Vermont Distributed Generation
2017-2026 Expectations

Distributed Generation Forecast Working Group
December 16, 2016
Ed McNamara, VT DPS

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)

VERMONT
DEPARTMENT OF PUBLIC SERVICE

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/MWh

VERMONT
DEPARTMENT OF PUBLIC SERVICE

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 solar 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

VERMONT
DEPARTMENT OF PUBLIC SERVICE

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 50MW, 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

VERMONT
DEPARTMENT OF PUBLIC SERVICE
Clean Energy Development Fund

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

VERMONT
DEPARTMENT OF PUBLIC SERVICE

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 2016 RFP process, PSB required that 2.2 MW be allocated based solely on cost, with remaining non-Provider Block (approx 4 MW) be set aside for non-solar resources
- Reflects the statutory goal of supporting a diversity of renewable resources

Standard-Offer Program – 2016 Results

Small Wind (100 kW and below)

- Two 100 kW projects, and two 50 MW projects
- Price is $0.251/kWh incl RECs

Large Wind (Above 100 kW)

- One 2.2 MW project
- Price is $0.116/kWh incl RECs

Solar PV

- On 2.16 MW project at $0.075/kWh incl RECs
- One 2.2 MW project at $0.1087/kWh incl RECs

VERMONT
DEPARTMENT OF PUBLIC SERVICE

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

- 2016 RFP set aside 4.175 MW for non-solar; only 2.5 MW of small and large wind successfully bid

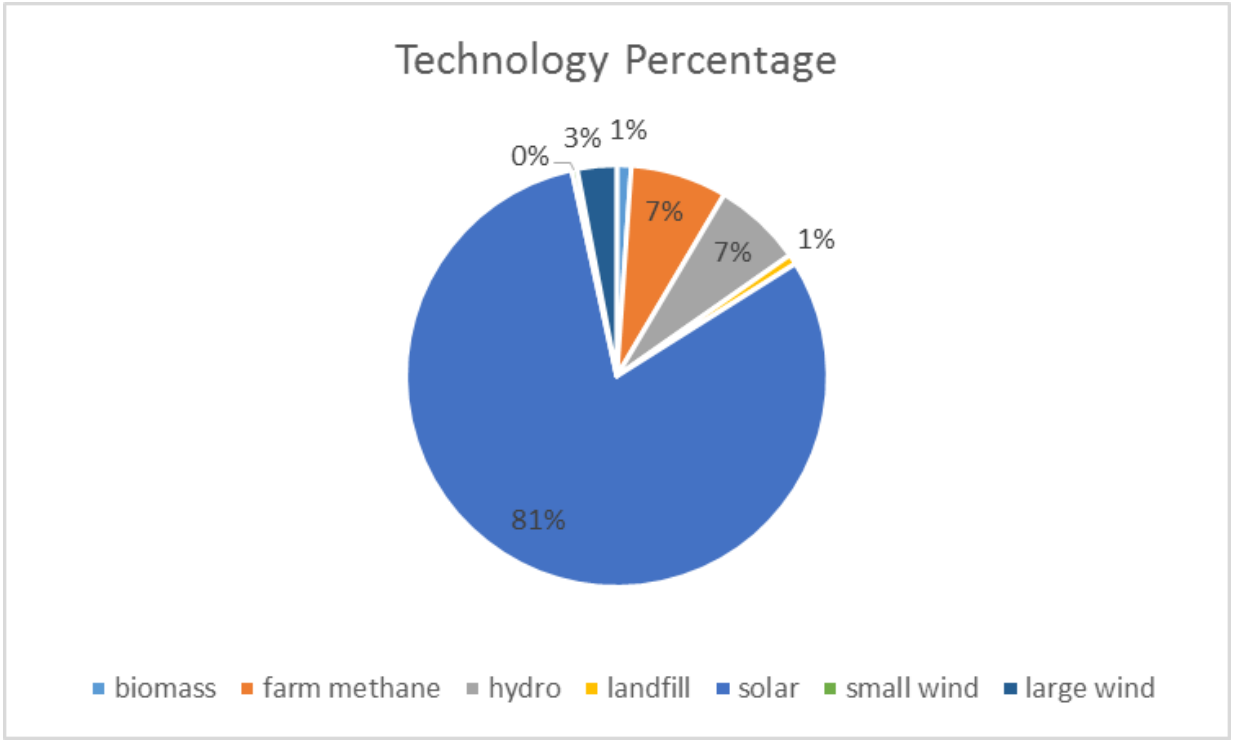
VERMONT
DEPARTMENT OF PUBLIC SERVICE

Standard-Offer Program – Preferred Locations

- Act 174 (June, 2016) requires one-year pilot program for projects located at preferred locations
  - 1/6 of the annual increase to projects located over parking lots or on parking lot canopies
  - 1/6 of the annual increase to projects located in preferred locations other than parking lots or parking lot canopies
- Expectation is that these will be solar projects due to ease of siting solar

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Standard-Offer Program – Resource Under Contract



VERMONT
DEPARTMENT OF PUBLIC SERVICE

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

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Net Metering – Overview

- Statewide, net metering currently makes up almost 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

VERMONT
DEPARTMENT OF PUBLIC SERVICE
Clean Energy Development Fund

Net Metering Pre-2017

- Each kWh generated is credited at retail rate.
- Solar projects received an additional $0.06/kWh
- Customers can net out entire bill, including
  - Customer service charge
  - Energy Efficiency Charge
  - Energy Assistance Program
  - Rental fees (hot water heaters, heat pumps)
- Statute provided that the rate would be the same for ten years from date of installation

Net Metering 2017 Changes

- PSB proposed new rules to be effective January 1, 2017
- Each kWh generated is credited at retail rate with adjusters

  + $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 adjusters applied for 10 years; negative adjusters 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
- Adjusters updated every two years, starting in 2018

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Vermont DG Summary 2017-2032

- Vermont will need at least 36,850 MWh per year of new DG, for 2017 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
DEPARTMENT OF PUBLIC SERVICE

Vermont DG Summary 2017-2032 (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.)
- 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

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Questions?

Ed McNamara
Department of Public Service
ed.mcnamara@Vermont.gov

VERMONT
DEPARTMENT OF PUBLIC SERVICE