STANDING COMMITTEE ON PUBLIC ACCOUNTS

Chapter 3, Public Accounts of the Province
Key Messages, Q&A Response and Issues
February 2018

KEY MESSAGES

- We remain committed to working with the Office of the Auditor General and respectfully reviewing the independent views it provides to the Legislative Assembly.

- However, we disagree with a number of the report's findings, including:

    - The characterisation of certain electricity reliability programs – programs that ensure Ontario families and businesses have an electricity system they can count on every second of every day; and

    - The comments on the Industrial Conservation Initiative (ICI).

- We are confident in the Ontario Energy Board (OEB) and the Independent Electricity System Operator (IESO), both of whom play vital roles in ensuring an efficient, fair and reliable electricity market for ratepayers across the province.

- According to IESO, both programs that are the subject of the Auditor General's analysis are required for system reliability and ensure we continue to meet North American reliability standards.

- If these programs were eliminated, reliability would be put at risk.

Industrial Conservation Initiative (ICI):

- The Industrial Conservation Initiative (ICI) benefits electricity consumers by reducing demand at peak periods, helping to reduce the need to build more peaking electricity generation in the long-term.

- Our electricity system is planned to ensure we have enough generation to meet peak demand.

- By keeping peak system demand as low as it can be, we can avoid building costly new generation.

- This makes the system more cost-effective for all ratepayers.

- Our system operator estimates that this program reduced peak demand by about 1,300 megawatts in 2016 – the peak electricity demand of a city roughly the size of Mississauga.

- The Ministry of Energy continues to monitor and report on the impact of the ICI program on the electricity system, including reductions in peak demand and impacts on all classes of electricity consumers.

- The results of the ICI program can be seen in monthly Independent Electricity System Operator (IESO) reports and the quarterly Ontario Energy Report.

Additional Legislative Power for OEB, MSP and MACD:

- We are confident in the Ontario Energy Board (OEB) and the Independent Electricity System Operator (IESO), both of whom play vital roles in ensuring an efficient, fair and reliable electricity market for ratepayers across the province.
- We welcome and appreciate the recommendations of the Auditor General and agree with the need for effective and strong electricity market oversight in Ontario.
- We are working closely with IESO and OEB to ensure effective market oversight mechanisms, including the investigatory powers of MSP and Market Assessment and Compliance Division (MACD) and the role and authority of OEB in the market rule amendment process, particularly in instances of potential abuse of the market rules.
- This year, Ontario is undertaking a review of OEB to build on its mandate and prepare for the future of the electricity sector. Market oversight is an important factor as modernization of OEB progresses.
- The Ministry plans to meet with the OEB modernization panel to discuss these issues later this month.

Real-Time Generation Cost Guarantee (RT-GCG) and Congestion Management Settlement Credit (CMSC) Programs:

Instances of Generators Claiming Ineligible Costs

- Our system operator continues to take strong action when market participants contravene the market rules – it investigates and imposes fines, recovers ineligible claims and returns these funds to Ontario ratepayers.
- All actions taken put the ratepayer first by aiming to maintain reliability and reduce costs. This includes striving to recoup the maximum amount of costs, while minimizing legal fees.
- Both programs are required to keep the grid stable. If these programs were removed, reliability would be put at risk.

Next Steps for the Electricity Market

- Our system operator is working to transform our electricity market.
- The Market Renewal initiative is expected to result in a more competitive marketplace that meets our system's needs while increasing flexibility and efficiencies.
- It is projected that Market Renewal will save up to $5.2 billion over 10 years.

- Market Renewal will replace the Real-Time Generation Cost Guarantee (RT-GCG) program and Congestion Management Settlement Credits (CMSC) with more efficient and transparent mechanisms.

Interim Steps until IESO's Market Renewal Takes Hold

- Until this transformation is complete, our system operator remains committed to ensuring the current electricity market continues to be improved and operates fairly and efficiently for ratepayers across the province.

- Due to ongoing changes and improvements, programs are more efficient today – with the total cost of the Real-Time Generation Cost Guarantee program dropping from $61 million in 2014 to $23 million in 2016 and $22 million in 2017– a more than approximately 60 per cent cut in program costs over the course of two years.

- In addition, our system operator will continue to prioritize reliability, and optimize programs within the existing electricity system framework.

- Working with the Ontario Energy Board (OEB) and our system operator, we are undertaking a review of the Electricity Act (1998) – focusing on how market rules are approved.

- We will also review the Ontario Energy Board's authority regarding the enforcement of electricity market rules and the response to abuses of these rules.

- To ensure that our system operator can effectively conduct its investigations, we are working together regarding the potential need for additional legislative powers to assist our system operator in performing its critical responsibilities.

Cybersecurity:

- Our system operator complies with all applicable North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection standards, which include standards for cybersecurity.

- A recent audit from The North American Electric Reliability Corporation found that the IESO is fully compliant with continent-wide operating standards, including recently introduced cyber asset protection rules that represent significant progress in mitigating cyber risks to the bulk power system. The electricity sector is unique as the only critical infrastructure sector with mandatory and enforceable cybersecurity standards.

- Our system operator takes this very seriously, and is already in the process of recruiting a new Chief Information Officer (CIO) with an increased focus on cybersecurity.

- Our system operator will also consider creating a senior-level position for cybersecurity with formal reporting to both the system operator's executive leadership and Board of Directors.

- Our system operator is working to implement an independent consultant's recommendation to increase the number of current cybersecurity staff in a manner in line with the Auditor General's recommendation.

Q&AS RESPONSE

Industrial Conservation Initiative (ICI)

Q. What changes were made to the Industrial Conservation Initiative (ICI) as part of Ontario's Fair Hydro Plan?

Industrial Conservation Initiative (ICI) is a demand response program and cost allocation mechanism that was introduced in 2011 following consultation with our stakeholders.

ICI allows large electricity consumers to lower their electricity costs by reducing their demand during peak hours. This benefits companies financially, but it also benefits the electricity system by reducing the need for peaking generation, which reduces system costs that would otherwise need to be recovered from all Ontario ratepayers. It's a voluntary program and eligible consumers are able to opt in or out in June of each year.

As part of Ontario's Fair Hydro Plan (OFHP), ICI has been expanded to include smaller manufacturers and greenhouses with peak demand between 500 kW and 1 MW, in addition to the consumers over 1 MW who were already eligible.

- The smaller manufacturing and greenhouse consumers include those with North American Industry Classification System (NAICS) codes starting with 31-33 and 1114.

- Newly eligible participants would have begun to see the impact on their July 2017 bills.

This was in addition to an earlier regulatory amendment, effective January 2017, which had expanded the ICI to all consumers over 1 MW of average monthly peak demand.

Prior to these two expansions, there were approximately 300 ICI participants. For the current adjustment period there are approximately 1,100 participants, many of which would not have previously been eligible but realized they could benefit their companies or organizations by opting in to the program as a result of the expansions.

Q. The AG Report states that the ICI program is "shifting a significant amount of the global adjustment charge from large industrial ratepayers to residential and small-business ratepayers". Is it fair that these classes of ratepayers are subsidizing electricity costs of big businesses?

The Industrial Conservation Initiative (ICI) is about fairness for electricity consumers – large and small.

Consumers who are drawing electricity from the system at times of peak demand in the province pay a larger proportion of the costs.

Similarly, consumers who are contributing the least to peak electricity demand pay a smaller portion of these related costs.

This program reduces the need for additional investments in expensive electricity generation infrastructure – benefiting all ratepayers.

Our system operator estimates that this program reduced peak demand by about 1,300 megawatts in 2016 – the peak electricity demand of a city roughly the size of Mississauga. This program helped us reduce peak demand in the province. Reduced peak demand has allowed us to suspend procurements such as LRP II, saving ratepayers $3.8 billion in costs for the electricity system.

The Ministry of Energy continues to monitor and report on the impact of the ICI program on the electricity system, including reductions in peak demand and impacts on all classes of electricity consumers.

The results of the ICI program can be seen in monthly Independent Electricity System Operator (IESO) reports and the quarterly Ontario Energy Report.

If pressed, additional details on the peak reduction:

- The peak demand reduction associated with ICI is equivalent to:
    - The peak demand of a city roughly the size of Mississauga[1];
    - Nearly 6 per cent of province-wide peak demand[2];
    - Two gas plants the size of Halton Hills Generating Station west of the Greater Toronto Area[3]; or
    - Nearly three times the amount of demand response that cleared the market in the most recent auction held by the Independent Electricity System Operator (IESO) in December 2016[4].

Q. Will you review the impact of the ICI on low-volume consumers and report it, as recommended by the OAG?

Ontario's Fair Hydro Plan's significant savings for residential consumers and as many as half a million small businesses and farms will not be impacted by this program's expansion.

Ontario's Fair Hydro Plan reduced electricity bills for residential consumers by an average of 25 per cent and will hold any increases to the rate of inflation for four years.

Information related to Global Adjustment (GA) and the allocation of costs and consumption for each class of electricity consumer is published by the Independent Electricity System Operator (IESO) on a monthly basis.

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[1] According to the IESO and data from the OEB's 2016 Yearbook, peak demand for Mississauga in the summer of 2016 was 1,455 MW. http://www.ieso.ca/power-data/demand-overview/historical-demand

[2] According to the IESO, peak demand in Ontario was 23,213 MW in 2016 – therefore 1,300 MW represents about 6%.

[3] Halton Hills Generating Station provides 683 MW of capacity – therefore 1,300 MW is approximately twice this amount. https://www.transcanada.com/globalassets/pdfs/power/halton-hills/transcanada-hh-fact-sheet.pdf

[4] The 2016 DR Auction totaled 455 MW for the summer commitment period – therefore 1,300 MW is approximately three times this amount. http://www.ieso.ca/corporate-ieso/media/news-releases/2016/12/ieso-announces-results-of-demand-response-auction

- Specifically, the information published includes total GA, GA allocated to Class A and Class B, and demand allocated to Class A and Class B[5].

The Ministry of Energy continues to monitor and report on the impact of the ICI program on the electricity system, including reductions in peak demand and impacts on all classes of electricity consumers.

The results of the ICI program can be seen in monthly Independent Electricity System Operator (IESO) reports and the quarterly Ontario Energy Report.

Q. What is the history of ICI and what benefits does it provide to the electricity system?

The Industrial Conservation Initiative (ICI) is an electricity demand response program and cost allocation mechanism that was implemented in 2011 following consultation with industry partners and the public.

Consumers who are drawing electricity from the system at times of peak demand in the province pay a larger proportion of the costs.

Similarly, consumers who are contributing the least to peak electricity demand pay a smaller portion of these costs.

It's a voluntary program and eligible consumers are able to opt in or out in June of each year.

Initially, this program was available to consumers with peak demand above five megawatts. Since 2011, the program has been expanded three times:

- Effective July 2015, extended to consumers operating in select electricity-intensive sectors with average monthly peak demand greater than 3 megawatts.

- Effective July 2017, extended to all consumers with average monthly peak demand greater than 1 megawatt.

- Effective July 2017, extended to manufacturers and greenhouses with average monthly peak demand greater than 500 kilowatts.

In addition to the cost savings for participating businesses and organizations –a 1/3 cut in their electricity costs on average – the program provides a number of system benefits.

First, the ICI benefits electricity consumers by reducing demand at peak levels, helping to delay the need for more electricity generation in the long-term.

Second, it better aligns consumer costs with their contribution to those costs. Under the program, consumers who are drawing electricity from the system at times of peak demand in the province pay a larger proportion of the costs. This is fair because they are contributing to the incurrence of electricity system costs associated with higher peak demand.

Lastly, ICI allows participants to reduce electricity costs by one third on average, helping to keep our large electricity consumers in the province – these consumers continue to contribute towards fixed electricity system costs, such as the capital costs of new generation that would otherwise be the responsibility of remaining consumers.

We have partnered with the Ontario Chamber of Commerce (OCC) and Canadian Manufacturers and Exporters (CME) to ensure that all Ontario businesses are aware of the benefits of this program.

Q. How does the Ministry of Energy monitor the Industrial Conservation Initiative (ICI)?

The Ministry of Energy collects information and data on the Industrial Conservation Initiative (ICI) primarily from our system operator and Local Distribution Companies (LDCs).

Information related to Global Adjustment (GA) and the allocation of costs and consumption for each class of electricity consumer is published by the Independent Electricity System Operator (IESO) IESO on a monthly basis.

- Specifically, the information published includes total GA, GA allocated to Class A and Class B, and demand allocated to Class A and Class B[6].

The Ministry also receives information from IESO and LDCs regarding the number of ICI participants.

Since ICI is a form of demand response (i.e., allows participating customers to manage their GA costs by reducing demand during peak periods), IESO also reports on the peak reduction associated with ICI. In 2016, ICI is estimated to have reduced peak demand by 1,300 MW[7]. This estimate is reported in number of publications, including IESO's ICI Backgrounder and the 18-Month Outlook.

The Ministry continues to monitor and report on the impact of the ICI program on the electricity system, including reductions in peak demand and impacts on all classes of electricity consumers.

The results of the ICI program can be seen in monthly Independent Electricity System Operator (IESO) reports and the quarterly Ontario Energy Report.

Q. Do you think the cost shift to non-ICI participants is in reasonable? What is actual cost shift?

Industrial Conservation Initiative (ICI) is about fairness for electricity consumers – large and small. Through the program, the consumers who contribute the least to peak demand pay a smaller portion of costs associated with electricity generation, conservation and demand management programs.

In addition, because ICI provides a reduction in Ontario peak demand, it helps defer the need to build expensive new peaking generation facilities in the longer term and reduces costs for all ratepayers across the province: residential, commercial and industrial.

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[6] http://www.ieso.ca/en/sector-participants/settlements/global-adjustment-components-and-costs

[7] http://www.ieso.ca/-/media/files/ieso/document-library/global-adjustment/ici-backgrounder.pdf?la=en

By keeping peak system demand low, we are making the system more cost-effective for all ratepayers into the future. Simply put, ICI is fair because it is designed to match each customer's share of costs with their contribution to those costs.

If pressed on the amount of the cost shift:

For the 2017 calendar year, Global Adjustment (GA) charges paid by Class A electricity consumers were about $1.2 billion lower than they would have been if the program was not in place (i.e., GA was charged volumetrically for all consumers).

In the report, the AG noted the Market Surveillance Panel's (MSP) estimate that GA for Class A was reduced by almost $245 million in the first 10 months of the program (i.e., in 2011). The AG also notes that, given the expansions of the program that this amount has increased.

<u>Market Surveillance Panel's – Recommendations</u>

Q. Why didn't the Ministry respond to the recommendations of the Market Surveillance Panel (MSP)?

We are confident in the Ontario Energy Board (OEB) and the Independent Electricity System Operator (IESO), both of whom play vital roles in ensuring an efficient, fair and reliable electricity market for ratepayers across the province.

The Ministry of Energy is committed to effective and strong electricity market oversight in Ontario.

The Ministry is briefed on all Market Surveillance (MSP) reports, including monitoring and investigations. The Ministry discusses the recommendations and status of actions taken to address them with the Independent Electricity System Operator (IESO).

IESO has made numerous revisions to the market rules in response to MSP recommendation, and continues to work to analyze and assess the recommendations and consider possible amendments to market rules, while balancing the need to ensure electricity system reliability and consider any unintended adverse effects.

The Ministry is continuing to work closely with IESO and the Ontario Energy Board (OEB) to ensure effective and strong market oversight mechanisms, including reviewing the market rule amendment process and ensuring that any issues raised by MSP are effectively addressed in a timely fashion.

<u>MACD Investigations</u>

Q. Do you have the authority to direct IESO to investigate a market participant?

In accordance with the requirement for independence in the investigation process, the Ministry of Energy does not have the specific authority to direct investigations undertaken by the Independent Electricity System Operator (IESO) or Market Assessment and Compliance Division (MACD).

Market oversight in Ontario is undertaken by three independent bodies:

- Ontario Energy Board (OEB),
- OEB's Market Surveillance Panel (MSP);
- IESO's Market Assessment and Compliance Division.

Each plays a vital role in ensuring an efficient, fair and reliable electricity market for ratepayers across the province:

- OEB is the independent regulator for the energy sector with a mandate to protect the interests of consumers and provide advice to the government. The Minister of Energy has the general authority to direct OEB to review the market rules or market participant licenses in order to address possible abuse of market power.
- OEB's MSP monitors, investigates and reports on activities and behaviour in IESO-administered markets, including how well the market is functioning.
- MACD, an independent branch within IESO, works to foster compliance with the market rules, monitors the markets for anomalous or inappropriate behaviour by market participants, and is authorized to impose sanctions (i.e., financial penalties) for failure to comply with the market rules. MACD staff also support MSP in its analysis and investigations.

We are confident in the ability of OEB, MSP and MACD to ensure a fair, efficient and reliable electricity market and remain committed to working collaboratively to ensure effective and strong electricity market oversight in Ontario.

The Ministry is continuing to work closely with IESO and the Ontario Energy Board (OEB) to ensure effective and strong market oversight mechanisms, including reviewing the market rule amendment process and ensuring that any issues raised by MSP are effectively addressed in a timely fashion.

Additional Legislative Power for OEB, MSP and MACD

Q. Based on the AG's recommendations is the Ministry of Energy planning to provide MSP or MACD with additional powers?

We welcome and appreciate the recommendations of the Auditor General and agree with the need for effective and strong electricity market oversight in Ontario.

To that end, we are working closely with the Independent Electricity System Operator (IESO) and the Ontario Energy Board (OEB) to ensure effective market oversight mechanisms, including the investigatory powers of MSP and Market Assessment and Compliance Division (MACD) and the role and authority of OEB in the market rule amendment process, particularly in instances of potential abuse of the market rules.

To ensure effective and strong electricity market oversight in Ontario, the potential need for additional legislative authorities for the OEB, MSP and MACD is under review as highlighted is our written correspondence to the Standing Committee on Public Account on February 21, 2018.

This year, Ontario is undertaking a review of OEB to build on its mandate and prepare for the future of the electricity sector. Market oversight is an important factor as modernization of OEB progresses.

The Ministry plans to meet with the OEB modernization panel to discuss these issues later this month.

NOTE – THESE ARE Q&AS RELATE TO IESO ISSUES. THESE WERE PREPARED IN ADVANCE OF THE RELEASE OF THE AG's 2017 ANNUAL REPORT. THESE HAVE BEEN UPDATED AS NECESSARY.

Real-Time Generation Cost Guarantee (RT-GCG)

Legend:

- IESO's Real-Time Generation Cost Guarantee Program (RT-GCG) = Standby Cost Recovery Program (AG)

- IESO's Congestion Management Settlement Credits (CMSC) = Lost Profit Recovery Program (AG)

Q. There are a lot of different numbers floating around in this report. Can you clarify what the total cost is of the Real-Time Generation Cost Guarantee Program? What is the total cost of the Congestion Management Settlement Credits?

Note: *The OAG's report states that about **$1.6 billion** of Congestion Management Settlement Credits (CMSC) have been paid since 2002.*

Payments made through these credits ensure reliability for our electricity system.

They incent generators to follow Independent Electricity System Operator (IESO) instructions that would otherwise result in a financial loss. Without CMSC, suppliers could refuse to follow dispatch instructions and impact reliability:

- These costs result from the natural physical limits of the power system, such as transmission line limits, which can prevent power from getting to where it needs to go;

- These are costs, about $1.6 billion since 2002, that are inherent in any electricity system and cannot be eliminated without overbuilding Ontario's transmission system; and

- These credits are needed to maintain the reliability of Ontario's electricity system.

Note: *The OAG's report claims that as much as **$260 million** in ineligible costs were paid under the Real-Time Generation Cost Guarantee (RT-GCG) program between 2006 and 2015.*

Two thirds **($168 million)** of ineligible costs from this program have been returned to ratepayers.

The system operator's auditors make sure that the costs returned to ratepayers outweigh any kind of legal risk that might exist by taking matters to the courts.

The system operator has an active compliance division and a new CEO that is going to ensure they have the resources they need.

***Note:** The OAG's report also claims that **$30 million** in additional costs is spent per year on the RT-GCG program despite the MSP recommending IESO scale back the program.*

According to IESO, the Panel's recommendations, which would significantly reduce the incentive structure under the program, would have negative impacts on the reliability of our electricity system and put our obligation to meet North American reliability standards at risk – not only jeopardizing the reliability of Ontario's grid, but those of our neighbours as well.

The electricity from some gas-fired units might not be offered into the market in real time, which would, in turn, impact the reliability of our electricity system, potentially impairing the system operator's ability to address changing conditions through the day.

As a result of this change and other improvements, this program is more efficient today – with the total cost dropping from $61 million in 2014 to $23 million in 2016 and $22 million in 2017 – a more than 60 per cent cut in program costs over the course of two years.

Q. Why is IESO not able to recoup 100 per cent of the ineligible costs that have paid to private power generators? Doesn't this just encourage further 'gaming' within the electricity system?

To ensure ratepayers are protected and cost recovery is maximized, our system operator negotiated settlements with generators where it made sense – avoiding costly litigation.

Priority is placed on ratepayer protection, and ensuring that recouped costs go back to Ontario's electricity consumers.

Q. What is the total amount of ineligible costs that private power generators have received from the Independent Electricity System Operation (IESO) since the electricity market opened in 2002? At what point does IESO give up on recouping the full cost lost to ratepayers?

There are strong measures in place under Ontario's electricity market rules that allow the system operator to identify and take action on false claims under this program (i.e., Real-Time Generation Cost Guarantee (RT-GCG).

Our system operator has the authority to conduct audits of claims made by generators and other market participants.

And, if needed, our system operator can impose fines and seek the recovery of amounts that were incorrectly claimed.

In the case of Goreway – a $10 million fine was imposed and a substantial portion of payments were recovered from the generator's total RT-GCG claims.

Our system operator is now working on additional resources to strengthen their oversight division.

Q. Why has the Independent Electricity System Operator (IESO) repeatedly failed to make changes or cancel both the Real-Time Generation Guarantee Program (RT-GCG) and Congestion Management Settlement Credits (CMSC) as recommended by the Ontario Energy Board's Market Surveillance Panel (MSP)?

According to the Board's Market Surveillance Panel (MSP), many of the issues associated with these credits have been brought to an end, as a result of the Panel having identified them, and our system operator acting to improve the program's effectiveness and transparency.

Our system operator has made a number of changes since market opening that have improved program effectiveness and transparency.

According to IESO, both programs are required to ensure Ontario families and businesses have an electricity system they can count on every second of every day and that we continue to meet North American reliability standards.

Our system operator has the power to conduct audits of claims made by generators and other market participants.

And, if needed, our system operator can impose fines and seek the recovery of amounts that were incorrectly claimed.

Our system operator has made more than a dozen market rule changes since 2002 to make CMSC payments more efficient and transparent.

Q. The OAG reports that in almost all of the OEB Panel's reports – 28 since 2002 – that the Panel has recommended changes to the Real-Time Generation Cost Guarantee (RT-GCG) program. Why do these programs continue to exist after alarm bells have been going off for years from your own Panel?

According to the Board's Market Surveillance Panel (MSP), many of the issues associated with these credits have been brought to an end, as a result of the Panel having identified them, and our system operator acting to improve the program's effectiveness and transparency.

This program guarantees the recovery of certain costs incurred whenever an eligible electricity generation facility starts up and is brought up to the minimum level of electricity output that it can reliably supply into our grid.

At times, our system operator has had concerns that the Panel's recommendations would significantly reduce the incentive structure under this program, leading to negative impacts on the reliability of Ontario's electricity system.

Our system operator has taken a number of actions to improve the RT-GCG program, resulting in a significant reduction in the annual cost of the program compared to 2014.

Q. As the province's independent agency responsible for protecting ratepayers, why has the OEB not forced IESO to make changes or cancel these programs?

Our system operator and the Ontario Energy Board's Market Surveillance Panel (MSP) have a shared responsibility to monitor behaviour in the province's electricity market.

According to the MSP, many of the issues associated with these credits have been brought to an end, as a result of the MSP having identified them, and our system operator acting to improve the program's effectiveness and transparency.

We are confident in our system operator's ability to administer an efficient and fair electricity market, as well as the MSP's ability to provide independent monitoring and investigations. Working with the Ontario Energy Board (OEB) and our system operator, we are undertaking a review of the Electricity Act (1998) – focusing on how market rules are approved.

We are also undertaking a review of the OEB's authority regarding the enforcement of electricity market rules and the response to abuses of these rules.

To ensure that our system operator can effectively conduct its investigations, we are working together regarding the potential need for additional legislative power to assist our system operator in performing its critical responsibilities.

- Powers that could include compelling documentation from market participants related to their behaviour in the electricity market.

Q. Why did we start reimbursing generators for maintenance costs? Why has this continued despite the alarm bells? What benefit does this provide to the system when it clearly causes so many problems?

As part of the phase out of coal, our supply mix changed to include more gas-fired generation.

Because of this transition, our system operator launched improvements to the program (i.e., Real-Time Generation Cost Guarantee (RT-GCG)) to ensure continued reliability.

These improvements included:

- Guaranteeing certain start-up operating and maintenance costs;
- Tightening program eligibility criteria; and
- Putting in place restrictions on eligible fuel costs.

These were aimed at improving the overall efficiency of the program and ensuring we continued to have an electricity system that families and businesses could count on.

The Panel's recommendation to eliminate guarantees under this program (i.e., Real-Time Generation Cost Guarantee (RT-GCG) for operating and maintenance costs is based on earlier versions of this program where eligible payments were limited to fuel-only costs.

As our generation supply mix has become cleaner, the program has been adjusted accordingly.

Q. Can you name any other programs or jurisdictions that allow expenses to be reimbursed/paid before they're reviewed and approved? Why is this the way it works with these programs?

All but one of the nine system operators in North America also commit generators and compensate them for starting up.

Cost submissions by electricity generators through this program (i.e., Real-Time Generation Cost Guarantee (RT-GCG) and related payments happen in a timeframe very close to the ongoing financial settlement of the ~$20 billion electricity market.

As a result, generator costs were only able to be audited after payment. This is similar to a Canada Revenue Agency income tax process whereby submissions are presumed to be correct until such time as audits and evaluations take place.

There are processes in place under our system operator's market rules to identify and manage false claims under this program. Our system operator has the power to conduct audits of claims made by generators and other market participants.

Q. These investigations have shown up a huge range of claimed but ineligible costs, including $175,000 for parkas and coveralls, the costs of staff car washes, carpet cleaning, road repairs, landscaping, scuba gear and raccoon traps. Do you consider it appropriate that Ontario ratepayers are picking up the tab for these?

Those costs were clearly unacceptable and our system operator has taken appropriate steps to recover these payments.

The ineligible costs mentioned in the Auditor General's Report were identified by our system operator as part of the audit process that is in place.

Our system operator continues to take strong action when power producers claim ineligible costs – it investigates and imposes fines, recovers ineligible claims and returns these funds to Ontario ratepayers.

In the case of Goreway – a $10 million fine was imposed and a substantial portion of payments were recovered from the generator's total Real-Time Generation Cost Guarantee (RT-GCG) claims.

Q. With this outrageous amount of ineligible costs being paid out of the pockets of Ontario ratepayers, how can families and businesses be confident with IESO's oversight of the electricity market?

Our system operator continues to take strong action when power producers claim ineligible costs – it investigates and imposes fines, recovers ineligible claims and returns these funds to Ontario ratepayers.

In the case of Goreway – a $10 million fine was imposed and a substantial portion of payments were recovered from the generator's total Real-Time Generation Cost Guarantee (RT-GCG) claims.

Our system operator has taken action to address issues raised by the Ontario Energy Board's Market Surveillance Panel.

Our system operator has taken a number of actions to improve the RT-GCG program and implemented market rule changes that address the issues and recommendations highlighted by the Panel.

Q. The AG's report mentions that the MSP has been "concerned" about payments of $500 million paid to market participants in Northwestern Ontario. Can you explain these payments?

Congestion Management Settlement Credits (CMSC) are paid mainly to generators when they are instructed by our system operator to produce power that would result in them being hit with a financial loss.

These payments are generally the result of system constraints, such as transmission line limits, that lower the ability of power to flow in or out of a particular area of the province.

The Ontario Energy Board's Market Surveillance Panel recognized that the payments in the northwest were due to hydroelectric generation supply in this part of the province and the limited ability to transfer excess power out of the northwest due to congestion on transmission lines.

These programs have been constantly evolving with improvements to transparency and effectiveness through changes initiated by our system operator.

These payments are necessary to ensure our province's generators can comply with our system operator's instructions for when, where and how much electricity is needed to keep the lights on for families and businesses.

Our system operator is working to transform our electricity market.

The Market Renewal initiative is expected to result in a more competitive marketplace that meets our system's needs while increasing flexibility and efficiencies.

It is projected that Market Renewal will save up to $5.2 billion over 10 years.
Once launched, Market Renewal will replace the Real-Time Generation Cost Guarantee (RT-GCG) program and Congestion Management Settlement Credits (CMSC).

Q. With both the design of the Market Renewal Initiative and with previous changes to the Real-Time Generation Guarantee Program and Congestion Management Settlement Credits being overseen by the same market participants that have claimed ineligible expenses, aren't you just letting the fox guard the henhouse?

The resignations of the co-chairs of the Market Renewal Working Group were effective December 1, 2017.

As we head into the next phase, our system operator will also be adding an independent fairness commissioner to oversee the work of this group. The Market Renewal Working Group includes a diverse group of participants from consumers to generators.

It's important that our system operator hears from a wide array of perspectives to ensure the transformation of our electricity system is done right.

The Market Renewal Working Group includes participants that advocate for low-volume consumers, including Weir Foulds.

All Market Renewal sessions are fully transparent, and open to the public.
Stakeholders in Ontario's electricity sector have the opportunity to participate in our system operator's stakeholder engagement process for Market Renewal.

Through this process, our system operator is working to transform the province's electricity market.

The Market Renewal initiative is expected to result in a more competitive marketplace that meets our system's needs while increasing flexibility and efficiencies.

This transformation is expected to save up to $5.2 billion between 2021 and 2030 and forms a key component of the government's plan to bring down the cost of electricity for families and businesses

Our system operator will make the final decisions regarding the design of a transformed electricity system, with oversight provided by the independent Ontario Energy Board (OEB).

Q. The AG finds that IESO Oversight Division's investigative powers lack teeth and it can only receive information from *willing* market participants to support investigations. This means there is no way to uncover the extent of violations. Are you concerned with the Division's lack of powers to fulfill its role adequately?

We are confident in our system operator's ability to administer an efficient and fair electricity market, as well as the Panel's ability to provide independent monitoring and investigations.

Our system operator is actively working to strengthen the Market Assessment and Compliance Division (MACD).

We are considering the potential need for additional legislative powers to assist our system operator in performing its critical responsibilities, including its investigations.

- Powers that could include compelling documentation from market participants related to their behaviour in the electricity market.

Q. With Ontario's surplus of electricity supply, why is the Real-Time Generation Cost Guarantee Program even needed? Aren't you just paying generators to 'standby' for electricity that's won't be required?

According to IESO, this program makes sure that adequate electricity will be available to meet the expected electricity demand– an important factor in meeting North American reliability standards.

The Real-Time Generation Cost Guarantee (RT-GCG) program plays a key role in ensuring reliability by providing generators – our natural gas plants, our hydroelectric dams – with an incentive to offer flexible electricity supply.

This program guarantees the recovery of certain costs incurred whenever an eligible electricity generation facility starts up and is brought up to the minimum level of electricity output that it can reliably supply into our grid.

Q. The OAG finds that IESO hasn't been distributing resources in an effective way to ensure all investigations are being completed into improper costs being claimed. In fact, the OAG states that only one in five potential cases identified by the Director of the Oversight Division can be investigated, because of lack of resources.

What is the scale of this problem (i.e., how many investigations should have been done)? And what is IESO's plan to deal with it? Why does IESO's oversight team not have the proper IT system to do their investigations?

Working with the Ontario Energy Board (OEB) and our system operator, we are undertaking a review of the Electricity Act (1998) – focusing on how market rules are approved.

We are also undertaking a review of the Ontario Energy Board's authority regarding the enforcement of electricity market rules and the response to abuses of these rules.

We are considering the potential need for additional legislative powers to assist our system operator in performing its critical responsibilities, including its investigations.

- Powers that could include compelling documentation from market participants related to their behaviour in the electricity market.

Q. With so many stones left unturned, will IESO commit to undertaking a more fulsome audit of generators to ensure ineligible claims are recovered? If given more resources and authority, will the system operator take action on these uncompleted audits?

Ontario is in a robust supply situation as a result of investments made over the last decade, making now the right time to make more fundamental changes to the electricity market.

These changes are being made through IESO's Market Renewal Program, which will result in a more efficient, competitive, and transparent electricity market.

The Ontario Energy Board's Market Surveillance Panel is supportive and is participating in the initiative to help inform its efficient design and implementation.
The program will result in up to $5.2 billion in savings over a 10-year period, the majority of which will be realized by Ontario ratepayers.

These benefits will come from better scheduling and dispatching of resources, and more efficient and competitive procurement of Ontario's electricity needs.

As part of these efforts, the RT-GCG program will end. Generators' start-up costs will still need to be compensated, but it will be more transparent, competitive and efficient as they will be included in the offers they submit into the market.

The IESO is currently working with a wide range of stakeholders on a high level design for the Market Renewal Program and will begin the detailed design and implementation phase in 2019.

Q. You talk about Market Renewal as though it will solve all the problems flagged by the Auditor, but isn't market renewal years away from taking effect?

These programs have been constantly evolving with improvements to transparency and effectiveness through changes initiated by our system operator.

Market Renewal is expected to save up to $5.2 billion between 2021 and 2030, and forms a key component of the government's plan to bring down the cost of electricity for all consumers.

Our system operator is taking the time to work with experts and sector partners to maximize the efficiencies that can help bring down costs – this will be the most fundamental redesign of the electricity system since the market opened in 2002 and it cannot be rushed.

Once launched, our transformed electricity marketplace will significantly restrict gaming opportunities and reduce the need for payments and credits through these programs.

In the meantime, we are working with the Ontario Energy Board and our system operator, to undertake a review of the Electricity Act (1998) – focusing on how market rules are approved.

We are also undertaking a review of the Ontario Energy Board's authority regarding the enforcement of electricity market rules and the response to abuses of these rules.

We are considering the potential need for additional legislative powers to assist our system operator in performing its critical responsibilities, including its investigations.

- Powers that could include compelling documentation from market participants related to their behaviour in the electricity market.

Q. What is the Real-Time Generator Cost Guarantee (RT-GCG) program?

The Real-Time Generation Cost Guarantee (RT-GCG) program ensures sufficient generation is available to meet expected demand and operating reserve requirements on a daily basis and is a key component in demonstrating compliance with mandatory continent-wide operational planning standards. The RT-GCG program does this by guaranteeing certain start-up costs to participants who otherwise might not commit their units if they were not certain they would be able to recover these costs.

The Information Electricity System Operator (IESO) is making fundamental changes to the electricity market that will include replacing the RT-GCG program with a more efficient and transparent form of unit commitment. Until fundamental changes can be made, the RT-GCG program is necessary to maintain the reliability of our electricity system and comply with mandatory continent-wide power system reliability standards.

If pressed, additional background information:

The IESO-administered markets select and schedule just enough resources to meet energy and operating reserve demands every five minutes. The IESO has to be prepared for changes, both expected and unexpected, to the electricity system in order to maintain reliability. Having additional resources on standby allows IESO to effectively meet those changes, without reducing reliability or causing significant price fluctuations.

Gas generators typically perform this function and they can take several hours to start and synchronize to the grid. During this period, these generators incur costs to start up and idle that they might be unable to recover through market revenues. The RT-GCG addresses this by covering certain costs should market revenues fall short. Without this program, IESO would be unable to ensure that generators are on standby to maintain reliability and would have to manage them in a less efficient manner, resulting in higher costs and negative impacts on reliability for Ontario and its neighbours.

Since the blackout in 2003, all system operators are required to create operating plans for each day that clearly demonstrate their ability to maintain reliability for the region. Other system operators have similar approaches that commit generators and compensate them for starting up and being on standby.

The IESO introduced the Spare Generation On-Line (SGOL) program in 2003, now called the Real-Time Generation Cost Guarantee (RT-GCG) program.

Q. Why hasn't the IESO eliminated the RT-GCG program?

The Real-Time Generation Cost Guarantee (RT-GCG) program ensures sufficient generation is available to meet expected demand on a daily basis and is a key component in demonstrating compliance with mandatory continent-wide operational planning standards. The RT-GCG program does this by guaranteeing certain start-up costs to participants who otherwise might not commit their units if they were not certain they would be able to recover these costs.

The IESO is making fundamental changes to the electricity market that will include replacing the RT-GCG program with a more efficient and transparent form of unit commitment.

Until fundamental changes can be made, the RT-GCG program is necessary to maintain the reliability of our electricity system and comply with mandatory continent-wide power system reliability standards.

The IESO will continue to engage with the Market Surveillance Panel (MSP) throughout this process.

Q. What improvements have been made to the RT-GCG program?

Over the years a number of changes have been made to the Real-Time Generation Cost Guarantee (RT-GCG) program, including changes to eligibility and cost submissions.

The IESO now pre-approves 14 of 15 eligible costs, removing the potential for overpayments and the need for after-the-fact audits for these components.

The IESO is making fundamental changes to the electricity market that will include replacing the RT-GCG program with a more efficient and transparent form of unit commitment. Until fundamental changes can be made, the RT-GCG program is necessary to maintain the reliability of our electricity system and comply with mandatory continent-wide power system reliability standards.

Furthermore, the Enhanced Real-Time Unit Commitment initiative of Market Renewal will replace the current RT-GCG program with a transparent and competitive mechanism that will ensure reliability through a more efficient commitment of resources near real time. Final decisions and high level design are expected by Q3 2018; implementation of initiative is expected in 2020.

Q. What is a timeline of events for changes made to the RT-GCG program?

The Real-Time Generation Cost Guarantee (RT-GCG) program chronology includes:

- 2003: the RT-GCG program is created, then known as the Spare Generation Online Program
- 2009: More stringent eligibility requirements introduced to the RT-GCG
- 2011: The IESO commences audits of the RT-GCG program
- 2012: Revisions to eligibility and cost submissions
- 2013: The IESO completes onsite work for most audits and compiles preliminary findings
- 2014: The IESO commences settlement negotiations with a range of program participants
- 2014:The IESO issues "Interpretation Bulletin" to clarify eligible costs
- 2016: RT-GCG program costs are $23 million compared with $61 million in 2014
- 2017: New cost recovery framework is created where 14 of 15 cost components are pre-approved
- 2017: RT-GCG program costs are $22 million compared with $61 million in 2014

Q. The Market Surveillance Panel (MSP) states the Independent Electricity System Operator (IESO) does not need to reimburse generators for operating and maintenance costs through the RT-GCG program. Why does IESO think otherwise?

Substantially reducing generator incentives, as recommended by the MSP, could result in insufficient generation being available to reliably meet electricity demand. This would negatively impact reliability and impair IESO's ability to meet continent-wide planning requirements. Therefore, IESO will continue to allow the recovery of operating and maintenance costs. However, the IESO is currently working with stakeholders to design and implement fundamental and enduring changes to Ontario's electricity market that will address the report's findings by introducing a more efficient real-time commitment program.

When the Real-Time Generation Cost Guarantee (RT-GCG) program was first introduced, 80 per cent of the starts under the program were for coal-fired units. By 2009, coal-fired generation was being replaced by natural gas-fired generation, which has different operating characteristics and incurs more costs when starting up compared to coal-fired generation.

As IESO began to rely less on coal-fired generation, there became an increasing need to make changes to the program parameters and incentives to ensure that resources were available when needed.

In 2009, IESO addressed this need by introducing more stringent eligibility criteria to make better use of existing assets while allowing the recovery of incremental operating and maintenance costs to ensure that resources still were incented sufficiently and that the program continued to meet its reliability objectives.

Q. Is it true that there have been $260 million in overpayments through the Real-Time Generation Cost Guarantee (RT-GCG) program?

The Independent Electricity System Operator (IESO) provided the Office of the Auditor General with the $260 million figure, but noted that it was an extreme and unlikely figure – the highest possible in a range.

The IESO's estimate of ineligible costs is closer to $200 million over a 10-year period, of which we've recovered approximately 85 per cent of, or $168 million.

Two-thirds of these ineligible costs were submitted by one generator, who was fined an additional $10 million for failing to provide true, correct and complete information to the best of its knowledge.

Q. Why is there a difference between the AG's number and IESO's? Why is there a $60-million gap between the two?

It is IESO's position that the $260 million figure is not an accurate representation of the total amount of ineligible costs. This number was provided to the AG as a partial and initial estimate, but also as a maximum and unlikely figure – the highest possible in a range.

The IESO's Market Assessment and Compliance Division (MACD) advised AG staff that the total ineligible costs as determined by an independent adjudicator would likely be significantly less.

The final total of ineligible costs is highly dependent on a range of variables including debates related to accounting treatments of costs and legal arguments around rule interpretations.

The IESO's estimate of ineligible costs is closer to $200 million over a 10-year period, of which we've recovered approximately 85 percent of or $168 million.

Q. Why is it a range? You don't know for certain how much you overpaid?

That number is highly dependent on a range of variables including debates related to accounting treatments of costs and legal arguments around rule interpretations.

Where the estimated full costs were not recovered, the potential litigation risks and costs were assessed to be higher than what might reasonably be expected to be recovered. Any attempt to recover additional costs was likely to result in a worse outcome for ratepayers.

The costs we recovered through negotiated settlements are well within range of settlements that occur in contested law or regulatory enforcement contexts.

Q. Why were overpayments allowed to happen?

Cost submissions and payments were made in close proximity and audited after-the-fact. This is similar to how the CRA income tax process works whereby submissions are presumed to be correct until such time as audits and evaluations take place by CRA audit staff.

However, changes to the program in 2009 resulted in unexpected requests for cost recovery. The IESO quickly sought to address ineligible cost submissions and use its authority to recover as many costs as possible.

Two-thirds of these ineligible costs were submitted by one generator, who was fined an additional $10 million for failing to provide true, correct and complete information to the best of its knowledge.

The IESO now pre-approves 14 of 15 eligible costs, removing the potential for overpayments and the need for after-the-fact audits for these components.

Q. Has IESO recovered all the money overpaid through the RT-GCG program? Why not?

The number of ineligible costs is highly dependent on a range of variables including debates related to accounting treatments of costs and legal arguments around rule interpretations.

Where the estimated full costs were not recovered, the potential litigation risks and costs were assessed to be higher than what might reasonably be expected to be recovered. Any attempt to recover additional costs was likely to result in a worse outcome for ratepayers.

The costs we recovered through negotiated settlements are well within range of settlements that occur in contested law or regulatory enforcement contexts.

The IESO now pre-approves 14 of 15 eligible costs, removing the potential for overpayments and the need for after-the-fact audits for these components.

Q. Why hasn't IESO provided data to the Market Place Surveillance Panel (MSP) to support its claims about Real-Time Generation Cost Guarantee (RT-GCG)?

On April 5, 2018, the Independent Electricity System Operator (IESO) will present to the MSP a detailed analysis supporting the rationale for its previous assertions that a real-time generator commitment mechanism (currently the RT-GCG program) is necessary to allow IESO to comply with North American power system reliability standards and ensure a reliable supply of electricity for Ontarians.

The IESO and MSP agree that there is a need to manage changing system conditions between day-ahead commitments and real time. The IESO meets this need through the RT-GCG program and will continue to do so until broader, more fundamental and enduring changes can be made that will address the report's findings.

The IESO has provided its rationale for the continued need for RT-GCG, explaining that a mechanism to ensure resource availability to meet the change in demand between day-ahead commitments and real time is both necessary and consistent with industry practice. The IESO also provided an assessment of the need for the GCG program through a public stakeholder engagement exercise that reviewed generation guarantee programs.

Q. Did IESO recover the money spent on car washes, carpet cleaning, road repairs, landscaping, scrub gear, raccoon traps, coveralls and parkas?

Yes – these costs were identified by the Independent Electricity System Operator (IESO) audits and recovered.

Q. How do generators submit costs to the RT-GCG program?

During the time period covered by IESO's audits, program participants submitted aggregated cost amounts for fuel and operating & maintenance (O&M) cost(s) in relation to Real-Time Generation Cost Guarantee (RT-GCG) program starts. The IESO reimbursed participants for those costs, subject to being audited and trued-up later on.

The IESO also recently implemented a new cost recovery framework in which IESO now pre-approves 14 of 15 eligible costs, removing the potential for overpayments and the need for after-the-fact audits for these components. Fuel and O&M costs are now broken down into 15 distinct and clearly defined cost components that are eligible for recovery.

Q. Why didn't IESO review costs initially before paying them?

Some changes to the Real-Time Generation Cost Guarantee (RT-GCG) program in 2009 resulted in unexpected requests for cost recovery. This was when we exercised our authority to audit submissions and create a public stakeholder engagement to review the program.

The IESO has since implemented a new cost recovery framework in which IESO pre-approves 14 of 15 eligible costs, removing the potential for overpayments and the need for after-the-fact audits for these components.

Q. Why didn't you audit the Real-Time Generation Cost Guarantee (RT-GCG) program until 2011?

Participation in the RT-GCG program increased considerably in the late 2000s as more natural gas generators were brought online to help support the reliable operation of the electricity system.

The IESO's MACD monitoring team highlighted an increase in RT-GCG payments in 2009 and provided this information to the MSP, after which the MSP reported on this trend. The MACD enforcement section at the same time initiated an audit program of all participants and concluded that overpayments were made to several participants of the RT-GCG program.

The majority of the estimated overpayments were attributed to one participant.

Q. How did the Independent Electricity System Operator (IESO) discover the overpayments?

Staff of IESO's Market Assessment and Compliance Division (MACD) monitors the market as part of its appointed role assessing market performance. It provides its findings to the Ontario Energy Board's (OEB) Market Surveillance Panel (MSP), with which MACD closely works. MACD may direct that enforcement actions, such as audits, be conducted. MACD has special divisions that conduct investigations and audits, again similar to what CRA does with respect to income tax submissions.

The MACD monitoring team highlighted an increase in Real-Time Generation Cost Guarantee (RT-GCG) payments in 2009, after which the MSP reported on this trend. The MACD then initiated an audit and discovered the overpayments of the RT-GCG program.

Q. How will the Independent Electricity System Operator (IESO) prevent participants from submitting inaccurate costs in the Real-Time Generation Cost Guarantee (RT-GCG) program going forward?

The IESO now pre-approves 14 of 15 eligible costs, removing the potential for overpayments and the need for after-the-fact audits for these components. This new cost recovery framework was implemented on August 1, 2017.

The IESO is making fundamental changes to the electricity market that will include replacing the RT-GCG program with a more efficient and transparent form of unit commitment. Until fundamental changes can be made, the RT-GCG program is necessary to maintain the reliability of our electricity system and comply with mandatory continent-wide power system reliability standards.

Q. Are the RT-GCG audits finished?

Audits occur on an ongoing basis. However, under a new cost recovery framework implemented on August 1, 2017, eligible costs are now set and approved in advance of participating in the program for each program participant. This change removed the potential for overpayments and the need for after-the-fact audits for these components.

Q. What is the one cost component that is still subject to audit?

The only value that is not pre-approved is the quantity of natural gas, or other fuel, consumed during the eligible period. This value is highly variable with each start and is therefore not appropriate for establishing a pre-approved value. The price of the gas, or other fuel, is a pre-approved value. All costs are what the Independent Electricity System Operator (IESO) believes to be reasonable and eligible for recovery.

Q. Who are the market participants who submitted ineligible costs?

Audit information is confidential under the provisions of the *Market Manual, Market Rules and Electricity Act, 1998.*

Furthermore, releasing the names of these market participants would violate our settlement agreements and market rules.

Q. Is it true that generators who received RT-GCG payments were called on only one percent of the time? Is it true that the reliability benefits of the GCG program are not commensurate with the cost?

The Real-Time Generation Cost Guarantee (RT-GCG) program acts as insurance by ensuring sufficient generation is available to balance supply and demand as conditions change closer to real time and is a key component of meeting mandatory continent-wide operation planning standards. Like insurance, the value is in the ability to manage the risk of events that don't happen frequently but can have serious consequences when they do. As such, usage of the RT-GCG program in past years is not an indication of its value.

As the Market Surveillance Panel (MSP) report acknowledges, the Independent Electricity System Operator (IESO) has to manage changing conditions between day-ahead commitments and real time. The RT-GCG program meets this need.

Eliminating the RT-GCG program could result in insufficient generation being available to reliably meet Ontario electricity demand. This would negatively impact reliability and impair the IESO's ability to meet continent-wide planning requirements.

Q. Do other jurisdictions have a Real-Time Generator Cost Guarantee (RT-GCG) program?

Every North American jurisdiction has a need to ensure sufficient generation is available to balance supply and demand as conditions change closer to real time and to meet mandatory continent-wide standards for operation planning. This need is met differently across jurisdictions.

The Independent Electricity System Operator (IESO) currently meets this need partly through the Real-Time Generation Cost Guarantee (RT-GCG) program and is also working with stakeholders through the Market Renewal initiative to design and implement changes to Ontario's electricity market that will create efficiencies in how this need is met.

Congestion Management Settlement Credits

Q. What are Congestion Management Settlement Credits (CMSC), referred to in the report as the Lost Profit Recovery Program?

Congestion Management Settlement Credits (CMSC) are paid to market participants, like generators and some large consumers, when they are scheduled by the Independent Electricity System Operator (IESO) to consume or inject when they would otherwise be doing so at an operating loss. Instances where CMSC are paid are a result of system constraints, such as transmission line limits.

For example, if a generator submitted an offer to produce power at a cost that was above the market clearing price, it would typically not be scheduled to produce power. However, if transmission limits in another area prevented a lesser-cost generator from delivering energy, the higher-cost generator may be told it must produce to maintain local reliability. In this example, a CMSC payment would make up the difference between the market clearing price and the price at which the generator had originally offered its power.

The payment ensures the generator complies with IESO instruction and produces the power needed to maintain reliability by giving it the revenue it had originally said it required to produce.

Q. Why doesn't the IESO eliminate Congestion Management Settlement Credits (CMSC)?

Congestion Management Settlement Credits (CMSC) payments are necessary to incentivize resources to comply with the Independent Electricity System Operator (IESO) dispatch. These are generally costs associated with ensuring the reliability of Ontario's electricity system but not reflected with the energy market clearing prices.

According to IESO, eliminating CMSC under the current market structure would undermine grid operations as suppliers would refuse to follow dispatch instructions if they were asked to operate at a loss. This would challenge the reliability of Ontario`s electricity system and impair our ability to meet North American power system reliability standards. Until fundamental changes can be made to the electricity market, RT-GCG and CMSC will continue to be needed.

Fundamental changes to Ontario's electricity market are being made through a Market Renewal Program. The Market Renewal Program will provide an enduring solution to the inefficiencies discussed in the AG's report as well as deliver a range of efficiency savings, from better scheduling and dispatching resources to more efficiently procuring the capacity Ontario needs. In total, Market Renewal will result in up to $5.2 billion in savings over a 10-year period, the majority of which will be realized by ratepayers.

Q. When will Market Renewal replace CMSC and RT-GCG?

Work is underway and we expect to begin the detailed market design and implementation phase in 2019. Changes to the foundation of the electricity market take time. We want to make sure we get it right and don't put in place another band-aid solution with continuing inefficiencies at the expense of ratepayers.

Q. What steps has the IESO taken to address inefficiencies with CMSC?

The Independent Electricity System Operations (IESO) has made more than a dozen changes to market rules since market opening that improved program effectiveness and transparency, increased efficiency of Congestion Management Settlement Credits (CMSC), and reduced costs – many of these changes are responsive to Market Surveillance Panel (MSP) recommendations. A December 2016 MSP report noted: "many of the most problematic issues associated with the CMSC regime have been brought to an end – in large measure as a result of the Panel having identified these situations, and the IESO having acted to eliminate them."

Remaining inefficiencies are best addressed by the broad and fundamental market design changes the IESO is pursuing through Market Renewal.

Changes over the years have eliminated inappropriate CMSC payments resulting from:

- Artificially raising or lowering offers into the market, when the participant is expecting to be constrained-on or off (2004, 2005, 2006, 2010);
- Offering into the market over interties to maximize CMSC or with limited intention of having to deliver power (2006, 2011, 2012, 2015);
- Safety, environmental or legal reasons that result in a facility unable to follow dispatch (2003, 2011); and
- Units that are slow to come offline when no longer economic (2010, 2015).

Going forward, the Single Schedule Market initiative of Market Renewal will eliminate the CMSC Program. Final decisions and high level design are expected by Q3 2018; implementation of initiative is expected in 2020.

Q. Why has the Independent Electricity System Operator (IESO) paid about $1.6 billion for Congestion Management Settlement Credits (CMSC) – aren't these wasted costs?

These payments have not resulted in additional costs to consumers.

These are mostly costs that are inherent in any electricity system, reflecting constraints, such as transmission line limitations, and measures required to maintain reliability.

As the Market Surveillance Panel (MSP) has acknowledged, some costs associated with CMSC will continue to exist in different forms even with the replacement of the current market design.

A December 2016 MSP report noted: "many of the most problematic issues associated with the CMSC regime have been brought to an end – in large measure as a result of the Panel having identified these situations, and the IESO having acted to eliminate them."

As part of Market Renewal, IESO is working to make sure that the market is more efficient so that these costs are as low. Market Renewal will result in a better market design that will schedule resources more efficiently and the opportunity for inappropriate out of market payments is largely eliminated.

However, many of the existing CMSC costs are legitimate operating costs that will still be paid by consumers and are necessary to maintain reliability (i.e., generator start-up costs will be reflected in offer and bid prices and recovered from consumers through the market clearing price).

Q. Why has it taken so long to begin fixing market inefficiencies? Wasn't CMSC supposed to be temporary?

Adopting the current structure at market opening in 2002 was a deliberate decision to "simplify" the transition from the wholly regulated system. The two-schedule system allowed for a smooth transition to an open market. IESO has since made over a dozen changes to Congestion Management Settlement Credits (CMSC) that have made it more efficient.

There have been many significant developments in electricity system over the past decade, including the phase out of coal-fired generation and replacement with renewable, natural gas-fired, nuclear and demand response resources. Now we're in a stable supply situation that is expected to continue into the 2020s, making now an opportune time to pursue more fundamental changes to the electricity market that will make sure these costs are reflected in the market price instead of through less efficient out-of-market payments.

Q. Is it true that Ontario ratepayers have paid $1.6 billion in CMSC costs since market opening?

Congestion Management Settlement Credits (CMSC) payments are necessary to incentivize resources to comply with the Independent Electricity System Operator (IESO) dispatch. These are generally costs associated with ensuring the reliability of Ontario's electricity system, but not reflected with the energy market clearing prices.

According to IESO, eliminating CMSC under the current market structure would undermine grid operations as suppliers would refuse to follow dispatch if they were asked to operate at a loss.

This would challenge the reliability of Ontario`s electricity system and impair our ability to meet North American power system reliability standards.

As stated by the Market Surveillance Panel (MSP), some costs associated with CMSC will continue to exist in different forms even with the replacement of the current market design. These are costs that are inherent in any electricity system, reflecting constraints, such as transmission line limitations, and measures required to maintain reliability.

The IESO has taken numerous steps over the years to improve the efficiency of CMSC and limit gaming opportunities. Remaining inefficiencies are best addressed by the broad and fundamental market design changes the IESO is pursuing, which will see CMSC costs reflected in the market price instead of through out-of-market payments.

Other

Q. Why are market participants who have misused IESO programs allowed to participate in the market renewal working group?

The Independent Electricity System Operator (IESO) accepts feedback from a broad range of stakeholders, including residential consumers, industrial consumers, distributors, transmitters, generators, and other market participants. But at the end of the day, the final decision is made by us.

Two market participants who were found to have ineligible costs have stepped down as Chairs from the market renewal working group. One of these members is still on the group but not as a chair.

The IESO will continue to evaluate the membership and structure of the group. For example, a new low-volume customer representative has been recently added.

It is also worth noting that the working group also includes a member from the OEB's Market Surveillance Panel (MSP).

Q. Why are generators allowed to have so much influence in changing market rules?

A Technical Panel advises about market rule changes and includes representation from residential consumers, industrial consumers, distributors, wholesalers, transmitters, generators and other market participants. So we look for input from a wide variety of stakeholders. But at the end of the day, the final decision is made by the IESO Board of Directors.

Q. But will you remove those who misused the Independent Electricity System Operator (IESO) programs from the market renewal working group?

Two market participants who were found to have ineligible costs have stepped down as Chairs from the market renewal working group. One of these members continues to serve on the group but not as a chairperson.

The IESO will continue to evaluate the membership and structure of the group. For example, a new low-volume customer representative has been added.

It is also worth noting that the working group also includes a member from the OEB's Market Surveillance Panel (MSP).

Q. Why are low volume consumers not better represented?

The Independent Electricity System Operator (IESO) recently announced the appointment of a low-volume consumer representative on IESO's market renewal working group to ensure that perspective was being captured.

There currently is representation for residential consumers on IESO's Technical Panel and there are multiple consumer representatives on its Stakeholder Advisory Committee, two key vehicles for receiving input into IESO market rules and its decision-making.

The IESO is undertaking a general review of its engagement strategy. The IESO expects to communicate and implement updates to its engagement strategy by Q2/Q3 2018. According to IESO, the engagement strategy will continue to be aligned with IESO engagement principles and ensure wide representation from our market participants, sector stakeholders and other stakeholders such as low volume consumers.

Q. What is Market Renewal?

Market Renewal is a collaborative effort between the Independent Electricity System Operator (IESO) and stakeholders to pursue enhancements to Ontario's electricity market that will address inefficiencies, put downward pressure on electricity costs and lay a foundation that will prepare us to meet future electricity needs as the sector evolves.

Market Renewal will incorporate lessons learned in Ontario and best practices from other jurisdictions to achieve a "made-in-Ontario" market design tailored to our province's needs. The initial findings from the Market Renewal benefits case show potential for cost savings that will be realized by both consumers and suppliers. Cost savings are achieved through the better utilization of existing assets, greater competition among resources, a reduced need to build new resources and a more flexible procurement process that will better reflect system needs.

Market Renewal is estimated to result in up to $5.2 billion in savings over 10 years, the majority of which will be realized by ratepayers.

This will include replacing the RT-GCG program with a more efficient and transparent mechanism and eliminating CMSC.

Q. Is the IESO doing anything to ensure that the Market Renewal Initiative considers and protects all ratepayers' interests?

The initial findings from the Market Renewal benefits case show potential for cost savings that will be realized by both consumers and suppliers. Cost savings are achieved through the better utilization of existing assets, greater competition among resources, a reduced need to build new resources and a more flexible procurement process that will better reflect system needs.

The Independent Electricity System Operator (IESO) will continue to ensure that its stakeholder engagement processes, including Market Renewal, seek representation from low-volume consumers where appropriate. The IESO's stakeholder engagement processes seek the input from a wide representation of participants – generators, traders, consumers, stakeholders, First Nations and Metis Peoples, communities, and the general public.

One of the principles, which applies to Market Renewal, seeks to ensure adequate representation in each engagement of the public or those that have a tendency to remain silent or reluctant to engage.

The IESO recently undertook five regional forums across the province, to address the concerns and seek input on developing solutions to improve our system locally and province-wide. These forums provided the opportunity to meet face to face and seek input from municipalities, consumers, First Nations and Metis peoples, as well as the general public.

The IESO is undertaking a general review of its engagement strategy. The IESO expects to communicate and implement updates to its engagement strategy by Q2/Q3 2018. The engagement strategy will continue to be aligned with the IESO engagement principles and ensure wide representation from our market participants, sector stakeholders and other stakeholders such as low volume consumers.

If pressed additional background:

Ontario's electricity market was designed in the late 1990s and introduced in 2002, when the electricity landscape looked very different from today. The elimination of coal, integration of renewables, increase in distributed resources, and growing role of the consumer has dramatically changed the dynamics of Ontario's electricity system.

Inefficiencies have been identified over the years through the work of the Electricity Market Forum, the Market Surveillance Panel (MSP), IESO studies and stakeholder input. The IESO and its stakeholders have worked together to improve different aspects of the market, but more fundamental changes are required to address remaining inefficiencies.

Ontario is now in a stable supply situation that is expected to continue until the mid-2020s, making this an opportune time to consider and implement needed market design changes.

Q. What is the Market Assessment and Compliance Division (MACD)?

IESO's Market Assessment and Compliance Division (MACD) monitors the operation of Ontario's electricity market, fostering compliance with the Ontario market rules and North American reliability standards.

MACD does this through its prevention, monitoring, auditing, investigations and enforcement activities. It performs audits and investigations into these matters.

Q. What is the IESO's position on the AG's recommendation that the MACD be made more independent?

The Independent Electricity System Operator (IESO) has indicated that it agrees with the Auditor General's recommendation. IESO's independent Board of Directors approved in October 2017 a new reporting structure whereby the Director of MACD will report directly to the IESO Board of Directors.

Q. Does MACD have the resourcing it needs?

IESO has indicated that it agrees with the Auditor General's recommendation that a review of sufficiency of enforcement resourcing be conducted, as it is consistent with recent increases in staff at Market Assessment and Compliance Division (MACD) and the process of ongoing review of priorities.

According to IESO, attracting staff with expertise in market rules and investigations will be a priority. As part of the IESO Business Planning for 2018, the IESO is evaluating the risk profile of a variety of its priorities, including the enforcement of market rules. As part of this exercise, consideration is being undertaken to both increase the total level of resources made available for enforcement, as well as the conversion of some current resources to full-time and non-temporary staff.

Like all other such market oversight agencies, MACD does not have the resources to pursue every single possible violation of the market rules. Many of the issues cited in the AG Report which it recommends could lend itself to further investigation are not necessarily violations of the rules. In all cases, they also involve market outcomes that will be remedied via Market Renewal.

Q. The OAG finds that IESO hasn't been distributing resources in an effective way to ensure all investigations into improper costs being claimed are being completed. In fact, the OAG states that only one in five potential cases identified by the Director of the Oversight Division can be investigated, because of lack of resources.

Attracting staff with expertise in market rules and investigations will be a priority. The IESO has recently increased staff in MACD. As part of our business planning process for 2018, IESO is also evaluating the risk profile of a variety of its priorities, including the enforcement of market rules. As part of this exercise, consideration is being undertaken to both increase the total level of resources made available for enforcement, as well as the conversion of some current resources to full-time and non-temporary staff.

Q. What is the scale of this problem (i.e., how many investigations should have been done)? And what is IESO's plan to deal with it? Why does IESO's oversight team not have the proper IT system to do their investigations?

The IESO has investigated nine participants and recovered the majority of ineligible costs. The IESO now pre-approves 14 of 15 eligible costs, removing the potential for overpayments and the need for after-the-fact audits for these components. Further and more fundamental changes will be made through the Market Renewal Program.

As part of the IESO Business Planning for 2018, the IESO is evaluating the risk profile of a variety of its priorities, including the sufficiency of resources directed towards MACD's IT support and replacement of the computer system.

Q. With so many stones left unturned, will IESO commit to undertaking a more fulsome audit of generators to ensure ineligible claims are recovered? If given more resources and authority, will the system operator take action on these uncompleted audits?

The IESO has concluded negotiated settlements with participants found to have submitted ineligible costs and has recovered the majority of them. The IESO now pre-approves 14 of 15 eligible costs, removing the potential for overpayments and the need for after-the-fact audits for these components. Further and more fundamental changes will be made through the Market Renewal Program.

Q. What is the impact on ratepayers of CMSC and RT-GCG?

In 2016, there was $112 million in CMSC costs and $23 million in GGC costs. These are costs that were required to maintain the reliability of the electricity grid.

To put that into context, $17 billion flowed through the electricity market over that time.

<u>*Regarding the Release of Company Names*</u>

Q. Can you release all audit information now?

Individual audit information is confidential under the provisions of the *Market Manual, Market Rules and Electricity Act, 1998.*

As part of its role overseeing Ontario's electricity market, the Independent Electricity System Operator (IESO) receives a lot of confidential and commercially sensitive information.
This includes information related to individual market participants' offers and bids, and information related to audits.

We need to respect the confidential and commercially sensitive nature of information we receive from market participants.

Releasing the names of the market participants would violate our settlement agreements and market rules.

Q. Did you not release the names before because you needed permission?

Audit information is confidential under the provisions of the *Market Manual, Market Rules and Electricity Act, 1998.*

Releasing the names of the market participants would violate our settlement agreements and market rules.

Q. How many of these generators are on the market renewal working group?

The Independent Electricity System Operator (IESO) seeks feedback from many stakeholder segments, including residential consumers, businesses, communities, transmitters, generators and distributors.

The market renewal working group (MRWG) is one of many stakeholder feedback groups we have. The MRWG is a representative stakeholder forum created to guide, advise and inform IESO on important strategic, policy and design issues that will impact the overall success of market renewal initiative.

The MRWG is made up of a cross-section of different participants from across the sector, including generators, LDCs, associations, consumers groups, as well as the MSP and OEB.

We recently announced the appointment a low-volume consumer representative on our MRWG to ensure that perspective was being captured.

These representatives are not the decision makers – rather, we listen to their feedback and consider their input. But at the end of the day, the IESO has the final say about market design considerations.

Q. Will you recover the remaining $32 million?

These costs were disputed by market participants and negotiated settlements were reached whereby the Independent Electricity System Operator (IESO) received about 85 per cent of what it deemed to be ineligible costs.

An example of a disputable cost would be whether certain facility maintenance costs were related to the starting-up of the facility, which would be covered by the RT-GCG program, or whether those maintenance costs were related to the regular operation of the facility.

So IESO identified what it believed to be ineligible RT-GCG costs, and then entered negotiated settlements to discuss costs that were disputed and reach agreements for repayment.

Where the estimated full costs were not recovered, the potential litigation risks and costs were assessed to be higher than what might reasonably be expected to be recovered. Any attempt to recover additional costs was likely to result in a worse outcome for ratepayers.

The costs we recovered through negotiated settlements are well within range of settlements that occur in contested law or regulatory enforcement contexts.

Q. Did Ontario Power Generation (OPG) pay back the entire amount of ineligible costs?

We can't release information specific to individual audits.

But we can say that, as a whole, we received about 85 per cent of what we deemed to be ineligible costs across the nine participants.

<u>Cybersecurity – General</u>

Q. Why is cybersecurity such an important issue for the Independent Electricity System Operator (IESO)?

The IESO takes its responsibility of assuring the reliability of the IESO-controlled grid very seriously.

Ontario depends on the reliable functioning of its critical infrastructure, and electricity is one of our most vital systems. Being a reliability coordinator goes beyond just the flow of electrons.

In an increasingly interconnected, distributed and widespread sector, maintaining the safe and sustainable operation of the power grid extends to being best-in-class in cybersecurity.

The IESO complies with all cybersecurity standards set forth by the North American Electric Reliability Corporation (NERC) and in 2016 began operating under an even more robust security governance framework, based on the National Institute of Standards and Technology

(NIST) Framework for Improving Critical Infrastructure Cybersecurity. This framework is considered absolute best practice on cybersecurity across all industries.

The IESO has also taken a leadership role in cross-sector cybersecurity awareness through industry capacity building sessions, the promotion of leading security standards and best practices, and collaboration with organizations and experts in cyber- and IT security policy from across North America.

Q Does the IESO have a tested cyber incident response plan?

Yes, under North American Electric Reliability Corporation (NERC) rules the Independent Electricity System Operator (IESO) is required to develop and maintain cybersecurity incident response plans. This includes a variety of response actions, including roles and responsibilities of incident response teams, incident handling procedures, and communication plans. These exercises represent relevant cybersecurity risks and support the ongoing continuous improvements of our processes and technologies.

The IESO recently participated in "GridX 4," a biennial exercise designed to simulate cyber/physical attacks on electric and other critical infrastructures across North America. These sessions provide exercise scenarios that link physical and cyberattacks with how system operators would respond to mitigate the impact of these attacks on bulk power system reliability.

The IESO has also shared publicly a series of incident response playbooks that define the procedures for security event investigations, which enables a responder to follow a structured method for validating and responding to each unique security alert.

Q. How is the Independent Electricity System Operator (IESO) audited for compliance with cybersecurity?

In alignment with the IESO's role in delivering superior reliability in a changing environment, every three years, the organization undergoes an audit of its compliance with North American Reliability Corporation (NERC) standards.

This includes two separate audits – one for Operations and Planning standards and a separate audit of Critical Infrastructure Protection (CIP) standards. Cybersecurity requirements fall under the CIP standards.

The purpose of these audits is to ensure that the organization is meeting the requirements of standards set for all users, owners and operators of the bulk electricity system.

The most recent audit occurred in October 2017 and was conducted by the Northeast Power Coordinating Council (NPCC).

For CIP, this was the first audit under the new CIP V5 standards, which came into effect on July 1, 2016. The purpose of CIP V5 is to protect any cyber assets that can affect bulk electric system reliability within 15 minutes of unavailability, mis-operation or misuse.

The audit concluded that IESO is in compliance with applicable standards related to cybersecurity.

In addition to ongoing internal compliance, IESO also engages a professional consulting service provider to perform readiness and compliance assessments.

Cybersecurity Issues Specific to the AG Report

Q. Does the Independent Electricity System Operator (IESO) agree with the characterizations made by the Auditor General about its IT security and cyber management practises?

The IESO welcomes the Auditor General's report and the opportunity to provide responses, in part to clarify the IESO's existing processes, but also to indicate a number of specific initiatives that are either currently underway or are scheduled in the near term.

The Auditor General accurately identified that IESO complies with rigorous cybersecurity industry standards overseen by the North American Reliability Corporation (NERC).

Moreover, the electricity sector is unique in that it is the only critical infrastructure sector with mandatory and enforceable cybersecurity standards

Q. Does the IESO agree with the Auditor General's finding that the IESO should create a senior-level position dedicated to cybersecurity?

Prior to the release of the report, the Independent Electricity System Operator (IESO) initiated a recruitment process for a Chief Information Officer (CIO) with an increased focus on cybersecurity.

The successful candidate in the CIO position will be an experienced senior technology executive with a deep understanding of Critical Infrastructure Protection (CIP) environments, like IESO, and demonstrated experience in overseeing enterprise-wide cybersecurity management programs. The target date for the appointment of the CIO is by end of Q1 2018.

The IESO is also looking to establish a senior-level position for cybersecurity, reporting to the CIO, who will be responsible for the delivery and operations of IESO's cybersecurity program. The timing of the senior-level cybersecurity role is targeting Q1 2018.

If pressed, additional information:

The CIO will have cross-organizational influence to ensure that cybersecurity risk management is being addressed and integrated across all business units of the organization.

The CIO will report to IESO's Chief Executive Officer. This was an internal governance decision, made by the IESO's executive in collaboration with the board.

Effective cybersecurity management is also a collective responsibility that extends to all levels of the organization. The IESO provides its staff with compliance and awareness training on an annual basis.

Q. Does IESO agree with the Auditor's recommendation that IESO should increase the number of cybersecurity staff and engage an external IT cybersecurity vendor?

The Independent Electricity System Operator (IESO) is in the process of implementing an independent consultant's recommendation to increase the number of cybersecurity staff, in a manner consistent with the Auditor General's recommendation. The IESO intends to double the size of its current cybersecurity team in 2018.

The IESO has launched a competitive process to retain a cybersecurity third-party vendor that will, in conjunction with IESO staff, provide a robust security operations center enabling 24/7/365 real-time cybersecurity monitoring. The SOC vendor is expected to be in place in Q2 2018.

The IESO is also an active member of the North American Cybersecurity Mutual Assistance Program that provides access to cybersecurity specialists from over 150 North American utilities in the event of a cyber-incident.

Q. Does IESO agree with the Auditor's recommendation that IESO's IT department needs to involve its cybersecurity staff in the early stages of all IT projects that could pose cybersecurity risks?

It is the Independent Electricity System Operator's (IESO) current practice that security risk assessments are incorporated into IT project management practices.

The IESO also understands the complexity and evolutionary nature of cyber readiness and will continue to enhance its approach to ensure "cybersecurity by design" in all of its IT-related projects. This means ensuring that the cybersecurity requirements are being considered early in the process of any new IT program design and that sufficient cybersecurity staff are allocated at this important part of any project.

This will be further facilitated by the formation of the IESO's new Program Management Office, which will work to ensure a holistic view on all IESO projects, as well as the appointment of the CIO.

If pressed, additional information:

The incoming Chief Information Officer (CIO) and senior-level cybersecurity resource will establish effective governance, ensuring that security practices are being built-in to IESO's project management program and individual IT project lifecycles.

The IESO is also developing a best practice guide for the sector on cybersecurity risks in the supply chain. This would be applicable to the vendor supply chain that delivers industrial control system hardware, software, and computing and networking services associated with not only the bulk system operations, but traditional enterprise environments.

Q. Does IESO agree that it should procure technology that prevents and identifies breaches of confidential information and monitor staff access to confidential information?

The Independent Electricity System Operator (IESO) has procured robust detection technology that has the ability to not only identify unusual activity that could lead to breaches of confidential information, but also malicious activity that could compromise the integrity of IESO IT environments.

Through the delivery of the Advanced Malware project, the detection technology is now in place, and in addition, all objectives identified in the business case for the project were met in 2017.

Q. Does IESO agree that it should encrypt all backup tapes and store them in a secure off-site location?

The Independent Electricity System Operator (IESO) has eliminated the use of tape-based backups in favour of system and data redundancy across two highly available and redundant data centers.

Q. Does IESO agree with the AG's recommendation to establish an external vendor cybersecurity policy; and have the cybersecurity team conduct a regular assessment of the security risk that external vendors pose to the IESO?

The Independent Electricity System Operator's (IESO) cybersecurity team works directly with the procurement and legal processes to ensure security requirements are met.

The IESO is also in the process of developing and implementing supply chain risk management measures to that comply with NERC Critical Infrastructure Protection Supply Chain risk standards, which will also include processes that are responsive to the recommendation.

In addition to that, IESO is expanding its cybersecurity governance framework over the next two to three years to meet the National Institute of Standards and Technology (NIST) Cybersecurity framework that will help assess and mitigate vendor risks to the supply chain. This framework will establish effective security governance around external vendors

The IESO is developing a best practice guide for the sector on cybersecurity risks in the supply chain. The target completion date for the report is Q3 2018.

Q. The Auditor's report identified a 2015 IESO breach where confidential contract information of a market participant was accessible to other participants. What happened, and how has/ will IESO prevent that from happening in the future?

The Independent Electricity System Operator (IESO) takes its responsibility of assuring the reliability of IESO-controlled grid very seriously and ensures compliance with North American cybersecurity standards

On September 14, 2015, IESO detected a technical issue that had caused its public reports site (reports.ieso.ca/public) to display the private reports and records of its Market Participants in addition to the standard public reports.

The issued occurred after IESO's IT group was troubleshooting intermittent outages on the new private reports site, which had been implemented about six weeks before.

In the process of troubleshooting the outages, a configuration error occurred, which essentially reversed the URLs for the public and private report sites.

As a result, access to the private reports site was open to the public for just under seven minutes. Upon discovery of the error, IESO immediately disabled all access to the report site until the configuration was corrected.

Subsequently, IESO put into place control measures through the report sites information migration process to prevent the issue from re-occurring.

APPENDIX – IESO'S KEY MESSAGE FOR STANDING COMMITTEE ON PUBLIC ACCOUNTS CHAPTER 3 (MARKET OVERSIGHT AND CYBERSECURITY)

- Real-Time Generation Cost Guarantee Program (RT-GCG) = Standby Cost Recovery Program (AG)
- Congestion Management Settlement Credits (CMSC) = Lost Profit Recovery Program (AG)

KEY MESSAGES – GENERAL

- The Independent Electricity System Operator (IESO) supports the Ontario Energy Board's Market Surveillance Panel's (MSP) work and acknowledges the recommendation made by the Auditor General.
- The IESO carefully considers every MSP recommendation and its underpinning analysis and responds to each recommendation outlining the actions IESO will take in a letter directed to the Chair and CEO of the Ontario Energy Board (OEB).
- The IESO has been taking action to address market inefficiencies since market opening in 2002.
- Many improvements have been made over the years to reduce payments to the minimum necessary to operate the grid reliably.
- Fundamental changes to Ontario's electricity market are now being made as expeditiously as possible through the Market Renewal Program.
- We are in stable supply situation, making now the right time to make these changes.
- Until fundamental changes can be made, Real-Time Generation Cost Guarantee Program (RT-GCG) and Congestion Management Settlement Credits (CMSC) will continue to be needed to maintain reliability and meet North American reliability standards.
- Due to the changes that have been introduced, the RT-GCG program operates more efficiently today. Program costs have fallen from $61million in 2014 to $23 million in 2016 and $22 million in 2017.
- A new cost recovery framework has removed the potential for overpayments and the need for after-the-fact audits for 14 of 15 cost components in the RT-GCG program.
- Generators who submitted and received ineligible costs through the GCG program were identified by IESO audits and the majority of costs (up to 85 per cent) were recovered.
- The Market Renewal Program will result in up to $5.2 billion in savings over a 10-year period, the majority of which will be realized by ratepayers.
- Market Renewal savings come from better scheduling and dispatching resources, and more efficiently procuring the capacity Ontario needs.

- A low-volume consumer representative is on our Market Renewal Working Group to ensure that perspective is being captured.

KEY MESSAGES – REAL-TIME GENERATION COST GUARANTEE PROGRAM (RT-GCG)

- The Independent Electricity System Operator (IESO) administered markets select and schedule just enough resources to meet energy and operating reserve demands every five minutes.

- The IESO has to be prepared for changes, both expected and unexpected, to the electricity system in order to maintain reliability. Having additional resources on standby allows IESO to effectively meet those changes, without reducing reliability or causing significant price fluctuations.

- Gas generators typically perform this function and they can take several hours to start and synchronize to the grid. During this period, these generators incur costs to start up and idle that they might be unable to recover through market revenues. The Real-Time Generation Cost Guarantee Program (RT-GCG) addresses this by covering certain costs should market revenues fall short.

- Without this program, IESO would be unable to ensure that generators are on standby to maintain reliability and would have to manage them in a less efficient manner, resulting in higher costs and negative impacts on reliability for Ontario and its neighbours.

- Since the blackout in 2003, all system operators are required to create operating plans for each day that clearly demonstrate their ability to maintain reliability for the region. Other system operators have similar approaches that commit generators and compensate them for starting up and being on standby.

- The RT-GCG program ensures sufficient generation is available to meet expected demand on a daily basis and is a key component in demonstrating compliance with mandatory continent-wide operational planning standards.

- The IESO is making fundamental changes to the electricity market that will include replacing the RT-GCG program with a more efficient and transparent form of generator unit commitment.

- Until fundamental changes can be made, the RT-GCG program is necessary to maintain the reliability of our electricity system and comply with mandatory continent-wide power system reliability standards.

- The IESO has made changes over the years that have made the RT-GCG program more efficient and transparent today, including to eligibility and cost submissions.

- Program costs have fallen from $61million in 2014 to $23 million in 2016 and $22 million in 2017. The IESO now pre-approves 14 of 15 eligible costs, removing the potential for overpayments and the need for after-the-fact audits for these components.

- Generators who submitted and received ineligible costs through the RT-GCG program were identified by IESO audits and the majority of costs were recovered.

- Two-thirds of ineligible costs were submitted by one generator, who was fined for failing to provide true, correct and complete information to the best of its knowledge.

- Where the estimated full costs were not recovered, the potential litigation risks and costs were assessed to be higher than what might reasonably be expected to be recovered. Any attempt to recover additional costs was likely to result in a worse outcome for ratepayers.

<u>KEY MESSAGES – CONGESTION MANAGEMENT SETTLEMENT CREDITS (CMSC)</u>

- Congestion Management Settlement Credits (CMSC) are paid to market participants, like generators and some large consumers, when they are scheduled by the Independent Electricity System Operator (IESO) to consume or inject when they would otherwise be doing so at an operating loss. Instances where CMSC are paid are a result of system constraints, such as transmission line limits.

- CMSC payments are needed to maintain the reliability of Ontario's electricity system. They are necessary to incentivize resources to comply with IESO dispatch instructions.

- These are mostly costs that are inherent in any electricity system, reflecting constraints, such as transmission line limitations, and measures required to maintain reliability.

- According to IESO, eliminating CMSC under the current market structure would undermine grid operations as suppliers would refuse to follow dispatch if they were asked to operate at a loss. This would challenge the reliability of Ontario`s electricity system and impair our ability to meet North American power system reliability standards.

- CMSC will continue to be needed until fundamental changes can be made to the electricity market through the Market Renewal Program.

- The IESO has made more than a dozen market rules since 2003 that improved program effectiveness and transparency, increased efficiency of CMSC, and reduced costs – many of these changes are responsive to Ontario Energy Board's Market Surveillance Panel (MSP) recommendations.

- A December 2016 MSP report noted: "many of the most problematic issues associated with the CMSC regime have been brought to an end – in large measure as a result of the Panel having identified these situations, and the IESO having acted to eliminate them."

- As the MSP acknowledges, some costs associated with CMSC will continue to exist in different forms even with the replacement of the current market design.

<u>KEY MESSAGES – IESO'S CYBERSECURITY PROGRAM</u>

- The Independent Electricity System Operator (IESO) is working to shape the future cybersecurity landscape in Ontario's electricity sector. We're doing this by collaborating with policy makers from around the world and addressing emerging challenges and opportunities associated with an increasingly digital sector.

- The IESO is also driving continuous improvements in three key areas:

- Strengthening our organization's security posture;
- Ensuring compliance while driving innovation; and
- Establishing strategic partnerships to innovate cyber defense.

- The IESO's new Chief Information Officer (CIO) will oversee our enterprise-wide cybersecurity management program and ensure that cybersecurity risk management is being addressed and integrated across all levels of the organization.

- To support our in-house team of cybersecurity specialists, IESO is establishing a robust security operations centre to provide 24/7 real-time cybersecurity monitoring that will assist with incident detection and response. This will help ensure that threats targeting data and assets are locked down and eliminated before they cause widespread damage and disruption.

- We have expanded our threat management and detection capabilities that protect our corporate network. This includes replacing traditional antivirus software with advanced endpoint malware protection technology. Studies put the number of security breaches originating at endpoints between 70-95 per cent. The IESO is making investments to close that gap over its network.

- The IESO has adopted a robust security governance framework that goes beyond current electricity sector standards and is based on the National Institute of Standards and Technology (NIST). This framework is considered the absolute best practice on cybersecurity across all industries and will help IESO remain current with the latest in cryptographic techniques, encryption, identity and access management and network security.

- The IESO brings together sector counterparts as well as the world's leading cybersecurity policy experts to stay up to date on best practices and trends in the emerging cyber-threat landscape. Our cybersecurity executive briefing was the first of its kind in Ontario's electricity sector, and we are developing a best practice guide for the sector on cybersecurity risks in the supply chain.

- The IESO has developed a collaborative legal framework with the Communications Security Establishment (CSE), Canada's cryptographic agency, internationally recognized for its cyber expertise. This framework will promote integrated information and data sharing in defending cyber-attacks. It has been leveraged by more than 25 utilities across Canada. The IESO will assist the CSE in expanding its cyber capabilities with respect to Ontario's electricity sector.

- The IESO is working with provincial government and electricity regulator to ensure cybersecurity defenses are providing effective oversight to mitigate cyber risks and threats at the distribution level. The IESO also works directly with Ontario's electricity distributors to provide training and best practices. The IESO shares and promotes best practice guides.

KEY MESSAGES – COMPLIANCE AND RELIABILITY

- Cybersecurity is a fundamental component of the Independent Electricity System Operator's (IESO) role in maintaining the safe and sustainable operation of Ontario's power grid. We make sure our network is secure by:
    - Ensuring compliance with North American regulatory requirements and industry standards;
    - Investing in new technology, techniques and training to ensure we are equipped with the best resources to combat cyber-threats;
    - Collaborating with our sector counterparts as well as the world's leading cybersecurity policy experts to remain current on best practices and trends in the emerging cyber-threat landscape;
    - Creating robust response capabilities by conducting cyber-incident scenario planning; and
    - Incorporating a "cybersecurity by design" approach into IT program development.
- The IESO complies with a series of continent-wide cybersecurity standards, defined by a standards body called the North American Electric Reliability Corporation, or NERC.
- Ontario's generators, transmitters and other industry participants are required to implement and comply with these standards. Some of these standards include:
    - Security management controls to protect critical cyber assets;
    - Ongoing cyber vulnerability assessments;
    - Cybersecurity incident response and recovery planning;
    - Mandatory staff training and awareness programs; and
    - Procedures to restore critical cyber assets.
- In 2016, IESO developed a renewed cybersecurity strategy that included the adoption of an even more robust security governance framework. It is based on the National Institute of Standards and Technology (NIST) Framework for Improving Critical Infrastructure Cybersecurity. This framework is considered absolute best practice on cybersecurity across all industries.
- In addition to continuously strengthening our protection and resilience to cyberattacks, the IESO plays a leadership role in the sector by supporting innovation and capacity building in the field of cyber threat management. We do this by:
    - Providing collaborative forums to share best practices to address existing and emerging cybersecurity issues to improve cybersecurity within Ontario's electricity sector;

    - Hosting executive and board-level cybersecurity briefings to learn from cybersecurity experts from around the world to conduct productive, collaborative and forward-looking dialogues on key areas of cybersecurity; and

    - Working directly with our reliability partners, like smaller utilities and sector participants, to address cybersecurity issues at all levels of the provincial system.

- Supporting the development of new policies and industry frameworks that focus on reliability, security and privacy.

APPENDIX – KEY ISSUES FOR STANDING COMMITTEE ON PUBLIC ACCOUNTS CHAPTER 3 (MARKET OVERSIGHT AND CYBERSECURITY)

Real-Time Generation Cost Guarantee Program (RT-GCG) / Congestion Management Settlement Credits (CMSC) – IESO

The Auditor General's report highlight the follow issues with respect to the Independent Electricity System Operator's RT-GCG and CMSC. The AG Report is critical of the RT-GCG program and CMSC:

- $30 million in additional costs is spent per year on RT-GCG program despite the Market Surveillance Panel (MSP) recommending the Independent Electricity System Operator (IESO) scale back the program.

- $260 million in ineligible RT-GCG costs were paid out from 2006-2015 and only about half has been recovered.

- About $1.6 billion of CMSC paid since 2002, including $500 million to just a few market participants in the northwest; was supposed to be temporary.

- Market participants who have misused programs are allowed to participate in the market renewal working group.

- Market Assessment and Compliance Division (MACD) has limited resources and is not sufficiently independent.

Legislative Power and Authority of the Ontario Energy Board (OEB) – Ministry of Energy

In the Auditor General's report it is recommended that to ensure that ratepayers' interests are protected and that recommendations made by the OEB's Market Surveillance Panel (MSP) to improve market rules are addressed that the Ministry of Energy review the legislative power and authority of the OEB to conduct a review of a market rule on its own motion, and to consider expanding its authority under the Electricity Act, 1998, when misuse and abuse of a market rule is brought forward by the MSP and is not effectively being addressed by the Independent Electricity System Operator (IESO).

Legislative Authority Market Assessment and Compliance Division (MACD) – Ministry of Energy

In the Auditor General's report it is recommended that to enable the Independent Electricity System Operator's MACD to conduct thorough and effective investigations that the Ministry of Energy should give MACD explicit legislative authority under the Electricity Act, 1998 to compel information and evidence in the course of its investigations.

Industrial Conservation Initiative – Ministry of Energy

In the Auditor General's report it is recommended that to ensure the transparency of government decisions with respect to the Industrial Conservation Initiative (ICI) that the Ministry of Energy review the impact of the Industrial Conservation Initiative on low-energy consuming ratepayers and publicly report this information.

Cybersecurity – IESO

The Auditor's review acknowledges that the Independent Electricity System Operator (IESO) complies with regulatory standards, but suggests there are potential vulnerabilities in its practices that could leave IESO susceptible to cyber breaches, which could in turn jeopardize reliability.

The AG report includes a range of recommendations, paraphrased below, that suggest IESO should:

- Create a senior-level position dedicated to cybersecurity and establish a formal reporting process to both IESO executives and the IESO Board of Directors
- Increase the number of cybersecurity staff and engage an external IT cybersecurity vendor
- Ensure its IT department involves its cybersecurity staff in the early stages of all IT projects that could pose cybersecurity risks
- Procure technology that prevents and identifies breaches of confidential information and monitor staff access to confidential information
- Encrypt all backup tapes and store them in a secure off-site location