ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998, S.O. 1998*, c. 15, Sch. B, as amended (the "**OEB Act**")**;**

AND IN THE MATTER of an application by Grand Renewable Wind LP for an Order or Orders granting Leave to Construct new Transmission Facilities within Haldimand County, Ontario.

APPLICANT RESPONSE TO HALDIMAND FEDERATION OF AGRICULTURE INTERROGATORIES

Interrogatory

Preamble: SRE proposes to offer the electricity produced by the solar component of the GREP to the Ontario grid at a cost no greater than that required to recover all reasonable costs. Since this cost will ultimately be paid by our (HFA) members, it is important to us.

Reference: Exhibit A, Tab 2, Schedule 1, Item 10.

Questions/Answers:

The Applicant notes that the basis upon which HFA poses these questions is incorrect. The cost required to transport the electricity generated from the Solar Project will not ultimately be paid by the HFA members. Rather this is a cost of operation that is absorbed directly by Grand Renewable Solar LP.

1. If this cost [at which electricity produced by the solar component of the GREP will be sold into the Ontario grid] is now known, what is it? If not, what criteria will be used to establish this cost? What accounting principles will be used and what assumptions made in arriving at a price[?]

   Please see attached **Schedule A**—Proposed Feed-in Tariff Price Schedule.

2. In addition to capital and operating costs, will [the abovementioned price] include the cost of rehabilitation of the land to its current agricultural productive capacity upon decommissioning, including replacement of topsoil, removal of roads and other infrastructure and the decontamination of the soil by chemical agents released through breakage of solar panels during the years of operation?

   The cost to transport the energy generated by the Solar Project to the grid only covers operational charges and costs.

   The cost associated with rehabilitation of the solar land to its current agricultural productive capacity upon decommissioning, including replacement of topsoil, removal of roads and other infrastructure and the decontamination ("Surrender or Restoration") is covered under Solar ground lease agreement section in section 17, Surrender and Restoration, which states the following:

   17.1 Surrender. Upon any termination, surrender, or expiration of this Lease, Grantee shall remove all of Grantee's Improvements and shall peaceably deliver up to Grantor possession of the Premises or any part thereof, and other rights granted by this Lease, and shall execute, at Grantor's request, any and all reasonable documents needed to record or evidence such termination.

   17.2 Restoration. Upon any termination, surrender, or expiration of this Lease, and within one year thereof Grantee shall restore, to the extent required by any applicable ordinance of the Town, City County, or Province, the subsurface of the Premises, but in any event Grantee shall remove structures and Improvements to the extent reasonably practicable to a depth of three (3) feet below the surface of the

Premises. In addition, Grantee shall restore the surface of the Premises as is reasonably practicable to its original condition as the same existed at the inception of this Lease and shall repair any damage, to the extent the same existed at the inception of this Lease and shall repair any damage, to the extent reasonably practicable, to the Premises as a result of any removal of Grantee's Improvements under this Section. Notwithstanding any of the foregoing, in no event shall Grantee have the obligation to modify the grade of the Premises as established by Grantee for its uses or to restore any vegetation.

3. Will [the abovementioned price] include mitigating measures to minimize or prevent radio interference common near high tension lines?

Please see HFA IRR#2.

In practice, transmission lines are designed so that potential effects of electric charge and magnetic fields ("Effects") are eliminated or minimized. These effects can be predicted by calculation so that efficient mitigation measures can be easily implemented. The transmission lines do not usually interfere with normal television and radio reception. In some cases, interference is possible at a location close the ROW due to weak broadcasting signals or poor receiving equipment. These cases are difficult to address in a general sense; no discussions with farmers have been held with farmers to determine if their situations meet the described conditions.

The discontinuation of over the air analogue broadcasting at the end of August, 2011 will likely reduce any impact associated with this issue.

4. Will [the abovementioned price] include Municipal realty taxes related to the solar component of the GREP as they change from time to time?

Please see HFA IRR #2.

Also, the Solar Ground Lease Agreement addresses the payment of taxes in Section 16:

16.2 The Grantee covenants and agrees to pay all rates and taxes that may be assessed and levied against the Premises from time to time as a result of the Grantee's interest in the Premises and the Improvements or in connection with its Operations thereon, either to the municipality, if separately assessed, or the Grantor if part of the Grantor's tax assessment.

EXHIBIT A

PROPOSED FEED-IN TARIFF PRICE SCHEDULE

Ontario Power Authority

ONTARIO POWER AUTHORITY

April 7, 2009

Proposed Feed-in Tariff Price Schedule

Stakeholder Engagement – Session 4

April 7 - Agenda

9:00 – 9:10	Introduction by Jason Chee-Aloy (OPA)
9:10 – 10:30	FIT Price Schedule Overview
10:30 – 10:40	Coffee Break
10:40 – 12:00	FIT Pricing Model and General Assumptions
12:00 –1:00	Lunch
1:00 – 2:00	FIT Pricing
2:00 – 2:10	Coffee Break
2:10 – 3:00	FIT Pricing (Continued)
3:00	Adjourn

Proposed Feed-in Tariff Price Schedule

- The proposed or draft Feed-in Tariff (FIT) Price Schedule is a list of standard prices (¢/kWh)
  - These prices or FITs are guaranteed for the term of the applicable contract
  - Contract settlement is based on these prices and the quantity of electricity produced
    - Contracts are not 'take or pay'
- Different prices applied to different technologies
- Different prices applied to different size tranches within applicable technologies

Draft FIT Price Schedule

Technology	Capacity Range	Price (¢/kWh) (CAD)	Automatic Price Adjustment
Micro Solar PV	≤ 10 kW	80.2	None
Rooftop Solar PV	> 10 kW ≤ 100 kW	71.3	None
Rooftop Solar PV	> 100 kW ≤ 500 kW	63.5	None
Rooftop Solar PV	> 500 kW	53.9	None
Ground Mounted Solar PV	> 10 kW ≤ 10 MW	44.3	9% price reduction triggered every 100 MW
Community Based or Aboriginal Wind	≤ 10 MW	14.4	None
On-shore Wind	Any size	13.5	None
Off-shore Wind	Any size	19.0	None
Community Based Waterpower	≤ 2 MW	13.4	None
Waterpower	≤ 50 MW	12.9	None
Biomass	Any size	12.2	None
Biogas	≤ 5 MW	14.7	None
	> 5 MW	10.4	None
Landfill gas	≤ 5 MW	11.1	None
	> 5 MW	10.3	None

FIT Price Schedule – Objectives

- FIT Price Schedule designed to balance several objectives:
  - To promote broad participation in the program
    - Including different technologies, project sizes, and proponents (e.g., Aboriginal and community-based)
  - To provide price stability necessary to promote the investment objectives of the proposed Green Energy Act
  - To encourage efficient project development
    - Striking a balance of enabling project development while not overpaying for projects

FIT Price Schedule – Overview

- To develop a FIT price schedule, OPA had to make assumptions about the costs and performance characteristics of a 'typical' project

- OPA will closely monitor uptake of FIT contracts and will reassess prices at regular intervals, consistent with regular program review
  - OPA will review prices to reflect changes that impact the costs to develop renewable energy supply projects, for example material changes in:
    - Equipment supply costs
    - Exchange rates

FIT Price Schedule – Overview

- Prices are designed to provide participants and associated industries with a high measure of price stability and program sustainability

- Prices for each category will aim to favour the most cost efficient projects in order to manage customer rate impacts

FIT Price Schedule – Applicable Technologies

- Prices were developed for renewable energy supply technologies that are anticipated to have widespread application in Ontario

- Technologies include:
  - Solar PV (rooftop and ground mounted)
  - On-shore and off-shore wind
  - Waterpower (≤ 50 MW)
  - Landfill gas
  - Biogas
  - Renewable Biomass (including Bio-fuel)

FIT Price Schedule – Other Technologies

- Prices were not developed for all renewable energy supply technologies

- These technologies may have had
  - Limited application in Ontario
  - Costs that are likely to vary widely (e.g., site specific)
  - Considerable uncertainty regarding costs
  - Technology that is immature and still developing

FIT Price Schedule – Other Technologies

- Technologies currently not included in proposed FIT Price Schedule
  - Solar thermal electric
  - Concentrating solar power
  - Large waterpower (> 50 MW)
  - Large Solar PV (> 10 MW)
  - Geothermal electric
  - Energy storage (including pumped storage)

- These technologies better lend themselves to alternative procurement methods
  - Such approaches may be more effective recognizing the distinct characteristics of these technologies

FIT Price Schedule – Size Tranches

- Size tranches established for different technologies to account for cost differences where there are distinct applications with meaningful cost or value differences

- Size tranches were based on
  - Experience in other jurisdictions
  - Experience with Renewable Energy Standard Offer Contract (RESOP) contracts influenced size tranches
  - Consistency with Ontario Energy Board (OEB) Distribution System Code (DSC)

- Aboriginal and community-based projects also have distinct size tranches to reflect projects that are expected to come forward

RESOP Experience – Rooftop Solar PV

- Rooftop solar PV size tranches and typical applications
  - ≤10 kW (residential)
  - >10 kW ≤ 100 kW (small commercial)
  - >100 kW ≤ 500 kW (large commercial)
  - >500 kW (industrial)

Capacity Range	Number of RESOP Contracts
≤ 10 kW	240
> 10 kW ≤ 100 kW	7
> 100 kW ≤ 500 kW	3
> 500 kW ≤ 1 MW	0
> 1 MW ≤ 10 MW	55

RESOP Experience – Solar PV

- The majority of the RESOP contracts were micro-generation projects (≤ 10 kW)
  - Contract holders were early adopters of solar PV technology and were motivated by environmental benefits
- Few RESOP contracts executed for mid-ranged projects
- Most of the executed contracts > 1 MW are close to the 10 MW maximum
  - Many of these contracts were executed with larger developers who divided projects into 10 MW increments

RESOP Experience – Wind

- Wind size tranches
  - ≤ 10 MW: Aboriginal and community-based
  - Otherwise no limit

Capacity Range	Number of RESOP Contracts
≤ 10 MW	93

- Very few projects < 500 kW
- Many of these contracts were executed with developers who divided larger projects into 10 MW increments
- OPA heard from many proponents interested in developing Aboriginal and community-based projects
  - 10 MW wind project with 30% equity requires approximately $9 million investment

RESOP Experience – Waterpower

- Waterpower size tranches
  - ≤ 2 MW: Aboriginal and community-based
  - ≤ 50 MW

Capacity Range	Number of RESOP Contracts
≤ 2 MW	13
> 2 MW ≤ 10 MW	7

- Approximately two thirds of the contracts were for projects < 2 MW

- OPA heard from many proponents who were interested in developing Aboriginal and community-based projects

RESOP Experience – Biogas

- Biogas size tranches
  - ≤ 5 MW
  - > 5 MW

Capacity Range	Number of RESOP Contracts
≤ 5 MW	6
> 5 MW ≤ 10 MW	0

- All Biogas contracts were < 5 MW

- Expect greater uptake of farm-based biogas

RESOP Experience – Landfill gas

- Landfill gas size tranches
  - ≤5 MW
  - >5 MW

Capacity Range	Number of RESOP Contracts
≤ 5 MW	8
> 5 MW ≤ 10 MW	3

- The majority of landfill gas projects were < 5 MW

RESOP Experience – Biomass

- Biomass tranche sizes
  - Only one price category

Capacity Range	Number of RESOP Contracts
≥ 10 MW	5

- Biomass projects experienced limited uptake
- All projects were > 2.5 MW

FIT Pricing – Aboriginal and Community Projects

- OPA proposes size tranches and prices that recognize the unique attributes of Aboriginal and community-based projects
  - Proposed prices for these size tranches are only available to Aboriginal and community-based projects
  - These projects are typically smaller, based on the local resource potential and benefit from local participation

FIT Pricing – Aboriginal and Community Projects

- Aboriginal and community-based projects recognized to have higher cost structures than projects developed by more commercially oriented developers
  - These higher costs can include
    - Requirements for greater consultation
    - Longer development lead times
    - Inability to fully utilize the tax benefits provided by project
    - net operating losses
    - Different financing structures
    - Local resource availability

FIT Price Schedule – Derivation

- Proposed prices established to allow the proponent to recover project costs and earn a reasonable rate of return on investment
  - Cost-based pricing was used to enable a wide range of technologies and participation in program
  - Cost-based pricing methodology used in many European FIT Programs

FIT Price Schedule – Derivation

- Prices based on the following elements
  - Capital costs
    - Reasonable project development, construction, and equipment costs
  - Operating and maintenance costs
    - Reasonable project staffing and maintenance costs, including ongoing capital expenditures and property taxes
  - Connection costs
    - Reasonable project connection costs, no significant grid upgrade costs assumed

FIT Price Schedule – Derivation

- Prices based on the following elements
  - Contract term
    - Assumed 20-year contract term
  - Reasonable rate of return
  - Efficient project financing structure given long-term power purchase agreement with a credit-worthy counterparty

FIT Price Schedule – Cost-Based vs. Market-Based

- Cost-based prices vs. market-based prices
  - OPA considered alternative approaches to cost-based prices
  - For example, Spanish FIT Price Schedule offers two options for renewable suppliers:
    - Fixed price option
    - Market price + premium option
- At this time, introduction of the FIT Program in Ontario requires stable and guaranteed long-term prices to best meet broad policy objectives (i.e., infrastructure investment) as proposed in the Green Energy Act
  - A cost-based approach best ensure this
- OPA will consider alternative pricing approaches over time as the FIT Program matures

FIT Price Schedule – Location and Resource

- Locational-based and resource-based pricing were also considered
- However, these approaches are not being initially proposed due to
  - Complexity of methodology
  - Inconsistency with existing market design
    - IESO-administered markets do not have locational marginal pricing
  - Potential pricing distortions from current approach for allocating transmission facility costs
  - Objective of stimulating best resource locations first

FIT Price Schedule – Model Overview

- Prices developed using a Discounted Cash Flow (DCF) model
  - DCF models are commonly used in project finance
- The DCF model calculates the prices required to
  - Cover the cost of investment
  - Cover ongoing operating expenses
  - Earn a reasonable rate of return over a 20-year contact term

FIT Price Schedule – Model Overview

A seven step process was used to calculate prices

(1) Annual generation output is estimated for a given project based on the project capacity and assumed capacity factor

(2) Operating expenses estimated and include fuel cost, variable operation and maintenance cost, fixed operation and maintenance cost, and property tax

(3) Annual depreciation calculated using an appropriate capital cost allowance rate

FIT Price Schedule – Model Overview

(4) Operating expenses, depreciation, interests, and income taxes deducted from revenue to arrive at net income

(5) Depreciation added back to net income to estimate actual cash flow

(6) Capital investment, debt borrowing, and debt repayment added to calculate free cash flow for each year

(7) Free cash flows are then discounted using the target return on equity

FIT Price Schedule – Financing Assumptions

- Financing assumptions assume that financial markets stabilize and return to conditions that are closer to historical norms
  - Prices are to be maintained for an extended period, so a long-term view was taken

FIT Price Schedule – Financing Assumptions

- Non-recourse project finance structure assumed, based on experience with RESOP

- Experience indicates that this is the most efficient financing structure

Variable	Assumption
Percent Equity	30%
After Tax Return on Equity	11%
Percent Debt	70%
Cost of Debt	7%
Income Tax Rate	30.5%

FIT Price Schedule – Depreciation Assumptions

- The majority of project capital costs were assumed to qualify for Class 43.2 Capital Cost Allowance treatment
  - Ranged from 60 to 80%, with more modular technologies (e.g., solar PV) assumed to have higher proportion of capital costs covered by Class 43.2
  - The remaining portion of project costs assumed to be 8% declining balance

FIT Price Schedule – Other Assumptions

- 20% of the contract price assumed to escalate at the Consumer Price Index (CPI) for all renewable energy supply technologies (except solar PV)
  - 20% is generally consistent with the proportion of project costs that vary with inflation and provides protection against changes in the rate of inflation
  - 2.25% inflation assumption used in analysis
- No credit assumed for revenues from federal ecoENERGY program

FIT Price Schedule – Other Assumptions

- Domestic (Ontario) content requirements assumed to be phased in a manner that there is no adverse impact on project costs
  - Final Ontario government direction on domestic content may require recalculation of some, if not all, of the proposed prices

FIT Price Schedule – Data Sources

- Project cost information was developed from a range of sources using best available information
  - Consistent with literature and industry experience
  - Sources clearly documented
- Preference was given to more recent cost estimates from reliable sources with transparent assumptions, which can be updated as appropriate and necessary

The OPA used a wide rate of sources as inputs into the applicable models. The OPA necessarily applied professional judgment were applicable.

FIT Prices – Cost and Performance Assumptions

- Project costs can vary significantly depending on site conditions, proponent experience, and the cost and performance characteristics of the various technologies

- Project cost estimates are part of an integrated package
  - Care needs to be taken when changing just one element of the cost estimates

FIT Pricing – PV Assumptions

- PV costs and performance estimates are from a Navigant Consulting study performed for the OPA

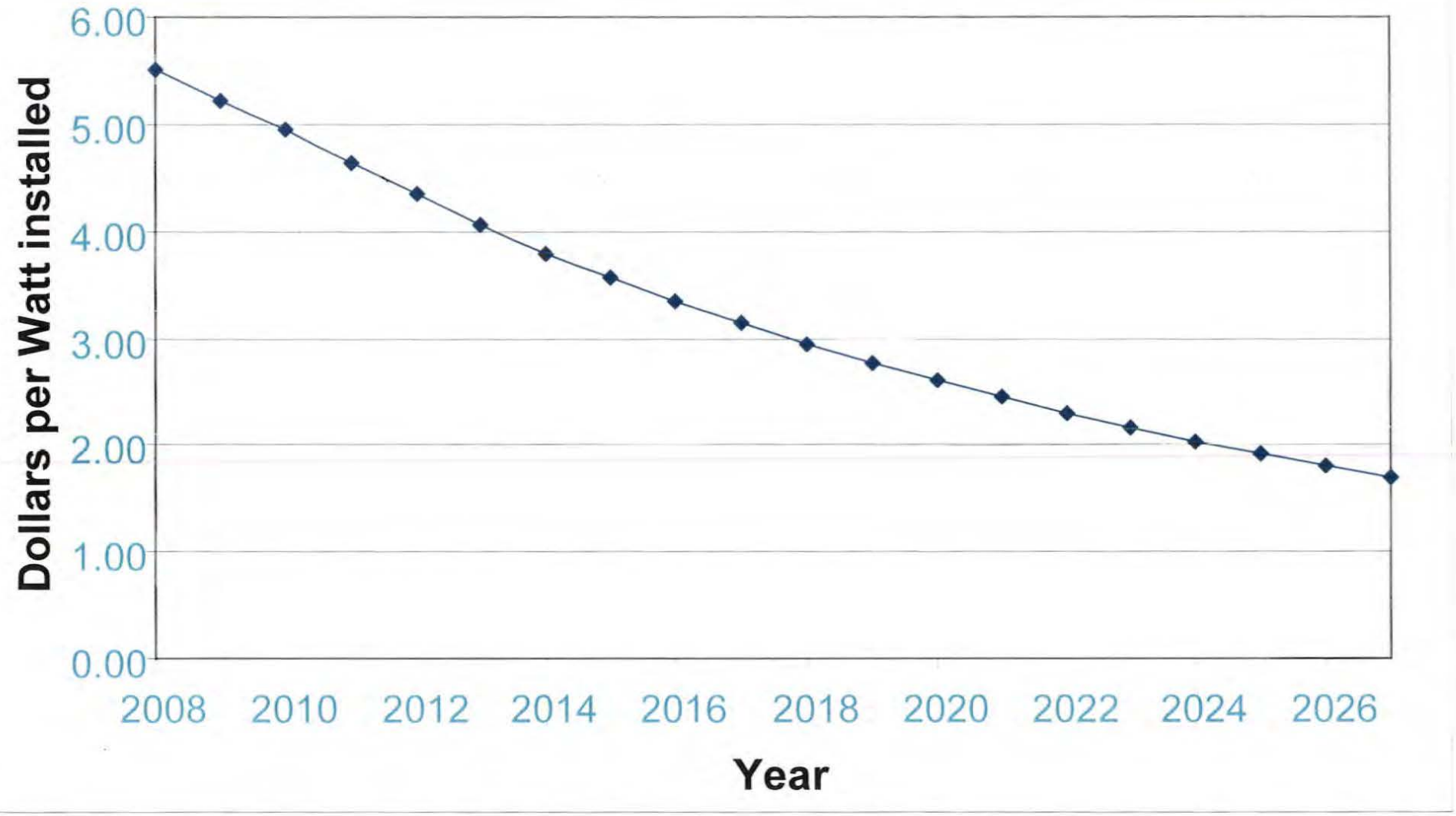
	Rooftop ≤ 10kW	Rooftop 10-100kW	Rooftop 100-500kW	Rooftop > 500kW	Ground mounted
Typical Size (kW)	5	100	500	1,000	10,000
Contract year	2009	2009	2009	2009	2009
Construction Lead Time (yr)	1	1	2	2	2
Start Year	2010	2010	2011	2011	2011
Capacity Factor	13%	13%	13%	13%	14%
Capital Cost ($/kW)	9,200	8,160	6,690	5,650	4,600
Fixed O&M ($/kW/yr)	10	11	12	13.5	15

Source: Navigant Consulting, Inc., *Photovoltaics in Ontario, January 2009*

FIT Pricing – Solar PV Automatic Price Adjustment

- For ground mounted solar PV, there is an Automatic Price Adjustment of 9% of the contract price after 100 MW of contract capacity has been awarded
  - Use of an Automatic Price Adjustment is consistent with other jurisdictions (e.g., California)
  - This helps to mitigate customer rate impacts, given the size of ground mounted solar PV projects and the premium relative to other applicable renewable energy supply technologies

Cost Projections for Ground Mounted Solar PV



Source: Navigant Consulting, Inc., *Photovoltaics in Ontario, January 2009*

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FIT Pricing – Solar PV Automatic Price Adjustment

- Degression rate recognizes the significant cost reductions that are being realized for solar PV systems

- An Automatic Price Adjustment is appropriate for technologies that are expected to experience a rapid decline in installed costs
  - The adjustment is an automatic correction mechanism

- OPA will provide information regarding projects that have been awarded contracts so that proponents can evaluate the potential for Automatic Price Adjustments

FIT Pricing – Wind Assumptions

- Wind costs are from a range of reputable sources; capacity factors based on OPA estimates supported by Helimax studies and actual wind project production in Ontario

	Community	Onshore	Offshore
Typical Size (MW)	10	100	400
Construction Lead Time	1	2	3
Capacity Factor (%)	30	30	37
Capital Cost ($/kW)	3,200	2,900 (2)	4,800 (1)
Fixed O&M ($/kW/yr)	65	55 (1)	100 (3)

Source: (1) Energy Information Administration of the US Department of Energy, *Annual Energy Outlook 2009.*

(2) Cambridge Energy Research Associates, *Capital Costs Analysis Forum — Power: Market Review*, November 2008.

(3) Pace Global Energy Services, *Assessment of Florida Power & Light Energy Capital Cost Estimate*

FIT Pricing – Wind Assumptions

- Community wind projects were assumed to have a 10% economies of scale penalty
  - This reflects reduced buying power with turbine vendors and EPC contractors, higher proportional mobilization costs

- Fixed O&M costs increased to reflect land lease payments and property taxes

FIT Pricing – Waterpower Assumptions

- Waterpower assumptions are from a range of reports: (i) capital costs from Hatch Acres; (ii) FOM costs from CPUC; and (ii) capacity factors from Navigant

	Community	General
Typical Size (MW)	1	10
Construction Lead Time	4	4
Capacity Factor (%) **(1)**	52	52
Capital Cost ($/kW)	5,000	4,500 **(2)**
Fixed O&M ($/kW/yr) **(3)**	15	15

Source: **(1)** Navigant Consulting, Inc., *Renewable Energy: Costs, Performance and Market – An Outlook to 2010 Final Report*, June 2007

(2) Hatch Acres, *Evaluation and Assessment of Ontario's Waterpower Potential Final Report*, October 2004

(3) California Public Utilities Commission (CPUC), *Greenhouse Gas Modelling Report*, 2007.

FIT Pricing – Waterpower Assumptions

- Hatch Acres capital cost estimates were believed to be too low and were escalated by 30% to reflect increases in costs in power plant construction

- Capital costs for community waterpower projects were assumed to have approximately a 10% economies of scale penalty relative to general waterpower

FIT Pricing – Biogas Assumptions

- Biogas assumptions are from a Navigant study, the larger Anaerobic digester is assumed to have a tipping fee

	Biogas	Biogas
Typical Size (MW)	1	5
Construction Lead Time	2	2
Capacity Factor (%)	75	75
Capital Cost ($/kW)	6,700	5,600
Fixed O&M ($/kW/yr)	55	174
Variable O&M ($/MWh)	21	29
Heat Rate (MMbtu/MWh)	17	19
Fuel Cost ($/MMBtu)	0	(2.5)

Source: (1) Navigant Consulting, Inc., *Renewable Energy: Costs, Performance and Market – An Outlook to 2010 Final Report*, June 2007

FIT Pricing – Landfill gas Assumptions

- Landfill gas assumptions are from a Navigant study

	Landfill Gas	Landfill Gas
Typical Size (MW)	2.5	5
Construction Lead Time	2	2
Capacity Factor (%)	83	85
Capital Cost ($/kW)	2,900	2,700
Fixed O&M ($/kW/yr)	300	300
Variable O&M ($/MWh)	17	14
Heat Rate (MMbtu/MWh)	12	10.6

Source: (1) Navigant Consulting, Inc., *Renewable Energy: Costs, Performance and Market – An Outlook to 2010 Final Report*, June 2007

FIT Pricing – Biomass Assumptions

- Biomass assumptions are from a Navigant study

	Biomass
Typical Size (MW)	30
Construction Lead Time	2
Capacity Factor (%)	85
Capital Cost ($/kW)	4,000
Fixed O&M ($/kW/yr)	150
Variable O&M ($/MWh)	7
Heat Rate (MMbtu/MWh)	9
Fuel Cost ($/MMBtu)	3

Source: (1) Navigant Consulting, Inc., *Renewable Energy: Costs, Performance and Market – An Outlook to 2010 Final Report*, June 2007

Draft FIT Price Schedule

Technology	Capacity Range	Price (¢/kWh) (CAD)	Automatic Price Adjustment
Micro Solar PV	≤ 10 kW	80.2	None
Rooftop Solar PV	> 10 kW ≤ 100 kW	71.3	None
Rooftop Solar PV	> 100 kW ≤ 500 kW	63.5	None
Rooftop Solar PV	> 500 kW	53.9	None
Ground mounted Solar PV	> 10 kW ≤ 10 MW	44.3	9% price reduction triggered every 100 MW
Community Based or Aboriginal Wind	≤ 10 MW	14.4	None
On-shore Wind	Any size	13.5	None
Off-shore Wind	Any size	19.0	None
Community Based Waterpower	≤ 2 MW	13.4	None
Waterpower	≤ 50 MW	12.9	None
Biomass	Any size	12.2	None
Biogas	≤ 5 MW	14.7	None
	> 5 MW	10.4	None
Landfill gas	≤ 5 MW	11.1	None
	> 5 MW	10.3	None

FIT Implementation – Incentive Payments

- For technologies that are dispatchable (i.e., not intermittent): waterpower; biogas; landfill gas, and biomass
  - Incentive payment of 135% of contract price paid for 8 hour on-peak period, 11 am to 7 pm Monday to Friday, excluding statutory holidays
  - Off-peak payment of 90% of the contract price paid for all other hours
- Incentive payment structure only rewards proponents who adjust the output profile of their projects
- Projects that produce power 7 x 24 year round will earn the full price