

Improved Day-Ahead Mechanisms

Presentation to Stakeholder Advisory Committee
August 22, 2007



- **Current Market in which day-ahead designs must operate**
- **Major findings:**
 - From discussions with stakeholders
 - Identified problems, opportunities
- **Discussion of possible day ahead mechanisms**
- **Next Steps**

- **Original IMO market rules included a day-ahead energy forward market, but was never pursued.**
- **2003/2004 – significant effort by the IESO and several stakeholders led to the development of a sophisticated and comprehensive DAM**
 - Set aside due to resulting complexity and implementation costs
- **2005 – DACP designed in response to difficult operating conditions, partly attributed to unreliability of real-time imports**

- **DACP was specifically designed to address reliability concerns in an expedient manner.**
- **DACP has been effective in ensuring reliability, but efficiency could improve:**
 - **Generation and imports committed on an hourly basis - costs minimized for each individual hour based on incremental energy only**
 - **DACP is not a market – participants do not secure a day-ahead price**
 - **DACP advisory schedules are a poor predictor of real-time operations**

- **Uniform pricing creates a mismatch between incentives to consumers and producers of electricity**
 - Addressed through congestion management settlement credits in real-time
- **Impacts of regulated, contracted supply**
 - 80% of supply currently settled under contract or regulation with financial differences passed through to consumers via Global Adjustment or OPG Rebate

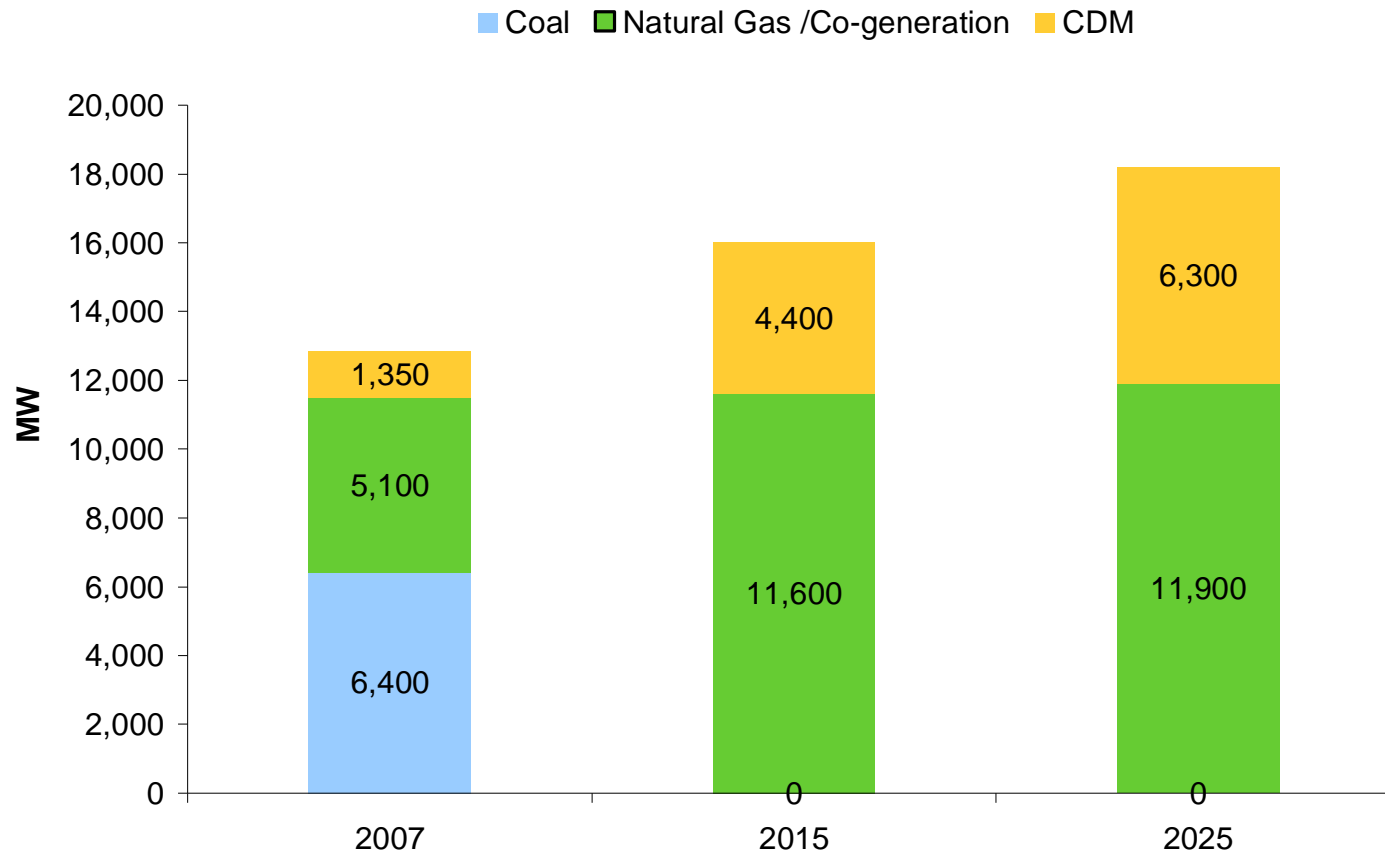
A 3-Step Approach:

- 1. Questionnaires distributed to stakeholders in January**
 - Survey questions tailored to participant class
 - Approximately 30 responses
- 2. Group session to discuss questionnaires in April**
 - Attended by ~50 participants
- 3. One-on-one sessions**
 - Visited many that don't normally participate
 - ~30 meetings

- **Feedback varied by class of participant, but some themes consistently brought forward:**
 - Participants want to understand problems that will be solved by a DAM
 - Decision should be based on a cost-benefit analysis
 - General support for an incremental approach to market evolution, but some wish to have agreement on an “end state”
 - Perceived inaccuracy of pre-dispatch price signals and advisory schedules

- **Integrating and Optimizing the Changing Fleet**
- **Providing opportunities to better manage conservation and demand response and utilize smart meter technology**
- **Support Efficient Resource Commitment**
- **More Efficient Use of Growing Embedded Generation**
- **Supporting Forward Contracting**

Changing Fleet



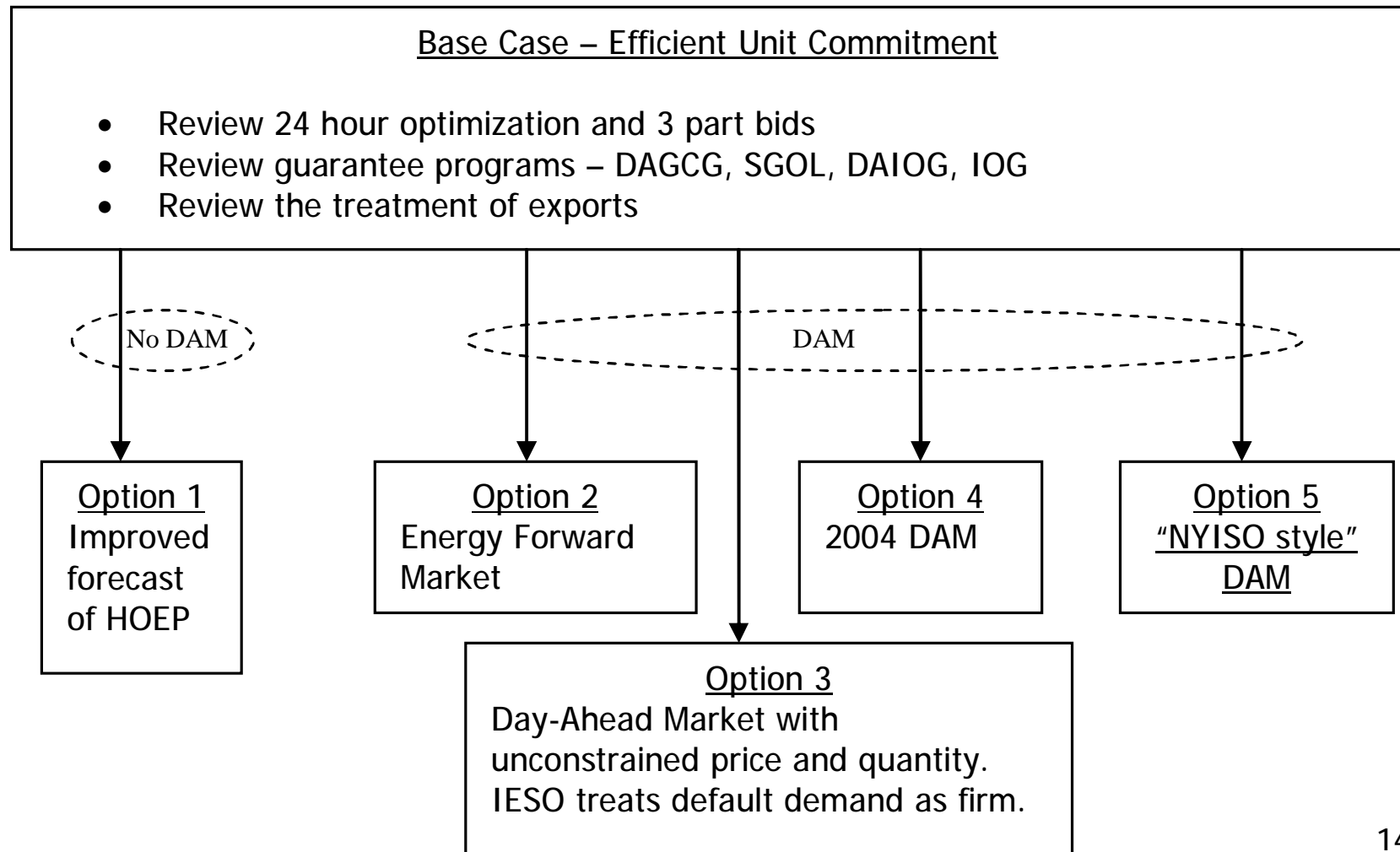
Approximate Values

- **Increased supply from gas fired generation to replace coal**
 - Efficient unit commitment challenges
 - Natural gas fuel management less expensive with advance commitment
- **Accurate price signals in advance will support conservation and demand response**

- **More Efficient Use of Growing Embedded Generation**
 - Better day-ahead price could play a key role for cost-effective operations
- **Support Efficient Resource Commitment**
 - Economic assessment of total costs through 3 part bidding/ 24 hour optimization ensures most economic resources are committed

- **Supporting Forward Contracting**
 - A transparent day-ahead price can form the basis for futures and forward contracts through an improved price index.
 - Current market lacks liquidity, which limits long-term arrangements and risk management options for some market participants.

- **Limitations on DAM design:**
 - **Incremental approach to market evolution**
 - Not going to propose significant change to existing market
 - No LMP
 - **2004 DAM design included CMSC**
 - Required very complex settlement
 - Based on DACP implementation experience, we are hesitant to recommend DA CMSC
- **At a minimum, we must review DACP and improve if warranted**



- **DACP – examine use of 3 part bids and 24 hour optimized unit commitment**
- **Review existing RT and DA guarantees (IOG, SGOL, DAIOG, DAGCG)**
- **Review the treatment of exports in DACP**

- **Generator offers would separately include start-up and minimum run costs (plus incremental energy)**
 - **This, along with optimizing over the whole day would allow more efficient resource commitment**
 - **Eg. A short duration shortage could be addressed by a higher cost import to avoid starting a lower marginal cost generator with high start-up cost**
 - **The total costs, including start-up and minimum costs, are optimized for the whole day**

- **Any change to DACP such as 24 hour optimization and 3 part bidding or a comprehensive DAM that replaces DACP will require new or changed guarantees.**
- **If there are no changes to DACP and no DAM, then it is still appropriate to review the effectiveness and efficiency of the existing guarantees. (IOG, SGOL, DAIOG, DAGCG)**

- **Examine the inclusion of exports in DACP**
 - Initial DACP design discussions on exports included concerns of gaming opportunities and lack of reliability rationale
 - Excluding export transactions can result in fewer resources committed relative to what is needed in real-time to most efficiently meet both Ontario demand and exports
- **Including exports would allow DACP to provide a more accurate forecast of real-time**

- **DACP prices are not intended to provide a good forecast of HOEP, but are used to make day-ahead resource commitments**
- **Some consumers and suppliers could make use of an accurate HOEP forecast**
- **A DAM should provide an accurate HOEP forecast, but if no DAM, then what?**

An accurate HOEP forecast would provide signals for efficient production decisions by electricity consumers and suppliers that do not receive dispatch instructions

- **An improved forecast of HOEP will not:**
 - **Provide certainty to consumers or suppliers**
 - **Improve the efficiency of commitment**
 - **Allow gas generators to lock in fuel a day in advance**
- **There may be concern with the IESO forecasting price in the market it operates**

- **Simple Energy Forward Market (IESO EFM or run by another entity)**
 - Simple economic market – supply offers and demand bids
 - No constraints
 - Only one price, no inter-tie zone or reserve prices
 - Voluntary participation
 - No tie to the physical market
- **Separate from existing pre-dispatch process and DACP**

A well-functioning EFM could provide:

- **An accurate price forecast for planning purposes**
- **A financial hedge for participants wishing to lock into a DAM price**
- **Increased liquidity to enhance risk management options**

- **May be thinly traded**
 - Engaged participants already have the ability to trade day-ahead via third-party exchanges and the over-the-counter market, but these mechanisms are thinly traded
 - If there is value in an EFM, why has another entity not created this already?
- **No improvements on efficiency of unit commitment**
- **Only partially hedges gas generators trying to nominate fuel for the next day**

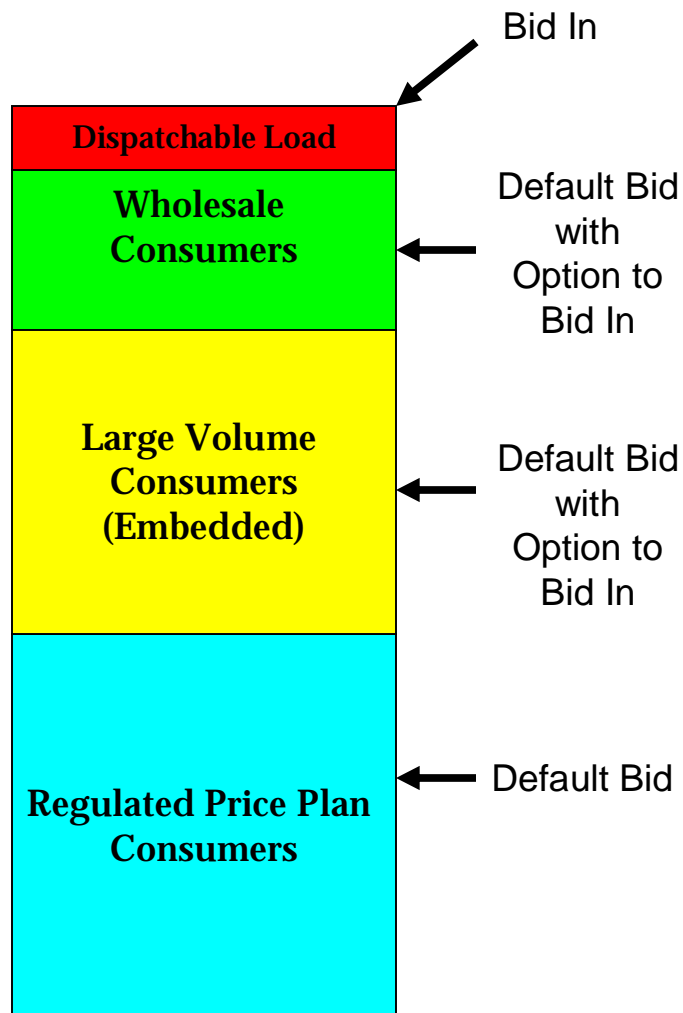
- **Almost identical to EFM, with these exceptions:**
 - Use unconstrained algorithm to produce DAM prices
 - Move all retail load into DAM timeframe with IESO entering forecast retail demand as firm load; settle retail consumption in day ahead
- **No Day Ahead CMSC**
- **Allow imports, exports and virtual participation**
- **Incorporate run(s) for reliability unit commitment (replaces DACP)**

- **Two-settlement equation is the sum of day ahead financial and real-time physical:**

$$\text{Energy Settlement} = (\text{QD} \times \text{PD}) + \text{PRT} (\text{DQSI} - \text{QD})$$

Where:

- PD = DA Unconstrained price
 - QD = DA Unconstrained quantity
 - PRT = RT Unconstrained price
 - DQSI = RT Dispatch quantity supplied
- **CMSC is based on RT price and quantity only and is unchanged from today**



- **IESO forecasts default demand in DAM until LSEs materialize after which LSEs decide whether or not to be in DAM**
- **Optional DAM for non-default (dispatchable loads, imports, and exports)**

- **Ontario supply - optional or mandatory:**
 - Purely voluntary – follow demand to market?
 - Same as current DACP?
 - Mandatory for generators under government contract?
- **Significant amount of generation is under contract**
 - CESOP, OPG prescribed and non-prescribed, Bruce Power
 - Move settlement of these contracts to day-ahead?

- **Provides an accurate price forecast**
- **Allows participants to lock in price and quantity, reduce exposure to real-time volatility**
- **Optimized unit commitment provides better advisory schedules for all dispatchable participants**
 - **More efficient unit commitment**
 - **Allows gas generators to schedule gas day ahead at potentially lower cost and with less risk**

- **IESO's forecast of firm load a day in advance has a much more significant impact on consumers bills than today**
- **Involves moving RPP customers to a DAM price**
- **Potentially new risks for some suppliers with government contracts; based upon current contract design**
- **More expensive to build than EFM (cost estimate under development)**

Market Opportunities Solutions	Providing Opportunities to Better Manage Conservation and Demand Response (Utilizing Smart Meter Technology)	More Efficient Use of Growing Embedded Generation	Integrating and Optimizing the Changing Fleet	Support Efficient Resource Commitment	Supporting Forward Contracting
Optimized DACP (3 part bids with 24 hour optimization and guarantee review)			P	P	
Improved HOEP forecast	P	P			
Export Inclusion in DACP	P	P		P	
Voluntary Energy Forward Market	P	P			P
Physical Advisory (DACP) and Financial Commitment (unconstrained price and quantity with inputs from DACP)	P	P	P	P	P
2004 DAM Implementation	P	P	P	P	P
Full LMP DAM	P	P	P	P	P

- **Sept 13 – Consumers Forum**
 - General discussion of possible day-ahead mechanisms with particular focus on the benefits for, and the concerns of, consumers
- **Sept 20 – Open Session**
 - General discussion of the possible day-ahead mechanisms
- **Sep 21 – Open Session**
 - Specific discussion of DAM options geared to dispatchable participants
 - Impacts of CMSC, production cost guarantees, etc.

- **September: Stakeholder meetings**
- **Oct 12: Stakeholder comment deadline**
- **Nov 5: IESO publishes DAM proposal**
- **Nov 12: Meeting with stakeholders**
- **Dec 5: SAC – final stakeholder input on DAM**
- **Dec: DAM to IESO Board**

End of Slides