

Contract Review Directive Report

Prepared for the Ministry of Energy, Northern Development and Mines

February 28, 2020

1 Executive Summary

On November 6, 2019 the Independent Electricity System Operator (the “IESO”) received a directive from the Minister of Energy, Northern Development and Mines, with the support of the Associate Minister of Energy, requesting the IESO to retain an independent third party to undertake a review of existing generation contracts for viable cost-lowering opportunities (the “ Directive”).

In response to the Directive (attached as Appendix 1), the IESO retained the services of Charles Rivers Associates (the “Third Party”) to undertake the targeted review. The Third Party documented their assessment in a report that is attached as Appendix 2 (the “Third Party Report”).

As part of the review, the IESO consulted larger contracted generators for potential cost-lowering ideas to validate the merits of existing ideas and identify new ones. This feedback was provided to the Third Party for their assessment and is incorporated in the analysis of the identified opportunities.

The Third Party, informed by the information provided from the IESO, contracted generators, as well as their own independent research, has completed a comprehensive review of potential cost-lowering opportunities. The IESO has assessed and summarized the potential cost-lowering opportunities in this document, as well as implementation considerations that should be evaluated in contemplation of pursuing the identified cost-lowering opportunities.

The IESO notes that the Third Party identified the “Buyout” and “Buydown” options for wind and solar contracts as the opportunities with the greatest cost-lowering potential. These opportunities have similar characteristics, in that they both enable consumer savings based on the difference between lower borrowing rates of the IESO or the Province compared with the cost of capital typically seen by contracted generators in the private sector. The risks associated with these opportunities, however, are different.

In the Buyout option, both the IESO and contracted generator take on risk associated with future market prices relative to the forecasted values used in establishing the buyout price. The contracted generator assumes the risk that future market revenues may be lower than those forecasted in the established buyout price and must continue to operate the facility to earn these future market revenues. The IESO takes on the risk that future market revenues may be higher than those forecasted within the established buyout price which would erode projected savings and create a perception that bought out contracted generators have been overcompensated.

The Buydown option does not place this market risk on either party as the contract is still active post-buydown and it does not rely on forecasted future market revenues in the same way as the Buyout option. This additional risk in the Buyout option is a major driver for the lower assumed take-up rates relative to the Buydown option.

The Third Party concluded that the opportunity with the most cost-lowering potential is the Buydown option, which can be applied to wind, solar and gas contracts. The base case scenario is estimated to result in net cost savings of \$37 Million in the first year of implementation. The potential total savings over the term of a Buydown program were evaluated at a range of social discount rates as shown in the table below. The net present value of the net savings from the Buydown option ranges from \$303 to \$443 Million over the term of the program and would require over \$2.1 Billion of new debt.

Buydown Option	First Year Net Savings (2021)	Net Present Value of Net Cost Savings Discounted at Various Rates			Debt Requirement
		3%	6%	9%	
Wind and Solar	\$32 Million	\$396 Million	\$323 Million	\$268 Million	\$1.8 Billion
Gas-fired	\$5 Million	\$47 Million	\$40 Million	\$35 Million	\$0.3 Billion
Total	\$37 Million	\$443 Million	\$363 Million	\$303 Million	\$2.1 Billion

An important consideration is that potential savings figures do not include any implementation or transaction costs for the opportunities and are not adjusted for any risks. The IESO's preliminary estimate of the implementation costs to pursue these cost-lowering opportunities could be in the order of \$3 Million, depending on the approach and scope. The IESO also estimates it would take more than a year before cost reductions could begin to be realized by consumers.

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3 Introduction

3.1 BACKGROUND

Pursuant to Order in Council 1499/2019, the Minister of Energy, Northern Development and Mines, with the support of the Associate Minister of Energy issued a directive on November 6, 2019 to the IESO to undertake a targeted review of existing generation contracts for viable cost-lowering opportunities (the “Directive”).

Among other things, the Directive (attached as Appendix 1) requires the IESO to:

1. Retain the services of an independent third party;
2. Identify measures or adjustments that could result in reduced costs for Ontario consumers;
3. Place particular focus on larger gas, wind and solar contracts expiring in the next 10 years;
4. Provide the third-party report along with the IESO’s assessment of the findings to the Ministry by no later than February 28, 2020; and
5. Identify any additional opportunities to lower system costs beyond the scope of the contract review.

3.2 OBJECTIVE AND SCOPE

The review focused on larger gas, wind and solar contracts (or large portfolios of contracts held by the same company), as well as other opportunities that could lead to lowering costs to Ontario consumers. In accordance with the Directive, the review did not consider the Bruce Power Refurbishment Agreement or contracts related to conservation and demand-management initiatives.

This report documents the IESO’s assessment of the findings summarized in the Third Party Report and provides context to support this assessment.

3.3 REPORT ORGANIZATION

This report is organized into three main sections:

- Background information and context
- Discussion of potential cost-lowering opportunities
- Assessment of opportunities

3.4 DISCLAIMER

This report has been prepared for the Government of Ontario and may not be relied upon by any other party. This report does not constitute legal advice or a guarantee, representation, or warranty, express or implied. In the event there is any conflict or inconsistency between the information contained in this report and any IESO contract or the IESO market rules, the terms of the subject contract or market rules, as applicable, govern.

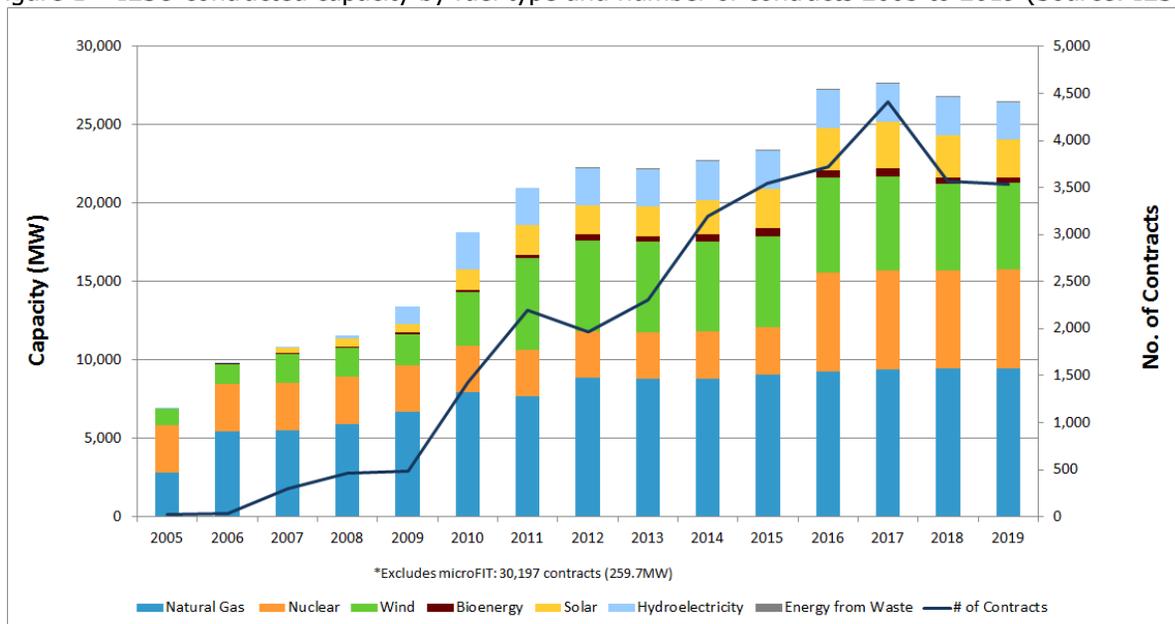
4 Background and Context

4.1 HISTORY AND PURPOSE OF CONTRACTS

In 2004, the Ontario government passed the *Electricity Restructuring Act*, creating the Ontario Power Authority (the “OPA”), an organization responsible for long-term system planning and procurement of generation under long-term contracts for the purpose of meeting the province’s resource adequacy requirements. The government directed the OPA to execute contracts representing approximately 2,500 MW of generation and demand-response resources, based on a previously issued Request for Proposals. These contracts were required to maintain provincial resource adequacy. As described in more detail in Section 0, these contracts secured capacity by providing a financial hedge against electricity market prices – providing generators a level of certainty that they would be able to recover their costs and earn a return.

Between 2005 and 2016, at the direction of the Ontario government, the OPA (and later the IESO¹) entered into over 30,000 Renewable Energy Supply (“RES”), Renewable Energy Standard Offer Program (“RESOP”), Feed-in Tariff (“FIT”), microFIT and Large Renewable Procurement (“LRP”) contracts representing over 7,000 MW of additional contracted capacity. These contracts are energy contracts, or power purchase agreements (“PPAs”), which are described in more detail in Section 0. Over the same period, at the direction of the Ontario government, the IESO also entered into a smaller number of contracts for a variety of different resources such as natural gas-fired generation (including combined heat and power), existing uncontracted generation facilities, and energy from waste through a number of initiatives.

Figure 1 – IESO contracted capacity by fuel type and number of contracts 2005 to 2019 (Source: IESO)



Throughout this time, contracts entered into by the IESO (and the predecessor OPA) pursuant to governmental directives served multiple purposes, including maintaining the resource adequacy of Ontario’s electricity system and assisting in the implementation of broader government policies, such as

¹ Pursuant to subsection 3(1) of Schedule 7 to the *Building Opportunity and Securing Our Future Act (Budget Measures), 2014*, the OPA was amalgamated with the IESO and continued as the IESO as of January 1, 2015.

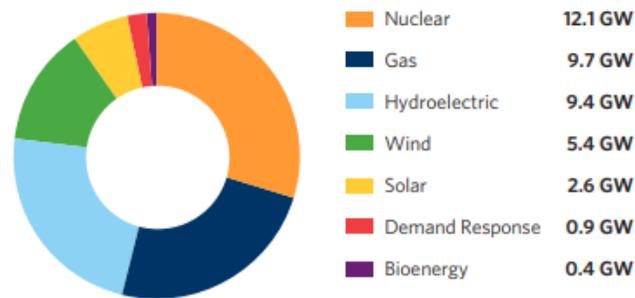
reducing greenhouse gas emissions and achieving renewable energy penetration targets. Figure 1 illustrates IESO contracted capacity by fuel type and the increasing contracted capacity and number of contracts held by the OPA/IESO from 2005 to 2019.

4.2 CURRENT SYSTEM OUTLOOK

Today, Ontario has over 40 GW of installed capacity and is generally expected to have a surplus of both energy and capacity until 2022.

As shown in Figure 2, Ontario has a diverse supply mix, with the majority of installed capacity coming from nuclear (30%), gas (24%), and hydroelectric (23%) resources, and the remainder from wind (13%), solar (6%), demand response (2%) and bioenergy (1%).

Figure 2 – 2019 Installed Capacity by Fuel Type (Source: IESO Annual Planning Outlook, January 2020)

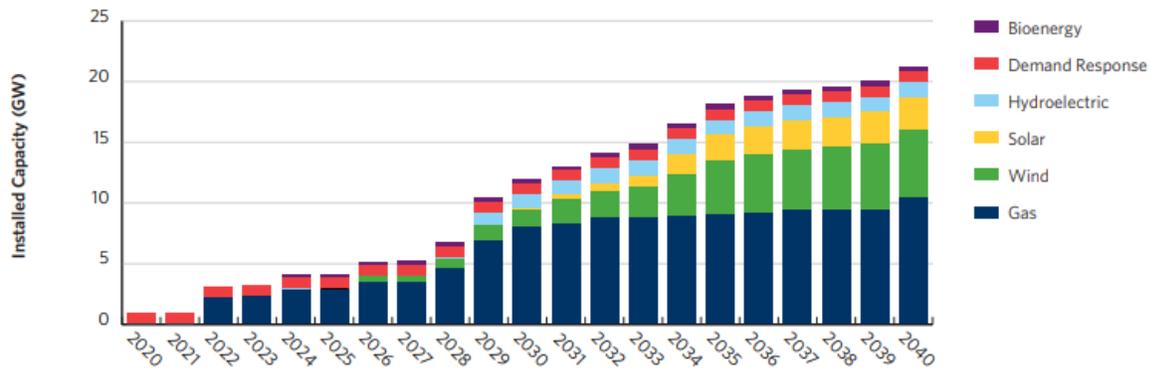


The province is well positioned to meet future resource adequacy needs. The IESO’s Annual Planning Outlook (“APO”) released in January 2020 forecasts that Ontario is generally expected to have enough energy to supply demand over the next 20 years.

Although Ontario’s energy requirements can largely be met with existing and available resources, a summer capacity need arises in the early 2020s. Assuming existing resources remain available (i.e. all resources with expiring contracts remain available), a capacity need of approximately 1,000 to 2,000 MW is expected to emerge in 2023 and grow slowly through 2040. If the resources with expiring contracts are not reacquired and are no longer available, the capacity need in 2023 is projected to be approximately 4,000 MW.

In order to meet the 2023 capacity need, the IESO will need to reacquire the resources with contracts that expire over the next decade and beyond, or acquire new resources. As illustrated in Figure 3 below, over 10,400 MW of capacity from currently contracted resources will expire over the next ten years. Of this, 6,900 MW is thermal generation (predominantly gas), and the remaining 3,500 MWs is hydroelectric, wind, bioenergy and demand response resources. These contracted resources play an important role in meeting the IESO’s current capacity adequacy requirements and any changes to their availability may result in a larger need to reacquire these same resources or acquire new ones, when capacity needs arise in 2023.

Figure 3 – Existing Resource Post-Contract Expiry 2020 – 2040 by Fuel Type (Source: IESO Annual Planning Outlook, January 2020)



4.3 TYPES OF CONTRACTS

The IESO holds two primary types of contracts – energy-style contracts (e.g. FIT contracts) and capacity-style contracts (e.g. Clean Energy Supply (“CES”) natural gas contracts).

Energy-style contracts guarantee a contract price for every MWh of energy produced. These contracts generally have limited financial incentives to respond to market signals and typically relate to “non-dispatchable” resources (i.e., generation facilities that have little to no ability to adjust their output in response to market conditions). Resources currently contracted under this contract model include nuclear, solar, wind, run-of-river hydro, and bioenergy.

Capacity-style contracts provide revenue support for each MW of capacity made available to the system. These contracts provide financial incentives to respond to market signals when energy is needed and typically relate to “dispatchable” resources (i.e., generation facilities that have the ability to adjust their output to market conditions). Resources contracted under the capacity contract model are primarily natural gas-fired facilities.

The designs for both types of contracts were constructed to coincide with Ontario’s electricity market, acting as a financial hedge against market outcomes for both the generator and the IESO. For example, if energy market revenues are high, contract payments will be lower or may even result in payments from the generators to the IESO. If energy market revenues are low, contract payments will be higher. Since the design of these contracts is primarily financial in nature, there are few physical obligations provided for in the contracts, especially once commercial operation is reached. Physical obligations during the operation of the facility generally pertain to the compliant operation of the facility using good engineering and operating practices.

How the facilities operate is not dictated by the contract, although it may be guided by the financial incentives provided by both the applicable contract and the electricity market. The risks and opportunities of operating and maintaining the generation facilities (and the associated costs) reside with the generators. IESO contracts do not guarantee profits, which are dependent on the generator’s ability to successfully build and efficiently operate a facility. In the context of cost-lowering opportunities within IESO contracts, this limits the scope of potential opportunities that would be beneficial to ratepayers as operational-related efficiencies will generally be to the generators’ account (just as increases to operational costs would be detrimental to their profits).

4.4 THE IESO'S APPROACH TO CONTRACT MANAGEMENT COST-LOWERING OPPORTUNITIES

The IESO manages its portfolio of generation contracts effectively and efficiently on behalf of Ontario ratepayers, in compliance with the terms of the contract. Generally, contract counterparties have a legal duty to act honestly and in good faith in their contractual performance. As is typical in commercial contracts of this nature, the IESO's generation contracts do not provide either party with the right to unilaterally amend or vary the terms of the contract (other than in specific limited circumstances). As a result, when one party identifies a beneficial opportunity that requires changes to the terms of the contract, it may only be implemented with agreement of the other party. Parties will generally only agree to changes that benefit them and/or if some other benefit is received in return. Therefore, most opportunities require negotiations to find mutually beneficial outcomes that all parties can agree on. For facilities with secured lenders, the consent of the lenders may also be required for any contractual amendments.

The IESO has provided advice and supported policy decisions to end unnecessary procurement initiatives and exercise available termination rights for resources that are not needed. In addition, the IESO also has a long-standing practice of agreeing to mutual terminations of contracts when appropriate. Over the last 10 years, almost one thousand IESO contracts have been mutually terminated by the parties. These terminations relieved both parties of their contractual obligations without any penalties to the other and have resulted in cost savings to consumers.

The IESO has also been actively pursuing and implementing opportunities to find efficiencies and cost savings within contracts, including contracts for facilities that are under development and those that are in commercial operation. As the majority of contracted facilities have come into service, the IESO has put more focus on pursuing and implementing opportunities with generation contracts for facilities in commercial operation that have potential savings for ratepayers. Some examples from the past few years include: converting natural gas-fired non-utility generator energy contracts managed by the Ontario Electricity Financial Corporation into IESO managed capacity-style contracts; piloting revenue-generating opportunities such as contracted capacity exports and the sale of renewable energy credits; and agreeing to early terminations of contracts for facilities that no longer benefit the parties. These and additional opportunities that may be available going forward are discussed further in Section 5.3.5.

4.5 THE IESO'S APPROACH TO ELECTRICITY SYSTEM COST-LOWERING OPPORTUNITIES

In addition to contract opportunities, the IESO has been introducing efficiencies into the structure of Ontario's electricity market to provide additional savings to ratepayers in the future. Over the last several years, the IESO has implemented several market-based initiatives to reduce system costs. Cost reductions have been realized by improving price transparency, increasing competition in the market, and reducing out-of-market payments where possible. Individually, many of these initiatives have improved reliability and reduced system operating costs by tens of millions of dollars annually.

Looking ahead, the IESO launched the Market Renewal Program to improve market efficiency and provide Ontario with an electricity market that will continue to meet its future needs.

The Market Renewal Program, developed through a comprehensive stakeholder engagement process, will implement a new energy market design with the following benefits:

- Enhanced reliability by aligning price and dispatch
- Greater certainty and reduced risk through introduction of a day-ahead market
- Reduced opportunities for gaming by eliminating most out-of-market programs
- Broader market benefits with improved signals to encourage new investment
- Enable future markets and drive innovation by providing more transparency and certainty

Transitioning to the new market design will result in market efficiencies and elimination unnecessary out-of-market payments, leading to persistent long-term savings that are estimated to be approximately \$800 million in net financial benefits to Ontario consumers over the first 10 years of implementation.

5 Cost-Lowering Opportunities

5.1 GENERAL DISCUSSION REGARDING CONSIDERATIONS

The IESO assembled cost-lowering ideas that have been considered in the past, identified new potential ideas, and canvassed larger contracted generators for any ideas they may have.

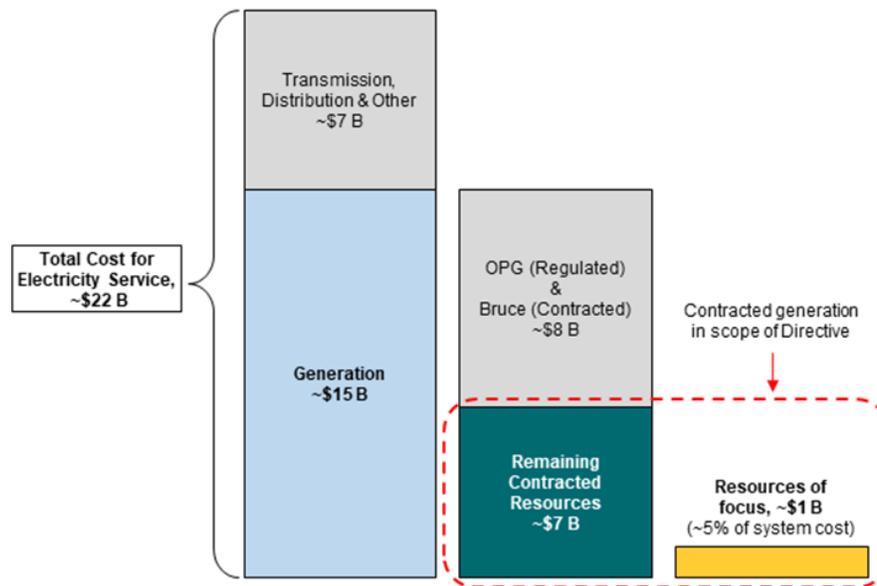
The potential opportunities were screened for the following four main considerations:

1. Contractual rights and obligations – Opportunities for cost savings should be possible within the existing terms of the contracts and/or capable of being agreed to by the parties through negotiated contract amendments.
2. Impact on system reliability – Opportunities should not compromise the IESO's ability to meet system reliability criteria.
3. Benefit to Ratepayers - Opportunities should represent the potential for a net-benefit to ratepayers, giving consideration to short-term savings, long-term costs, and future competitiveness of the electricity marketplace.
4. Practicality to Realize – Opportunities should be attainable in a timely manner and not outweighed by potential transaction costs.

As described in Section 3.2, the focus of the Directive is on natural gas, wind and solar facilities with large contracts (or large portfolios of contracts held by the same company), that will expire over the next ten years, as well as other opportunities to lower electricity costs that were identified by the IESO and the Third Party. The analysis did not consider the Bruce Power Refurbishment Agreement or contracts related to conservation and demand-management initiatives.

As illustrated in Figure 4 below, due to the fact that only a few contracts are expiring within the next 10 years, the Directive's primary focus represents approximately \$1b, or 5% of total annual Ontario electricity system costs. For the purpose of identifying the greatest potential opportunities for cost-lowering, the analysis focused on all larger contracts, except for the Bruce Power Refurbishment Agreement. This expanded scope represents approximately \$7b, or 32% of total annual costs of the Ontario electricity system.

Figure 4 – Estimated 2020 Cost Breakdown of the Ontario Electricity System (2020\$) (Source: IESO)



5.2 FEEDBACK FROM CONTRACTED GENERATORS

As part of the IESO's comprehensive effort to identify cost-lowering opportunities, the IESO consulted with contracted generators. Shortly after the receipt of the Directive, the IESO sent letters to all contracted generators that hold larger contracts or a larger portfolio of contracts, requesting identification of viable cost-lowering opportunities. The letter is attached as Appendix 3. The IESO saw value in directly engaging with the generator community and exploring potential ideas from a wide range of sources to both validate the merits of existing ideas and to identify new ones.

The summary of the feedback on cost savings opportunities related to contracts is as follows:

- 25 separate submissions were received.
- About a quarter of the responses commented that they did not have any cost-lowering ideas. The majority of the other responses were of modest detail, speaking generally to overarching themes and ideas prompted by the language in the Directive.
- A few submissions indicated that little or no savings are available in competitively procured contracts, as financing arrangements and other agreements were optimized for the economic parameters and contract terms of each project at that time.
- Many of the submissions indicated that any potential opportunities or initiatives should be considered on a contract-by-contract basis to account for unique terms, parameters, and economic considerations applicable to each contract. These submissions advised against a unilateral or one-size-fits-all approach.
- Blend and Extend or similar concepts were noted most frequently, with general openness to discussing the concept with the IESO, but many highlighted limitations or constraining factors to implementation. In particular, most responses outlined the limitations and challenges to modifying contract economics and terms due to impacts on underlying financing arrangements with lenders and equity sponsors.

- Several submissions identified financial arbitrage concepts or other financing arrangements, but some also noted implementation challenges due to existing debt agreements. Examples include:
 - Government sponsored take-out financing at favourable interest rates to reduce higher-rate existing debt facilities.
 - Government guarantees of existing loans to negotiate more favourable rates from lenders as a result of reduced default risk of the guarantee.
 - Buyouts of contracts or physical acquisition of the facility.
- A few responses noted potential opportunities to monetize environmental attributes and changes to contractual or operational requirements that may reduce facility operating costs.
- A few submissions identified technology enhancements, reconfigurations, or co-location of energy storage to optimize facility output, which may lead to greater efficiency or services provided to the grid, but not necessarily lower costs.
- Several submissions were endorsements for existing or new facility-specific proposals that do not relate to the scope of the Directive.

Some respondents also noted high-level ideas that are not related to contracts, but were nonetheless reviewed and assessed as part of the potential cost-lowering opportunities outside of the contracts review. These included such ideas as reviewing system planning cost assumptions, reducing financial security carrying cost for market participants, eliminating other IESO programs, shaping demand and improving time-of-use rates, enabling transmissions solutions and enhancing export capacity, and other ideas related to electricity market design.

All feedback was reviewed in detail and provided to the Third Party for their assessment. The feedback and the IESO's assessment of the feedback is incorporated in the analysis of the identified opportunities below.

5.3 IDENTIFIED OPPORTUNITIES

The IESO has been continuously identifying, evaluating and refining potential cost-lowering opportunities from its existing contracts. The feedback that was received from contracted generators is consistent with the opportunities that have been explored by the IESO in the past. Opportunities with more potential and consistent with the Third Party's report are identified and summarized at a high level below. In addition, other opportunities that may have potential are also discussed.

5.3.1 Contract Terminations

Certain IESO generation contracts have termination rights which, depending on project status, allow the IESO to unilaterally terminate the contract with limited liability (generally referred to as "termination for convenience"). The exercise of such termination rights is capable of reducing electricity costs by avoiding future contract payments for energy or capacity that is not required to meet system needs.

In July of 2018, pursuant to a directive from the Minister of Energy, Northern Development and Mines, the IESO exercised its termination right for over 750 FIT and LRP contracts that had not yet met certain contractual milestones². These terminations included all contracts with available termination for

² These contracts were eligible for energy prices of between 13 and 30 ¢/kWh once the facilities reached commercial operation. Ontario government's announcement and list of terminated contracts can be found at: <https://news.ontario.ca/mndmf/en/2018/07/ontario-to-cancel-energy-contracts-to-bring-hydro-bills-down.html>

convenience rights where electricity cost savings were anticipated to be achieved. There remains a small number of contracts for small solar facilities that are still under development and for which the IESO has a termination for convenience right prior to commercial operation. The exercise of this right is not anticipated to result in cost savings due to the status of the facilities and the very small size of the remaining facilities compared with anticipated transaction costs.

The IESO's generation contracts do not provide the IESO with termination for convenience rights once the facility has achieved commercial operation. This is typical for contracts of this nature and reflects that the vast majority of capital investment in a generation facility occurs prior to commercial operation and including such a termination right would be expected to result in increased costs to finance the project due to increased contractual uncertainty, thereby increasing the overall project cost. Once a project is operational, in the earlier years of a facility's life there is often little (if any) costs to be saved by unilaterally terminating the contract, after taking into account incurred costs and the break fees that would normally be incurred in an early termination.

As is standard in commercial contracts, the IESO's generation contracts also include termination rights in the event of a material breach by the generator. The IESO strictly enforces the obligations in its contracts, including the obligation for generation projects to reach commercial operation by a specified milestone date and will exercise available termination rights where such material obligations have been breached. While the IESO considers this to be reasonable and effective contract management, the enforcement of these obligations is not considered to be a source of cost savings, as the IESO presumes that suppliers will comply with their contractual obligations.

Further, the circumstances where the IESO could potentially exercise a termination right for a generator default that occurs after the facility has achieved commercial operation are very limited. After a facility has achieved commercial operation, the contracted generator's obligations during the operating term are generally readily achievable by any prudent generator. As such, absent unique circumstances, it is unlikely the IESO would have the right to terminate contracts for defaults that occur after a facility has achieved commercial operation.

In connection with the Directive, the IESO also sought external legal counsel review of its termination rights in the contracts that are the subject of the analysis. A memo from the IESO's external legal counsel, Osler, Hoskin & Harcourt, commenting on such termination rights is attached as Appendix 4.

5.3.2 Contract Buyouts

In the absence of viable unilateral termination rights, only negotiated terminations are possible through a "Buyout" of a contract. A Buyout can take several forms, but would essentially consist of a lump sum payment by the IESO to a contracted generator for the anticipated, future net revenue from the contract. The facility owner would then be free to make decisions on the future of the facility, such as operating the facility as a merchant generator, permanently shutting it down or selling it.

To finance the Buyout, the IESO would need to borrow funds (on behalf of ratepayers) and would repay the loan over time through charges to ratepayers. The potential savings to the ratepayer would come from the anticipated difference between the IESO's borrowing costs and the contract generator's cost of capital on the stream of future cash flows, similar to other financing arbitrage opportunities discussed below. The amount of this savings opportunity would also depend on any differences in assumptions placed on the value of the facility without an IESO contract.

5.3.3 Financing Arbitrage and Contract Buydowns

Financing arbitrage refers to the ability of the IESO or the Province to borrow money at lower cost than a private sector entity's cost. Potential opportunities to lower costs can be created when the IESO and a contracted counterparty agree to one of the following:

- The IESO provides replacement financing to the contracted generator at a below market rate by borrowing at its lower rate; or
- The IESO "buys down" a portion of the contracted generator's projected future contract payments in a lump sum which is funded by borrowing money at its rate (which is lower than the contracted generator's cost of capital).

These types of opportunities require the IESO or the Province to borrow money and transfer it to the generator in the form of an up-front lump sum payment to reduce the magnitude of the future contract payments that will be paid to the generator. The generator and the ratepayer can both benefit from this opportunity if the lump sum payment received by the generator is greater than the net present value of their revenue stream/cash flows (discounted at the generator's higher discount rate) and the reduced contract payments plus the costs of debt repayment are lower than the sum of the original future contract payments.

Any financing arbitrage opportunity would require negotiated contract amendments, which would need to create sufficient value, net of any implementation and administration costs, for both the ratepayer and the generator relative to any risks transferred to either party.

Unlike the Buyout option discussed previously, the IESO contract would remain in full force and appropriate contractual safeguards would have to be put in place to establish security on advanced funds in the event that the contracted generator fails to meet its ongoing contractual obligations.

The primary obstacle to these types of arrangements are existing loan agreements that already provide security over the facilities to existing lenders and limit equity owners in their ability to enter into other financial arrangements. Breakage of existing loan agreements would likely come with considerable costs.

5.3.4 Blend and Extend

An opportunity that can lower costs for ratepayers in the near term involves extending the term of existing contracts in return for lowering the rates paid to the contract party under the contract. It is expected that once the contract expires, the contracted facility can continue to operate at a lower cost and thus accept a lower price under the contract. By blending the current higher contract prices with expected lower contract prices over the extended period of the contract, a blended contract price (which is lower than the current contract price) can be achieved. The blending of contract prices and extending of contract term have led to this opportunity being commonly referred to as "Blend and Extend".

The opportunity is better suited for contracts that are set to expire in the near term, as the value of blending the expected lower prices in the extended term gets increasingly diluted over longer periods of existing term. The most opportune time to implement this opportunity would likely be with a pool of contracts set to expire within 3 to 5 years, as this is the time that asset owners would be considering investment decisions and evaluating them against potential market opportunities.

Blend and Extend, unlike the potential financing arbitrage opportunities discussed above, has a counteracting effect on actual savings due to contracted generators' discount rates being higher than the IESO's. Therefore, the value of lowering the current contract price will be valued higher by the generator than the IESO and the present value of the extended term will be valued lower by the contract counterparty than the IESO. While ratepayer costs may be lowered in the near term, it is likely that ratepayers will pay more than they otherwise would over the extended term of the contract. Actual savings for ratepayers are only likely to be achieved if contract counterparties highly value the additional certainty of future revenues when contracts expire.

5.3.5 Other Opportunities Related to Contracts

5.3.5.1 Monetizing Environmental Attributes

The IESO's contracts give the IESO rights to a broad set of "Environmental Attributes", which can be simply described as rights to certain environmental benefits of the contracted facility that may have monetary value. Historically there has never been a clear market valuation of these attributes making it difficult to factor their value into the contracted rates. The Environmental Attributes that have emerged to have monetary value to date are Renewable Energy Certificates or Credits ("RECs"), which have historically been traded in voluntary and compliance markets in various jurisdictions. In Ontario, RECs from merchant generation have been marketed directly to consumers who voluntarily want to purchase them typically at prices far below the premium required to support the development of new renewable generation. The market in Ontario for these products has been small, given that the vast majority of Ontario's electricity comes from rate-regulated and contracted resources which have typically been ineligible to generate RECs.

The IESO has on several occasions explored selling or auctioning off RECs from its contracted facilities, but was not able to certify and monetize the RECs due to policy and regulatory constraints. More recently, viable markets for RECs exports have started to emerge in New York and potentially other jurisdictions. The IESO has piloted a limited sales opportunity with one contracted generator to better understand potential opportunities. Based on continued evaluation of the pilot, the IESO will explore a larger program that would be open to all eligible contracted generators.

5.3.5.2 Enhanced Dispatch Agreements with Non-Utility Generators

Non-Utility Generator ("NUG") contracts are legacy contracts that were entered into by Ontario Hydro and are currently managed by the Ontario Electricity Financial Corporation. These contracts, which were created at a time when Ontario was still relying heavily on coal-fired generation to meet electricity needs, provide financial incentives for facilities to maximize their output. In recent years, following many changes to Ontario's electricity supply mix, this meant ratepayers were often paying NUG facilities to burn natural gas to generate electricity when there were other lower cost alternatives available. The IESO has been successful in renegotiating all but one of these natural gas NUG contracts to curtail their operations and respond to market signals.

The final remaining facility currently provides strategic locational value and must continue to operate as it historically has done, negating any value that could be generated from renegotiating its contract. The IESO and the owner/operator of the facility have been working together to explore options to reconfigure the facility, enhance transmission infrastructure and other options in order to realize savings for ratepayers. A renegotiated contract that will provide savings to ratepayers should be possible, once scheduled upgrades to transmission infrastructure are completed in the next 2 to 3 years.

5.3.5.3 *Gas Distribution & Management Services*

The cost of Gas Distribution & Management (“GD&M”) services for a small number of the IESO’s gas generation contracts are shared between the ratepayer and the facility owner. Gas management committees (“GMC”), consisting of representatives from the IESO and facility owners, are responsible for developing gas management plans (“GMPs”) and acquiring GD&M services to meet the conditions set out in the contracts at the lowest possible cost.

The GMCs meet regularly to assess the GMPs and look for efficiencies and opportunities to optimize the plans and reduce costs. Opportunities may exist to acquire less flexible and/or less dependable GD&M services for a lower cost. However, the services are optimized for the facility’s operational requirements and therefore modifications to services may require contract amendments and could impact system reliability. Nevertheless, the IESO is continuing to explore opportunities with contracted generators to realize savings where operational risks can be reasonably accepted.

5.3.5.4 *Reducing Stringency of Contract Obligations*

The IESO’s contracts have several obligations on contracted generators that are meant to reduce risk to the IESO. For example, most contracts for larger facilities require specific insurance coverage, financial performance security, and capacity availability obligations. These obligations are the responsibility of the generators as are the associated costs. There may be opportunities to reduce some of these obligations, where the risk would still be acceptable to the IESO, but the cost of these obligations would reduce. Contracts would have to be amended to adjust these obligations in exchange for a portion of the savings to be returned to the IESO.

5.3.5.5 *Unique Opportunities*

Given the large number of contracts that the IESO manages, there are often unique situations that are specific to a contracted facility that can sometimes lead to cost savings. These are often brought up by contracted generators to the IESO as their situations change. These types of opportunities are explored and in some cases, mutually beneficial outcomes arise that lead to cost savings. In many other cases, proposals either lead to additional cost or risk to the IESO and are therefore not pursued. The IESO expects to continue discussing contract-specific opportunities and evaluating them for cost saving outcomes.

5.3.6 **Other Opportunities (not contract-related)**

The Directive also required that the IESO identify any additional opportunities to lower system costs beyond the scope of the contract review. The IESO has identified two opportunities which the IESO is already pursuing: 1) review of the assumptions in the IESO’s planning criteria to ensure an appropriate amount of investment is made in resources to meet reliability standards; and 2) enhancements to the IESO-administered electricity markets that would increase competition and result in lower costs for electricity products and service acquisitions.

5.3.6.1 *Review of Planning Criteria*

The IESO plans the system to ensure that the amount of supply available to meet demand satisfies the Northeast Power Coordinating Council (“NPCC”) reliability criteria which specifies that the annual loss of load expectation (“LOLE”) is no greater than 0.1 days per year.³ One area the IESO is giving

³ LOLE is a common reliability index used to assess generating capacity adequacy. It represents the number of days per year, on average, in which the load exceeds the available generating capacity.

consideration to is using non-firm imports to meet future capacity needs. Historically, the IESO has relied on generation within Ontario or firm (contract-backed) imports to meet the NPCC reliability criteria. The IESO is assessing its current planning criteria and will seek stakeholder input to determine if the amount of capacity that the IESO procures could be reduced by leveraging non-firm imports (i.e. capacity from other jurisdictions that is provided through the energy markets via interties that is not committed by a firm contract). While the potential cost savings achievable through this measure will depend on the results of IESO's assessment, for illustrative purposes potential electricity system annual cost savings could be approximately \$10 million for every 100 MW of non-firm import capacity assumed in years when there is both a summer and winter need of at least the amount of non-firm imports assumed.

5.3.6.2 Market Enhancements to Increase Competition

The IESO is currently working on a number of initiatives to increase competition in the IESO-administered markets. The rules and tools used to administer the IESO markets were developed at a time when there were fewer technology options available to deliver the electricity products and services Ontario needs. Accordingly, in many cases, the IESO market rules and tools do not allow (or efficiently enable) the participation of newer technologies to participate in the wholesale electricity markets. The IESO has initiated a number of activities that will ultimately enable existing and new technologies to compete to provide each of the products and services that they are technically capable of providing. Examples of these initiatives include:

- 1) Storage Design Project – to develop a design and schedule for market updates to fully enable storage to compete in energy, capacity and ancillary service markets;
- 2) The IESO's work to expand distributed energy resource ("DERs") participation in the wholesale markets (including a whitepaper setting out potential models for expanded participation and a number of projects to evaluate the technical potential of DERs to provide various wholesale electricity products and services);
- 3) The IESO's development of a pilot energy-efficiency auction which will inform long-term options for procuring energy efficiency to address system needs through a competitive market-based mechanism; and
- 4) Expanding Participation in Operating Reserve and Energy markets ("EPOR-E") – a scoping and assessment exercise to identify potential market development projects that can expand participation in the IESO's Operating Reserve and Energy markets. The IESO's prior experience with the development and expansion of the Demand Response Auction ("DRA") and the year over year⁴ reductions in auction clearing price observed therein are demonstrative of the way in which efforts to expand competition in the IESO administered markets result in lower costs for ratepayers. As the DRA evolves to the Capacity Auction and Capacity Auction eligibility expands year over year, further savings are expected to be realized.

⁴ The clearing price in the IESO's Demand Response Auction has decreased from approximately \$92,350 in the first auction in December 2015 to \$58,725 in the December 2019 auction.

6 IESO’s Assessment of Opportunities

6.1 ASSESSMENT OF OPPORTUNITIES

The IESO notes that the Third Party identified the Buyout and Buydown options for wind and solar contracts as the opportunities with the greatest potential for cost-lowering. These opportunities have similar characteristics, in that they both take advantage, or arbitrage, the difference between lower borrowing rates of the IESO or the Province compared with the cost of capital typically seen by contracted generators in the private sector. The risks associated with these opportunities, however, are different.

In the Buyout option, both the IESO and contracted generator take on risk associated with future market prices relative to the forecasted values used in establishing the buyout price. The contracted generator assumes the risk that future market revenues may be lower than those forecasted in the established buyout price and must continue to operate the facility to earn these future market revenues. The IESO takes on the risk that future market revenues may be higher than those forecasted within the established buyout price which would erode projected savings and create a perception that bought out contracted generators have been overcompensated.

The Buydown option does not place this market risk on either party as the contract is still active post-buydown and it does not rely on forecasted future market revenues in the same way as the Buyout option. This additional risk in the Buyout option is a major driver for the lower assumed take-up rates relative to the Buydown option.

The Third Party Report estimates potential savings both with (net savings) and without (gross savings) consideration of the repayment of debt required to fund the potential opportunity. Since there ultimately is a need to acquire and service the debt, the IESO’s assessment of potential savings is on a net savings basis. It should also be noted that any reference to savings is on such basis prior to consideration of any associated transaction costs. The Third Party report notes, but does not quantify the transaction costs that would reduce potential savings. These are further discussed in Section 6.2.

The Third Party’s assessment from the Buyout and Buydown options has some variation based on the assumptions used, but the Third Party concludes on the following base case results:

Options	First Year Savings (2021)	Net Present Value of Net Savings Discounted at Various Rates			Debt Requirement
		3%	6%	9%	
Buyout Wind and Solar	\$37 Million	\$253 Million	\$216 Million	\$187 Million	\$1.5 Billion
Buydown Wind and Solar	\$32 Million	\$396 Million	\$323 Million	\$268 Million	\$1.8 Billion
Buydown of Gas-fired	\$5 Million	\$47 Million	\$40 Million	\$35 Million	\$0.3 Billion

Since the Third-party Report identifies the Buydown as the option that provides the highest cost-lowering opportunity on a net present value basis and it is applicable to wind, solar and gas contracts, the IESO has assessed the aggregate range of savings to ratepayers:

Buydown Aggregate Option (Wind, Solar and Gas)	First Year Savings (2021)	First Year Savings as a % of Reduction in Total Electricity Costs	Net Present Value of Cumulative Savings Discounted at 6%	Debt Requirement
Total low-end	\$19 Million	0.09%	\$181 Million	\$1.0 Billion
Total high-end	\$56 Million	0.25%	\$543 Million	\$3.2 Billion
Base Case	\$37 Million	0.17%	\$363 Million	\$2.1 Billion
Average (midpoint between total low-end and high-end)	\$38 Million	0.17%	\$362 Million	\$2.1 Billion

The savings that were derived by the Third Party are inherently contingent on the assumed take-up rates. It is very likely that the actual take-up of an opportunity may be somewhat higher or lower and is difficult to determine without considerable market research. Based on the feedback received from contracted generators, the main obstacle for a reasonable take-up will be non-recourse project financing arrangements that secure the rights to both, the underlying assets and the IESO contracts. These financing agreements also generally contain breakage fees and penalties for losses due to differences in market lending rates.

The Third Party also identified a “Buyout with Extended Amortization” option, which is the same as the Buyout option, but spreads the repayment of debt over a longer period. The IESO notes that the debt extension portion of this approach does not lead to savings for ratepayers, but rather a deferral of the debt to future ratepayers. A portion of current electricity costs are already being postponed through a debt-funded mechanism and therefore the Buyout with Extended Amortization approach would add to the amount of debt that would need to be repaid in the future. The IESO therefore does not see using extended amortization as integral to any specific contract-related cost-lowering opportunity. In other words, similar to the gross versus net savings discussion, such cost deferral mechanisms can be used to lower current costs irrespective of whether or not they are tied specifically to generation contracts.

The Third Party also identified cost-lowering opportunities related to Blend and Extend, but at a smaller potential to the Buyout or the Buydown options. Under some circumstances, the Third Party Report noted that the savings could be negative and therefore increase long-term cost to ratepayers. Given the limited amount of contracts that expire in the near term, the higher discount rates for generators, and the IESO plans to reacquire resources through more competitive market means, the Third Party’s analysis shows that Blend and Extend may be of limited potential to lower costs.

The IESO also notes that the Third Party Report identified other potential cost-lowering opportunities from contracted resources that either have limited potential or are specific to individual contracts.

6.2 IMPLEMENTATION CONSIDERATIONS

The IESO has also identified various implementation considerations that may be applicable to the different cost-lowering opportunities. As noted above, given that contracts afford all parties protection against unilateral actions, the main implementation consideration is the incentive that is required for both parties to agree on a change. It is assumed that contracted generators would only engage in discussions to implement changes if they expect the benefits to outweigh investment of time, costs, and resources, as well as any net additional risk they may be taking on.

As energy infrastructure projects are capital intensive, most facilities are financed with debt that is secured against the facility and the IESO contract. Therefore, the existence of current debt will be one of the main impediments for any contracted generator to pursue the opportunities discussed in the Third Party report. This concern was also widely noted in the feedback that the IESO received from the generators.

If the IESO were to create a limited time, standard offer initiative for all eligible contracted generators, it is estimated that the savings would not accrue to the consumers until a program is designed, stakeholdered, launched and agreements executed, including those for financing arrangements. It is anticipated that this type of an initiative would require a lead time of not less than one year. In total, it would be expected to take more than a year before any cost-lowering opportunities could begin to be realized by consumers. The cost to implement such an initiative is estimated to be on the order of \$1 to \$2 million, depending on the complexity of offerings.

A consideration that was widely noted in the feedback from contracted generators was the unique nature of every facility and contract. Therefore, a one-size-fits-all approach may not be feasible in many cases, and this will have impacts on the costs and timing of implementation. If the IESO were to create an initiative that involved negotiating with multiple parties to address individual circumstances, it is expected negotiations would need to be staggered and prioritized, as it would not be practical to hold all negotiations simultaneously. Timing for negotiations is difficult to estimate, but based on the scope of changes involved, it could be six months to two years to complete negotiations with eligible and interested parties. The cost of the negotiated approach is estimated to be on the order of \$2 to \$3 million.

Lastly, the opportunities identified by the Third Party are all dependent upon the IESO and/or the province obtaining financing to fund such opportunities. Implications on provincial debt or credit ratings of such debt and impact to provincial credit ratings have not been assessed by the Third Party or the IESO.

6.3 CONCLUSION

The Third Party concluded that the opportunity with the most cost-lowering potential is the Buydown option, which can be applied to wind, solar and gas contracts. The Buydown option does not place additional market risk on participating contracted generators or the IESO as in the Buyout option and is expected to have greater take-up relative to the Buyout option. The base case scenario is estimated to result in cost savings of \$37 Million in the first year that such program would be implemented. The potential total savings over the term of a Buydown program were evaluated at a range of social discount rates as shown in the table below. The net present value of the net savings from the Buydown option ranges from \$303 to \$443 Million over the term of the program and would require over \$2.1 Billion of new debt.

Buydown Option	First Year Net Savings (2021)	Net Present Value of Net Cost Savings Discounted at Various Rates			Debt Requirement
		3%	6%	9%	
Wind and Solar	\$32 Million	\$396 Million	\$323 Million	\$268 Million	\$1.8 Billion
Gas-fired	\$5 Million	\$47 Million	\$40 Million	\$35 Million	\$0.3 Billion
Total	\$37 Million	\$443 Million	\$363 Million	\$303 Million	\$2.1 Billion

The IESO also identified several other opportunities outside of the contracts review that it is already pursuing and should result in future cost savings.

Appendix 1 - Order in Council 1499/2019

Appendix 2 – Third Party Report

Appendix 3 – Letter from IESO to Contracted Generators

Appendix 4 – Memo from Osler, Hoskin & Harcourt to the IESO