Rhode Island
Renewable Energy Growth Program:

Summary of 2017 Ceiling Price Process & Recommendations

January 6, 2017

Sustainable Energy Advantage, LLC

Introduction & Overview

- SEA
  - Provides policy, market & strategic analysis
  - Focused exclusively on renewable energy
  - Since 1998, supported decision-making of over 200 clients, including 40 governmental entities
  - Known and respected as an independent and objective analyst

- SEA's role
  - Technical consultant to the OER and DG Board
  - Support informed decision-making with respect to Ceiling Prices
  - Facilitate stakeholder engagement and feedback process (Jun through Oct)
  - Conduct quantitative research and analysis in support of CP recommendations differentiated by technology, size and ownership structure
  - Serve as a continuously available resource to stakeholders, DG Board, National Grid, and other interested parties

Summary of Assumptions & Changes (1)

- **Inputs** updated based on:
  - Data from stakeholders: written, verbal (by phone or at 1 of 4 Public Meetings)
    - Solar (13), wind (3), AD (3), hydro (3)
  - Data from National Grid: historic actual and estimated (interconnection) costs
  - Bid data from previous rounds of REG program
  - Other recent transactions, where available (many solar, few wind/hydro/AD)
  - Supplemental Research: NREL, MassCEC & NYSERDA databases
- **Ceiling Price Category Updates**
  - Small wind recommended for reinstatement
  - Community Remote Distributed Generation (CRDG) recommended, see later slide
- **Incentives**:
  - Ensure RI ratepayers benefit from leverage of Federal incentives
  - ITC (including in lieu of PTC, for wind)
    - Solar: 100% of face value; adjusted for "haircut" to ensure reasonable equity return
    - Wind: 80% of face value; adjusted for "haircut" to ensure reasonable equity return
    - AD & Hydro: not available
  - MACRS, including Bonus Depreciation where applicable
    - Net Operating Losses assumed to be used "as generated"
  - Based on cost, not value: % of costs qualifying for ITC/MACRS reviewed with stakeholders

Summary of Assumptions & Changes (2)

- **Tax Issues**
  - ***Property*** Tax:
    - Methodology shifted from declining cost basis and mill rate to fixed fee per installed kW
    - Installations on residential and manufacturing facilities are exempt
    - Hydro installations also exempt
  - ***Income*** Tax:
    - Net annual payments from National Grid (for production not directly offsetting consumption) are assumed taxable
- **Cost of Capital**
  - Reflects effective use of both equity and debt (including potential back leverage)
  - Targets reasonable rate of return at assumed level of cost and production
  - Cost of, and access to, capital can vary widely among market participants
- **Market Value of Production**
  - For solar and hydro: After National Grid tariff expires, projects are assumed to collect wholesale revenues and nominal REC price for remainder of useful operating life
  - Does not apply to wind and AD, where tariff duration and assumed useful life are equal

Community Remote Distributed Generation (CRDG)

- **Legislative authority:**
  - Creates CRDG CPs for projects > 250 kW, all technologies
  - Allows up to a 15% premium vis-à-vis otherwise comparable CP categories
  - Objective to create a participation option where on-site installation is not possible
- **CRDG categories created for:**
  - Commercial & Large Solar
  - Wind I, II & III
- **Stakeholder comments :**
  - 15% premium is insufficient; actual premium to deliver CRDG is ~25%
    - Owing to customer: (1) acquisition, (2) care & billing, (3) replacement
- **Analytical results: "Large Solar"**
  - Recommended CRDG premium = 12% (above Large Solar CP)
  - *Effective* premium above wtd-average REG Rd 2 project bids = 34%
- **Analytical results: "Commercial Solar"**
  - Recommended CRDG premium = 10% (above Commercial Solar CP)
  - *Effective* premium above wtd-average REG Rd 2 project bids = 17%

Summary of Recommendations

- **Ceiling Price Objective**
  - Balance policy objectives and cost effectiveness

- **Ceiling Price Category Recommendations**
  - Solar I, Host Owned: recommended same CP for Residential and Non-Residential
  - Solar I, 3rd-Party Owned: recommended same CP for Residential and Non-Residential
  - Solar II: recommended same CP for Residential and Non-Residential
  - Hydro: recommend same CP for Hydro I and Hydro II
  - Anaerobic Digestion: recommend same CP for AD I and AD II

- **Ceiling Price Recommendations**
  - See following slide sequence…

SUMMARY RESULTS

Final Draft Proposed Ceiling Prices, 2017 REG Program (1)
(cents/kWh)

Technology	Size Range (Modeled Size)	Analysis Run	15 year Tariff Duration	20 year Tariff Duration
Small Solar I, Host Owned, Residential	1 to 10 kW (5)	2016 Final CP 2017 Final Draft	37.65 34.75 (-8%)	33.45 30.85 (-8%)
Small Solar I, Host Owned, Non-Residential	1 to 10 kW (5)	2016 Final CP 2017 Final Draft	NA 34.75	NA 30.85
Small Solar I, TPO, Residential	1 to 10 kW (5)	2016 Final CP 2017 Final Draft	28.35 27.05 (-5%)	24.70 24.05 (-3%)
Small Solar I, TPO, Non-Residential	1 to 10 kW (5)	2016 Final CP 2017 Final Draft	NA 27.05	NA 24.05

When comparing Ceiling Prices, please note that property taxes were applied to residential projects for 2016 CPs and are not applied to residential projects for 2017 CPs.

Final Draft Proposed Ceiling Prices, 2017 REG Program (2)

(cents/kWh)

Technology	Size Range	Analysis Run	20-Yr Tariff
Small Solar II, Residential	11 to 25 kW (25)	**2016 Final CP** **2017 Final Draft**	**24.90** **27.75 (11%)**
Small Solar II, Non-Residential	11 to 25 kW (25)	**2016 Final CP** **2017 Final Draft**	**NA** **27.75**
Medium Solar	26 to 250 kW (140)	**2016 Final CP** **2017 Final Draft**	**22.55** **22.75 (1%)**
Commercial Solar	251 to 999 kW (500)	**2016 Final CP** **2017 Final Draft**	**19.30** **18.75 (-3%)**
Commercial Solar, Community Remote DG	251 to 999 kW (500)	**2016 Final CP** **2017 Final Draft**	**NA** **20.65**
Large Solar	1 to 5 MW (2)	**2016 Final CP** **2017 Final Draft**	**15.10** **15.05 (-0.3%)**
Large Solar, Community Remote DG	1 to 5 MW (2)	**2016 Final CP** **2017 Final Draft**	**NA** **16.85**

Final Draft Proposed Ceiling Prices, 2017 REG Program (3)

(cents/kWh)

Technology	Size Range	Analysis Run	20-Yr Tariff
Small Wind	1 – 999 kW (100 kW)	**2016 Final CP** **2017 Final Draft**	**NA** **21.45**
Wind I	1 – 3 MW (1.65 MW	**2016 Final CP** **2017 Final Draft**	**18.75** **19.45 (4%)**
Wind I, Community Remote DG	1 – 3 MW (1.65 MW	**2016 Final CP** **2017 Final Draft**	**NA** **20.65**
Wind II	3 – 5 MW (3.3 MW)	**2016 Final CP** **2017 Final Draft**	**18.00** **18.25 (1%)**
Wind II, Community Remote DG	3 – 5 MW (3.3 MW)	**2016 Final CP** **2017 Final Draft**	**NA** **19.35**
Wind III	3 – 5 MW (4.95 MW)	**2016 Final CP** **2017 Final Draft**	**17.40** **17.35 (-0.3%)**
Wind III, Community Remote DG	3 – 5 MW (4.95 MW)	**2016 Final CP** **2017 Final Draft**	**NA** **18.55**

The analysis assumes that wind projects qualify for 80% of the full ITC value.

Final Draft Proposed Ceiling Prices, 2017 REG Program (4)

(cents/kWh)

Technology	Size Range	Analysis Run	20-Yr Tariff
Hydro I	10 – 250 kW (150 kW)	**2016 Final CP** **2017 Final Draft**	**18.65** **22.45 (20%)**
Hydro II	251 kW – 5 MW (500 kW)	**2016 Final CP** **2017 Final Draft**	**17.45** **22.45 (29%)**
AD I	150 – 500 kW (325 kW)	**2016 Final CP** **2017 Final Draft**	**20.20** **20.15 (-0.25%)**
AD II	501 kW – 5 MW (750 kW)	**2016 Final CP** **2017 Final Draft**	**20.20** **20.15 (-0.25%)**

2017 Target Classes and Megawatt Allocation Plan

<table>
<tr><th>Technology/Classes</th><th>Megawatt/Kilowatt Allocation</th></tr>
<tr><td>Small Solar I – Host Owned (15 Year Tariff)</td><td rowspan="5">6.55 MW DC</td></tr>
<tr><td>Small Solar I – Host Owned (20 Year Tariff)</td></tr>
<tr><td>Small Solar I – Third Party Owned (15 Year Tariff)</td></tr>
<tr><td>Small Solar I – Third Party Owned (20 Year Tariff)</td></tr>
<tr><td>Small Solar II (11-25)</td></tr>
<tr><td>Medium Solar (26-250)</td><td>3.0 MW DC</td></tr>
<tr><td>Commercial Solar</td><td>5.0 MW DC</td></tr>
<tr><td>Community Remote - Commercial Solar</td><td>3.0 MW DC</td></tr>
<tr><td>Large Solar</td><td>12.05 MW DC</td></tr>
<tr><td>Community Remote - Large Solar</td><td>3.0 MW DC</td></tr>
<tr><td>Small Wind</td><td>400 kW DC</td></tr>
<tr><td>Community Remote and Non-Community Remote Wind I, II and III</td><td>6.0 MW DC</td></tr>
<tr><td>Anaerobic Digestion I</td><td rowspan="4">1.0 MW DC</td></tr>
<tr><td>Anaerobic Digestion II</td></tr>
<tr><td>Small Scale Hydropower I</td></tr>
<tr><td>Small Scale Hydropower II</td></tr>
<tr><td>Total</td><td>40 MW DC</td></tr>
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