

# Vermont Distributed Generation 2021-2030 Expectations



Distributed Generation Forecast Working Group  
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# Renewable Energy Standard

- Total Renewable requirement (55% by 2017 increasing to 75% in 2032)
  - Includes any vintage and large hydro
  - VT exceeded 2019 requirement of 55% @ 66% statewide
- Distributed Generation carve-out (1% of sales in 2017 increasing to 10% in 2032)
  - 2019 requirement of 2.2% (100%-renewable utilities exempt)
  - In 2019, VT utilities retired 2.0% for Tier II\*, 0.2% banked for future years and 0.2% used toward Tier III (Energy Transformation) compliance
- 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

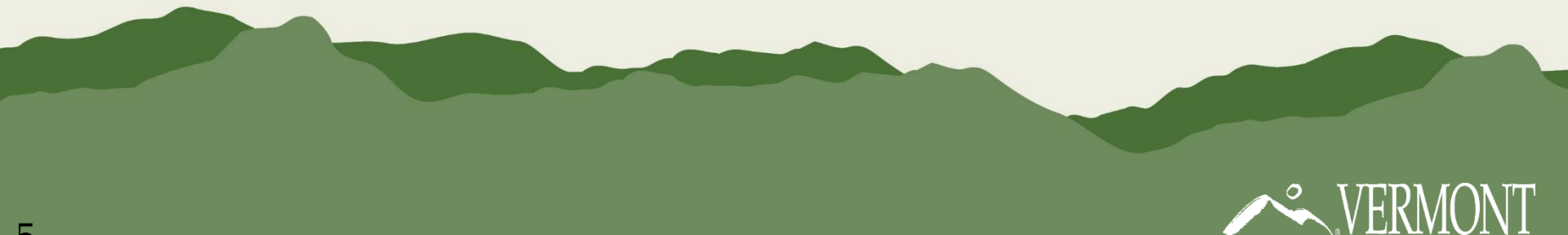
- “This category encourages the use of distributed generation to support the reliability of the State's electric system; reduce line losses; contribute to avoiding or deferring improvements to that system necessitated by transmission or distribution constraints; and diversify the size and type of resources 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
- **2021 Alternative Compliance Payment = \$64.18/MWh**

# RES – DG carve-out Expectations

- Flat retail sales in Vermont (5,400 – 5,800 GWh/year over the last ten years)
- **25-27 MW** of DG per year needed to meet requirement
  - Assumes continued aggressive energy efficiency, with resulting flat load growth
  - Assumes that **85-100%** of eligible resources will be solar
- Output from Standard Offer projects counts towards DG carve-out (RECs are purchased through the contract)
- Output of net metering projects count if customer “assigns” RECs to utility (for additional compensation – 99.5% are assigned in the current program)
- 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 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 (PV \$0.24 to \$0.30/kWh)
- 2013-2020 competitive solicitations result 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
  - 2018 auction results: 4 “price competitive” PV projects
    - 1.7 MW @ \$0.0884; 2.2 MW each @: \$0.1087, \$0.1106, and \$0.1112, incl. RECs
  - 2019 auction results: 4 “price competitive” PV projects
    - 2.2 MW each @ \$0.0838, \$0.0849, \$0.0910, and \$0.0919 incl. RECs
  - 2020 auction results: 7 “price competitive” PV projects
    - 1.0 MW, 2.05 MW, and 5 x 2.2 MW in size, with prices ranging from \$0.878-\$0.908/kWh, including 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
- The **2020 RFP** contained the following allocations:

<b>2020 Standard-Offer Program Technology Allocation</b>	
<b><u>Developer Block</u></b>	
<b>Price-Competitive Developer Block</b>	4.810 MW
<b><u>Technology Diversity Developer Block</u></b>	
<b>Biomass</b>	1.8258 MW
<b>Small Wind</b>	1.8258 MW
<b>Large Wind</b>	1.8258 MW
<b>Food Waste Anaerobic Digestion</b>	1.8258 MW
<b>Hydroelectric</b>	1.8258 MW
<b><u>Provider Block</u></b>	
<b>All provider projects</b>	3.485 MW
<b>Total</b>	17.424 MW

Source: VEPP, Inc. ([vermontstandardoffer.com](http://vermontstandardoffer.com))

# Standard-Offer Program – 2020

## Awards

Table 2. Award Group and Reserve Group

Award Group Recommendation Summary – Option A				
Project Name	Technology	Price (\$/kWh)	Capacity (MW)	Category Total (MW)
<b>PROVIDER BLOCK</b>				
1. Bristol Solar	Solar	0.0870	2.200	
2. Pittsford Solar	Solar	0.0899	2.200	<b>4.400</b>
<b>DEVELOPER BLOCK</b>				
<b>Technology Diversity Block</b>				
1. Windmill Point A	Small Wind	0.2580	0.050	
2. Windmill Point B	Small Wind	0.2580	0.050	
3. Windmill Point C	Small Wind	0.2580	0.050	
4. Rainville Ranch	Small Wind	0.2580	0.025	
5. Montpelier Water Resource	Food Waste	0.2070	0.400	<b>0.575</b>
<b>Price Competitive Block</b>				
1. Trolley Tracks	Solar	0.0878	2.050	
2. Waite Cemetery	Solar	0.0885	2.200	
3. NEER DG - Woodstock	Solar	0.0887	2.200	
4. 63 Acre Solar	Solar	0.0887	2.200	
5. Patch Pond Solar	Solar	0.0895	2.200	
6. Walloomsac River Solar	Solar	0.0895	1.000	
7. Evergreen Road	Solar	0.0908	2.200	<b>14.050</b>
<b>Total</b>				<b>19.025</b>
<b>RESERVE GROUP</b>				
1. NEER DG – Adams Road	Solar	0.0911	2.200	
2. Stone Mill	Solar	0.0918	2.200	
3. NEER DG – Outback Acres	Solar	0.0979	2.200	<b>6.600</b>

Source: VEPP, Inc. (vermontstandardoffer.com)

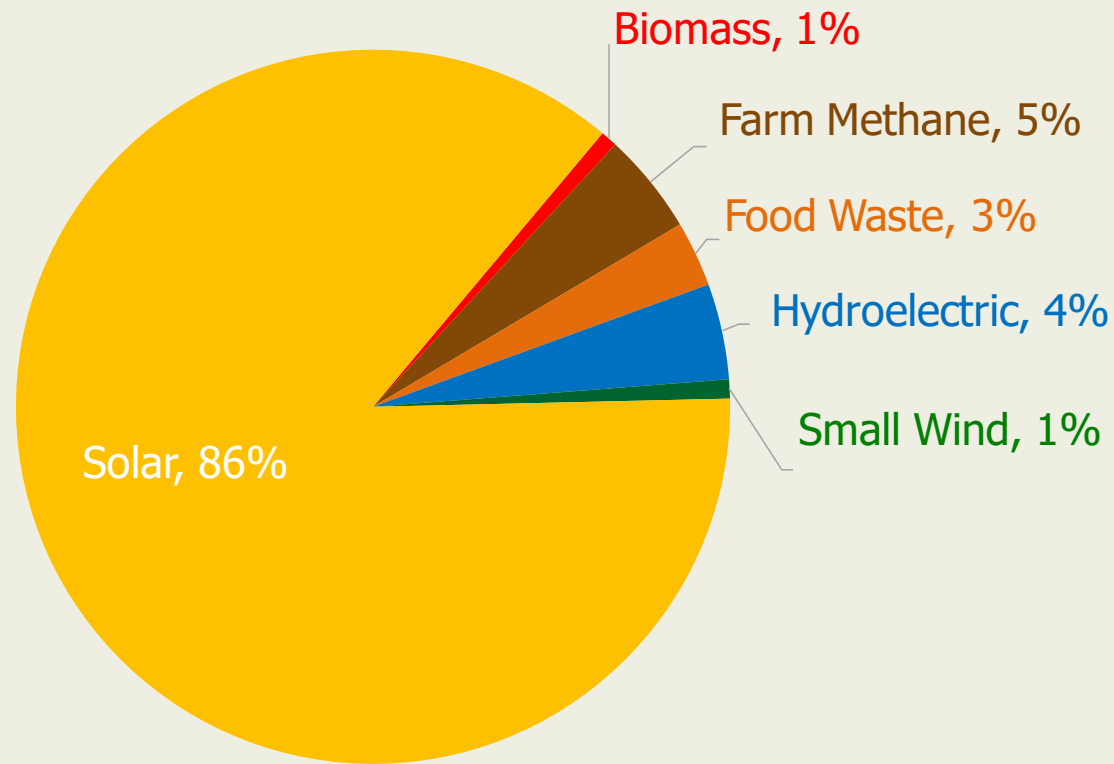
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# Standard-Offer Program – Future Expectations

- Solar is expected to continue to be predominant technology type
  - Very limited number of hydro, landfill methane, food waste digester, and biomass sites
  - Farm methane projects likely to be limited, but also outside cap
  - Wind can be difficult to site in Vermont
- 2020 RFP set aside 9.129 MW for non-solar; ~0.6 MW of small wind and food waste digesters successfully bid, so the unused capacity from the technology diversity block as well as project attrition were added to the provider and price-competitive blocks.

# Standard-Offer Program – Resources Under Contract\*



*\*Includes resources selected in the 2020 solicitation.*

# 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
- Only one small wind project expected to come online in 2020, although there is over 25 MW in development from pre-2020 RFPs (including 21 MW of PV)

# Net Metering Overview – NM 2.x

- Each kWh generated credited at retail (or statewide blended retail) rate with adjustors, *currently and until 2/2/21 pursuant to the Final Order issued in Case No. 20-0097-INV on 11/12/20:*
  - + \$0.01 if RECs provided to utility (\$0.00 starting 2/2/21)
  - - \$0.03 if customer keeps RECs (-\$0.04 starting 2/2/21)
  - + \$0.01 for projects up to 150 kW on a preferred site (\$0.00 starting 2/2/21 and -\$0.01 starting 9/1/21)
  - - \$0.02 for projects over 150 kW on a preferred site (-\$0.03 starting 2/2/21 and -\$0.04 starting 9/1/21)
  - - \$0.03 for projects 15 kW to 150 kW not on a preferred site (-\$0.04 starting 2/2/21 and -\$0.05 starting 9/1/21)

*(Positive adjustors applied for 10 years; negative adjustors applied in perpetuity)*
- Preferred site = existing structure, disturbed area, on site of primary offtaker, location designated by municipal plans
- Projects over 150 kW *must* be on a preferred site
- Customer can only net out energy component of bill
- **Next biennial review of adjustors in early 2022**

# Net Metering Biennial Compensation Adjustments

Table 6. Summary of Changes to Net-Metering Compensation<sup>106</sup>

Category	Current	February 2, 2021 -August 31, 2021	September 1, 2021
Category I (up to 15 kW)	\$0.17417	\$0.16413/kWh	\$0.15413/kWh
Category II (>15 to 150 kW on preferred site)	\$0.17417	\$0.16413/kWh	\$0.15413/kWh
Category III (>150 to 500 kW on preferred site)	\$0.14417	\$0.13413/kWh	\$0.12413/kWh
Category IV (>15 to 150 kW on non-preferred site)	\$0.13417	\$0.12413/kWh	\$0.11413/kWh

# Net Metering Biennial Policy Discussion

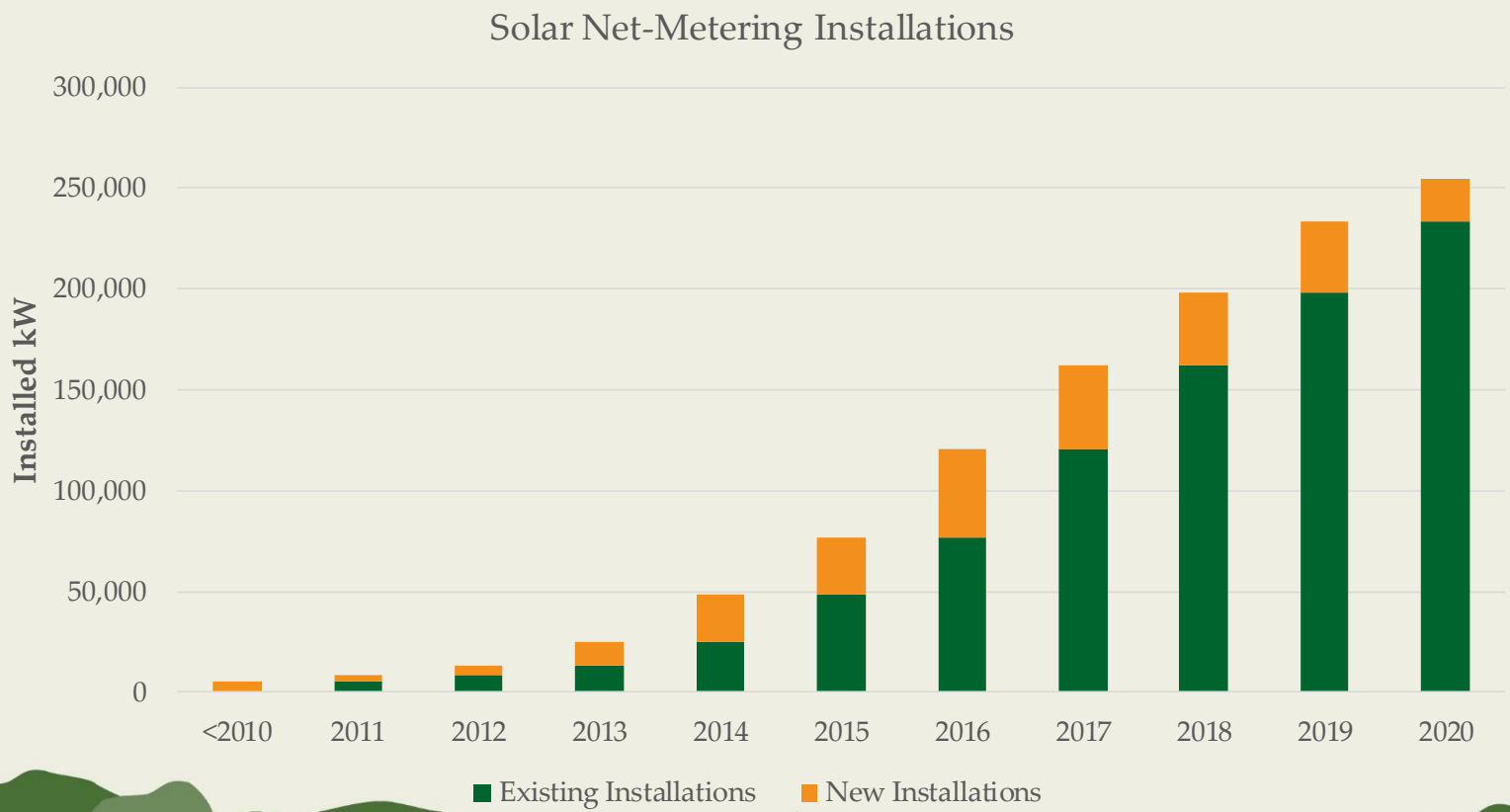
*".... the Commission finds that the current pace of net-metering deployment is more than adequate to meet the State's renewable energy requirements. It is not consistent with State energy policy to have net-metering systems displacing more cost-effective Tier II resources. Accordingly, it is appropriate to reduce net-metering compensation to ensure that the program does not cause an undue cost-shift between customers who net-meter and those who do not. In the future, the Commission expects that net-metering compensation will become more competitive with other Tier II resources, either through future biennial updates or through a rulemaking that aligns net-metering compensation with the value of net-metered power."*

-VT Public Utility Commission Final Order in Case No. 20-0097-INV, issued 11/12/20

# Net Metering Rulemaking

- 2018 PUC workshop on preferred sites **expanded** to become a rulemaking potentially addressing diverse areas of the rule. *This rulemaking remains open, alongside a related interconnection rulemaking:*
  - **Administrative issues**
    - Information needed to streamline the registration/interconnection process and reduce need for amendments
  - **Preferred sites**
    - Standards and procedures for preferred site designation via joint letter of support from regional and local bodies requested
  - **Compensation structure**
    - Detailed information from utilities and others on whether the net-metering program is causing a cost shift, effect on rates, costs and benefits, and alternatives

# Cumulative Net Metering PV Installations\*



\*Derived from utility monthly DG resource surveys to ISO-NE and includes data for GMP through 10/31/20, VEC through 11/30/20, Stowe through 10/31/20, and BED and WEC through 8/30/20.



# Vermont DG Summary 2020-2032

- Vermont will need at least 33,000 MWh per year of new DG, for 2019 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 (27 MW if 100% solar)
- Some amount of non-solar will be built, but likely to be fairly limited absent significant technology changes

# Vermont DG Summary 2020-2032 (cont.)

- Standard Offer Program and Net Metering are expected to account for most of new resources to meet RES DG requirement
  - Standard Offer program ends after 2022, likely leading to a more predictable pace of DG deployment
  - Unclear how many new net metered projects will be additional to the 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 built generation and entered into PPAs ahead of 2017, the first year of RES compliance and may be "long" for several years
  - Utilities can bank an unlimited # of RECs (for up to 3 years) or sell "excess" RECs from Standard Offer, PPA, or utility-owned projects; they can also use Tier 2 (DG) RECs for Tier 3 (Energy Transformation) compliance (and expect Tier 3 to be challenging to meet otherwise)

# Vermont DG Summary 2020-2032 (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

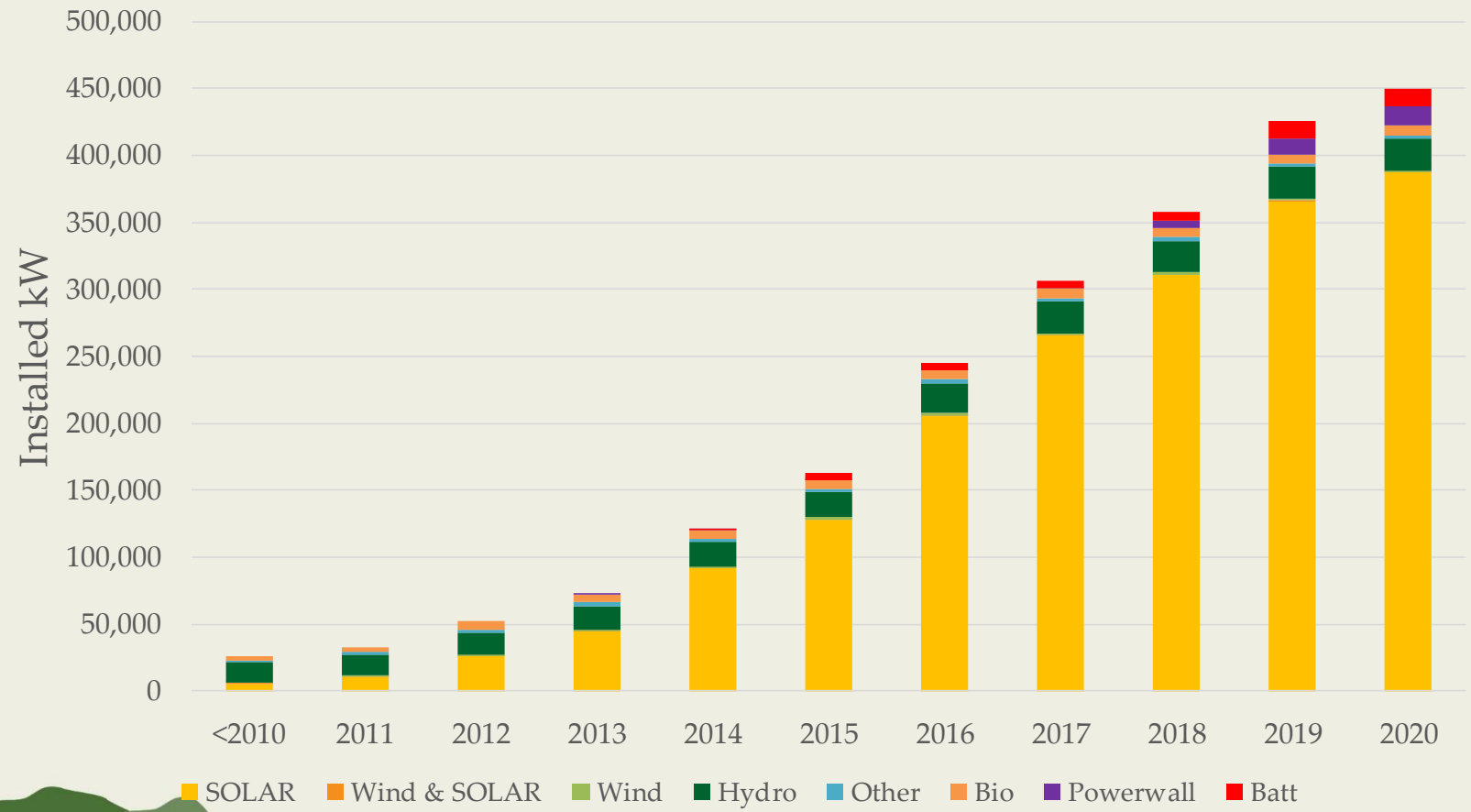
# 2020 Actuals

- DPV interconnections in 2020 through October 30 were ~21 MW\*
- Estimate another ~10 MW will interconnect through year-end
- Estimated total for 2020 PV interconnections ~31 MW
- Compared with 55 MW of PV interconnections in 2019, 45 MW in 2018, 59 MW in 2017 and 73 MW in 2016
- Trajectory and policy developments support 2021 PV forecast pre-discount nameplate values of 25-27 MW/yr through 2030
  - Some utility-owned or PPA projects contracted in runup to RES, and NM projects from previous, higher-incentive regimes, still coming online. PV projects are also likely to push to get online before tax or NM incentives drop.

*\*Utility monthly DG resource surveys to ISO-NE. This sum includes: 18 MW installed through 10/31/20 in GMP; 2 MW thru 10/30/20 in VEC; 75 kW through 10/30/20 in Stowe; and 343 kW through 8/30/20 in WEC.*

# 2020 VT BTM Installations\*

Behind-the-Meter Installations



\*Derived from utility monthly DG resource surveys to ISO-NE and includes data for GMP through 10/31/20, VEC through 11/30/20, Stowe through 10/31/20, and BED and WEC through 8/30/20.



# 2021 Expectations

- Policy-driven (RES) 25-27 MW
  - Comprised of SO (10 MW solicited), utility-owned or PPAs (>0 MW), and NM (>0 MW)
  - Utility can sell or bank excess SO/UO/PPA RECs; must retire NM RECs
- Net metering additional to RES
  - Adjustors will be revised downward February 2, 2021 and again September 1, 2021
  - Federal stepdown of ITC
  - Availability of preferred locations
  - Net-metering rulemaking
  - 2021 VT legislative session
  - GWSA, stimulus?

# Questions?

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