

THIRD PARTY RESEARCH TO SUPPORT IMPLEMENTATION OF GLOBAL ADJUSTMENT (GA) REFINANCING – SCOPE OF WORK

PURPOSE:

The Ministry is seeking technical consultation services to conduct third party research that would support the implementation of Global Adjustment (GA) refinancing.

Refinancing the Global Adjustment (GA)

On March 2, 2017, the government announced that a portion of the GA would be refinanced as part of Ontario's Fair Hydro Plan. Refinancing the GA would provide rate relief by spreading the cost of electricity investments over a longer time period. In the early years, a portion of the costs covered by the GA will be refinanced to reduce pressure on today's electricity ratepayers. In later years, the cost of refinancing would be recovered from ratepayers.

In this context, the Ministry is seeking analysis that would inform the expected lifecycle of the existing generation infrastructure (i.e., to what extent it is possible and at what cost can Ontario's existing contracted generation operate beyond end of contract). Also being sought is the anticipated outlook for supply adequacy in the years that the Independent Electricity System Operator (IESO) contracted generation begins to reach end of contract. Finally, the Ministry is seeking analysis of the social, health and environmental benefits of phasing-out of coal-fired generation in the province and identify which, if any of these benefits are already accounted for in generator contracts.

Consultants will be required to provide detailed research, analysis and expert opinion with respect to the deliverables outlined below.

SCOPE OF WORK / DELIVERABLES:

i. Technical Feasibility and Other Feasibility Considerations

Research and analysis to ascertain the likely service lives of gas generating facilities larger than 50 megawatts (MW) as well as wind and solar projects larger than 10 MW under contract with IESO from a largely technical point of view. This will require research to be performed at the project level, to the extent that the parties involved (e.g., generation owners and/or IESO) are willing to disclose the required information.

The Ministry expects the scope of work to include a literature review to identify recent studies of relevance, and a summary of any significant findings of the studies identified by the literature review.

The information in the summary would be supplemented with information obtained through interviews with staff in IESO's Contract Management group, manufacturers (e.g., GE), O&M firms and generation owners.

In addition, the research should consider the following items, where applicable:

- a. What did the initial design and build envision in terms of the useful life of the generators?
- b. What has been the experience with respect to operating hours and starts of generators relative to expectations?
- c. What is the current condition of turbines, towers, blades and photovoltaic modules? Have they experienced any degradation including cracks and corrosion? What has been the rate of failure of electronics, inverters, gear box, pitch control and other components?
- d. Have the generators followed the maintenance program recommended by the manufacturer?
- e. What has been the experience of similar makes and models of turbines, towers, blades, inverters and solar photovoltaic modules in other jurisdictions in terms of reliability?
- f. Do the land leases underlying the project allow for an extension of the lease?
- g. Would any extensions or modifications be required for existing regulatory approval?
- h. To what extent do decommissioning plans contemplate re-use of any equipment?
- i. What may be needed from partners (including community and aboriginal partners)?

ii. Cost of Extension / Repowering

Informed by the findings of section (i), provision of analysis related to the expected cost of extending the service lives of facilities under contract with IESO. It is expected that this would factor in the likely impact of the following items (as with section (i), this will involve research to be performed at the facility/turbine/contract level):

- a. New capital investment required, expressed as a share of the fixed costs of the current IESO contract and identified by equipment type;
- b. How operating expenses could increase as facilities age;

- c. Degree of performance deterioration by the end of the contract and how this would impact the cost of extension;
- d. Any additional regulatory approval costs;
- e. For projects on leased land, the likely cost of an extension of the lease;
- f. The cost of necessary adjustments to maintenance contracts as well as administration and other support contracts; and
- g. Technology improvements that could impact the cost/value of repowering (e.g., more efficient photovoltaic panels, etc).

The analysis should include a discussion of the expected life of the major components of the facilities and, where applicable, include a review of the expected timing of replacement of the component parts of the project.

Supplemental analysis that considers the cost of decommissioning and a more extensive repowering investment is also required.

iii. Financial Implications of Refinancing GA

In light of the above research on generator costs, for each generator under consideration determine the annual cost of a refinanced contract that provides the same value as each generator's actual contract but is extended over the expected life of each generator. For example, if a 50 MW generator has a 20-year contract but is expected to run for 30 years, determine the value of financing the contract costs over the entire 30-year lifetime. This calculation will take into account expected investments required to achieve the full expected lifetime of each generator.

The next stage of this analysis involves determining a debt financing plan that achieves the same effect of refinancing all generator contracts under consideration. Specifically, for the years 2005-2050:

- a) Calculate the annual difference between the total cost of the refinanced contracts and the total cost of existing contracts.
- b) Starting in 2017, calculate the total annual borrowing in the early term to effectively achieve the total refinanced contract savings relative to existing contract costs.
- c) Calculate the schedule in which this borrowing is paid back in the later term when refinanced contract costs are higher than existing contract costs.

- d) For the years 2005-2016, calculate the value in 2017 of potential savings that would have been realized had the refinanced contract costs been incurred rather than the actual contract costs (assuming a reasonable interest rate).
- e) Calculate the accumulated debt and associated interest costs associated of this financing plan.
- f) Determine the annual residential electricity bill impact of the financing plan described above assuming the money borrowed leads to savings only for those ratepayers who are eligible for the Regulated Payment Plan (RPP).

This section of the analysis should consider the refinancing of any nuclear refurbishment costs that are unevenly distributed as well as planned conservation expenditures.

iv. Social and Environmental Benefit of Contracted Generators

Many of the natural gas and renewable generators brought online since 2005 contributed to the phase-out of coal-fired generation in the province. Relative to a scenario in which coal had continued to generate, there is significant health, social and environmental benefit to these generators. Conduct an analysis to quantify these benefits and identify which, if any of these benefits are already accounted for in generator contracts.