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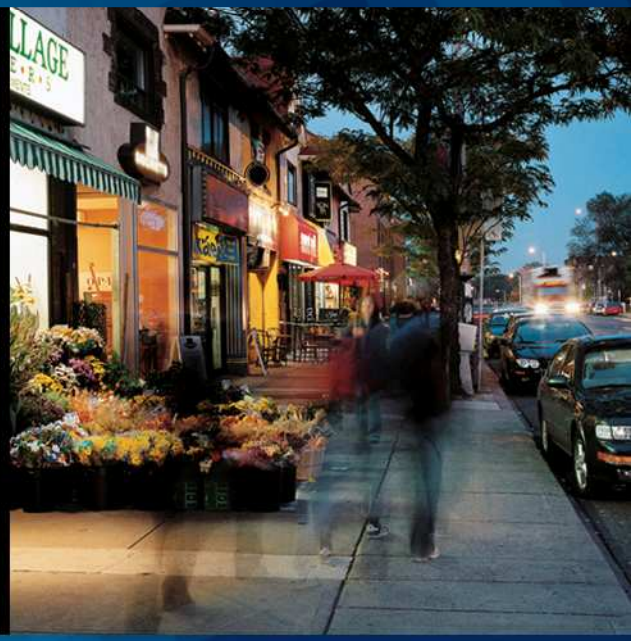
# Day-Ahead Market Evolution Preliminary Assessment

Presentation to Stakeholder Advisory Committee
June 4, 2008



# Goals

Goals entering into the day-ahead market assessment:

1. Enhanced unit commitment efficiency
2. Better day-ahead price signals and examine opportunities for day-ahead financial commitments
3. Ensuring continued reliable system operations

# Key Benefits From Goals

Key benefits that the project will deliver are:

- Operational efficiency (stakeholder and IESO),
- Reduced transaction costs,
- Increased demand response,
- Increased opportunities for embedded or distributed generation; and
- Efficient integration of the changing supply mix expected to emerge in the next few years

# Process

- Develop day-ahead mechanism options for review
- Rigorously assess costs and benefits of accepted options through a recognized Cost Benefit Analysis model
- Recognize 'non-quantifiable' considerations in the process
- Identify day-ahead mechanism improvements that would result in net benefits to the province as a whole relative to the existing Day-Ahead Commitment Process (DACP).

# Options Considered

- **Baseline Scenario** – Carrying on with the current wholesale market with some assumptions about the market going forward
- **Option 1:** An enhanced DACP and automated production of day-ahead price forecast
- **Option 2:** Option 1 with an Energy Forward Market (EFM)
- **Option 3:** Unconstrained Day-Ahead Market (UDAM) would produce day-ahead hourly prices and schedules for the next day but would also provide market participant's a day-ahead financial position.

# Methodology and Assumptions

- Baseline Scenario
  - Wholesale market, uniform price, OPA contracts and Integrated Power System Plan (IPSP) fleet
  - Includes continuing with day-ahead price forecast and cost guarantees review
- Quantified and Non-quantified impacts included
  - Non-quantified factors considered qualitatively. Also compared to quantified benefits to establish the net incremental value required from the qualitative factors to offset differences in quantified results.

# Methodology and Assumptions (continued)

- Discount rate
  - 7% with sensitivity of 4% and 10%
- Time horizon
  - 15 years but
  - Cumulative Net Present Value (NPV) provided to detect year when pay-back occurs
- Risk
  - NPV based on "expected" costs and benefits but consider different scenario's
  - Provide NPV of high cost and low benefit outcome in assessment

# IESO and Participant Cost

- Table below gives expected implementation costs of different options.
- Estimated cost of baseline scenario (not shown in table below) is $1M.
- Expected OM&A ongoing costs range from $300,000 to $600,000 per year.
- Participant costs range from $2.4M to 6.2M (excludes annual OM&A).

| *$ Millions* | **Labour and OM&A** | **Procurement** | **Upgrades** *After 7 years* | **Other*** | **Total** |
|---|---|---|---|---|---|
| Option 1 | 4.3 | 17.0 | 8.1 | 5.7 | **35.1** |
| Option 2 | 3.8 | 18.0 | 8.3 | 5.7 | **35.8** |
| Option 3 | 7.0 | 24.0 | 11.7 | 8.0 | **50.7** |

**Includes contingency and interest costs*

# Quantified Benefits

- **Unit Commitment Efficiencies**
  - Expected annual benefits: $4.3M to $5.0M
- **Reduced Cost for Gas-Fired Generators**
  - Estimated annual benefits: $8.7M to $13.7M
- **Day Ahead Demand Response Efficiencies**
  - Expected annual benefits: $200,000 to $2 million

# Non-Quantified Benefits

*Table 3 Summary of Non Quantified Impacts*

| Impact | Option 1 | Option 2 | Option 3 |
|---|---|---|---|
| Embedded Generation | + | + | + |
| Reliability | + | + | + |
| Impact of Financial Commitment on Real-time Dispatch | - | - | - |
| Alignment of Constrained and Unconstrained Algorithms | NA | NA | - |
| Integration of Regulated Contracts | NA | NA | - |
| Price/Scheduling Accuracy | + | + | + |
| Financial Commitment | NA | + | + |

+ Implies likely additional benefit
- Implies likely negative impacts

# Net Present Value

| | 15 Year Time Horizon ($ Million) | Pay-back Post Implementation (# years) | Annualized Value ($ Million) | Differences in Annualized Values ($ Million) |
|---|---|---|---|---|
| Option 1 | 88.41 | 2 | 12.59 | - |
| Option 2 | 88.24 | 2 | 12.56 | **0.03** |
| Option 3 | 60.93 | 3 | 8.67 | **3.92** |

# Consumer Impact

| | 15 Year Time Horizon ($ Million) | NPV Pay-back Post Implementation (# years) | Bill Impact Post Implementation (# years) | Net Bill Impact |
|---|---|---|---|---|
| Option 1 | 23.31 | 1 | 1 | **Reduction 1 – 3 cents** |
| Option 2 | 22.82 | 1 | 1 | **Reduction 1 – 3 cents** |
| Option 3 | 13.81 | 6 | 2 | **Increase 1 cent (yr 1) then reduction 1- 3 cents** |

# Most Significant Option 1, 2 & 3 Differences

- Representation of Exports
  - Option 1 (none),
  - Option 2 (likely),
  - Option 3 (yes)
- Virtual Participation
  - Option 1 (none),
  - Option 2 (none),
  - Option 3 (yes)
- Financial Guarantees
  - Option 1 (none),
  - Option 2 (yes through EFM),
  - Option 3 (yes through DAM)

# Common Elements to Options 1, 2, & 3

- Constrained Algorithm:
  - 24 hour optimization/ 3 part bidding
  - Same unit commitment process, multiple passes based on average and peak
  - Advisories based on average
- Production Cost Guarantee (PCG) review:
  - PCG for the entire advisory schedule is required

# What Stakeholders have told us

- Most recognize benefits for the Province of common elements
- Support for EFM is stronger if based on an exchange platform (e.g. NGX/ICE) and if prudentials could be co-ordinated
- Traders and most generators see greater value in the forward position created by UDAM and support it as more robust market evolution
- Consumers see common elements as prudent evolution not convinced of merits for moving to UDAM

# Next Steps

**Maintain momentum on common elements of 3 options:**

1. Demonstrated value to Ontario
2. Represents a large part of any investment in DAM
3. Common elements, common dollars – independent of whether we proceed with additional elements of EFM or UDAM

**Proceed over the summer:**

1. To address the specific issues raised by stakeholders
2. To complete the work required to support an early fall decision on implementation

# Next Steps

Specific Issues:

1. Exports
2. Guarantees
3. Energy Forward Market
4. IESO assessment of alignments

Return in August to present results

# Next Steps

- **June 19, 2008** - Update IESO Board of Directors re development of common elements of Options (24 hour optimization and 3 part bids) and process to resolve stakeholder issues

- **Over summer** – Provide details on PCG, export inclusion and EFM design for Option 1 and 2

- **August 20, 2008** - Stakeholder Advisory Committee

- **September 2008** - Recommendation to IESO Board of Directors