

# Demand Response Pilots to Meet System Needs

Update on May 8<sup>th</sup> DR Pilots Sub-Committee Discussion  
June 3, 2014



- Enabling Market Rules will align with the target in service date for the pilot programs (TBD)
- Participants in each pilot program will be selected via competitive procurement (i.e. IESO-administered RFP)
- Discussion question: Do any contractual barriers exist for current DR participants which would prevent them from participating in pilot programs?

- Two timeframes:
  - Day-ahead
  - Intraday, 1 to 3 hour-ahead
- For generators who:
  - are not considered quick start generators
  - require advance notification to purchase fuel or prepare their equipment
  - must run at a minimum generation level for a certain period of time for technical reasons

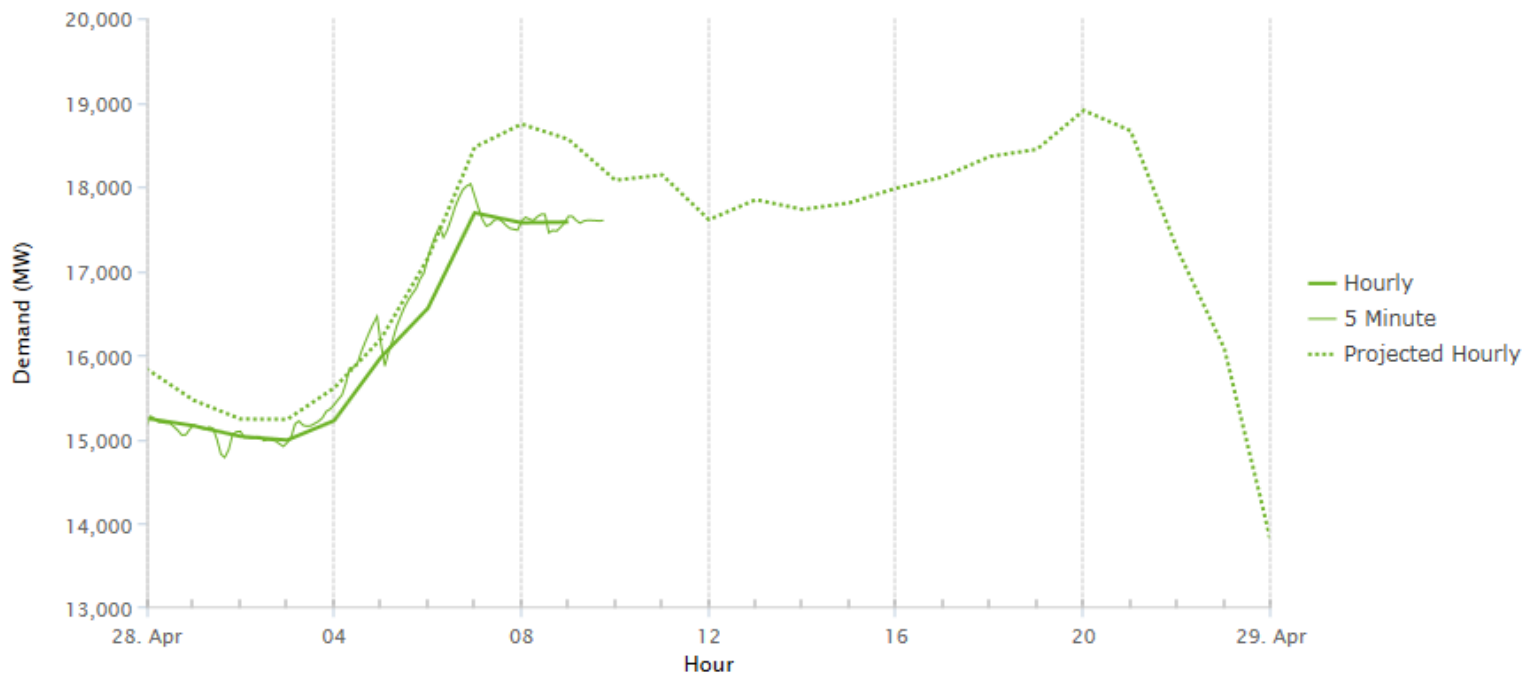
- Over the course of these minimum run-times, generators incur costs which may not be recovered through the energy market price alone
- IESO scheduling processes respect the technical characteristics of these generators and allow for recovery of costs when they are not recovered through the energy market price
- Can demand response perform comparably in the market and reduce the cost of unit commitment? What costs and technical parameters need to be considered?

- As aggregation of DR resources grows over time, they may be able to provide the amplitude required to be a cost effective resource in unit commitment
- Identified advantages of leveraging existing generator model:
  - Ease of cross comparison between generators & loads to identify scheduling efficiencies/cost effectiveness
  - Mitigates changes to IESO tools
  - Provides clear dispatch compliance protocol to loads (same as generators)
  - Reduces the barrier to entry for load
  - Though generators do not necessarily have a maximum run time – loads do, and it is not yet clear what that may mean for unit commitment
    - May be able to signal through offers

- The characteristics of their resources can meet and possibly improve upon the timelines of the current unit commitment structure:
  - Different types of loads may be able to participate in different ways (Load that reacts when called upon versus loads who maintain an inherit storage/inventory ability)
  - Though generators do not necessarily have a maximum run time – loads do, and it is not yet clear what that may mean for unit commitment
  - Unit commitment is a new opportunity for flexible load, as well as the overall market, as load may have better granularity than generators
- Equivalent costs that loads need to recover to provide these services will need further study. Examples included:
  - start-up costs  $\cong$  opportunity cost of not starting a shift
  - speed-no-load  $\cong$  cost to maintain the curtailment
- How will the costs of pilots be recovered?
  - The costs of pilots will be recovered through the market via uplift. The specific design of these uplifts has yet to be determined.



- Load following ensures that supply and demand balance is maintained at all times, through decisions made in different timeframes to match resource capabilities
- DR pilots will focus on hourly and 5-minute timeframes



- Intertie transactions provide hourly load following
  - Notified 1 hour ahead with real-time scheduled quantity for next hour → Deadline to submit is 2 hours ahead
  - Guaranteed to receive offer price for the scheduled import quantity (Intertie Offer Guarantee)
  - Subject to failure charges for not meeting their real-time schedule
- Dispatchable generation and load provide 5-minute load following
  - Notified 5 minutes ahead with real-time scheduled quantity for next 5 minutes



Can the characteristics of your resources meet the criteria of the current load following structure?

- Yes – similar to participation in other markets, there is value in the ability to move flexibly
- Aggregators currently have loads participating in other markets in regulation, 5-minute, 15-minute load following services
- Similar principles to solve this issue that are used to solve regulation in other markets 1) loads with storage ability 2) loads that will do something different based on a schedule
  - Category 1 can address load following
  - Category 2 may require different notification and dispatch frequency
- Determining the appropriate baseline measurement technique will be important (needs to be an ability to measure movement from one point to the next in load following)
  - That measurement technique may become a design element
  - How it will drive compensation requires further investigation

- Surplus Baseload Generation (SBG) is a condition that occurs when the demand in Ontario is lower than the amount of baseload generation that is online and which wants to continue to run for economic, operational or regulatory reasons
- Baseload energy includes all available nuclear, must-run hydroelectric, self-scheduling, commissioning and intermittent generators
- SBG can either be managed through reducing baseload generation or increasing demand
- Typically occurs overnight during the Spring season, but can occur year round
- The IESO publishes forecasts of expected and actual SBG events

- In many cases, we correctly forecast the SBG conditions in the planning timeframe and take the planned actions as we move into real-time
- In other cases, despite our forecasts, we sometimes encounter SBG conditions in real-time that were not expected. In such events, market responses or control actions are required:
  - Hydro-electric spill
  - Interchange Scheduling
  - Flexible nuclear manoeuvres or full nuclear shutdown
  - Variable generation dispatch

### Is there a way for loads to participate in alleviating SBG?

- A number of loads that may be able to participate
  - Some loads who participate in DR2 operate at night and/or build storage and shut down during the day to take advantage of SBG periods already
  - If loads consume during periods of SBG to take advantage of negative prices when they otherwise wouldn't have they could create/manufacture new items that would have otherwise not been created (e.g. increase inventory) – this has societal value

### Identified areas of concern

- Lack of exposure to the cost/price to the market for SBG was identified as a barrier to load participation
- Maintaining load profile is fundamental to baseline calculation – it may be difficult to respond to SBG events unless this action exempted the load from standard baseline calculation
- Does the cost of investing in infrastructure to alleviate SBG align with the anticipated persistence of this problem?

## Pilot Discussion Wrap-Up

What barriers exist to participation in these programs and/or the IESO-administered markets?

- Important to allow aggregation and to relax metering telemetry requirements so that smaller loads can increase their participation in DR
- Metering costs are a large barrier to entry for smaller loads – measurement alternatives based on size would be an area the pilot group would like to explore
- Dispatch Workstations: requirement should be one per aggregator not per load
- Each contributing load should not have to be a market participant – the aggregator should be offering and assuming the risk on behalf of their loads (loads seek out aggregators for this purpose and wish to be completely transparent to the market)
- Performance should be based on aggregation not on individual load performance