

# Overview of the Renewable Energy Standard

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# History of Renewable Requirements

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## 2005 – Sustainably Priced Energy Enterprise Development (SPEED) Program

- Required utilities to enter into long-term stably priced contracts for renewable resources
- Did not require retirement of RECs

## 2009 – Standard Offer Program

- Created a single, statewide procurement process for small (2.2 MW or less) renewable resources
- Initially 50 MW, expanded to 127.5 MW in 2012
- Initially, administratively determined price, moved to reverse bid process in 2012
- Did not require retirement of RECs

## Net metering

- 2008 – allowed group net metering, expanded overall cap from 1% to 2%; increased project size cap to 250 kW
- 2011: Project cap expanded to 500 kW; registration process for small systems begins; overall cap expanded to 4%; solar adder introduced
- 2014: Cap expanded to 15%; NM 2.0 process initiated
- 2017: NM 2.0 starts; compensation based in part on whether RECs are given to utility

# Renewable Energy Standard

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Enacted in 2015, compliance started 2017

Tiers 1 and 2 require retirement of renewable energy credits

- Brings Vermont into line with the rest of the region

Tier 3 requires utilities to provide programs that reduce fossil fuel use by customers or retire Tier 2 RECs

- Examples of Tier 3 measures include:
  - Cold climate heat pumps
  - Electric vehicles and charging stations
  - Weatherization
  - Custom projects- line extensions to electrify saw mills and maple sugaring

# Renewable Energy Credits

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- One MWh of renewable generation = one REC
- RECs are used throughout U.S. to demonstrate renewability
- Renewable attributes can be separated from the underlying generation
- Creates fungible commodity that can be traded
- Creates uniform system for ensuring that there is no double counting and clear ownership
- Value of REC
  - Theory is that REC value should represent the difference between the revenues a resource receives from wholesale markets and the cost to build
  - Reality is that value is based on supply and demand
  - Different state Tier/Class eligibility and annual requirements means different prices

# Tier 1 – Total Energy

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Eligibility – any renewable resource that can deliver into New England, regardless of when resource was constructed. Includes resources from NY and Quebec.

Required Amounts: 55% of retail sales in 2017, increasing 4% every three years, until 75% in 2032

- Maintained at 75% thereafter

Alternative Compliance Payment = \$10/REC in 2017, increasing by CPI annually

- The ACP acts as a price ceiling for REC prices

REC prices relatively low: \$0.60 average in 2017; \$1 - \$7 estimated going forward

# Tier 2 – Distributed Generation

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Eligibility – renewable resources commissioned after June 30, 2015; connected to a distribution or subtransmission line in Vermont; nameplate capacity of less than 5 MW

Required Amounts: 1% of retail sales in 2017, increasing 0.6% every year, until 10% in 2032

- Maintained at 10% thereafter
- Carve out of Tier 1 requirements (not additional)

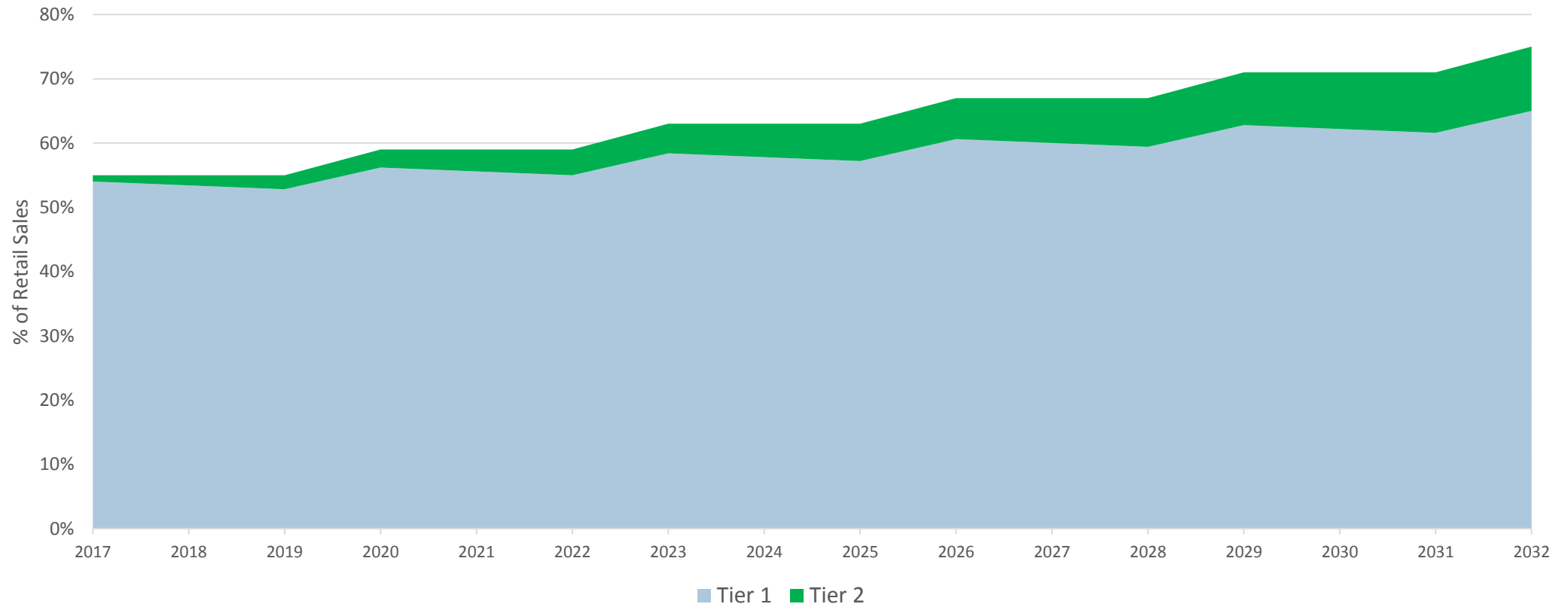
Alternative Compliance Payment = \$60/REC in 2017, increasing by CPI annually

2017 Tier 2 compliance cost was relatively high compared to traded REC prices:

- average \$25.74/REC (includes the cost of NM RECs)

Tier 2 average REC price forecast for new RECs: \$12 - \$36/REC

# Tier 1 & 2 Annual Requirements



# Tier 3 – Energy Transformation

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Purpose: Support fossil fuel reductions for utility customers

Eligibility: fuel switching from fossil fuels to electric usage; weatherization; Tier 2 RECs

Required Amounts: 2% of retail sales in 2017, increasing by 2/3 % each year until reaching 12% in 2032

- Maintained at 12% thereafter
- Later start date and lower overall requirement for small municipal utilities

Alternative Compliance Payment = \$60/REC in 2017, increasing by CPI annually

Costs vary considerably in terms of incentives paid to customers



# RES Benefits: Tiers 1 and 2

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Renewable energy displaces energy generated from fossil fuel-fired plants

CO2 reduction as a result of RES = 579,000 tons in 2017

CO2 emissions from Vermont's electricity sector went from about 440 lbs/MWh pre-RES to 205 lbs/MWh after RES, compared to regional average emissions of 682 lbs/MWh

Increased certainty regarding resale of RECs into the region

# RES Costs: Tiers 1 and 2

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Compliance costs were \$3.3 million in 2017

- Tier 1: 3,355,501 RECs required statewide; average price = \$0.60/REC
- Tier 2: 49,934 RECs required statewide; average price = \$25.74/REC
  - Significant variation in Tier 2 REC prices: \$2 to \$60

If REC prices were at ACP; total cost would have been \$36.3 million

REC price volatility makes predicting future costs difficult



# RES Benefits: Tier 3

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Equivalent of 99,839 MWh of fossil fuel savings

2017 carbon reduction of 6,720 tons

- Tier 3 savings claims are based on lifetime savings, but emission reductions are on an annual basis and will continue for the life of the project

Increased kWh sales from electrification efforts

- Fixed costs of the system are spread over a greater number of kWh, reducing the cost per kWh
- Assumes that new electric loads are managed so they do not increase peak

# RES Costs: Tier 3

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Total cost = \$2.2 million, including incentives and overhead

Cost per MWh saved = \$21.58 in 2017

In 2017, Tier 3 was met primarily with cost-effective large custom projects. Custom projects at a relatively low cost, will likely continue for the next few years, but when those projects dry up Tier 3 may come at a greater cost.

# Projections of Future Performance (2027)

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30 V.S.A. 8005b(b)(2) requires the DPS to conduct analysis of expected performance of RES over ten-year period

General takeaway - Significant variations in cost depending on assumptions

- Compliance cost drivers: REC prices, net-metering adoption rate, Tier 3 incentive costs, peak contribution of new load

Overall reduction in fossil fuel based energy (all sectors) = 13%

Tiers 1&2 reduction in fossil fuel energy = 60%

Tier 3 reduction in fossil fuel energy = 2%

CO2 reduction = 12%

- 900,000 tons, compared to current levels of 7,000,000 to 8,000,000

# Projections of Future Performance (2027)

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	<b>HIGH INCREMENTAL COST</b>	<b>LOW INCREMENTAL COST</b>
REC Price Forecast	HIGH	LOW
NM Deployment Rate	HIGH	LOW
Peak contribution of New Load	90%	None
Fossil Fuel Price	LOW	HIGH
Tier 1 Cost	\$136,000,000	\$20,000,000
Tier 2 Cost	\$63,000,000	\$48,000,000
Tier 3 Net Cost	-\$25,000,000	-\$58,000,000
<b>TOTAL Cost of RES</b>	<b>\$174,000,000</b>	<b>\$10,000,000</b>
Rate Impact	4.92%	0.63%

# Overall Conclusions re RES

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RES is the single most impactful statute with respect to putting Vermont on a path to meet climate and renewable energy policy goals

RES sets the pace for renewable development within Vermont

- To the extent that projects are constructed beyond the RES requirements, unlikely that the output will count toward meeting Vermont renewable and climate goals

Difficult to estimate the likely future economic impacts

# Reports to the Legislature

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2019 Annual Report on the Renewable Energy Standard

<https://legislature.vermont.gov/assets/Legislative-Reports/2019-Annual-Report-on-the-RES-w-cover.pdf>

Biennial Report on Renewable Energy Programs

<https://legislature.vermont.gov/assets/Legislative-Reports/2019-Renewable-Programs-Report-w-cover.pdf>