

Vermont Distributed Generation 2018-2027 Expectations



Distributed Generation Forecast
Working Group
December 15, 2017
Anne Margolis, VT DPS

Photo credit: Green Mountain Power



Renewable Energy Standard

- Total Renewable requirement (55% by 2017 increasing to 75% in 2032)
 - Includes any vintage and large hydro
- Distributed Generation carve-out (1% of sales in 2017 increasing to 10% in 2032)
- Energy Transformation Projects (2% of sales in 2017 increasing to 12% in 2032)
 - Reduce fossil fuel use, including in thermal and transportation sectors (heat pumps, weatherization, electric vehicles)

RES – DG carve-out

- “This category encourages the use of distributed generation to support the reliability of the State's electric system; reduce line losses; contribute to avoiding or deferring improvements to that system necessitated by transmission or distribution constraints; and diversify the size and type of resources connected to that system.” 30 V.S.A. § 8005(a)(2)(A)
- Eligible projects must be 5 MW or less, located within Vermont, and commissioned after July 1, 2015
 - Exception to 5 MW size threshold may be granted in very limited circumstances
- RECs used to demonstrate compliance
- Alternative Compliance Payment = \$60.78/MWh

RES – DG carve-out Expectations

- Flat retail sales in Vermont (5,500 – 5,800 GWh/year over the last ten years)
- At least 25 MW of DG per year needed to meet requirement
 - Assumes continued aggressive energy efficiency, with resulting flat load growth
 - Assumes that approximately 85% of eligible resources will be solar
- Output from Standard Offer projects will count towards DG carve-out (RECs are purchased through the contract)
- Output of net metering projects from proposed program count if customer “sells” RECs to utility
- RECs for compliance can also be obtained through bundled PPAs, utility-owned generation, REC-only contracts

Standard-Offer Program - Overview

- Created in 2009, provides incentives for generation units utilizing renewable technology with a capacity of 2.2 MW or less
- Original programmatic cap of 50 MW, fixed prices; expanded in 2012 to 127.5 MW, solicitation with specific solicitation guidelines:
 - 2013-2015: 5 MW per year
 - 2016-2018: 7.5 MW per year
 - 2019-2022: 10 MW per year
- Outside cap: Farm Methane & projects that provide “sufficient benefit” to grid operations

Standard-Offer Program – PV Costs

- 2009-2012 Rates fixed – varied by technology
 - Solar rates varied from \$0.24 to \$0.30 per kWh
- 2013-2015 Competitive solicitation results in reduced costs
 - 2013 auction results: 4 PV projects:
 - Between \$0.134 and \$0.1441, incl RECs
 - 2014 auction results: 3 PV projects:
 - Between \$0.119 and \$0.129, incl RECs
 - 2015 auction results: 2 PV projects
 - \$0.1096 and \$0.1097, incl RECs
 - 2016 auction results: 2 PV projects
 - \$0.075 and \$0.1087, incl RECs
 - 2017 auction results: 3 “price competitive” PV projects
 - \$0.0889, \$0.0904, and \$0.0946, incl. RECs

Standard-Offer Program – Specific Allocations

- Under statute, 10-20% of annual amount available set aside for distribution utilities (Provider Block)
 - 10% to 2015, 15% to 2018, 20% to 2022
- In the 2017 RFP process, PSB required an allocation of 2.4 MW for projects on preferred locations and 1.3 MW each for small wind plants and food waste digesters; the remainder of the non-Provider Block (approx 2.4 MW) was set aside for price-competitive projects, but 5.8 MW rolled over due to lack of proposals for other categories
- Reflects the statutory goal of supporting a diversity of renewable resources

Standard-Offer Program – 2017 Results

Small Wind (100 kW and below)

- One 50 kW project @ \$0.252/kWh incl RECs

Food Waste Digesters

- One 300 kW project @ \$0.2080/kWh incl RECs

Preferred Location – Other

- One 1.222 MW rooftop PV project @ \$0.1089/kWh incl RECs

Price Competitive

- One 2.2 MW PV project @ \$0.0889/kWh incl RECs
- One 2.2 MW PV project @ \$0.0904/kWh incl RECs
- One 2.2 MW PV project @ \$0.0946/kWh incl RECs

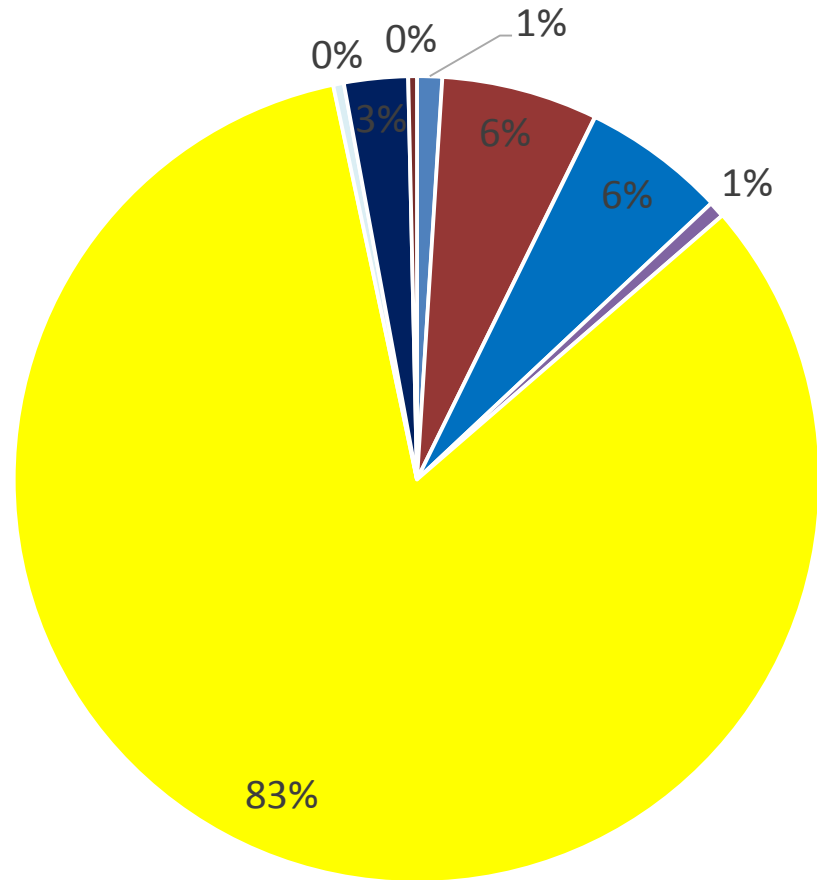
Provider Block – Non-Preferred Locations

- One 855 kW PV project @ \$0.1290/kWh
- One 860 kW PV project @ \$0.1295/kWh

Standard-Offer Program – Future Expectations

- Solar is expected to continue to be predominant technology type
 - Very limited number of hydro, landfill methane, and biomass sites
 - Farm methane projects likely to be limited, but also outside cap
 - Wind can be difficult to site in Vermont
- 2017 RFP set aside 2.6 MW for non-solar; only 350 kW of small wind as well as food waste digesters successfully bid
- 2017 RFP set aside 1.3 MW for parking canopies and 1.3 MW for projects on other preferred locations; no successful parking canopy bids, one successful 1.2 MW “other” bid, on a rooftop

Standard-Offer Program – Resources Under Contract



■ Biomass

■ Farm Methane

■ Hydro

■ Landfill

■ Solar

■ Small Wind

■ Large Wind

■ Food Waste

Standard-Offer Program – Certainty of Resources

- Statutory directive for “rapid deployment” of standard offer projects
- Contracts contain milestones with financial penalties if milestones are not met (tracked by purchasing agent)
 - Interconnection application – must be filed prior to entering program
 - Permitting application – must be filed within 12 months
 - Commissioning – must be achieved within 24 months (solar)
- If project drops out, capacity becomes available during the next auction

Net Metering – Overview

- Statewide, net metering currently makes up 15% of peak demand
- 15% cap established in 2014, met in 2015 for most utilities
 - Eligible technologies: any renewable technology and micro combined heat and power
 - Approximately 95% of net metered projects have been solar
- 150-500 kW projects took up considerable amount of the cap
- Some utilities allowed projects 15 kW or less to be interconnected even after hitting the cap
- In 2015, Public Service Board tasked with developing new metering rules
 - No longer a cap on the number of net metering projects
 - Pacing “controlled” by adjustors, but is only one of many other program considerations

Net Metering Pre-2017

- Each kWh generated is credited at retail rate.
- Solar projects received an additional adder, as much as \$0.06/kWh, for overall compensation of \$0.19-\$0.21/kWh for a period of 10 years from the date of installation
- Customers could net out entire bill, including
 - Customer charge
 - Energy Efficiency Charge
 - Energy Assistance Program
 - Rental fees (hot water heaters, heat pumps)

Net Metering 2017 Changes

- PSB new program (by order) effective January 1, 2017; codified in rule starting July 1, 2017
 - Each kWh generated is credited at retail rate with adjustors
 - + \$0.03 if RECs provided to utility
 - \$0.03 if customer keeps RECs
 - + \$0.01 for projects up to 150 kW on a preferred site
 - \$0.01 for projects over 150 kW on a preferred site
 - \$0.03 for projects 15 kW to 150 kW not on a preferred site
- Positive adjustors applied for 10 years; negative adjustors applied in perpetuity
- Preferred site = existing structure, disturbed area, location designated by municipal plans
 - Projects over 150 kW must be on a preferred site
 - Customer can only net out energy component of bill
 - Adjustors updated every two years, starting in 2018

Vermont DG Summary 2018-2032

- Vermont will need at least 36,850 MWh per year of new DG, for 2018 through 2032, to meet the RES DG carve-out requirement (assuming no load growth)
- Assuming 85% of that amount comes from solar, at least 25 MW of new solar DG is needed each year to meet RES requirement
- Some amount of non-solar will be built, but likely to be fairly limited absent significant technology changes

Vermont DG Summary 2018-2032 (cont.)

- Standard Offer Program and Net Metering are expected to account for most of new resources to meet RES DG requirement
- If these programs don't provide sufficient resources, utilities must get the RECs through other means (PPA, utility-owned generation, etc.)
 - Utilities have been building generation and entering into PPAs ahead of their first year of RES compliance and may be “long” for several years; they can bank RECs or sell “excess” RECs from Standard Offer, PPA, or utility-owned projects)

Vermont DG Summary 2018-2032 (cont.)

- Unclear how many new net metered projects will be additional to the RES DG requirement
 - For net metering customers that don't "sell" RECs to the interconnecting utility
 - Net metering designed to achieve goals additional to pacing consistent with the RES:
 - Pacing consistent with the Comprehensive Energy Plan (90% renewable across all sectors) and "any other relevant State program," including 25 x 25 and greenhouse gas goals
 - Minimizing cost shifting, accounts for all costs & benefits, ensures all customers who want to net meter can do so, balances pacing and cost with rate impact, and accounts for changes in technology costs over time

2017 Actuals

- Department supports 2017 PV forecast pre-discount nameplate values of 25 MW (same for each year through 2026), which is the amount required to meet the RES; however:
- 2017 is first year of RES compliance; utilities likely overcompliant
- Actual 2017 PV interconnections will be ~ 30-45 MW (with net metering accounting for 27-34 MW of that)
 - Some pent up demand from NM 1.0
 - Anticipation of NM 2.0
 - NM 2.0 rates still relatively generous
 - SO stepped up to 7.5 MW/yr
- Compared with 73 MW of PV interconnections in 2016 (of which net metering counted for > 40 MW)
 - Utility-owned or PPA projects in runup to RES
 - Last year of NM 1.0

2018 Expectations

- **Policy-driven (RES) 25 MW**
 - Utility compliance filings will reveal extent and disposition of oversupply, if any
 - Comprised of SO (7.5 MW), utility-owned or PPAs (>0 MW), and NM (>0 MW)
 - Federal tax credits
 - Utility can sell or bank excess SO/UO/PPA RECs; must retire NM RECs
- **Net metering additional to RES**
 - Adjustors revised May 1, effective July 1
 - Changes to federal tax or tariff provisions
 - Availability of preferred locations
 - 2018 VT legislative session

Questions?



Anne Margolis
Department of Public Service
anne.margolis@vermont.gov