

Energy Payments for Economic Activation of Demand Response Resources – Shut-Down Cost Options

May 21, 2020

Purpose

- To further scope-out the options pertaining to treatment of demand response (DR) shut-down costs and screen out those that are not feasible at this time

Agenda

- Re-cap of February stakeholder meeting
- Review of stakeholder feedback
- Categorizing demand response costs
- Shut-down cost option development
- Option screening
- Next steps

Re-Cap: February Meeting

- At the February stakeholder engagement meeting, the IESO:
 - Discussed expanding the scope of the engagement to include the shut-down cost question articulated through the OEB proceeding;
 - Solicited input, including data, to enable the IESO to develop options that address the root cause of the shut-down cost question; and,
 - Presented high-level options pertaining to treatment of shut-down costs that would be further scoped and evaluated as part of the next steps.

Review of Stakeholder Feedback

- The IESO requested stakeholders to provide specific information and data on the nature of their shut-down costs
 - The IESO highlighted the importance of this input in enabling the development of options that address the root cause of the matter, evaluation of options and support for a recommendation
- Stakeholders were not able to provide any data to the IESO on their shut-down costs

Review of Stakeholder Feedback

- Ryerson University submitted the following research papers:
 - Annual demand response procurement method using an options contract technique – A planning tool; and,
 - Positive demand response and multi-hour net benefit test
- The first paper explores the use of an options contract mechanism to disaggregate DR payments into premium and strike prices based on the value of DR to the system and a FERC Order 745 approach
- The second paper explores the concept and use of positive demand response, meaning increasing demand based on a signal from the operator
- While these papers do not address demand response shut-down costs, they outline interesting and innovative research related to demand response
 - The second research paper could be discussed at the DRWG as part of the planned discussions on future options for demand response

Categorizing Demand Response Costs*

Cost Category	Description	Current Cost Recovery Mechanism
Capacity	Costs that are incurred to make DR capacity available to fulfill a capacity obligation	Reflected in <i>Demand Response / Capacity Auction offers</i> and compensated through availability payments which reflect the market value of capacity
Energy	Variable costs (\$/MWh) that are associated with the incremental unit of energy curtailed in an activation; linked to the value of lost load (VOLL)	Reflected in <i>energy market bids</i> and compensated via energy cost savings from reduced consumption
Shut-down	One time fixed incremental costs (\$/MW) that are incurred only when the resource is activated, i.e., the fixed incremental costs that the resource incurs when they curtail consumption	Stakeholders have indicated that these costs cannot be managed via capacity auction offers or energy market bids

Nature of Shut-Down Costs

- At a high-level, the IESO understands that shut-down costs can vary from resource-to-resource and can depend on the means by which the curtailment is enabled. For example:
 - A DR resource enabled by temporary shut-down of a manufacturing process could have shut-down costs from indirect labour, operating and equipment costs and/or opportunity costs
 - A DR resource that is enabled by HVAC set-point changes may have no shut-down costs at all
- Given this potential variation, shut-down costs can be difficult to define in general, across-the-board, terms
 - This is especially applicable to aggregations of multiple load facilities that may have different means of enabling the DR

OPTION DEVELOPMENT

Overall Objective of the Options Presented at the February Meeting

- The high-level options discussed at the February engagement meeting are shown on the next slide
- These options sought to:
 - Limit the instances in which the participant incurs shut-down costs (*option 1*); or
 - Provide out-of-market cost recovery of shut-down costs so that they can be kept out of the energy bid (*options 2 and 3*); or
 - Provide a more efficient way to incorporate the shut-down costs into the energy bid with consideration of event duration (*option 4*)

High Level Options Presented to Stakeholders in February

Option	Objective
Option 1: Risk Mitigation Approach	Reduce the risk of the DR resource from incurring significant shut-down costs if activated more frequently than they have forecast
Option 2: Cost Recovery Approach	Allow for cost recovery of shut-down costs that are submitted by the participant and verified by the IESO
Option 3: Representative Cost	Administrative approach that would compensate DR with an amount representative of Ontario DR shut-down costs
Option 4: 2-Part Bid Reflected in Dispatch	Incorporate shut-down cost into dispatch using a 2-part energy market bid and either a) include the shut-down cost in price formation, or b) provide a make-whole payment for unrecovered costs

Option 1: Risk Mitigation Approach

- Objective
 - Reduce the risk of the DR resource from incurring significant shut-down costs if activated more frequently than they have forecast by capping the number of in-market activations
- Applicability
 - HDRs and dispatchable loads (DLs) may need to be treated differently to account for differences in their participation
 - It may not be feasible to determine an appropriate one-size-fits-all activation cap to limit risk
- Additional Detail:
 - Would create a change to the obligation of DR resources with respect to in-market activations

Option 1: Risk Mitigation Approach

- Items to be Defined:
 - What is a reasonable cap on in-market activations?
 - How should a cap differ for HDRs and dispatchable loads?
- Key Concerns:
 - Would change the obligation of DR resources with respect to that of other resources

Option 2: Cost Recovery Approach

- Objective
 - Allow for cost recovery of shut-down costs that are submitted by the participant and verified by the IESO
- Applicability
 - May be more practical for dispatchable loads
 - May be more difficult for HDRs to submit costs given the diversity in their portfolios

Option 2: Cost Recovery Approach

- Additional Detail*:
 - Allow a DR resource to voluntarily submit eligible shut-down costs to the IESO for cost recovery following an in-market activation, subject to provisions below
 - The IESO would complete an audit of submitted costs after an in-market activation and it would be the responsibility of the participant to prove accuracy and reasonableness of submitted costs
 - Provide a make-whole payment to the DR resource, for eligible costs approved by the IESO, when total savings and revenues from the curtailment are insufficient to cover the variable energy costs and shut-down costs for the activation

**early thinking shared for discussion purposes*

Option 2: Cost Recovery Approach

- Items to be Defined:
 - What are the eligible costs? (these need to be defined together with stakeholders)
 - What does the cost submission process (including governance, data requirements and timelines) entail?
 - What savings and revenues should be included in the calculation of a make-whole payment?
- Key Concerns:
 - Creates an out of market payment
 - May be difficult to define eligible costs due to the lack of available information on the nature of shut-down costs

Option 3: Representative Cost

- Objective
 - Administrative approach that would compensate DR with an amount representative of Ontario DR shut-down costs
- Applicability
 - General approach could be applicable to dispatchable loads and HDRs; however payment may need to be different to account for differences in characteristics
- Additional Detail
 - Demand response would receive an administrative payment (\$/MW) per curtailment
- Key Concerns:
 - In absence of stakeholder data, the IESO does not have a transparent basis from which a representative shut-down cost for Ontario DR resources can be informed

Option 4: 2-Part Bid Reflected in Dispatch

- Objective
 - Incorporate shut-down cost into dispatch using a 2-part energy market bid and either:
 - a) include the shut-down cost in price formation; or,
 - b) provide a make-whole payment for unrecovered costs
- Applicability
 - Same as Option 2:
 - May be more practical for dispatchable loads
 - May be more difficult for HDRs to submit costs given the diversity in their portfolios

Option 4: 2-Part Bid Reflected in Dispatch

- Additional Detail:
 - Participant submits a 2-part energy market bid including the variable energy component (\$/MWh) and an additional fixed shut-down component (\$/MW)
 - Dispatch engine optimizes these two costs with the duration of the activation in a multi-hour optimization
 - In sub-option a):
 - The wholesale market price incorporates both the variable energy component and the fixed shut-down component which is levelized over the duration of the dispatch schedule. This ensures that the resource is only activated when the wholesale price of electricity exceeds the bid price that includes energy and shut-down components

Option 4: 2-Part Bid Reflected in Dispatch

- In sub-option b):
 - The wholesale market price is not formed factoring in the fixed shut-down component and thus there could be instances where actual prices are not sufficiently high to ensure the resource covers its energy and shut-down costs
 - If actual prices over the activation duration end up being insufficient to cover the variable energy costs and the shut-down costs, a make-whole payment is provided consistent with the provisions and requirements in Option 2

Option 4: 2-Part Bid Reflected in Dispatch

- Items to be Defined:
 - Same as Option 2 (e.g., eligible costs, cost submission process and savings / revenues to be considered in the calculation of a make-whole payment, where applicable)
- Key Concerns:
 - Sub-option b) creates an out of market payment
 - Implementation of such option is not feasible in the near-term

OPTION SCREENING

Preferential High Level Option Based On Market Design Principles

- Applying the lens of the market renewal principles to the high-level options yields a preference for Option 4 from a market design perspective
- Implementation of Option 4 is not feasible in the near-term, however, it could be considered as part of a future market design
- For this reason, Option 4 has been screened out from consideration in the near-term

Market Renewal Principles

Efficiency - lower out-of-market payments and focus on delivering efficient outcomes to reduce system costs (good price formation)

Competition - provide open, fair, non-discriminatory competitive opportunities for participants to help meet evolving system needs

Implementability - work together with our stakeholders to evolve the market in a feasible and practical manner

Certainty - establish stable, enduring market-based mechanisms that send clear, efficient price signals

Transparency - accurate, timely and relevant information is available and accessible to market participants to enable their effective participation in the market

Option Screening

- In addition to Option 4, Option 3 has been screened out from consideration in the near-term due to a lack of stakeholder data from which to inform a representative shut-down cost for Ontario DR resources

Status of Options

Option	Status
Option 1: Risk Mitigation Approach	Option to be further considered
Option 2: Cost Recovery Approach	Option to be further considered
Option 3: Representative Cost	Screened Out
Option 4: 2-Part Bid Reflected in Dispatch	Screened Out

Stakeholder Feedback Requested

- The IESO requests stakeholder input to help further develop Options 1 and 2
- Would these options address the root of stakeholder's concerns related to shut-down costs?
 - Option 1:
 - What is a reasonable cap on in-market activations? How should a cap differ for HDRs and dispatchable loads?
 - Option 2:
 - What costs should be included in eligible costs?
 - What does the cost submission process entail?
 - What savings and revenues should be included in the calculation of a make-whole payment?
 - What evidence can be provided and used to audit costs?

Stakeholder Feedback Requested

- The IESO invites stakeholder feedback on the options screened out from consideration in the near-term. Is there anything else that should be considered in screening out Options 3 and 4?
- Please submit feedback by June 11 to engagement@ieso.ca using the feedback form on the engagement web page

Next Steps

- IESO will aim to review and respond to stakeholder feedback by end of June 2020