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# Distributed Generation in the Ontario Regulatory Context

Distributed Generation and the Future of Ontario 's Electricity Grid

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# Agenda

- Introduction
- Benefits and Barriers to DG
- Environmental Assessments and DG
- Current Regulatory Initiatives Promoting DG
  - The Renewable Energy Standard Offer Program (OPA)
  - The Clean Energy Standard Offer Program (OPA)
  - Quantifying the Benefits of DG (OEB)



# What is Distributed Generation?

- Distributed generation (or “**DG**”) generally refers to small-scale electric power generators that produce electricity at a site close to customers or that are tied to an electric distribution system.
  - Distributed generators can include synchronous generators, induction generators, reciprocating engines, microturbines (combustion turbines that run on high-energy fossil fuels such as oil, propane, natural gas, gasoline or diesel), and combustion gas turbines as well as fuel cells, solar photovoltaics, and wind turbines.



# Benefits of Distributed Generation

- There is a long list of benefits of distributed generation.
  - In general, pricing of electricity should reflect these benefits so that DG proponents receive the benefits attributable to their projects.
  - We will return to this later when we discuss the Ontario Energy Board's current attempt to Quantify the Benefits of DG.
- ## Benefits of DG
- Potential to defer or avoid capital expenditures to upgrade congested transmission (T) and/or distribution (D) networks.
  - Local solutions to transmission constraints.
  - Reduce T&D system losses and improve T&D load factors.
  - Increase reliability at LDC level and provide support or ancillary services to LDC network.
  - Help reduce peak prices and transmission charges.
  - Make more efficient use of fuel, particularly in case of cogeneration.
  - Environmental.
  - Power factor correction and voltage support.



# Barriers to Distributed Generation

## Economic

- high legal, consultant, regulatory costs, lengthy approval processes
- proportionately higher burden on small proponents – per unit cost of power from some technologies higher than power from the grid
- small size can render projects ineligible for RFPs
- no ability to avoid DRC as other DSM initiatives can, but system impact identical

## Regulatory

- lack of LRAM mechanism for distributors – keep LDCs whole
- need to recognize value of LDC efforts in integrating DG
- assessment fees/upgrade costs can be high – LDC systems not designed to take multiple generation inputs
- need for standardized connection agreements and policies

## Benefit Sharing

- transmission savings flow to ratepayers – did not create benefit
- this was not rectified by OEB in 2006 EDR process
- need for benefits to flow to proponents – recommended by ECSTF



# Environmental Assessments of DG Projects

- All Environmental Assessment (EA) requirements in Ontario flow from the Ontario Environmental Assessment Act and/or the Canadian Environmental Assessment Act.
- Individual Environmental Assessment (“IEA”) required in absence of exemption or class EA
- Ontario Regulation 116/01 applies to most generation facilities
  - Those with “benign” environmental effects, such as small wind turbine projects are not subject to any EA requirements.
  - Others may be subject to Environmental Screening Process (“ESP”)
- Waterpower DG Projects
  - New Class Environmental Assessment.
- Energy from Waste Projects
  - Ontario Regulation 101/07
  - Certain types of waste management projects (including EFW projects) may avoid the IEA process, if undertaken in accordance with an ESP as outlined in the Ministry of the Environment’s March 15, 2007 guide.



# Current Regulatory Initiatives

- A number of regulatory initiatives have been initiated to promote DG.
  - The Ontario Power Authority's Renewable Energy Standard Offer Program ("RESOP")
  - The Ontario Power Authority's Clean Energy Standard Offer Program ("CESOP")
  - The Ontario Energy Board's Effort to Quantify the Benefits of Distributed Generation



# Background to the Renewable Energy Standard Offer Program (“RESOP”)

- Before the Renewable Energy Standard Offer Program (“RESOP”), DG programs faced challenges getting developed because they were often too small for RFP processes.
  
- RESOP Backgrounder
  - May 2005 - Ontario Sustainable Energy Association report to Ministry of Energy on policy options to encourage small or community owned renewable generation.
  - August 2005 – Minister of Energy directs OPA and OEB to develop terms and conditions for a standard offer program for small embedded generators using clean or renewable resources
  - November 2005 - OPA discussion paper and consultation
  - March 2006 - Joint OPA/OEB Report to the MOE
  - October 2006 - OEB Form of Connection Agreement for Small – Mid-sized Embedded Generation Facilities
  - November 2006 - Final Program Rules Issued





# RESOP Eligibility

- **DG:** Maximum project capacity 10 MW
- **Renewable:** To be eligible, projects must generate electricity from renewable sources such as wind, solar PV, renewable biomass, biogas, biofuel, landfill gas or water power
- **Distribution Connected:** Projects must be connected at a voltage of 50 kV or less
- **Long Term:** 20 year contracting period
- **Regular Reviews:** RESOP is an ongoing program with anticipated regular reviews – it is not a pilot project.



# RESOP Pricing

- Non-Photovoltaic
  - 11.0¢/kWh Base Price
    - ◆ 9.4¢ (from RES II RFP) + 0.94¢ (scale bonus) + .66¢ (avoided Tx losses)
  - 3.52¢/kWh incentive on peak (11-7) for controllable generation
  - 20% of base price escalated at annual Ontario CPI
- Photovoltaic
  - 42¢/kWh, no escalation – subject to price discovery/review

## The Details

- Market-based with adders for value of DG (reduced Tx losses) and lost economies of scale
- Fixed base price plus performance incentive for projects with controllable (dispatchable) output
- WPPI/RPPI split 50/50 between generator and OPA - other government incentives to accrue to OPA (incl. emissions credits)
- Regular review of prices from 2 years out
- Contract Payments reduced to account for total generation consumed by Load Customer
- OPA may amend pricing prospectively – no impact on existing contracts



# RESOP Progress

- When RESOP launched Nov 2006, the OPA expected 1,000 MW to be developed over 10 years.
  
- **As of May 2008:**
  - 314 contracts
  - 1,300 MW of potential new renewable supply
  - 140 residential projects (<10kW)
  - 12 farm-based projects
  - 22 small-scale projects (<1MW)
  - Potential total investment of \$4.9 billion in the next 3 years
  
- The OPA has undertaken a review of the program to ensure continued success moving forward.



# RESOP Changes

## ■ The Challenges Noted by the OPA:

- Some larger projects divided up to qualify for RESOP contracts
- Larger projects better equipped to participate in competitive procurements
- Commercial proponents have been successful in securing grid capacity that has impeded some smaller and community-based projects from moving forward
- This has been a challenge faced by farm-based biomass projects

## ■ Changes to RESOP:

- Proponents will be limited to no more than 10 MW of generating projects per transformer station.
- A generator can have no more than 50 MW of projects per resource type (wind, water, solar PV, biomass) under development at one time.
- Progress milestones will be created for new contracted projects.
- OPA will better coordinate RESOP initiatives with other generation procurement activities in terms of limited transmission capacity.



# RESOP Status Update

- **August 5, 2008 Update:** The OPA recently completed a series of technical sessions to gather feedback from stakeholders concerning implementation of the proposed new RESOP rules and revised contract.
- Some feedback included:
  - the current approach to solar photovoltaic (PV) under the RESOP is seen as unsustainable and the need for a longer-term Provincial strategy on PV procurement was expressed;
  - developing new requirements ("milestones") for projects to demonstrate progress; and
  - the relationship between a RESOP contract and the OEB's Codes with respect to how LDCs manage the queue to connect to their distribution systems is complex - many observers have requested that OPA and OEB explore options to integrate these processes.
- The OPA staff have indicated their intention to release draft RESOP program rules for stakeholder review and comment this Fall, although this release has been delayed.



# Background to the Clean Energy Standard Offer Program (“CESOP”)

- On June 15, 2007, the Minister of Energy directed the OPA to develop the CESOP.
  - Concerns raised by stakeholders as well as changes in market conditions and other factors led the OPA to delay the launch of the CESOP pending a review of these issues.
- On May 27, 2008 the OPA released a “*Report on the Ontario Power Authority’s Revisions to the Clean Energy Standard Offer Program*” reflecting the results of that review.
- On September 25, 2008 the OPA posted its final “*Updated Report on the Ontario Power Authority’s Revisions to the Clean Energy Standard Offer Program*”, outlining revisions to the program being made in response to industry and stakeholder feedback on the May 27, 2008 Report.

# CESOP Eligibility

- CESOP contracts will be awarded to **eligible projects** that have a gross nameplate capacity of no more than 10 MW, for a 20 year term.
  
- Eligible clean energy projects must:
  - be located in Ontario,
  - have an installed generating gross nameplate capacity of no more than 10 MW,
  - be connected to an eligible distribution system licensed by the OEB and connect at a voltage of no more than 50kV,
  - be metered by the local distribution company in accordance with OEB requirements,
  - adhere to transmission constraint limits, as applicable, and
  - have a commercial in-service date after August 18, 2005.



# Proposed CESOP Pricing

- CESOP contract payments reflect the capacity value of these projects to the OPA.
- The CESOP approach involves two methods of compensation, each with a set portion tied to the Ontario CPI, to be determined depending on the type of project
  - Natural Gas Combined Heat and Power (“CHP”) – Net Revenue Guarantee less imputed Net Market Revenue of “virtual” plant
  - By-product Fuel Fired Projects/Under-Utilized Energy Projects – generator receives fixed price – OPA receives market revenue
- The CHP price is determined by three elements:
  - The value of the generation in the market, minus variable operating costs;
  - The capacity value to the OPA; and
  - The value of avoided transmission losses and postponed or avoided transmission investment.
- By-product/Under-Utilized Energy approach similar, but capacity value lower to reflect lower reliability





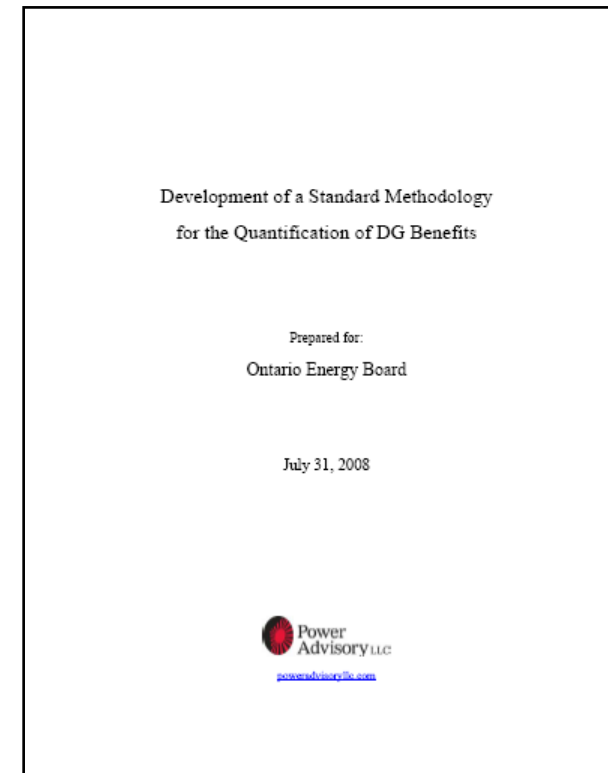
# CESOP Next Steps

- With the release of this final Updated Report, the OPA intends to develop draft Program Rules.
- The OPA anticipates being able to release the Final Rules and Contract for the CESOP in October 2008, with Program launch slated for sometime in the Fall.
  - As of October 25<sup>th</sup>, the Draft Rules and Contract have not yet been released.



# Quantifying the Benefits of DG

- On September 22, 2008 the Ontario Energy Board issued a report for stakeholder comment authored by Power Advisory LLC and titled *Development of a Standard Methodology for the Quantification of DG Benefits*.
  - The deadline for submitting comments was Oct. 13, 2008.
- Power Advisory was engaged to develop a standard methodology for quantifying certain specific, readily quantifiable system-wide benefits of DG.





# Quantifying the Benefits of DG

- The Power Advisory Report proposes a standard methodology to quantify the benefits of:
  - Deferred Transmission Investments
  - Deferred Distribution Investments
  - Reduced Transmission & Distribution Losses
  - Improved Voltage Stability



# Selected Stakeholder Comments

- **Reliability and System Performance:** The IESO noted that as the number of DG facilities grows that adequate provisions should be provided to ensure the IESO can monitor these operations to ensure they do not negatively impacting system performance (currently, DG facilities don't have to register as IESO market participants).
- **Location, Location, Location:** Hydro One noted that as a result of various OPA programs, experience shows that most new DG is looking to locate in lightly loaded areas away from large load centres which can result in additional Tx/Dx facilities and higher Tx/Dx losses - if more DG applications were at urban sites, where the load exists, these limitations would not be as great.
- **Regulatory Harmony:** The OPA raised the potential for “double counting” benefits of distributed generation, especially in light of the OPA’s CESOP and RESOP.
- **LIRP (the distributors role):** the EDA noted that if distributors were able to choose the least cost option as between diversified DG and distribution plant, and could earn a return on either, then distributors would have the proper incentive to carry out local integrated resource planning (“LIRP”) which would be more conducive to DG development.
  - Toronto Hydro submitted an alternative to integrate distribution system planning within the distributor, which would then be charged with determining the least-cost combination of DG and other distribution plant facilities to meet prospective demand on its system within a local integrated resource planning (“LIRP”) framework.



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# Thank You