

BEFORE THE PUBLIC UTILITIES COMMISSION
RENEWABLE ENERGY GROWTH PROGRAM
DOCKET 4536B

RESPONSE TO PUC RECORD REQUESTS

Question: Please provide the most recent ceiling prices from the VT SPEED Program.

Answer: (Provided by Carrie Gilbert of LaCapra Associates)

The most recent avoided costs for the VT Sustainably Priced Energy Enterprise Development (SPEED) program were established in an order dated March 20, 2015.¹ The SPEED program is Vermont’s version of a renewable energy development program. According to the attached Order, the program has a program capacity of 127.5MW. The recent Vermont Public Service Board Order is appended to this response. Similar to Rhode Island, the established Vermont avoided costs are a cap on the price a bidder may submit in the standard offer procurement for distributed generation. (The term “standard offer” as used in Vermont does not have the same meaning as in Rhode Island. The Vermont standard offer program refers to the state’s renewable energy development program.) The projects must be 2.2 MW or smaller. The avoided costs are included in the table below.

2015 Avoided-Cost Schedule for Standard-Offer Projects (\$/kWh)							
	Biomass	Hydroelectric	Landfill Gas	Wind >100 kW	Wind ≤ 100 kW	Food Waste Methane	Solar
Levelized	0.125	0.123	0.090	0.118	0.253	0.208 for 20 years	0.155 for 25 years
Year 1	0.121	0.119	0.087	0.113	0.245		
Year 2	0.121	0.119	0.087	0.113	0.246		
Year 3	0.122	0.120	0.088	0.114	0.247		
Year 4	0.123	0.121	0.089	0.114	0.249		
Year 5	0.124	0.121	0.089	0.115	0.250		
Year 6	0.125	0.122	0.090	0.115	0.251		
Year 7	0.126	0.122	0.091	0.116	0.252		
Year 8	0.127	0.123	0.091	0.117	0.254		
Year 9	0.128	0.124	0.092	0.117	0.255		
Year 10	0.129	0.124	0.093	0.118	0.256		
Year 11	0.130	0.125	0.093	0.118	0.258		
Year 12	0.131	0.126	0.094	0.119	0.259		
Year 13	0.132	0.126	0.095	0.120	0.260		
Year 14	0.133	0.127	0.096	0.120	0.262		
Year 15	0.135	0.128	0.097	0.121	0.263		
Year 16	0.136	0.128	NA	0.122	0.265		
Year 17	0.137	0.129	NA	0.122	0.266		
Year 18	0.138	0.130	NA	0.123	0.268		
Year 19	0.140	0.131	NA	0.124	0.269		
Year 20	0.141	0.131	NA	0.124	0.271		

¹ ORDER RE 2015 PRICE CAPS FOR THE STANDARD-OFFER PROGRAM. Vermont Public Service Board, Docket 7873 and 7874. March 20, 2015. <http://vermontspeed.squarespace.com/storage/board-orders/2015AvoidedCostPriceCaps%203-20-15.pdf>

STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7873

Programmatic Changes to the Standard-Offer Program)

and Docket No. 7874

Investigation into the Establishment of Standard-Offer)

Prices under the Sustainably Priced Energy Enterprise)

Development ("SPEED") Program)

Order entered: 3/20/2015

ORDER RE 2015 PRICE CAPS FOR THE STANDARD-OFFER PROGRAM

I. INTRODUCTION

On March 1, 2013, pursuant to 30 V.S.A. § 8005a(f)(1), the Vermont Public Service Board ("Board") determined that a request for proposal ("RFP") mechanism would be used to select the standard-offer projects that will fill annual plant capacity available under the program.¹ The Board also established the price caps that would apply in each annual RFP. In this Order, pursuant to Section 8005a(f)(3), we determine the avoided costs that will serve as price caps on the standard-offer projects solicited through the 2015 RFP.

II. BACKGROUND AND PROCEDURAL HISTORY

Background

Title 30 V.S.A. § 8005a mandated significant changes to the Sustainably Priced Energy Enterprise Development ("SPEED") standard-offer program, which include: (1) annually increasing the cumulative plant capacity of the standard-offer program until the 127.5 MW capacity of the program is reached, pursuant to a predetermined schedule; (2) allocating the cumulative plant capacity among different categories of renewable energy technologies; and

1. Dockets 7873 and 7874, Order of 3/1/13 (the "2013 Order").

(3) setting standard-offer prices for each renewable energy category at avoided cost, with the requirement that the Board employ a market-based mechanism.

Section 8005a(f)(2)(B) defines avoided cost as:

the incremental cost to retail electricity providers of electric energy or capacity or both, which, but for the purchase through the standard offer, such providers would obtain from distributed renewable generation that uses the same generation technology as the category of renewable energy for which the board is setting the price.

In addition, pursuant to Section 8005a(f)(B), the definition of avoided cost includes the consideration of each of the following:

- (i) The relevant cost data of the Vermont composite electric utility system.
- (ii) The terms of the contract, including the duration of the obligation.
- (iii) The availability, during the system's daily and seasonal peak periods, of capacity or energy purchased through the standard offer, and the estimated savings from mitigating peak load.
- (iv) The relationship of the availability of energy or capacity purchased through the standard offer to the ability of the Vermont composite electric utility system or a portion thereof to avoid costs.
- (v) The costs or savings resulting from variations in line losses and other impacts to the transmission or distribution system from those that would have existed in the absence of purchases through the standard offer.
- (vi) The supply and cost characteristics of plants eligible to receive the standard offer.

The determination of avoided-cost prices pursuant to Section 8005a(f)(2) is addressed below. Pursuant to Section 8005a(f)(2)(A)(ii), the avoided costs, except for farm methane, serve as caps on the prices solicited through the market-based mechanism.²

Section 8005a(f)(3) requires that the Board annually review the established avoided costs "to decide whether they should be modified in any respect in order to achieve the goal and requirements of this subsection."

2. Pursuant to Section 8005a(g), farm methane projects remain outside the programmatic cap. The Board intends to issue a determination on farm methane prices in a separate Order.

Procedural History

On January 15, 2010, the Board established standard-offer prices pursuant to Section 8005.³ These prices replaced the statutorily set default prices that applied to standard-offer contracts entered into previously.⁴

On January 23, 2012, the Board revised the standard-offer prices for solar projects and wind projects with a nameplate capacity of 100 kW or less ("small wind").⁵ In addition, the 2012 Order retained the standard-offer prices for the remaining technology categories that were established in the 2010 Order.

On March 1, 2013, the Board established, pursuant to Section 8005a(f)(1), a request for proposal ("RFP") mechanism to determine the standard-offer projects that will fill annual plant capacity available under the program, and directed the SPEED Facilitator,⁶ by April 1 of each year, to issue an RFP to solicit standard-offer projects to meet the requirements of Section 8005a(c).⁷ The 2013 Order also established avoided costs to serve as caps on the standard-offer prices solicited through the RFP. The 2013 Order revised the standard-offer prices for solar projects and retained the standard-offer prices for the remaining technology categories that were established in the 2012 Order.

On March 21, 2014, pursuant to Section 8005a, the Board established avoided costs to serve as caps on the standard-offer prices solicited through the 2014 RFP.⁸ The 2014 Order retained the standard-offer prices for all the technology categories that were established in the 2013 Order. In addition, in the 2014 Order the Board remanded Docket 7874 to Board staff to conduct additional proceedings as necessary, pursuant to Section 8005a(f)(3), to review for

3. Docket 7533, Order of 1/15/10 (the "2010 Order").

4. The requirements of the standard-offer program were moved to Section 8005a. In addition, the statutory criteria for establishing the standard-offer prices have been altered over time.

5. Docket 7780, Order of 1/23/12 (the "2012 Order").

6. VEPP Inc. serves as the SPEED Facilitator under contract to the Board. The 2015 RFP will be available at: <http://vermontspeed.com>.

7. Dockets 7873 and 7874, Order of 3/1/13 (the "2013 Order").

8. Dockets 7873 and 7874, Order of 3/23/14 (the 2014 Order").

possible adjustment the avoided costs to serve as caps on the standard-offer prices solicited through the 2015 RFP.

On September 5, 2014, the Vermont Department of Public Service ("Department") filed a proposal for the calculation of avoided costs to serve as price caps for solar and small wind projects solicited in the 2015 RFP. On September 5, 2014, Green Mountain Power Corporation ("GMP"), NEO Energy LLC ("NEO"), Renewable Energy Vermont ("REV"), and VEPP Inc. ("VEPPI") filed comments with regard to calculation of avoided-cost price caps.

On September 9, 2014, Board staff held a workshop to discuss proposals for the calculation of avoided costs, pursuant to Section 8005a(f)(2), to serve as avoided-cost price caps on the standard-offer projects solicited through the 2015 RFP. At the September 9th workshop, the Department agreed to lead working groups to develop final proposals for avoided-cost price caps for small wind and solar projects, and the Vermont Agency of Agriculture, Food, and Markets agreed to lead a working group to develop an avoided-cost price cap for food waste anaerobic digestion projects.

On November 7, 2014 the Department filed a proposal for avoided-cost price caps for small wind and solar resources. On November 7, 2014, REV filed comments on the Department's proposal and provided a cash-flow model for food waste anaerobic digestion projects, along with reference materials associated with input assumptions to the model.

On November 25, 2014, the Department filed a proposal for an avoided-cost price cap for food waste methane digestion projects. On November 25, 2014, Allco Renewable Energy Limited ("Allco") filed comments on the proposed avoided-cost price caps.

On December 4, 2014, Allco, GMP, and REV filed additional comments on the proposed avoided-cost price caps.

On February 17, 2015, pursuant to Section 8005a(c)(2), the Board reserved 1.5 MW of the cumulative capacity of the standard-offer program for small wind projects and food waste anaerobic digestion projects, the latter of which represent a new technology in the standard-offer program.⁹

9. Dockets 7873 and 7874, Order of 2/17/15.

III. PRICE CAP FOR SOLAR PROJECTS

Participants' Comments

The Department proposes an avoided-cost price cap of \$0.155 per kWh for solar projects solicited through the 2015 RFP.¹⁰ The Department reviewed the assumptions and cash-flow model used to determine the existing solar price cap. The cash-flow model has been used by the Board in previous standard-offer proceedings for estimating the prices that a new project would need in order for the developer of that project to earn a reasonable return on investment.¹¹

Specifically, the Department recommends the following assumptions to be used as inputs to the solar cash-flow model:

- Installation Costs: Assume \$2.50 per watt, based on cost data provided by the SPEED Facilitator and the Stafford Hill Solar Farm.¹² Cost data from existing standard-offer projects ranged between \$2.57 and \$3.52 per watt-AC, and \$2.14 and \$3.30 per watt-DC. (The 2014 solar price cap assumed \$3.06 per watt.)
- Inverter Replacement Costs: Assume a cost of \$400,000 for inverter replacement in year 12 of the project life, based on the recommendation of working group members. (The 2014 solar price cap assumed \$517,000.)
- Annual Maintenance Cost: Assume \$25,528 per year, based on input from the working group members, who provided actual operations and maintenance contracts to the Department for review. The maintenance cost assumption also includes costs associated with a letter of credit for decommissioning, estimated at 0.4% of the installed project cost. (The 2014 solar price cap assumed \$14,667.)
- Investment Tax Credit Percent Realized: Assume that 100% of both the federal and state credit is realized, based on the advent of creative financing models that will allow for all of the tax credit to be realized. (The 2014 solar price cap assumed 50%.)

10. The solar price cap for the 2014 RFP was \$0.257 per kWh.

11. See Docket 7533, Order of 1/15/10; Docket 7780, Order of 1/23/12; and Docket 7874, Order of 3/1/13.

12. *Petition of GMP*, Docket 8098, Order of 7/14/14.

- Property Tax Rate: Assume \$14 per watt, based on input from the working group. Property tax depreciation was assumed to be zero, based on changes to 32 V.S.A. § 3481(1)(D). (The 2014 solar price cap assumed \$45 per watt and a 4% depreciation.)
- Land Lease Costs: Assume 6.8 acres per MW (approximately 15 acres for a 2.2 MW project) at \$1,000 per acre, based on input from the working group. (The 2014 solar price cap assumed 4 acres per MW at \$2,000 per acre.)
- Decommissioning Costs: Assume to be zero, based on input from the working group. Working group discussions highlighted that decommissioning funds were established through a letter of credit, and salvage costs may offset any costs that may occur at the end of a project's useful life. The costs associated with the letter of credit were included in maintenance costs. (The 2014 solar price cap assumed \$85,000 for decommissioning costs.)
- Inflation: Assume 1.89% annually. (The 2014 solar price cap assumed 1.6% annually.)
- Rate of Return: Assume 9.6%, which is equivalent to that of GMP's current return on equity. (The 2014 solar price cap assumed 9.75%.)
- Debt/Equity Ratio: Assume that the capital structure of a project would be 60% debt and 40% equity. (The 2014 solar price cap assumed a ratio of 60 to 40%.)

The Department performed a sensitivity analysis on the assumptions contained in the cash-flow model. The Department states that the results of the analysis indicated that the price determined by the cash-flow model was particularly sensitive to the assumptions about debt/equity ratio and assumed realization of the investment tax credit. The Department represents that some of the working group members raised competing concerns that the debt portion of the debt/equity ratio may be too low, or too high. The Department also represents that some of the working group members suggested that "YieldCos" and other capital sources can secure equity financing at a lower rate than the 9.6% internal rate of return assumed in the cash-flow model analysis. In addition, the Department represents that working group members raised concerns that there are not many individuals or entities in Vermont with an adequately large state tax bill, so as to allow the state investment tax credit to be realized. The Department contends

that a developer who cannot take advantage of the state investment tax credit may be able to develop the project with a lower rate of return or with lower property taxes.

The Department notes that the 2014 RFP resulted in 12 bids to develop solar projects under the price cap that it is recommending for the 2015 RFP. The Department contends that there is a reasonable amount of flexibility in capital structures that should allow for a range of developers to bid below the proposed avoided-cost price cap, even if the capital structure assumptions in the cash-flow model do not apply to all developers equally. The Department further argues that the RFP process itself protects the ratepayer from incurring higher-than-necessary costs.

Based on a review of the models and assumptions provided by the Department, GMP maintains that both the approach employed by the Department and the final proposed avoided cost for solar projects are reasonable. GMP points out that the proposed solar avoided-cost price cap is higher than twelve bids submitted for the 2014 RFP, but contends that as this is a ceiling price there can be a reasonable expectation that the winning bid or bids for the 2015 RFP will be below this cap.

REV states that it does not concur with the proposed price caps for solar projects. REV contends that building projects at or below the proposed price cap requires a large financial partner which many REV members cannot secure. REV raises concerns with regard to the design and implementation of the market-based mechanism, including the size of the annual allocation, and raises concerns as to whether the market-based mechanism is achieving the renewable energy goals under 30 V.S.A. § 8001.

Allco argues that the determination of avoided costs in this proceeding and Docket 8010 need to be consistent.¹³ Allco further argues that the proposed avoided-cost price caps are inconsistent with federal law because the costs are tied to the producer's cost of production and are not offered to all identically-situated qualifying facilities. In addition, Allco contends that the market-based mechanism is not permissible under federal law.

13. *Investigation into Establishing Rates for Power Sold to the Rule 4.100 Purchasing Agent*, Docket 8010, Order of 2/9/15.

Discussion

Based on a review of the assumptions and the cash-flow model analysis, we accept the Department's recommendation of an avoided cost of \$0.155 per kWh for solar projects. With respect to the appropriate installed costs for solar projects, we are persuaded that the value of \$2.50 per watt is appropriate based on the cost data provided for existing solar projects. The cash-flow model analysis is sensitive to the assumptions about debt/equity ratio and assumed realization of the investment tax credit. We agree with the Department's position that there is a reasonable amount of flexibility in capital structures that should allow for a range of developers to bid below the proposed avoided-cost price cap, even if the capital structure assumptions in the cash-flow model do not apply to all developers equally. The 2014 RFP results support this conclusion, with 12 bids to develop solar projects under the recommended price cap. Moreover, the 2013 and 2014 RFPs have resulted in the available plant capacity being filled and standard-offer contracts issued, meeting the statutory mandate for rapid deployment.

Using the assumptions recommended by the Department, the cash-flow model calculates an avoided cost of \$0.155 per kWh for solar projects. Accordingly, we establish an avoided cost for solar projects of \$0.155 per kWh, fixed over the life of the project.

Further, we conclude that the arguments and concerns raised by REV and Allco with regard to the market-based mechanism remain outside the scope of this proceeding. As stated in the 2014 Order, pursuant to Section 8005a(f)(3), the scope of this proceeding was limited to the review for possible adjustment of the avoided costs established for standard-offer projects. In previous Orders and other Dockets, the Board has addressed the standard-offer program's consistency with federal law and the appropriateness of the market-based mechanism, and the limited scope of this proceeding does not warrant a revisit of these issues.¹⁴

14. See Dockets 7873 and 7874, Order of 3/1/14, and Docket 8010, Order of 1/7/14.

IV. PRICE CAP FOR SMALL WIND PROJECTS

Participants' Comments

The Department reviewed the assumptions and cash-flow model used to determine the existing small wind price cap. The Department used the following assumptions as inputs to the cash-flow model to determine an initial price cap for working group discussions:

- Installation Costs: Assume \$5.00 per watt, based on discussions with a small wind developer. (The 2014 small wind price cap assumed \$5.80 per watt.)
- Annual Maintenance Costs: Assume \$2,000 per year, based on discussions with a small wind developer. (The 2014 small wind price cap assumed \$3,000 per year.)
- Property Tax: Assume a value of \$12,000 per year. (The 2014 small wind price cap assumed \$5,000 per year.)
- Decommissioning Fund Costs: Assumed \$60 per watt cost for project decommissioning. (The 2014 small wind price cap assumed no decommissioning costs.)
- Land Lease Costs: Assume 10 acres per MW (1 acre for a 100 kW system) at \$750 per acre. (The 2014 small wind price cap assumed no lease costs.)
- Investment Tax Credit Percent Realized: Assume that 100% of state and federal credit is realized, consistent with the solar cash-flow model analysis. (The 2014 small wind price cap assumed 50%.)
- Inflation: Assume 1.89% annually, consistent with solar cash-flow model analysis. (The 2014 small wind price cap assumed 1.6%.)
- Rate of Return: Assume 9.6%, which is equivalent to that of GMP's current return on equity. (The 2014 small wind price cap assumed 9.75%.)
- Debt/Equity Ratio: Assume that the capital structure of a project would be 60% debt and 40% equity. (The 2014 small wind price cap assumed a ratio of 45% debt to 55% equity.)

Using the above assumptions, the cash-flow model resulted in a price of \$0.233 per kWh for small wind projects. However, the solution of the cash-flow model resulted in a debt-service coverage ratio of less than one (i.e., the resulting price did not generate sufficient revenue to allow the developer to cover its debt obligations). The Department attempted to change the model to provide minimum debt-service coverage, but no scenario allowed for a 9.6% internal

rate of return to be reached. The Department examined the use of an alternative model, the Cost of Renewable Energy Spreadsheet Tool ("CREST") developed by Sustainable Energy Advantage under the direction of the National Renewable Energy Laboratory. The CREST model required less debt service (43%) in order to maintain a debt service coverage ratio above one. The CREST model resulted in a price of \$0.242 per kWh, assuming a 9.6% return on equity.

Given the uncertainties in the cash-flow model analysis and the limited information available about Vermont-specific costs, the Department recommends the use of the 2014 price cap for small wind projects of \$0.253 per kWh in the 2015 RFP. The Department recommends reexamining the avoided-cost price cap for small wind after the 2015 RFP.

GMP contends that the Department's proposal to leave the small wind cap unchanged at \$0.253 per kWh is reasonable in light of the proposals that the various parties have submitted regarding technology allocations and the fact that one bidder showed interest in pursuing a small wind project at \$0.253 per kWh in the 2014 RFP.

REV does not concur with the proposed price cap for small wind projects given that not all active REV members supported the proposed price. However, REV states that most REV members associated with wind technology development support the proposed price.

Discussion

We accept the Department's recommendation of a levelized avoided cost of \$0.253 per kWh for small wind projects, which is unchanged from the 2014 price. Given the limited new information provided on small wind projects and given the uncertainties in the cash-flow model analysis, we conclude the small wind avoided cost should remain at the 2014 established value. Our conclusion is supported by the market interest in the 2014 RFP, in which one unsuccessful bidder showed interest in pursuing a small wind project at \$0.253 per kWh. We will review the outcome of the 2015 RFP to inform future assumptions and the appropriateness of using the current cash-flow model to determine small wind avoided costs.

Accordingly, for the 2015 RFP, we establish a levelized avoided cost for small wind projects of \$0.253 per kWh.

V. PRICE CAP FOR FOOD WASTE ANAEROBIC DIGESTION PROJECTS

Participants' Comments

REV provided an initial set of assumptions and a cash-flow model for use in developing a price cap for food waste anaerobic digestion projects solicited in the 2015 RFP. The Department reviewed REV's assumptions and recommends that the following assumptions be used as inputs to the cash-flow model for food waste anaerobic digestion projects:

- Installation Costs: Assume \$10,000 per kW, based on cost data from Rhode Island's Renewable Energy Growth ("REG") program. Assume an interconnection fee of \$275 per kW. (REV recommended \$11,125 per kW.)
- Capacity Factor: Assume 78.2% net capacity factor, based on REV recommendation.
- Annual Maintenance Cost: Assume \$63,355 per year, based on REV recommendation.
- Annual Revenue: Assume \$250,000 in annual revenues for waste disposal fees (\$25 per ton), based on REV recommendation.
- Investment Tax Credit Percent Realized: Assume 50% of the federal and state credits are realized, based on REV recommendation.
- Property Tax Rate: Assume rate of 1.8%, based on REV recommendation.
- Land Lease Costs: Assume \$10,000 per year for land lease costs, based on recommendation from REV.
- Inflation: Assume 1.89% annually, based on REV recommendation and consistent with the solar cash-flow model analysis.
- Rate of Return: Assume 9.6%, which is equivalent to that of GMP's current return on equity.
- Interest Rate on Debt: Assume 6% interest rate, based on the assumption that lenders might charge a higher interest rate to finance a less proven technology. For reference, the interest rate assumed in the solar cash-flow model analysis was 4.5% for long-term debt, and 3% for short-term debt. (REV supported the assumption of 6% interest rate.)
- Debt Term: Assume loan life of 20 years that matches the assumed asset life of 20 years. (REV recommended a loan life of 18 years.)

- **Debt/Equity Ratio:** Assume that the capital structure of a project would be 60% debt and 40% equity, based on REV recommendation and consistent with the solar cash-flow model analysis.

The Department observes that there are at least two variables that are uncertain, which are particularly critical to determining the price for food waste anaerobic digestion projects – the installed cost and the interest rate associated with debt financing. The Department contends that an installed cost value of \$10,000 per kW is appropriate and supported by information from the Rhode Island REG program. The Department also examined the sensitivity of changes in the interest rate associated with debt financing. Using the above model inputs, the cash-flow model results in a price of \$0.186 per kWh. Changing the interest rate to 7% would result in a price of \$0.193 per kWh. The Department also evaluated results of using Vermont-specific assumptions with the CREST model. Depending on the two variables – installed cost and interest rate – the CREST model results in a price between \$0.194 and \$0.218 per kWh.

The Department recommends an avoided-cost price cap of \$0.200 per kWh, fixed over the life of the project. The Department contends that its proposal accounts for the uncertainties associated with the model inputs, while also considering the statutory and policy goals of the standard-offer program. The Department further argues that comments submitted by NEO, a potential developer of food waste anaerobic digestion projects, proposing an avoided-cost price cap of \$0.200 per kWh, suggests that there is market interest at this price. The Department asserts that a price lower than \$0.200 per kWh would risk no projects responding to the 2015 RFP, and that a price higher than \$0.200 per kWh risks unnecessary ratepayer costs because the amount of competition for food waste anaerobic digestion projects is unknown and bidders could theoretically bid projects at the price cap. The Department contends that a price that is correlated with market interest is the appropriate price at which utilities could otherwise purchase power from food waste anaerobic digestion projects.

The Department notes that the Rural Energy for America Program ("REAP") or other taxpayer-funded grants may be available for food waste anaerobic digestion projects. REAP grants were not included in any of the provided cash-flow model analysis, and these grants would have the effect of lowering the avoided cost. The Department recommends that the Board

consider approving two avoided-cost price caps for food waste anaerobic digestion projects: one cap (as proposed above) associated with projects that do not have federal or state grants; and the second cap associated with projects receiving the REAP or other similar grant. Under the Department's proposal, the price offered with the standard-offer contract would reflect whether the project secured any federal grants.

REV recommends the establishment of price cap of \$0.208 per kWh, fixed over the life of the project, for food waste anaerobic digestion projects. REV's recommendation is based on the cash-flow model analysis performed by the Department with changes to two assumptions: debt term and installed costs. REV contends that the appropriate assumption for debt term is 18 years, which is two years less than the term of the contract. REV argues that lenders will typically set the term of a loan to two years less than the term of the power contract.

REV maintains that the appropriate assumption for installed costs is \$11,250 per kW, because the assumption for installed costs used by the Rhode Island REG Program (\$10,000 per kW) is based on a larger project of 725 kW. REV contends that the assumption of \$11,250 per kW is an appropriate installed cost given the "reverse" economies of scale for smaller projects, although REV has presented no project-specific data in support of this claim. In addition, REV contends that NEO's recommendation for a \$0.200 per kWh price cap assumed a project size of 500 kW in the cash-flow model analysis instead of a project size of 300 kW. REV contends that the rationale behind choosing a 300 kW-sized project was based on current understanding of available food-waste feedstock and the size of the allocation that would be set-aside for this technology in the 2015 RFP. REV further notes that the recommended 2015 ceiling price in the Rhode Island REG Program for both 725 kW and 325kW projects is \$0.208 per kWh.

GMP contends that the proposed avoided cost of \$0.200 per kWh for food waste anaerobic digestion projects appears reasonable, based on the model analysis that the Department provided and the discussions that occurred within the working group. GMP states that it does not have sufficient experience with this technology to provide any additional recommendation.

Discussion

Based on a review of the assumptions and the cash-flow model analysis, we accept REV's

recommendation of an avoided cost of \$0.208 per kWh for food waste anaerobic digestion projects. The assumptions used in the cash-flow model analysis to determine REV's proposed price were identical to the Department's recommended assumptions, except in the case of installed cost and debt term.

With regard to the appropriate installed cost for food waste anaerobic digestion projects, we recognize that there is limited information on which to develop a cost estimate. Participants provided cost information for a project size of 725 kW (\$10,000 per kW), but recommend a cash-flow model analysis based on a project size of 300 kW. While we are persuaded that the value of \$10,000 per kW might not be appropriate for 300 kW-sized projects, we also recognize the uncertainty associated with the \$11,125 per kW value proposed by REV, which was not based upon actual projects. Nonetheless, we conclude that there might be some increase in costs associated with smaller projects due to the loss of economies of scale given the limited available information on installed costs. We will review the outcome of the 2015 RFP as well as additional cost data to inform future assumptions on the appropriate value for installed cost.

With regard to debt term, we are persuaded that the appropriate assumption for debt term is 18 years. We find REV's contention that lenders will typically set the term of a loan to less than the term of the power contract reasonable. The 18-year term for debt is consistent with previous avoided-cost determinations for solar, wind, and hydroelectric projects and the avoided-cost determination for solar projects in this Order.¹⁵

We do not accept the Department's proposal for a second avoided-cost price cap for food waste anaerobic digestion projects associated with receiving a REAP or other similar grant. The Department did not provide a specific avoided-cost price cap for projects receiving a REAP grant, nor details on how two caps would be implemented in the 2015 RFP, which awards this technology category based on the lowest price provided by a bidder. We recognize that the value of these grants should be considered in the establishment of an avoided cost, but have no information at this time on the actual value of such grants. If these grants are in fact available to developers, they should be reflected in the avoided cost the same way the Board has included tax credits or Clean Energy Development Fund grants. We will review the outcome of the 2015 RFP

15. Docket 7533, Order of 1/15/10; Docket 7780, Order of 1/23/12.

and other relevant information to inform future assumptions on the appropriate value for a REAP or other similar grant.

Using the assumptions recommended by the Department with changes to the assumptions on installed cost and debt term recommended by REV, the cash-flow model calculates an avoided cost of \$0.208 per kWh. Accordingly, we establish an avoided cost for food waste anaerobic digestion projects of \$0.208 per kWh, fixed over the life of the project.

VI. CONCLUSION

Pursuant to 30 V.S.A. § 8005a(f)(3), the Board is required to annually review the established avoided costs "to decide whether they should be modified in any respect in order to achieve the goal and requirements of this subsection." Pursuant to Section 8005a(f)(2)(A)(ii), the avoided costs serve as caps on the prices solicited through the annual RFP.

No party provided evidence to evaluate the existing standard-offer price for large wind projects, biomass projects, farm methane projects, and hydroelectric projects. In addition, the opportunities for landfill gas are limited to already developed projects. Therefore, we are maintaining the avoided costs from the 2014 Order, except for solar, small wind, and food waste anaerobic digestion projects. For solar, small wind, and food waste anaerobic digestion projects, we are establishing avoided costs as identified in the discussion above.

Section 8005a(e) requires that the term of a standard offer "shall be 10 to 20 years, except that the term of a standard offer for a plant using solar power shall be 10 to 25 years." Consistent with the Board's determination in Dockets 7533 and 7780 and in previous Orders in this proceeding, we conclude that the term of a standard-offer contract should be based on the term used to calculate the standard-offer avoided cost, and that the term should be based on the assumed life of the project capped by the statutory requirement of 20 or 25 years.¹⁶

Pursuant to Section 8005a, the following avoided-cost price caps remain effective for the 2015 RFP. As required by the 2013 Order in this proceeding, by April 1, 2015, the SPEED

16. The Board set a term of 15 years for standard offers for landfill gas projects; however, this assumption is based on the fact that the fuel source for landfill gas will decline over time. Docket 7533, Order of 1/15/10 at 65.

Facilitator will issue an RFP, consistent with the requirements of this Order and prior Orders in this proceeding, to solicit standard-offer projects to meet the requirements of Section 8005a(c).

2015 Avoided-Cost Schedule for Standard-Offer Projects (\$/kWh)							
	Biomass	Hydroelectric	Landfill Gas	Wind >100 kW	Wind ≤ 100 kW	Food Waste Methane	Solar
Levelized	0.125	0.123	0.090	0.118	0.253	0.208	0.155
Year 1	0.121	0.119	0.087	0.113	0.245		
Year 2	0.121	0.119	0.087	0.113	0.246	for 20 years	for 25 years
Year 3	0.122	0.120	0.088	0.114	0.247		
Year 4	0.123	0.121	0.089	0.114	0.249		
Year 5	0.124	0.121	0.089	0.115	0.250		
Year 6	0.125	0.122	0.090	0.115	0.251		
Year 7	0.126	0.122	0.091	0.116	0.252		
Year 8	0.127	0.123	0.091	0.117	0.254		
Year 9	0.128	0.124	0.092	0.117	0.255		
Year 10	0.129	0.124	0.093	0.118	0.256		
Year 11	0.130	0.125	0.093	0.118	0.258		
Year 12	0.131	0.126	0.094	0.119	0.259		
Year 13	0.132	0.126	0.095	0.120	0.260		
Year 14	0.133	0.127	0.096	0.120	0.262		
Year 15	0.135	0.128	0.097	0.121	0.263		
Year 16	0.136	0.128	NA	0.122	0.265		
Year 17	0.137	0.129	NA	0.122	0.266		
Year 18	0.138	0.130	NA	0.123	0.268		
Year 19	0.140	0.131	NA	0.124	0.269		
Year 20	0.141	0.131	NA	0.124	0.271		

VII. ORDER

IT IS HEREBY ORDERED, ADJUDGED, AND DECREED by the Public Service Board ("Board") of the State of Vermont that:

Effective for any standard-offer contract executed after March 1, 2015, the standard-offer prices for renewable power under 30 V.S.A. § 8005a(b)(2) shall be determined through a request for proposal issued by the SPEED Facilitator and shall be no higher than the avoided costs as specified within this Order.

Dated at Montpelier, Vermont, this 20th day of March, 2015.

<u>s/James Volz</u>)	
)	
)	
<u>s/Margaret Cheney</u>)	
)	
)	
<u>s/Sarah Hofmann</u>)	

PUBLIC SERVICE
BOARD
OF VERMONT

OFFICE OF THE CLERK

FILED: March 20, 2015

ATTEST: s/Susan M. Hudson
Clerk of the Board

NOTICE TO READERS: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Board (by e-mail, telephone, or in writing) of any apparent errors, in order that any necessary corrections may be made. (E-mail address: psb.clerk@state.vt.us)

Appeal of this decision to the Supreme Court of Vermont must be filed with the Clerk of the Board within thirty days. Appeal will not stay the effect of this Order, absent further order by this Board or appropriate action by the Supreme Court of Vermont. Motions for reconsideration or stay, if any, must be filed with the Clerk of the Board within ten days of the date of this decision and Order.