and make adjustments as required based on business need and resource availability and where timing is a concern, resources may be reallocated from other planned projects on a priority basis to minimize delays in the initiation of these more time critical projects.

b) There are a number of techniques and approaches the IESO uses to bring projects back on schedule including schedule compression through resequencing of activities or applying additional resources to activities on the critical path and, where necessary, reducing scope, all while managing associated risks and ensuring projects are delivering the required value.

c) The IESO is working to bring these projects in on schedule. As described in response to a) and b) above, the IESO has different techniques and approaches that can be utilized to maintain schedule. Where necessary, projects can be reprioritized within the portfolio to ensure focus is maintained on the highest priority projects to ensure schedules are maintained.

CCMBC INTERROGATORY 2

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1-CCMBC-2

INTERROGATORY

Reference: Exhibit E-1-1, pages 2 and 3, and Exhibit E-3-1, Attachment 1, Service Life and Amortization Expense

Did the IESO prepare the Service Life Comparison and Amortization Expense or did a consultant such as Kinectrics Inc. assist IESO in preparing it? If a consultant assisted IESO, please file the consultant's report or other documents that the IESO received from the consultant. If the IESO was not assisted by a consultant, please explain why not.

RESPONSE

a) The IESO prepared the Service Life Comparison and Amortization Expense schedules as the necessary skills were available in-house.

CCMBC INTERROGATORY 3

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1-CCMBC-3

INTERROGATORY

Reference: Exhibit E-2-1 Attachment 2, Dynamic Limits in Real-Time (DLRT) project, pages 1 to 32, and Exhibit D-1-2, Table 1, page 1.

a) Please confirm that the IESO seeking OEB approval for the $5.1 million DLRT project? If the answer is no, please explain what approvals is IESO seeking.

b) The total project cost of $5,081,251 includes (page 12) operating costs of $200,499 in 2021 and $102,960 in 2022.

   i. Please explain why a capital project would have operating expenses in 2021 and 2022 when it will not be completed until 2024.

   ii. Where are these operating expenses included in Table 1: Summary of OM&A for Business Units (D-1-2, page 1)

c) Please explain how the following quantities that are shown In the Appraisal of Alternatives (page 27) were determined:

   i. The NPV of + $1.7 million for this project, and

   ii. The NPV of - $ 4.4 million for implementing high voltage monitoring in EMS.

d) Why is this project considered "low risk"? On what evidence or experience does the IESO base its conclusion that this is a low risk project?

RESPONSE

a) The IESO is not seeking specific approval of the $5.1million for the DLRT project but is rather seeking approval for the overall capital envelope of $71.2 million for 2022, which includes the DLRT project. This is consistent with the requested approvals for past IESO revenue requirement submissions.

b) Certain activities, particularly those carried out in the Initiation and Planning Phases of a project, cannot be capitalized and must therefore be expensed. These activities include project planning, gathering high level business requirements and developing process maps, models and specifications.

   The operating expenses are largely related to internal labour and are included within the expenses of the appropriate Business Unit. See Exhibit D-1-1 Attachment 3 – OM&A Business Unit Table (Appendix 2-JC).

c) In alternative 2, the present value of expenditures is $4.7M with an expected savings of $6.4M for a Net Present Value (NPV) for this alternative of $1.7M.

In alternative 3, the present value of expenditures is $4.4M with no anticipated savings. Therefor the NPV for this alternative is -$4.4M.

d) The project is not considered low risk but rather the lower risk option when compared to the other alternatives. Section 7.3 of Exhibit E-2-1 Attachment 2 – Project Charter (DLRT)) has identified a number of risks that can be further mitigated, if required, using the identified control actions.

CCMBC INTERROGATORY 4

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1-CCMBC-4

INTERROGATORY

Reference: Exhibit E-2-1 Attachment 3, Market Analysis and Simulation Toolset (MAST), Pages 1 to 22.

a) Please confirm that the IESO is seeking OEB approval for the $6.8 million MAST project. If the answer is no, please explain your answer.

b) The total project cost of $6.8 million includes (page 8) operating costs of $40,000 in 2021 and $80,000 in 2022.

   i. Please explain why a capital project would have operating expenses in 2021 and 2022 when it will not be completed until 2024.

   ii. Where are these operating expenses included in Table 1: Summary of OM&A for Business Units (D-1-2, page 1)

c) Considering that requirements with the vendor have not been validated (page 17) and the risks are "high" (pages 13-14) why should the OEB have confidence in the $6.8 million cost estimate for this project?

RESPONSE

a) The IESO is not seeking specific approval of the $6.8 million for the MAST project but is rather seeking approval for the overall capital envelope of $71.2 million for 2022, which includes the MAST project. This is consistent with the requested approvals for past IESO revenue requirement submissions.

b) See response to Schedule 5 – 1.0 CCMBC 3(b).

c) The projected cost of $6.8 million of the MAST project presented in Exhibit E-2-1 Attachment 3 – Project Charter (MAST) is a rough order of magnitude estimate and includes $1.5 million of capital cost contingency to reflect cost uncertainties (+/- 40%). As outlined in the Project Charter, the MAST Project sought approval to move into the Planning Phase where the cost and schedule along with the project risks will be further refined before the project seeks approval to execute. At that point the project will refine cost and schedule estimates to successfully complete the project along with a revised set of project risks and mitigations. Levels of uncertainty at this point are expected to be in the order of +/- 20%.

ED INTERROGATORY 7

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.0-ED-7

INTERROGATORY

Reference: Exhibit B-1-2, Page 20

Preamble:

> **Risk: Regulatory Change.** A regulatory decision is made that impedes the ability of the IESO to enhance competition.
>
> **Risk Assessment: Medium**
>
> **Risk Mitigation Approach**
>
> While the Ontario Energy Board (OEB) is typically aligned with IESO direction for achieving a more competitive electricity market, in making decisions, the OEB will give significant weight to past decisions which may impede market competition. The IESO will seek to engage the OEB in support of a coordination framework to enable ongoing education and strengthen the understanding of the foundational Market Renewal Program (MRP) or wider market or grid-operation changes.

Question(s):

a) Please provide a list of potential regulatory decisions that are contemplated by the above passage.

RESPONSE

a) The risk assessment does not focus on specific OEB decisions, but the IESO is mindful of oversight as a regulated/licensed entity as well as the impact an OEB decision can have on the IESO's strategic priorities.

ED INTERROGATORY 8

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.0-ED-8

INTERROGATORY

Reference: Exhibit C, Tab 2, Schedule 1, Page 2

The IESO commissioned a study on the IESO Regulatory Scorecard by John Todd of Elenchus and filed it in EB-2017-0150, Exhibit C-1-1, Attachment 1. It stated at page 36:

> "[S]ince system losses are important to Ontario's electricity users it is reasonable to suggest that a comprehensive metric would be a useful indicator of the performance of the industry with respect to optimizing the various types of investment and grid management opportunities that impact on transmission system losses. …
>
> It may be reasonable to give further consideration to including a measure of the cost efficiency of transmission losses in the IESO scorecard in the future. Factors to consider include the degree of control that the IESO has over transmission losses and the division of responsibilities between the IESO and transmission owner/operators. In addition, further work would be needed to develop an acceptable methodology for calculating transmission loss metrics that factors in cost optimization."

Questions:

a) Does the IESO agree with John Todd that "system losses are important to Ontario's electricity users."?

b) Does the IESO agree with John Todd that "a comprehensive metric would be a useful indicator of the performance of the industry with respect to optimizing the various types of investment and grid management opportunities that impact on transmission system losses."?

c) Has the IESO given further consideration to including a measure of the cost efficiency of transmission losses in the IESO scorecard and if not, when does it believe it would be the appropriate time to do so?

d) Please provide a table with the following data for the most recent five years that this data is available:

   i. Annual transmission losses (MWh);
   ii. Annual transmission losses as a percent of annual demand;
   iii. The ratio of the figure in (ii) to the peak demand (peak hour); and
   iv. Transmission losses at the time of system peak demand as a percentage of system peak demand (peak hour).

e) What share of supply costs are currently reflected in market prices? Please provide a detailed answer, including appropriate references to the Global Adjustment ("GA") and Hourly Ontario Electricity Price ("HOEP").

f) Please describe at a qualitative level the percent of energy costs that are reflected outside of market prices (i.e. outside of HOEP). Please also estimate the approximate percent of energy costs reflected outside of market prices (i.e. outside of HOEP).

g) Please describe at a qualitative level the percent of operating costs that are reflected outside of market prices (i.e. outside of HOEP). Please also estimate the approximate percent of operating costs reflected outside of market prices (i.e. outside of HOEP).

h) Please complete this table to the best of the IESO's ability, making and stating assumptions, simplifications, and caveats as necessary:

Breakdown of Total Electricity Supply Costs				
	Operating costs	Capital costs	Return/profit	Total
% reflected in HOEP				100%
% reflected in GA				100%
% elsewhere				100%
Total	100%	100%	100%	

i) Please complete this table to the best of the IESO's ability, making and stating assumptions, simplifications, and caveats as necessary:

Breakdown of Total Electricity Supply Costs			
	Energy costs	Capacity costs	Total
% reflected in HOEP			100%
% reflected in GA			100%
% elsewhere			100%
Total	100%	100%	

RESPONSE

a) The IESO's 2022 Revenue Requirement Submission is based on a Business Plan that has been reviewed and approved by the Minister of Energy and the review of the IESO's application should be focused on the IESO's OM&A and capital expenditures. However, as noted in the IESO's transmission losses stakeholder engagement, transmission losses are one of many technical and economic considerations the IESO undertakes within the system planning process.

b) As per the IESO's submission in EB-2017-0150, a metric in the regulatory scorecard should be an indicator of the cost effectiveness of IESO activities. A measure that relates to overall attributes (such as distance from major generation sources to major load centres) and characteristics (such as the inherent conductor and transformer losses) of the electricity system in Ontario are aspects of system performance for which the IESO has limited control. Since the IESO would not be responsible or accountable for these additional metrics, these measures should not be reported through the Scorecard.

c) Given the answer to b) above, the IESO has not further considered including a metric where the IESO would have limited control and that does not fall within the scope of its Revenue Requirement Submission.

d) This question is out of scope as it is not focused on the IESO's OM&A and capital expenditures. To be responsive, the IESO has assembled the following information.

Table 1 below provides the most recent five years of data covering: i) annual transmission losses, ii) annual transmission losses as a percent of annual demand, iii) the ratio of annual transmission losses as a percent of annual demand compared to the peak demand (peak hour), and iv) transmission losses at the time of system peak demand as a percentage of system peak demand (peak hour).

Table 1: Transmission Losses Data

	2017	**2018**	**2019**	**2020**	**2021**
Actual annual transmission losses (MWh)	2,696,327	2,801,979	2,864,311	2,601,979	2,504,022
Actual annual transmission losses as a percent of annual demand (%)	1.81	1.82	1.88	1.73	1.68

Actual transmission losses at the time of system peak demand as a percentage of system peak demand (%)	2.15 On September 25, 2017 in hour ending 17	1.54 On September 5, 2018 in hour ending 17	2.56 On July 5, 2019 in hour ending 17	2.39 On July 9, 2020 in hour ending 17	1.54 On August 26, 2021 in hour ending 14
Ratio of actual annual transmission losses as a percent of annual demand (%) to Actual transmission losses at the time of system peak demand as a percentage of system peak demand (%)	0.84	1.18	0.73	0.72	1.09

e) The IESO's 2022 Revenue Requirement Submission is based on a Business Plan that has been reviewed and approved by the Minister of Energy and the review of the IESO's application should be focused on the IESO's OM&A and capital expenditures. The IESO's 2022 Revenue Requirement Submission is not a proceeding to analyze historical wholesale market outcomes. Further, this calculation would require a large set of detailed data and labour and could not reasonably be completed within the time allowed for interrogatories. The IESO's website provides public data sets on HOEP, Global Adjustment and Supplier output and interested parties can avail themselves of this information.[1]

f) See response to e).

g) See response to e).

[1] Global Adjustment: https://www.ieso.ca/en/Power-Data/Price-Overview/Global-Adjustment

h) See response to e).

i) See response to e).

ED INTERROGATORY 11

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.0-ED-11

INTERROGATORY

Reference: Exhibit G-1-1 Attachment 4, Page 16

Preamble:

> Through the Reliability Standards Review stakeholder engagement, the IESO reviewed assumptions related to compliance with Northeast Power Coordinating Council (NPCC) resource adequacy standards (NPCC "Directory 1"), including assumptions for non-firm imports. Through this engagement, the IESO proposed a methodology to determine an appropriate assumption for non-firm imports which takes into account the NPCC Review of Interconnection Assistance Reliability Benefits study. The Reliability Standards Review concluded on April 9, 2021.
>
> The stakeholdered methodology to determine an appropriate assumption for non-firm imports will be included in the assessments for the 2021 Annual Planning Outlook (APO).

Question(s):

a) Please describe the changes in methodology at a high level, and quantify the impact (MW, $, and %) on the level of non-firm imports that is now considered appropriate to assume in resources adequacy studies.

b) Please confirm that these assumptions can have major financial impacts through the capacity that the IESO will need to procure.

c) Please confirm whether the IESO will continue this work in an effort to lower costs if possible in 2022 or the future.

RESPONSE

a) The 2020 Reliability Standards Review[1] outlined six methodologies to calculate the reliability benefits of non-firm imports, with the most conservative approach selected based on numerical results. The selected methodology looks at the 90th percentile dependable import flows during the top 5% of HOEP hours over the previous 4 years. This increased the reliability benefits of non-firm imports from 0 MW in the 2020 APO to 250 MW and 240 MW for Summer and Winter, respectively, in the 2021 APO. There are

[1] IESO Reliability Standards Review: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Reliability-Standards-Review

no incremental costs associated with this consideration, and value is discussed below in b).

b) The reliability benefits of non-firm imports will avoid otherwise procured resources through the Resource Adequacy Framework. The IESO is unable to speculate on the outcomes of these competitive processes which would inform the size of the financial impact.

c) The IESO will assess and update the reliability benefits of non-firm imports on an annual basis as part of the Annual Planning Outlook. Per the engagement and the methodology, the assessment is driven by reliability and not cost.

ED INTERROGATORY 12

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.0-ED-12

INTERROGATORY

Reference: Exhibit G-1-1 Attachment 4, Page 25

Preamble: Market surveillance panel recommendation:

> "The IESO should immediately cease reimbursements to gas generators of carbon cost payments."

Question(s):

a) Has the IESO received specific government direction regarding this recommendation? If yes, please provide the documentation containing that direction.

b) Please confirm that the IESO has declined to follow this recommendation.

c) Please confirm whether the IESO is open to reconsidering its response.

d) Please confirm that following through with this recommendation would not increase the IESO's requested revenue requirement.

RESPONSE

a) The IESO has not received specific government direction regarding this recommendation.

b) As set out in the IESO's reply to the Market Surveillance Panel's recommendation, the Real-Time Generation Cost Guarantee (RT-GCG) program ensures that non-quick start generators are available to meet reliability in real-time. The RT-GCG Program is not a full cost recovery program. The objective of the program is to provide eligible generators recovery of certain incremental fuel, operating, and maintenance costs incurred as a result of starting up and ramping to minimum loading point, to the extent those costs are not recovered through market revenues. Carbon costs are an additional operating cost incurred by generators during the start-up period and the IESO considers recovery of these costs to be consistent with the program's methodology, and appropriately reimbursed.

c) At this point, the IESO has no new information that would indicate a reconsideration of the recommendation is necessary.

d) The IESO does not have an estimate of the potential impacts to the IESO's revenue requirement and usage fees to address the recommendation any differently than as set

out in the IESO's response in Exhibit G-1-1 Attachment 4 – OEB Annual Update on MSP Recommendations.

ED INTERROGATORY 13

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.0-ED-13

INTERROGATORY

Reference: Exhibit G-1-1 Attachment 4, Page 27

Preamble:

> "As noted in response to recommendation 3-3 from the Market Surveillance Panel's September 2021 report, in the short term, the RT-GCG program will continue to reimburse carbon costs to ensure reliability consistent with the current program design as set out in 2017. In the future, the Market Renewal Program (MRP) will introduce the enhanced realtime unit commitment process which will facilitate enhanced competition between generators based on their all-in costs, including carbon costs. MRP is expected to be in service by November 2023."

Question(s):

a) Please confirm that this does not entail ceasing the reimbursement of generators or preserving the incentives of the carbon price.

b) Could the IESO adjust the dispatch order as if the carbon price was added to gas generation to preserve the carbon price impact? Please discuss. Please indicate the cost to do so in 2022 if implemented immediately.

RESPONSE

a) In the future, the Market Renewal Program will introduce the enhanced real time unit commitment (ERUC) process that will replace the RT-GCG program, including eligible cost reimbursements made under the program. The ERUC will incent generators to price their full costs incurred during their start-up period, including carbon costs, into their competitive market offers.

b) The effect of a carbon price is to increase the costs of fossil fuel generation, which translates to higher offer prices. The carbon price impacts offer prices today, and the IESO dispatches based on offers and bids submitted by market participants, in accordance with the Market Rules Chapter 7, Section 4.4 There is no need for the IESO to adjust the dispatch order to preserve the impact of a carbon price.

ED INTERROGATORY 14

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.0-ED-14

INTERROGATORY

Reference: Exhibit G-1-1 Attachment 4, Page 27

Preamble: Market surveillance panel recommendation:

"If the IESO does reimburse gas generators for carbon cost payments, the total annual reimbursement from the IESO should be made public to improve transparency, beginning with the total reimbursement to gas generators for 2019 that was made in 2021."

Question(s):

a) Please provide the above-referenced information or provide a link to where it is publicly available. If only draft or partial details are available, please provide those.

RESPONSE

a) In 2021, $1.02 million of carbon costs were paid to eligible generators under the Real-Time Generation Cost Guarantee program for the 2019 compliance year. This is information is publicly available on the IESO's website.[1]

[1] Market Assessment Overview: https://www.ieso.ca/en/Sector-Participants/Market-Oversight/Market-Assessment/Market-Assessment-Overview.

ED INTERROGATORY 15

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.0-ED-15

INTERROGATORY

Reference: Exhibit B

Preamble:

Question(s):

a) The OEB has prepared a report for the Ministry of Energy on an Optional Enhanced Time of Use rate structure. If this were to be implemented, what tasks would fall to the IESO? Would these entail additional costs or staff work for the IESO? If yes, how much?

b) The OEB report on the optional enhanced rate structure briefly discussed implementation issues relating to net metering.[1] Customers with net metering are typically made to switch to tiered rates (from TOU rates) when they get a net meter. This means that customers with net metering will not be able to benefit from the new optional enhanced TOU rates. This would rule out a number of proactive customers who might otherwise be interested in the optional rate. Does the IESO have tools or mechanisms to resolve that issue? Please explain. If yes, would that fix entail additional costs or staff work for the IESO? If yes, how much?

c) Net metering is currently not available for residential customers with local storage that do not also have renewable generation. If that were to change (e.g. via a change to the regulation), what steps would the IESO need to take to implement that change and what costs and staff time would be required from the IESO.

RESPONSE

a) This work is the responsibility of the Smart Metering Entity ("SME"), which is required by the Electricity Act, 1998 to have its own budget and fee (the Smart Metering Charge). The IESO, in its responsibility as the SME. has committed to the OEB to provide revised Meter Data Management and Repository ("MDM/R") Technical Interface Specification ("TIS") and Report Documentation to LDCs by September 1, 2022 and provide a Sandbox environment for testing by November 1, 2022. There are no additional costs associated with the configuration changes and documentation preparation.

[1] https://www.oeb.ca/sites/default/files/Report-Design-of-an-Optional-Enhanced-Time-of-Use-Price-20220331.pdf, p. 58.

b) The IESO's 2022 Revenue Requirement Submission is based on a Business Plan that has been reviewed and approved by the Minister of Energy and the review of the IESO's application should be focused on the IESO's OM&A and capital expenditures. Net metering is not within scope of the IESO's 2022 Revenue Requirement Submission. Additionally, the Smart Metering Entity does not currently perform or have the authorization to perform net metering.

c) See response to b).

OSEA INTERROGATORY 1

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1-OSEA-1

INTERROGATORY

Reference: Exhibit B-1-2

Preamble: The IESO business plan describes expanded activities for Resource Adequacy and Enabling Resources. IESO's procurement target has risen from ~1,000 MW of effective capacity described in the 2021 Annual Acquisition Report ("AAR") to over 6,000 MW in the 2022 AAR. OSEA is interested in the amount of investments and operating funds expected by the IESO to support different resource types and community choice.

Questions:

a) The IESO procurement target through the Resource Adequacy process is ~6,000 MW of new effective capacity by 2030. Please provide an estimate of the amount of Distributed Energy Resources ("DERs") and community energy projects that will be procured by the IESO through the Resource Adequacy process.
    i. If no estimate is available, please explain what resources the IESO's expects to procure by resource type and connection type (i.e., transmission or distribution).

b) Please provide an estimate of changes to capital and operating expenditures to reflect the increased procurement target from 2021 AAR to 2022 AAR. Please provide all supporting documentation and analysis for the estimated changes in expenditures.

RESPONSE

a) No estimate is available on the amount of DERs and community energy projects that may be acquired through the Resource Adequacy process. The Resource Adequacy Framework outlines a framework to procure products and services from new and existing resources to address system needs. As such, the IESO is endeavouring to deploy a technology agnostic approach, so long as the underlying resources can address the need that is to be met. The IESO has no estimate for the connection type (transmission or distribution) of resources to be procured through competitive processes. It is anticipated that DERs that are eligible to participate in the IESO-Administered Markets would be eligible for the various acquisition mechanisms, as they were in the first Medium-Term RFP; so long as they can provide the products or services that are being acquired.

As for community energy projects, the IESO does not anticipate that there would be a need for restrictions on any particular project ownership structure in the future acquisition mechanisms.

Separately, the IESO has been directed to develop programs for hydroelectric facilities. The programs are expected to acquire transmission and distribution connected hydroelectric resources.

Lastly, the IESO runs a Capacity Auction on an annual basis which acquires demand response resources, generation resources, and storage resources, which could be distribution or transmission connected. Capacity imports are also acquired through the Capacity Auction, however, these are only transmission-connected.

b) The IESO has reprioritized work to accommodate the increased procurements from the 2021 AAR to the 2022 AAR within the requested 2022 Budget, however procurement activities are ongoing, including stakeholder consultation of various options, and until the options are fully determined and the procurement work is underway there remains risk to budget impacts.

OSEA INTERROGATORY 2

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1-OSEA-2

INTERROGATORY

Reference: Exhibit B-1-2

Preamble: The IESO business plan describes expanded activities for Resource Adequacy and Enabling Resources. The procurement schedule focuses only on new supply resources under the assumption of continued operation of existing assets. The ability of existing resources, including a significant amount of small and community projects, will depend on IESO's procurement programs. OSEA is interested in how the IESO is planning to procure the continued operation of existing resources, especially small and community projects. Re-powering of existing facilities requires investment decisions be made 3 to 5 years in advance and therefore must be addressed within the IESO's budget window.

Questions:

a) Please provide an estimate of capital and operating expenditures to support potential re-contracting and re-powering of small and community DERs (e.g., Renewable Energy Standard Offer Program ("RESOP") contracts reaching end of contract term).
    i. If no estimate is available, please explain why no estimate is available.

b) For DERs reaching end of contract term, will the Enabling Resources program address the barriers to their continued operation (i.e., the ability to receive market revenue from LDCs without a contract with the IESO)?
    i. If so, please provide details on how IESO's investments will support the continued operation of DERs.
    ii. If not, please explain why the Enabling Resources program does not address barriers to the continued operation of existing resources and receiving market revenues without a contract with the IESO.

c) The IESO is currently undergoing a medium-term Request for Proposal ("RFP") that offers 3- to 5-year contracts for existing resources. The IESO has announced a 3 year forward capacity auction.
    i. Do IESO's operating expenses include the two parallel near- to medium-term procurement structures?

ii. Please comment on the ability of DERs to participate in both procurement structures. How does the Enabling Resources investment align with the increase in procurement and Enabling Resources across the two procurement processes?

RESPONSE

a) No estimate is available, as there is no specific initiative for re-contracting RESOP generators. For initiatives such as the Capacity Auction, the first Medium-Term RFP and the small hydro program under development, where some RESOP contracts could be eligible, costs are not allocated according to the legacy contract type.

b) The objective of the DER Market Vision and Design Project, which are part of the Enabling Resources program, is to reduce existing barriers and enhance the value DERs can provide to Ontario's electricity system by expanding participation in the wholesale markets. The project goals include: introducing wholesale participation models that enhance DERs' ability to compete to provide the services they are technically capable of providing within the IESO's broader Resource Adequacy procurements; fostering greater competition by unlocking DER capabilities to address future reliability needs; making efficient use of IESO resources and minimizing implementation risks considering other priorities. It should also be noted that through existing market rules, the IESO has already enabled the participation of DERs if they are a single generation, storage or load resource rated greater than 1 MW or if they are a part of an aggregation of Demand Response (DR) resources, including physical hourly demand response (HDR), virtual HDR – residential, virtual HDR – commercial and industrial (C&I) and dispatchable loads (DLs).

c)

i. Yes, it does include the two parallel near- to medium-term procurement structures.

ii. See response to Schedule 11 – 1.0 OSEA 1(a). With regard to the alignment between the IESO's Enabling Resource initiative and the IESO's resource adequacy procurements, these are separate but related initiatives. Resource adequacy procurements, including the Medium-Term RFP and forward capacity auction, are required to meet identified system needs by securing resources. The Enabling Resources program will, over time, enable new types of resources to participate in future resource adequacy procurements and the IESO-Administered Markets.

SUP INTERROGATORY 1

Issue 1.0 Revenue Requirement, Operating Costs and Capital Spending

1.1-Society-1

INTERROGATORY

SUP notes that Hydro One Networks Inc. (Hydro One) has recently refiled it's EB-2021-0110 five-year rate application due to forecast changes and uncertainty caused by recent inflationary trends.[1] SUP notes that inflation does not appear to be a specifically identified risk in the approved IESO business plan for 2022.

a) Would the IESO agree that inflation is a recently emerging risk that it needs to consider. If not, please explain why not.

b) Please comment on the impacts of known inflation since the business plan date on the IESO's forecast.

c) Please comment on which IESO capital and OM&A cost categories are at risk for further inflation (or deflation should it occur). Please provide the rationale the response.

d) SUP presumes that any unanticipated inflationary impacts on the IESO's 2022 cost levels would be accommodated using the IESO's reserve account. Given growing uncertainties resulting from recent inflationary forces, would the IESO reconsider and support replenishing this account to the approved $10 million level? Please provide the rationale for the response.

e) Please provide the IESO's specific inflation assumptions for 2022 and the support for these assumptions.

f) Hydro One has undertaken to update its inflation assumptions at the draft rate order stage of it's proceeding. Please comment on whether or not a similar late stage update would make sense for the IESO too. Please provide the rationale for the response.

RESPONSE

a) The IESO agrees that inflation is an emerging risk that needs to be considered, however, does not expect it to have a material impact on the IESO's 2022 budget, as most of the budgeted expenses include pre-determined escalations.

b) See response to Schedule 12 – 1.1 PWU 1(d).

c) Technology related costs of capital projects that have not yet been initiated are at risk of further inflation for the balance of 2022; however, the IESO does not expect this to have a material impact since most of the capital costs are comprised of internal labour costs. Regarding OM&A costs, please see response to Schedule 12 – 1.1 PWU 1(d).

[1] "EB-2021-0110 - Custom IR Application (2023-2027) for Hydro One Networks Inc. Transmission and Distribution (Hydro One) - Evidence Update", dated 20220331.

d) Given the scope and complexity of its mandate, the IESO recognizes the potential for additional unplanned events that may be material in scope and cost and are beyond the control of management. 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 tracks these variances through the FVDA. The IESO is confident that the FVDA balance of $8.7 million will afford it the ability to manage operational challenges in the short-term. The IESO acknowledges that operating below its approved reserve threshold does add risk to the organization's financial position, however the IESO balances this short-term risk with minimizing usage fee impacts to market participants, and the IESO has not included any additional revenue requirement in 2022 to recover the remaining operating reserve amount.

e) See response to Schedule 12 – 1.1 PWU 1(d).

f) A late-stage update of the IESO's pre-filed evidence, including the revenue requirement and Usage Fees, is not required for the reasons described in responses provided in a), b) and e).

OEB STAFF INTERROGATORY 1

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1-Staff-1

INTERROGATORY

a. Exhibit B / Tab 1 / Schedule 2 / p. 15

Preamble: On page 15 of the IESO's 2022-2024 business plan, the IESO states that the cumulative effect of its proposed revenue requirement increases over the 2022-2024 period for the average residential consumer are 2.3 cents per month, or 27 cents per year.

Questions:

a) Please provide the IESO's definition of an "average residential consumer" and specify all relevant assumptions used to calculate the projected monthly and annual bill impact (e.g., assumptions related to the average residential consumer's annual electricity consumption).

b) Please provide the bill impact of only the 2022 revenue requirement on the bill of the average residential consumer. Please show the bill impact calculation.

RESPONSE

a) The IESO defines the average residential consumer as the typical Ontario household consumer of residential electricity, which as per the April 14, 2016 OEB report on "Defining Ontario's Typical Electricity Customer" (EB-2016-0153), indicated that the average standard used for illustrative purposes should be 750 KWh per month.

b) Assuming Ontario's demand of 155.0 TWh for 2022, the projected year over year bill increase to the average residential consumer is 3.8 cents per month, which is higher than the 2.3 cents per month stated in the Business Plan as the latter is the average for the 3-year planning cycle. The Bill impact is calculated by dividing the IESO domestic Usage Fee over the average Ontario household consumption.

OEB STAFF INTERROGATORY 2

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1-Staff-2

INTERROGATORY

a. Exhibit A / Tab 2 / Schedule 2 / Attachment 1 / p. 2

Preamble: Attachment 1 provides the IESO's "Year-end review of performance against IESO Performance measures and targets." Performance measure 3 is entitled "Operational Efficiency – Percentage of Strategic Initiatives that are completed within only 50% of schedule contingency". For 2021, the IESO targeted achieving 80% for this performance metric, however, the actual achievement was 50%.

Questions:

a) Please identify the strategic initiatives reflected in performance measure 3 and show the performance of each initiative against its target.
    i. Please demonstrate how the 50% achievement was calculated.
b) For each underperforming initiative, please describe the reason(s) for the underperformance as well as any resultant operational impacts.
c) Please demonstrate the 2021 budgeted versus actual expenditures for each strategic initiative reflected in performance measure 3.
d) If applicable, please describe how the level of performance against this measure in 2021 has affected the financial approvals being sought by the IESO in its 2022 revenue requirement application.

RESPONSE

a) In 2021, the IESO established a new project category of "Strategic Initiative" to identify those IESO initiatives or programs that are critical to achieving the corporate strategy. A separate category of "Core Business Project" was also introduced to identify projects that are undertaken to maintain a business service, improve efficiency or remain compliant with a regulatory requirement.

   In order to drive improved performance around on-time completion of Strategic Initiatives the IESO also identified a new Performance Measure that would, over the next 5 years, improve focus and deliver these initiatives within 50% of assigned schedule contingency.

   As the Strategic Initiative category was new, the IESO did not have a baseline for current performance when an initial target of 80% completion for 2021 was established.

There were only four Strategic Initiatives that met the measurement criteria and were planned to be completed in 2021. These are shown in Table 1 below. In practice, due to the very small sample size, this became a very coarse measure. In order to have met the target the IESO would have had to deliver all of four of the Strategic Initiatives on time in 2021.

Two initiatives, the Identity Access Management Program (IAM) – Project 3 – Establish IAM Governance project and the Review of CMSC paid to Dispatchable Loads – Phase 2, were not completed within the approved schedule. The other Strategic Initiatives planned for 2021 were completed within the approved schedule, including contingency.

While the IESO may use all of a projects' allocated contingency, per established project management governance process, the measure was intended to be more stringent in order to gain the benefits of these important initiatives as soon as possible.

Due to the challenges in not having a sufficiently large data set of Strategic Initiatives to support this measure, the IESO is currently looking at more effective measures to drive efficient delivery of Strategic Initiatives.

The IESO has included the specific information that supports calculation of this measure in Table 1.

Table 1: List of Strategic Initiatives scheduled to close in 2021:

Project Title	Approved Completion w/o Contingency	Approved Completion w/ Contingency	Actual Completion	Achieved Measure ?	2021 Capital Budget	2021 Capital Actual	Impact
Transmission Rights Clearing Account (TRCA) Disbursement	May 31, 2021	Apr 30, 2021	Apr 13, 2021	Y	$0	$14K	N/A
Capacity Auction	Aug 31, 2021	Jun 30, 2022	Oct 6, 2021	Y	$100K	-$100K (due to expensing of certain project costs)	N/A
Review of CMSC paid to Dispatchable Loads Phase 2	Feb 26, 2021	Mar 31, 2021	Apr 20, 2021	N	$0 (Only Opex budget in 2021)	$0	No impact

IAM Program – Project 3 – Establish IAM Governance	Apr 30, 2021	Dec 31, 2021	May 30, 2022 (forecast)	N	$0 (Only Opex budget in 2021)	$0	Resulted in a minor delay to the start of Project 4 of the IAM Program but is not expected to impact the planned end date.

Out of the 4 projects that are part of this measure for 2021, 2 of 4 (50%) Strategic Initiatives were delivered within 50 % of the approved schedule contingency.

b) The Review of Congestion Management Settlement Credits (CMSC) paid to Dispatchable Loads Phase 2 required the release of all remaining time contingency therefore was not completed within 50% contingency. Capital project work was completed on time but the corresponding Market Rule went into effect beyond the approved end date for the project.

IAM Program – Project 3 – Establish IAM Governance was expected to be complete by November 30, 2021 however due to challenges with resource availability and a dependency on the completion of a software upgrade, which was not originally contemplated, required additional time to complete. A revised completion date of May 2022 was formally approved through an exception report in late 2021.

See Table 1 above for resultant impacts.

c) See Table 1 above for the 2021 budget vs. actual for the Strategic Initiatives planned to be delivered in 2021.

d) The performance of these Strategic Initiatives has had no material impact on the financial approvals being sought by the IESO in its 2022 Revenue Requirement Submission.

OEB STAFF INTERROGATORY 3

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1-Staff-3

INTERROGATORY

a. Exhibit B / Tab 1 / Schedule 2 / p. 27 (2021 Annual Report p. 25)
b. Exhibit D / Tab 1/ Schedule 2 / p. 7

Preamble:

Effective January 1, 2011, the IESO adopted Canadian public sector accounting standards (PSAS) with a transition date of January 1, 2010. The adoption of PSAS was accounted for by retroactive application with restatement of prior periods subject to the requirements in Section PS 2125, First-time Adoption by Government Organizations. The corresponding change to pension and other-post employment benefits resulted in previously unrecognized actuarial losses and past service costs of $98,832,000 at the date of transition being charged to the PSAS Transition Item's accumulated deficit. Each year, the IESO recovers a portion of the PSAS Transition Item's deficit through the IESO's annual system fees revenue. The annual amount recovered is transferred from the Regulatory Deferral Account to the PSAS Transition Item accumulated deficit each year. OEB staff notes that a portion of the PSAS Transition Item's deficit is recovered as part of "Corporate Adjustments" which are included in the IESO's revenue requirement OM&A.

In its application, the IESO demonstrated its actual and budgeted Corporate Adjustments included in OM&A, as shown in OEB Staff Table 1 below. The IESO stated that its Corporate Adjustments are mainly comprised of the annual amortization of the accumulated deficit resulting from the PSAS transition item corresponding to the change in pension and other-post employment benefits; partially offset by the overhead cost recovery from other funding sources.

OEB Staff Table 1 – Overview of Corporate Adjustments

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

Questions:

a) Please provide a breakdown for each year (e.g., 2021 Budget, 2021 Actual, 2022 Budget) of the Corporate Adjustments shown in OEB Staff Table 1, listing the PSAS Recovery Amount versus "other". Please identify and explain any significant changes in

the PSAS Recovery Amount, year-over-year, specifically 2021 Budget versus 2021 Actual, 2022 Budget versus 2021 Actual, and 2022 Budget versus 2021 Budget

b) Please confirm that there is no impact to capital expenditures or amortization from the Corporate Adjustments, in particular the recovery of PSAS transition items. If this is not the case, please explain.

RESPONSE

a) Please see the breakdown in Table 1 below for each year of the Corporate Adjustments shown in OEB Staff Table 1.

Table 1: Breakdown of Corporate Adjustments

($ in millions)	2021 Budget	2021 Actual	2022 Budget
PSAS amortization	$3.3	$3.3	$3.3
Pension/OPEB adjustment	$0.0	($0.2)	$0.0
Other one-time items	$0.4	$0.6	$0.0
Overhead cost recovery	($2.1)	($2.2)	($2.1)
Total Corporate Adjustment	**$1.6**	**$1.5**	**$1.2**

There is no change to the PSAS recovery amount year-over-year.

b) Confirmed that there is no impact to capital expenditures or amortization from the Corporate Adjustments, in particular the recovery of PSAS transition item.

OEB STAFF INTERROGATORY 4

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1-Staff-4

INTERROGATORY

a. Exhibit F / Tab 1 / Schedule 1 / p. 2 & 3
b. Exhibit F / Tab 1 / Schedule 1 / p. 1
c. Exhibit B / Tab 1 / Schedule 2 / p. 24 (2021 Annual Report p. 22)

Preamble:

The IESO noted that in the OEB staff submission on the settlement proposal for the IESO's 2020-2021 revenue requirement proceeding,1 OEB Staff questioned "why certain amounts are included in the FVDA [Forecast Variance Deferral Account] as period charges in 2018, instead of grouping all amounts with those recorded in the PSAS Transition Item – Accumulated Deficit account, which is recovered over a longterm period."

In the current application, the IESO stated that the $13.4 million is a current period expense and therefore reflected in the FVDA in the current period (fiscal year 2018). The reason this was not grouped in the PSAS Transition Item – Accumulated Deficit account was because this amount is the additional expenses as a result of using "cost of borrowing", subsequent to adopting PSAS on the transition date of January 1, 2010. Therefore, this is required to be calculated as a current period expense under PSAS, as it is not a result of Section PS 2125.

The IESO further stated that it incurred a total increase to its liability of $31.3 million. The breakdown of the $31.3 million is as follows:

- $17.9 million that is calculated as prior period expenses (at the transition date of January 1, 2010)
- $13.4 million that is calculated as a current period expense (subsequent to the transition date of January 1, 2010 up until December 31, 2017)

The IESO stated that its practice is to seek OEB approval to return any surplus in excess of the reserve threshold of $10 million to market participants.

The 2021 Annual Report notes that the expected average remaining service life (EARSL) of employees covered by the pension plans is 14.5 years and other postemployment benefit plan is 17.2 years, for both 2020 and 2021.

Questions:

a) Please explain any implications to the IESO if the OEB ordered, for regulatory purposes, that the $13.4 million be moved from the FVDA balance, as period charges in 2018, to

the PSAS Transition Item – Accumulated Deficit account (which is amortized over a longer period using the EARSL).

b) Please confirm that in the scenario outlined in part a) of this question, the FVDA balance, as at December 31, 2021, would become $22.1 million ($8.7 million plus $13.4 million) and surpass the reserve threshold of $10 million. Please explain whether it would be the IESO's intention to return such surplus in excess of the reserve threshold of $10 million to market participants.

RESPONSE

a) The implication of the OEB ordering the IESO to move the $13.4M from the FVDA to the PSAS Transition Item is that the IESO would violate Canadian public sector accounting standards (PSAS) [PS 2120] and would be acting contrary to the Auditor General's expectations that the IESO comply with PSAS. In doing so, the IESO would also violate the Memorandum of Understanding with the Minister of Energy which requires the IESO's financial statements to be prepared in accordance with Canadian generally accepted accounting principles (GAAP) in order for the IESO's accounts to be consolidated into the Province of Ontario's Public Accounts. As the IESO is a Public Sector Entity, for the IESO's financial statements to be prepared in accordance with GAAP, the IESO must also be in compliance with PSAS.

b) Notwithstanding the IESO's response to a), as a general matter, the IESO's intent would be to return any balance in the FVDA in excess of the OEB approved balance of $10M to market participants.

OEB STAFF INTERROGATORY 5

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1-Staff-5

INTERROGATORY

a. EB-2020-0230 / OEB Staff Submission / October 20, 2021 / p. 5
b. EB-2020-0230 / Response to OEB Staff Interrogatory 12 / September 9, 2021
c. EB-2020-0230 / Responses to Settlement Conference Question #2 / October 12, 2021

Preamble:

In the OEB staff submission on the settlement proposal for the IESO's 2020-2021 revenue requirement proceeding, OEB staff noted that the IESO had previously committed to reviewing its strategy on how it intends to collect the incremental $31.3 million associated with its accounting policy changes in 2018.[1]

OEB staff notes that there is no updated proposal from the IESO with respect to how it intends to collect the incremental $31.3 million. Absent any updated proposal, it is OEB staff's understanding that the IESO intends to maintain $13.4 million in the FVDA, while including $17.9 million in the PSAS Transition Item deficit account (with no intention to increase to the annual recovery amount of that deficit account). Whether retroactive charges are recorded in the FVDA, versus the PSAS Transition Item account, has ramifications with respect to the timing of recovery.

Question(s):

a) Please outline the IESO's proposal for how it intends to recover the $31.3 million amount (and any future deficits that may be reflected in the FVDA), and why that strategy is appropriate.
b) Please explain different potential strategies, other than the IESO's current practices noted in the response to 1-Staff-12 (and Responses to Settlement Conference Question #2), in the 2020-2021 revenue requirement proceeding, of:
    i. Recovering the PSAS Transition Item by including approximately $3.3 million in its revenue requirement annually (via the Corporate Adjustments in OM&A)
    ii. Deferring of the inclusion of additional revenue requirement in its budget to restore the $10 million operating reserve in the FVDA

[1] EB-2019-0002; OEB Staff Interrogatory 4, April 30, 2019

c) Please provide a comparison of alternative recovery plans of each of the $13.4 million and $17.9 million (including the time period and the impact on ratepayers) and why the IESO's proposed alternative is appropriate.

RESPONSE

a) The IESO's proposal to recover the $31.3M is set out in Exhibit F-1-1 – Forecast Variance Deferral Account, pg. 2-3. In 2022, the IESO seeks to recover $3.3 million through the revenue requirement, which is an equal amount of the remaining PSAS Transition Item over the Estimated Average Remaining Service Life (EARSL) of employees.

This proposal for treatment of the $31.3M is appropriate as it is consistent with PSAS (PS 2120 and PS 2125) and adheres to Auditor General and Ministry of Energy expectations that the IESO present financial statements in accordance with Canadian public sector accounting standards (PSAS). See response to Schedule 1 – 1.1 OEB STAFF 4.

b)

i. The IESO does not have different potential strategies related to the recovery of the PSAS Transition Item since the IESO is required to follow Canadian public sector accounting standards (PSAS) as described in Exhibit F-1-1 – Forecast Variance Deferral Account, pg. 2-3, and the IESO's response to a).

ii. The IESO considered seeking additional funds to restore a portion of the operating reserve in its 2020/2021 Revenue Requirement Submission, and could have sought additional funds through the 2022 Revenue Requirement Submission to restore the operating reserve to $10 million. The IESO elected not to seek additional funding to restore the operate reserve in order to minimize the impact of further fee increases on market participants. The current FVDA balance of $8.7 million will afford the IESO the ability to fund operations if a revenue shortfall occurs or unexpected expenditures are incurred in the short term.

c) The IESO does not have alternative recovery plans for the reasons stated in response to a) and Schedule 1 – 1.1 OEB STAFF 4.

OEB STAFF INTERROGATORY 6

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1-Staff-6

INTERROGATORY

a. Exhibit A / Tab 1 / Schedule 3 / p. 5
b. Exhibit B / Tab 1 / Schedule 2 / p. 27 (2021 Annual Report p. 25)
c. EB-2020-0230 / Response to OEB Staff Interrogatory 11 / September 9, 2021
d. Exhibit F / Tab 1 / Schedule 1 / p. 1

Preamble:

The IESO stated that its 2021 opening balance in the FVDA was $1.3 million. The IESO's December 31, 2021 financial results recorded a surplus of $7.4 million, and the closing balance of the FVDA is $8.7 million.

The IESO indicated that the annual recovery of a portion of the PSAS Transition Item's deficit (through the IESO's annual system fees revenue) is transferred from the Regulatory Deferral Account – Accumulated Surplus/(Deficit) to the PSAS Transition Item accumulated deficit each year.

In the response to 1-Staff-11 in the 2020 and 2021 Revenue Requirement proceeding, the IESO provided the following FVDA table, which is shown in OEB Staff Table 2 below.

OEB Staff Table 2 – Breakdown of the FVDA

FVDA (in $ millions)	2015	2016	2017	2018	2019	2020	2021
Beginning Balance	7.6	10.0	10.0	6.0	(4.7)	(1.0)	1.3
In year surplus/(deficit)	12.0	12.6	1.4	1.3	3.7	2.3	-
OEB decision and order - reduce operating reserve	-	-	(4.0)	-	-	-	-
Rebates to Market Participants	(9.6)	(12.6)	-	-	-	-	-

Impact of accounting policy change (discount rate)	-	-	-	(13.4)			
2017 surplus allocated to 2018 operating reserve deficit	-	-	(1.4)	1.4	-	-	-
Ending balance	10.0	10.0	6.0	(4.7)	(1.0)	1.3	1.3

Questions:

a) Please extend the OEB Staff Table 2 continuity schedule, adding 2021 Actual and 2022 Budget values.
b) Please identify and provide an explanation for any significant changes in any components of the year-over-year balances, specifically, 2021 Actual compared to 2020 Actual (further to anything described at reference #d), 2021 Budget compared to 2021 Actual, 2022 Budget compared to 2021 Actual, and 2022 Budget compared to 2021 Budget.

RESPONSE

a) Please see below updated continuity schedule to include 2021 Actual and 2022 Budget values:

Table 1: Breakdown of the FVDA

FVDA (in $ millions)	2015	2016	2017	2018	2019	2020	2021 Budget	2021 Actual	2022 Budget
Beginning Balance	**7.6**	**10.0**	**10.0**	**6.0**	**(4.7)**	**(1.0)**	**1.3**	**1.3**	**8.7**
In year surplus/(deficit)	12.0	12.6	1.4	1.3	3.7	2.3	-	7.4	-
OEB decision and order - reduce operating reserve	-	-	(4.0)	-					
Rebates to Market Participants	(9.6)	(12.6)	-	-					
Impact of accounting policy change (discount rate)	-	-	-	(13.4)					
2017 surplus allocated to 2018 operating reserve deficit	-	-	(1.4)	1.4					
Ending Balance	**10.0**	**10.0**	**6.0**	**(4.7)**	**(1.0)**	**1.3**	**1.3**	**8.7**	**8.7**

b) No further variance explanation to add for the variance between 2021 Actual and 2020 Actual, then what is provided in reference d.

The variance between 2021 Budget and 2021 Actual is driven by the $7.4 million surplus in 2021 Actual explained in reference #d.

The 2022 Budget beginning balance is aligned to 2021 Actual ending balance and no surplus or deficit are anticipated.

The balance in 2022 Budget compared to the 2021 Budget is $7.4 million higher due to the surplus in 2021 Actual, explained in reference d.

AMPCO INTERROGATORY 2

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-AMPCO-2

INTERROGATORY

Two Summit-Lite events were also held in 2021 to bring together thought leaders and support in-depth conversations with stakeholders on key sector topics. In June, the event focused on innovation, ranging from the advancement of distributed energy resource markets in Ontario and globally, as well as the ongoing role of innovation in providing solutions to meet system needs.

a) Please provide the agenda, attendee list, presentations, meeting notes, recommendations and outcomes from the innovation event.

b) Please provide any other relevant information or materials related to the event.

RESPONSE

a) Available materials are posted on the IESO's website for the June Summit-Lite[1] and November Summit-Lite[2].

b) See response to a).

[1] June Summit-Lite: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Summit-Lite-June-2021
[2] November Summit-Lite: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Summit-Lite-Nov-2021

AMPCO INTERROGATORY 3

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-AMPCO-3

INTERROGATORY

Ref: A-2-2 Attachment 1 Page 2

With respect to Performance Measures and Targets, Measure 3 is Operational Efficiency-Percentage of Strategic Initiatives that are completed within only 50% of schedule contingency. The 5-year strategic target is 90% of Strategic Initiatives are completed on time. The 2021 result is 50%.

a) Please explain the meaning and impact of the results in 2021.
b) Please provide the Strategic Initiatives included in the 2021 results.
c) Please provide the calculation that underpins the 2021 result.
d) Please discuss if 2021 results have resulted in a backlog of work. If yes, please discuss the impact on work in 2022.

RESPONSE

a) See response to Schedule 1 – 1.1 OEB STAFF 2(a).
b) See response to a).
c) See response to a).
d) See response to a). There is no material impact to work in 2022.

REASCWA INTERROGATORY 1

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-REASCWA-1

INTERROGATORY

Reference: Exhibit A, Tab 1, Schedule 3, Pages 1 through 6, and Exhibit B

Preamble: Ontario's electricity supply needs have significantly increased since the IESO's previous expenditure and revenue requirement submissions (e.g., now, approximately 6,000 MW of to be developed effective capacity supply has been forecast to be needed around 2030 to maintain reliability of Ontario's power system). With every subsequent IESO forecast from 2016 to present, Ontario's supply needs have consistently and significantly increased. Towards addressing these significant supply needs, as recently as April 2022, the IESO announced changes to supply resource procurement plans to address some, but not all, of these supply needs (i.e., IESO has increased the number of procurement initiatives to address growing and significant supply needs through planned multiple Request for Proposals (RFPs) to contract for resources (e.g., generators, energy storage, etc.), enhancements to Capacity Auctions to administer a one-off Forward Capacity Auction, etc.).

a) Regarding the fiscal year 2022 revenue requirements, 2022 budgeted OM&A expenses of $186.5 million represent an increase of $12.2 million from the 2021 actual results. Please provide a description of how the increase in OM&A is being allocated to help meet Ontario's increasing and significant supply needs (e.g., through administration of RFPs to contract for supply resources, proposed enhancements to Capacity Auctions, bilateral contract negotiations for sole sourced supply resources, etc.). Particularly, please list the OM&A expenses with description of these expenses regarding the activities and staffing requirements (including any external legal and consulting resources) to be undertaken to administer the following IESO announced supply resource procurements to help meet a portion of Ontario's increasing and significant supply needs:

- Medium-Term (MT) RFP 1 to re-contract 475 MW;
- MT RFP 2 to re-contract additional supply post expiry of contracts;
- Long-Term (LT) RFP 1 to contract for 2,500 MW, included associated Request for Qualifications (RFQ);
- LT RFP 2 to contract for 1,500 MW;
- Expedited Procurement RFP to contract for approximately 500 to 1,000 MW, including associated RFQ;
- Same Technology Expansions procurement to enable uprates and expansion of operating facilities (e.g., generators, energy storage, etc.) for approximately 500 to 1,000 MW;
- Enhancements to a Capacity Auction through a one-off Forward Capacity Auction;

- Program to re-contract small hydroelectric generation facilities and potential additional program to re-contact for larger hydroelectric generation facilities; and
- Bilateral contract negotiations to sole source specific projects and operating generation facilities (i.e., Brighton Beach GS, Oneida storage project, Lake Erie Connector transmission interconnection project, Calstock GS).

b) Regarding the fiscal year 2022 revenue requirements, and the budgeted increase in OM&A expenses of $7.2 million in support of initiatives critical to transforming Ontario's electricity sector and various government initiatives including a pathway to decarbonization in the electricity sector, please provide a list and description of all the initiatives the IESO is undertaking (e.g., integration of Distributed Energy Resources (DERs), hybrid energy storage and generation projects, etc.) or planning to undertake to support transforming Ontario's electricity sector in-line with meeting the priorities listed within the IESO 2022 to 2024 Business Plan (e.g., planning for the future, enabling resources, etc.).

c) Regarding the above interrogatory 1.1-REASCWA-1b, please list the OM&A expenses with description of these expenses regarding the activities and staffing requirements (including any external legal and consulting resources) to be undertaken to administer the initiatives the IESO is undertaking or planning to undertake to support transforming Ontario's electricity sector.

d) Regarding the above interrogatory 1.1-REASCWA-1c, please describe how these initiatives link to helping to meet Ontario's increasing and significant supply needs and linkages to the resource procurement initiatives listed in the above interrogatory 1.1-REASCWA-1a.

RESPONSE

a) The IESO does not do activity-based accounting and is therefore unable to provide budget and FTEs for each individual initiative listed in interrogatory a).

Much of the work described in the interrogatory falls under the Resource Adequacy and Other Initiatives key initiatives, which collectively represent a $5.0 million incremental investment in 2022 by the IESO to secure the supply needed to meet Ontario's growing demand and comply with directives from the Minister of Energy. The key initiatives are identified separately in the 2022-2024 Business Plan to provide additional transparency on the incremental work that the IESO will be undertaking in 2022 in order to achieve its Core Strategies or comply with directives received from the Minister of Energy. The key initiatives are resourced by cross functional teams carrying out their ongoing core functions. For resource adequacy procurements, the capacity auction, bilateral contract negotiations, programs, and analysis of unsolicited proposals, the bulk of this work is contained in the budgets for the Planning, Conservation & Resource Adequacy Business Unit and the Legal Resources and Corporate Governance (LRCG) Business Unit. Business Unit plans include incremental additions in staff (temporary or regular) and of consulting services to supplement particular skills or needs, as identified in Exhibit D-1-2 – OM&A Business Unit Detail, to support the key initiatives. See response to c) below which lists

the incremental OM&A expenditure for the key initiatives, including expenditure for professional and consulting services.

The IESO notes that the budget for the bilateral contract negotiation for Brighton Beach is contained within the budget for the LRCG Business Unit and not within the budgets for key initiatives.

b) The referenced $7.2 million incremental OM&A expenditure is related to key initiatives. See Schedule 13 – 1.1 SEC 7 and 1.1 SEC 8 for description of the IESO's divisional planning process and key initiatives. A list and description of key initiatives that the IESO will be undertaking with the incremental $7.2 million of OM&A expenditure can be found in Exhibit D-1-1 – OM&A Overview, pg. 4-6. These initiatives include MRP Post-go-live, Resource Adequacy, Enabling Resources, Pathways to Decarbonization, and other initiatives. The key initiatives are often comprised of sub-initiatives and are worked on by Business Units across the organization. See Table 1 below for a list of key initiatives with sub-initiatives related to the IESO's core strategies of enabling competition, and preparing for the sector of the future.

Table 1: Key Initiatives and Sub-Initiatives

Key Initiative	Sub-Initiative	Description
Enabling Resources	DER Market Vision and Design Project[1]	The Market Vision and Design Project is a key focus area of IESO's DER integration activities and is what much of the near-term DER Roadmap[2] efforts build towards. This project is separated into two key phases; the first, the DER Market Vision Project (MVP) will explore new, "foundational" participation models for DER integration into wholesale markets and will identify the criteria for more sophisticated models that will form the basis of future DER integration

[1] DER Market Vison and Design Project: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Distributed-Energy-Resources-Market-Vision-and-Design-Project

[2] DER Roadmap: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Distributed-Energy-Resources-Roadmap

		efforts. The second phase, the DER Market Design Project (MDP) will design and implement the foundational participation models from the MVP.
	DER Achievable Potential Study[3]	A key focus of the DER Potential study is to determine the system value of various types of DERs, and the timing of their emergence under different scenarios. The Potential Study will; look out over a 10-year time horizon; consider a broad range of DERs; and use cases in the Ontario context will be explored to determine economic and achievable potential, and to provide recommendations. The Potential Study result will be used as an input to the DER Market Vision and Design Project.
	Hybrid Integration Project[4]	This Hybrid Integration Project will identify participation model(s) to enable hybrid resources in the IESO-administered markets (IAMs) and have the capability to support Ontario's future system needs. The changes will be

[3] DER Achievable Potential Study: https://ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/DER-Potential-Study
[4] Hybrid Integration Project: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Hybrid-Integration-Project

		implemented after the implementation of the Market Renewal Project.
	Storage Operational Enhancements[5]	IESO has committed to two key operational enhancements that aim to further integrate storage resources into IESO tools; these are (1) the Automatic Approval of State-of-Charge (SOC) project, and (2) the Supporting Changes for Storage in Automatic Generation Control (AGC). Through tool upgrades, both projects aim to help the IESO and market participants manage storage resources in a manner that is more reliable and efficient when providing energy and ancillary services.
Pathways to Decarbonization[6]	None	With the Pathways to Decarbonization study, the IESO will verify that pathways meet the capacity and energy needs of the system, while providing the characteristics necessary to reliably operate the electricity system.

[5] Storage Operational Enhancements: https://www.ieso.ca/-/media/Files/IESO/Document-Library/engage/enabling-resources/er-20211216-presentation.ashx

[6] Pathways to Decarbonization: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Pathways-to-Decarbonization

Other Initiatives	Energy Storage Report[7]	In response to a request from the Minister of Energy, the IESO has worked closely with the Ontario Energy Board to provide an update on the removal of obstacles for energy storage resources in Ontario. This new report builds on "Removing Obstacles for Storage Resources in Ontario," published in 2018. It outlines the progress made to date as well as the activities that are underway to address remaining obstacles.
	Clean Energy Credits[8]	The Minister of Energy has asked the IESO to assess options for the establishment and ongoing operation and management of a registry to support the creation and/or recognition, trading and valuation, and the retirement of renewable and clean energy credits (CECs) within the province. A voluntary CEC market can use clean energy to drive economic development in the province by helping corporations meet their clean energy goals.

[7] Energy Storage Report: https://ieso.ca/-/media/Files/IESO/Document-Library/ieso/update-on-obstacles-to-storage-resources-in-Ontario.ashx

[8] Clean Energy Credits: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Clean-Energy-Credits

		Investment in CECs can support efforts to decarbonize the Ontario electricity system.

c) As described in response to b), key initiatives are often comprised of sub-initiatives. The IESO does not do activity-based accounting and is therefore unable to provide budget and FTEs for each individual initiative. Table 2 below describes OM&A expenses for the key initiatives in 2022.

Table 2: Key Initiative OM&A Expenditures

KEY Initiatives	OM&A ($ millions)			Average FTE
	Labour	Professional & Consulting (including legal)	Total	
MRP Post-go-live	0.5	-	0.5	3
Resource Adequacy	0.5	0.8	1.3	3
Enabling Resources	0.1	0.3	0.4	1
Pathways to Decarbonization	1.1	0.2	1.3	7
Other initiatives:	1.4	2.3	3.7	10
Biomass	-	0.2	0.2	-
Small Hydro	0.2	0.5	0.7	1
Energy Storage report	0.1	-	0.1	1
Unsolicited proposals	0.7	0.6	1.3	5
Clean Energy Credits	0.5	1.0	1.5	3

d) The IESO's 2022 Revenue Requirement Submission is based on a Business Plan that has been reviewed and approved by the Minister of Energy and the review of the IESO's application should be focused on the IESO's OM&A and capital expenditures. In an effort to be responsive, the IESO is providing the following information.

The IESO's Enabling Resources Program facilitates the integration of emerging technologies into the post-Market Renewal electricity market, and ensures that resources acquired through the Resource Adequacy Framework will be successfully integrated in market in time to meet forecasted system needs. In December 2021, the IESO presented the Enabling Resources Work Plan to sector participants and communities, to outline the sequencing, timing and scope of activities to be undertaken by the IESO to enable emerging resources to provide electricity system services in the renewed Ontario wholesale market. For more information on the Enabling Resources Program, see the IESO's public engagement webpage.[9]

[9] Enabling Resources Program: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Enabling-Resources-Program

EDA INTERROGATORY 1

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-EDA-1

INTERROGATORY

Evidence Reference: ExB-T1-S2 Page 17 / ExE-T2-S1 / ExE-T2-S1 Attachment 2 / ExF-T1-S1

a) Please discuss how the IESO's accounting policies achieve and align with the matching principal; please discuss capital costs separately from capitalized OM&A.

b) Please analyze whether the IESO's accounting policies will result in capital costs being recovered in the period in which the consumer uses the service(s) enabled by the capital invested or if there is a risk of intergenerational inequities.

c) The balance recorded in the Forecast Variance/Deferral Account as at December 31 2021 is $8.7 million. Please describe how the IESO proposes to manage the disposition of the balance recorded in this account:

- To avoid intergenerational inequities
- To avoid undue subsidization

RESPONSE

a) Please see Exhibit B-2-1 – 2021 Annual Report and Audited Financial Statements Note 2: Summary of Significant Accounting Policies. OM&A costs are not capitalized.

b) The capital cost of tangible capital assets are amortized on a straight-line basis over their estimated service lives. See Exhibit B-2-1 – 2021 Annual Report and Audited Financial Statements Note 2 d): Tangible Capital Assets.

c) The balance recorded in the Forecast Variance/Deferral Account as at December 31 2021 was $8.7 million which is below the OEB approved operating reserve threshold of $10 million. The IESO can use the FVDA balance to manage operational challenges that may arise in the short term to minimize the impact on market participants until such time as the $10 million operating reserve can be restored. Any balance in the FVDA in excess of the OEB approved balance of $10 million would be returned to Market Participants in accordance to what they paid in IESO fees in the year in which the surplus occurred.

EP INTERROGATORY 1

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-Energy Probe-1

INTERROGATORY

Ref.: Exhibit A Tab 1 Schedule 3 Page 1; Exhibit C Tab1 Schedule 1

Preamble: The current IESO interim usage fees of $1.227/MWh for domestic customers and $1.0125/MWh for export customers were made effective January 1, 2020 by a December 17, 2019 OEB Decision on interim fees, and remain interim until final fees are approved by the OEB.

a) Please provide a schedule that shows details of the 2021 Actual Revenue Requirement compared to Forecast Board-approved.

b) Provide the 2021 Deficit/Surplus and indicate how this is to be disposed of.

c) Do IESO's proposed expenditures for 2022 take into consideration the most recent inflationary pressures? If not, how will inflationary pressures affect the realization of 2022 projects?

RESPONSE

a) See Table 1 below.

Table 1: 2021 Revenue: OEB Approved vs 2021 Actual

Revenue (In $ Millions)	2021 OEB Approved	2021 Actual
Revenue	191.8	195.0

b) See response to Schedule 1 – 1.1 OEB STAFF 6(a) for 2021 Deficit/Surplus and Schedule 6 – 1.1 EDA 1(c) for proposed disposition.

c) See response to Schedule 12 – 1.1 PWU 1(d).

EP INTERROGATORY 2

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-Energy Probe-2

INTERROGATORY

Ref.: Exhibit A, Tab 2 Schedule 2, Attachment 1, Affordability, Reliability, Sustainability Measures 5-8

a) Please provide historic levels 2017-2021 for each measure.

b) Discuss the use of the measures -internal (such as Performance/Compensation) and external (Stakeholder Engagement).

c) What are the consequences of achieving/not meeting each of the measures? For example on Compensation/Incentives.

RESPONSE

a) The measures and targets framework were new for the organization in 2020. Baseline levels of performance were established based on actuals for 2020 only. Back-tested set of comparable historical levels for the interval 2017-2019 are not available.

b) The strategic measures are factored into executive compensation decisions and if the IESO deviates from target, course correction takes place as part of wider Executive Leadership Team discussions on how best to manage performance and priorities going forward. As identified in Exhibit B-2-1 – 2021 Annual Report and Audited Financial Statements, pg. 36, the IESO Board annually establishes a set of performance measures, which are evaluated each year. The IESO Board assesses corporate performance results and the CEO's individual performance results. Under the plan, having assessed the results against target, the Board has discretion in determining the final performance rating. The Board considers the assessed results, which have been verified through an internal audit process, to award variable compensation. The plan provides for awards at or below the capped amount depending on the performance results achieved. External measures are not included in the performance measurement framework for compensation plan related decisions. Use of external measures was to provide an expanded view of measuring and monitoring performance not just within the IESO but on a broader sector scale. This was intended to provide benefits in supporting advice to the market and in our stakeholder engagements.

c) See response to b).

EP INTERROGATORY 3

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-Energy Probe-3

INTERROGATORY

Ref.: Exhibit F Tab 1 Schedule 1 Table 1

Preamble: As of January 1, 2021, the FVDA had a balance of $1.3 million and in 2021, the IESO's core operations were in a surplus position of $7.4 million mainly driven by $3.2 million from higher than expected demand volume that resulted from a heat wave over the summer months, $2.7 million increase in net interest related to better than expected long term investments performance associated with a strong equity market, $0.6 million of underspend on the Market Renewal Program, and $0.7 million lower amortization expense due to delays in capital projects completion, resulting in an $8.7 million total balance as of January 1, 2022.

The IESO is confident, however, that the FVDA balance of $8.7 million will afford it the ability to manage operational challenges that may arise in the short term to minimize the impact on market participants until such time as the $10 million operating reserve can be restored.

a) What are the primary risk factors that may increase/decrease the FDVA balances in 2022? Please list these, such as inflation, and discus/delineate those that are/are not under IESO control.

RESPONSE

a) Please see Exhibit C-1-1 – Revenue Requirement and Usage Fee Methodology, pg. 3, for primary risk factors that may increase/decrease IESO's revenues and operating expenses and thus the FVDA balance. In addition, the recent increases in interest rate may contribute to increases of the FVDA balance, while inflationary pressures might decrease the FVDA balance. The aforementioned risks are not under the IESO's control, however, we do not believe they will have a material impact on the 2022 Budget. Also see response to Schedule 12 – 1.1 PWU 1(d).

ED INTERROGATORY 1

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-ED-1

INTERROGATORY

Reference: Exhibit A, Tab 1, Schedule 2, Page 1

Preamble: "The IESO proposes a 2022 revenue requirement of $201.5 million."

Question(s):

(a) What is the approximate annual value of the costs that the IESO oversees, such as the total value of transactions in IESO-administered markets and the capital projects driven by IESO planning processes, including a breakdown of the various elements? A value for a sample year or an average is sufficient. We are seeking the information to get a picture of importance of the IESO's work as it relates to overall electricity costs borne by customers.

RESPONSE

a) As identified in Exhibit B-1-2 – 2022-2024 Business Plan, pg. 3, approximately $20 billion flows through the IESO's markets annually. The IESO is unable to speculate on the total costs of projects built or owned by other entities in the electricity sector that were undertaken in response to the IESO's work, however, in an effort to be responsive, the IESO is providing the following additional information related to regional and bulk transmission system planning in 2021.

In 2021 the IESO completed and published five regional plans and one bulk transmission plan. The five regional plans together recommended the development of various projects to meet local needs in the near or mid-term, representing approximately $90 M worth of investments (not including costs for end of life replacements supported by the plan which would have been considered "like-of-like investments). The bulk system plan recommended the development of a combination of transmission and resource projects to meet mid-term needs, representing approximately $1-1.4B worth of investments.

ED INTERROGATORY 2

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-ED-2

INTERROGATORY

Reference: Exhibit B-1-2, Page 7

Preamble:

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

Question(s):

a) Approximately what portion of the IESO's $201.5 million revenue requirement is attributable to the above-referenced capacity auctions and RFPs?

b) Please list each of the specific RFPs noted above by (i) MW to be procured and (ii) commitment period start and end.

c) Please list the outcomes of the above-referenced RFPs that are complete broken down by (i) generation type and (ii) average price.

RESPONSE

a) The IESO's capacity auction and resource adequacy RFPs are a part of the Resource Adequacy key initiative. OM&A expenditures related to the Resource Adequacy initiative are included in Exhibit B-1-2 – 2022-2024 Business Plan, pg. 18.

b) The first medium-term RFP (MT I RFP) is targeted to procure up to 475 MW of year-round capacity services on a Summer Unforced Capacity (UCAP) basis for a five-year commitment period commencing on May 1 of either 2024, 2025 or 2026, ending immediately prior to the fifth anniversary of such date. The target capacity of the MT I RFP was adjusted from 'up to 750 MW' to 475 MW UCAP. The IESO issued an addendum to the MT I RFP to reflect this change on April 4, 2022.

   The Long-Term RFP will procure 2,500 MW of effective capacity for a minimum 15-year commitment period commencing on May 1, 2027 ending April 30 of the anniversary of such date. The specific anniversary will depend on the contract length (15 or more years).

The Capacity Auction will procure, at minimum, 500 MW of unforced capacity each December for the following summer obligation period and winter obligation period. The summer obligation period is from May 1 to October 31 of each year. The winter obligation period is from November 1 to April 30 of each year. Each Annual Acquisition Report will outline the target capacity for the upcoming auction and also provide forward guidance for subsequent auctions. The December 2022 auction has a summer 2023 target capacity of 1,200 MW and a winter 2023/2024 target capacity of 750 MW. The actual amount of capacity that clears the auction could be more or less than the target capacity.

c) The MT I RFP is currently being evaluated, therefore the IESO cannot comment on the results of the procurement at this time. The Long-Term RFP has not yet been initiated, so results are unknown at this time. The Capacity Auction is a competitive mechanism, so prices are not known in advance of the auction being run each year. Results of past capacity auctions are publicly available on the IESO's website.[1]

[1] IESO Capacity Auction: https://www.ieso.ca/en/Sector-Participants/Market-Operations/Markets-and-Related-Programs/Capacity-Auction

ED INTERROGATORY 3

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-ED-3

INTERROGATORY

Reference: Exhibit B-1-2, Page 7

Reference: Exhibit B-1-2, Page 13

Preamble:

> "With a budget of $692 million, the current suite of programs is forecasted to achieve 440 MW of peak demand savings and 2.7 TWh of energy savings."

Question(s):

a) Please express the IESO's 2022 CDM programming as a LUEC figure.

b) What are the total benefits (gross benefits and net of costs) forecast from the IESO's 2022 CDM program according to (i) the TRC test and (ii) the SCT test.

c) Please express the IESO's 2022 CDM programming as a cost (or savings) per tonne of avoided CO2e figure.

RESPONSE

a) The IESO's 2022 Revenue Requirement Submission is based on a Business Plan that has been reviewed and approved by the Minister of Energy and the review of the IESO's application should be focused on the IESO's OM&A and capital expenditures. The information sought is not within scope of the IESO's 2022 Revenue Requirement Submission as the IESO is not seeking funding through its revenue requriement related to CDM programming. In an effort to be responsive, the IESO is providing the following information.

   Energy and demand LUEC for the Business Programs in the 2021-2024 CDM Framework is $24.52/kWh and $154,746.14/MW. These values are publically available in the posted CDM Plan. LUEC is calculated at the framework-level (2021-2024) to provide the most accurate representation of framework performance. LUEC for Support Programs and individual program years is not available.

b) See response to a).

c) See response to a).

ED INTERROGATORY 4

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-ED-4

INTERROGATORY

Reference: Exhibit B-1-2, Page 13 and the attached materials regarding OPG sales of credits

Preamble:

Per Exhibit B-1-2, Page 13: "At 94 per cent emissions free in 2020, Ontario has the one of the lowest emitting electricity systems in North America, if not the world."

a) Please describe the approach taken by the IESO with respect to the environmental attributes for the electricity it purchases on behalf of Ontario. For instance, does the IESO sell those environmental attributes, and if it does, does it use that revenue to reduce its revenue requirement? If it does not sell the attributes, please explain the reasoning behind that decision.

b) Is the IESO considering sales of its environmental attributes in 2022 or in future years?

c) How many MWh of clean energy credits (i.e. environmental attributes) did OPG sell in 2020? What percent of Ontario's electricity grid was carbon emission free in 2020 after netting out those sales?

d) Is the IESO responsible for determining whether OPG should sell the environmental attributes relating to OEB-rate-regulated assets and for how any proceeds should be used? If not, which entity is responsible and is does the IESO's mandate including providing advice to that entity?

RESPONSE

a) The IESO currently retains the rights to environmental attributes for most of the contracted electricity it purchases. In certain contracts and in the case of OPG regulated generation, the IESO does not have the rights to those environmental attributes. As the markets for environmental attributes have been evolving and are still in their infancy, no policy decision has been made on the sale of environmental attributes. Future decisions about environmental attributes are addressed in response to b).

b) In January, 2022, the Minister of Energy asked the IESO to assess options for a Clean Energy Credit registry in Ontario and report back by July 4, 2022. In the report, which is currently under development, the IESO has identified options for the treatment of environmental attributes from IESO contracted generation. Initial options have been posted on the IESO engagement page.[1] These options reflect feedback received by the

[1] Clean Energy Credits: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Clean-Energy-Credits

IESO from stakeholders and communities on the potential sale of environmental attributes.

c) The IESO's 2022 Revenue Requirement Submission is based on a Business Plan that has been reviewed and approved by the Minister of Energy and the review of the IESO's application should be focused on the IESO's OM&A and capital expenditures. OPG's sale of environmental attributes is not within scope of the IESO's 2022 Revenue Requirement Submission. The IESO also notes that Environmental Defence has submitted a letter to the OEB requesting that the OEB re-open or institute a new proceeding to consider issues relating to OPG's sales of environmental attributes. If initiated by the OEB, that proceeding would be a more appropriate place in which to deal with this question.

d) See response to b). The IESO is not responsible for determining whether OPG should sell environmental attributes from its generating assets. The IESO is not involved in OPG's decision-making process.

ED INTERROGATORY 5

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-ED-5

INTERROGATORY

Reference: Exhibit B-1-2, Page 14

Preamble:

> With respect to decarbonization efforts, including the new gas moratorium and pathways study, the IESO states as follows: "In addition to electricity system benefits, these initiatives will also help achieve other policy objectives, such as economic development and job creation. The scope and magnitude of this new work will require some additional resources with expertise in a number of specific areas. These include research and analysis, modelling and simulations, system operations, contract management, communications, settlements, finance and other critical functions."

Question(s):

a) If the IESO is required based on government directives to take steps that will increase costs above forecast for 2022 relating to decarbonization or otherwise, how will it secure the funding to take those steps? Could a deferral or variance account be created for that purpose?

RESPONSE

a) The IESO can use the FVDA balance to manage operational challenges that may arise in the short term to minimize the impact on market participants.

ED INTERROGATORY 10

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-ED-10

INTERROGATORY

Reference: Exhibit D, Tab 1, Schedule 1, p. 5-6

Preamble:

> "The Minister has asked the IESO to evaluate a moratorium on procuring new natural gas generating stations and to develop a pathway to decarbonization in the electricity sector.4 The IESO will provide this additional analysis by November 2022. This effort is currently structured to support the development of a proposed pathway, but does not account for the resources needed for implementation. The budget for 2022 includes resources for additional staff and technical consultants to undertake the analysis, design and stakeholder engagement necessary to develop a plan to phase-out gas generation in a cost-effective and reliable way for Ontarians."

Question(s):

a) Please provide a complete breakdown of the above-referenced budget for the pathways study.

RESPONSE

a) The projected 2022 staff allocation for Pathways to Decarbonization is the equivalent of 14 full-time staff, and of the full-time equivalent staff, 7 are budgeted as new incremental FTEs in 2022 at a cost of $1.1 million. The budget includes $0.2 million for consulting services. The total incremental cost included in the 2022 budget is $1.3 million.

ED INTERROGATORY 16

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-ED-16

INTERROGATORY

Reference: Exhibit A, Tab 1, Schedule 2, Page 1

Preamble: "The IESO proposes a 2022 revenue requirement of $201.5 million."

Question(s):

a) When did the IESO develop its proposed budget of $201.5 million for 2022? Please provide as specific of an answer as possible.

b) For the point in time when the IESO developed the $201.5 million budget, please provide the underlying planning assumptions:

   i. Short term electricity demand forecast;

   ii. Long term electricity demand forecast;

   iii. Low, medium, and high electric vehicle penetration forecasts (# of vehicles and impact on electricity demand);

   iv. Government directives on electric vehicles; and

   v. Forecast impacts on electricity demand from electrification of heating.

c) For each of the items in (b), please provide the IESO's latest assumptions, or where they are unchanged, please state so.

d) Please describe how any changed assumptions could impact IESO's costs.

e) If those assumptions change between now and the end of 2022 necessitating increased spending, how can the IESO ensure cost recovery? Could a deferral or variance account be created for that purpose?

RESPONSE

a) The 2022 Budget of $201.5 million was developed in Q2-2021 and was revised in Q4 to account for new government directives. The IESO's 2022-2024 Business Plan (see Exhibit B-1-2 – 2022-2024 Business Plan) was submitted to the Minister of Energy for approval on December 9, 2021 (see Exhibit B-1-1 – IESO's Letter to the Minister Requesting Approval of 2022-2024 Business Plan). The Minister approved the Business Plan and the IESO's proposed expenditures for 2022 on February 3, 2022 (see Exhibit B-1-3 – Minister's Letter Approving the IESO's 2022-2024 Business Plan).

b) The IESO's Usage Fee was calculated using the demand forecast contained in the "Reliability Outlook: January 2022 to June 2023" released in December 2021. This can be found in the IESO's document library.[1] The long-term electricity demand forecast at the time this budget was created is contained in the 2021 Annual Planning Outlook[2], which includes discussion of electric vehicle policy and a forecast of electric vehicle uptake within the Demand Forecast Module. Potential impacts on electricity demand due to electrification of heating are included in a high demand scenario, discussed in Chapter 8.

c) The Reliability Outlook is updated and published on a quarterly basis. The Annual Planning Outlook is updated and published on an annual basis. Since the 2022 Budget was established, one Reliability Outlook has been published in March 2022, which contain the latest assumptions.[3] The demand forecast is similar to that in the Reliability Outlook used to calculate the IESO's Usage Fees. The 2021 Annual Planning Outlook is the last published long-term forecast.

d) See response to Schedule 7 – 1.1 EP 3.

e) See response to Schedule 8 – 1.1 ED 5.

[1] IESO Document Library: https://www.ieso.ca/en/Document-Library
[2] 2021 Annual Planning Outlook: https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook)
[3] Reliability Outlook: https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Reliability-Outlook

PWU INTERROGATORY 1

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1-PWU-1

INTERROGATORY

Ref 1: Exhibit A / Tab 1 / Schedule 3 / p. 1

Since 2017, the IESO has maintained its revenue requirement at a relatively flat level, absorbing $14 million of inflation and collective agreement impacts by deferring investments in processes, tools and workspaces, and by finding efficiencies and prioritizing certain work over others.

Ref 2: Exhibit D/Tab 1/Schedule 2/Page 1

The reference indicates that the IESO undertook organizational changes which got implemented in Q4-2021

Questions:

a) Please list the investments that have been deferred in Ref.1

b) Please describe the impacts of the deferral of investments on reliability and operation of IESO's business

c) Does the IESO consider deferral of investments the appropriate course of action to control the cost of its operation?

d) Do IESO's proposed expenditures for 2022 take into consideration the most recent inflationary pressures? If not, to what extent these inflationary pressures affect the realization of 2022 projects?

e) What were the reasons for the organizational changes in Ref 2 and what cost savings and efficiency gains, if any, does the IESO expect from the change?

RESPONSE

a) See Table 1 below for capital investments deferred since 2017.

Table 1: Capital Investments Deferred Since 2017

Project	Year Deferred	Current Status
Oracle 12c Technical Refresh	2018	Completed 2021
Operability - Enabling System Flexibility	2018	Remains Deferred
PMU Integration - Phase 3	2018	Planned to start Q4 2022

Hub Intranet Redevelopment	2018	Initiated in 2020 and expected to complete in 2023
Separation of Corporate & Market Transactions	2018	Initiated in 2022
Network Performance Monitoring and Diagnostics	2018	Hardware deployed 2020 Software project initiated in 2021 and expected to be complete in 2023
Automatic Approval of State-of-Charge Changes	2018	Deferred to 2024
Review of CMSC paid to Dispatchable Loads	2019	Phase 2 deferred and completed in 2021
MACD Enforcement Support Tool	2019	Remains Deferred
Access Switches Refresh	2020	Initiated in 2021 and expected to be complete in 2022
Funds Management	2020	Remains Deferred
Human Resource Analytics and Workforce Planning (WFP)	2020	Planned to start Q4 2022
Transmission Rights Review	2021	Remains Deferred
Generation Contracts– Further Integration & Ongoing Optimization	2021	Remains Deferred

b) The IESO takes a risk informed approach when deciding on the deferral of investments and no material impact has been experienced on reliability and the operation of the IESO's business from the deferral of certain investments to date. Project deferrals can be used in the short term to manage priorities but cannot be sustained in perpetuity, and as described in the approved 2022-2024 Business Plan, the IESO now needs to move forward on key initiatives that are critical to maintaining its core operations, to continue Ontario's electricity transformation, and to address various government initiatives including a pathway to decarbonization in the electricity sector.

c) In addition to other courses of actions (e.g. rationalization, continuous improvements), the IESO does consider deferral of low-risk investments an appropriate means to control its costs.

d) The IESO's 2022 budget includes inflationary assumptions based on the information available at the time of development of the budget. About 70% of the IESO's OM&A expenditure is labour related which increases based on collective agreements and Bill 124 which legislated an annual compensation increase limit of 1%. A further 20% of the

IESO's OM&A expenditure is pre-established which provides higher certainty on the projected increase included in the budget (e.g., rent, insurance, North American Electric Reliability Corporation and Northeast Power Coordinating Council fees, OEB fee, various IT services). The IESO does not expect recent inflationary pressures will materially impact the 2022 budget.

e) The organizational change implemented in Q4-2021 was required to better align and focus the IESO's organization in support of evolving industry needs, while also continuing to deliver on our reliability and cost-effectiveness mandate. There are no cost savings and efficiency gains expected from this reorganization.

SEC INTERROGATORY 1

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-SEC-1

INTERROGATORY

Please provide a copy of all budget guidance documents that were issued regarding the budgets that underlie this application.

RESPONSE

a) See Attachment 1 to this Exhibit. Also see response to Schedule 13 – 1.1 SEC 7.

MAY 19, 2021

2022-2024 Business Planning

ELT alignment on planned initiatives

Lia Kosic
Director Enterprise Planning, Risk and Performance

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Purpose and Summary

Purpose: Gain ELT alignment on prioritization and sequencing of initiatives to be included in 2022-2024 business plan; and consider modular approach to incremental requirements and management of cost pressures.

Summary: 2022 cost pressures due to commitment of 1% funding increase vs 2021, as well as organizational capacity limits will require disciplined trade-offs to be made at the enterprise level. 2023 and 2024 years are step-change years to position IESO to transition to an effective post-MRP operating model.

2022 baseline budget which only incorporates existing staff levels and in-flight initiatives exceeds target funding by $1.6M or 1%. Further accommodation is required to make room for incremental initiatives and related resourcing/funding.

New approach to developing the narrative within the business plan is proposed for ELT consideration.

Reminder: Planning Approach

- Planning process will focus on detailed budget for 2022 and high level 2023-24
- Enterprise planning and risk assumptions:
  - On-schedule/budget delivery of MRP-RSS is #1 organizational priority
  - Organizational capacity limits all other initiatives to previously identified priorities, with very limited exceptions of incremental initiatives (e.g. EDI work approved by ELT)
  - All cross-functional initiatives (capital and non-capital) will utilize common prioritization criteria to sequence timing and manage risk and cost pressures
  - Latest 3+9 projection for 2021 will be starting point for staffing levels in 2022
  - Divisional planning will focus on review and fine-tuning draft plans built on above assumptions, in-flight projects and existing PPMT portfolio project intakes (vs bottom up build up of all requests)
  - ELT review/calibration of draft budgets, priorities and interdependencies is an explicit plan step
  - Planning process will incorporate necessary risk informed trade-off discussions to ensure no funding gaps in the plan

Preliminary view of 2022 funding

- Initial high level estimates of 2022 base requirements is 1% over the $193.7M target. The base business plan only includes impact from in-flight projects (e.g. CAMS, SCADA/EMS)
- The variance to target is mainly due to delayed savings from reduced footprint as suppressed real estate market is delaying ability to sub-lease current space, partially offset by higher capital labour than initially planned

($ Millions)*						
Operating Expenses	**2022**	**2023**	**2024**	**2022 Prior BP**	**2022 vs prior BP Favourable / (Unfavourable)**	
Core Operations Expenses	**174.8**	**178.1**	**181.9**	**173.9**	**(0.9)**	**(1%)**
Amortization	20.4	23.3	30.0	19.1	(1.3)	(7%)
Interest	(4.5)	(5.9)	(6.0)	(3.5)	1.0	29%
Total Core Operations Expenses	**190.8**	**195.5**	**206.0**	**189.5**	**(1.2)**	**(1%)**
MRP	4.6	4.0	1.3	4.2	(0.4)	(10%)
Total Core IESO	**195.4**	**199.5**	**207.3**	**193.7**	**(1.6)**	**(1%)**

*Numbers still subject to change

Proposed priority initiatives

Initial impact assessment of the other priority initiatives not included in the baseline (planned and proposed), indicates the need for an additional $8.5M operating expense funding in 2022:

Initiatives/Projects	Operating Expenses ($ Millions)* 2022	2023	2024
Lake Erie Connector	3.2	1.5	1.2
MRP Readiness	1.6	3.1	3.4
Resource Acquisition	1.2	1.4	0.5
New Capacity/Resource Acquisition	1.0	0.0	0.0
Market Analysis and Simulation Toolset (MAST)	0.5	0.3	0.2
Building organizational capability and Employee Engagement	0.4	0.5	0.5
Diversity and Inclusion	0.3	0.3	0.3
Capacity Enhancements	0.2	0.1	0.1
Dynamic Limits in Real-Time (DLRT)	0.1	0.0	0.0
MSP Recommendations	0.1	0.1	0.1
Transmission Rights Markets Platform Refresh	0.0	0.1	0.1
HR Analytics & Workforce Planning	0.0	0.1	0.1
Backup Operating Centre Relocation	0.0	0.0	0.1
Grand Total	**8.5**	**7.4**	**6.4**

*Numbers still subject to change

To know about Strategic Initiatives

Green arrow initiatives represent in-flight work which is built into the baseline business plan

Orange arrow initiatives are currently prioritized within the 2021 project portfolio but are not formally approved to proceed

Blue arrow initiatives are proposed for consideration but not initiated

Supplemental Information:

- Resource acquisition includes the Medium Term and Long Term RFPs
- MRP readiness is for enhanced monitoring and Day 2 fixes
- MSP recommendations represents a placeholder for high priority recommendations
- Transmission Rights Market Platform refresh includes some enhancements from the TR Markets Review
- Specific timing still to be confirmed for Enabling Resources initiatives
- Diversity & inclusion 2021 action plan being implemented; ongoing focus on systems, capability, and measurement
- Organizational capability sourcing, assessments, learning approaches, and leadership development are ongoing
- Employee engagement annual cycle of plan, act, measure

Strategic Initiatives

Committed/In-flight

Planned – in current project portfolio

Proposed – under consideration

Core Strategies	Priority Initiatives	Strategic Initiatives	2021	2022	2023	2024
Ensure cost-effective reliability	Resource Adequacy Transition	Capacity Auction (Formerly TCA)				
		Capacity Enhancements				
		Resource Acquisition Initiative				
	MRP-RSS	MRP-Energy				
		Replacement of Settlement Systems				
		Market Analysis and Simulation Toolset (MAST)				
		MRP Readiness				
	Cyber Security	Identity Access Management (IAM)- Phase 2				
		Mobile Cyber Security Controls				
		Data Loss Prevention				
	Market Surveillance Panel Recommendations	Improving Accessibility of Operating Reserve				
		Transmission Rights Clearing Account (TRCA) Disbursement				
		Review of CMSC paid to Dispatchable Loads Phase 2				
		OR and Interties				
		MSP Recommendations				
		Transmission Rights Markets Platform Refresh				
	Ancillary Services	(placeholder for a competitive procurement)				
	2021 – 2024 Conservation First Framework	CDM-IS Enhancements				
	(not mapped to priority)	Dynamic Limits in Real-Time (DLRT)				

Strategic Initiatives

Committed/In-flight
Planned – in current project portfolio
Proposed – under consideration

Core Strategies	Priority Initiatives	Strategic Initiatives	2021	2022	2023	2024	
Enable competition	Competitive Transmission Procurement	(Not expected to proceed with competitive procurements)					
	Storage Integration	Enabling Resources Program					
		Energy Storage Resources in the DSO Tool					
		Supporting Changes for Storage in the AGC Tool					
	Unsolicited proposals	Lake Eerie Connector					
Advance sector leadership	Unsolicited proposals	Oneida					
	Industrial Rate Design	(No Strategic Initiatives currently Identified)					
Prepare for the sector of the future	Distributed Energy Resources	Enabling Resources Program					
	Hybrid Storage	Enabling Resources Program					
	10 Year Plan	(No Strategic Initiatives currently Identified)					

Strategic Initiatives

Committed/In-flight
Planned – in current project portfolio
Proposed – under consideration

Core Strategies	Priority Initiatives	Strategic Initiatives	2021	2022	2023	2024
Drive business transformation	Technology and Data	Data Excellence Program				
		Data Warehouse Optimization				
		HR Analytics & Workforce Planning				
	Diversity and Inclusion	Foster Safety and Strengthen Equity				
	Building organizational capability	Implement the talent acquisition strategy and support the learning framework				
	Employee Engagement	Build connection between employees and strategy				
	Space Needs	IESO Space Needs Phase 2 - Design & Assessment				
		Office Pilot				
		BOC Relocation				
		IESO Space Needs Phase 3 - Implement & Transition				

Proposed approach to business plan narrative – for ELT consideration

Approach gives Ministry funding options, with articulation of risks/impacts of each:

Component A: Baseline 2022 Budget of 1% increase vs prior year

Component B: Unsolicited Proposals incremental costs, based on stages

Component C: Enabling Resources incremental costs, assume funding sources as 50% NRCan and 50% Ministry approved increase in funding

Component D: 'All Other' proposed initiatives' incremental costs

Next Steps/Implementation

- ELT alignment on initiatives included/excluded from business plan
- Further refinement of costing estimates to build out modular approach elements of plan
- Divisional planning meetings and validation of outcomes with each VP and across the organization through ELT review
- June Board/Audit Committee – articulation of priorities within plan, as well as impacts of excluded priorities and approach to the plan narrative
- August Board/Audit Committee – full plan review/approval

Key Deliverables and Timeline

Deliverables	Timeline	Accountable	Supporting
Kick-off guidelines	April 15	FP&A	-
Initial project portfolio costing Impact assessment meetings	April 19 -30 May 3 - 14	FP&A/PMO	BU Directors/Management Business Units and FP&A
June Board/AC materials – ELT concurrence on priorities	May 27	FP&A/PMO	ELT
Divisional planning and budgeting	May 25 – June 11	FP&A	Business Units and PMO
Directors trade-off discussions (via PPMT project sponsors)	June 21 - 25	FP&A	Business Units and PMO
ELT Business Plan review	July 5 - 15	FP&A	ELT
IESO's Board submission for August meetings	July 30	FP&A	-
Ministry submission	September 1	FP&A	Communications, Regulatory, PMO

SEC INTERROGATORY 2

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-SEC-2

INTERROGATORY

Please provide a copy of all documents that were provided to the Board of Directors in approving the underlying budget contained in the Business Plan and this Application.

RESPONSE

a) The Board of Directors approved the 2022-2024 Business Plan presented on August 2021, as well as the subsequent revisions to the Business Plan that were submitted to the Ministry in December 2021 to reflect the incremental needs to support initiatives in the government directive issued October 2021. See the following attachments:
   i. Attachment 1: 2022-2024 Business Plan Overview to IESO Board
   ii. Attachment 2: 2022-2024 Business Plan IESO Board Resolution
   iii. Attachment 3: Revised 2022-2024 Business Plan Overview to IESO Board
   iv. Attachment 4: Revised 2022-2024 Business Plan IESO Board Resolution

AUGUST 16, 2021

Audit Committee of the IESO Board of Directors 2022-2024 Business Plan

Business Plan Overview and Approval

Lesley Gallinger, President & CEO
Barbara Anderson, Vice President Corporate Services & CFO
Lia Kosic, Director Enterprise Planning, Risk & Performance

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Purpose and Summary

- **Purpose of Item:** Recommendation for approval to the Board
- **Executive Summary:**
  - The IESO's funding requirement for 2022-2024 represents 2.0%, 2.9% and 2.9% year over year increases, after 5 years of maintaining flat funding through offsetting $14 million in cost escalations
  - The key drivers of increased funding requirements are:

MRP/RSS[1]	Investing in Sector Future
Amortization to begin to recover the investment as $800 million in market benefits begin to materialize	Acquire resources to meet expected supply shortfalls later this decade
Additional enduring requirements to operate the more complex renewed market	Enable existing and emerging resources such as storage, hybrid integration and demand response to compete to meet supply needs and ensure reliability over the long-term
	Update IESO tools and processes that underpin the reliable and cost-effective provision of electricity in the province

Significant Issues, Risks and Opportunities: main risk is Government sensitivity to funding increases

[1]Market Renewal Program (MRP), Replacement Settlement System (RSS)

Proposal and Analysis

- Propose to approve funding requirement with 2.0%, 2.9% and 2.9% year over year increases for 2022, 2023 and 2024. For the average residential electricity bill, this translates to a 1.2 cents per month increase over the 2022-2024 planning period, or 14 cents per year.
- Five year trend of holding funding flat which meant absorbing $14 million of inflation and collective agreement impacts. This was achieved through efficiencies and deferral of investments in processes, tools and workspace and now investments are needed to maintain core operations and to continue modernizing Ontario's electricity sector
- The IESO's Market Renewal program will begin to deliver more than $800 million in ratepayer savings as it goes into service in 2023, more than offsetting the MRP[1] investment recovery through amortization and the impact of operating the renewed market

[1]Market Renewal Program (MRP), Replacement Settlement System (RSS)

Proposal and Analysis

- To meet the energy needs of the future, the IESO will invest in the acquisition of resources and enabling existing and emerging resources to compete in the market
- In support of business and workforce transformation, the IESO continues to examine its office space needs, with any funding and savings impacts to be reflected in future business plans
- To address Government sensitivity to annual funding requirement increases above 1%, the IESO's Business Plan has aligned funding and resources to specific priorities, which will support mitigation of the strategic risks as outlined on slide 14

Detailed Financials

- Approval by the Ministry is sought for 2022 funding
- Baseline expenses reflect 2021 year-end expected staffing levels, committed contracts and in-flight and carryover initiatives
- In 2022, preparations for the new renewed market functions and services begin, while continuing to develop resource acquisition strategies, capacity auction enhancements, and enabling resources to participate in the market
- 2023-2024 is focused on ramp-up of MRP[1] preparedness to go live, MRP/RSS[1] amortization impacts and investments to upgrade IESO's tools and infrastructure

Pro Forma Statement of Operations For the Year Ended December 31 ($ Millions)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
Revenue				
IESO Usage Fee	191.8	195.6	201.2	207.1
Total Revenue	**191.8**	**195.6**	**201.2**	**207.1**
Expenses				
Baseline Expenses	171.5	172.8	175.0	178.2
Year-over-year variance	-	*0.7%*	*1.3%*	*1.8%*
MRP Post-go-live requirements	-	0.5	2.7	4.0
Resource Adequacy	-	1.8	1.9	1.3
Enabling Resources	-	0.4	0.6	0.5
Operating Expenses inclusive of Initiatives	171.5	175.4	180.2	184.0
Amortization	19.2	20.0	23.3	30.0
Net Interest	(2.5)	(5.0)	(7.2)	(7.8)
Market Renewal Program	3.6	5.2	4.9	0.9
Total Expenses	**191.8**	**195.6**	**201.2**	**207.1**
Year-over-year variance	-	*2.0%*	*2.9%*	*2.9%*
Operating Surplus/(Deficit)	-	-	-	-

[1]Market Renewal Program (MRP), Replacement Settlement System (RSS)

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MRP[1] Post-go-live requirements

- MRP[1] will introduce new functions and services (e.g. Day Ahead Market, preparing settlement ready data, facility and participant registration, network models), requiring more oversight and complex workload, enforcement activities, fixes and development of new tools and processes
- The business plan includes resources for additional staff, technical consultants and support & maintenance to transition and operate the renewed market, as well as resources to enhance the Market Analysis and Simulation Toolset (MAST) functionality
- This investment is critical to ensure the success of the MRP[1] implementation, which will generate $800 million in ratepayer savings over a 10-year span, a 3.5 benefit-to-cost ratio

($ Millions)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
MRP post-go-live - Operating Expenses	-	0.5	2.7	4.0
MRP post-go-live - Capital Expenses	-	2.0	2.2	-
MRP post-go-live Total	**-**	**2.5**	**4.9**	**4.0**

[1]Market Renewal Program (MRP)

Resource Adequacy

- To meet Ontario's emerging system needs and ensure optimal value for ratepayers, the IESO launched the resource adequacy framework which will use competitive mechanisms to acquire resources in the short, medium, and long term
- The business plan includes resources for additional staff, legal and technical consultants, as well as undertaking the design and execution of procurement mechanisms (e.g. RFPs, negotiations)
- This investment is critical today in order to ensure there is sufficient and cost effective resource capacity to maintain reliability later in the decade

($ Millions)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
Resource Adequacy - Operating Expenses	-	1.7	1.9	1.3
Resource Adequacy - Capital Expenses	-	2.0	-	-
Resource Adequacy Total	**-**	**3.7**	**1.9**	**1.3**

Enabling Resources Program

- The program will prioritize and undertake work to increase the number of resource types (e.g., hybrids, storage, and DERs) that can participate in IESO markets to deliver energy, capacity and ancillary services. This investment addresses stakeholder concern about equitable opportunity to compete in IESO markets and increases the number and diversity of resources available to meet emerging system needs that grow through the decade
- The business plan includes resources for additional staff and technical consultants to focus on completing hybrid design vision to give potential proponents sufficient information for the 2022 long-term RFP, and perform the bulk of design and implementation work post MRP go-live
- IESO is currently pursuing access to NRCAN funding to allow an expedited work plan and scope

($ Millions)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
Enabling Resources - Operating Expenses	-	0.4	0.6	0.5
Enabling Resources - Capital Expenses	-	-	-	2.5
Enabling Resources Total	**-**	**0.4**	**0.6**	**3.0**

Market Renewal Program Financials

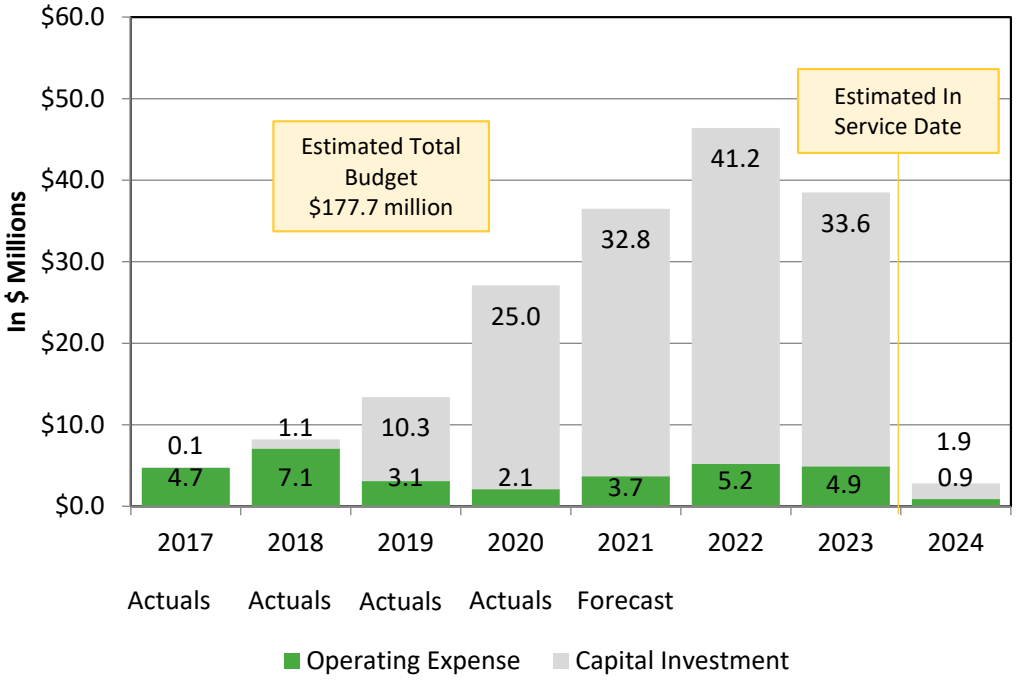
MRP[1] business case was approved by IESO's Board in late 2019, with a mid-range program cost of $170 million.

In March 2021, the IESO's Board approved a revised schedule and in-service date, with related revisions to $177.7 million in program funding, with $10 million in contingency.

The revised $177.7 million is the basis of the 2022-2024 business plan, with some adjustments in timing and dollars between years.

In 2024, MRP[1] requires operating funding post go-live to deliver market participant support and training, complete internal document updates, and start project closure activities, and capital funding for changes identified after the in service date.

Projected Market Renewal Costing



9 [1]Market Renewal Program (MRP)

What Is Not Included

- Unsolicited proposal contract negotiations and implementation (e.g. post Gate 3)
  - Work to support unsolicited proposals is included in 2021 only, however, if government direction is provided to progress in 2022 and beyond, the IESO would need to source additional funding to cover that cost
- Transmission Procurement – As noted in the IESO's report to the Ministry, the IESO has recommended that this initiative not proceed at this time given the other pressing resource acquisition needs and the potential value in light of Hydro One's market power
- Potential changes to IESO facilities and realignment of office space, including development of a new backup control center, will be addressed in IESO's 2023-2025 plan

IESO's Operating Reserve

- The IESO has approval from the Ontario Energy Board to maintain an operating reserve of $10 million, to manage cost or revenue variances from budgets, as well as changes to the external environment that impact the IESO and may not be within its control or reasonably foreseeable, a practice adopted by similar sector organizations.
- Given the scope and complexity of its mandate, the IESO recognizes the potential for additional unplanned work activities that may be material in scope and are beyond the control of management.
- The operating reserve balance was drawn down in 2019 due to an accounting policy change and is currently at $1.2 million.
- The IESO is seeking to restore the $10 million operating reserve over time through retention of any operating surpluses and is committed to continuing to look for efficiencies to create capacity to support rebuilding of the operating reserve.

Capital Projects

- 2022 core capital budget of $30.0 million includes continuation of strategic initiatives (RSS[1], Data Excellence, Dynamics Limits in Real-Time), completion of the SCADA/Energy Management System (EMS), and introduction of Market Analysis and Simulation Toolset to ensure ability to monitor, correct, improve or alter market design or operations over the day-ahead, pre-dispatch and real-time periods following the introduction of MRP[1]
- MRP[1] capital spending includes solution development deliverables and testing to ensure both the IESO and market participants are prepared for the launch of the renewed market, targeted for Q4 2023

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

 [1]Market Renewal Program (MRP), Replacement Settlement System (RSS)

Full Time Equivalent (FTE) Staffing

Key staffing related drivers:

- Core staff increases required ahead of the implementation of the new market functions/services, to support resource adequacy strategy and enabling resources program, and to invest in effectively planning for the rapidly changing Ontario power system
- MRP[1] resources increase in 2022 for market implementation and in 2023 for operations testing. 2024 staff is retained to provide training, complete internal documentation, tool changes post go-live and to ensure an effective framework to measure the benefits post go-live
- Over the course of 2024, MRP program resources are expected to return to their home positions within core IESO

Average FTEs

Full Time Equivalents (FTEs)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
Core Operations	713	713	739	732
Market Renewal Program	81	97	101	10
Total FTEs	**794**	**810**	**840**	**742**

13 [1]Market Renewal Program (MRP)

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Risks to IESO Strategic Objectives

Risk Description	Strategic Objective		
	Reliability, Affordability & Sustainability	Culture & Workforce Transformation	Stakeholder Trust
Stakeholder acceptance of the IESO's resource adequacy mechanisms	X		X
Stakeholder support for the IESO's determined acquisition quantities	X		X
Undersupply of system demand	X		
Oversupply of generation capacity	X		X
Competitive wholesale markets	X		
Information security and data governance	X	X	X
Successful cyber attack on Ontario's grid reliability	X	X	X
Regulatory change	X		X
Extreme weather	X		
Information technology system failure	X		X
Program and enterprise priority delivery	X	X	X

Performance Measures

5-Year Strategic Objectives	Measures	5-Year Strategic Outcome (Strategic Achievement Defined)	2022 Target
Culture & Workforce Transformation	**1. Employee engagement** - Commitment to the execution of enterprise priorities	Annual employee pulse survey results sustain 4% increased performance.	4%
	2. Organizational Agility - Openness to Change	Annual employee survey results improve each year to a result of 71%.	65%
	3. Operational Efficiency - Percentage of Strategic Initiatives that are completed on time	90% of Strategic Initiatives are completed on time.	80%
Stakeholder Trust	**4. Stakeholder Satisfaction** – Engagement process	A 5-year target of 84%.	80%
Reliability, Affordability & Sustainability	**5. Cost Effectiveness –** Forecast accuracy	Performance target is to have annual forecast error within +/- 2.5% (actual vs. forecast).	+/- 2.25%
	6. Cost Effectiveness – Resource balance: Energy Curtailments to total production	10% improvement to 'right size' the system and achieve resource adequacy and effectiveness of meeting energy and ancillary services needs for Ontario.	1.72%

Performance Measures

5-Year Strategic Objectives	Measures	5-Year Strategic Outcome (Strategic Achievement Defined)	2022 Target
Reliability, Affordability & Sustainability	**7. Cost Effectiveness** – Resource balance: annual energy / operating reserve shortage frequency	10% improvement to 'right size' the system and achieve resource adequacy and effectiveness of meeting energy and ancillary services needs for Ontario.	0.048%
	8. Reliability – Number of forced outages to thermal resource fleet above 250 MW	Measure of probability that thermal facilities greater than 250 MW will be unavailable due to forced outages to thermal fleet below 9.2% annually.	<9.2%
	9. Reliability – Number of extended forced outages to transmission facilities above 230 kV	Forced outages and extensions to outages over 4 hours in duration to significant transmission elements is below 334 annually which is the five year historical high.	<334
	10. Market Efficiency – Market cost/revenue transparency index	The transparency index increases by 1% and represents the proportion of revenues received by suppliers (or payments from consumers) for electricity in the wholesale market to the total costs of supplying the electricity.	19.4%

Next Steps/Implementation

- Through August: Briefings with Ministry on Business Plan
- August 18: Board approval of Business Plan
- September 1: Deliver Business Plan to the Minister of Energy
- October/November: File 2022 revenue requirement submission with the Ontario Energy Board

Committee Recommendation

The Committee is asked to approve the following resolution:

WHEREAS the IESO presented a 2022 - 2024 Business Plan to the Audit Committee for its review and recommendation to the Board of Directors;

AND WHEREAS by approving the 2022 – 2024 Business Plan, the Board of Directors will be approving the following elements as set forth in the Business Plan: (i) the funding requirements incorporated within the 2022 – 2024 Business Plan; and (ii) the Performance Measures and Targets;

NOW THEREFORE the Audit Committee approves recommending the approval of the 2022 – 2024 Business Plan by the Board of Directors.

Business Plan 2022-2024

Independent Electricity System Operator

September 1, 2021

Contents

Letter from the President & CEO

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

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

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

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

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

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

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

While the IESO continues to carefully review all expenditures and will find efficiencies where possible, investments are needed. To fully enable the sector of the future, we must invest in the people, tools and processes that underpin the reliable and cost-effective provision of electricity in the province. As a result, the IESO is proposing measured increases to its budget to ensure it can continue to meet Ontarians expectations of an efficient – and resilient – electricity system. This includes a revenue requirement of $195.6 million in 2022, $201.2 million in 2023, and $207.1 million in 2024, translating to an increase of 2%, 2.9%, 2.9%, respectively. For the average residential electricity bill, this translates to a 1.2 cents per month increase over the 2022-2024 planning period, or 15 cents per year.

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

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

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

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

Over this business planning period, the IESO anticipates issuing an RFP for up to 750 megawatts in late 2021, for three-year commitment periods, and a longer-term RFP for at least 1,000 megawatts in late 2022. We will secure only the resources we are certain we need, with annual capacity auctions enabling us to respond to changing circumstances and secure the remainder of what is needed.

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

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

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

Lastly, investments are required in our people and processes. After years of deferring certain upgrades to our infrastructure, targeted investments are needed in aging IT assets and tools to

maintain sustainable operations, and to prepare for the renewed electricity markets going live at the end of 2023.

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

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

Lesley Gallinger

President and CEO, IESO

2022-2024 Business Plan: IESO Priorities

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

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

Planning for the Future

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

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

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

To support these efforts, the IESO will replace the existing Long-Term Demand Forecast tools which have reached end of life and update the end-use load profiles used to develop the long-

term forecasts. These tools are essential to support the planning processes that forecast system needs and provide infrastructure investment advice for the next 20 years.

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

Resource Adequacy

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

Over the past decade, Ontario's electricity system has become more diverse and dynamic, necessitating changes in the way we secure resources to meet system needs. A move to shorter-term contracts procured through a robust competitive process will help drive down costs for ratepayers. In the years to come, this approach will help facilitate participation from new technologies and, at the same time, provide the IESO with flexibility to adapt to changing conditions.

To that end, the IESO is initiating an RFP in late 2021 for up to 750 megawatts (MW), with a three-year commitment period beginning in 2026. A longer-term RFP with a commitment period of at least seven years is expected to launch in late 2022 for at least 1,000 MW. We will secure only the resources we are certain we need, with annual capacity auctions enabling us to respond to changing circumstances and cost-effectively secure the remaining resources. By implementing flexible and competitive procurements, and securing only those resources we require, we will be taking important steps to ensure Ontario's power system is not overbuilt.

For unique or innovative projects that do not have a clear pathway to be acquired through these competitive processes, the IESO will review them through the Ministry of Energy's assessment process for unsolicited energy projects. These projects are assessed to see if they provide electricity system benefits and reduce costs for ratepayers, but the recovery of implementation costs would need to be considered. These projects will be dealt with on a case-by-case basis.

Enabling Resources

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

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

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

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

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

Market Renewal Program

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

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

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

Driving Business Transformation

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

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

In addition to our people, effective processes and tools are required to carry out our mandate. Complex IT programs and tools enable us to perform essential tasks that include forecasting demand, dispatching resources and monitoring the grid for cyber threats. After years of deferring investments, many of the IESO's IT systems are near or at their end of life. Some of these upgrades will be made to control room systems to support the integration of emerging resources, and to improve situational awareness. In the coming years, we will continue to update or replace many of these key IT systems that help us maintain the reliability of the grid.

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

associated with implementation of the Market Renewal Program and ensure our systems meet current and future business needs.

Reinforcing the Resilience and Integrity of the Grid

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

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

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

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

On the cybersecurity front, the IESO has made investments into advance threat detection and response technology to strengthen its core posture. The technologies continue to be fine-tuned to adapt to emerging cyber threats with the potential to impact the IESO's operations.

Our cybersecurity program continues to focus on expanding the IESO Lighthouse program membership and increasing the value delivery around situational awareness and information sharing as a service for members within Ontario's electricity sector. This includes developing cybersecurity training and resources for the sector, which will strengthen our collective cyber posture.

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

Powering Change in First Nations Communities

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

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

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

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

Engaging with Communities and Industry Stakeholders

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

When it comes to electricity planning, understanding what's important to communities, businesses and regions is critical. Every region of the province has unique characteristics and

energy needs, which the IESO must understand and consider. For this reason, we've launched IESO Connects (www.iesoconnects.ca), an online community engagement hub that enables regional electricity network members to follow developments and contribute their ideas and perspectives. It will remain an important engagement mechanism going forward, enabling active dialogue in a targeted and cost-effective manner.

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

Energy Efficiency

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

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

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

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

procurements. This approach will enable a broad range of participants to propose CDM programs and opportunities encouraging competition, innovation, cost savings and customer-driven solutions.

Financial Overview

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

The IESO has maintained its revenue requirements at similar levels since 2017, absorbing $14 million of inflation and collective agreement impacts by deferring investments in processes, tools and workspaces, and by finding efficiencies. However, after five years of holding funding requirements flat, the IESO now needs to move forward on key initiatives that are critical to maintaining its core operations and to continue modernizing Ontario's electricity sector. While the IESO continues to carefully review all expenditures and will find efficiencies where possible, investments are now needed for initiatives in support of the future of the sector and in the people, tools and processes that underpin the reliable and cost-effective provision of electricity in the province. The IESO is proposing measured increases to its revenue requirement of 2%, 2.9%, 2.9% over the three year planning period. For the average residential electricity bill, this translates to a 1.2 cents per month increase over the 2022-2024 planning period, or 14 cents per year.

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

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

In 2022, the IESO will start preparing for the new functions and services that the Market Renewal Program will introduce when it goes into service. Operating costs for 2023 include the continuation of initiatives started in 2022, increase preparedness for post-Market Renewal Program implementation, and investments in core operations to upgrade tools and maintain

critical functions required for IESO to deliver on its mandate. 2024 is a step-change year for the IESO, driven by beginning to recover the Market Renewal Program investments through amortization and the impacts of operating the new market.

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

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

For 2022, the IESO anticipates an average of 810 full-time equivalent employees to deliver on core electricity system responsibilities and initiatives, as well as to support the Market Renewal Program. After rigorous review, core operations staffing levels will remain relatively flat in 2022, with additions related to MRP support. In 2023, a number of strategic positions are added to support key initiatives (including the Market Renewal Program). Staffing levels will be reduced in 2024 after the Market Renewal Program and the Replacement of Settlement System project have gone into service, with certain program resources returning to core functions.

The 2022-2024 business plan does not include further work on unsolicited proposals for contract negotiations and implementation beyond 2021. If government direction is provided to progress, the IESO would need to source additional funding to cover that cost.

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

The IESO has approval from the Ontario Energy Board to maintain an operating reserve of $10 million, to manage cost or revenue variances from budgets, as well as changes to the external environment that impact the IESO and may not be within its control or reasonably foreseeable, a practice adopted by similar sector organizations. Given the scope and complexity of its mandate, the IESO recognizes the potential for additional unplanned work activities that may be material in scope and are beyond the control of management.

The operating reserve balance was drawn down in 2019 due to an accounting policy change and is currently at $1.2 million. The IESO is seeking to restore the $10 million operating reserve over time through retention of any operating surpluses and is committed to continuing to look for efficiencies to create capacity to support rebuilding of the operating reserve.

Detailed Financials

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

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

($ Millions)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
Revenue				
IESO Usage Fee	191.8	195.6	201.2	207.1
Total Revenue	**191.8**	**195.6**	**201.2**	**207.1**
Expenses				
Baseline Expenses	171.5	172.8	175.0	178.2
Year over year variance	-	*0.7%*	*1.3%*	*1.8%*
MRP Post-go-live	-	0.5	2.7	4.0
Resource Adequacy	-	1.7	1.9	1.3
Enabling Resources	-	0.4	0.6	0.5
Operating Expenses inclusive of Initiatives	171.5	175.4	180.2	184.0
Amortization	19.2	20.0	23.3	30.0
Net Interest	(2.5)	(5.0)	(7.2)	(7.8)
Market Renewal Program	3.6	5.2	4.9	0.9
Total Expenses	**191.8**	**195.6**	**201.2**	**207.1**
Year over year variance	-	*2.0%*	*2.9%*	*2.9%*
Operating Surplus/(Deficit)	-	-	-	-

Capital

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

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

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

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

Project details and associated descriptions are included in Appendix 3.

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

Full Time Equivalent (FTE) Staffing

In 2022, the average core operations FTEs remain at 2021 levels as additional resources to support the IESO's core initiatives are offset by staff attrition. Additionally, MRP implementation support is driving the increase of MRP program FTEs by 16 in 2022. Core operations FTE levels in 2023 increase to 739, mainly due to ramp-up of staff required to prepare for the new market functions/services, in order to develop processes, analysis, assist with fixes, improvements and sector readiness, and eventually operate the new market. In 2024, core operations FTE levels decline slightly to 732, driven by completion of the Replacement Settlement System project.

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

Average FTEs

Full Time Equivalents (FTEs)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
Core Operations	713	713	739	732
Market Renewal Program	81	97	101	10
Total FTEs	**794**	**810**	**840**	**742**

Market Renewal Financials

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

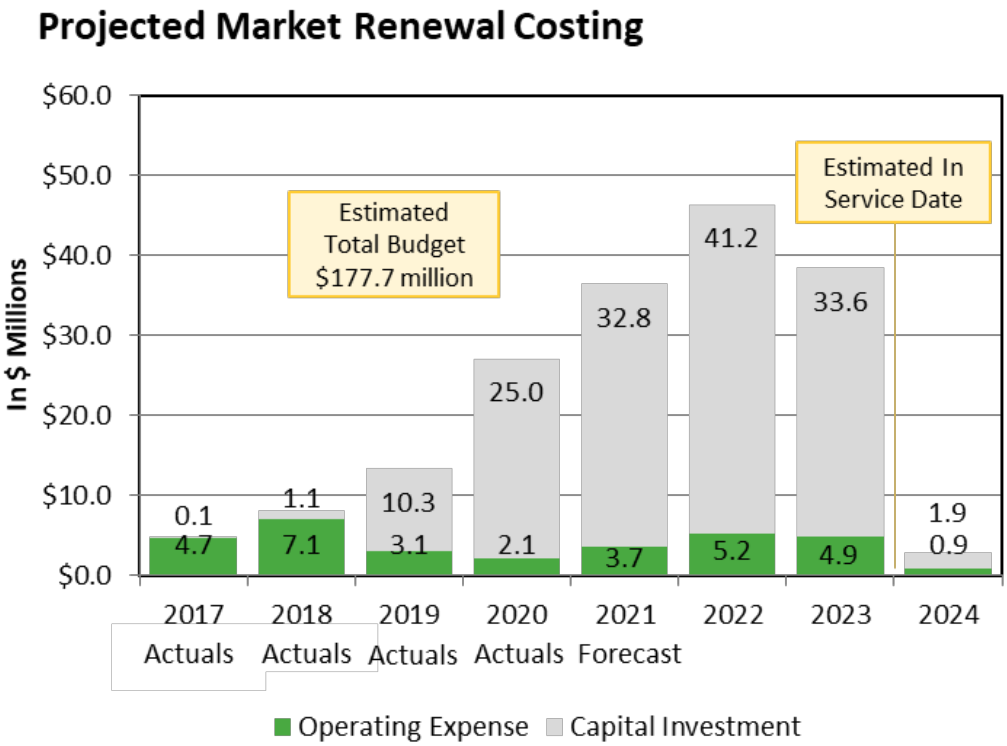
Market Renewal Program Baseline Schedule, Budget Update and Funding

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

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

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

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



Appendix 1: IESO Performance Management – Measures and Targets

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

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

5-Year Strategic Objectives	Measures	5-Year Strategic Target
Culture & Workforce Transformation	**1. Employee engagement** - Commitment to the execution of enterprise priorities	Annual employee pulse survey results sustain 4% increased performance.
	2. Organizational Agility - Openness to Change	Annual employee survey results improve each year to a result of 71%.
	3. Operational Efficiency - Percentage of Strategic Initiatives that are completed on time	90% of Strategic Initiatives are completed on time.
Stakeholder Trust	**4. Stakeholder Satisfaction** – Engagement process	A 5-year target of 84%.

5-Year Strategic Objectives	Measures	5-Year Strategic Target
Reliability, Affordability & Sustainability	**5. Cost Effectiveness –** Forecast accuracy	Performance target is to have annual forecast error within +/- 2.5% (actual vs. forecast).
	6. Cost Effectiveness – Resource balance: Energy Curtailments to total production	10% improvement to 'right size' the system and achieve resource adequacy and effectiveness of meeting energy and ancillary services needs for Ontario.
	7. Cost Effectiveness – Resource balance: annual energy / operating reserve shortage frequency	10% improvement to 'right size' the system and achieve resource adequacy and effectiveness of meeting energy and ancillary services needs for Ontario.
	8. Reliability – Number of forced outages to thermal resource fleet above 250 MW	Measure of probability that thermal facilities greater than 250 MW will be unavailable due to forced outages to thermal fleet below 9.2% annually.
	9. Reliability – Number of extended forced outages to transmission facilities above 230 kV	Forced outages and extensions to outages over 4 hours in duration to significant transmission elements is below 334 annually which is the five year historical high.
	10. Market Efficiency – Market cost/revenue transparency index	The transparency index increases by 1% and represents the proportion of revenues received by suppliers (or payments from consumers) for electricity in the wholesale market to the total costs of supplying the electricity.

Appendix 2: Enterprise Risk Management

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

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

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

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

STAKEHOLDER TRUST STRATEGIC RISKS

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

Risk assessment: Critical

Risk Mitigation Approach

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

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

Risk assessment: High

Risk Mitigation Approach

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

AFFORDABILITY, RELIABILITY, SUSTAINABILITY STRATEGIC RISKS

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

Risk assessment: Medium

Risk Mitigation Approach

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

Risk: Long-Term Reliability. Oversupply of generation capacity. **Risk assessment: Medium**

Risk Mitigation Approach

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

Risk: Market Competitiveness. Competitive wholesale markets. **Risk Assessment: High**

Risk Mitigation Approach

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

Risk: Cyber Security. Information security and data governance. **Risk Assessment: High**

Risk Mitigation Approach

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

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

Risk Assessment: Medium

Risk Mitigation Approach

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

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

Risk Assessment: Medium

Risk Mitigation Approach

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

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

Risk Assessment: Medium

Risk Mitigation Approach

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

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

Risk Assessment: Medium

Risk Mitigation Approach

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

CULTURE AND WORKFORCE TRANSFORMATION STRATEGIC RISKS

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

Risk Assessment: High

Risk Mitigation Approach

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

Appendix 3: Capital Spending

Summary for 2022-2024 capital spending

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

2022-2024 Capital Plan Details

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

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

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

Project Name	Project Description
Transmission Rights Auction Platform Refresh	The IESO uses the Transmission Rights Auction (TRA) tool to administer the monthly Transmission Rights Market. The underlying technology (i.e., the platform) has reached end of life and is unable to support further enhancements to the TRA tool. This project will update the TRA platform, improve efficiency for support staff and introduce some high-value enhancements identified in the recent Transmission Rights Market Review performed by the IESO in response to a Market Surveillance Panel recommendation.
Enterprise Resource Planning (ERP)	The IESO's current financial applications and accounting ledgers are composed of several segregated systems (and tools) that interface together to provide comprehensive records for the IESO. The IESO must conduct a refresh of at least the accounting ledgers as these systems will become obsolete once the vendor's support ceases within the next few years. Through this project the IESO will replace the accounting ledgers and various other segregated systems (and tools) that interface together with the ledgers as part of more comprehensive and efficient system.
Windows Infrastructure Refresh	The current version of Microsoft Windows Server operating system is nearing end-of-life at which time Microsoft no longer provides support for the product, including critical security patches. This project will move us to the latest supported version of the Windows operating system and refresh the underlying hardware.
Firewall Refresh	The existing IESO firewalls which provide access control to critical parts of the network such as the NERC Electronic Security Perimeter (ESP) and DMZ are nearing the end of vendor support and need to be upgraded. This project seeks to build on the strengths of the existing security architecture by upgrading the key security controls at the firewall perimeter of IESO's data network and allow the IESO to take advantage of features which are used to reduce the risk of evolving cyber attacks and ensure mitigation of security concerns related to the industry.
Advanced Malware Refresh	The existing Advanced Malware appliances are nearing end of vendor support. This refresh project will upgrade the aging network threat prevention infrastructure and seeks to build on the strengths of the existing security architecture by upgrading the key security controls at the perimeter of the IESO's data network. Advanced malware protection complements the existing traditional security controls such as firewalls, intrusion prevention systems and endpoint protection by using advanced detection capabilities based on current threats.

Project Name	Project Description
Meter Data Management System Replacement	The current Meter Data Management solution that supports the IESO settlement processes is currently deployed on an application that does not have an upgrade path. As a result the IESO will need to invest in replacing the application when it reaches end of life.
Aruba Introspect Refresh	Aruba Introspect is a cyber security tool used to detect and monitor anomalies on user workstations and laptops. The tool is being discontinued and will no longer supported by the vendor. The solution will need to be replaced with a vendor-supported solution in order to ensure the effectiveness of the IESO's cybersecurity posture.

Resolution of the Board of Directors
Independent Electricity System Operator

August 18, 2021

In Respect of Approval of the 2022 - 2024 Business Plan

WHEREAS the IESO presented a 2022 - 2024 Business Plan to the Audit Committee and by approving the 2020 – 2022 Business Plan, the Board of Directors will be approving the following elements as set forth in the Business Plan: (i) the revised funding requirements incorporated within the 2022 – 2024 Business Plan; and (iii) the Performance Measures and Targets.

AND WHEREAS the Audit Committee has reviewed and recommends the approval of the 2022 – 2024 Business Plan by the Board of Directors.

NOW THEREFORE BE IT RESOLVED THAT, as recommended by the Audit Committee and presented and discussed at this meeting of the Board of Directors, the 2022 – 2024 Business Plan is approved.

DECEMBER 6, 2021

Audit Committee of the Board of Directors Revised 2022-2024 Business Plan

Revised Business Plan Overview Approval

Barbara Anderson, Vice President Corporate Services & CFO
Jeannette Briggs, Director Corporate Finance
Lia Kosic, Director Settlements

ieso
Connecting Today. Powering Tomorrow.

Purpose and Summary

- **Purpose of Item:** Approval of planned recommendation to the Board
- **Executive Summary:**
- In September, the IESO submitted for Ministry approval a funding requirement for the 2022-2024 Business Plan of 2.0%, 2.9% and 2.9% year over year increases, after 5 years of maintaining flat funding
- Recently the Ministry formally requested the IESO to address a number of unplanned initiatives that are resource intensive with timelines that compete with the planned priorities (MRP, Resource Adequacy, Enabling Resources), therefore an additional $5.9, $2.8, $2.2 million in funding is being requested for each respective year in the 2022-2024 Business Plan which changes the year over year increase to 5.1%, 1.2% and 2.6%
- The additional funding for these incremental initiatives are indicated as Pathway to Zero Emissions and Other Initiatives within the Business Plan document
- **Significant Issues, Risks and Opportunities:** Ministry's formal request for unplanned activities came with an understanding that IESO Business Plan would be revised to enable timely delivery on the requests. There may be sensitivity to significant funding increases between 2021 and 2022.

Proposal and Analysis

- After submission of the 2022-2024 Business Plan to the Ministry, the Minister of Energy requested the IESO embark on additional initiatives to ensure reliability and sustainability of resources important to other government policies, as well as to respond to interest in sourcing clean electricity, specifically:
  - Re-contract biomass and small hydroelectric generation facilities
  - Update the 2016 Energy Storage in Ontario study
  - Move to the next phase of various unsolicited proposals (Marmora, Meaford and Schreiber Pumped Storage Project), Oneida and Lake Erie Connector
  - Develop a voluntary market for clean energy credits
  - Pathway to phase-out natural gas plant generation

Proposal and Analysis

- Proposal to revise the 2022-2024 Business plan submitted to Ministry on September 1st, 2021, in order to seek an additional funding of $5.9 million in 2022 and $2.8 and $2.2 million in 2023 and 2024 respectively to address new initiatives requested by the Ministry of Energy
- The 2022 revenue requirement increases from $195.6 million to $201.5 million. For the average residential electricity bill, this translate into a 2.3 cents per month increase over planning horizon, or 27 cents per year compared to the previously Board approved Business Plan of 14 cents per year

[1]Market Renewal Program (MRP), Replacement Settlement System (RSS)

Detailed Financials

- In September we sought approval by the Ministry for $195.6M funding requirement for 2022, a 2% increase over the 2021 revenue requirement
- To address additional initiatives requested, the IESO requires $5.9M of incremental funding in 2022, a 5.1% increase over 2021 revenue requirement, to secure the necessary resources to execute, design and operate:
  - Biomass generation and small hydro program
  - Energy storage report
  - Unsolicited proposals
  - Clean energy credit
  - Pathway to Zero Emissions

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

($ Millions)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
IESO Usage Fee Revenue				
Main Business Plan	191.8	195.6	201.2	207.1
Revised Business Plan		5.9	2.8	2.2
Total Revenue Requirement	**191.8**	**201.5**	**204.0**	**209.3**
Expenses				
Included in Main Business Plan	191.8	195.6	201.2	207.1
Other Government Initiatives	-	4.6	2.8	2.2
Pathway to Zero Emissions	-	1.3	-	-
New Initiatives in Revised Business Plan		5.9	2.8	2.2
Total Expenses	**191.8**	**201.5**	**204.0**	**209.3**
Operating Surplus/(Deficit)	-	-	-	-

Capital Projects Remains Unchanged

- The new initiatives requested by the Ministry are not expected to require additional capital funding, thus the 2022 core capital budget remains unchanged from the Board approved 2022 – 2024 Business Plan at $30.0 million and MRP[1] at $41.2 million for a total portfolio of $71.2 million

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

[1]Market Renewal Program

Staffing Levels

- To ensure the timely delivery and ongoing execution of the new Ministry initiatives - while the IESO continues to focus on completing MRP/RSS[1] and preparing for the implementation of the new market functions/services, resource adequacy framework and enabling resources program - an additional 23 staff are required for 2022, which represent 17 full time equivalent.
- The resources in 2023 through 2024 are required to move forward other government priorities such as re-contracting of biomass, small hydro and unsolicited proposals

Average Full Time Equivalent (FTEs)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
Total Headcount included in Main Business Plan	794	810	841	742
Other Government Initiatives	-	10	12	9
Pathway to Zero Emissions	-	7	0	0
New Initiatives in Revised Business Plan	-	17	12	9
Total FTEs	**794**	**827**	**853**	**751**

[1]Market Renewal Program (MRP), Replacement Settlement System (RSS)

Other Government Initiatives

- The IESO will engage with biomass and hydro facilities with the aim of having new agreements in place prior to the expiry of their current contracts
- To help inform future decisions on energy storage technologies, the IESO will provide an update on the implementation status of solutions for barriers to storage identified in the 2016 Energy Storage Report, as well as provide options to address any remaining barriers
- The IESO will move forward various initiatives into the next phase of the unsolicited proposal framework
- To meet Ontario's clean energy requirements, the IESO will report back to the Ministry by January 1, 2023, on how a voluntary market for Clean Energy Credits in Ontario would be feasible

($ Millions)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
Other initiatives - Operating Expenses	-	$ 4.6	$ 2.8	$ 2.2
Other initiatives – FTEs	-	10	12	9

Pathway to Zero Emissions

- To meet Ontario's goal of zero emissions in the electricity sector, on request by the Ministry, the IESO will develop a viable pathway to phase-out natural gas generation and assess a potential moratorium on new gas procurements
- The revised Business Plan includes resources for additional staff and technical consultants, to undertake the design and stakeholder engagement necessary to phase-out gas generation in a cost-effective and reliable way for Ontarians
- The 2022 – 2024 Business Plan excludes any investments or staff increases that would be required should the IESO be directed to implement any of the recommended initiatives to deliver on the zero emissions pathway

($ Millions)	**2021 Budget**	**2022 Budget**	**2023 Budget**	**2024 Budget**
Pathway to Zero Emissions- Operating Expenses	-	$ 1.3	-	-
Pathway to Zero Emissions– FTEs	-	7	-	-

Risks

- In light of known challenges in the hiring process to fill current vacancies, adding an additional 23 staff, may be unrealistic and upend 2022 Ministry deliverable timing and commitments
- Focus on completing MRP/RSS and/or preparing for the implementation of the new market functions/services, resource adequacy framework and enabling resources program may be impacted (timing, stakeholder commitments, & IESO reputation) as staff is redirected temporarily in 2022 to enable timely response to Ministry directed initiatives
- Other capital/operations projects may be impacted if required resources are not available as scheduled in project plans
- Staff engagement may be negatively impacted if workload of current staff increases to accommodate any hiring delays or skills void in the marketplace for new hires
- Mitigations to offset these risks is underway but not completed.

Next Steps/Implementation

- December 8, 2021: Board approval of the Revised 2022-2024 Business Plan
- December 9, 2021: Submit a Revised 2022-2024 Business plan to Ministry of Energy to address new initiatives requested by the Minister of Energy
- January: File 2022 revenue requirement submission with the Ontario Energy Board inclusive of the new initiatives

Committee Recommendation

The Audit Committee is asked to approve the following motion:

WHEREAS the IESO presented a revised 2022 - 2024 Business Plan to the Audit Committee to address requests from the Minister of Energy that were not reflected in the 2022-2024 Business Plan approved in August 2021.

NOW THEREFORE BE IT RESOLVED THAT, the Audit Committee recommends that the Board of Directors approves the revised 2022 – 2024 Business Plan as presented.

Business Plan 2022-2024

Independent Electricity System Operator
September 1, 2021

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Connecting Today.
Powering Tomorrow.

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Letter from the President & CEO

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Lesley Gallinger

President and CEO, IESO

2022-2024 Business Plan: IESO Priorities

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

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

Planning for the Future

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

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

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

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

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

Resource Adequacy

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

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

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

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

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

Enabling Resources

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

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

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

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

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

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

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

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

Market Renewal Program

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

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

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

Driving Business Transformation

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

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

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

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

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

Reinforcing the Resilience and Integrity of the Grid

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

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

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

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

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

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

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

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

Powering Change in First Nations Communities

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

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

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

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

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

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

Engaging with Communities and Industry Stakeholders

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

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

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

Energy Efficiency

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

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

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

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

Supporting Decarbonization and Government Policy Objectives

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

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

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

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

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

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

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

Separately, the Minister of Energy has also asked the IESO to take steps toward creating a market for clean energy credits, re-contracting with some small hydro and biomass generation facilities, assessing the feasibility of several project proposals submitted to the government.

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

Financial Overview

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

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

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

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

- Maintain existing costs to run the business and complete existing initiatives, consistent with the approved 2021 budget.
- Complete the $178 million Market Renewal Program investment by end of 2023, at which time the new market will begin to generate $800 million in ratepayer savings over a 10-year span, a 3.5 benefit-to-cost ratio. The program investment will be amortized over a 20-year period, starting in late 2023.
- Embark on a large-scale effort to acquire resources to meet expected energy shortfalls later this decade, following a period of adequate supply, by implementing a competitive resource acquisition strategy for short-, medium- and long-term capacity needs and capacity auction enhancements.
- Ensure reliability over the long term through initiatives to enable existing and emerging resources such as storage, hybrid integration and demand response to compete in the market and help meet supply needs.
- Upgrade aging planning and operations tools that have been deferred for multiple years.
- Undertake several new initiatives to ensure reliability and government policy priorities are met, including: taking steps toward creating a market for clean energy credits, re-contracting some biomass generation and small hydroelectric facilities, assessing barriers to energy storage, and advancing several Unsolicited Project Proposals to the next phase of the framework.

- Develop a pathway to zero emissions in Ontario's electricity sector through a phase-out of gas generating facilities

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

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

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

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

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

The IESO has approval from the Ontario Energy Board to maintain an operating reserve of $10 million, to manage cost or revenue variances from budgets, as well as changes to the external environment that impact the IESO and may not be within its control or reasonably foreseeable, a practice adopted by similar sector organizations. Given the scope and complexity of its mandate, the IESO recognizes the potential for additional unplanned work activities that may be material in scope and are beyond the control of management.

The IESO's operating reserve balance was drawn down in 2019 due to an accounting policy change and is currently at $1.3 million. The IESO has deferred including additional revenue requirement in its budget to restore the $10 million operating reserve in order to mitigate the impact of cost increases on market participants. The IESO is able to manage this risk, and any operating deficits in the near

term, through its credit facility, and will look to restore its balance over time through retention of any operating surpluses, while it is committed to continuing to look for efficiencies to create capacity to support rebuilding of the operating reserve.

Detailed Financials

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

Pro Forma Statement of Operations
For the Year Ended December 31

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

Capital

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

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

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

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

Project details and associated descriptions are included in Appendix 3.

Total Capital Envelope

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

Full-Time Equivalent (FTE) Staffing

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

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

Average FTEs

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

Market Renewal Financials

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

Market Renewal Program Baseline Schedule, Budget Update and Funding

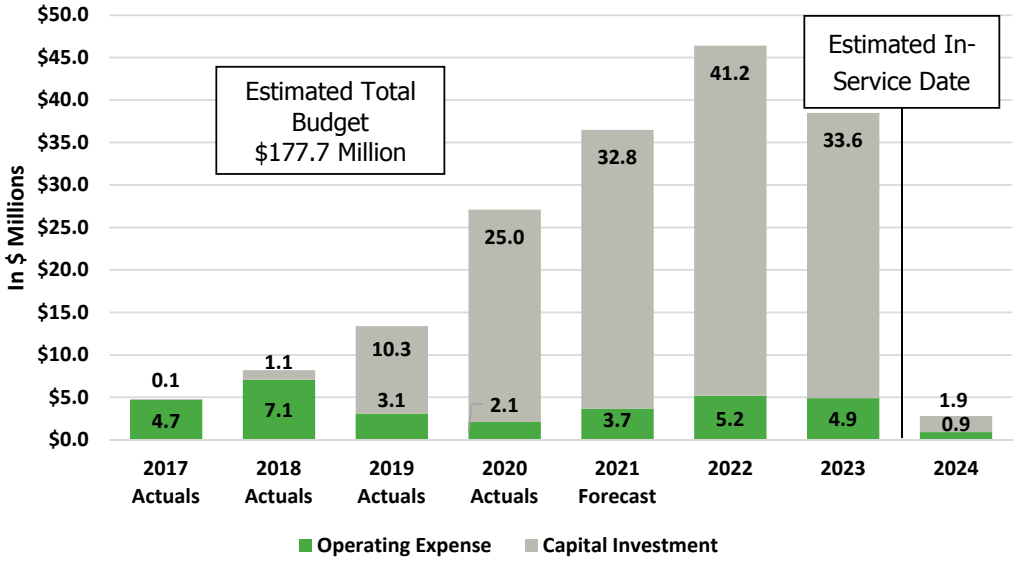
The business case for the Market Renewal Program was approved by the IESO Board in October 2019. The IESO's transition from detailed design to implementation provided a natural review point of the schedule, budget and risks – a common practice in the management of large-scale projects. In March 2021,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

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

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

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

Projected Market Renewal Costing



Appendix 1 – IESO Performance Management – Measures and Targets

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

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

5-year Strategic Objectives

Culture & Workforce Transformation

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

Stakeholder Trust

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

Reliability, Affordability & Sustainability

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

Appendix 2 – Enterprise Risk Management

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

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

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

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

Stakeholder Trust Strategic Risks

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

Risk Assessment: Critical

Risk Mitigation Approach

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

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

Risk Assessment: High

Risk Mitigation Approach

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

Affordability, Reliability, Sustainability Strategic Risks

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

Risk Assessment: Medium

Risk Mitigation Approach

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

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

Risk Assessment: Medium

Risk Mitigation Approach

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

Risk: Market Competitiveness. Competitive wholesale markets.

Risk Assessment: High

Risk Mitigation Approach

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

Risk: Cybersecurity. Information security and data governance.

Risk Assessment: High

Risk Mitigation Approach

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

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

Risk Assessment: Medium

Risk Mitigation Approach

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

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

Risk Assessment: Medium

Risk Mitigation Approach

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

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

Risk Assessment: Medium

Risk Mitigation Approach

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

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

Risk Assessment: Medium

Risk Mitigation Approach

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

Culture and Workforce Transformation Strategic Risks

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

Risk Assessment: High

Risk Mitigation Approach

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

Appendix 3 – Capital Spending

Summary for 2022-2024 capital spending

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

2022-2024 Capital Plan Details

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

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

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

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

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

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Resolution of the Board of Directors

Independent Electricity System Operator

December 8, 2021

In Respect of Approval of the revised 2022 - 2024 Business Plan

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WHEREAS the IESO presented a revised 2022 - 2024 Business Plan to the Audit Committee to address requests by the Minister of Energy that were not reflected in the 2022 – 2024 Business Plan approved in August 2021.

AND WHEREAS the Audit Committee has reviewed and recommends the approval of the revised 2022 – 2024 Business Plan by the Board of Directors.

NOW THEREFORE BE IT RESOLVED THAT, as recommended by the Audit Committee and presented and discussed at this meeting of the Board of Directors, the revised 2022 – 2024 Business Plan is approved.

SEC INTERROGATORY 3

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-SEC-3

INTERROGATORY

Please provide details of all productivity and efficiency measures the IESO undertook in 2021 and plans to undertake in 2022. Please quantify the savings.

RESPONSE

a) The IESO continues to prioritize work and evolve internal processes as part of the ongoing focus on internal continuous improvement to better allow support for capital projects and other initiatives with fewer resources, and avoid external costs by leveraging existing staff expertise. Due to the prolonged impacts of the COVID-19 Pandemic, the IESO also continued to have savings in 2021 related to work-from-home and remote learning and meetings.

   Given that these activities are function centered across multiple areas in the organization it is difficult to quantify specific savings. Exhibit D-1-1 – OM&A Overview outlines the main drivers in the year over year OM&A variances, with savings opportunities offsetting risks, cost increases or unplanned items. Also see response to Schedule 14 – 1.1 SUP 2.

SEC INTERROGATORY 4

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-SEC-4

INTERROGATORY

The IESO notes that it "continues to work towards the implementation of a multi-year Business Plan and Revenue Requirement Submission approval process in consultation with the Ministry of Energy and the OEB and will make efforts to complete this process in 2022." Please explain what the implementation issues are that the IESO still needs to work towards, considering that the IESO's Business Plan, which the Minister approves, is already on a three-year basis.

RESPONSE

a) The IESO currently submits a three-year business plan to the Minister but approval by the Minister is typically only for one year of that business plan. The revenue requirement submission to the OEB corresponds with the approval year of the business plan. The IESO and the Ministry have recently revised the Memorandum of Understanding[1] to include provisions that would allow for approval of a multi-year IESO business plan. This would then allow for the corresponding multi-year revenue requirement submission to the OEB.

[1] Memorandum of Understanding: https://www.ieso.ca/-/media/Files/IESO/Document-Library/corporate/governance/MOU-Minister-of-Energy-and-Chair-IESO.ashx

SEC INTERROGATORY 5

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-SEC-5

INTERROGATORY

[A-2-1, p.2] Please provide a full copy of the 2021 IESO Stakeholder and Community engagement survey results.

RESPONSE

a) A summary report of the 2021 IESO Stakeholder and Community Survey results will be shared with the IESO Stakeholder Advisory Committee (SAC) at its meeting on July 6, 2022. The materials will be available one week in advance of the meeting on the SAC webpage.[1]

As noted in Exhibit A-2-1 – IESO Stakeholder Engagement, the 2021 survey results indicated that 79% of stakeholders report that their experience with IESO engagement has met or exceeded expectations.

While it is unclear how the full survey results will help inform a review of the IESO's revenue requirement submission, in an effort to be responsive, additional information from the 2021 survey results is provided below:

i. Survey results are fairly consistent with past years.
ii. Overall impressions of the IESO continue to be largely positive with operational reliability and IESO staff continuing to be core strengths.
iii. The most important priorities for stakeholders remain consistent and are to ensure cost-effective system reliability and to prepare for the future of the sector.

[1] Stakeholder Advisory Committee: https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Stakeholder-Advisory-Committee/Meetings-and-Materials

SEC INTERROGATORY 6

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-SEC-6

INTERROGATORY

[A-2-2, Attachment 1, p.3] Please provide the full underlying calculations for the Cost Effectiveness – Forecast accuracy, Cost Effectiveness – Resource balance: Energy Curtailments Index target and results, Cost Effectiveness – Resource Balance: Energy Shortage Index, and Market Efficiency – Market cost/revenue transparency index.

RESPONSE

a) **Cost Effectiveness - Forecast accuracy** is calculated as follows:

The calculation is a measure of the accuracy of the hourly day-ahead market forecasts to actual demand. The accuracy of the forecast is an indicator of grid reliability and the efficiency of the market. This is expressed as the mean absolute percentage error of the 12-month model forecast.

The formula to calculate the Mean Absolute Percent Error is as follows:

$$Yearly\ MAPE\ \% = \frac{\sum Absolute\ (\frac{Actual\ Demand - Published\ Forecast}{Actual\ Demand})}{N}$$

Where N is the number of observations on an hourly basis

Cost Effectiveness – Resource Balance: Energy Shortage Index is calculated as follows:

This calculation is the annual number of instances where there was an energy or operating reserve shortage. This is expressed as the percentage of the total instances of shortage divided by the number of 5-minute intervals the IESO dispatches resources in a year (8760 hours x 12 Intervals per hour).

Cost Effectiveness – Resource Balance: Market Efficiency is calculated as follows:

This calculation is curtailed energy expressed as a percentage of total energy production.

Curtailed energy is in the numerator of the calculation and includes: Variable Generation Curtailment and Nuclear curtailment.

Total energy production is in the denominator of the calculation and is the summation of all energy output.

Market Efficiency – Market cost/revenue transparency index is calculated as follows:

This calculation is a ratio of revenues received by suppliers (equivalently payments from consumers) for electricity in the wholesale market to the total costs to supplying electricity.

The revenues received by suppliers is in the numerator of the calculation and includes the variables in Table 1 below.

Table 1: Numerator Variables for Market Efficiency – Market Cost/Revenue Transparency Index

Category	Numerator Variable Input
Capacity	Capacity Based Recovery Amount for Class A loads
Capacity	Capacity Based Recovery Amount for Class B loads
Energy	Net Energy Market Settlement for Generators and Dispatchable Load
Energy	Net Energy Market settlement for Non-dispatchable Load
Losses	Net Energy Market Settlement Uplift
Uplift	10 Minute Spinning Market Reserve Hourly Uplift
Uplift	10 Minute Non-Spinning Reserve Market Shortfall Uplift
Uplift	30 Minute Operating Reserve Market Hourly Uplift

The total costs to supplying electricity is in the denominator of the calculation and includes all the components in the numerator specified above and the variables in Table 2 below.

Table 2: Denominator Variables for Market Efficiency – Market Cost/Revenue Transparency Index

Category	Denominator Variable Input
Ancillary Services	Black Start Capability Settlement Debit
Ancillary Services	Hourly Reactive Support and Voltage Control Settlement Debit
Ancillary Services	Monthly Reactive Support and Voltage Control Settlement Debit
Ancillary Services	Regulation Service Settlement Debit
Ancillary Services	Must Run Contract Settlement Debit

Capacity	Capacity Based Recovery Amount for Class A loads
Capacity	Capacity Based Recovery Amount for Class B loads
Energy	Net Energy Market Settlement for Generators and Dispatchable Load
Energy	Net Energy Market settlement for Non-dispatchable Load
GA	Class A - Global Adjustment Settlement Amount
GA	Class B - Global Adjustment Settlement Amount
Rebate	Emergency Energy
Rebate	Northern Industrial Electricity Rate Program Settlement Amount
Rebate	Local Market Power Rebate
Rebate	Intertie Failure Charge Rebate
Rebate	Day-Ahead Generator Withdrawal Rebate
Rebate	Class B Global Adjustment Prior Period Correction Settlement Amount
Uplift	Congestion Management Settlement Uplift
Uplift	Generation Cost Guarantee Recovery Debit
Uplift	10 Minute Spinning Market Reserve Hourly Uplift
Uplift	Intertie Offer Guarantee Settlement Credit
Uplift	10 Minute Non-Spinning Reserve Market Shortfall Uplift
Uplift	30 Minute Operating Reserve Market Hourly Uplift
Uplift	Day-Ahead Production Cost Guarantee Recovery Debit
Losses	Net Energy Market Settlement Uplift
Other	Station Service Reimbursement Debit
Other	Forecasting Service Balancing Amount
Other	Adjustment Account Credit

1

SEC INTERROGATORY 7

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-SEC-7

INTERROGATORY

[C-1-1] With respect to the IESO business planning process:

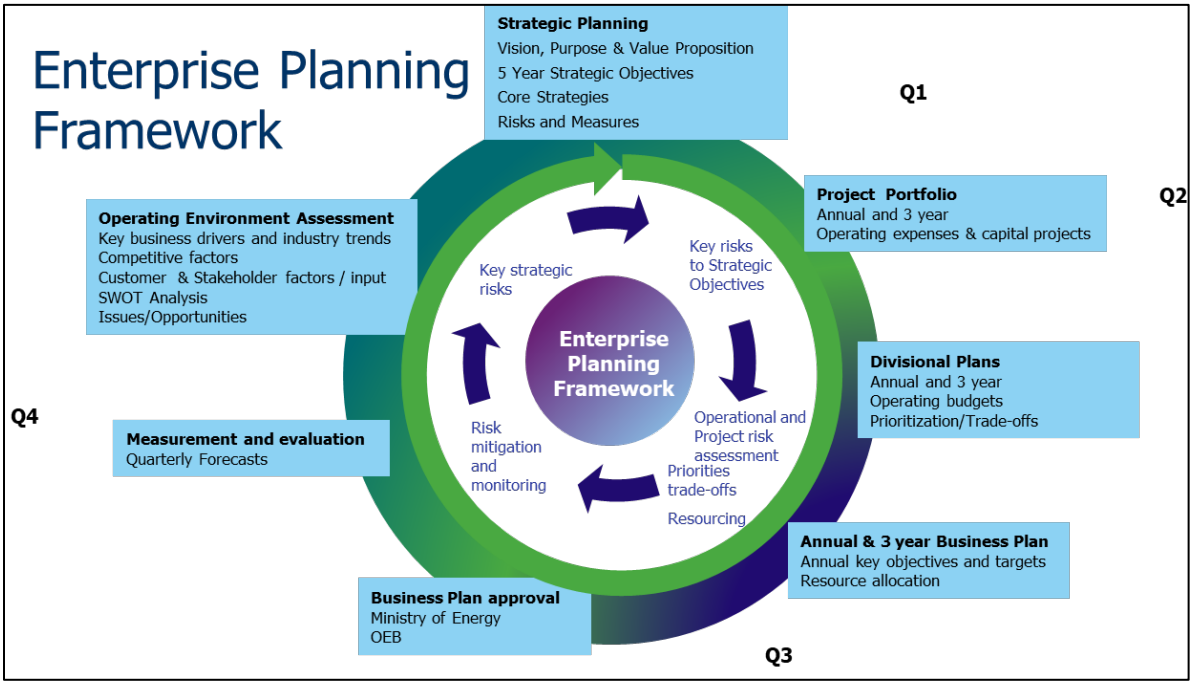
a) Has the IESO made any changes to its business planning process since its last application? If so, please provide details.
b) Please provide a more detailed explanation of the divisional planning process, including an illustrative example of the planning process by a division and/or business unit in which its budget is proposed to increase in 2022.

RESPONSE

a) The IESO has not made changes to its business planning process since the 2020/2021 Revenue Requirement Submission.

b) The IESO's divisional planning process is conducted in accordance with the Enterprise Planning Framework outlined in Figure 1 below.

Figure 1: IESO Enterprise Planning Framework



The divisional planning process begins with the distribution of divisional planning guidance by the Financial & Resource Planning and Analysis (F&RPA) group (within the Corporate Services Business Unit) to Business Units. This guidance includes assumptions/guidelines for the IESO communicated by the IESO's Executive Leadership Team (ELT).

Business Units then develop divisional plans. Divisional planning incorporates both ongoing core functions of the Business Unit, as well as new initiatives, in order to develop staffing requirements and funding for operations and capital projects that roll up for the Business Unit. Staffing is not mapped on an activity or initiative basis for ongoing core functions. In the 2022-2024 business planning process, the IESO identified key initiatives that require incremental expenditure in order to achieve the IESO's Core Strategies or comply with directives received from the Minister of Energy. The expenditures for the key initiatives are assigned to Business Units that contribute to the initiatives (see Exhibit D-1-2 – OM&A Business Unit Detail).

The F&RPA group works with each Business Unit to validate their resource requirements and ensure alignment with the IESO's Core Strategies and priorities and the overall guidance provided by ELT. Once each divisional plan is completed with the corresponding budgets and resourcing requirements, a meeting is held among divisional leadership to review the year-over-year variances and the variances versus the previous business plan. At this point there is the opportunity to identify cross-functional interdependencies between initiatives, resourcing needs and gaps, determine alignment of initiatives to business priorities, and undertake risk-informed trade off discussions to prioritize work and most effectively allocate resources. As part of risk-informed prioritization, some initiatives may be changed in scope or deferred, based on their relative ranking. Capital projects identified through the divisional planning process will move through the IESO's normal capital project planning process (see Exhibit E-1-2 Capital Expenditure Planning Process Overview).

The outcome of the divisional plan process is the business plan document that is reviewed and approved by the IESO's ELT before it is submitted to the IESO's Board of Directors for approval, ahead of submission to the Minister of Energy.

SEC INTERROGATORY 8

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-SEC-8

INTERROGATORY

[D-1-2] Much of the explanation of the various business unit cost increases relate to new, or expanded, initiatives that the IESO is undertaking (e.g. Pathways to Decarbonization, Resource Adequacy). Using one of the referenced initiatives as an illustrative example, please explain how initiative budgets are planned, and approved. Please provide a copy of the project charter, budget, and any similar document that outlines the project scope, and the corresponding project budgets for non-capital initiatives.

RESPONSE

a) The key initiatives identified in the IESO's 2022-2024 Business Plan (as described in Exhibit D-1-1 – OM&A Overview, pg. 4-6) were planned and approved as part of the IESO's business planning process (see responses to Schedule 13 – 1.1 SEC 1, 1.1 SEC 2, 1.1 SEC 7). The key initiatives are identified separately in the 2022-2024 Business Plan to provide additional transparency on the incremental work that the IESO will be undertaking in 2022 in order to achieve its Core Strategies or comply with directives received from the Minister of Energy. The key initiatives are resourced by cross functional teams carrying out their ongoing core functions. Divisional plans include incremental additions in staff (temporary or regular) and of consulting services to supplement particular skills or needs, as identified in Exhibit D-1-2 – OM&A Business Unit Detail, to support the key initiatives.

   Key initiatives are not capital projects to be amortized and as such do not follow the capital planning process or have project charters or similar documents. If elements of key initiatives require the initiation of a capital project, that project would go through the IESO's normal capital project planning process (see Exhibit E-1-2 – Capital Expenditure Planning Process Overview).

SUP INTERROGATORY 2

Issue 1.1 Is the IESO's Fiscal Year 2022 revenue requirement of $201.5 million appropriate?

1.1-Society-2

INTERROGATORY

Reference: EB-2021-0230 A-2-2 Pages 1,2

The IESO has also started an assessment of office space needs in response to the COVID-19 pandemic impact which has the potential to allow the IESO to reconfigure and reduce overall office footprint by exploring a hybrid working model for returning to the office.

a) Please provide a copy of the final version of this assessment.

b) Please explain the hybrid working model which was being explored.

c) Has this been put in place?

d) What impact has this had on 2022 costs?

RESPONSE

a) The assessment is still ongoing and is not expected to be complete until early 2023 when the hybrid work model pilot and an office design pilot, which will test out a number of activity based work design concepts, are complete and have been evaluated.

b) The IESO's hyrbid work model pilot provides for an adaptable work arrangement that enables employees to perform their regular work duties interchangeably between an IESO office and a remote work location in Ontario. During the six-month pilot period, employees have the flexibility to work from home up to three days per week.

c) The hyrbid work model pilot was initially implemented in November 2021. It was then paused in December in response to public health guidance, and resumed again in late March 2022. It is expected to run for 6-months, until the end of September 2022.

d) In October 2021, the IESO was able to release a portion of the 120 Adelaide St. West office location at the end of its lease for a savings of $0.3 million in operating costs included in the 2022 Budget.

OEB STAFF INTERROGATORY 7

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1-Staff-7

INTERROGATORY

a. Exhibit A / Tab 1 / Schedule 3 / p. 1
b. Exhibit A / Tab 1 / Schedule 3 / p. 3
c. EB-2020-0230 / Responses to Settlement Conference Questions #4 / October 12, 2021

Preamble:

The IESO stated that since 2017, it has maintained its revenue requirement at a relatively flat level, absorbing $14 million of inflation and collective agreement impacts by deferring investments in processes, tools and workspaces, and by finding efficiencies and prioritizing certain work over others.

The IESO further stated that it has made efforts to remain cost-effective in delivering its critical responsibilities including absorbing inflationary costs, mostly related to compensation and benefits, which are the IESO's single largest expense. Specifically, the IESO stated that it continues to implement initiatives and safeguards to ensure compensation, benefits and pension plans are cost effective while continuing to ensure that it remains competitive in the recruitment and retention of its employees to carry out the IESO's unique mandate.

During the 2020 and 2021 revenue requirement proceeding (the Settlement Conference Questions #4), the IESO confirmed significant increases in its pension and OPEB amounts. For example, versus 2019 OEB-approved, the 2021 Actual Pension & OPEB amounts increased by $5.2 million, or 28.6%, or 14.3% per year (over two years).

Questions:

a) Please explain the IESO's statement that it has absorbed $14 million of inflation and collective agreement impacts, as well as its statements that it has made efforts to remain cost-effective, in the context of the increases in pension and OPEB amounts.
b) Please provide a breakdown of the pension and OPEBs amounts by year (including a separation of OM&A and capital), for 2021 Budget, 2021 Actual, and 2022 Budget.
c) Please identify and explain any significant changes related to pension and OPEB costs incurred year-over-year, specifically, 2021 Budget compared to 2021 Actual, 2022

Budget compared to 2021 Actual, and 2022 Budget compared to 2021 Budget. Please explain whether the changes are reasonable.

RESPONSE

a) Since 2017 until 2021 the pension and OPEB costs have increased about $6 million while the IESO's revenue requirement has remained relatively flat year over year, reflecting the ability of IESO to manage cost pressures while delivering its mandate.

b) See Table 1 below with a breakdown of the pension and OPEBs amounts by year (including a separation of OM&A and capital), for 2021 Budget, 2021 Actual, and 2022 Budget.

Table 1: Breakdown of Pension and OPEB Amounts

Included in OMA and Capital ($000's)	2021 Budget	2021 Actual	2022 Budget	2021 Actual vs 2021 Budget	2022 Budget vs 2021 Actual	2022 Budget vs 2021 Budget
Pension	**$12,240**	**$10,208**	**$10,203**	**$(2,032)**	**$(5)**	**$(2,037)**
OM&A	$10,965	$8,784	$9,037	$(2,181)	$253	$(1,928)
Capital	$1,275	$1,425	$1,167	$149	$(258)	$(109)
Other Benefits (OPEB)	**$10,913**	**$13,208**	**$8,615**	**$2,295**	**$(4,593)**	**$(2,297)**
OM&A	$9,776	$11,551	$7,628	$1,775	$(3,923)	$(2,148)
Capital	$1,137	$1,658	$988	$521	$(670)	$(149)
Total included in IESO Usage Fee and Capital Portfolio	**$23,153**	**$23,417**	**$18,818**	**$264**	**$(4,598)**	**$(4,335)**
Pension/OPEB - Other Segments (OM&A)	$1,755	$1,946	$1,519	$191	$(428)	$(236)
Total IESO Pension and OPEB	**$24,908**	**$25,363**	**$20,337**	**$455**	**$(5,026)**	**($4,571)**

c) The total pension and OPEB costs in 2021 Actual were about 2% or $455 thousand higher than the 2021 Budget, driven primarily by higher OPEB expenses caused by a lower discount rate than planned based on the cost of borrowing rate as applicable to the IESO, partially offset by lower pension (RPP) expenses due to changes in asset values and cash flows.

The 2022 Budget for total pension and OPEB is $5 million lower than 2021 Actual, primarily due to higher discount rate projection for SERP and OPEB expense. This is reasonable considering the projected discount rate is approximately double the value of 2021 Actual discount rate (4.0% vs 2.6%) and the inverse relationship between the present value of pension and OPEB obligation costs and the discount rates (e.g. the higher the discount rate, the lower the present value and hence the cost).

The 2022 Budget for total pension and OPEB is $4.6 million lower than the 2021 Budget driven by the higher projected discounted rate for SERP and OPEB, as well as the lower RPP expenses due to the stronger asset value projected which is in line with the 2021 Actual results.

OEB STAFF INTERROGATORY 8

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1-Staff-8

INTERROGATORY

a. Exhibit D / Tab 1 / Schedule 1 / p. 2 & 3
b. Exhibit D / Tab 1 / Schedule 3 / p. 2

Preamble:

The IESO stated that its 2022 budgeted OM&A expenses of $186.5 million represent an increase of $12.2 million from the 2021 actual results. The net increase of $12.2 million included both increases and decreases of 2022 budgeted expenses versus 2021 actual. The decreases include a $4.0 million reduction of employee benefits costs, mostly driven by an actuarial update of pension liability.

The IESO noted that the reduction in costs in the 2022 budget reflects the IESO's actuarial provider assumptions for retirement benefits plans (Registered Pension Plan - RPP, Supplemental Employee Retirement Plan – SERP, and other post-employment and post-retirement benefits – OPEB Plan).

Questions:

a) Please explain how the $4.0 million decrease (mostly driven by an actuarial update of pension liability) was derived, and how this decrease impacts the RPP, SERP, and the OPEB Plan, as applicable.
b) Please explain why there were no decreases in 2022 Budget versus 2021 Actual associated with the OPEB liability.
c) Please confirm that there is an inverse relationship between the discount rate and the present value of any pension and OPEBs obligations, as well as versus those incorporated into the pension and OPEB amounts included in the IESO's 2021 Actual and 2022 Budget, meaning that the higher the discount rate, the lower the present value. If this is not the case, please explain.
d) In the context to the response to part c), please explain how the general economic increases in interest rates have impacted the 2022 Budget values for pension and OPEB.
e) Please describe how each of the key actuarial assumptions by which the 2022 Budget pension and OPEB amounts were determined and why they are reasonable.

RESPONSE

a) For the 2022 Budget, the IESO used a projection from the actuarial service provider (AON) based on a discount rate of 4.0% for SERP and OPEB, which was higher than the 2021 Actual rate of 2.6% thus resulting in a lower expense projection. The $4.0 million referenced by the IESO is the portion of the variance affecting the OM&A expenses funded through the IESO's Usage Fee (see response to Schedule 1 – 1.2 OEB STAFF 7(b).

b) The 2022 Budget includes a reduction in pension liabilities, including OPEB. Please see response to a).

c) Yes, there is an inverse relationship between the discount rate and the present value of any pension and OPEBs obligations, meaning that the higher the discount rate, the lower the present value.

d) The IESO does not have an updated projection for 2022 based on recent interest rate increases and is therefore unable to indicate how the general economic increases in interest rates have impacted the 2022 Budget values for pension and OPEB. The IESO does not expect recent inflationary pressures will materially impact the 2022 Budget, given that higher interest rates could be offset by lower asset values resulting from unfavourable market performance.

e) The 2022 Budget was based on a scenario projection provided by AON, which used the same actuarial methods and assumptions as were used for the fiscal 2020 year-end disclosure (see reports provided in response to Schedule 1 – 1.2 OEB 9 Attachment 2) with the exception of changes to the RPP, OPEB and SERP discount rates which were updated to reflect more up-to-date market conditions, as described in response to a).

OEB STAFF INTERROGATORY 9

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1-Staff-9

INTERROGATORY

Exhibit B / Tab 1 / Schedule 2 / p. 30 (2021 Annual Report p. 28)

Preamble:

The IESO stated that the most recent actuarial valuation of the IESO registered pension plan for regulatory funding purposes was completed as at January 1, 2019.

Questions:

a) Please explain whether there is a revised actuarial valuation of the IESO registered pension plan available, as typically an actuarial report would be filed no later than three years after the valuation date of the previous actuarial report.
b) Please provide the most recent actuarial reports/valuations for all pension and OPEB plans.
c) Please demonstrate how the pension and OPEBs amounts in the 2021 Actual and 2022 Budget tie to the most recent actuarial reports/valuations and the audited financial statements, as applicable.
d) If the balances in the actuarial reports/valuations and the audited financial statements are different from the 2021 Actual and 2022 Budget revenue requirements, please provide an explanation supporting why the amount in the revenue requirements is more appropriate.
e) Please quantify and explain whether the largest drivers of any decreases in pension and OPEB amounts in 2022 Budget versus 2021 Actual, and also 2022 Budget versus 2021 Budget, may be attributable to both actuarial assumption experience and actual experience, rather than driven by collective bargaining, plan design changes (e.g., employee contribution levels), or substantial membership changes.

RESPONSE

a) The actuarial valuation is currently underway and is expected to be filed in September 2022 with the Financial Services Regulatory Authority of Ontario (pension regulator).
b) The most recent actuarial report is included as Attachment 1 to this Exhibit.

c) Please see Table 1 below for the reconciliation to the most recent actuarial report provided in response to b).

Table 1: Reconciliation – 2021 Actual and 2022 Budget

($000's)	2021 Actual[1]	2022 Budget[2]
Per Actuarial Report:		
Pension Benefits	11,108	11,029
Other Benefits (OPEB)	14,255	9,308
Total Pension/OPEB	**25,363**	**20,337**
Reconciliation:		
Capital and Operating in Revenue Requirement Submission	$23,417	18,818
Pension/OPEB included in Non-IESO Core services	$1,946	1,519
Total Pension/OPEB	**$25,363**	**20,337**

[1] The latest actuarial report that is being provided in response to b) is the year-end report which ties back to the 2021 Audited Financial Statements.

[2] Reconciliation of 2022 Budget is based on the actuarial projection received via email (see Attachment 3 to this Exhibit). The projection was provided at the request of IESO management, in order to reflect a potentially higher SERP and OPEB discount rate (4.0% instead of 3.5%), while all other assumptions remained the same as the original projection report (see Attachment 2 to this Exhibit).

d) The balances in the actuarial report and the 2021 Audited Financial Statements are higher from what was sought in the 2021 Actual and what is being sought in the 2022 Budget, because they are inclusive of the portion of pension and OPEB for work that is funded from other sources and not included in the revenue requirement (i.e. SME, MACD, government programs).

e) The largest drivers of the decreases in pension and OPEB amounts in 2022 Budget versus 2021 Actual, and also 2022 Budget versus 2021 Budget, is attributable to both actuarial assumption experience and actual experience, rather than driven by collective bargaining, plan design changes (e.g., employee contribution levels), or substantial membership changes, since they are based on the last actuarial valuation done in 2019.

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January 13, 2022

BY E-MAIL

PRIVATE & CONFIDENTIAL

Ms. Melanie Dugard
Grant Thornton LLP
201 City Centre Drive, Suite 501
Mississauga ON L5B 2T4

RE: INDEPENDENT ELECTICITY SYSTEM OPERATOR ("IESO")
PUBLIC SECTOR ACCOUNTING INFORMATION FOR FISCAL YEAR 2021

Dear Ms. Dugard:

This letter and the attached appendices summarize the results of the accounting valuations for the post-employment pension and benefits plans named below for the fiscal year from January 1, 2021 to December 31, 2021. We have also included the results for the fiscal year 2020 for comparison purposes. Our report covers the following plans:

- Independent Electricity System Operator Pension Plan ("RPP");
- Independent Electricity System Operator Supplemental Employee Retirement Plan ("SERP"); and
- Other (non-pension) post-employment and post-retirement benefit arrangements ("OPEB").

The year-end liabilities have been determined using a September 30 measurement date. Aon has been engaged by IESO for the development of the results in these valuations.

All figures are in Canadian dollars.

We confirm that:

- The valuations have been performed in accordance with the requirements of Public Sector Accounting Handbook Section PS 3250 ("PSAB").
- The plans are all defined benefit plans as defined by PSAB.

It is our understanding that for the purposes of PSAB accounting:

- The discount rate for the RPP is determined by reference to the expected return on plan assets; consistent with management's best estimate of expected long-term experience and short-term forecasts.

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- The discount rate for SERP and OPEB is determined using the cost of borrowing applicable to IESO. To estimate the rate expected plan cash flows were discounted using a yield curve based on Ontario provincial bonds and a single rate was determined which produced an equivalent present value. We then added a spread of 50 basis points to the single rate.
- Unrecognized gains or losses are amortized on a systematic basis over the EARSL of the related employee group.
- Expected return on assets is based on market-related value of assets which is determined by deferring and amortizing all asset gains and losses (including fixed income gains and losses) each year over 3 years.
- Prior service costs are recognized in the period in which the amendment occurs.

We have discussed with the administrator that:

- The valuations include all employee future benefit plans required to be included in the valuations.
- The plan provisions are up to date as of the date of our report.
- The plan administrator will advise us of changes to plan provisions and events which occur in the period from the date of the valuations up to the expected date of our report that could have a material effect on the valuations.

In conducting these valuations, we have used:

- Plan membership information supplied by IESO's third-party administrator, Morneau Shepell, as of January 1, 2019;
- Expected contributions and benefit payments for the development of the fiscal 2021 expense;
- Actual contributions and benefit payments for the December 31, 2021 funded status;
- Financial statements of the pension fund prepared by CIBC Mellon;
- The projected benefit actuarial cost method; and
- Actuarial assumptions that have been determined as best estimate assumptions developed by management. A summary of the assumptions used are in the appendices.

The SERP plan is secured with a letter of credit and as such contributions are required to be made to a refundable tax account that has been established with the Canada Revenue Agency when premiums for the letter of credit are paid. The balance of the refundable tax account is being recorded as a corporate asset and therefore is not included as an asset for the purposes of the SERP.

We are not aware of any subsequent events which occurred or were fully committed to after December 31, 2021 and before the date of this report which would have a material impact on these results.

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For the purposes of these valuations, it is our opinion that:

- The membership data on which the valuation is based are sufficient and reliable for the purpose of the valuation.
- The assumptions are appropriate for purposes of the valuation.
- The calculations have been made in accordance with our understanding of the requirements of PSAB 3250.
- This report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada.

Sincerely,

Linda M. Byron, FCIA, FSA
Senior Partner

Reinhart Kramreither, FCIA, FSA
Health & Benefits Assistant Vice President

Encl.

cc: Mr. Joel Helder, IESO
Ms. Jeannette Briggs, IESO
Mr. John Radich, Aon

INDEPENDENT ELECTRICITY SYSTEM OPERATOR
PSAB Disclosures
December 31, 2021 ($000s)

	Registered Plan	Non-Registered Plan	OPEB Plan	Total
Change in benefit obligation				
Benefit obligation - September 30, 2020	$ 603,733	$ 46,556	$ 165,698	$ 815,987
Current service cost (employer)	12,618	1,559	8,931	23,108
Interest cost	33,596	1,233	4,503	39,332
Employee contributions **	9,278	-	-	9,278
Plan amendments	-	-	-	-
Benefits Paid	(29,585)	(3,067)	(2,499)	(35,151)
Net transfer in (out)	-	-	-	-
Actuarial loss (gain)	244	(4,856)	(28,831)	(33,443)
Benefit Obligation - September 30, 2021	$ 629,884	$ 41,425	$ 147,802	$ 819,111
Change in plan assets				
Market value of plan assets - September 30, 2020	$ 663,464	$ -	$ -	$ 663,464
Actual return on plan assets	68,413	-	-	68,413
Employer contributions	9,215	3,067	2,499	14,781
Employee contributions	9,278	-	-	9,278
Benefits paid	(29,585)	(3,067)	(2,499)	(35,151)
Surplus paid out to employer	-	-	-	-
Settlement payments	-	-	-	-
Net transfer in (out) *	-	-	-	-
Acquisitions (divestitures)	-	-	-	-
Actual plan expenses	-	-	-	-
Foreign exchange rate changes	-	-	-	-
Market value of plan assets - September 30, 2021	$ 720,786	$ -	$ -	$ 720,786
Actuarial Value of Assets - BOY	$ 655,774	$ -	$ -	$ 655,774
Actuarial Value of Assets - EOY	$ 698,425	$ -	$ -	$ 698,425
Reconciliation of funded status - end of period				
Funded status - surplus (deficit)	$ 90,902	$ (41,425)	$ (147,802)	$ (98,325)
Employer contributions after measurement date	3,198	405	631	4,234
Unamortized transitional obligation (asset)	-	-	-	-
Unamortized past service cost	-	-	-	-
Unamortized net actuarial loss (gain)	(82,514)	8,745	(15,529)	(89,298)
Accrued benefit asset (liability)	$ 11,586	$ (32,275)	$ (162,700)	$ (183,389)
Expected Future Benefit	-	-		-
Valuation allowance	-	-	-	-
Accrued benefit asset (liability), net of valuation allowance	$ 11,586	$ (32,275)	$ (162,700)	$ (183,389)
Components of 2021 expense				
Current service cost (employer)	$ 12,618	$ 1,559	$ 8,931	$ 23,108
Interest cost	33,596	1,233	4,503	39,332
Expected return on plan assets	(35,763)	-	-	(35,763)
Curtailment loss (gain)	-	-	-	-
Settlement loss (gain)	-	-	-	-
Amortization of past service costs	-	-	-	-
Amortization of net actuarial loss (gain)	(3,142)	1,007	821	(1,314)
Increase (decrease) in valuation allowance	-	-	-	-
Special termination benefits	-	-	-	-
Net expense (income)	$ 7,309	$ 3,799	$ 14,255	$ 25,363
Expected average remaining service life ("EARSL")	14.5	14.5	17.2	
Balance Sheet Reconciliation				
Accrued benefit asset/(liability) at Dec 31, 2020	$ 6,482	$ (31,602)	$ (150,961)	$ (176,081)
Net income / (expense) for period	(7,309)	(3,799)	(14,255)	(25,363)
Contributions	12,413	3,126	2,516	18,055
Accrued benefit asset/(liability) at Dec 31, 2021	$ 11,586	$ (32,275)	$ (162,700)	$ (183,389)

Actual Asset Allocation at September 30, 2021			
Canadian equity securities	9.9%	N/A	
Foreign equity securities	41.1%	N/A	
Canadian debt securities	29.4%	N/A	
Global infrastructure	9.4%	N/A	
Canadian real estate	9.0%	N/A	
Cash equivalents	1.1%	N/A	

Assumptions at the beginning of the period		**Assumptions at the end of the period**	
Discount rate for RPP	5.50%	Discount rate for RPP	5.50%
Discount rate for SERP & OPEB	2.60%	Discount rate for SERP & OPEB	3.40%
Rate of compensation increase	3.50%	Rate of compensation increase	3.50%
Health care inflation - Select	6.20%	Health care inflation - Select	6.00%
Health care inflation - Ultimate	4.00%	Health care inflation - Ultimate	4.00%
Expected rate of return on plan assets	5.50%	Expected rate of return on plan assets	5.50%
Inflation	2.00%	Inflation	2.00%
Mortality	95% CPM Public MI-2017	Mortality	95% CPM Public MI-2017

2021 Cash Flows			
Estimated Employee Contributions	9,278	-	-
Estimated Employer Contributions	9,215	1,415	2,499
Estimated Benefit Payments	29,585	1,415	2,499
EARSL	14.5	14.5	17.2
Actual Employee Contributions	9,278	-	
Actual Employer Contributions	9,215	3,067	
Actual Benefit Payments	29,585	3,067	

*** Transfer amount represents the net transfers resulting from reciprocal transfer agreements**
**** Includes employee contributions for past service**

INDEPENDENT ELECTRICITY SYSTEM OPERATOR
PSAB Disclosures
December 31, 2020 ($000s)

	Registered Plan	Non-Registered Plan	OPEB Plan	Total
Change in benefit obligation				
Benefit obligation - September 30, 2019	$ 575,483	$ 43,393	$ 145,316	$ 764,192
Current service cost (employer)	12,494	1,448	7,629	21,571
Interest cost	32,030	1,281	4,396	37,707
Employee contributions **	8,793	-	-	8,793
Plan amendments	-	-	-	-
Benefits Paid	(28,824)	(1,357)	(2,158)	(32,339)
Net transfer in (out)	1,835	-	-	1,835
Actuarial loss (gain)	1,922	1,791	10,515	14,228
Benefit Obligation - September 30, 2020	$ 603,733	$ 46,556	$ 165,698	$ 815,987
Change in plan assets				
Market value of plan assets - September 30, 2019	$ 632,234	$ -	$ -	$ 632,234
Actual return on plan assets	35,393	-	-	35,393
Employer contributions	14,033	1,357	2,158	17,548
Employee contributions	8,793	-	-	8,793
Benefits paid	(28,824)	(1,357)	(2,158)	(32,339)
Surplus paid out to employer	-	-	-	-
Settlement payments	-	-	-	-
Net transfer in (out) *	1,835	-	-	1,835
Acquisitions (divestitures)	-	-	-	-
Actual plan expenses	-	-	-	-
Foreign exchange rate changes	-	-	-	-
Market value of plan assets - September 30, 2020	$ 663,464	$ -	$ -	$ 663,464
Actuarial Value of Assets - BOY	$ 614,134	$ -	$ -	$ 614,134
Actuarial Value of Assets - EOY	$ 655,774	$ -	$ -	$ 655,774
Reconciliation of funded status - end of period				
Funded status - surplus (deficit)	$ 59,731	$ (46,556)	$ (165,698)	$ (152,523)
Employer contributions after measurement date	-	346	614	960
Unamortized transitional obligation (asset)	-	-	-	-
Unamortized past service cost	-	-	-	-
Unamortized net actuarial loss (gain)	(53,250)	14,608	14,123	(24,519)
Accrued benefit asset (liability)	$ 6,482	$ (31,602)	$ (150,961)	$ (176,081)
Valuation allowance	-	-	-	-
Accrued benefit asset (liability), net of valuation allowance	$ 6,482	$ (31,602)	$ (150,961)	$ (176,081)
Components of 2020 expense				
Current service cost (employer)	$ 12,494	$ 1,448	$ 7,629	$ 21,571
Interest cost	32,030	1,281	4,396	37,707
Expected return on plan assets	(33,612)	-	-	(33,612)
Curtailment loss (gain)	-	-	-	-
Settlement loss (gain)	-	-	-	-
Amortization of past service costs	-	-	-	-
Amortization of net actuarial loss (gain)	(2,614)	949	223	(1,442)
Increase (decrease) in valuation allowance	-	-	-	-
Special termination benefits	-	-	-	-
Net expense (income)	$ 8,298	$ 3,678	$ 12,248	$ 24,224
Expected average remaining service life ("EARSL")	14.5	14.5	17.2	
Balance Sheet Reconciliation				
Accrued benefit asset/(liability) at Dec 31, 2019	$ 3,000	$ (29,296)	$ (140,841)	$ (167,137)
Net income / (expense) for period	(8,298)	(3,678)	(12,248)	(24,224)
Contributions	11,780	1,372	2,128	15,280
Accrued benefit asset/(liability) at Dec 31, 2020	$ 6,482	$ (31,602)	$ (150,961)	$ (176,081)

Actual Asset Allocation at September 30, 2020		
Canadian equity securities	15.4%	N/A
Foreign equity securities	35.9%	N/A
Canadian debt securities	30.3%	N/A
Global infrastructure	9.3%	N/A
Canadian real estate	8.9%	N/A
Cash equivalents	0.3%	N/A

Assumptions at the beginning of the period		**Assumptions at the end of the period**	
Discount rate for RPP	5.50%	Discount rate for RPP	5.50%
Discount rate for SERP & OPEB	2.90%	Discount rate for SERP & OPEB	2.60%
Rate of compensation increase	3.50%	Rate of compensation increase	3.50%
Health care inflation - Select	6.40%	Health care inflation - Select	6.20%
Health care inflation - Ultimate	4.00%	Health care inflation - Ultimate	4.00%
Expected rate of return on plan assets	5.50%	Expected rate of return on plan assets	5.50%
Inflation	2.00%	Inflation	2.00%
Mortality	95% CPM Public MI-2017	Mortality	95% CPM Public MI-2017

2020 Cash Flows			
Estimated Employee Contributions	8,793	-	-
Estimated Employer Contributions	14,033	1,308	2,158
Estimated Benefit Payments	28,824	1,308	2,158
EARSL	14.5	14.5	17.2
Actual Employee Contributions	8,793	-	
Actual Employer Contributions	14,033	1,357	
Actual Benefit Payments	28,824	1,357	

*** Transfer amount represents the net transfers resulting from reciprocal transfer agreements**
**** Includes employee contributions for past service**

Actuarial Assumptions
December 31, 2020 Disclosure and 2021 Expense

Economic Assumptions	
Discount Rate – RPP	5.50% per year
Discount Rate – SERP & OPEB	2.60% per year
Inflation	2.00% per year
Return on Assets	5.50% per year
Increases in Salary	3.50% per year
Increases in YMPE	2.75% per year
Increases in ITA Maximum	$3,025.56 per year in 2019 and increasing by 2.50% per year after 2019
Dental Inflation	4.00% per year
Prescription Drugs Inflation	6.20% per year in 2020 grading down to an ultimate rate of 4.00% per year in 2031
Other Medical (Non-Drug) Inflation	4.00% per year
Expenses	Included in Return on Assets
Demographic Assumptions	
Retirement Age	Rates vary by age and service (see January 1, 2019 actuarial valuation report)
Mortality Rates	95% of CPM public sector mortality table with improvement scale MI-2017
Withdrawal Rates	Rates vary by age and service (see January 1, 2019 actuarial valuation report)
Percent With Spouse at Retirement	90%
Age Difference	Male Spouse three years older
Cost Methods	
Actuarial Cost Method	Projected Unit Credit
Asset Valuation Method	
For RPP	Market-related value[1]
For SERP and OPEB	N/A

[1] Investment gains and losses during each year are recognized in the smoothed value of assets over three years

Actuarial Assumptions
December 31, 2021 Disclosure

Economic Assumptions	
Discount Rate – RPP	5.50% per year
Discount Rate - SERP & OPEB	3.40% per year
Inflation	2.00% per year
Return on Assets	5.50% per year
Increases in Salary	3.50% per year
Increases in YMPE	2.75% per year
Increases in ITA Maximum	$3,025.56 per year in 2019 and increasing by 2.75% per year after 2019
Dental Inflation	4.00% per year
Prescription Drugs Inflation	6.00% per year in 2021 grading down to an ultimate rate of 4.00% per year in 2031
Other Medical (Non-Drug) Inflation	4.00% per year
Expenses	Included in Return on Assets
Demographic Assumptions	
Retirement Age	Rates vary by age and service (see January 1, 2019 actuarial valuation report)
Mortality Rates	95% of CPM public sector mortality table with improvement scale MI-2017
Withdrawal Rates	Rates vary by age and service (see January 1, 2019 actuarial valuation report)
Percent With Spouse at Retirement	90%
Age Difference	Male Spouse three years older
Cost Methods	
Actuarial Cost Method	Projected Unit Credit
Asset Valuation Method	
For RPP	Market-related value[1]
For SERP and OPEB	N/A

[1] Investment gains and losses during each year are recognized in the smoothed value of assets over three years

Membership Data—RPP

Reference should be made to the valuation report for funding purposes as at January 1, 2019 for a complete description of the data and the tests performed to ensure the reliability of the data.

Membership Data—SERP

The following table presents relevant characteristics of the membership as at January 1, 2019 for those estimated to be entitled to a benefit from the SERP on the accounting basis. For confidentiality purposes an age and service table has not been included.

Active Members of the SERP

	January 1, 2019		
	Males	**Females**	**Total**
Number	59	24	83
Average age	47.1	49.5	47.8
Average service from date of hire	16.4	12.4	15.3
Average credited service	14.9	8.6	13.1
Average pensionable earnings	$ 195,477	$ 197,679	$ 196,114

Retired Members of the SERP

	January 1, 2019		
	Males	**Females**	**Total**
Number	46	7	53
Average age	67.7	68.0	67.8
Average monthly pension	$ 2,179	$ 554	$ 1,964

Deferred Vested Members of the SERP

	January 1, 2019		
	Males	**Females**	**Total**
Number	4	0	4
Average age	50.4	0	50.4
Average monthly pension	$ 963	$ 0	$ 963

Membership Data—OPEB

The following table presents relevant characteristics of the membership as at January 1, 2019 for those estimated to be entitled to a benefit from the OPEB on the accounting basis. For confidentiality purposes an age and service table has not been included.

	1-Jan-19
Post-Retirement Benefits	
Active Employees	
Number	708
Average Age	42.5
Average Years of Service	9.5
Expected Average Remaining Service Lifetime (EARSL)]	17.2
Expected Average Service to Full Eligibility	12.2
Retirees	
Number	
Single Coverage	29
Family Coverage	274
Total	303
Average Age	70.0
Beneficiaries	
Number	
Waived Coverage	0
Single Coverage	46
Total	46
Average Age	77.0
Post-Employment Benefits	
Disabled Employees Receiving Benefits	10

Claims Costs assumption – OPEB

PWU

	Drugs	Other Medical	Dental
	2019	2019	2019
<=55	$2,005	$647	$716
60	$2,608	$761	$877
65	$1,203	$869	$908
70	$1,328	$880	$938
75	$1,328	$890	$946
80	$1,328	$897	$890
85+	$1,328	$884	$848

Society

	Drugs	Other Medical	Dental
Age	2019	2019	2019
<=55	$1,366	$1,102	$854
60	$1,776	$1,297	$1,045
65	$819	$1,481	$1,082
70	$905	$1,499	$1,118
75	$905	$1,517	$1,127
80	$905	$1,528	$1,061
85 and over	$905	$1,507	$1,011

Management

	Drugs	Other Medical	Dental
Age	2019	2019	2019
<=55	$1,321	$836	$755
60	$1,718	$984	$925
65	$793	$1,123	$958
70	$875	$1,137	$990
75	$875	$1,151	$997
80	$875	$1,159	$939
85 and over	$875	$1,143	$895

Plan Provisions—Pension

Registered Plan

See January 1, 2019 actuarial valuation report for a summary of the plan provisions.

SERP

The SERP provides the portion of the RPP formula benefits that are in excess of the amounts that are permitted by the *Income Tax Act* to be paid from the RPP. The SERP also includes special pension arrangements provided to certain individuals.

Plan Provisions—OPEB

Eligibility Retirees from active service, in receipt of a pension, are eligible for life insurance, medical and dental coverage as described later.

Employees hired on or after certain dates described below must also meet applicable service requirements. Employees in the Management group hired on or after January 1, 2006 must have more than 10 years of service at retirement to be eligible under the Standard plan, or have at least 21 years of service at retirement to be eligible under the Enhanced plan. Employees represented by the PWU and hired after April 1, 2006 and before April 1, 2012 require 7 years of service to be eligible for post-retirement benefits. Employees represented by the PWU and hired on or after April 1, 2012 require at least 10 years of service to be eligible for post-retirement benefits. Employees represented by the Society and hired after January 1, 2010 require 10 years of service to be eligible for post-retirement benefits.

Deferred vested members with 25 or more years of service at termination are eligible for medical and dental coverage once they commence receiving a pension from the Company. Members of the Society group who are eligible to retire with an unreduced pension and with 25 or more years of service at termination who choose to take the commuted value of their pension instead of receiving a pension from the Company may elect benefits coverage of 70% of the medical and dental coverage or choose a one-time lump-sum payout instead of the benefits.

Spouses and dependents are eligible for medical and dental coverage while the retiree is alive. After the retiree’s death, spouses and dependents are eligible for coverage if the spouse is in receipt of a pension.

Surviving spouses and dependants of an employee who died in active employment are also eligible for medical and dental coverage if the spouse is in receipt of a pension.

Plan Provisions—OPEB (continued)

Benefits

Life Insurance

Life coverage equal to 50% of base annual earnings at retirement is provided in the first 10 years of retirement, reducing to 25% of base annual earnings 10 years after retirement.

Retirement Bonus

Employees with 10 or more years of continuous service receive a lump-sum payment of one month's earnings at retirement, subject to advance notice requirements.

Medical and Dental

Vary depending on the employee group the retiree was in as an active employee. The groups are as follows:

- Members of the Society of Energy Professionals ("Society")
- Members of the Power Workers' Union ("PWU")
- Management Group ("Management")

Semi-Private and Private Hospital Accommodation Plan

- The semi-private differential between ward accommodation and semi-private accommodation in an active treatment hospital.

- Up to $30 per day ($40 for Society and Management) for a maximum of 120 days in any period of 365 consecutive days towards semi-private or private room accommodation in a hospital for the chronically ill or a chronic care unit of a general hospital.

- Up to $20 per day (no limit for Society and Management) for the differential between ward accommodation and semi-private accommodation (or private room for PWU) in a contract (private) hospital or a convalescent/rehabilitative hospital up to 120 days (365 days for Society and Management) per lifetime.

These expenses are not subject to the annual deductible.

Plan Provisions—OPEB (continued)

Extended Health Care Benefits Plan

Covers benefits such as:

- Differential between semi-private and private room accommodation in an active treatment hospital.

- Prescription drugs (as listed in the Company Drug Formulary List) subject to the following:
  (a) A dispensing fee up to a maximum of $9.00 for PWU (increasing to $9.50 effective April 1, 2011), $9.00 for Management, and $9.50 for Society, per prescription for drugs that require a prescription by law (the maximum does not apply in certain limited situations).
  Generic substitution unless the physician requests no substitution.
  Over-the-counter drugs that do not require a prescription by law are covered where medically required (life sustaining drugs only for Society and Management).

- Blood and blood products.

  Private-duty nursing, subject to a maximum fee as set by the largest Nursing Registry in Ontario.

- Ambulance services.

- Physiotherapy treatments (subject to some limitation).

- Miscellaneous items such as prosthetic appliances, equipment rental, support stockings.

- Dental treatment as the result of an accident.

- Hearing aids (once every three years, no restriction for Management).

- Eyeglasses (including contact lenses) up to $500 for PWU and Management and $550 for Society per person every two calendar years.

- Laser eye surgery up to a lifetime maximum of $3,000 for PWU and Management and $3,200 for Society

Plan Provisions—OPEB (continued)

- Services of clinical psychologists, registered massage therapists, speech therapists, chiropractors, podiatrists, chiropodists, naturopaths, dieticians (for Society and Management only), registered nutritionists (for PWU only), homeopaths, acupuncturists, certified shiatsu therapists (for Society only) and clinical ecologist subject to certain per person per calendar year maximum which may vary by Claim Branch.

Annual deductibles are as follows:

- Management and PWU: $20 single / $40 family
  Society: $25 single / $50 family

Deductibles do not apply to vision care and hearing aids.

Out-of-Province Medical Emergency Benefit Coverage

For management pensioners the plan provides comprehensive coverage for emergency medical and dental treatment required when traveling temporarily outside of Ontario or outside of Canada. Reimbursement is based on reasonable and customary charges of the area in which the service or supply is provided.

Dental Benefits

The plan pays 100% of Class A Services and 75% of Class B Services (85% for Society and Management members).

Class A Services include examinations, x-rays, preventive services, periodontal services, endodontic services and extensive oral surgery. Class B Services include dentures and crowns.

For all Claim Branches, the current ODA Fee Guide applies for Society, and the prior year Guide applies for Management and PWU.

No deductibles apply. There is an annual maximum of $4,500 (excluding orthodontics).

This plan also pays 75% of eligible charges related to Orthodontic Benefits subject to a lifetime maximum per individual of $5,000 per person ($4,500 for PWU effective April 1, 2009).

About Aon

Aon plc (NYSE:AON) is a leading global professional services firm providing a broad range of risk, retirement and health solutions. Our 50,000 colleagues in 120 countries empower results for clients by using proprietary data and analytics to deliver insights that reduce volatility and improve performance.

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May 18, 2021

BY E-MAIL

PRIVATE & CONFIDENTIAL

Mr. Kevin Reid
Manager, Financial Resource Planning & Analysis
Independent Electricity System Operator
Station A, Box 4474
Toronto, ON M5W 4E5

RE: INDEPENDENT ELECTRICITY SYSTEM OPERATOR ("IESO") PUBLIC SECTOR ACCOUNTING EXPENSE SENSITIVITY ESTIMATES FOR FISCAL YEARS 2021 THROUGH TO 2024

Dear Kevin:

We are pleased to provide you with projections of the pension expense through 2024 for business planning purposes, for the following plans:

- Independent Electricity System Operator Pension Plan ("RPP");
- Independent Electricity System Operator Supplemental Employee Retirement Plan ("SERP"); and
- Other (non-pension) post-employment and post-retirement benefit arrangements ("OPEB")

We have also prepared a funding estimate for the years 2021 through 2024 inclusive for the RPP.

This letter reflects the following:

- Expected employer contributions for future years based on IESO's funding policy;
- Discount rate and expected return on assets assumption of 5.40% throughout the expense projection period from the 2021 year end to 2024 for the RPP and is 10 basis points lower than the discount rate used at December 31, 2020 year end;
- Discount rates of 3.50% throughout the expense projection period from the 2021 year end to 2024 for the SERP and OPEB. The 3.50% was based on market rate for provincial bonds plus 50 basis points and reflects market conditions at April 30, 2021;
- For the projected RPP going concern results at January 1, 2022, we have used a discount rate of 5.40% and a provision for adverse deviations of 8.00%, under the assumption that the next actuarial valuation will be filed on that date. These rates reflect current market conditions at March 31, 2021. Other key assumptions unchanged from the 2019 actuarial valuation;
- For the solvency valuation we have used the preliminary assumptions prescribed as at April 30, 2021;
- Asset performance through March 31, 2021;
- Expected 2021-2024 contributions based on IESO's funding policy and projections of funded position in accordance with January 2019 valuation.

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In conducting this analysis, we have used:

- Plan membership information supplied by IESO as of January 1, 2019 for the pension plans, as summarized in the summary of results for the January 1, 2019 actuarial valuation;
- Plan membership information supplied by IESO as of January 1, 2019 for the OPEB plan;
- Scheduled changes in PWU, Society and non-represented member contributions;
- Actual asset returns and cash flows for the RPP to March 31, 2021;
- Expected contributions based on the plan's funding policy and the January 1, 2019 actuarial valuation;
- Expected benefit payments for the fiscal years 2021 through to 2024;
- An acceptable method to roll forward the plan liabilities; and
- An acceptable method to roll forward the plan assets, while assuming a 5.40% investment return.

We have used the same actuarial methods and assumptions as were used for the fiscal 2020 year-end disclosure with the exception of changes to the RPP, OPEB and SERP discount rates which have been updated to reflect current market conditions.

We note that the 2021 expense included in this letter is not expected to change unless there is a significant event that would require an adjustment, such as changes due to collective bargaining, plan design changes or substantial membership changes. The 2022, 2023 and 2024 expense estimates will differ from these estimates as a result of asset returns differing from expectations and differences in contributions and benefit payments. Furthermore, if there are any changes in actuarial assumptions, these will impact the following year's expense. Changes in membership are not expected to impact the expense until 2023, since the next actuarial valuation is planned for January 1, 2022, which will be reflected in the 2022 year end disclosures and 2023 expense.

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See Appendix B for a breakdown of each benefit plan's expense by component.

Expense (in CDN $000s)	**2021**	**2022**	**2023**	**2024**
RPP	$ 7,465	$ 8,074	$ 8,123	$ 7,892
SERP	3,799	3,226	3,284	3,342
OPEB	14,255	11,028	11,725	12,448
Total	**$ 25,519**	**$ 22,328**	**$ 23,132**	**$ 23,682**

Sincerely,

Linda Byron
Fellow of the Canadian Institute of Actuaries

Reinhart Kramreither
Fellow of the Canadian Institute of Actuaries

Encl.

cc: Mr. Anthony Martinello, Independent Electricity System Operator
Mr. Dawar Ahmed, Aon
Mr. John Radich, Aon

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Appendix A

Independent Electricity System Operator
Funding Projection for 2021-2024 (in CDN $000s)

	2021 [1]	2022 [2]	2023	2024
Going Concern (BOY)				
Actuarial Value of Assets (net of PYCB) [3]	696,500	695,317	732,791	770,600
Liabilities	618,900	689,303	719,957	752,525
Funded Position as at January 1	77,600	6,014	12,834	18,075
Discount Rate	5.80%	5.40%	5.40%	5.40%
Inflation Rate	2.00%	2.00%	2.00%	2.00%
Provision for Adverse Deviations (PfAD)	7.80%	8.00%	8.00%	8.00%
Mortality Table	95% CPM Public 2014 with projection MI-2017			
Solvency (BOY)				
Market Value of Assets (net of PYCB)	696,503	713,942	745,878	779,796
Liabilities	682,600	630,852	655,948	681,294
Funded Position as at January 1	13,903	83,090	89,930	98,502
Discount Rate - CV	1.2% for 10 years; 2.8% thereafter	1.9% for 10 years; 3.5% thereafter		
Discount Rate - Annuity Purchase	2.58%	3.23%	3.23%	3.23%
Mortality Table	CPM Combined 2014 with projection CPM-B			
Contributions				
Total Normal Cost	21,800	25,315	26,201	27,118
Employee Contributions	9,147	9,473	9,810	10,159
Employer Normal Cost	12,653	15,842	16,391	16,959
Contribution exempt under transitional rules	(239)	-	-	-
Going Concern Special Payments	-	-	-	-
Solvency Special Payments	-	-	-	-
Minimum Required Contributions	12,414	15,842	16,391	16,959
Funding Policy Recommended Contribution	12,653	15,842	16,391	16,959
Prior Year Credit Balance	-	-	-	-
Total Expected Company Contributions	**12,653**	**15,842**	**16,391**	**16,959**

Notes

1. Based on Q4 2020 dashboard results
2. Next valuation required as at January 1, 2022
3. Asset gains/losses smoothed over 3 years. Asset expected to return 5.80% per annum for 2021 and 5.40% per annum for 2022 through 2024.

Empower Results®

Appendix B

Independent Electricity System Operator
PSAB Expense Projection for FY2021-2024 (in CDN $000s)

	RPP	SERP	OPEB	Total
Salary Scale	3.50%	3.50%	3.50%	
Inflation	2.00%	2.00%	2.00%	
Mortality	CPM Public MI-2017	CPM Public MI-2017	CPM Public MI-2017	
Fiscal 2021 Expense				
Discount Rate	5.50%	2.60%	2.60%	
Expected Return on Assets	5.50%	n/a	n/a	
Current Service Cost	$ 12,759	$ 1,559	$ 8,931	$ 23,249
Interest Cost	33,553	1,233	4,503	39,289
Expected Return on Plan Assets	(35,705)	-	-	(35,705)
Amortization of Net Actuarial Loss (Gain)	(3,142)	1,007	821	(1,314)
Net expense (income)	$ 7,465	$ 3,799	$ 14,255	$ 25,519
Fiscal 2022 Expense				
Discount Rate	5.40%	3.50%	3.50%	
Expected Return on Assets	5.40%	n/a	n/a	
Current Service Cost	$ 13,490	$ 1,329	$ 6,875	$ 21,694
Interest Cost	34,936	1,449	5,238	41,623
Expected Return on Plan Assets	(37,232)	-	-	(37,232)
Amortization of Net Actuarial Loss (Gain)	(3,120)	448	(1,085)	(3,757)
Net expense (income)	$ 8,074	$ 3,226	$ 11,028	$ 22,328
Fiscal 2023 Expense				
Discount Rate	5.40%	3.50%	3.50%	
Expected Return on Assets	5.40%	n/a	n/a	
Current Service Cost	$ 14,329	$ 1,376	$ 7,184	$ 22,889
Interest Cost	36,468	1,490	5,563	43,521
Expected Return on Plan Assets	(39,324)	-	-	(39,324)
Amortization of Net Actuarial Loss (Gain)	(3,350)	418	(1,022)	(3,954)
Net expense (income)	$ 8,123	$ 3,284	$ 11,725	$ 23,132
Fiscal 2024 Expense				
Discount Rate	5.40%	3.50%	3.50%	
Expected Return on Assets	5.40%	n/a	n/a	
Current Service Cost	$ 14,825	$ 1,424	$ 7,507	$ 23,756
Interest Cost	38,002	1,529	5,904	45,435
Expected Return on Plan Assets	(41,412)	-	-	(41,412)
Amortization of Net Actuarial Loss (Gain)	(3,523)	389	(963)	(4,097)
Net expense (income)	$ 7,892	$ 3,342	$ 12,448	$ 23,682

From: Reinhart Kramreither <reinhart.kramreither@aon.com>
Sent: June 25, 2021 4:49 PM
To: Kevin Reid <kevin.reid@ieso.ca>
Cc: Linda Byron <linda.byron@aon.com>; John Radich <john.radich.2@aon.com>; Dawar Ahmed <dawar.ahmed@aon.ca>
Subject: Funding and expense projections through 2024

Hi Kevin,

Please see the below expense sensitivities for the cost of borrowing increasing by 0.50% and 1.00%. Please note the following:

- RPP expense does not change as the discount rate is not related to the cost of borrowing
- 2021 SERP & OPEB expense is based on a discount rate of 2.60% and will not be subject to change based on a future discount rate change
- Our expense projection from earlier this year used a discount rate of 3.50% for SERP and OPEB. As a result, the discount rate for the sensitivities presented is 4.00% and 4.50% respectively.

SERP & OPEB @ 4.00% **Expense** **(in CDN $000s)**	**2021**	**2022**	**2023**	**2024**
RPP	$ 7,465	$ 8,074	$ 8,123	$ 7,892
SERP	3,799	2,955	3,024	3,094
OPEB	14,255	9,308	10,016	10,747
Total	**$ 25,519**	**$ 20,337**	**$ 21,163**	**$ 21,733**

SERP & OPEB @ 4.50% **Expense** **(in CDN $000s)**	**2021**	**2022**	**2023**	**2024**
RPP	$ 7,465	$ 8,074	$ 8,123	$ 7,892
SERP	3,799	2,712	2,792	2,872
OPEB	14,255	7,829	8,545	9,281
Total	**$ 25,519**	**$ 18,615**	**$ 19,460**	**$ 20,045**

Please let us know if you have any questions.

Thanks,
Reinhart

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OEB STAFF INTERROGATORY 10

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1-Staff-10

INTERROGATORY

a. Exhibit B / Tab 1 / Schedule 2 / p. 38 (2021 Annual Report p. 36)
b. EB-2020-0230 / Responses to Settlement Conference Question #8 / October 12, 2021

Preamble:

The 2021 Annual Report states that the RPP provides a maximum benefit of 70% of highest paid, pre-retirement pensionable earnings. As the Canada Revenue Agency limits the amount of pension payable from a registered plan, the IESO has a secured SERP to provide required pension income to meet the commitments of the RPP, above that payable from the registered plan.

Question(s):

a) As noted in the 2020-2021 revenue requirement proceeding (Responses to Settlement Conference Question #8) please clarify the IESO's statements that:
    i. "With regard to [the] SERP, the IESO consolidates employee contributions within the RPP… and employees are fully contributing their required percentage based on the pension plan contribution rates." Please explain whether this means that there is no room for the IESO to increase employee contributions for the SERP.
    ii. "Employees do not contribute to [the] OPEB [Plan], as this is a health benefit provided by the company in retirement." Please explain whether this means that it is not possible for the IESO to require employee contributions for the OPEB Plan.
b) Please explain the reasonableness of the structure of the SERP Plan, in particular any special pension arrangements and amounts paid that exceed those based on 70% of the highest paid, pre-retirement pensionable earnings.
c) Please also explain the reasonableness in light of the IESO's explanation (Responses to Settlement Conference Question #8), that it "views this [SERP] structure as reasonable due to the need to attract and retain talent." Please also explain why the SERP is a necessary feature in the IESO's overall compensation structure.

RESPONSE

a) Employee pension contributions, including contributions applicable to the SERP, are set as a percentage of salary and are all directed to the RPP for practical reasons. Employee pension contributions are negotiated via collective agreement for unionized employees, meaning that any increase to employee pension contributions would need to be negotiated via collective bargaining. There are no employee contributions to OPEB, as this is a health benefit paid in retirement. Any change to employee contributions to OPEB would need to be negotiated via collective bargaining.

b) The IESO Pension Plan formula provides a pension based on service and it is integrated with Canada Pension Plan (CPP) benefits. The 70% income replacement ratio would only be reached for a member with 35 years of service and that would include CPP benefits. (i.e. not all of the pay replacement would come from the IESO pension plan). The longer a member works for the IESO the higher the pension will be. This income replacement ratio is consistent with other public sector plans such as Ontario Teacher's pension plan, Ontario Municipal Employees' Retirement System (OMERS), Healthcare of Ontario Pension Plan (HOOPP), and Ontario Public Service Employees Union (OPSEU).

c) The IESO's pension consultant (AON) has confirmed that in the public sector, and the electricity sector in particular, it is common practice to offer a supplemental pension arrangement that covers earnings that are in excess of those eligible under the Income Tax act. The Income Tax Act limits the pension that is payable from the registered pension plan to a dollar value per year of service. This would impact members with earnings above approximately $190,000 per year. We note that in the absence of a SERP these members would be disadvantaged as they would not receive the promised pension on all of their earnings. Given the prominence of the SERP in the sector and in particular from the competing organizations, the removal of this benefit would create an attraction and retention challenge for roles that are paid above the $190,000 per year mark.

OEB STAFF INTERROGATORY 11

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1-Staff-11

INTERROGATORY

a. Exhibit D / Tab 2 / Schedule 1 / p. 1

Preamble:

The IESO has provided the following Interest amounts that are embedded into OM&A which are shown below in OEB Staff Table 3.

OEB Staff Table 3 – Interest Amounts

	2021 Budget	2021 Actual	2022 Budget
Interest	(2.5)	(5.2)	(5.0)

OEB staff is seeking additional information that demonstrates that the interest on the cumulative difference between cash and accrued pension and OPEBs amounts is being appropriately allocated to the revenue requirements.

Questions:

a) Please confirm that for each year (e.g., 2021 Budget, 2021 Actual, 2022 Budget) the interest income shown in OEB Staff Table 3 includes calculated interest on the cumulative difference between the amounts collected under the cash basis versus amounts collected under the accrual basis for pension and OPEBs costs. If this is not the case, please explain.
b) Please provide the supporting calculation for the amount referred to in part b).

RESPONSE

a) Yes, for each year (e.g., 2021 Budget, 2021 Actual, 2022 Budget) the interest income shown in OEB Staff Table 3 includes calculated interest on the cumulative difference between the amounts collected under the cash basis versus amounts collected under the accrual basis for pension and OPEBs costs.
b) See Table 1 below for how the net interest is calculated.

Table 1: Calculation of Net Interest Expense

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

OEB STAFF INTERROGATORY 12

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1-Staff-12

INTERROGATORY

a. Exhibit D/ Tab 1 / Schedule 1/ p. 3

Preamble: Table 3 at the above reference demonstrates the incremental costs resulting in a projected year-over-year Operations, Maintenance and Administrative (OM&A) increase of $12.2 million.

Questions:

a) Table 3 indicates that $3.1 million of the increase stems from "Collective agreements/escalations." OEB staff interprets this to represent the increased remuneration costs associated with unionized staff (i.e., staff represented by either the Society of United Professionals or the Power Workers' Union). A similar line demonstrating increases stemming from non-union/management staff is not provided in Table 3.

   If applicable, please indicate how much of the $12.2 million increase stems from increases in remuneration for all non-unionized/management staff and provide a dollar figure of the amount.

b) OEB staff request that the IESO fill-in Table 4 to demonstrate the incremental year-over-year increases in both OM&A and capital remuneration budgets for both non-unionized/management staff and unionized staff. The IESO is welcome to alter the format of the table if appropriate.

Table 4: Incremental 2022 Remuneration Costs

($ Millions)	2022 Budget
2021 Total capital and OM&A remuneration costs	
Incremental remuneration costs for 2022:	

non-unionized/management staff – capital	
non-unionized/management staff – OM&A	
Unionized staff – capital	
Unionized staff – OM&A	
Total 2022 remuneration budget	

RESPONSE

a) The $3.1 million increase in OM&A stemming from "Collective agreements/escalations" includes the increased remuneration costs associated with unionized staff (i.e., staff represented by either the Society of United Professionals or the Power Workers' Union) and for the non-unionized/management staff.

Included in the $3.1 million year-over-year OM&A increase, $0.4 million is related to increases in remuneration for all non-unionized/management staff.

b) See Table 1 below.

Table 1: Incremental 2022 Remuneration Costs

($ Millions)	**2022 Budget**
2021 Actual Total capital and OM&A remuneration costs	146.6
Incremental remuneration costs for 2022:	
Non-unionized/management staff – capital	0.0
Non-unionized/management staff – OM&A	0.4
Unionized staff – capital	0.5
Unionized staff – OM&A	2.7
Total 2022 remuneration Budget*	**150.2**

*This represents what the total remuneration budget would be after salary increases applicable to 2022.

OEB STAFF INTERROGATORY 13

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1-Staff-13

INTERROGATORY

a. Exhibit D / Tab 1 / Schedule 3 / p. 1-2

Preamble:

At the above reference, the IESO states that due to staff attrition the 2021 average full-time employees (FTEs) were below budget. The IESO explains that staff turnover was a result of voluntary attrition and retirements prompted by the newly introduced hybrid work model and vaccination policy for IESO employees. For 2022, the IESO proposes an average of 827 FTEs, representing an increase of 53 FTEs on average from 2021 actuals.

Table 5 below is an extract from reference a.

Table 5: Staffing and Operating Compensation Expenses

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

Non-Management Regular	89.8	88.1	89.2
Non-Management Temporary	5.4	4.9	6.7
Total	**125.3**	**126.9**	**129.5**

Questions:

a) Please indicate how many of the planned 53 FTEs for 2022 the IESO has hired to-date.
   i. Has the IESO revised its budgeted number of FTEs for 2022? If so, please provide the revised FTE projection as well as the impact of the revised projection on the IESO's 2022 compensation and benefits budget.

b) Table 5 as provided in the application indicates both operating and capital FTEs, however, related expenses are only shown for operating (i.e., OM&A) staff. Accordingly, please fill in Table 6 below to show only the average number of FTEs and staff compensation that correspond to the operations expense budget.

Table 6: Staffing Compensation from Operating Budget

	2021 Budget	**2021 Actual**	**2022 Budget**
Average Number of Employees (Operating expenses FTEs)			
Executive			
Management			
Non-Management Regular			
Non-Management Temporary			
Total			
Total Compensation for Operating Expenses ($M) (Salary, Wages & Benefits)			
Executive			
Management			
Non-Management Regular			
Non-Management Temporary			
Total			
Compensation per Average Operating Employee			

Executive			
Management			
Non-Management Regular			
Non-Management Temporary			
Total			

c) Based on the IESO's response to b), please provide reasons for any changes in operations-related compensation per average employee from 2021 actual to 2022 budget.

d) As stated, Table 5 as provided in the application indicates both operating and capital FTEs, however, related expenses are only shown for operating staff. Accordingly, please fill in Table 7 below to show only the average number of FTEs and staff compensation that correspond to the capital expense budget.

Table 7: Staffing Compensation from Capital Budget

	2021 Budget	**2021 Actual**	**2022 Budget**
Average Number of Employees (Capital expenses FTEs)			
Executive			
Management			
Non-Management Regular			
Non-Management Temporary			
Total			
Total Compensation for Capital Expenses ($M) (Salary, Wages & Benefits)			
Executive			
Management			
Non-Management Regular			
Non-Management Temporary			
Total			
Compensation per Average Capital Employee			

Executive			
Management			
Non-Management Regular			
Non-Management Temporary			
Total			

e) Based on the answer to d), please provide reasons for any changes in capital-related compensation per average employee from 2021 actual to 2022 budget.

f) If applicable, please describe the reasons for any differences between the average 2022 compensation calculated for capital versus operating employees.

RESPONSE

a) Nineteen (19) FTEs from the incremental headcount budgeted in 2022 have been hired to date. The IESO has not revised the 2022 budgeted FTEs and the corresponding compensation and benefits budget. Should the IESO have difficulty hiring the budgeted FTEs in 2022, the IESO can take mitigating actions including engaging external talent search firms to support our talent acquisition team.

b) See Table 1 below for FTEs and staff compensation that correspond to the operations expense budget.

Table 1: Staffing Compensation from Operating Budget

	2021 Budget	2021 Actual	2022 Budget
Average Number of Employees (Operating expenses FTEs)			
Executive and Board	7	7	8
Management	123	138	135
Non-Management Regular	523	498	506
Non-Management Temporary	44	36	53
Total	**697**	**678**	**702**
Total Compensation for Operating Expenses ($M) (Salary, Wages & Benefits)			
Executive and Board	4.5	4.4	4.7
Management	25.6	29.5	28.9
Non-Management Regular	89.8	88.1	89.2
Non-Management Temporary	5.4	4.9	6.7
Total	**125.3**	**126.9**	**129.5**
Compensation per Average Operating Employee ($M)			
Executive and Board	0.7	0.7	0.6
Management	0.2	0.2	0.2

Non-Management Regular	0.2	0.2	0.2
Non-Management Temporary	0.1	0.1	0.1
Total	**0.2**	**0.2**	**0.2**

c) The 2022 Budget projects a decrease in Executive average compensation per headcount compared to 2021 Actual due to the change in salary rate mix and one-time expenses in 2021. Similarly, a slight reduction in Non-Management Temporary is due to one-time expenses in 2021 not projected to be repeated in 2022 (e.g. overtime and allowances due to backfilling for staff affected by COVID).

d) See Table 2 below for FTEs and staff compensation that correspond to the capital expense budget.

Table 2: Staffing Compensation from Capital Budget

	2021 Budget	2021 Actual	2022 Budget
Average Number of Employees (Capital expenses FTEs)			
Executive and Board	0	0	0
Management	4	9	9
Non-Management Regular	73	72	79
Non-Management Temporary	19	15	38
Total	**97**	**96**	**125**
Total Compensation for Capital Expenses ($M) (Salary, Wages & Benefits)			
Executive and Board	-	-	-
Management	0.8	2.6	2.0
Non-Management Regular	19.1	14.5	13.2
Non-Management Temporary	2.5	2.6	4.9
Total	**22.4**	**19.7**	**20.0**
Compensation per Average Capital Employee			
Executive and Board	-	-	-
Management	0.2	0.3	0.2
Non-Management Regular	0.3	0.2	0.2
Non-Management Temporary	0.1	0.2	0.1
Total	**0.2**	**0.2**	**0.2**

e) The variance in 2022 Budget vs 2021 Actual for capital headcount is a function of changes in staff mix since the skills, and correspondingly the pay scale, required for each capital project and each stage of the project will vary which leads to a lower average.

f) As illustrated in the Tables 1 and 2 above, there is no material differences between the average 2022 compensation calculated for capital versus operating employees.

AMPCO INTERROGATORY 4

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-AMPCO-4

INTERROGATORY

Ref: D-1-2 P1

Table 1 provides a Summary of OM&A for Business Units.

Ref: D-1-3 P1

Table 1 provides the Staffing and Operating Compensation Expenses.

Please map the total FTEs for 2021 (forecast and actual) and 2022 (forecast) to each Business Unit.

RESPONSE

a) See Table 1 below for average FTEs for 2021 and 2022 by Business Unit.

Table 1: Average FTE by Business Unit

Average FTE by Business Unit	2021 Budget*	2021 Actual	2022 Budget
Markets & Reliability	201	187	190
Planning, Conservation and Resource Adequacy	97	100	112
Corporate Relations, Stakeholder Engagement and Innovation	61	60	66
Information and Technology Services	128	125	130
Legal Resources and Corporate Governance	73	77	74
Market Assessment and Compliance Division	7	6	7
CEO	8	8	8
Corporate Services	118	113	120
Human Resources	21	21	23
Market Renewal Program	81	77	97

Total	**794**	**774**	**827**

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

AMPCO INTERROGATORY 5

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-AMPCO-5

INTERROGATORY

Ref: D-1-2 P1

a) With respect to the Corporate Relations, Stakeholder Engagement and Innovation Business Unit, please provide the budget and FTEs for Innovation, Research and Development.

b) With respect to the organizational changes implemented in Q4-2021, please provide a schedule that tracks the impact on each Business Unit in terms of the change in $ and FTEs.

RESPONSE

a) See Table 1 below for budget and FTEs for the Innovation, Research and Development Business Unit.

Table 1: Budget and FTE for Innovation, Research and Development

Business Unit	2022 Budget	
	Avg. FTE	($ Millions)
Innovation, Research and Development	18	4.3

b) The organizational changes implemented in Q4-2021 were: The Planning, Acquisitions and Operations business unit was split between the Markets & Reliability, and Planning and Conservation & Resource Adequacy business units; and the Energy Efficiency division was transferred from the Policy, Engagement & Innovation business unit to the Planning, Conservation & Resource Adequacy business unit, prompting a change in naming of the original business unit to Corporate Relations, Stakeholder Engagement and Innovation; and the NERC Membership costs were transferred from the Corporate Relations, Stakeholder Engagement and Innovation to the Legal Resources and Corporate Governance business unit. See Tables 2 and 3 below for impact of these changes in terms of FTEs and $.

Table 2: 2021 Reorganization Impact on FTEs by Business Unit

	PAO	PCRA	M&R	PEI	CRSE	Total
Original Approved FTE	**254**	-	-	**105**	-	**359**
VP Office & Admin	(3)	-	3	(2)	2	-
Power System Assessments	(93)	-	93	-	-	-
Resource Planning	(26)	26	-	-	-	-
Transmission Planning	(27)	27	-	-	-	-
Market Operations	(75)	-	75	-	-	-
Markets & Procurement	(30)	–	–	-	-	(30)
Wholesale Market Development	–	10	–	–	–	10
Resource & System Adequacy	–	–	20	–	–	20
Energy Efficiency	-	44	-	(44)	-	-
Corporate & Indigenous Relations	-	-	-	(41)	41	-
Policy Innovation	-	-	-	(18)	18	-
Restated OEB Approved FTE	**-**	**107**	**191**	**-**	**61**	**359**

Table 3: Reorganization Impact on $ by Business Unit

($ Millions)	PAO	PCRA	M&R	PEI	CRSEI	LRCG	Total
Original Approved Budget	**48.5**			**24.1**		**19.1**	**91.7**
VP Office & Admin	(0.9)		0.9	(0.9)	0.5		(0.3)
Power System Assessments	(14.7)		14.7				-
Resource Planning	(5.3)	5.3					-
Transmission Planning	(4.8)	4.8					-
Market Operations	(15.6)		15.6				-
Markets & Procurement	(7.2)						(7.2)
Wholesale Market Development			5.0				5.0

Resource & System Adequacy		2.2					2.2
Energy Efficiency		6.2		(6.2)			-
Corporate & Indigenous Relations				(8.6)	8.6		-
Policy Innovation				(3.7)	3.7		-
NERC & NPCC Membership		-	-	(4.8)		5.2	0.3
Revised OEB Approved Budget	**-**	**18.5**	**36.2**	**-**	**12.7**	**24.2**	**91.7**

1

AMPCO INTERROGATORY 6

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-AMPCO-6

INTERROGATORY

Ref: D-1-2 P5

a) Please provide the internal audit plan for 2022-2024.

RESPONSE

a) See Attachment 1 to this Exhibit.

3 Year Audit Services Plan

	2022	2023	2024
Corporate			
IESO	ERM review (partner with ERM team to bring in external)	Entity Level Controls (lite)	Strategy development
	Continuous fraud testing	Continuous fraud testing	Continuous fraud testing
		Internal & External Emergency response	Policy development and maintenance
	TB/MBC directive compliance	TB/MBC directive compliance	TB/MBC directive compliance
	Corporate Performance Measures review	Corporate Performance Measures review	Corporate Performance Measures review
ITS	IT Asset Portfolio & Management	Cyber Security program	IT & Data architecture
		Disaster recovery	
Market Rule Oversight	IESO Reliability compliance program	Market rules exemption process	Internal market monitoring & oversight
		MACD process part 1	MACD processes part 2
IA	Internal Audit Quality Assurance	Internal Audit Quality Assurance	Internal Audit Quality Assurance
Core			
Grid & Market Operations	Real-time and day ahead dispatch algorithm review	Connection assessment	Real-time and day ahead dispatch algorithm review
	Plan Operations lifecycle review (includes outage management)	NERC Mock Audit	Root cause analysis process

		Mapping NBM to offline and combined models	Network model build including inputs (online)
	Security Limits		MRP related audits
Planning & Procurement		Annual Acquisition Report	
		Provincial & Regional planning (demand, resources, transmission)	Energy efficiency (CDM) portfolio and program design
Market settlement	Prepare for Market settlement review	Market Settlement Service Organization Controls 1 + 2	Prepare for Market settlement review
	Metered Market Participant independence audit	Metered Market Participant independence audit	Metered Market Participant independence audit
Resource Settlement			Conservation contract management & settlement
Enabling			
CR	External communications (media, website etc)		Internal communications
Legal & Info	Baseline review		
Corporate services	Support annual control self-certification	Support annual control self-certification	Support annual control self-certification
		Corporate Accounting	Budget monitoring
	Business analysis incl requirements	Corporate Procurement	Corporate contract & vendor management
		Project portfolio management	Facilities
HR		Talent Acquisition	
IT	Access reviews	Access Management	Information Technology incident & problem

		Implement security patch, patch technology & change management	System Development Lifecycle & QA
Business Unit Audits			
IT	Smart Meter Entity CSAE 3416	Smart Meter Entity CSAE 3416	Smart Meter Entity CSAE 3416
	Disaster recovery testing *	Disaster recovery testing *	Disaster recovery testing *
	Penetration & vulnerability testing *	Penetration & vulnerability testing *	Penetration & vulnerability testing *
Corporate services	Financial Statements Audit	Financial Statements Audit	Financial Statements Audit
	Pension Financial Statement Audit	Pension Financial Statement Audit	Pension Financial Statement Audit
MRP/RSS	Third Party Market renewal and settlement system program readiness assessment (4 audits) *		
	Third party Dispatch system pre-implementation testing		
PAO & IT		NERC compliance audit	

**** monitored by Internal Audit***

CME INTERROGATORY 3

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-CME-3

INTERROGATORY

Ref: Exhibit D, Tab 1, Schedule 3, pp. 1 of 7

At p. 2, Table 1, the IESO indicates that it had 20 fewer FTEs than budget, but a total compensation of $1.6 million higher than budget. The IESO explains that the variance is due to severance, benefits and ongoing COVID-19 pandemic impacts.

a) Please quantify the total impact of each of severance, benefits and ongoing COVID-19 impacts (as CME understands it, the $1.6 million is the difference between the actual and the budget, whereas with 20 fewer FTEs would have made the baseline actual for 2021 lower than the budget, prior to the impact of the listed factors.)

b) Define what the IESO's definition of "absenteeism" is.

c) Does the IESO anticipate that impacts such as "absenteeism" will persist into 2022?

d) If the answer to (c) above is yes, does its 2022 budget reflect both the hiring of approximately 50 additional employees (as compared to 2021 actual) and the impact of absenteeism?

RESPONSE

a) The $1.6 million higher compensation spend in 2021 Actual compared to 2021 Budget, is comprised of about $1.0 million from ongoing COVID-19 impact, $1.0 million in severance, $0.4 million in net benefits variance, partially offset by $0.8 million related to savings from variance in FTEs. The 2021 budget included an assumption for savings from lower FTEs, hiring delays, lower than planned salary rates for new hires and any other potential driver of compensation savings; however, this saving assumption was not translated to FTE reductions in the budget thus the reason why the variance in compensation dollars and FTEs in 2021 don't align. For the 2022 Budget the IESO has changed this approach to avoid confusion going forward.

b) Absenteeism is considered when staff is not able to work for various reasons, such as personal illness, caring for family members, bereavement, and due to COVID exposure.

c) The absenteeism observed in 2021 was mostly related to the pandemic (people falling ill to COVID, having to care for an ill relative, people having to isolate as they have been exposed to a positive COVID case, etc.). In the 2022 Budget, the IESO considered some potential continuation of the pandemic impact (mostly reflected in overtime required to cover for potential absenteeism), but the IESO cannot anticipate if the impact will be as high as it was in 2021.

d) Yes, the 2022 Budget reflects both the hiring of additional employees compared to 2021 Actual and the higher overtime required to cover for potential absenteeism.

REASCWA INTERROGATORY 2

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-REASCWA-2

INTERROGATORY

Reference: Exhibit B 1-2 Pages 1-36

Preamble: Resource Adequacy (i.e., ensuring sufficient supply resources to meet the reliability needs of Ontario's power system) is one of the identified IESO priorities in the 2022-24 Business Plan. After a period of oversupply, Ontario is now facing increasing and significant supply needs driven by increasing demand, the retirement of the Pickering NGS, refurbishment of the Bruce NGS and Darlington NGS, and expiring contracts for existing facilities (e.g., generators, etc.).

a) Considering the resource procurement initiatives listed in the above interrogatory 1.1-REASCWA-1a, the IESO full-time equivalent staffing information in Exhibit B-1-2, Page 20 of 36 identifies three incremental staffing resources being assigned to this priority in 2022. Does the IESO have staffing plans/analysis that it can provide to demonstrate that this level of incremental OM&A is appropriate and sufficient to address this identified Business Plan priority – Resource Adequacy – including the work associated to successfully develop and administer these supply resource procurement initiatives? Can the IESO provide the staffing plan/analysis that this level of resourcing is appropriate and will be sufficient to successfully develop and administer all announced procurement initiatives to towards enabling needed supply resources to be developed and brought into commercial operation in time to help meet Ontario's significant supply needs?

Preamble: Enabling Resources is one of the identified IESO priorities in the 2022-24 Business Plan. This initiative is intended to enable more resources (e.g., DERs, etc.) to provide needed supply and other electricity system services that they are technically capable of providing but currently cannot or partially not able to provide under the IESO's current market design and rules. The IESO's 2022-24 Business Plan states that work planned "will establish market participation models for hybrids, storage and DERs to be in place to future reliability [supply] needs and enable strong competition in Resource Adequacy procurements [for example, the procurement initiatives listed in the above interrogatory 1.1-REASCWA-1a]".

b) The IESO full-time equivalent staffing information in Exhibit B-1-2, Page 20 of 36 identifies one incremental staffing resource being assigned to this priority initiative (i.e., Enabling Resources). Is very small increase in staffing sufficient to ensure development and integration of the Enabling Resources initiative within the IESO-Administered Markets as well as enabling applicable resources (e.g., DERs, energy storage, hybrid energy storage and generators) within the procurement initiatives listed in the above interrogatory 1.1-REASCWA-1a? Does the IESO have staffing plans/analysis that it can

provide to demonstrate that this level of incremental OM&A is appropriate to address this priority, and if so please provide such plans/analysis.

RESPONSE

a) A need of 3 incremental FTEs was identified to design and execute the procurements and other mechanisms for the Resource Adequacy key initiative in 2022. The Resource Adequacy key initiative is supported by staff from Business Units throughout the IESO. See Exhibit D-1-2 – OM&A Business Unit Detail for a description of the work of these Business Units and their respective responsibilities related to the Resource Adequacy key initiative).

The key initiatives identified in the IESO's 2022-2024 Business Plan were planned and approved as part of the IESO's business planning process (see responses to Schedule 13 – 1.1 SEC 7 and 1.1 SEC 8). The key initiatives are identified separately in the 2022-2024 Business Plan to provide additional transparency on the incremental work that the IESO will be undertaking in 2022 in order to achieve its Core Strategies or comply with directives received from the Minister of Energy.

Per the 2022-2024 Business Plan, the IESO is currently planning to add an additional FTE for the Resource Adequacy key initiative in 2023.

b) A need of 1 incremental FTE for the Enabling Resources key initiative in 2022 was identified to support the work program. The Enabling Resources key initiative is supported by staff from Business Units throughout the IESO. See Exhibit D-1-2 – OM&A Business Unit Detail for a description of the work of these Business Units and their respective responsibilities related to the Enabling Resources key initiative.

The key initiatives identified in the IESO's 2022-2024 Business Plan were planned and approved as part of the IESO's business planning process (see responses to Schedule 13 – 1.1 SEC 7 and 1.1 SEC 8). The key initiatives are identified separately in the 2022-2024 Business Plan to provide additional transparency on the incremental work that the IESO will be undertaking in 2022 in order to achieve its Core Strategies or comply with directives received from the Minister of Energy.

Per the 2022-2024 Business Plan, the IESO is currently planning to add an additional FTE for the Enabling Resources key initiative in 2023.

EDA INTERROGATORY 2

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-EDA-2

INTERROGATORY

Evidence Reference: ExD-T1-S1-Pg 4-6 / ExD-T1-S3-Pg 1

Preamble

The IESO's proposed 2022 budget includes additional staff resources to support new functionalities. The IESO's proposed timing to acquire these additional staff resources contemplates an onboarding process and training ahead of the implementation of MRP and in advance of the Enabling Resources initiative.

Question:

a) Please provide the duration of the proposed onboarding and early training period(s) for:
   - MRP implementation
   - Enabling Resources

b) Please explain how the proposed additional 16 FTE staff resources will be assigned to MRP implementation and Enabling Resources; please identify the number of staff resources that will be assigned exclusively to one or the other of these initiatives and the number of staff resources that will be shared between them.

c) Please explain any duplication between the tasks that are currently being performed by IESO staff at current complement of 774 versus those that are to be performed with the additional staff resources of 827.

RESPONSE

a) MRP Post-go-live and Enabling Resources are initiatives being worked on mostly by the IESO's Markets & Reliability, and Corporate Relations, Stakeholder Engagement and Innovation Business Units. The duration of onboarding and training for staff working on MRP Post-go-live is approximately 18 months due to the specialized skills required for this work that requires on-the-job experience. The duration of onboarding and training period for staff working on Enabling Resources would be expected to be similar to most other Business Units at the IESO. The IESO expects that staff are able to demonstrate the expected level of competence within 6 months.

b) The 16 FTE referenced in Exhibit D-1-3 – Staffing and Compensation are related to the implementation phase of MRP and not Enabling Resources. For details on the distribution of the incremental FTE resources, please see Exhibit B-1-2 – 2022-2024 Business Plan, pg. 20.

c) There is no duplication of tasks currently being performed by IESO staff at the current complement of 774 versus those that are to be performed with the additional staff

resources of 827. The incremental headcount will support new tasks in support of the IESO's strategic priorities and government directives as outlined in Exhibit B-1-2 – 2022-2024 Business Plan.

EP INTERROGATORY 4

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-Energy Probe-4

INTERROGATORY

Ref.: Exhibit D, Tab 1, Schedule 3/p. 1: Exhibit D, Tab 1, Schedule 3/p. 1, Table 1

a) Please provide a 2021 variance Report showing plan and actuals staffing levels.

b) Please provide 2020, 2021 and 2022 Form 2K with forecast and actual Total Compensation

RESPONSE

a) See response to b).

b) See Table 1 below.

Table 1: FTE and Compensation (2020 – 2022)

	2020 Actual	2021 Budget	2021 Actual	2022 Budget
Average Number of Employees (Capital and Operating expenses FTEs)				
Executive	7	7	7	8
Management	133	127	147	144
Non-Management Regular	557	596	570	585
Non-Management Temporary	74	64	51	90
Total	**772**	**794**	**774**	**827**
Operating expenses ($ millions)				
Total Salary and Wages				
Executive and Board	3.4	3.4	3.4	3.8
Management	19.9	18.4	21.4	21.9
Non-Management Regular	62.6	64.8	63.1	67.2
Non-Management Temporary	6.8	5.0	4.6	6.3

Total	**92.7**	**91.7**	**92.5**	**99.1**
Total Benefits				
Executive	1.1	1.0	1.1	1.0
Management	7.5	7.2	8.1	7.0
Non-Management Regular	23.9	25.0	24.9	22.0
Non-Management Temporary	0.7	0.4	0.3	0.5
Total	**33.1**	**33.6**	**34.4**	**30.4**
Percentage of Salary and Wages	**36%**	**37%**	**37%**	**31%**
Total Compensation (Salary, Wages & Benefits)				
Executive and Board	4.5	4.5	4.4	4.7
Management	27.3	25.6	29.5	28.9
Non-Management Regular	86.4	89.8	88.1	89.2
Non-Management Temporary	7.5	5.4	4.9	6.7
Total	**125.7**	**125.3**	**126.9**	**129.5**

EP INTERROGATORY 5

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-Energy Probe-5

INTERROGATORY

Ref: Exhibit D Tab 1 Schedule 1 Table 3 Plus Attachment(s);

Preamble: The 2022 budgeted OM&A expenses of $186.5 million, represent an increase of $12.2 million from the 2021 actual results, mainly driven by $7.2 million incremental expenses for initiatives critical to drive the transformation of Ontario's electricity sector, and to address various government initiatives including a pathway to decarbonization in the electricity sector; $3.1 million in collective agreement escalations; $2.2 million for various consulting and stakeholder engagement activities; an additional $1.9 million in support of MRP work to enable a more competitive electricity marketplace and market rule and manual amendments; technology related expenses increasing by $1.4 million mostly related to contract price escalations; and $1.7 million of various other items including foreign exchange impact and overhead cost recovery.

a) Please provide a detailed Breakdown of OM&A Expenses for "Pathways to Decarbonization". Include Internal and External (e.g. Consulting) costs and project total costs.

b) Please provide names of consultants. nature and timing of deliverables.

c) What was the cost of the 2021 Decarbonization study? Please provide. internal, external and total costs.

d) What are the assumptions for the 2022 $3.1 million increase in collective agreements

e) Please provide details of the 2020-2022 increases in consulting and stakeholder engagement activities.

RESPONSE

a) See response to Schedule 8 – 1.1 ED 10(a).

b) The following consultants and external support will be used for the Pathways to Decarbonization project:

   i. Andrew Yan, transmission planning support, ongoing Q2 - Q3 2022
   ii. PA Consulting, jurisdictional review of Ontario's neighbours, due Q2 2022
   iii. Deloitte, independent review of project milestones, ongoing Q2 - Q4 2022
   iv. Energy Exemplar, Plexos modelling support, ongoing Q2 - Q3 2022
   v. Carol Anderson, editorial support, ongoing Q2 - Q4 2022

c) The 2021 decarbonization study was addressed by existing internal staff, and without tracking of time allocation. The cost of this work in 2021 was mostly subsumed within the Planning, Conservation and Resource Adequacy Business Unit (see Exhibit D-1-1 Attachment 3 – OM&A Business Unit Table (Appendix 2-JC)). Due to the pandemic, engagement and outreach were managed online, without incremental cost. Related to publication, the sum of services for design, editorial and media relations was $67,919.

d) Please see response to Schedule 1 – 1.2 OEB STAFF 12(a).

e) As stated in Exhibit D-1-1 – OM&A Overview, Table 3, the $2.2 million increase is associated with various legal, audit and consulting requirements. Specifically, the increased funding is required to support stakeholder engagement activities such as the IESO's Symposium event. This event was held virtually during COVID-19 Pandemic and is now planned to be an in-person event in 2022. Other consulting support includes work to examine corporate strategy, and legal support related to regulatory matters.

EP INTERROGATORY 6

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-Energy Probe-6

INTERROGATORY

Exhibit D, Tab 1, Schedule 2. Table 1 Plus Attachment(s)

Preamble: Legal Resources and Corporate Governance have increased by $3.9 million over 2021 Budget

a) Please provide a detailed budget breakdown for 2021 budget and actual and 2022 budget.

b) Provide further detail/explanation of material increases 2021-2022

RESPONSE

a) See Exhibit D-1-1 Attachment 3 – OM&A Business Unit Table (Appendix 2-JC) for a detailed budget breakdown by IESO Business Unit.

b) See Exhibit D-1-2 – OM&A Business Unit Detail, pg. 5, for detail on the increase of $2.6 million from 2021 Actual to 2022 Budget.

EP INTERROGATORY 7

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-Energy Probe-7

INTERROGATORY

Exhibit D Tab 1 Schedule 3 Table 1 and Table 2 Plus Attachment(s)

a) Please provide a schedule that shows the changes in FTEs from 2020 actual to 2022 and 2022 budget for non-management regular by department.

b) Please provide details of the increases in Salaries for each group of employees 2020-2022. Specifically provide performance pay for each group.

c) Please provide details of increases in benefits for each group of employees 2020-2022

d) What is the IESO pension contribution ratio for each group, relative to the goal of 1:1 (Leech Report)? Please show historic and 2021 data.

RESPONSE

a) Please see response to Schedule 2 – 1.2 AMPCO 4 for total FTEs by Business Unit. Note that the IESO does not track management/non-management by Business Unit in budgeting of FTEs.

b) Table 1 below provides a breakdown of average Management annual merit/pay for performance increase for last three years. Neither PWU or Society receive pay for performance increases but rather a negotiated economic increase. The PWU contract ended after Bill 124 was enacted hence the 1% economic increases shown for the last 3 years. The Society contract did not end until December 31, 2021, hence the negotiated 1% in 2022.

Table 1: Management Merit/Performance Pay and PWU/Society Negotiated Economic Increases

	2020	2021	2022
Average Merit/Performance Pay Increase (Management)	2.0%	2.0%	2.2%
PWU - Annual Economic Increases	1.0%	1.0%	1.0%
Society Annual Economic Increases	2.0%	2.5%	1.0%

c) Table 2 and Table 3 below include summaries of the negotiated/arbitrated increases in benefits since 2020 for PWU and Society employees. Management has not received any increase in benefits during this time.

Table 2: PWU Negotiated/Arbitrated Increases in Benefits

Year	Group	Benefit Change	Changed from:
2020	PWU	8 Weeks of Parental Leave EI top up to 93% of earnings added to SUB plan.	no Parental Leave top up SUB plan
2020	PWU	Naturopathy. Clinical Ecologist. Homeopath, Acupuncturists. Registered Nutritionist and Registered Massage Therapist – Combined Maximum Increased to one thousand ($1,000) dollars at a 50/50 co-pay per year.	combined max of $750
2020	PWU	Vision care increase to $600.00 every twenty-four (24) months.	$550
2020	PWU	Add Psychotherapist and Social Worker to Psychologist $4,000 allotment per year.	no Social Worker or Psychologist.
2021	PWU	Paramedical - Increase co-insurance to 75% coverage	50%

2021	PWU	Class B Dental - Increase co-insurance to 85% coverage	75%
2021	PWU	Orthodontia - Increase co-insurance to 85% coverage	75%
2022	PWU	Vision Care – Increase max to $700.00 per person every 24 months.	$600
2022	PWU	Chiropractor - Increase max to $750.00	$700

Table 3: Society Negotiated/Arbitrated Increases in Benefits

Year	Group	Benefit Change	Changed from:
2019 - 2021	SOC	Health and Dental benefits 100% paid by the IESO granted to temporary employees after 6 months of consecutive service	Granted after 12 months
2019 - 2021	SOC	Sick Day credits granted 8 days @100% and 15 days @75% to temporary employees after 6 months of consecutive service.	Granted after 12 months
2019 - 2021	SOC	Post-Retirement Health and Dental Benefits are now to be granted @ 10 years of consecutive service.	7 years
2019 - 2021	SOC	**Eye Exams:** Biannual (i.e. once every two years) coverage unless an employee receives a referral/note from a Canadian licensed optometrist or ophthalmologist, in which case there is annual coverage. Coverage subject to reasonable and customary rates.	Annual
2019 - 2021	SOC	**IUD:** Add coverage for Mirena and copper IUD.	No coverage for Mirena
2022	SOC	• Eliminate annual dispensing fee	Dispensing fee cap of $9.50
2022	SOC	Eliminate annual deductible	Annual deductible $50 for family and

			$25 for single coverage
2022	SOC	Corrective eye procedures: increase lifetime coverage to $4,100	$3,200
2022	SOC	Increase vision coverage to $675 once every two years.	$575

d) Table 4 below shows the cost sharing ratio for each pension valuation date since 2019. The actuary does not break down the cost sharing by groups but the IESO is able to provide the overall breakdown shown in table below.

Table 4: Cost Sharing Ratio per Pension Valuation

	2021	**2020**	**2019**
Employer contribution ratio	1.0	1.0	1.0
Employee contribution ratio	0.8	0.8	0.7

EP INTERROGATORY 8

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-Energy Probe-8

INTERROGATORY

Ref.: Exhibit D, Tab1, Schedule 3 Attachment 3,

Preamble: On an overall organization basis, the IESO's total remuneration, including the value of all cash compensation, benefit and pension plans is positioned 9%, 11% and 24% above the market 50th percentile for the energy, public and private sector peer groups respectively

a) Please provide a version of the Comparison Table showing for each group of Employees the Total Remuneration(TREM) for the three groups compared to the Energy, Public Sector and Private sectors, showing the percentage median % differences by group and total.

b) What is the Total annual incremental cost in 2021 compared to the Median for the Energy Industry.

c) Discuss if IESO has progressed towards the median (50 percentile) total compensation indicated by the OEB?

d) How will the IESO Compensation Guidelines in Attachment 2 address the main issue of above median base salaries since these protocols appear to only address promotion and merit increases. Specifically what hiring policies will be adopted to bring base salaries to within + 5% of Energy Industry norms?

RESPONSE

a) See Figure 1 below.

Figure 1: TREM Comparison Table

Compensation values are stated in CAD $000s		IESO Total Remuneration	Energy Sector		Public Sector		Private Sector	
Group	Grade		P50	% Diff. from P50	P50	% Diff. from P50	P50	% Diff. from P50
MGT	MANAGEMENT TOTAL	$203	$199	2%	$191	6%	$181	13%
SOC	SOCIETY TOTAL	$174	$156	11%	$154	13%	$138	26%
PWU	PWU TOTAL	$122	$102	19%	$94	30%	$84	45%
	OVERALL	$174	$160	9%	$157	11%	$141	24%

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

b) As noted in the figure above, the overall average IESO Total Remuneration in 2021 was $174K. The Energy Sector average was $160K. Therefore, the overall average difference in cost would be approximately $11M (IESO TR $174K – Energy TR $160K X 774 FTE).

c) As noted in the submission, the overall for Total Remuneration in 2018 was 11% over the Energy Sector average. The most recent Total Remuneration Report indicates that the IESO is now at 9% over the Energy Sector average. This 2% change from the IESO's last report indicates that the IESO has made progress towards the 50th percentile.

d) Current IESO compensation guidelines include the process and parameters around the placement of new hires within the specific jurisdictional salary range. For newly hired management/non-union employees, the IESO's target placement for salaries is between 90-95% comp-ratio (below the midpoint of the range). The salary recommendations also include a thorough internal equity review with employees of similar skill, experience and knowledge. For newly hired Society employees the IESO targets a placement of step 1 to 4 dependent upon the skill, experience and knowledge of the candidate. PWU employees are typically hired at step 1, however there are rare exceptions depending on the skill, experience and knowledge of the candidate.

ED INTERROGATORY 6

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-ED-6

INTERROGATORY

Reference: Exhibit B-1-2, Page 20

Preamble:

Average FTEs

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

Question(s):

a) The proposed staffing levels seem modest in comparison to staffing required to cost-effectively procure capacity and energy to meet forecast deficits, replace expiring contracts, and address economy-wide decarbonization. If it becomes clear that additional staff are necessary, what steps can be taken to ensure cost recovery?

b) How much capacity will be purchased by the IESO in 2022 (KW)? Please also provide a rough high-level estimate of the cost of that capacity over the lifetime of the contracts.

RESPONSE

a) See response to Schedule 8 – 1.1 ED 5.

b) Capacity needs are expected to be met through the planned actions identified in both the 2021 and 2022 Annual Acquisition Reports, including continued growth of the Capacity Auction, and resources secured through bilateral negotiations. Costs for bilateral negotiations are confidential. The competitive mechanisms for 2022 are underway and therefore the final capacity numbers are unknown at this time. The MT I RFP is currently in evaluation mode, the Long-Term RFQ is expected to be launched in Q2 2022, the Capacity Auction is planned to run next in 2022. The Capacity Auction is a competitive mechanism, meaning prices are not known in advance of the auction being run each year. For target capacity estimates to be purchased in 2022, see response to Schedule 8 – 1.1 ED 2(b). As the costs are determined through competitive mechanisms, the IESO does not have estimates for the costs over the contract term/commitment period length until each competition is completed.

PWU INTERROGATORY 2

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1-PWU-2

INTERROGATORY

Ref.1: Exhibit D / Tab 1 / Schedule 3 /p. 1 2

The 2021 average full-time equivalent employees (FTEs) of 774 was below budget levels due to staff attrition which was higher than budgeted. This staff attrition was prompted by labor market conditions related to the newly introduced hybrid work model and vaccination policy for IESO employees whereby the introduction of these policies contributed to an increase in voluntary attrition and retirements.

Ref.2: Exhibit D / Tab 1 / Schedule 3 /p. 1, Table 1

Table 1: Staffing and Operating Compensation Expenses

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

Questions:

a) Please explain the reasons for the variances between 2021 budget and 2021 Actual FTEs in Ref. 2 for:

   i. Management

   ii. Non-Management Regular

iii. Non-Management Temporary

b) Did the IESO make efforts to hire staff to deal with the staff attrition higher than budgeted in Ref. 1?

c) How did IESO deal with the impact, if any, of the staff attrition on its core operations and execution of initiatives? Were there initiatives that were deferred?

d) Ref 2 indicates that actual FTEs for Non-Management Regular for 2021 were less than budgeted by 26 and by 13 for Non-Management Temporary, for a total of 39. In contrast, actual FTEs for Management increased by 20 compared to budgeted. Did the increase in FTEs for Management have anything to do with the decrease in FTEs for non-Management staff? If not, what caused the increase?

RESPONSE

a) The referenced explanation provided in Exhibit D-1-3 – Staffing and Compensation holds true for all 3 categories of staffing; however, in the case of Management there was an increase compared to budget due to Non-Management staff being promoted or rotating into Management positions, as well as hiring new personnel into Management positions who had previously conducted work for the IESO as contractors.

b) Yes, the IESO has and continues to make efforts to hire staff for all existing vacancies.

c) Due to staffing attrition, there were delays in the initiation of a number of larger projects that resulted in later than anticipated project completion for some of the planned and in-flight projects. Certain lower priority initiatives were also deferred.

d) See response to a).

PWU INTERROGATORY 3

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1-PWU-3

INTERROGATORY

Ref.1: Exhibit D/Tab 1/Schedule 3 /p. 4

The Power Worker's Union (PWU) Collective Agreement expired as of April 1, 2020. Through collective bargaining, the PWU salary increases were set at 1% for the April 1, 2020 to March 31, 2021 period (one year contract). The IESO is currently in negotiations for the contract beginning April 1 2021.

Questions:

a) What wage increase for the PWU represented employees in 2022 was assumed in preparing the current application

RESPONSE

a) In alignment with Bill 124, the *Protecting a Sustainable Public Sector for Future Generations Act, 2019*, the 2022 Budget assumed a 1% wage increase for PWU represented employees.

PWU INTERROGATORY 4

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1-PWU-4

INTERROGATORY

Ref.1: Exhibit D-1-3 Attachment 3

Question:

a) Please list and describe any differences between the 2018 and the current Mercer studies in methodology including, but not limited to, the determination of the appropriate markets for comparison, the selected peer organizations, the presence of unions in the selected peer organizations, and the benchmarked positions.

RESPONSE

a) Outlined below are the differences in methodology between 2018 and the current study:

i. **Selected peer organizations:** Organizations varied due to data availability and participation in compensation surveys. Where possible, Mercer maintained consistency with the peer organizations used in the 2018 study. Three organizations were included in the energy sector relative to 2018 to provide a greater balance in representation between Ontario and Canadian comparators. Additional public sector organizations replaced those that did not participate in recent surveys. These organizations have complex unique operations and/or highly unionized workforces similar to the IESO. Private sector companies in compensation databases change significantly year-over-year, as many organizations do not participate annually. The private sector focused on financial services and engineering organizations in the Greater Toronto Area as these organizations have a workforce with a high concentration of IT roles, cyber security, data analytics, business analysts, project managers, electrical engineers, environmental engineers, financial professionals and legal professionals.

ii. **Benchmark positions:** The 2018 benchmark positions were a starting point for the selection of positions for the current study. A number of jobs changed since 2018 or no longer exist. As such, Mercer supplemented the 2018 position list with changed and new jobs to ensure sufficient representation.

iii. **Society Compensation:** The study reflected IESO compensation at the maximum step for all MP levels as the IESO is finding incumbents stay longer in jobs and are progressing to the maximum step.

SEC INTERROGATORY 9

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-SEC-9

INTERROGATORY

[D-1-3, p.1, Table 1] Please explain the significant increase in 2021, compared to budget, of the percentage of management to non-management employees.

RESPONSE

a) See response to Schedule 12 – 1.2 PWU 2(a).

SEC INTERROGATORY 10

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-SEC-10

INTERROGATORY

[D-1-3, p.1, Table 1] On average, how long is the average term of a 'non-management temporary' employee?

RESPONSE

a) The average term of a "non-management" temporary employee is 2.1 years.

SEC INTERROGATORY 11

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-SEC-11

INTERROGATORY

[D-1-3, p.2] Please explain why the Applicant believes that its attrition rate doubled in 2021 and why it believes the pre-2021 level is the appropriate assumption for 2022.

RESPONSE

a) The 2022 budget assumptions were based on attrition results observed in the first half of 2021 which were not as high as the rates experienced since that time. Over the last 12 months the labour market has been extremely competitive and as such the attrition rates have increased. The IESO did see a spike in exits in the latter part of 2021 due to the introduction of a Hybrid Work Model and the Vaccination Policy. Given that the Hybrid Model has now been normalized and the Vaccination Policy is no longer in effect, it is expected that these factors will not play a significant role in attrition going forward.

SEC INTERROGATORY 12

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-SEC-12

INTERROGATORY

[D-1-3, Attachment 3] Please provide a revised version of Appendix C that breaks down each of public sector and private sector categories into energy and non-energy comparators.

RESPONSE

a) Due to the size and limitations of the public sector sample, no breakdown was possible. See Figure 1 below.

Figure 1: Revised Appendix C Breakdown for Private Sector Category

Compensation values are stated in CAD $000s		IESO			PRIVATE SECTOR - ENERGY			PRIVATE SECTOR - NON-ENERGY		
Group	Grade	Salary[1]	TTC[2]	TREM[3]	Base Salary	TTC	TREM	Base Salary	TTC	TREM
MGT[4]	Band 3	$218	$218	$271	$185 *18%*	$232 *-6%*	$257 *5%*	$166 *31%*	$192 *14%*	$273 *-1%*
	Band 4	$169	$169	$212	$142 *19%*	$169 *0%*	$190 *12%*	$136 *24%*	$150 *12%*	$170 *25%*
	Band 5	$144	$144	$183	$142 *1%*	$164 *-12%*	$200 *-9%*	$122 *18%*	$135 *7%*	$158 *16%*
	Band 6	$92	$92	$120	$82 *13%*	$91 *1%*	$106 *13%*	$68 *36%*	$69 *33%*	$82 *46%*
	MANAGEMENT TOTAL	**$162**	**$162**	**$203**	**$142** *14%*	**$166** *-2%*	**$195** *4%*	**$127** *28%*	**$141** *15%*	**$172** *18%*
SOC	MP6	$152	$152	$198	$124 *22%*	$140 *9%*	$159 *24%*	$112 *36%*	$123 *24%*	$144 *38%*
	MP5	$142	$142	$186	$127 *13%*	$143 *0%*	$162 *15%*	$108 *32%*	$123 *16%*	$141 *32%*
	MP4	$134	$134	$175	$118 *14%*	$132 *2%*	$149 *18%*	$108 *24%*	$118 *13%*	$135 *29%*
	MP3	$125	$125	$165	$92 *36%*	$100 *25%*	$115 *44%*	$97 *29%*	$101 *24%*	$116 *42%*
	MP2	$118	$118	$155	$81 *46%*	$86 *37%*	$100 *55%*	$78 *50%*	$83 *41%*	$97 *59%*
	SOCIETY TOTAL	**$132**	**$132**	**$174**	**$113** *17%*	**$126** *5%*	**$144** *21%*	**$99** *34%*	**$108** *23%*	**$124** *40%*
PWU[5]	**PWU TOTAL**	**$92**	**$92**	**$123**	**$75** *22%*	**$78** *19%*	**$93** *32%*	**$62** *49%*	**$63** *46%*	**$76** *62%*
	OVERALL	**$134**	**$134**	**$175**	**$115** *16%*	**$130** *3%*	**$149** *17%*	**$102** *32%*	**$111** *20%*	**$130** *34%*

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

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

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

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

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

SUP INTERROGATORY 3

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-Society-3

INTERROGATORY

Reference: D-1-3 Staffing and Compensation, Page 1, Table 1 "Staffing and Operating Compensation Expenses"

As per the referenced table, management FTE's and compensation were more than 15% above budget in 2021. The 2022 budget for management FTE's and compensation are more than 13% above the 2021 budget.

a) Please explain why management FTE's and compensation are substantially higher than the 2021 budget for both 2021 actuals and the 2022 budget. Are these increases in part due to conversions of MP6 staff to management staff?
b) In contrast, non-management regular FTE's for both 2021 actuals and the 2022 budget are lower than the 2021 budget. Further, there are 4.7 non-management regular FTE's per management FTE in the 2021 budget, 3.9 in the 2021 actual, and 4.1 in the 2022 budget. Please explain why IESO has chosen to decrease the number of non-management FTE's per management FTE?
c) In 2022, the number of executive FTE's increases by 1, or more than 14% over both the 2021 actual and budget. Please explain this substantial increase in executive FTE's. If this increase is due to the substantial increase in management FTE's explored in part a) above, please explain why the existing 7 executive FTE's could not take line accountability for these additional management FTE's.

RESPONSE

a) See response to Schedule 12 – 1.2 PWU 2(a).
b) Management roles were added to address gaps in talent relative to the IESO's strategy requirements, in support of the Market Renewal Program (legal counsels), and due to increased volume of labour relations activity.
c) The increase of the executive FTE was due to a reorganization of some responsibilities on the Executive Leadership Team and the creation of a new position of Vice President, Planning, Conservation & Resource Adequacy. This change provides capacity within the role of Vice President, Markets & Reliability and Chief Operating Officer that did not exist prior to this change.

SUP INTERROGATORY 4

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-Society-4

INTERROGATORY

Reference: D-1-3 Staffing and Compensation Page 2, lns 4-8

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

a) Please provide a copy of the pension liability actuarial update report.
b) How often does IESO update its pension liability actuarial report?

RESPONSE

a) See response Schedule 1 – 1.2 OEB STAFF 9(b).
b) Valuations are filed at least every three years. See response to Schedule 1 – 1.2 OEB STAFF 9(a).

SUP INTERROGATORY 5

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-Society-5

INTERROGATORY

Reference: D-1-3 Staffing and Compensation Page 2, lns 13-19

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

a) Please provide "the IESO's actuarial provider assumption for retirement benefits plans", along with their calculations of the reduced benefit claims costs. If this is contained in a report and/ or memorandum please provide such.
b) If there is an OPEB actuarial update please provide that.

RESPONSE

a) See response to Schedule 1 – 1.2 OEB Staff 9.
b) See response to a).

SUP INTERROGATORY 6

Issue 1.2 Are the IESO's 2022 projected staffing levels and compensation (including salaries, benefits, pensions and other post-employment benefits) appropriate?

1.2-Society-6

INTERROGATORY

Reference: Exhibit D-1-3, Attachment 1 Appendix 2-K

a) For each of the four categories (ie FTE's, Total Salary and Wages, Total Benefits, Total Compensation), please break out Non-Management Regular and Non-Management Temporary into Society and PWU represented employees.

b) In the table provided to answer part a) above, please separate out pension contributions from Total Benefits

c) Does Attachment 1 include compensation costs which are capitalized? If not, please provide a version of the table created to answer parts a) and b) above for capitalized labour costs.

d) Please provide the above in an excel spreadsheet.

RESPONSE

a) The requested analysis would be onerous to produce and the IESO is unable to undertake the requested additional analysis within the timeframe provided for interrogatories within this proceeding. The IESO would be required to undertake the analysis manually as the IESO's financial software does not capture the requested detailed compensation information by jurisdiction (e.g. Management, Society and PWU). In an effort to be responsive, the IESO is able to provide Table 1 below which includes FTE and compensation by representation - Management, Society and PWU.

Table 1: FTE and Compensation by Representation

Average Full Time Equivalents (FTEs)	2021 Budget	2021 Actual	2022 Budget
Executive	7	7	8
Management	127	147	144
Society	593	557	608
PWU	67	63	67
Total IESO Core	**794**	**774**	**827**

Compensation & Benefits ($ Millions)	**2021 Budget**	**2021 Actual**	**2022 Budget**
Executive/Board	4.5	4.4	4.7
Management	25.6	29.5	28.9
Society	86.4	84.9	87.2
PWU	8.8	8.1	8.7
Total IESO Core	**125.3**	**126.9**	**129.5**

b) See response to a).

c) Compensation costs are operating only. No capitalized labour is included.

d) Given the condensed nature of Table 1 provided in response to a), an excel version was not required.

OEB STAFF INTERROGATORY 14

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1-Staff-14

INTERROGATORY

a. Exhibit B / Tab 1 / Schedule 2 / pp. 31 & 34

Preamble: Exhibit B/ Tab 1/ Schedule provides details of the IESO's 2022-2024 capital plans. OEB staff's questions relate to the following two listed capital projects: "Data Excellence Program" and "Meter Data Management System Replacement".

Questions:

a) The description of the Data Excellence Program states that "…this program establishes an evolved data management and analytics framework to support IESO business needs, and enhance third-party access to data and information."
    a. Please describe the degree to which the Data Excellence Program supports the Smart Metering Entity's (SME) efforts to provide de-identified electricity consumption data to third parties.
    b. If the project supports, in whole or in part, the SME's third-party access efforts, please describe how the IESO's intends to recover associated costs (i.e., will costs be recovered through IESO usage fees, the Smart Metering Charge or other?).
b) The description of the Meter Data Management System Replacement (MDM/R) project states the MDM/R requires replacement when it reaches end of life as an upgrade to the current version is not available.
    a. Please confirm that the MDM/R replacement is being undertaken to support the SME's business requirements. If the replacement supports another requirement, please describe it.
    b. Please describe how the IESO intends to recover the costs associated with the MDM/R replacement (i.e., will costs be recovered through IESO usage fees, the Smart Metering Charge or other?).

RESPONSE

a) The scope of the Data Excellence Program does not include any support to the Smart Metering Entity's ("SME") efforts to provide de-identified electricity consumption data to third parties that are Canadian Governmental Entities, as defined in the March 24, 2022 OEB Decision and Order. The SME is required by the *Electricity Act, 1998* to have its

own budget and fee (the Smart Metering Charge) and its third party access work is fully supported through the SME budget, with any costs incurred by the IESO (such as dedicated legal, regulatory or marketing support) recovered by the SME through an already established accounting process. The reference to "enhance third-party access to data and information" in the context of the Data Excellence Program is in relation to other IESO external parties that may benefit from better IESO data access and analytics such as Market Participants and others within the energy sector in Ontario.

b) The Meter Data Management System described in IESO's 2022-2024 capital plans is not the Meter Data Management/Repository (MDM/R) that supports the Smart Meter Entity but is rather the metering system that supports the settlement of the IESO-Administered Market.

AMPCO INTERROGATORY 7

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1.3-AMPCO-7

INTERROGATORY

Ref: EB-2020-0230 Exhibit I Tab 1.0 Schedule 2 – 1.0 AMPCO 5

Please provide the schedule and cost performance of projects closed in 2021.

RESPONSE

a) Table 1 below includes the schedule and cost performance of projects delivered in 2021 including projects included under "Other Initiatives/Projects (Less than $1 million)" in Exhibit E-2-1 – Capital Budget Overview and Progress on Capital Projects. Note that **Capital Budget** and **Approved Project Completion** include contingency.

Table 1: Schedule and Cost Performance for Capital Projects Closed in 2021

Project	Capital Budget (K$)	Actual Capital Cost (K$)	Variance (K$)	Approved Project Completion	Actual Project Completion	Variance (months)
AODA Compliance - Documents	50	45	- 5	2021/12/31	2021/10/21	-2
Backup Storage Array Refresh	341	234	- 107	2021/02/28	2021/02/08	-1
Capacity Auction	8,210	5,338	- 2,872	2022/06/30	2021/10/06	-9
Corporate PBX Phone System refresh	1,778	1,370	- 408	2021/03/28	2021/02/10	-2
DDMS Refresh	3,736	3,187	- 549	2021/12/31	2021/07/26	-5
Intrusion Prevention System (IPS) Refresh	1,517	1,134	- 382	2021/09/30	2021/09/03	-1

Project	**Capital Budget (K$)**	**Actual Capital Cost (K$)**	**Variance (K$)**	**Approved Project Completion**	**Actual Project Completion**	**Variance (months)**
ITSM Phase 2	1,473	1,193	- 280	2021/12/30	2021/11/04	-2
Lawson Upgrade	975	718	- 257	2021/03/31	2021/02/18	-1
Machine Learning Data Lab	-	83	83	2021/09/30	2021/12/09	2
Oracle Database Infrastructure Refresh	744	725	- 18	2021/08/31	2021/12/03	3
Transmission Rights Clearing Account (TRCA) Disbursement	163	137	- 26	2021/04/30	2021/04/13	-1
Web Filtering	277	195	- 82	2021/08/30	2021/05/27	-3

AMPCO INTERROGATORY 8

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1.3-AMPCO-8

INTERROGATORY

Ref: E-2-1 P2

Please provide the number and percentage of projects completed within 90% of the 2021 budget.

RESPONSE

a) Table 1 below shows the performance of capital projects delivered in 2021 as a percentage of their 2021 budget. It should be noted that allocation of budget per year for projects is a reflection of anticipated cashflow. Variance against annual budget is not necessarily a reflection of overall project performance but a reflection of timing. See response to Schedule 2 – 1.3 AMPCO 7 for overall project performance.

Table 1: Performance of 2021 Capital Projects as a Percentage of Budget

Project	2021 Capital Budget (K$)	2021 Capital Actual Spend (K$)	% of Budget	Comments
AODA Compliance - Documents	0	0	NA	No Capital budget assigned in 2021
Backup Storage Array Refresh	0	17	NA	No Capital budget assigned in 2021
Capacity Auction	100	-94	-94%	Capital spend of $0.2M in 2021 was offset by the need to expense approx. $0.3M for work that was initially capitalized earlier in the project

Project	**2021 Capital Budget (K$)**	**2021 Capital Actual Spend (K$)**	**% of Budget**	**Comments**
Corporate PBX Phone System refresh	0	1	NA	No Capital budget assigned in 2021
Dispatch Data Management Systems Refresh (DDMS)	100	356	356%	
Intrusion Prevention System (IPS) Refresh	180	74	41%	
ITSM Phase 2	560	944	169%	
Lawson Upgrade	190	19	10%	
Machine Learning Data Lab	0	83	NA	No Capital budget assigned in 2021
Oracle Database Infrastructure Refresh	400	725	181%	
Transmission Rights Clearing Account (TRCA) Disbursement	0	14	NA	No Capital budget assigned in 2021
Web Filtering	120	97	81%	

1

AMPCO INTERROGATORY 9

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1.3-AMPCO-9

INTERROGATORY

Ref: Appendix 2-AA

Please add the following columns to Appendix 2-AA.

a) Actual Spend Previous Years.
b) Forecast Spend Beyond 2022.
c) Provide an excel version of Appendix 2-AA.

RESPONSE

a) See Attachment 1 to this Exhibit.
b) See response to a).
c) See response to a).

CME INTERROGATORY 4

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1.3-CME-4

INTERROGATORY

Ref: Exhibit E, Tab 1, Schedule 2, pp. 3 and 4 of 4

At p. 2, Table 1, the IESO states that it scores, ranks and prioritizes the projects according to a number of criteria, including mitigation of risk and business value. The IESO explains that it "scores ranks and prioritizes" the projects accordingly. CME would like to better understand the scoring of these projects.

a) Are all criteria scored in the same fashion (for example, each one is a score out of 100?);

b) Are all of the criteria equally weighted? If not, please provide the relative weighting of each criteria;

c) Are ranks and prioritization of projects determined simply as the result of the highest scoring projects, or are there additional considerations that go into ranking at this stage (CME understands from the IESO's evidence that resource capacity and resource needs are established after the ranking and prioritization portion).

d) With respect to measurement of actual cost and schedule, are they measured against the original approved project values, or against whatever superseding values that may be approved during the course of the project?

e) What impact does the deferral of significant capital spending, such as the $18.3 million underspend in 2021 due to, inter alia, delays in larger projects, have on the project prioritization process going forward?

RESPONSE

a) Table 1 below shows each of the criteria used for prioritization and their associated weighting. Each project submission is assessed against each of the criteria as either High, Medium, Low or None and assigned scores of 10, 7, 3 or 0 respectively. The resulting project scores, once weighted and summed are out of a total of 1000.

Table 1: Prioritization Criteria

Category	Criteria	Weighting
Strategic Alignment	Supports the achievement of one or more core strategies or IESO Identity	30
Business Value	Benefit Realization	25
Risk	Mitigation of Strategic Risk(s)	30
Deliverability	Multi-Year Dependency	10
	Project Complexity/degree of Impact	5

These criteria and associated weightings were used to support the prioritization of projects in the 2022-2024 Business Plan.

b) See response to a).

c) The overall prioritization of projects considers other factors in addition to the quantitative assessment (or relative ranking) described above. These factors include availability of human resources to support the projects, interdependencies between projects, externally driven timelines, such as regulatory compliance dates, risk of deferring certain projects, such as the need to take on extended maintenance for refresh projects. The IESO also considers the appropriate mix of projects that drive strategic objectives and those that maintain critical business systems and services. All of these factors influence the proposed portfolio of projects each year.

d) Project Measurement is performed against the latest approved cost budget and schedule, which could include approved changes to the original project baselines.

e) Delays in the initiation of larger projects can have downstream impacts on other projects that have either technical or resource interdependencies with these projects. Significant delays could reduce the collective capacity to advance other planned projects as anticipated in subsequent years of the business plan as in-flight projects are given a priority over new projects. The IESO looks at ways to reduce these impacts such as assessing opportunities for schedule compression and, where appropriate, to reduce scope of the in-flight projects. The IESO also confirms that the in-flight project is still aligned to strategic objectives and will deliver the expected value.

EDA INTERROGATORY 3

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1.3-EDA-3

INTERROGATORY

Evidence Reference: ExB-T1-S2-Page 19, 27 / ExB-T1-S2-Appendix3 / ExD-T1-S2-Page 4 / ExG-T2-S2-Page 4

Preamble

Cyber Security is identified as a high-level risk in the Affordability, Reliability, and Sustainability assessment of strategic risks. In the IESO's 2022-2024 Business Plan and priorities Cyber Security tools are identified as "core business projects" in the total capital envelope budget.

Questions

a) Please provide the IESO's proposed 2022, 2023 and 2024 budget amounts for core operating initiatives associated with creating, maintaining, and enhancing strong cyber security conditions and partnerships. Please provide the data in the format that the revenue requirement is presented in.

b) Please confirm that the IESO's proposed capital spending for 2022-2024 does not include amounts specific to or related to cyber security.

c) Please provide the portion of IT operating costs in 2022 that relate to cyber security.

RESPONSE

a) See Table 1 below for the IESO's proposed 2022, 2023 and 2024 budget amounts for core operating initiatives associated with creating, maintaining, and enhancing strong cyber security conditions and partnerships, that were included in the IESO's 2022-2024 Business Plan. The 2022 Budget amount is also reflected in Exhibit D-1-1 Attachment 3 – OM&A Business Unit Table (Appendix 2-JC).

Table 1: Information Security Business Unit Budget

($ Millions)	2022 Budget	2023 Budget	2024 Budget
Compensation & Benefits	2.8	2.9	3.0
Professional & Consulting	1.8	1.8	1.8
Operating & Administration	0.1	0.1	0.1
Information Security Total	**4.7**	**4.8**	**4.9**

b) The IESO's capital spending in 2022-2024 does include amounts specific to cybersecurity including the following projects: Antivirus Replacement Project, Advanced Malware Refresh and Aruba Introspect Refresh which are discussed in Exhibit B-1-2 – 2022-2024 Business Plan, pg. 30-35.

c) See response to a).

EP INTERROGATORY 9

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1.3-Energy Probe-9

INTERROGATORY

Ref.: Exhibit E Tab 2 Schedule 1 Table 3 &Attachments 1-5

a) Please provide a schedule with the list of current major Capital Projects, including Approved Cost, Contingency, Current estimate, Variation, Cost to Complete and Completion Date:
   - Replacement of Settlement System (RSS)
   - Market Renewal Program Energy Stream (MRP)
   - Capacity Auction Project (CAP)
   - Dynamic Limits in Real-Time (DLRT)
   - Market Analysis and Simulation Toolset (MAST)
   - Other Capital Projects (<$2 million each)

b) Please provide the DRLT detailed NPV analysis (in confidence if necessary)

RESPONSE

a) Table 1 below includes all current (in-flight) Capital Projects greater than $1 million as described in Exhibit B-1-2 – 2022-2024 Business Plan, pg. 31-35.

Table 1: In-Flight Capital Projects

Project Name	Capital Budget	Contingency	Total Budget including Contingency	Current Estimate at Completion	Variance	Cost to Complete	Completion Date
Addressing Market Surveillance Panel (MSP) Recommendations	N/A	N/A	N/A	$2.3M	N/A	$1.9M	N/A

Centralized Alarm Management System Replacement	$4.4M	$0.8M	$5.3M	$5.0M	-$0.3M	$1.4M	Q1 2023
Core Network Refresh	$3.9M	$0.9M	$4.8M	$4.8M	$0.0M	$4.8M	Q2 2025
Data Excellence Program	$3.0M	$0.0M	$3.0M	$2.6M	-$0.4M	$1.3M	Q2 2024
Data Historian Expansion and Upgrade	N/A	N/A	N/A	N/A	N/A	N/A	TBD
Dynamic Limits in Real-Time	$2.9M	$1.7M	$4.6M	$3.5M	-$1.1M	$3.4M	Q1 2025
Enabling Resources Program	$8.2M	$0.8M	$9.0M	$8.2M	-$0.8M	$8.2M	Q4 2026
Enterprise Antivirus Replacement	$2.5M	$0.2M	$2.7M	$2.4M	-$0.3M	$2.4M	Q3 2023
Long Term Demand Forecast Tool Replacement	N/A	N/A	N/A	N/A	N/A	N/A	TBD
Market Analysis and Simulation Toolset (MAST)	$4.9M	$1.5M	$6.4M	$4.7M	-$1.7M	$4.6M	Q3 2025
Network Performance	$2.8M	$0.3M	$3.1M	$2.8M	-$0.3M	$2.8M	Q2 2023

Monitoring and Diagnostic (NPMD) Solution							
PMU Integration - Phase 3	N/A	N/A	N/A	N/A	N/A	N/A	TBD
Replacement of the Settlement Systems	$28.3M	$8.5M	$36.8M	$32.0M	-$4.8M	$11.2M	Q2 2025
Resource Adequacy Program	$3.3M	$0.3M	$3.6M	$3.2M	-$0.4M	$1.0M	Q4 2023
SCADA/Energy Management System (EMS) Upgrade	$12.1M	$2.3M	$14.3M	$12.4M	-$1.9M	$2.3M	Q1 2023
Transmission Rights Market Enhancement and Platform Refresh	$2.3M	$0.0M	$2.3M	$1.7M	$0.0M	$1.7M	Q3 2025
Wide Area Visualization Environment (WAVE) - Phase 2	$2.8M	$0.4M	$3.2M	$2.3M	-$0.9M	$1.1M	Q4 2024
Market Renewal Program	$136.3M	$10.0M	$146.3M	$146.3M	$0.0M	$77.7M	Q4 2023

Notes:

i. The values in Table 1 reflect capital costs only.
ii. Capacity Auction project is completed so is not shown in Table 1.
iii. Addressing Market Surveillance Panel (MSP) Recommendations is a portfolio of initiatives to develop, evolve and address inefficiencies in the electricity market in response to observations by the MSP and other stakeholders. This item represents an allocated budget to advance work that is done in response to MSP Recommendations.
iv. The Resource Adequacy Program reflects the capital costs and completion date associated with the Capacity Auction Enhancements Project. There are no capital costs associated with the Requests for Proposals.
v. Transmission Rights Market Enhancement and Platform Refresh Project is in the planning stage and no specific contingency amount has been assigned.
vi. **Capital Budget** reflects the amount formally approved by the IESO for the project and not the budget allocated in Exhibit B-1-2 – 2022-2024 Business Plan, pg. 31-35. "N/A" is shown where the project has not completed the Initiation Phase, i.e. is not yet formally approved.
vii. **Current Estimate** is the total estimate at completion for the project.
viii. **Variance** is the difference between the **Current Estimate at Completion** and the approved **Total Budget including Contingency.**

b) The NPV analyses for the DLRT project have been provided as Attachment 1 and Attachment 2 to this Exhibit. The NPV analyses are for alternative 2 and alternative 3 as described in Exhibit E-2-1 Attachment 2 – Project Charter (DLRT), pg. 25-26.

Net Present Value (NPV) Calculator:

A. Project information and Key Financial Rates:

Project Name:	**Dynamic Limits in Real-Time (DLRT) (Alt 2)**	
Recommended Option:		
Useful Life:	**5**	Years
IESO Labour Rate	**$110**	per hour
Cost of Capital - Year 0 (Current Year)	**1.13**	%
Cost of Capital - Year 1	**1.13**	%
Cost of Capital - Year 2 to Year 7	**2.75**	%

Enter the Annual Total Cash Flows below:

B. EXPENDITURES (cash outflow):

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Estimated Project Cost: (Analysis, design, build, implement)	367,107	2,096,947	1,362,244	82,108				

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Ongoing Maintenance $ Projected (after project is implemented)			77,970	138,459	169,047	191,023	215,856	243,917

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Labour Added: FTEs (after project is implemented) (Calculation based on 1496 working hours/FTE)								
Labour: $	$0	$0	$0	$0	$0	$0	$0	$0

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Other post implementation costs - itemize below								

	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Total Expenditures	**$367,107**	**$2,096,947**	**$1,440,214**	**$220,567**	**$169,047**	**$191,023**	**$215,856**	**$243,917**
Present Value of Expenditure:	**$367,107**	**$2,073,516**	**$1,364,154**	**$203,327**	**$151,663**	**$166,792**	**$183,431**	**$201,729**

C. SAVINGS (cash inflow):

Savings must be quantifiable, measurable and verifiable.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Labour Avoided or Reduced: FTEs (after project is implemented) (Calculation based on 1496 working hours/FTE)					0	0	0	0
Labour: $	$0	$0	$0	$0	$0	$0	$0	$0

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Maintenance $ Avoided (after project is implemented)								

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Monetized Internal Efficiency Gains (after project is implemented)								

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Monetized External Efficiency Gains (after project is implemented)				1,350,000	1,500,000	1,500,000	1,500,000	1,500,000

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Other - itemize below								

	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Total Savings	**$0**	**$0**	**$0**	**$1,350,000**	**$1,500,000**	**$1,500,000**	**$1,500,000**	**$1,500,000**
Present Value of Saving:	**$0**	**$0**	**$0**	**$1,244,481**	**$1,345,749**	**$1,309,731**	**$1,274,677**	**$1,240,562**

D. Net Present Value Analysis Results:

Present Value of Expenditures:	$4,711,720
Present Value of Savings:	$6,415,200
Net Present Value of Project Alternative	**$1,703,480**

Net Present Value (NPV) Calculator:

A. Project information and Key Financial Rates:

Project Name:	**Dynamic Limits in Real-Time (DLRT) (Alt.3)**	
Recommended Option:		
Useful Life:	**5**	Years
IESO Labour Rate	**$110**	per hour
Cost of Capital - Year 0 (Current Year)	**1.13**	%
Cost of Capital - Year 1	**1.13**	%
Cost of Capital - Year 2 to Year 7	**2.75**	%

Enter the Annual Total Cash Flows below:

B. EXPENDITURES (cash outflow):

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Estimated Project Cost: (Analysis, design, build, implement)	301,860	2,280,878	186,071	7,656				

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Ongoing Maintenance $ Projected (after project is implemented)			77,970	138,459	169,047	191,023	215,856	243,917

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Labour Added: FTEs (after project is implemented) (Calculation based on 1496 working hours/FTE)				1	1	1	1	1
Labour: $	$0	$0	$0	$164,560	$164,560	$164,560	$164,560	$164,560

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Other post implementation costs - itemize below								

	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Total Expenditures	**$301,860**	**$2,280,878**	**$264,041**	**$310,675**	**$333,607**	**$355,583**	**$380,416**	**$408,477**
Present Value of Expenditure:	**$301,860**	**$2,255,392**	**$250,097**	**$286,392**	**$299,301**	**$310,479**	**$323,272**	**$337,827**

C. SAVINGS (cash inflow):

Savings must be quantifiable, measurable and verifiable.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Labour Avoided or Reduced: FTEs (after project is implemented) (Calculation based on 1496 working hours/FTE)					0	0	0	0
Labour: $	$0	$0	$0	$0	$0	$0	$0	$0

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Maintenance $ Avoided (after project is implemented)								

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Monetized Internal Efficiency Gains (after project is implemented)								

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Monetized External Efficiency Gains (after project is implemented)								

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Other - itemize below								

	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Total Savings	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Present Value of Saving:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

D. Net Present Value Analysis Results:

Present Value of Expenditures:	$4,364,619
Present Value of Savings:	$0
Net Present Value of Project Alternative	**-$4,364,619**

SEC INTERROGATORY 13

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1.3-SEC-13

INTERROGATORY

[E-2-1, p.2] Please provide a table that shows for each capital project that was completed in 2021 or forecast to be completed in 2022, the original budgeted amount for the project, all revised project budgets, and actual or forecast final budget amounts for the project. Please provide an explanation regarding the variances.

RESPONSE

a) Table 1 below indicates the variance against approved budget for projects completed in 2021 and forecast to complete in 2022 along with description of material variances. Also included are projects with capital expenditures in 2022 where the project is forecast to be completed in future years. Note that **Capital Budget** includes contingency.

Table 1: 2021 Completed Capital Projects and Forecast Capital Projects

2021				
Project	**Capital Budget (K$)**	**Actual Capital Cost (K$)**	**Variance (K$)**	**Variance**
AODA Compliance - Documents	50	45	- 5	Non-material variance.
Backup Storage Array Refresh	341	234	- 107	Cost saving on backup storage equipment.
Capacity Auction	8,210	5,338	- 2,872	The final phase of the project was removed from scope and is being completed under the new Capacity Enhancements Project.
Corporate PBX Phone System refresh	1,778	1,370	- 408	Cost of hardware, IESO labour and vendor services were lower than estimated

				and use of contingency was not required.
DDMS Refresh	3,736	3,187	- 549	Only a small amount of assigned contingency was required to support remote testing due to COVID restrictions.
Intrusion Prevention System (IPS) Refresh	1,517	1,134	- 382	Automated testing was not required as planned along with reduced procurement, implementation and project management labour effort and interest on capital costs. None of the approved contingency was required.
ITSM Phase 2	1,473	1,193	- 280	Use of approved contingency was not required.
Lawson Upgrade	975	718	- 257	Use of approved contingency was not required.
Machine Learning Data Lab	-	83	83	Work is being conducted under the Data Excellence Program.
Oracle Database Infrastructure Refresh	744	725	- 18	Non-material variance.
Transmission Rights Clearing Account (TRCA) Disbursement	163	137	- 26	Non-material variance.
Web Filtering	277	195	- 82	IESO Labour less than budgeted and approved contingency was not required.
2022				
Project	**Capital Budget (K$)**	**Forecast Capital Cost (K$)**	**Variance (K$)**	**Variance**

Addressing MSP Recommendations - Improving Accessibility of Operating Reserve	97	96	- 1	Non-material variance.
Centralized Alarm Management System Replacement	5,260	4,967	-293	Project required use of contingency to upgrade to compatible hardware once final design of SCADA /EMS Upgrade was known. Contingency had been assigned to address this specific event
SCADA/Energy Management System (EMS) Upgrade	14,463	12,400	-1,943	Project has utilized some of the approved contingency to address increased costs due to vendor delays.
2023 and Beyond				
Project	**Capital Budget (K$)**	**Forecast Capital Cost (K$)**	**Variance (K$)**	**Variance**
Replacement of the Settlement Systems	36,815	31,981	-4,834	Planned Completion – 2025 The project has approved project contingency due to vendor change requests arising from User Acceptance Testing.
Data Excellence Program	3,000			Planned completion – 2023 Variance reflects minor revisions to scope.
Wide Area Visualization Environment (WAVE) - Phase 2	3,182	2,289	-893	Planned completion – 2023 Variance reflects reduction in internal labor costs.
Dynamic Limits in Real-Time	4,602	3,548	-1,054	Planned completion – 2025 Variance reflects approved contingency. The project

				does not anticipate the use of approved contingency at this time.
Network Performance Monitoring and Diagnostic (NPMD) Solution	3,102	2,799	-303	Planned completion – 2023 Variance reflects approved contingency. The project does not anticipate the use of approved contingency at this time.
Antivirus Replacement	2,683	2,438	-245	Planned completion – 2023 Variance reflects approved contingency. The project does not anticipate the use of approved contingency at this time.
Capacity Auction Enhancements (as part of the Resource Adequacy Program)	3,598	3,278	-320	Planned completion – 2023 Variance reflects approved contingency. The project does not anticipate the use of approved contingency at this time.
Long Term Demand Forecast Tool Replacement	N/A	N/A	N/A	Project not yet Initiated
Core Network Refresh	4,765	3,604	-1,161	Planned completion – 2025 Variance reflects approved contingency. The project does not anticipate the use of approved contingency at this time.
PMU Integration – Phase 3	N/A	N/A	N/A	Project not yet Initiated
Data Historian Expansion and Upgrade	N/A	N/A	N/A	Project is in the Initiation Phase and has not yet been approved
Transmission Rights Auction (TRA) Platform Refresh	2,300	1,706	-594	Planned completion – 2024

				Variance reflects approved contingency. The project does not anticipate the use of approved contingency at this time.

1

SEC INTERROGATORY 14

Issue 1.3 Is the IESO's 2022 capital expenditure envelope of $71.2 million for capital projects for Fiscal Year 2022 appropriate?

1.3-SEC-14

INTERROGATORY

[E-2-1, p.2] Please provide a similar table requested in **1.3-SEC-X** regarding any project in which capital expenditures are forecast to be spent in 2022, but which the project is not expected to be completed in the year.

RESPONSE

a) See response to Schedule 13 – 1.3 SEC 13.