2017 Price Review Questionnaire

July 08, 2016

1. Introduction

The IESO is undertaking the annual review of FIT and microFIT prices. The IESO is required to regularly review the prices offered to generators under these programs to ensure both ratepayer value and a reasonable return on investment. As part of the current price review, the IESO will focus on ensuring ratepayer value, with consideration of global renewable generation cost trends, prior FIT application volumes, and associated FIT price reductions.

Feedback from program participants, industry associations, municipalities, Indigenous communities and other interested parties is being sought through this questionnaire to support the IESO's price review. The deadline for responses is **July 28, 2016.** Please email your completed questionnaire to FIT@ieso.ca, indicating **"2017 Price Review"** in the subject line. Should you desire that a particular answer, or the entire submission, remain confidential, please mark it "Confidential." Please note that all submissions not marked Confidential, as well as those from industry associations and public entities, will be posted to the FIT website.

2. Questions

In providing your responses, please specify the renewable fuel/technology/size to which the feedback relates. Except where specifically noted for comparison to other jurisdictions, please consider the questions in the context of project development and operation in Ontario.

Economic and financial considerations

1. How have the costs of capital (both debt and equity) that are required to develop a renewable energy generation project changed over the past year?
    a. How do these costs vary with technology and project size?
    b. Describe and quantify any anticipated economic and financing trends that may substantially affect these costs.
2. Do the current FIT prices allow a renewable energy developer to earn a reasonable rate of return? If no, please describe recommended adjustments and provide supporting evidence.

a. What is considered a range of "acceptable" rates of return on equity for a renewable generation contract in Ontario's current financial market? Please provide an explanation for your answer, including worked calculations where possible.

b. The high application volumes and the fact that 52 percent of successful FIT 4 applicants applied for price reduction priority points could be interpreted as indicative of proponents having the ability to realize returns despite lower FIT prices. In what areas, if any, have proponents been able to cut costs in order to further reduce prices and realize acceptable returns?

3. In consideration of the current FIT prices, the significant interest in FIT 4 price reduction priority points and the contract price ranges of the recently executed Large Renewable Procurement contracts[1], what prices would you recommend for 2017 (in $/kWh) for each technology and size tranche and why? Provide/attach justifications for differences between your recommended prices and global pricing levels.

   a. For solar PV: The cost of solar continues to decline dramatically. Recent procurements in other jurisdictions have seen prices for solar PV as low as US$0.0299/kWh.[2] Solar LRP I Contracts averaged $0.1567/kWh. Costs are expected to continue to decline in the near future, with declines from 2005–2020 expected to exceed 35%.[3] Assuming Ontario follows this trend, FIT solar prices should continue to be reduced. Is this a reasonable conclusion? If not, please provide an explanation for your answer, including worked calculations where possible.

Project development costs

4. The IESO is seeking submissions that include specific cost data with respect to capital costs, operational costs, capacity factors, project financing information (e.g., cost of project and construction financing, debt terms, debt service coverage ratio requirements) and other costs and factors that influence the levelized cost of electricity for the various technologies and size tranches in the FIT and microFIT programs. Please include any data tables or Excel spreadsheets, as necessary.

[1] www.ieso.ca/lrp
[2] http://cleantechnica.com/2016/05/02/lowest-solar-price-dubai-800-mw-solar-project/
[3] On the Path to Sunshot, The Role of Advancements in Solar Photovoltaic Efficiency, Reliability, and Costs, May 2016, NREL/TP-6A20-65872

a. Please identify any cost categories that differ significantly between Ontario and other jurisdictions, and explain such differences. What are the main reasons, if any, for these differences? Will these differentials remain constant or are changes/reductions foreseen? Please comment, if possible, on each of project development, permitting, equipment, construction, operation and maintenance.

5. Are there any recent technologies or process improvements that have affected costs or may affect costs in the future? If so, please describe.

    a. For solar PV: What are the highest wattage panels available in Ontario at this time? What are the highest wattage panels expected to be installed in 2017, 2018 and 2019, respectively?

    b. For solar PV: How prevalent is the use of microinverters, string inverters or power adaptors on commercial-scale rooftop systems? Are there any software solutions that further reduce system losses? Are there other innovations that are being used/considered to further optimize solar PV installations?

    c. For solar PV: Local distribution companies have identified voltage control as one of the bigger issues limiting the increased deployment of distributed solar generation.[4] The use of so-called "advanced" inverters may mitigate some of these issues. Are "advanced" inverters being used in Ontario? What are the costs relative to traditional inverters?

    d. For solar PV: Has the trend to racking standardization accelerated or remained stagnant over the past two to three years? What is now the dominant racking type?

    e. For solar PV: Please comment on the additional upfront and ongoing costs of integrating storage into a system and the corresponding benefits of doing so. How are the costs expected to decline by 2019?

6. What is the range of typical connection costs for LDCs across Ontario for each of FIT and microFIT (excluding equipment or system upgrades that are unique to a specific project)?

    a. In terms of project interconnection costs, what variance, if any, has been observed for actual costs incurred versus estimates (both initial developer design estimates and those provided by the LDC during early project development)?

[4] On the Path to Sunshot, Emerging Issues and Challenges in Integrating Solar with the Distribution System, May 2016, NREL/TP-5D00-65331 SAND2016-2524 R

Have there been any noticeable changes in LDC estimate/actual variances since the inception of the FIT and microFIT programs?

b. What are the expected cost savings associated with the re-acceptance of in-series metering in both FIT and microFIT?

7. Identify the project development/construction costs anticipated to have the greatest potential for reductions/improvements in the near-term (e.g., 6–12 months) and long-term (e.g., 1–5 years)? Are there specific cost groups that are expected to increase? If yes, what are the drivers of these increases?

8. For solar PV: During last year's price review survey, there was no conclusive support for changing the maximum FIT DC/AC overbuild ratio. Is this still the case? If a change is desired, please provide information about the additional generation that can be achieved by building projects that exceed the 120% limit. How should an increased overbuild limit impact the price? If there were no overbuild limit, what would be the ideal overbuild ratio? What would be the percentage increase in generation for this ratio instead of 120%?

Ongoing project costs and performance

9. How have ongoing operation and maintenance costs for existing facilities been tracking over the past year? Have costs been higher/lower than expected?

10. Have any recent technology or process improvements had an impact on generally accepted performance assumptions (e.g., average capacity factors, equipment replacement, maintenance outages) for renewable energy projects? How has ongoing performance of renewable generation projects tracked relative to estimates?

Prioritization costs and other considerations

11. In relation to the items below, please identify and describe any:

    a. Administrative (e.g., legal, financial, etc.) costs associated with arranging partnership structures necessary to qualify for a Contract Capacity Set-Aside (as defined in the FIT Rules);

    b. Unique implications or advantages (e.g., taxation) of operating a project in a partnership structure; and

    c. Costs associated with obtaining FIT priority points.