

# Reviewing Vermont's Renewable Electricity Policies & Programs

**Final Report & Policy Recommendations**

April 2024

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# Introduction

This report provides a summary of the process taken by the Department of Public Service (Department) to review Vermont’s renewable and clean electricity policies and programs. It also presents the Department’s policy and program recommendations emerging from this process.

The report synthesizes key learnings from across public engagement efforts and supporting technical analyses conducted between January and December 2023. It distills five initial takeaways related to the future of electricity in Vermont and offers four recommendations relating to revising Vermont’s current Renewable Energy Standard and related programs. It also describes recommendations for future study and public engagement efforts.

In addition, the report offers several reflections on the process taken to engage Vermonters in this effort and provides an analysis on the extent to which the Department achieved its goals for the public engagement effort.

**Note:** When the 2024 Legislative Session began in January 2024, updates to the Renewable Energy Standard became an active topic of legislative discussion. Staff from the Department have testified on aspects the public engagement and technical analyses included in this process and the Department’s proposed policy and program revisions, while also providing testimony about the alternative proposal emerging from the [Renewable Energy Standard Reform Working Group](#), facilitated in Summer/Fall 2023 by the Joint Fiscal Office. These conversations are ongoing. As of this report’s release, the Public Service’s testimony has been provided to the [House Environment and Energy Committee](#) and is available on their website (Search for witness TJ Poor).

**The remainder of this introduction includes an overview of the key takeaways (slide 4), policy recommendations (slide 5), and reflections on the process (slide 6). It also provides links to materials referenced throughout this report (slide 7).**

# Key Learnings Overview



Over the course of the process, five core takeaways emerged about electricity in Vermont:

- 1 Affordability, reducing carbon emissions, and reliability were consistently highlighted as the most important issues to prioritize by Vermonters, with affordability being of paramount concern ([discussed starting slide 39](#))
- 2 A move toward a 100% Renewable or Clean Energy Standard, including increases in new renewable energy requirements, calls for tradeoffs between costs to ratepayers and societal benefits from emissions reduction ([slide 42](#))
- 3 Vermonters generally support solar, wind, and hydropower as sources of electricity while support for nuclear and biomass is more mixed. In some cases, resource characteristics such as size, location, and benefits or burdens placed on the host community or natural resources were considered more important than the technology type. ([discussed starting slide 44](#))
- 4 Many Vermonters are at least somewhat supportive of policy and program changes that increase requirements for low carbon and renewable electricity in a way that supports the most vulnerable Vermonters ([slide 51 & 52](#))
- 5 As Vermont considers achieving 100% renewable or low carbon electricity, it will need to do so in combination with a more granular understanding of the alignment of renewable generation and demand for electricity ([slide 53](#))

# Policy Recommendations



From these learnings, the Department of Public Service makes the following recommendations:

- 1 Adopt a 100% Clean Energy Standard, while maintaining the current 75% renewable energy by 2032 requirement.
- 2 Under the Clean Energy Standard, by 2035 require 30% renewable energy come from new renewable resources built after 2010. Half (15%) of this new renewable energy should be required to come from distributed renewable energy connected to the Vermont distribution system. Mitigate cost risks by lowering Alternative Compliance Payments and avoiding large infrastructure costs caused by cumulative impact of distributed generation.
- 3 Change the compensation structure of the current net-metering program to reduce costs of meeting the Clean Energy Standard and reduce the inequitable cost-shift.
- 4 Develop a Renewable Energy for Communities program to support community renewable energy systems and deliver benefits from renewable energy to communities who have been marginalized or faced inequitable access.
- 5 The Department of Public Service should further study opportunities of more granularly (sub-annual) accounting of renewability and the benefits and costs to transmission and distribution infrastructure associated with increases in distributed renewable energy.

These recommendations are discussed in detail on slides [55-61](#).

# Reflections on the Process & Accountability



Throughout this effort, the Department has sought to comprehensively engage Vermonters in the development of recommendations for policy and program changes in the electric sector. In reflecting on the effort, the Department offers the following reflections:



Centering public engagement in this process offered the opportunity to more meaningfully engage with Vermonters throughout the lifecycle of this effort



Establishing goals for the effort and accountability mechanisms for those goals ensured the Department collected data on who we were engaging and their experiences at events. This helped to build a baseline understanding of the success of public engagement



Partnerships were critical to reach broader audiences and think outside the box on engagement strategies to use



Prioritizing limited resources (staff capacity, budget, and time) to reach the most impacted is challenging and involves tradeoffs



There is a need for better educational materials and ongoing efforts to build capacity to engage in these discussions

In the public engagement plan released in December 2022, the Department set four goals for this effort ([detailed on slide 17](#)). On [slides 66-70](#), the Department evaluates its success in meeting these goals and next steps for future engagement efforts.



# Materials from this Effort

This report provides an overview of the public engagement and technical analyses conducted during this process. Detailed materials associated with each of these efforts are also available on the [Department's website](#). Links to key documents are provided here for easy reference:

## December 2022: [Public Engagement Plan](#)

### January-March 2023 Educational Webinar Series Recordings & Slides

- Webinar 1 - *Where Does Vermont's Electricity Come From*: [Recording 1: Lunchtime](#), [Recording 2: Evening](#), [Presentation slides](#)
- Webinar 2 – *Current Renewable Electricity Policies & Programs*: [Recording 1: Lunchtime](#), [Recording 2: Evening](#), [Presentation slides](#)
- Webinar 3 – *Renewable Energy Certificates and their Markets*: [Recording](#), [Presentation slides](#), [Webinar Questions & Answers](#)

### June – July 2023 Statewide Polling and Focus Groups:

- *Vermont Weights In: Public Opinion on Renewable Energy*: [Full report](#), [Summary slides](#); [Webinar Recording](#)

### July – November Technical Analysis & Stakeholder Advisory Group

- Meeting Materials: Meeting 1: [Slides](#), [Minutes](#); Meeting 2: [Slides](#), [Minutes](#); Meeting 3: [Slides](#), [Minutes](#); Meeting 4: [Slides](#), [Minutes](#); Meeting 5: [Slides/Draft Results](#), [Minutes](#); Meeting 6: [Slides/Final Results](#), [Minutes](#), [Recording](#), [Access the Final Model](#);
- October 11<sup>th</sup> Workshop on Draft Results: [Agenda](#), [Slides - Sustainable Energy Advantage](#), [Slides - Department](#), [Recording](#)

### September – October Regional Event Series with Regional Planning Commissions

- *Regional Planning Commission (RPC) Event Summaries*: [Addison County RPC](#), [Bennington County Regional Commission](#), Chittenden County RPC: [Event One](#), [Event Two](#); [Central Vermont RPC](#), [Lamoille County Planning Commission](#), [Mount Ascutney Regional Commission](#), [Northeastern Vermont Development Association](#), [Northwestern RPC](#), [Rutland RPC](#), [Two Rivers-Ottawaquechee Regional Commission](#), [Windham Regional Commission](#)

# Approach to Reviewing Renewable Electricity Programs & Policies

## Role of the Department

Brief overview of renewable polices & programs to date

## Context for this work

*Comprehensive Energy Plan & Climate Action Plan Recommendations*

## Developing this process

*Request for Input & Public Engagement Plan*





# What is the role of the Department?

The **Vermont Public Service Department** is an agency within the executive branch of Vermont state government. The Department represents the public interest in matters regarding energy, telecommunications, water and wastewater and helps carry out state energy policy (**Title 30, Section 202a**):

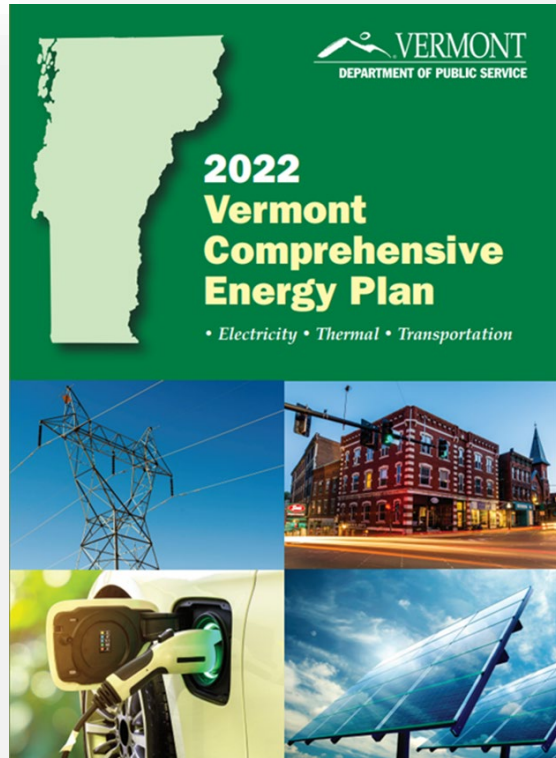
This means, ensuring, to the greatest extent practicable, that Vermont can meet its energy service needs:

- In a manner that is **adequate, reliable, secure, and sustainable**
- Ensuring **affordability** and encouraging the state's **economic vitality**
- Using energy resources **efficiently** and managing demands **cost effectively**
- In a manner that will **achieve greenhouse gas reductions requirements**

Through this role, the Department helps oversee policies and programs in the electric sector and coordinate the **Vermont Comprehensive Energy Plan** and participates in development of the **Vermont Climate Action Plan**.

# What motivated this review of programs & policies?

To meet state renewable energy goals and greenhouse gas requirements, the 2022 Comprehensive Energy Plan and 2021 Climate Action Plan both made recommendations about reviewing and revising Vermont's Renewable Energy Standard.



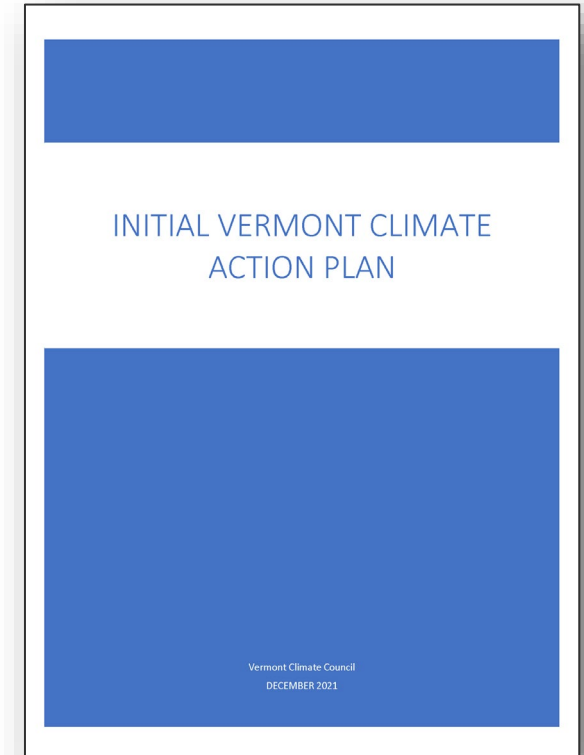
## 2022 Comprehensive Energy Plan:

“Consider adjustments to the Renewable Energy Standard and complementary renewable energy programs comprehensively, **through a transparent and open process**. . . The Considerations should include:

- Consideration of a low-carbon or carbon-free standard, in addition to a 100% renewable energy standard
- Consideration of a cohesive set of programs to support the standard” (p.270)

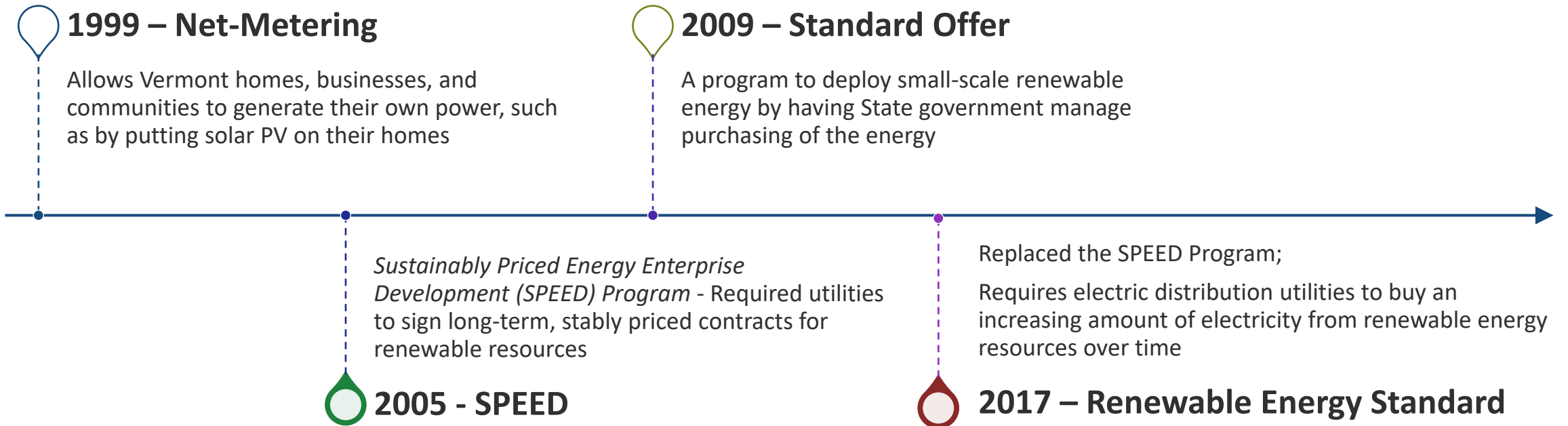
## 2021 Climate Action Plan:

*Electric Sector Strategy 1 Pathway 1:* “Vermont should develop 100% carbon free or renewable electric portfolio standard to ensure progress continues into the 2030s and beyond while being **mindful of the economic impact on cost-burdened Vermonters** and maintaining the cost-effectiveness of fuel-switching to electric measures.” (p.111)



# Current Electricity Policies & Programs

Over the last 20+ years, Vermont has developed several policies and programs to support renewable electricity. These include:



In Vermont law, these programs are described in [Title 30, Chapter 89 “Renewable Energy Programs”](#).

# Current Electricity Policies & Programs

Renewable Energy Standard (2017)

Net-Metering  
Program (1999)

Standard Offer  
Program (2009)

Other resources, ex.  
those owned by or  
contracted with utilities

Currently, the **Renewable Energy Standard (RES)** sets the overarching requirements for increasing the supply of renewable electricity in Vermont.

Resources developed under **other programs** support achieving the requirements of the RES.

For more detailed information on these existing policies and programs:

- See the slides from webinars offered by the Department in February 2023 ([access slides here](#)).
- This [two-page overview](#) also covers the RES and net-metering.

# How was the process for this review developed?

To develop an approach to implementing the recommendations from the Comprehensive Energy Plan and Climate Action Plan, in July 2022, the Department of Public Service issued a [Request for Input \(RFI\)](#).

This RFI aimed to collect feedback on three core issues:

## 1. Stakeholder Engagement

*How should the process to review these programs and policies occur?*

## 2. Decision Criteria

*What criteria should the Department use to make decisions and how should those criteria be prioritized?*

## 3. Key Issues

*What key issues should be considered?*

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### Initial Request for Input on Comprehensive Review of Vermont's Renewable & Clean Electricity Policy and Programs

Public Service Department  
July 5, 2022

To further advance state energy goals and climate requirements, both the [2022 Comprehensive Energy Plan \(CEP\)](#) and [2021 Climate Action Plan \(CAP\)](#) call for consideration of Vermont's existing Renewable Energy Standard (RES) and related electric sector programs. Specifically:

- The 2022 CEP recommends comprehensive consideration of adjustments to the RES and related renewables programs through a transparent and open process. The CEP notes this should include consideration of a low-carbon or carbon-free standard, in addition to 100% RES (pg 270).
- Similarly, the 2021 CAP recommends Vermont move from a 75% RES to a 100% carbon-free or 100% renewable energy requirement no later than 2030 (pg. 105).

In accordance with these recommendations, the Vermont Public Service Department ("Department") is initiating a comprehensive review of Vermont's renewable & clean electricity policies and programs. To solicit feedback on the process for this review, as well as gather initial input about what is important to Vermonters regarding the State's supply of electricity, the Department issues this Request for Input ("RFI"). This RFI represents the first step in the process and is *not* intended to seek final positions on any specific program or policy. Rather, responses will help the Department shape the process, fostering robust future engagement with a broad range of stakeholders and communities across Vermont. The RFI seeks to gather input on several key topics related to this effort including: the engagement effort for the process, core decision-making criteria to consider, and initial issues for consideration related to renewable and carbon-free electricity in Vermont

#### Topic 1: Timeline for Policy Review and Stakeholder Engagement

The Department seeks to continuously improve the way it engages with stakeholders and communities on key policies and programs, including with those who have historically not been engaged. In planning to review renewable electricity programs and policies, the Department drafted two potential timelines to illustrate tradeoffs with regard to depth and breadth of engagement and technical analyses, as detailed in Attachment A. These timelines/processes would aim to deliver recommendations for improvements to renewable electricity policies and programs in January 2023 and January 2024, respectively. The timelines do not offer an

# Lessons Learned from the Request for Input (RFI)

Responses to the Request for Input revealed:



There was general support for a **longer process (12-18 months)** to review programs utilizing **multiple engagement methods** like polling, workshops and forums, attendance at events, and written comments to understand stakeholder needs, values, and ideas about policies and programs.



Comments highlighted the topic (renewable electricity policies and programs) under consideration was **complex to holistically address**, requiring time and a **shared understanding** of terms and concepts. This pointed towards the need for **education and capacity building** opportunities.



While the RFI was a step towards more meaningful public engagement, **it did not reach everyone** and could have been better advertised. This pointed towards more **innovative outreach**, meeting people where they are, and a public engagement plan **flexible** enough to accommodate needs as they emerged.

# What did the Request for Input lead to?

Building off the responses to the Request for Input, the Department developed a Public Engagement Plan which it released in late 2022. The plan established:

1. **A three-phase approach** to the review of electricity policies and programs
2. **Goals** for the process and accountability mechanisms to assess progress towards meeting those goals
3. **Anticipated outcomes** for the effort and how they would be addressed in reports

The Department expected the results of this process would be published in time to inform the 2024 legislative session.



# Proposed Approach to the Review

The proposed three phased approach to reviewing renewable electricity programs and policies utilized a combination of public engagement efforts and technical analyses.





# Goals & Pathways for Accountability

In addition, the Department established four goals to guide the public engagement effort and identified pathways to hold itself accountable to those goals.

	1	2	3	4
GOAL	Reach a broad array of Vermonters beyond those stakeholders already deeply engaged in these conversations	Create inclusive spaces where stakeholders feel heard and able to share their expertise and opinions	Be transparent in how feedback shared during engagement opportunities is incorporated into recommendations	Build capacity for engagement in these discussions in the long term through elevating energy literacy
ACCOUNTABILITY	Collect and report demographic information on who participates in engagement opportunities to develop a baseline understanding of who is (and is not) engaged	Develop feedback surveys to request input on how accessible and inclusive engagement opportunities are and understand how to improve moving forward	Continue to publish all feedback received and record where it was or was not included in final recommendations, where appropriate	Develop accessible educational materials to support engagement opportunities and include in feedback surveys, where appropriate, questions on how people feel their understanding of the concepts under consideration has changed

See [slides 66-70](#) for the Department’s evaluation of how it achieved these goals during this effort and reflections of next steps for advancing public engagement efforts in future policy and programmatic conversations.



# What Did We Do & Who Did We Reach



## Public Engagement Efforts

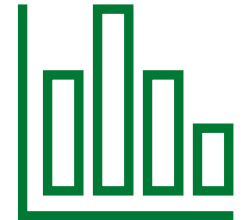
*Webinar Series*

*Statewide Polling & Focus Groups*

*Regional Events*

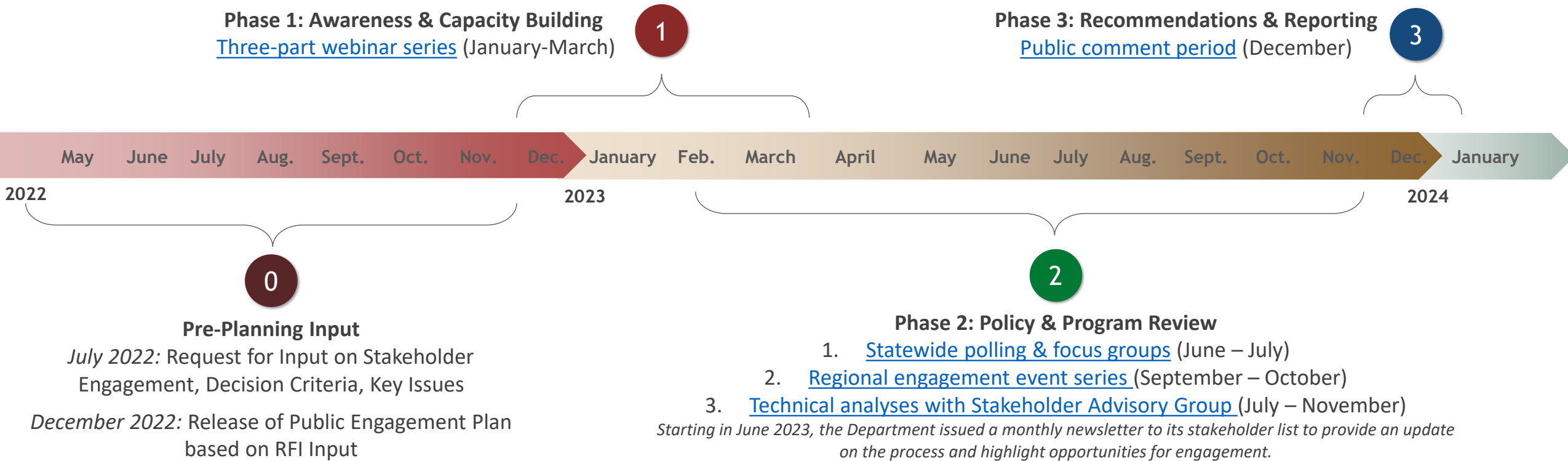
*Public Comment*

## Technical Analyses



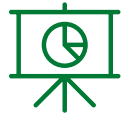
# The Process

Between December 2022 and December 2023, the Department, in collaboration with many partners, executed its three-phased process through educational webinars, polling, focus groups, regional events, and technical analyses. These efforts occurred through a mix of in-person and virtual opportunities. The following slides summarize each of the activities, the outreach undertaken, and who participated in each process.



# Phase 1: Webinar Series

Between December 2022 and March 2023, the Department developed and implemented a three-part educational webinar series. The series had several goals, including:



Provide foundational information on the electric sector in Vermont and the core policies and programs that govern it (and were under consideration in this review)



Offer space to address questions from the public on these topics and begin to hear from Vermonters on what matters most to them when considering where electricity comes from



Raise awareness more broadly of the Department's effort to review renewable policies & programs

To achieve these goals, the Department consulted with staff from [Vermont Energy Education Program](#) on the content and structure for some of the webinar sessions, planned for ample time for question and answer (30+ minutes of each session), and used dynamic polls to engage the audience.

# Phase 1: Webinar Series



**Webinar 1: Where does Vermont's electricity come from?**



**Webinar 2: Current Policies & Programs**



**Webinar 3: Renewable Energy Credits (RECs) & their Markets**

**Webinar 1** focused on how the electricity system works and offered four different perspectives on where Vermont's electricity comes from: what is generated in Vermont, what is generated in New England, what Vermont utilities purchase and generate, and how renewable Vermont's electric supply is based on Renewable Energy Certificates (or Renewable Energy Credits – RECs). The webinar included a poll on what participants felt was most important to consider when deciding where electricity comes from.

**Webinar 2** focused on the core policies and programs that would be reviewed by the Department during 2023, namely the Renewable Energy Standard and Net-Metering and Standard Offer programs. The presentation covered how much renewable generation has been purchased or developed through each program to date.

**Webinar 3** was initially designated as a “parking lot” session to cover major questions that the Department received but couldn't cover during the first two sessions. The session was ultimately devoted to the topic of RECs and their use and included a presentation by consultant Sustainable Energy Advantage and over 30 minutes of Q&A. The Department received many more questions than could be answered, and later followed up with written answers to questions that could not be answered live.

Webinars 1 and 2 were offered twice – once during the lunchtime hour (12:00pm-1:30pm) and evening (6:00pm-7:30pm) and webinar 3 was offered once during the lunchtime hour. All webinars were recorded. Each included dynamic polling, and asked participants questions about what they learned, what surprised them, and what they'd like to learn more about.

The educational material developed for this series served as the foundation for additional educational materials developed to support engagement throughout this effort.

The slides and recordings for each session are linked on [Slide 7](#) of this report.

# Phase 1: Webinar Series

Outreach for these sessions was done through statewide paid advertising on Front Porch Forum and WCAX, outreach to the Department’s stakeholder list, a statewide press release, and direct outreach to partners to help advertise.



**223 people participated in Webinar 1**  
*(153 lunch session, 70 evening session)*



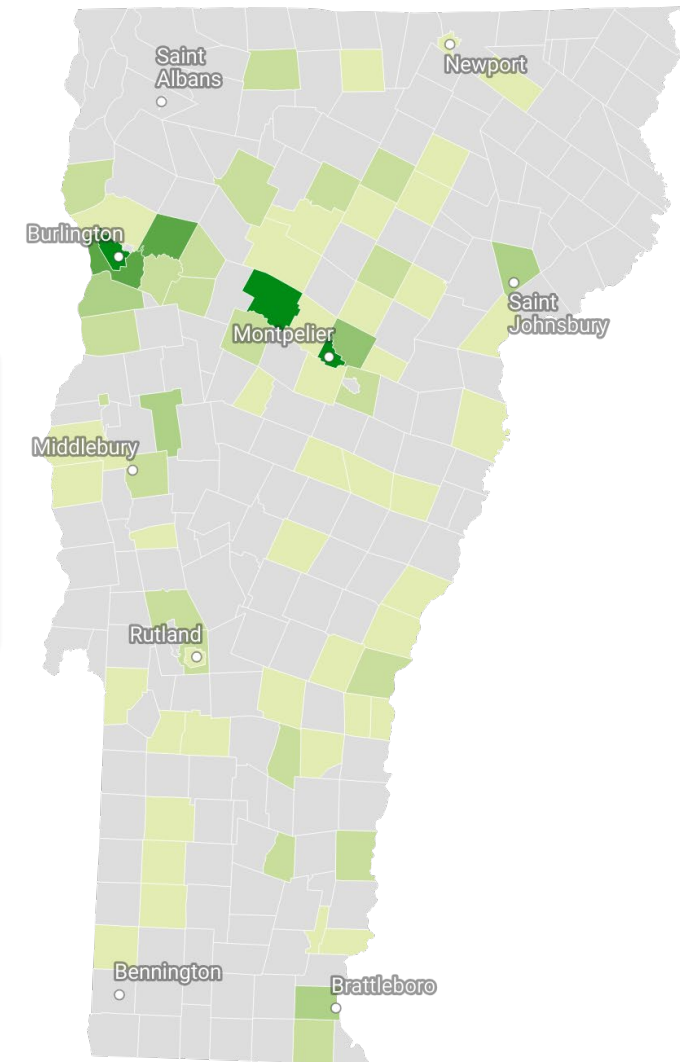
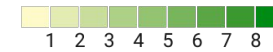
**144 people participated in Webinar 2**  
*(100 lunch session, 44 evening session)*



**85 people participated in Webinar 3**  
*(only one session offered at lunchtime)*

Individuals from over **90 towns across Vermont** participated in the webinar series. Webinar 1 had the most geographic diversity of the three, which is illustrated in the map here. The webinar series also attracted limited participation from individuals living out of state

Number of individuals participating in Webinar 1 (both sessions) by town.



Across the webinars, 44-65% of participants completed the voluntary demographic surveys distributed at the beginning of each event. The majority (88%) self-identified as white while a minority (2% each) identified as Hispanic, Latinx, or Spanish origin or another race or ethnicity. 51% and 43% self-identified as male and female, and less than one percent identified as gender queer or non-binary. About 8% and 5%, respectively, preferred not to answer the question.

Many individuals attended for personal interest (i.e., not related to their job), including 72% of participants for the first webinar. Other types of organizations that participated included local energy committees, non-profits, state and local government, utilities, and regional planning commissions, among others. Of note, participation of utilities, developers, and town energy committees spiked for Webinar 2 on current policies.

# Phase 2: Polling & Focus Groups

During **June and July 2023**, the Department worked with MassInc Polling Group and subcontractor Vermont Law School to conduct a statewide survey and a series of follow up focus groups. This effort began to engage with Vermonters in greater depth on their priorities about where Vermont's electricity comes from. The goals for this effort were to:



Reach a broad and representative sample of Vermonters



Better understand priorities around and preferred sources of electricity generation



Offer educational materials on the electric sector and understand whether engaging with those materials significantly shifted any priorities or preferences

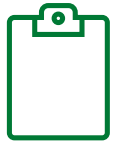


Engage in discussions about current programs and policies and where they might better achieve those priorities

This effort occurred over two core phases: an initial **statewide survey** and a follow-up series of **focus groups and follow-up survey**.

The full report, summary slides, and materials from the November 8<sup>th</sup> webinar are linked on [Slide 7](#) of this report.

# Phase 2: Polling & Focus Groups



An initial survey was fielded by phone and online survey from **June 7 – June 15, 2023**. It asked participants about priorities when considering where Vermont gets its electricity, support or opposition to getting electricity from different renewable or low-carbon sources, and how much more they would be willing to pay each month for 100% renewable or low-carbon electricity, among other things.



At the conclusion of the survey, participants were asked if they would like to participate in a **follow up event** to further engage with these topics.



In advance of these events, participants received a **policy brief** with information on electricity in Vermont covering three core topics: **The Grid and Electricity Sources, Vermont's Renewable Policies, and Vermont's Electricity: Present and Future**.

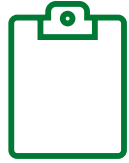
**11 focus groups were held between June 27 and July 20**. Five virtual and six in person across the state (Rutland, Brattleboro, South Royalton, Winooski, Burlington, and Lyndonville). Participants were compensated for their time. Each focus group was structured in three sections to align with the topics in the policy briefs and included a mix of presentation on the material in the brief and facilitated discussion.



At the end of the event, participants **completed a follow-up survey** to see if any of their priorities or preferred sources of electricity had shifted and answer questions about future policies in Vermont.



# Phase 2: Polling & Focus Groups

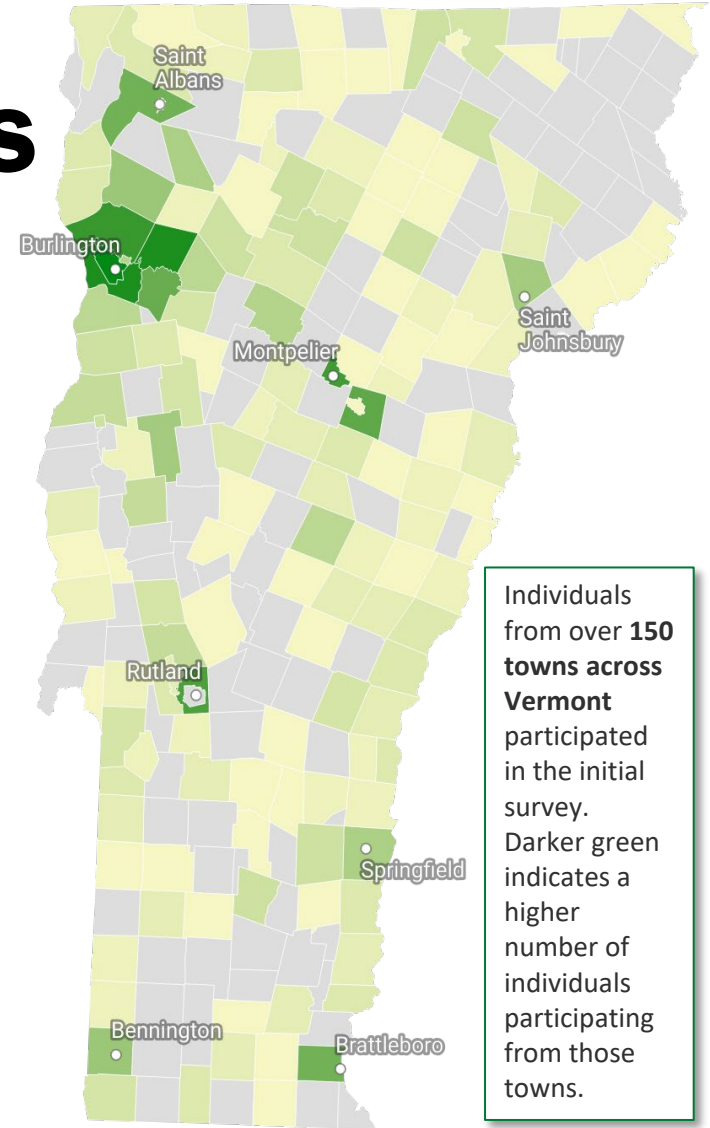


**700 Vermonters** took the initial survey, including a base group of 600, and an additional group (i.e. oversample) of 100 individuals who self-identified as non-white. To analyze the results, responses were weighted by core demographics to be representative of the current Vermont population.



**92 Vermonters** participated in the 11 focus groups and follow up survey. Because of the oversample in the initial survey, participants in the focus groups were slightly more racially diverse than the survey respondents. Focus group participants also tended to be slightly older, more highly educated, more likely to have solar panels, and had slightly lower incomes.

A more detailed description of the full weighted demographics for the initial survey and how they compared to the focus group participants is available in **Appendix A** ([initial survey](#), [focus groups & follow up survey](#)) of this report, and the final report from MassInc Polling Group.



# Phase 2: Regional Events

During **September and October 2023**, the Department partnered with Vermont's [11 Regional Planning Commissions](#) to offer a series of engagement opportunities for Vermonters to further weigh in on the future of renewable electricity policies and programs. The goal for the event series was to further understand:



What should be prioritized when thinking about where Vermont's electricity comes from?



How Vermonters want to get clean or renewable electricity (ex. from their utility, from their own system)



What Vermonters would like the state's electricity supply to look like in the future



What barriers exist in current policies and programs to achieving those desired outcomes

Summaries of events held by each of the 11 Regional Planning Commissions are linked on [Slide 7](#) of this report.

# Phase 2: Regional Events

**SAY WATT?**  
LET'S TALK ABOUT WHERE VERMONT'S ELECTRICITY COMES FROM

The Public Service Department and your local Regional Planning Commission have teamed up to ensure your voice is heard as critical energy policies are updated.

Help us determine the future of electricity in Vermont!

We are asking Vermonters:

1. What are your priorities when thinking about where our electricity comes from?
2. How can our policies and programs better support those priorities?

Join an event near you!

VERMONT DEPARTMENT OF PUBLIC SERVICE  
 VAPDA Vermont Association of Planning & Development Agencies

Department staff collaborated with the Regional Planning Commissions (RPCs) to develop **meeting and outreach toolkits** to support a consistent approach the events.

**The outreach toolkit** included template flyers and website, newsletter, and social media language for RPCs to modify for their own use. The Department hosted a central landing page to advertise events and RPCs conducted local outreach for each of their events through newsletters, Front Porch Forum, Facebook, posting flyers, and via networks and personalized outreach.

**The meeting toolkit** included a template workshop structure and slide presentation, example survey about electricity priorities and preferred sources, and demographic and feedback surveys to field at each event. It also included three educational one-pagers that were developed for this effort, covering:

- [Where does Vermont's electricity come from?](#)
- [Current policies & programs](#)
- [Trade-offs between electricity sources](#)

RPCs were given flexibility to modify toolkit materials and event structures as necessary for their specific outreach.

# Phase 2: Regional Events

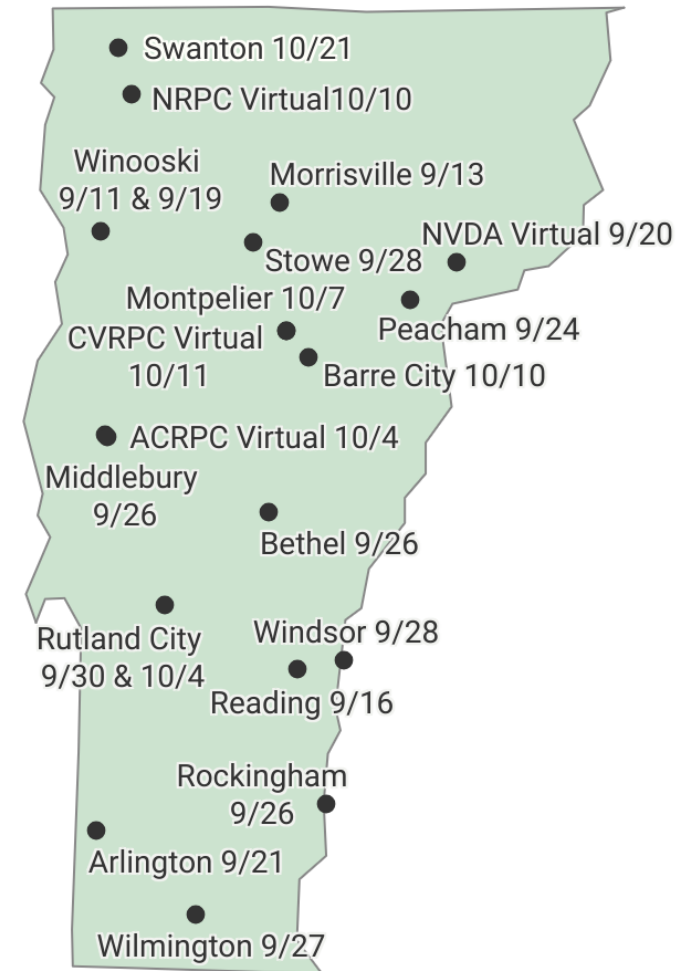
Between September 11<sup>th</sup> and October 21<sup>st</sup>, the Regional Planning Commissions held **21 engagement opportunities**, reaching over **340 Vermonters**. The events included:

- **16 listening sessions** (mix of in-person, virtual, and hybrid; with between 2 and 23 participants each)
- **5 tabling opportunities** (reaching between 30 and 70 participants each)
- **5 supplemental surveys** conducted outside of or in parallel with events

**Voluntary demographic surveys** were distributed at many events. While not all participants responded to them, those that did (roughly 50% of participants) indicated that in aggregate the regional event series reached Vermonters who were:

- Majority white (88%), with minorities indicating they identified as Hispanic, African American, Asian, or Indigenous and some preferring not to answer
- Roughly 50% male and 50% female, with < 1% identifying as another gender such as non-binary or gender fluid
- Majority (88%) homeowners and minority (12%) renters
- Generally older than the Vermont population (individuals less than 30 years of age represented 3% of those who participated)
- Moderate to high income (43% greater than \$100,000, 38% between \$50,000-\$100,000, and 24% less than \$50,000)

At least 8 of the events were advertised specifically to or held in combination with town energy committees, municipalities, or regional commission meetings.



# Phase 2: Technical Analyses

In addition to public engagement efforts, the Department contracted with consultant Sustainable Energy Advantage to conduct a **technical analysis that investigated possible impacts of modifying the existing Renewable Energy Standard**, aligned with recommendations made in the 2022 Comprehensive Energy Plan and 2021 Climate Action Plan. The goals of the technical analyses were to:



Conduct a scenario analysis to assess costs and benefits to Vermont ratepayers and society of moving to either a 100% Renewable or Clean Energy Standard.



Evaluate the role of in-state, distributed generation in achieving renewable or low-carbon requirements



Understand implications of changing what sources of electricity could be used by utilities to meet their requirements under future policies



Conduct the analysis in an open and transparent process to ensure a diversity of perspectives informed the analyses and provide a common quantitative baseline to inform policy discussions

The technical analysis also developed a tool that could continue to help evaluate potential policy designs on an ongoing basis. This effort took place between **July – November 2023**, with a public workshop held virtually to review and offer an opportunity to provide input on draft modeling results on October 10, 2023.

Materials related to the technical analysis are linked on [Slide 7](#) of this report.

# Phase 2: Technical Analyses

To help support an open and transparent analysis, the Department convened a **Stakeholder Advisory Group** to help review and advise on how to approach the analysis.

In June 2023, the Department initiated a public nomination process to identify possible Stakeholder Advisory Group members who could reasonably represent perspectives from:

- **Industry**
- **Utilities**
- **Environmental Advocates**
- **State Agencies**
- **Community Leadership**
- **Historically Underrepresented Customer Populations**



The nomination process was advertised through the Department’s stakeholder list and personal outreach to possibly interested individuals.

The Stakeholder Advisory Group was convened in July, **meeting six times between July and November** with the Department and Sustainable Energy Advantage. All meetings and related materials were open to the public and meetings had designated comment time for non-Stakeholder Advisory Group members. The Group also provided ample written feedback via surveys and email between meetings. Compensation was offered to individuals who were participating outside of their usual employment.

In addition to providing general advice, **the Group was charged with specifically helping define two of the six modeled scenarios.**

# Phase 2: Technical Analyses

In partnership with the Stakeholder Advisory Group and Sustainable Energy Advantage, the Department defined **six core scenarios** to compare to the current Renewable Energy Standard (“**business-as-usual**” or “**BAU**”). The current standard requires Vermont distribution utilities to purchase 75% renewable electricity by 2032 (Tier I), with 10% of this coming from in-state, scale-scale, new renewables (Tier II).

## The six core scenarios considered:

- Changes to the Tier I target date from 2032 to 2030
- Changes to the Tier II requirement:
  - Changes to the target date from 2032 to 2035
  - Increasing the total requirement from 10% to 20% or 30%
- The addition of a new “Regional Tier” which would require utilities to buy electricity from new renewable resources that can be imported into the New England region
- Changes to resources that can currently be used by utilities to meet Tier I, specifically biomass and nuclear
- Two different load forecasts: A “base case” and one considering high electrification of heating and transportation

Load flexibility, including storage, was intended to be assessed as a modeling output, on a scenario-specific basis.

In total, **68 different case runs** were modeled to explore the impacts of different combinations of and sensitivities around the issues identified.

	Regional Tier Target	Tier II Target	Tier I Target	Target Date	Nuclear Tier I Eligible	Biomass Tier I Eligible
<b>BAU</b>	0%	10%	75% by 2032	2032	No	Yes
<b>Scenario 1</b>	0%	30%	100% by 2030	2035	No	Yes
<b>Scenario 2</b>	30%	30%	100% by 2030	2035	No	Yes
<b>Scenario 3</b>	0%	30%	100% by 2030	2035	Yes	Yes
<b>Scenario 4</b>	30%	30%	100% by 2030	2035	Yes	Yes
<b>Scenario 5</b>	30%	20%	100% by 2030	2035	No	No
<b>Scenario 6</b>	50%	10%	100% by 2030	2035	Yes	No

# Phase 2: Technical Analyses

To better understand possible impacts of modifying the current Renewable Energy Standard, Sustainable Energy Advantaged conducted a **Benefit-Cost Analysis** comparing the costs and benefits of each scenario and the sensitivities. Through this approach, the analysis then compared the scenarios to the business-as-usual policy on key metrics:

- **Total Benefits and Costs** (in \$)
- **Renewable Energy Additions** (levelized cost of energy, avoided costs, and price effects)
- **Renewability** (how renewable is electric supply on an hourly basis compared to demand)
- **Generic Grid Impacts\*** (transmission & distribution impacts, in \$)
- **Equity** (what is the impact to electric bills, identification of sites of new renewables to be located)
- **Environmental Impacts** (avoided greenhouse gas emissions; land and water use estimates)

This analysis considered from **two different perspectives**: Costs and benefits to Vermont ratepayers (a Rate Impact Measure) and to society (a Societal Cost Test)

Value Stream	Cost or Benefit	Primary Data Source	Impact	Description
Incremental cost of resource	Cost	SEA calculations	High	Cost for resource incremental to generic, residual grid mix
Transmission integration costs	Cost	NREL	Low	Socialized transmission investments driven by shift to variable resources
Interconnection distribution system upgrades	Benefit	SEA estimates; MA Capital Investment Project (CIP) filings	Low	Of distribution interconnection costs paid for by interconnecting customer, a portion is assumed to be a benefit to load customers
Uncleared capacity value	Benefit	2021 Avoided Energy Supply Component (AESC) study	Low	VT-sited, distribution-connected projects are assumed to not bid their capacity into the FCM, instead, acting as load reducers
Reduced share of capacity costs	Benefit	2021 AESC	Moderate	VT-sited, distribution-connected projects that produce during the New England annual peak can reduce the portion of capacity costs paid for by Vermont
Price suppression	Benefit	2021 AESC	Moderate	Renewable resources with low marginal costs tend to drive down prices by shifting the supply curve to the right; applies to capacity, energy, and natural gas (through reduced demand for gas-generated electricity) prices
Reduced transmission costs	Benefit	2021 AESC; VT precedent	Low	Distribution-connected resources that generate energy during periods of high demand could reduce future needed transmission investments
Reduced share of transmission costs	Benefit	ISO-NE	Low	VT-sited, distribution-connected resources that generate energy during VT's monthly peak hours can reduce the share of regional transmission costs paid for by VT (cost shift to other New England ratepayers)
Reduced distribution costs	Benefit	2021 AESC; VT precedent	Low	VT-sited, distribution-connected resources that generate energy during periods of high demand may reduce future needed distribution investments
Reduced transmission and distribution losses	Benefit	2021 AESC	Moderate	Reduction in losses on T&D system
Improved generation reliability	Benefit	2021 AESC	Low	Improvements in generation due to additional capacity purchased in capacity market
Non-embedded GHG emissions	Benefit	2021 AESC	High	Value (based on social cost of carbon) of avoided GHG emissions not already captured RGGI embedded in energy prices
NOx emissions	Benefit	2021 AESC	Low	Value of avoided Nox emissions
Local pollutants	Benefit	EPA's AVERT/COBRA	Moderate	Value of avoided additional pollutants
RE development land use	Cost (not monetized)	Various		Acres of land associated with resources in RES portfolio
Fossil fuel water use	Benefit (not monetized)	Various		Gallons of water consumption and withdrawal reduced through RES portfolio

A detailed illustration of the costs and benefits considered, descriptions, and data sources is available [in the Appendix](#).



# Phase 2: Technical Analyses

## Notes on the Use of the Model

The model developed through this process was used to inform policy proposals that have been made to the Legislature, to understand their directional impacts of the proposals to Vermont ratepayers and society. The tool's public availability, and the vetting of assumptions through a Stakeholder Advisory Group, have narrowed and framed the issues for discussion at the Legislature and other policy forums.

The model has proven a helpful tool to identify the assumptions that make the biggest impact on the costs and benefits to Vermonters of potential policies, such as the assumed cost of new renewables, modifications to specific policies such as net metering, and changing certain parameters such as the Alternative Compliance Payments.

The model is not, however, structured to provide outputs regarding transmission and distribution infrastructure necessary to support the cumulative impact of distributed generation needed to achieve compliance with specific proposals, nor the non-carbon environmental or land use impacts. These types of costs need to be explicitly modeled by utilities and others, and specifically planned for.

# Phase 3: Public Comment

On November 27, 2023 the Department issued a draft version of this report for public review and comment ([full draft available here](#), [executive summary available here](#)). That draft included the overview of the process taken to date (Phases 1 & 2), five initial key takeaways, and reflections on the process. **This draft was available for public review and comment from November 27<sup>th</sup> – December 20<sup>th</sup>.** The goals of the public comment period were to:



Provide an opportunity for members of the public to review the Department’s key takeaways from the effort and comment on if they agreed, disagreed, or if any critical issues were missed



Hear from those who participated in parts of the process about what they thought worked well or what could be done better in the future



Collect general feedback on the draft report to help refine and clarify any issues before final publication

**The Department offered three pathways to engage in this process:** 1) Written feedback provided by email; 2) Written feedback through online webform, or 3) Verbal feedback via one of two virtual public comment forums held on December 5<sup>th</sup> at 10am ([recording here](#)) and 6pm ([recording here](#)). The Department advertised the public comment opportunities on its website, monthly newsletter, and through targeted outreach to certain stakeholders.

# Phase 3: Public Comment

Over the course of the public comment period the Department received public comments from:



**Webform**  
15 comments



**Virtual Public Comment Forum**  
25 participants

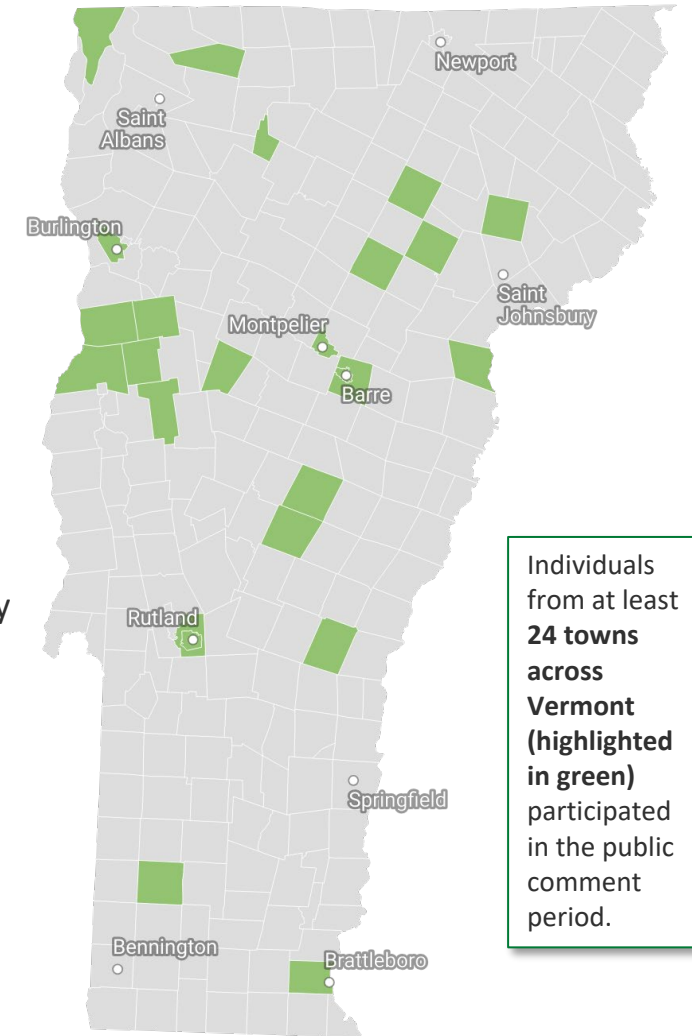


**Email**  
4 comments

The Department did not ask participants submitting comment via email or webform to provide voluntary demographic information but did provide a voluntary demographic survey at the two virtual public comment forums. This was completed by 46% of the participants.

Participants in the virtual events self identified as:

- 100% White
- Majority (75%) male and minority (25%) female
- 66% aged 45 and older
- Majority homeowners (83%)
- Majority with graduate courses or an advanced degree



# Phase 3: Public Comment

Following the close of the public comment period, Department staff reviewed all feedback provided and heard several common themes throughout many of the comments provided:



**Concern about cost and affordability** and the need for more financial analysis about impacts of policy and program change



**A desire to take a holistic perspective on climate action**, considering both electricity supply and demand (ex. conservation) and the thermal and transportation sectors, and assessing lifecycle impacts



**Prioritizing transparent data & assumptions** in analyses and recommendations



**A need to consider supporting programs**, particularly to mitigate costs of policy changes and support the most vulnerable and advance key priorities mentioned such as reliability

**In addition to these general themes, comments touched on each of the initial takeaways offered by the Department.** For example, comments supported key priorities of affordability, reliability, and emissions reductions (key takeaway 1), noted concerns regarding cost and a need for mitigation of those costs (key takeaway 2), and offered additional support for a diversified portfolio of resources, with support for specific resources varying consistent with prior public engagement activities (key takeaway 3). Some comments either opposed or voiced concern with moving towards 100% clean or renewable energy requirements either generally or with a preference for encouraging change with incentives not requirements. Comments highlighted some need for clarified terminology, such as around reliability and vulnerable Vermonters.

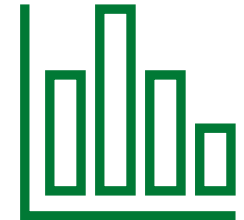
**Comments related to the process taken** voiced appreciation for the opportunities to engage, but highlighted remaining work to do related to accessibility of materials and reaching more Vermonters and **concerns whether policymakers would see or use the outcomes of the process.**

A more detailed summary of the comments received and how they influenced revisions to the draft report is available in [Appendix B](#) (Slide 76).

# What Did We Learn & Key Takeaways



Priorities for Electricity  
Preferred Sources  
Policy & Program Changes



# 1: Understanding Priorities for Electricity

## What did we ask about?

Throughout the public engagement efforts, the Department sought to better understand the following question:

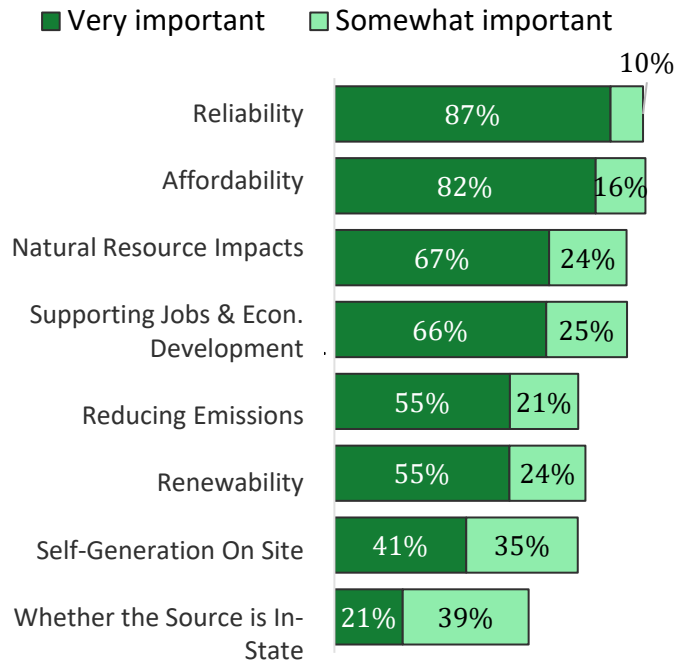
*What should be prioritized when deciding where electricity comes from?*

The technical analysis then helped shed light on how changes to the Renewable Energy Standard might impact a variety of issues, including those that Vermonters think are most important to consider.

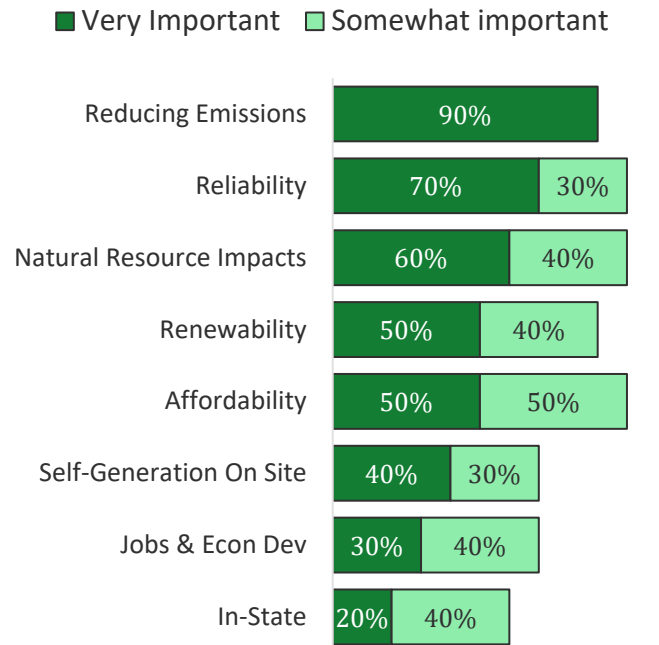
## Why does this matter?

Vermont law (**Title 30, Section 202a**) requires state government and Vermont's utilities to consider many factors when choosing what types of electricity to purchase or generate or developing policies and programs to support various sources of electricity ([described on slide 9](#)). An understanding of how Vermonters prioritize these issues helps to understand where to place emphasis when developing future policies and programs that inform where electricity will come from in the future.

# Understanding Priorities for Electricity



Results from statewide survey (700 responses)



Results from technical analysis Stakeholder Advisory Group (10 responses)

% who say \_\_\_\_\_ is \_\_\_\_\_ when considering how Vermont gets its electricity

## Key Takeaway 1

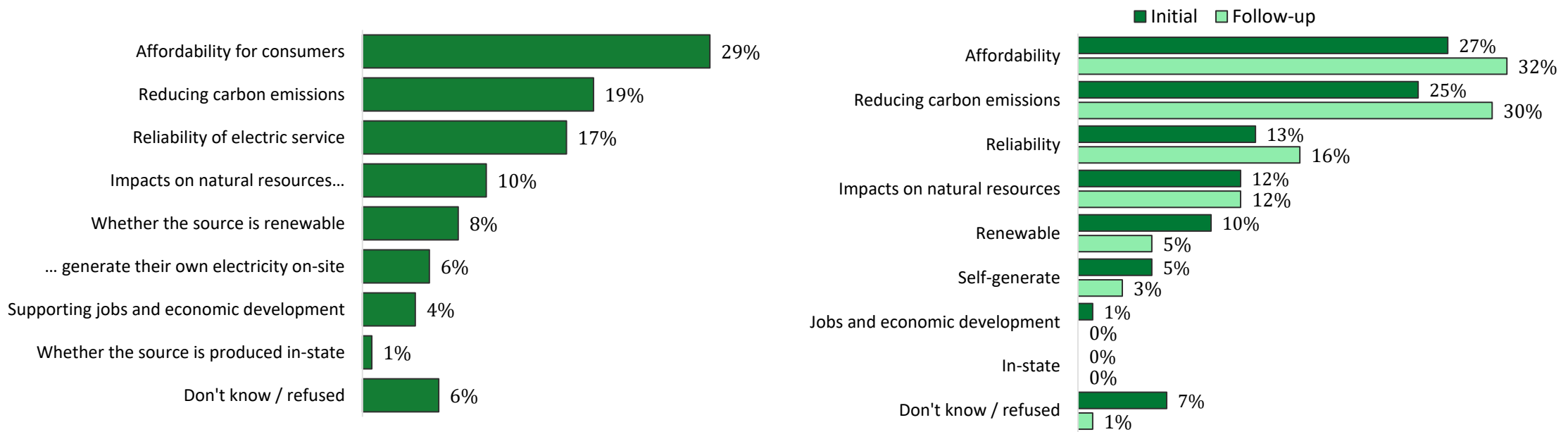
Affordability, reducing carbon emissions, and reliability were consistently highlighted as the most important issues to prioritize, with affordability being of paramount concern.

The importance placed on each of these priorities and others that were discussed throughout this effort differed to some extent across stakeholders and engagements. For example:

- In the initial statewide poll, reliability of electricity service and affordability for consumers were considered very important by over 80% of Vermonters and at least “somewhat important” by nearly all people who took the survey. However, across the regional events and conversations with the Stakeholder Advisory Group, the need to reduce emissions was more often cited as a top priority.
- One regional planner observed that during their engagement events it seemed that energy-engaged stakeholders seemed to focus more on emissions reductions, assuming affordability and reliability would be taken care of, while less energy-engaged stakeholders focused more on the latter two issues.

# Understanding Priorities for Electricity

**Key Takeaway 1, continued:** When asked to select what they felt should be the single most important factor in thinking about where Vermont gets electricity, participants in the statewide polling and focus groups indicated **affordability, reducing emissions, and reliability** were the top three issues they were concerned about. Results of the follow up survey (taken after the focus groups) shows these conversations significantly increased concern for affordability and reducing emissions.



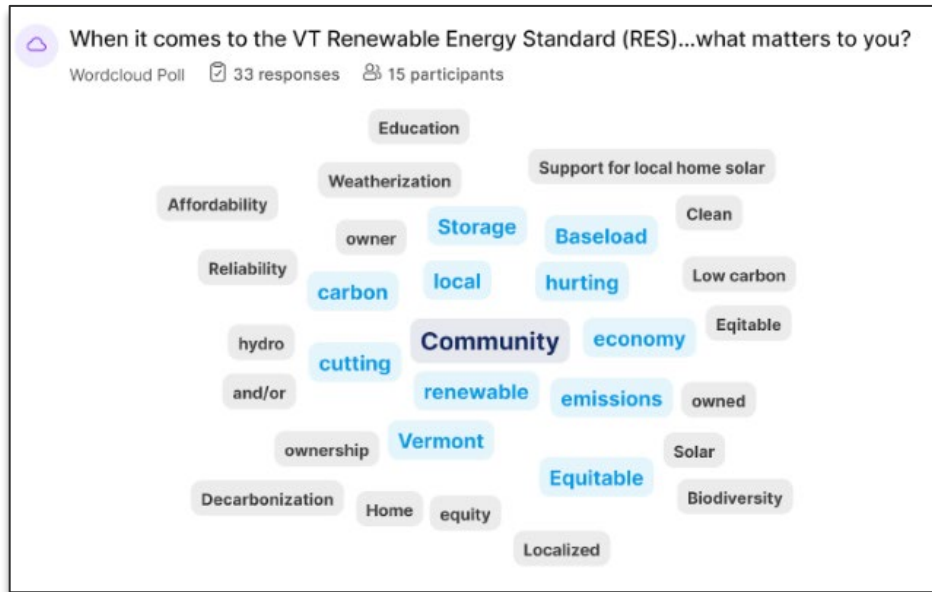
% who say \_\_\_\_\_ is the single most important factor when considering how Vermont gets its electricity.

**Results from initial statewide survey (left, 700 participants) and results from the follow-up survey (right, 92 participants) taken after the 11 focus group discussions.**

*Note: Results from the follow up survey show only the focus group participants responses from the initial survey and the follow up survey.*



# Understanding Priorities for Electricity



*Results from Northeastern Vermont Development Association Virtual Event*

## Key Takeaway 1, continued:

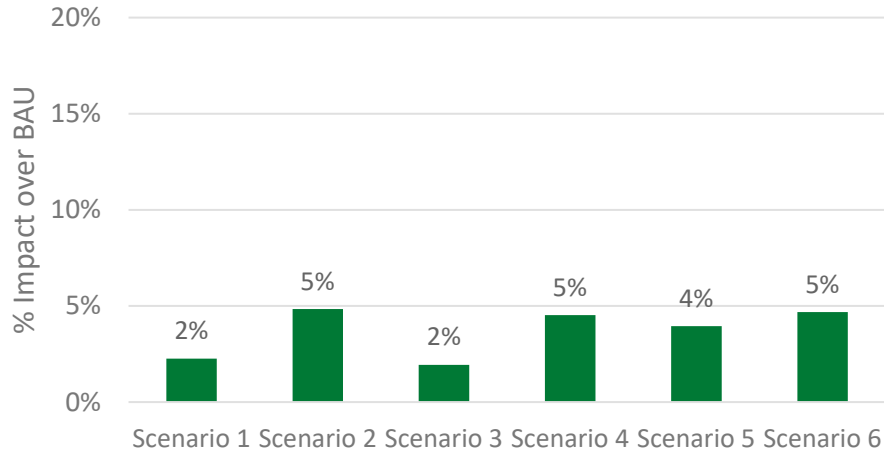
Although certain priorities were emphasized, Vermonters generally found it challenging to choose between the priorities under discussion. Often in conversations around this topic, individuals expressed that all the issues under consideration were important to consider and that it was difficult to choose between them. For example, the event summary from Addison County Regional Planning Commission captured a comment wondering:

*“How do we decide which is the ‘lesser evil’ when it comes to pursuing new methods of electrical generation that also have negative impacts (e.g. land use change, impacts to natural resources, increases in cost to consumers, etc)”*

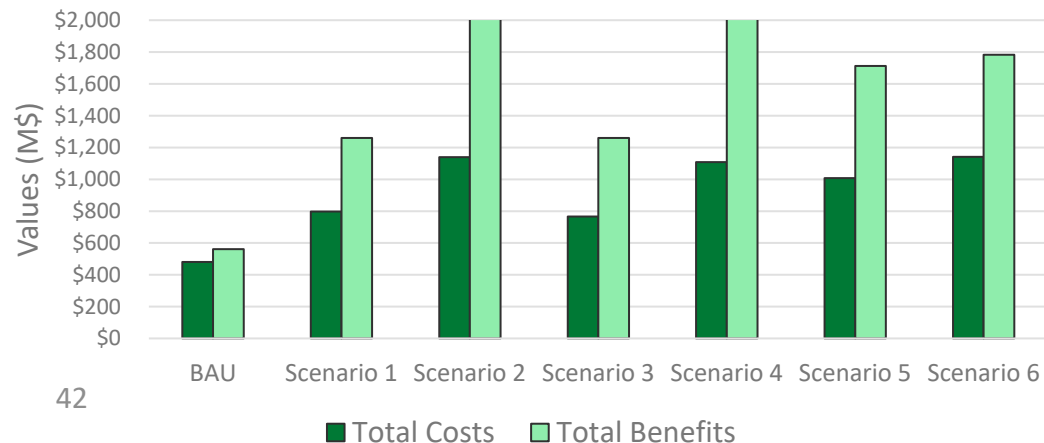
**Qualitative discussions particularly in the regional event series, expressed a desire to see more local, community-scale projects** even though whether the source of the electricity was located in-state did not often rise to the top of issues to prioritize. This was frequently mentioned as a way to support reliability of electric service and for communities to have more control over their energy sources. Similarly, conversations around the importance of siting of local generation and the need to both include communities in the process and carefully consider environmental impacts emerged throughout several engagements, including conversations with the Stakeholder Advisory Group and some regional events.

# Understanding Priorities for Electricity

**Fig 1: Average Projected Increase of Electric Ratepayer Bills 2025-2035 Over the Business-as-Usual**



**Fig 2: Total Cumulative Costs and Benefits Projected to Result from Each Scenario Based on the Societal Cost Test**



## Key Takeaway 2

A move toward a 100% Renewable or Clean Energy Standard from the current policy will face tradeoffs between costs to ratepayers (i.e. bill impacts) and societal benefits related to emissions reductions. Any policy modification should be accompanied by data collection to transparently track and evaluate ongoing costs of the policy or program and impacts to affordability. Additional consideration of supporting policies and programs or funding opportunities to mitigate costs is warranted.

This mirrors the sentiments voiced in the focus groups that it felt there were often tradeoffs between what participants could afford to do and their desire to invest or participate in emissions reducing activities.

In the modeling, both costs and greenhouse gas benefits are driven by the adoption of additional new renewable energy technologies. Results of the scenario analysis indicate that:

- Moving to a 100% renewable or clean energy supply will likely increase Vermont ratepayer electric bills an additional 1% to 5% above and beyond the rate impact expected from the current policy by 2035 (shown in **Figure 1** to the left). According the modeling, the current policy will also increase rates approximately 13% by 2035 relative to not having a Renewable Energy Standard.
- The modeled scenarios that lead to the highest rate impact are those with the highest deployment of new renewable technologies. These scenarios are also the ones with the greatest benefits to society (driven largely by benefits from greenhouse gas reductions) and the greatest net-benefits overall based on the Societal Cost test since only new renewables were modeled as reducing emissions (shown in **Figure 2** to the right).

**Note:** This modeling exercise did not include considerations of Tier III of the current Renewable Energy Standard, which seeks to reduce fossil fuel use including through electrification of the thermal and transportation sectors.

# 2: Preferred Sources of Electricity

## What did we ask about?

Throughout the public engagement efforts, the Department also asked Vermonters to weigh in on what sources of electricity they would support Vermont using in the future.

This looked like asking:

*How much would you support or oppose Vermont getting electricity from different resources? (statewide polling)*

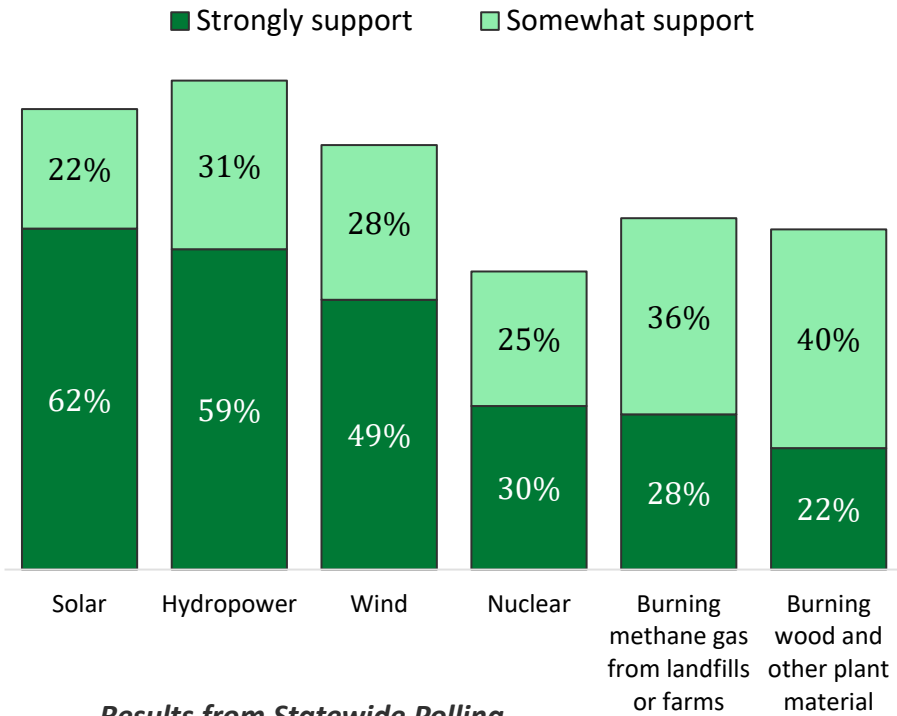
*What would you like to see Vermont's energy mix look like in the future? (regional events)*

The technical analysis then shed light on the different sources of electricity Vermont utilities might purchase under different policy options.

## Why does this matter?

Under the current Renewable Energy Standard, Vermont law ([30 VSA 8002-8005](#)) defines what sources of electricity utilities can use to meet their requirements to purchase increasing amounts of renewable electricity and any policy revisions will also need to define what sources utilities can use to meet the requirements. In addition, programs can facilitate deployment of specific types and scales of resources.

# Preferred Sources of Electricity



**Results from Statewide Polling**  
 % who strongly or somewhat support Vermont getting electricity from each source

### Key Takeaway 3

Vermonters generally support solar, wind, and hydropower as sources of electricity. Support for nuclear and biomass is more mixed. Often, conversations on this topic emphasized characteristics such as size of the generation plant, its location, and benefits and burdens experienced by the host community and natural resources as more important than the technology type.

This was consistent across the statewide polling and focus groups and regional event series. In the statewide polling, 90% of respondents at least somewhat supported getting electricity from hydropower, 84% supported getting electricity from solar, and 77% support getting electricity from wind.

**Preferences were also expressed for getting electricity from a diversity of resources.** Although not included in the statewide polling, several participants in the regional events expressed support for geothermal as a source of electricity and emphasized the role of storage. Storage and load flexibility were also highlighted as a key consideration through conversations with the Stakeholder Advisory Group for the technical analyses.

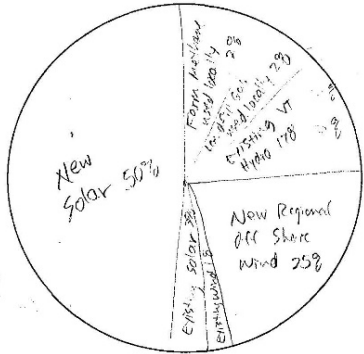
In the regional event series, participants were asked how they preferred getting renewable or clean electricity. Consistent preferences were stated for a combination of self-generation and utility purchasing.

**Preferences for sources of electricity were also influenced by what individuals felt were the most important issues to prioritize.** Based on the statewide poll, people who felt reducing emissions was the single most important issue were more likely to strongly support getting electricity from solar and wind. Those who felt reliability or affordability were the most important priority more strongly supported electricity from hydropower, nuclear, and biomass.

# Preferred Sources of Electricity

REDUCES ELECTRIC CONSUMPTION NEEDS TO Make the whole "Pie" smaller.

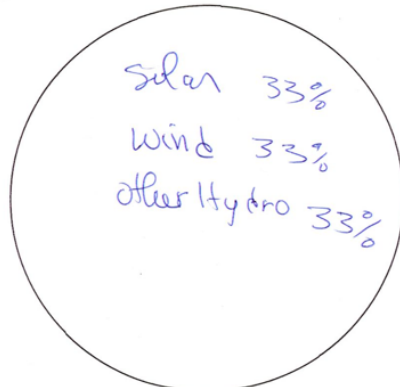
What would you like to see Vermont's energy mix look like in the future?



Percent of Mix (should add up to 100%)

Hydro-Quebec 52% <i>N</i>	Nuclear 18% <i>N</i>
Other Hydro Power 17% <i>Existing</i>	ISO New England Mix 10% <i>N</i>
Solar 3% <i>Existing</i> 3%	Farm Methane <1% <i>2%</i>
New Solar 30%	Landfill Gas <1% <i>5%</i>
Biomass (Wood) <1% <i>N</i>	Natural Gas <1% <i>N</i>
Wind 1% <i>Existing</i> 1%	
Offshore Wind 25%	

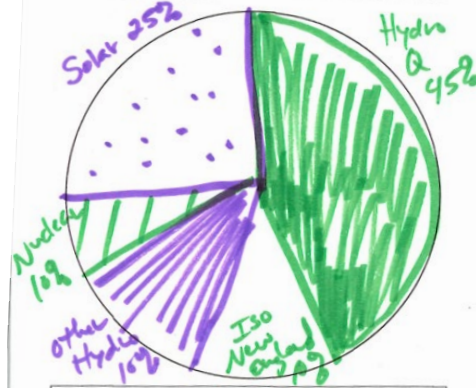
What would you like to see Vermont's energy mix look like in the future?



Percent of Mix (should add up to 100%)

Hydro Quebec 52%	Nuclear 18%
Other Hydro Power 17%	ISO New England Mix 10%
Solar 3%	Farm Methane <1%
Biomass (Wood) <1%	Landfill Gas <1%
Wind 1%	Natural Gas <1%

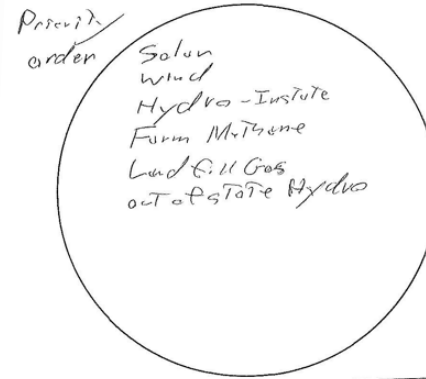
What would you like to see Vermont's energy mix look like in the future?



Percent of Mix (should add up to 100%)

Hydro Quebec 52% <i>45%</i>	Nuclear 18% <i>10%</i>
Other Hydro Power 17% <i>10%</i>	ISO New England Mix 10%
Solar 3% <i>25%</i>	Farm Methane <1%
Biomass (Wood) <1%	Landfill Gas <1%
Wind 1%	Natural Gas <1%

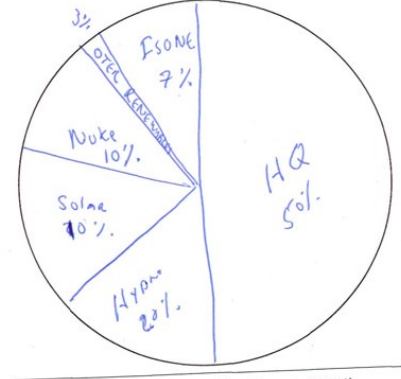
What would you like to see Vermont's energy mix look like in the future?



Percent of Mix (should add up to 100%)

Hydro Quebec 52%	Nuclear 18%
Other Hydro Power 17%	ISO New England Mix 10%
Solar 3%	Farm Methane <1%
Biomass (Wood) <1%	Landfill Gas <1%
Wind 1%	Natural Gas <1%

What would you like to see Vermont's energy mix look like in the future?



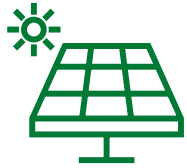
Percent of Mix (should add up to 100%)

Hydro Quebec 52% <i>(50%)</i>	Nuclear 18%
Other Hydro Power 17% <i>(20%)</i>	ISO New England Mix 10% <i>(7%)</i>
Solar 3% <i>(10%)</i>	Farm Methane <1%
Biomass (Wood) <1%	Landfill Gas <1%
Wind 1%	Natural Gas <1%

*Total 3%*

Example responses from events hosted by Bennington County Regional Commission and Windham Regional Commission showing what participants would like Vermont's future electricity mix to look like. These illustrate the variety of visions participants had on this topic.

# Preferred Sources of Electricity

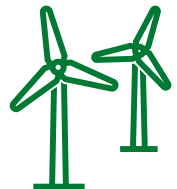


## Key Takeaway 3, continued:

Participants expressed a clear preference for **solar, particularly small or community-scale systems**. Although many focus group participants were not initially aware of community solar, discussions highlighted it as a way for renters to benefit from renewable electricity. Community-solar was a common theme across the regional event series, although was not specifically defined in the context of these conversations and could mean different things to different stakeholders. Conversations of larger systems highlighted land use and siting concerns, with a preference for use of existing structures.



**Hydropower** was generally supported, although there was a preference for smaller-scale projects across both the regional events and follow up survey after the focus groups. Large hydropower, namely from Hydro-Quebec, was a common discussion point. Across regional events some participants expressed a desire to reduce electricity coming from HQ while others were neutral on the topic or even discussed increasing the share.



Across the events, there was generally not much conversation about **wind**, although it was often discussed in the context of getting electricity from a diversified portfolio. Some concerns were raised about aesthetics and about the impact of offshore wind projects on wildlife.

	■ First	■ Second	□ Third
Smaller hydropower projects in Vermont	40%	27%	33%
Large-scale hydropower from Quebec, Canada	35%	26%	39%
Hydro projects in the northeast region of the United States	27%	48%	26%

**Focus group participants had a mix of views on the scale of hydropower** (% ranking each option first, second, or third preferred option)

# Preferred Sources of Electricity



## Key Takeaway 3, continued:

**Nuclear power** received mixed support throughout this effort. Through the regional events, we heard some participants express fear or uncertainty about nuclear whereas others felt it had a role to play in helping quickly reduce emissions. In the statewide polling, 55% of respondents supported getting electricity from nuclear to some extent.

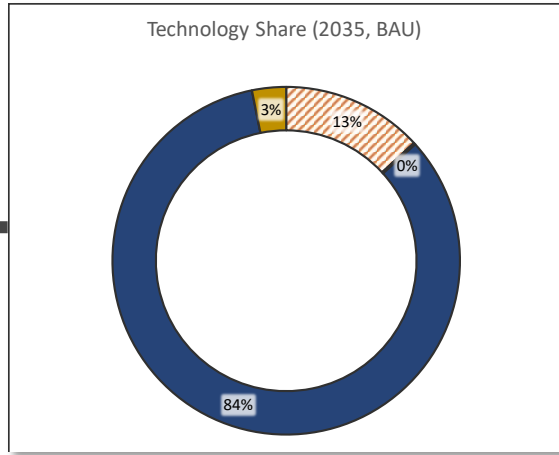


**Biomass**, generally, also received mixed support. With regards to **electricity from burning wood or other plant material**, support was limited across the statewide polling and regional events, particularly in Chittenden County. Comments across multiple regional events highlighted that many do not believe biomass should be considered renewable. **Biomass from burning methane gas from landfills or farms** was viewed slightly more favorably than burning wood. Following the focus groups, participants engaged in those conversations showed greater support for both forms of biomass. It seemed they had largely been unaware of that source of electricity before the event.



# Preferred Sources of Electricity

Modeling illustrates possible future statewide electricity portfolios compared to the current policy (BAU)\*



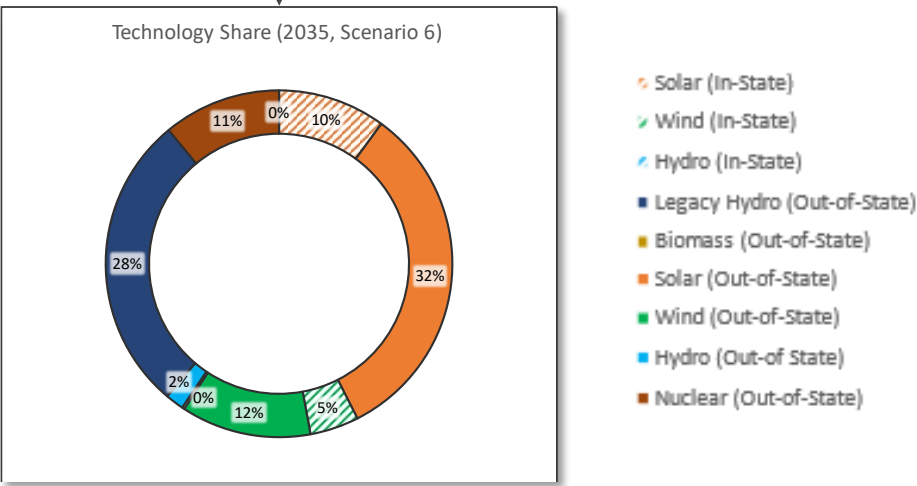
## Key Takeaway 3, continued:

Different policy structures which place varying emphases on getting electricity from existing versus new resources and whether those new resources are located in- or out-of-state, significantly influence Vermont's future supply of electricity.

Analyses of the six core scenarios and suite of sensitivities leads toward the following observations:

- Tier II is anticipated to be met largely by in-state solar in all scenarios.
- The introduction of the new Regional Tier increases the diversity of types of electricity resources utilities use to meet their requirements, including both in- and out-of-state wind, and out-of-state solar.
- Allowing utilities to use nuclear to meet Tier I requirements tends offset electricity that would otherwise be supplied by out-of-state, legacy hydropower.

The following slide illustrates modeled sources of electricity in 2035 for the core six scenarios that were analyzed. [Slides 19-25 of Sustainable Energy Advantage's final presentation on the modeling](#) showcases how the electricity supply in Vermont is projected to change over time under each of the core scenarios.

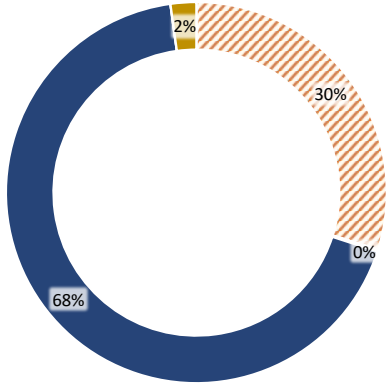


- Solar (In-State)
- Wind (In-State)
- Hydro (In-State)
- Legacy Hydro (Out-of-State)
- Biomass (Out-of-State)
- Solar (Out-of-State)
- Wind (Out-of-State)
- Hydro (Out-of-State)
- Nuclear (Out-of-State)

\*The technology share charts only show the technologies supplying electricity for the demand covered by the current policy. For the BAU scenario, this only covers 75% of the statewide demand, meaning 25% of electricity would be supplied by non-policy obligated resources.

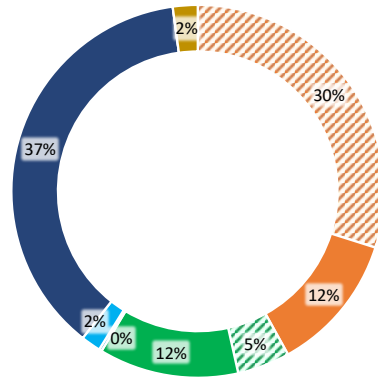


# Preferred Sources of Electricity



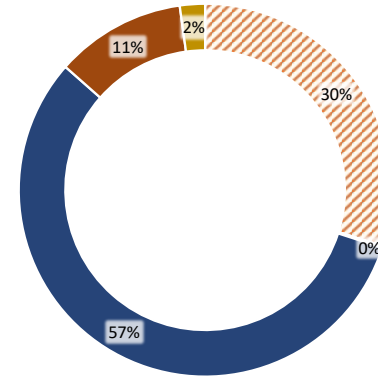
**Scenario 1 in 2035**

100% by 2030 Renewable Energy Standard  
30% Tier II by 2035  
Includes Biomass as Tier I resource



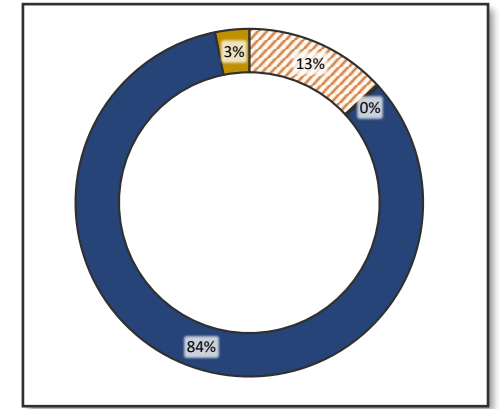
**Scenario 2 in 2035**

100% by 2030 Renewable Energy Standard  
30% Tier II and 30% Regional Tier by 2035;  
Includes Biomass as Tier I resource



**Scenario 3 in 2035**

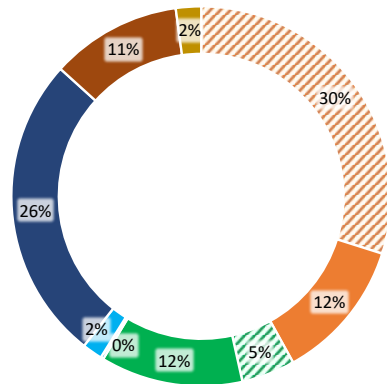
100% by 2030 Clean Energy Standard  
30% Tier II by 2035  
Includes Biomass and Nuclear as Tier I resources



**Business-as-Usual (BAU) in 2035**

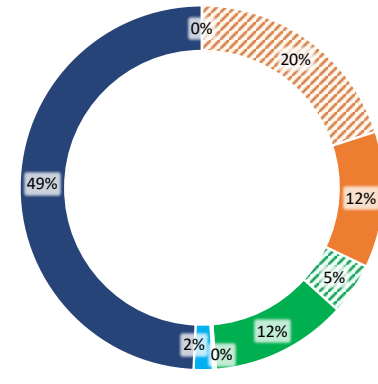
75% by 2032 Renewable Energy Standard  
10% Tier II by 2032  
Includes Biomass and excludes Nuclear as Tier I resources

- Solar (In-State)
- Solar (Out-of-State)
- Wind (In-State)
- Wind (Out-of-State)
- Hydro (In-State)
- Hydro (Out-of-State)
- Legacy Hydro (Out-of-State)
- Nuclear (Out-of-State)
- Biomass (Out-of-State)



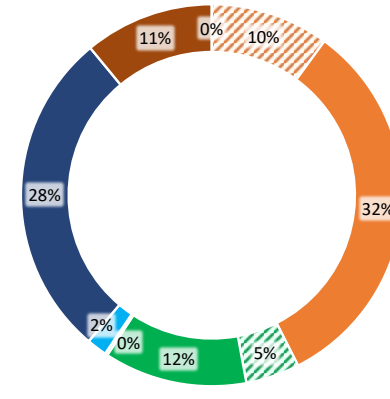
**Scenario 4 in 2035**

100% by 2030 Clean Energy Standard  
30% Tier II and 30% Regional Tier by 2035;  
Includes Biomass and Nuclear as Tier I resource



**Scenario 5 in 2035**

100% by 2030 Renewable Energy Standard  
20% Tier II and 30% Regional Tier by 2035  
Excludes Biomass from Tier I eligible resources



**Scenario 6 in 2035**

100% by 2030 Clean Energy Standard  
10% Tier II and 50% Regional Tier by 2035  
Includes Nuclear as Tier I resource  
Excludes Biomass from Tier I eligible resources

# 3: Possible Policy & Program Changes

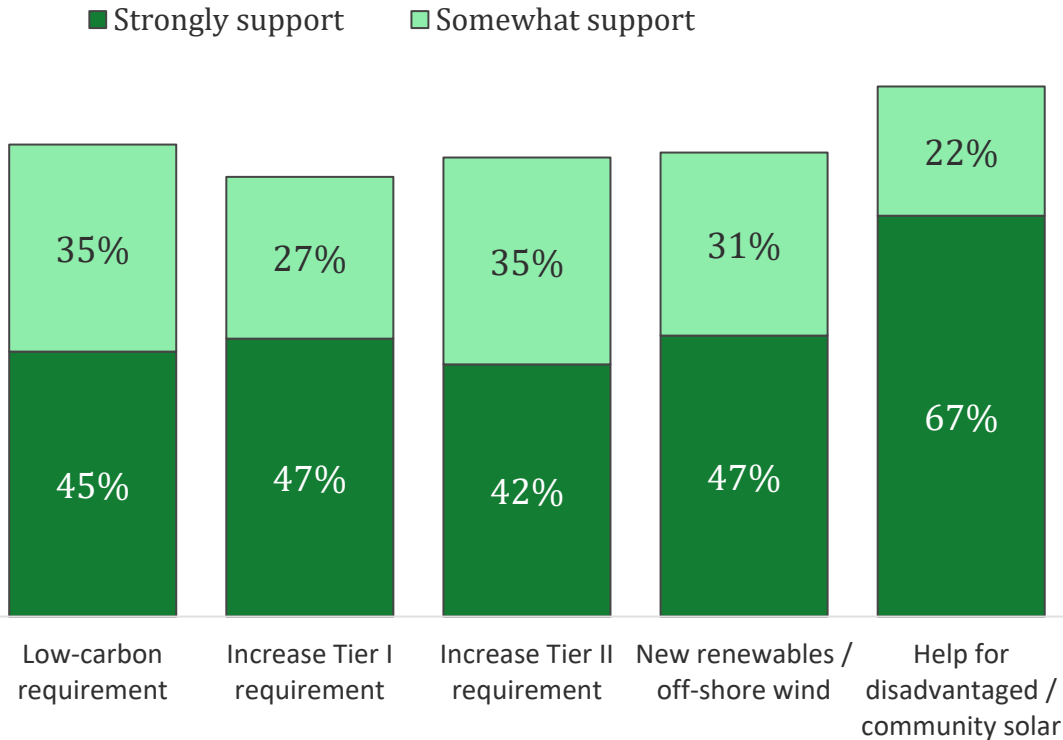
## What did we ask about?

Finally, throughout the public engagement efforts, the Department asked Vermonters to weigh in on **where they felt policies and programs could better achieve the outcomes they desired (ex. supporting priorities and preferred sources of electricity) and how much they would support (or oppose) certain policy changes.**

## Why does this matter?

Understanding where Vermonters would like to see changes in or greater emphasis from policies and programs will help the Department develop its recommendations to deliver to Vermont policymakers and weigh tradeoffs between the various issues they must consider under **30 VSA 202a.**

# Possible Policy & Program Changes



% of **follow-up survey (92 responses)** takers who strongly or somewhat support each policy. See the [Appendix](#) for full question wording for each option.

## Key Takeaway 4

Many Vermonters are at least somewhat supportive of policy and program changes that increase requirements for low carbon and renewable electricity in a way that supports the most vulnerable Vermonters. Any policy or program modifications should consider which Vermonters are most vulnerable to impacts from those changes (ex. increasing supply of clean or renewable energy, changing programs that provide access to benefits of renewables) and specify mechanisms to directly support them.

### Low carbon and renewable requirements:

Individuals participating in the focus groups and follow up survey were asked about support for different policy or program changes. A majority of the 92 people who participated indicated they were at least somewhat supportive of additional policy requirements around low carbon or renewable electricity, supporting both new regional and in-state generation.

Similar themes emerged in conversations across the regional events. When asked about what would like future electricity mix to look like, while some participants in regional events noted they liked the current electricity mix, many supported getting electricity from more low-carbon or renewable resources.

### Supporting Vulnerable Vermonters *(discussion continued the next slide)*

Discussions across the 11 focus groups and regional event series highlighted equitable access to the benefits from and opportunities to engage with renewable electricity as an area for future focus. In the follow up survey following focus groups conversations, two-thirds of those individuals voiced strong support for future policies providing support to disadvantaged Vermonters through mechanisms such as community solar, a theme often echoed in the regional events.

# Possible Policy & Program Changes

## From Focus Group Discussions:

“I was going to say affordability is my top. Obviously, the better angels of my nature want equity, renewability, and low emissions to be a priority. But I bought an old New England house for pennies on the dollar. I can't afford startup costs for new loans, and I don't have the budget for monthly payments in addition to my mortgage.”

## From Rutland Regional Planning Commission Event Summary:

“Most participants believed that Vermonters have their plates too full to engage in the energy regulatory apparatus. I would like to stress that all participants want a reliable, affordable, and sustainable energy system, and feel there is no collective bandwidth to add this to their struggle to survive.”

## Key Takeaway 4, continued:

As previously noted, on the statewide survey, affordability was identified as the single most important factor by 29% of respondents, more than any other issue. Focus group conversations sharpened this emphasis. In the groups, it often seemed as though many participants wanted to support reducing emissions but felt they could not do so due to financial reasons.

Pathways to help low-income populations to better access renewable energy programs (such as net-metering or community solar) and not leaving protection of low-income residents up to utilities was also a theme of the regional events. In both the regional events and focus groups, a desire to support net-metering without burdening those who could not participate was expressed.

In the Stakeholder Advisory Group and some regional events, the need to ensure communities are involved in the siting process was discussed, especially to the extent future policies increase the role of in-state generation in meeting clean or renewable energy objectives.

Of note, reflections on the regional events highlighted challenges of many to participate in conversations such as these given efforts just to make ends meet.

# Possible Policy & Program Changes

## Key Takeaway 5

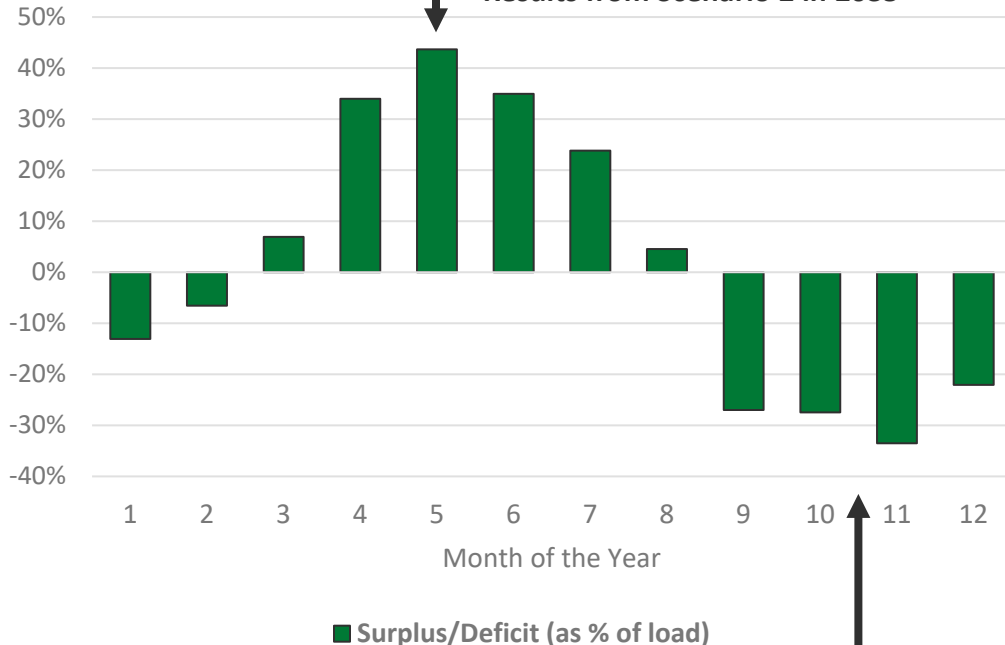
As Vermont considers achieving 100% renewable or low carbon electricity, it will need to do so in combination with a more granular understanding of the alignment of renewable generation and demand for electricity.

Compliance with the Renewable Energy Standard currently occurs on an annual basis. This means credits from times of the year with overgeneration by renewable sources can be used to cover requirements from other months where there is a deficit of renewable electricity generation. Results from the modeling indicate each scenario could achieve 100% renewable or low carbon electricity on an annual basis. However, this comes with significant variability of when renewable or low carbon electricity is produced throughout the year (a consistent finding across scenarios). Scenarios with larger seasonal swings between surpluses and deficits carry more exposure to wholesale electricity market volatility. Plus, during months of renewable generation deficit, Vermont's grid would rely on electricity from the regional generation mix which is anticipated to be primarily fossil fuel for the foreseeable future (albeit with decreasing emissions over time due to the combination of New England states' policies).

Becoming renewable or low carbon in all hours of the year will require holistically thinking about the diversity of Vermont's electric supply portfolio and demand-side resources: efficiency, load/generation flexibility including storage, and conservation. In the regional events, many Regional Planning Commissions noted participants struggled to discuss electricity generation without also discussing the roles of energy efficiency, weatherization, or other electrification measures in achieving decarbonization objectives. This may also warrant consideration of more granular (sub-annual) accounting of renewability.

Periods in the spring and summer months show surplus generation (more generation than demand) by renewable resources

Results from Scenario 2 in 2035



Periods in the fall and winter months show deficits of electric generation (less generation than demand) by renewable resources

# Recommendations

## Policy & Program Recommendations



# Policy Recommendations

Following the public engagement and technical analyses, the Department offers the following recommendations for the future of clean and renewable electricity policies and programs:

## Policy

### **1. 100% Clean Energy Standard by 2030**

Vermont should move towards a 100% Clean Energy Standard while maintaining the current 75% renewable by 2032 requirement.

### **2. 30% New Renewable Energy by 2035; 15% New, Renewable Energy from Distributed Generation**

Utilities should be required to increase electricity from new renewable sources, that can be delivered into the New England Region. Of the 30%, at least half new renewable energy should come from small, distributed generation in Vermont

## Programs

**3. Change the current net-metering program** to compensate “excess generation” at “avoided cost” (the cost utilities would otherwise pay for energy)

**4. Create the *Renewable Energy for Communities (RE4C) Program***  
Require utilities to procure 80 MW of community energy systems and other distributed generation to benefit communities to support equitable access to the benefits of renewable energy

## Further Study

### **5. The Department should conduct additional studies to:**

Understand benefits and costs to the transmission and distribution (“T&D”) system related to increases in distributed renewable energy

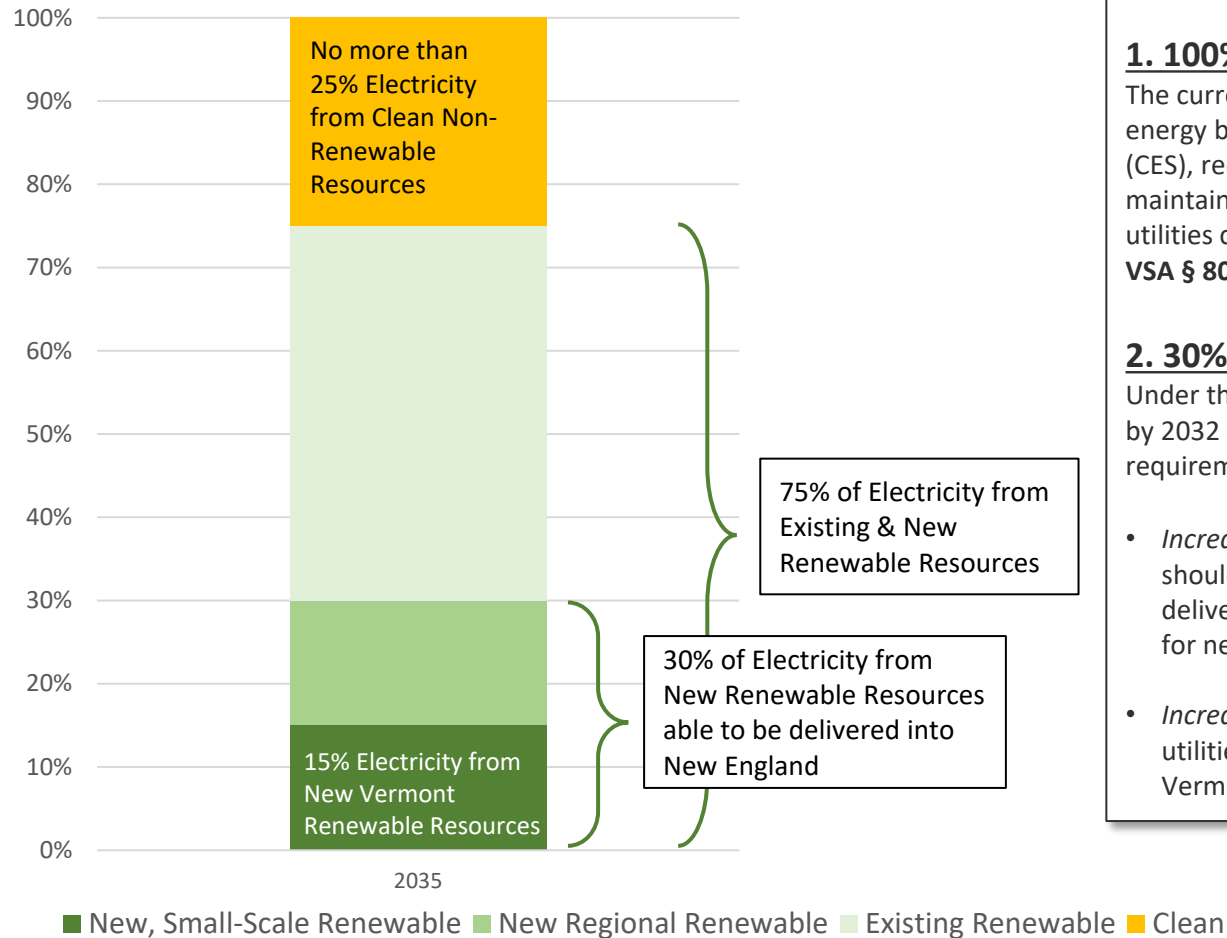
*and*

Understand opportunities for more granular reporting of renewability in the Renewable Energy Standard

[Appendix C](#) of this report provides language for how the Department proposes these recommendations be implemented in statute.

# Policy Recommendations

## 100% Clean Energy Standard in 2035



The Department makes the following recommendations about revising the current Renewable Energy Standard:

### 1. 100% Clean Energy Standard by 2030

The current Renewable Energy Standard (RES) requires retail electric utilities to purchase 75% renewable energy by 2032. The Department recommends that Vermont should adopt a 100% Clean Energy Standard (CES), requiring utilities to purchase 100% of electricity from carbon-free resources by 2030 while maintaining the current 75% renewable energy by 2032 RES requirement. To meet the CES requirement, utilities could utilize any resource that is currently considered renewable under the current RES (see **30 VSA § 8002**), such as wind, solar, hydropower, and biomass, in addition to nuclear energy.

### 2. 30% New Renewable Energy by 2035; 15% from Distributed Generation

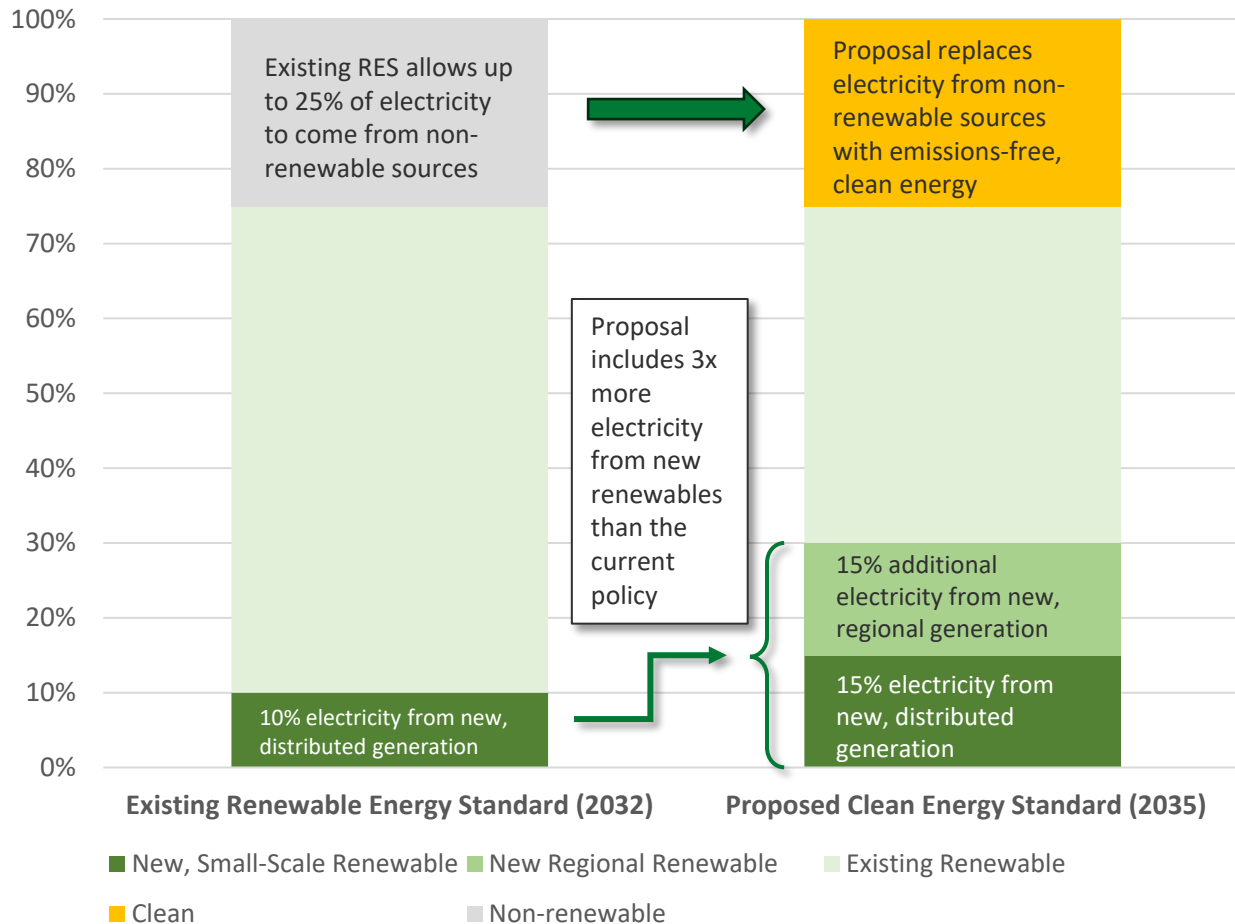
Under the current RES, utilities must purchase 10% renewable energy from new, small-scale generation by 2032 (currently the "Tier II" requirement). The Department recommends this existing Tier II requirement be modified in two ways under the proposed 100% CES:

- *Increase the requirement for new renewables from 10% to 30%.* The Department recommends utilities should be required to purchase or generate 30% of electricity from new renewable sources that can be delivered into the New England Region, regardless of size. This would increase the overall requirement for new renewable energy.
- *Increase the requirement for new, distributed generation to 15%.* The Department recommends utilities be required to purchase or generate 15% electricity from new distributed generation in Vermont. This requirement would contribute to a utility's 30% new renewable energy requirement.



# Policy Recommendations cont.

Comparing the current Renewable Energy Standard (left) with the Department's Proposed Clean Energy Standard



- The Department's proposal **increases the amount of emissions-free electricity** Vermont utilities are required to purchase from 75% to 100%. This signals a commitment to clean energy and reducing emissions as tracked by Vermont's greenhouse gas inventory pursuant to the Global Warming Solutions Act.
- A 100% Clean Energy Standard recognizes that many Vermont utilities have existing contracts for carbon-free, nuclear power through the 2030s and that nuclear facilities in New England provide a **valuable reliability service** that Vermont depends upon.
- The proposal also **increases the total amount of electricity from new resources** utilities are required to purchase from 10% to 30% and creates a new requirement for new regional renewables. This supports further emissions reductions and encourages Vermont utilities to pursue offshore wind and other similar projects to supply electricity at times when demand for electricity is high.
- As part of meeting the new, renewable small-scale generation requirement in Vermont, the Department proposes the Renewable Energy 4 Communities program. While this program would increase costs, it **enables greater community access** to the benefits of this generation (see slide 59).
- The Department estimates that the cost of adopting the 100% Clean Energy Standard described here would cost \$110 million over 10 years (equivalent to roughly a 1% rate increase) relative to business-as-usual including the current Renewable Energy Standard.

# Program Recommendations (1 of 2)

## 3. Changes to the Net-Metering Program will Help Mitigate Costs Associated with Increased New Renewables

Net Metering remains the most expensive new renewable resource delivered to Vermonters. It also provides the opportunity for Vermonters to produce their own electricity.

In parallel to the policy recommendations described on [Slides 56 and 57](#), the Department recommends the legislature direct the Public Utility Commission (PUC) to compensate “excess generation” from net-metered systems at “avoided cost”.

- *Excess Generation* means electricity that is generated by a net-metered system but not consumed on-site.
- *Avoided cost* refers to the value the generation provides to the utility, equivalent to the price of electricity they would purchase instead of the excess generation.

This change to the net-metering program will significantly reduce costs to ratepayers associated with the development of new, small-scale generation projects. This is likely to have the effect of limiting or effectively ending “group” or “virtual” net metering installation rates because it lowers the total compensation that a facility would receive because the resulting compensation is expected to be lower than what is necessary to install solar. The virtual net metering framework remains, however, and would be used again if prices were to increase.

This change to the compensation of excess generation encourages distributed generation sited with connected load. This change, or something similar, is critical to cost containment and the overall proposal would be less viable without them (because of undue rate pressure).

# Program Recommendations (2 of 2)

**4. Develop a *Renewable Energy for Communities (RE4C)* program. This would continue to support broad access to the benefits of renewable energy and provide an alternative mechanism to group net-metering.**

Such a program would strive to:

- **Deliver benefits** from renewable energy systems to customers who have historically been marginalized or faced inequitable access to the benefits of renewable energy, including tenants of affordable housing, schools and municipal buildings
- **Support community participation** in the development and governance of distributed generation

The Department recommends that the program require utilities to purchase **80 MW of community energy systems and other distributed generation to benefit communities by 2032** through yearly solicitations. Utilities would be required to review projects according to a consistent set of core criteria approved by the Public Utility Commission and consistent with the program objectives.

Since the Department's initial process did not get into the details of program design, **the Department recommends it initiate a process to conduct further public engagement and technical analysis to support the design and implementation of the program, considering issues such as:**

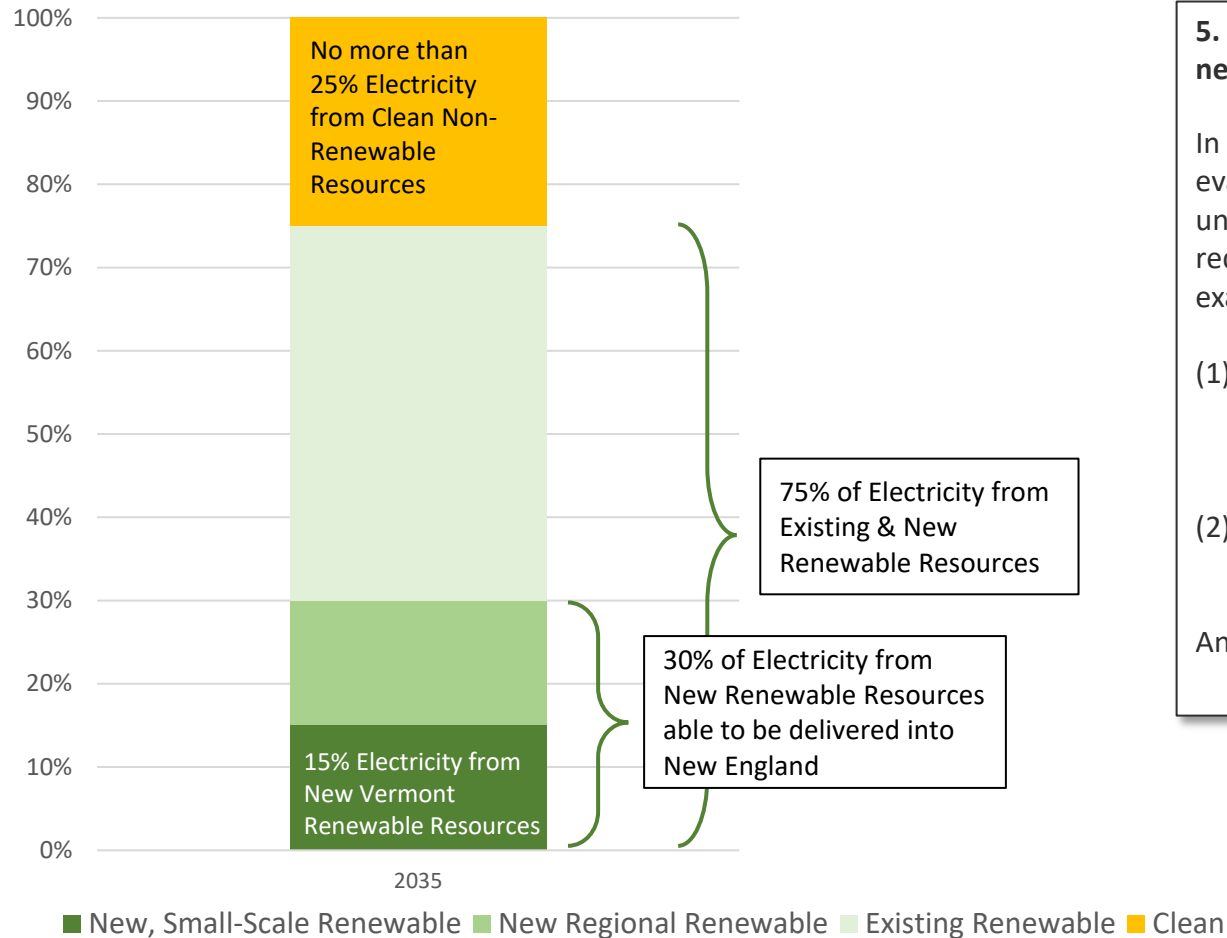
- Goals for the program
- Compensation for generation in the program and carveouts for projects benefiting specific communities
- Review criteria for projects considering issues such as community support and/or engagement, potential for local workforce development and other community benefits to be delivered to the host community, location of the project including whether it is identified as a preferred location in a regional or municipal enhanced energy plan, and generation profile

Through the process, the Department should strive to engage with a diverse array of stakeholders, including environmental justice focus populations, highly energy burdened communities, renters, and multifamily affordable housing representatives.

The Department's proposed language to implement the RE4C program can be found starting pg. 13, Section § 8005(c) of [Appendix C](#).

# Recommendations – Further Study

100% Clean Energy Standard in 2035



**5. To continue to prepare for a highly renewable energy future, additional study is necessary.**

In addition to the policy & program changes proposed, research is necessary to further evaluate the impact of significant increases in renewable energy deployment (whether under business-as-usual or increased investments). The General Assembly should require the Department of Public Service to complete an analysis, by March 2025, that examines:

- (1) the potential for the Renewable or Clean Energy Standard to account for renewable energy on a basis more granular than annually (e.g. seasonally, monthly, or hourly) and
- (2) the benefits and costs to distribution and transmission infrastructure of increases in distributed renewable energy.

Any such requirement should come with associated funding to fulfill the requirement.



# Recap: Recommendations

The Department believes this suite of policy recommendations best balances the priorities for affordability, reliability, & emissions reductions voiced during public engagement.

- 1 Adopt a 100% Clean Energy Standard, while maintaining the current 75% renewable energy by 2032 requirement.
- 2 Under the Clean Energy Standard, by 2035 require 30% renewable energy come from new renewable resources built after 2010. Half (15%) of this new renewable energy should be required to come from distributed renewable energy connected to the Vermont distribution system. Mitigate cost risks by lowering Alternative Compliance Payments and avoiding large infrastructure costs caused by cumulative impact of distributed generation.
- 3 Change the compensation structure of the current net-metering program to reduce costs of meeting the Clean Energy Standard and reduce the inequitable cost-shift.
- 4 Develop a Renewable Energy for Communities program to support community renewable energy systems and deliver benefits from renewable energy to communities who have been marginalized or faced inequitable access.
- 5 The Department of Public Service should further study opportunities of more granularly (sub-annual) accounting of renewability and the benefits and costs to transmission and distribution infrastructure associated with increases in distributed renewable energy.

# Reflections on the Process

**Reflections on Engaging with  
Vermonters**

**Accountability Assessment:  
Meeting Engagement Goals**

# 4: Reflections - Engaging with Vermonters

Throughout this effort, the Department has tried to comprehensively engage Vermonters in the development of recommendations for policy and program changes in the electric sector. It has also sought to make these engagement opportunities more equitable and accessible to a broader array of Vermont's communities.

This has been implemented by using a variety of engagement strategies, a focus on providing educational materials to support discussions, partnering with organizations to reach broader audiences, and ensuring budgets for supporting compensation of participation and translation of materials, as appropriate, were available.

To support this effort, the Department started this process by setting goals and accountability mechanisms to assess success in making the process more accessible and create a baseline of information on engagement efforts to build off moving forward. This section reflects on the process and provides a self-assessment of how the Department met its goals.

## **Why does this matter?**

The Department recognizes that engaging with Vermonters throughout the lifecycle of the policymaking and program development process, and not just after recommendations have been formulated, is critical for ensuring Vermonters' needs are met by state policies and programs. Better engaging with Vermont's communities will also be central to the Department's implementation of Vermont's environmental justice law ([Act 154 of 2022](#)) which highlights that environmental justice in Vermont means, in part, "meaningful participation in decision-making processes" for all individuals.

# Reflections: Engaging with Vermonters



Throughout this effort, the Department has sought to comprehensively engage Vermonters in the development of recommendations for policy and program changes in the electric sector. Although this process is not yet complete, the Department has the following reflections on how this process to date and welcomes public input on this topic to help the Department refine its efforts to engage with the public moving forward.

## Reflections on what worked well:



**Centering public engagement** as a core aspect of this policy review process with multiple engagement touchpoints allowed the Department to continuously engage with Vermonters and utilize different engagement strategies to hear what matters most to a variety of stakeholders. Throughout each aspect of this effort, the Department heard feedback that Vermonters welcomed the opportunity to engage in discussion on these issues and with members of the Department.



**A commitment to accountability** ([see slide 17](#)) ensured the Department took steps to try and understand and track who we reached with our engagements and who we did not. While we are still in the process of assessing all the data collected, this information will serve as a baseline to inform future engagement efforts and help us be transparent about who informed the recommendations coming out of this effort.



**Partnerships were critical** to help reach a broader audience, think outside the box on how to hold these conversations, and think through the accessibility of materials used during engagement opportunities. Expanding such partnerships, particularly with organizations that serve Vermont's most impacted communities, will be important moving forward



# Reflections: Engaging with Vermonters



Throughout this effort, the Department has sought to comprehensively engage Vermonters in the development of recommendations for policy and program changes in the electric sector. Although this process is not yet complete, the Department has the following reflections on how this process to date and welcomes public input on this topic to help the Department refine its efforts to engage with the public moving forward.

## Reflections on key learnings for future efforts:



**Prioritizing resources for targeted outreach to the most impacted communities** and having back up plans for engaging those communities was a lesson learned from this project. The Department attempted to include more equitable outreach strategies, such as regular and transparent communications and including budgets for compensating participation and translation of materials as appropriate, throughout this effort. However, a number of strategies to directly engage impacted communities or community-based organizations either fell through or lacked the appropriate timing or resources to be truly meaningful. Moving forward, the Department will need to reflect on how to best allocate funding and staff capacity to support the most critical engagement needs, informed by the engagement data collected by this effort.



**The need for educational materials and ongoing capacity building opportunities** was apparent throughout this effort. While the Department took steps to develop a series of educational materials, there is a need to continue to refine these materials to be more accessible, including reflections on what needs to be communicated and the best way to present the information. The statewide poll revealed that Vermonters vastly underestimate the amount of low carbon resources currently in Vermont's electricity portfolio, emphasizing the need for more engagement around these issues.

# Goals & Pathways for Accountability

As noted on slide 17, the Department established four goals to guide the public engagement effort and identified pathways to hold itself accountable to those goals:

	1	2	3	4
<b>GOAL</b>	Reach a broad array of Vermonters beyond those stakeholders already deeply engaged in these conversations	Create inclusive spaces where stakeholders feel heard and able to share their expertise and opinions	Be transparent in how feedback shared during engagement opportunities is incorporated into recommendations	Build capacity for engagement in these discussions in the long term through elevating energy literacy
<b>ACCOUNTABILITY</b>	Collect and report demographic information on who participates in engagement opportunities to develop a baseline understanding of who is (and is not) engaged	Develop feedback surveys to request input on how accessible and inclusive engagement opportunities are and understand how to improve moving forward	Continue to publish all feedback received and record where it was or was not included in final recommendations, where appropriate	Develop accessible educational materials to support engagement opportunities and include in feedback surveys, where appropriate, questions on how people feel their understanding of the concepts under consideration has changed

The following four slides (67-70) provide the Department’s self assessment about how each of these goals were achieved throughout this process, highlighting steps taken to achieve the goals and lessons for future engagement efforts.

# Accountability: Reaching Broad Audiences



## Goal 1

Reach a broad array of Vermonters beyond those stakeholders already deeply engaged in these conversations

## Accountability

Collect and report demographic information on who participates in engagement opportunities to develop a baseline understanding of who is (and is not) engaged

## Assessment

### Demographic Questionnaire:

The Department developed a template demographic questionnaire in January 2023 and used it to collect voluntary demographic information during the webinar series, regional events, technical workshop, and public comment workshops. Demographic information was also collected by MassInc Polling Group consistent with the Department's template during statewide polling and focus groups.

### Reporting:

Data collected through these voluntary surveys is presented in this report on slides [22](#), [25](#), [28](#), and [35](#).

### Future Considerations:

- The Department's template could be further refined to ensure only data that will be used to target future engagements is collected and to consider whether any questions should be added.
- Initial data show gaps in portions of the Department's outreach (ex. renters, youth, BIPOC populations). In the future, more targeted outreach should be considered to reach these communities.
- While this effort was an initial pilot for collecting this type of information to guide outreach and provide context for policy and program recommendations, the Department will need to reflect on broader implementation throughout the portfolio of its work and when this information should be regularly collected.

# Accountability: Creating Inclusive Spaces



## Goal 2

Create inclusive spaces where stakeholders feel heard and able to share their expertise and opinions.

## Accountability

Develop feedback surveys to request input on how accessible and inclusive engagement opportunities are and understand how to improve moving forward

## Assessment

### Feedback Questionnaire:

The Department developed a template feedback questionnaire in January 2023 and used it to collect voluntary feedback on the webinar series, regional events, technical workshop, and public comment workshops. Feedback was also collected by MassInc Polling Group (MPG) during statewide polling and focus groups and the regional planning commissions during the regional event series.

### Feedback Received:

The table to the right illustrates feedback provided to the Department for each of the events it hosted (this excludes the regional events hosted by the regional planning commissions and focus groups held by MPG).

	Disagree	Neutral	Agree
I'm happy with the amount of information presented during the event.	12%	19%	69%
The information presented was easy to understand and accessible	21%	22%	57%
My understanding of Vermont's electricity sector has increased as a result of attending the event.	10%	13%	78%
I had the opportunity and space to ask questions and participate.	15%	22%	63%
The event met my expectations.	23%	17%	60%

### Future Considerations:

Feedback offered during the suite of engagement efforts underscored that Vermonters appreciated opportunities to participate in this policy and program review and that the events helped increase broad Understanding of the electric sector in Vermont and related policies and programs.

Feedback illustrates the Department should continue to refine informational materials and presentations for accessibility, fine tuning the amount of information presented during events and space given to ask questions.

# Accountability: Transparency



## Goal 3

Be transparent in how feedback shared during engagement opportunities is incorporated into recommendations

## Accountability

Continue to publish all feedback received and record where it was or was not included in final recommendations, where appropriate

## Assessment

### Approach to Transparency

The Department took several steps to be transparent on how feedback from the public was incorporated into this process and influenced final recommendations, including:

1. Request for Information (RFI) to Inform Public Engagement Plan (PEP): Published a synthesis of what the Department heard alongside all public comments received; In the PEP, worked to explicitly tie public engagement strategies to what was heard in the RFI responses
2. Technical Analysis (Phase 2): The scope of work was provided to utilities, regional planning commissions, environmental advocates, and legislators for review and discussed during public hearings of the Senate Committee on Natural Resources and Energy; Entities that provided feedback were contacted directly by the Department about how their feedback was or was not included, and why. The Stakeholder Advisory Group (SAG) was also convened through a public nomination process and all meetings were open to the public. Two of the six modeled scenarios were specifically allocated to be developed by the SAG.
3. Public Comment Period (Phase 3): Recordings of hearings are available in addition to a summary of comments received (Appendix B) and how the report was changed as a result.
4. Report & Recommendations: The Department tied key takeaways directly to data collected and comments heard in public engagement opportunities and/or technical analysis and noted how those takeaways influenced recommendations.

### Future Considerations:

The Department will continue to evaluate and refine efforts to be transparent in how public feedback is incorporated into policy and program development. One learning from this process was the additional time required to be responsive to comments received and describe how they influence decision-making.

# Accountability: Building Capacity



## Goal 4

Build capacity for engagement in these discussions in the long term through elevating energy literacy

## Accountability

Develop accessible educational materials to support engagement opportunities and include in feedback surveys, where appropriate, questions on how people felt their understanding of the concepts under consideration changed

## Assessment

### Approach to Building Capacity:

Webinars (Phase 1): The webinar series was specifically targeted to enhance capacity to engage in this process through providing recent data and current information on Vermont's electric sector. Each webinar dedicated at least 30% of the time (if not more) to answer audience questions. Slides and recordings from the early events were used throughout the engagement effort and technical analyses to support basic understanding of the issues being discussed.

Statewide Polling & Focus Groups with MPG (Phase 2): An educational policy brief was developed based, in part, on the webinar series slides, and provided to all participants in the 11 focus groups. Focus group facilitators then walked through the information, offering space for questions, while encouraging conversation on the topics.

Regional Events (Phase 2): To support conversations across Vermont, informational two-page flyers were developed to provide basic information on the electric system in Vermont, current policies and programs, and tradeoffs for different sources of electricity. These were co-developed with Regional Planning Commission staff.

### Future Considerations:

1. Although the Department dedicated the initial phase of the engagement effort specifically to education and outreach, educational opportunities were a thread that ran throughout the entire process. This was critical support for people unfamiliar with the topics in engaging in policy and program conversations.
2. Feedback surveys ([slide 68](#)) show that overall, nearly 80% of people who completed a survey felt their understanding of electricity sector policy and programs increased after attending events hosted by the Department. Materials created for this effort showed Department staff how such information could support such learning, although continued refinement of these materials and their delivery will be necessary to increase accessibility (feedback surveys showed, on average, 20% of people did not find materials accessible).
3. The amount of time devoted to developing these materials highlighted the Department's lack of existing educational materials on electric supply and renewables programs, an area for improvement moving forward.
4. Given the success of the webinar series, the Department is considering whether to continue some efforts with some regularity, to keep Vermonters engaged in these discussions and enhance capacity to do so.

# Appendix A

# 1: Demographics from Statewide Polling & Focus Groups

The table here compares example demographics from participants of the initial statewide survey with those of the Vermont population.

- Survey of 700 Vermont residents, including an oversample of 100 residents who self-identified as a race or ethnicity other than white. Responses from white and non-white residents were weighted by race and ethnicity, age and gender, geography, and educational attainment. White and non-white respondents were then combined proportionally and weighted by the parameters above, plus party identification.
- Final weighted demographic closely match initial targets.
- Demographic targets were derived from the latest available 5-year American Community Survey conducted by the U.S. Census Bureau.
- Political ID targets were derived from the latest available estimates from Gallup and the Pew Research Center.

		Vermont residents 18+	Final Weighted Results
<b>Race and Ethnicity</b>	White alone	93%	92%
	Black alone	1%	1%
	Hispanic	2%	2%
	AAPI alone	2%	2%
	Other / more than one race	3%	3%
	Don't know / refused		1%
<b>Gender</b>	Men	49%	48%
	Women	51%	51%
	Non-binary / other		1%
<b>Age</b>	18-29	20%	20%
	30-44	22%	21%
	45-59	24%	24%
	60+	34%	34%
	Don't know / refused		1%
<b>Education</b>	HS or less	36%	35%
	Some college	28%	28%
	BA	23%	22%
	Advanced	14%	14%
	Don't know / refused		1%
<b>Region</b>	Chittenden	25%	26%
	Central (Addison, Orange, Washington)	20%	20%
	North (Caledonia, Essex, Franklin, Grand Isle, Lamoille, Orleans)	19%	22%
	South (Bennington, Rutland, Windham, Windsor)	32%	31%
	Don't know / refused		1%
<b>Party ID with leaners</b>	Democrat	55%	52%
	Republican	30%	27%
	Independent / Other	16%	15%
	Don't know / refused		5%



# 1: Demographics from Statewide Polling & Focus Groups

The table here illustrates how the demographic makeup of participants in the 11 focus groups and follow-up survey compared to those of individuals who participated in the initial statewide survey of 700 Vermonters.

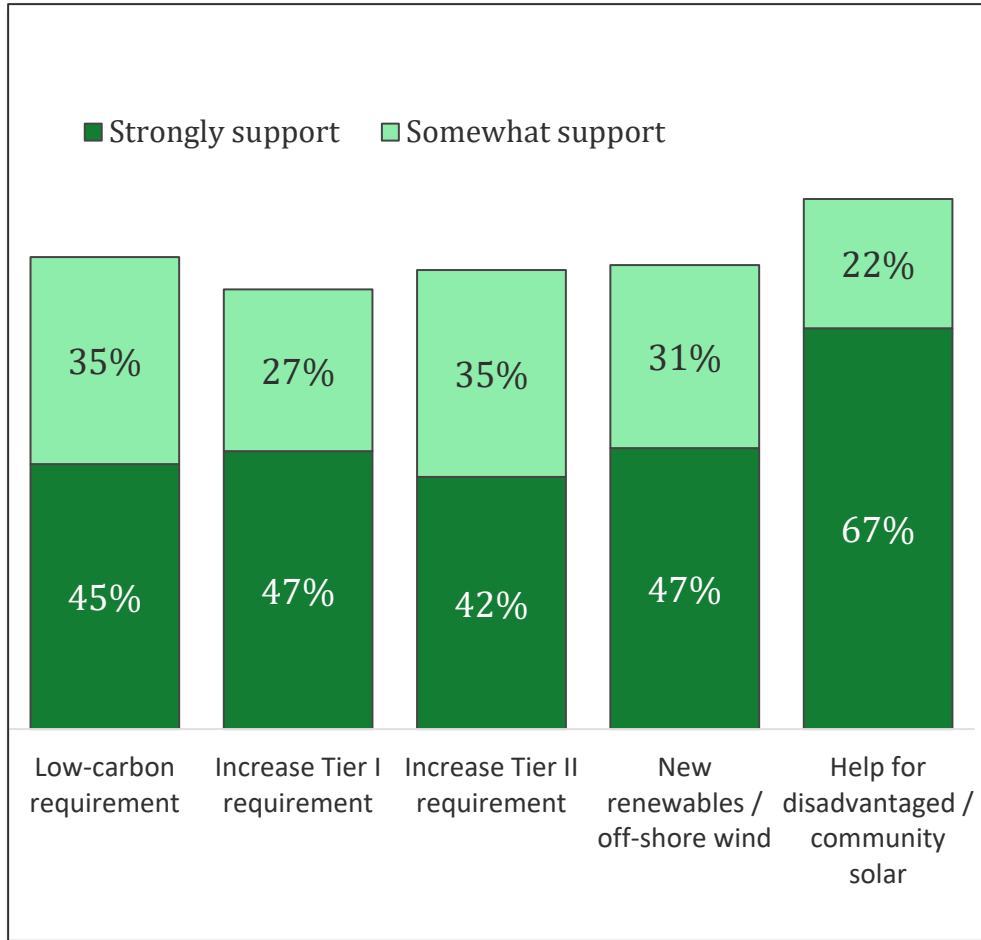
- Overall 92 focus groups participants submitted a follow-up survey.
- Follow-up respondents were older, slightly more diverse, more educated, more Democratic, and more likely to have solar panels.
- MassInc Polling Group used anonymized ID codes to link follow-up responses back to their initial responses.

		Initial Survey	Follow-up Survey
GENDER	Woman	51%	49%
	Man	48%	49%
	Non-binary	1%	2%
AGE	18-29	20%	12%
	30-44	21%	24%
	45-59	24%	23%
	60+	34%	41%
RACE	African American, Black, or African	1%	2%
	American Indian / Indigenous	2%	8%
	AAPI	2%	2%
	Hispanic, Latinx or Spanish Origin	2%	9%
	White	92%	86%
PARTY ID W LEANERS	Democrat	52%	68%
	Republican	27%	18%
	Independent / Other	15%	12%
	Don't know / Refused	5%	1%
EDUCATION LEVEL	High School or less	35%	21%
	Some college, no degree	28%	26%
	College graduate (BA/BS)	22%	35%
	Advanced degree	14%	17%
INCOME	< \$50K	28%	28%
	\$50-99K	31%	41%
	\$100K+	28%	24%
	Don't know / Refused	13%	7%
Do you own or do any of the following?	A heat pump hot water heater	20%	17%
	A heat pump for home heating or cooling	19%	17%
	A fully electric vehicle	4%	8%
	A hybrid gas and electric vehicle	12%	13%
	Have solar panels on your property	17%	22%
	Participate in community solar or group net metering	4%	4%
	None of these	54%	48%

## 2: Technical Analysis Value Streams

Value Stream	Cost or Benefit	Primary Data Source	Impact	Description
Incremental cost of resource	Cost	SEA calculations	High	Cost for resource incremental to generic, residual grid mix
Transmission integration costs	Cost	NREL	Low	Socialized transmission investments driven by shift to variable resources
Interconnection distribution system upgrades	Benefit	SEA estimates; MA Capital Investment Project (CIP) filings	Low	Of distribution interconnection costs paid for by interconnecting customer, a portion is assumed to be a benefit to load customers
Uncleared capacity value	Benefit	2021 Avoided Energy Supply Component (AESC) study	Low	VT-sited, distribution-connected projects are assumed to not bid their capacity into the FCM, instead, acting as load reducers
Reduced <i>share</i> of capacity costs	Benefit	2021 AESC	Moderate	VT-sited, distribution-connected projects that produce during the New England annual peak can reduce the portion of capacity costs paid for by Vermont
Price suppression	Benefit	2021 AESC	Moderate	Renewable resources with low marginal costs tend to drive down prices by shifting the supply curve to the right; applies to capacity, energy, and natural gas (through reduced demand for gas-generated electricity) prices
Reduced transmission costs	Benefit	2021 AESC; VT precedent	Low	Distribution-connected resources that generate energy during periods of high demand could reduce future needed transmission investments
Reduced <i>share</i> of transmission costs	Benefit	ISO-NE	Low	VT-sited, distribution-connected resources that generate energy during VT's monthly peak hours can reduce the <i>share</i> of regional transmission costs paid for by VT (cost shift to other New England ratepayers)
Reduced distribution costs	Benefit	2021 AESC; VT precedent	Low	VT-sited, distribution-connected resources that generate energy during periods of high demand may reduce future needed distribution investments
Reduced transmission and distribution losses	Benefit	2021 AESC	Moderate	Reduction in losses on T&D system
Improved generation reliability	Benefit	2021 AESC	Low	Improvements in generation due to additional capacity purchased in capacity market
Non-embedded GHG emissions	Benefit	2021 AESC	High	Value (based on social cost of carbon) of avoided GHG emissions not already captured RGGI embedded in energy prices
NOx emissions	Benefit	2021 AESC	Low	Value of avoided Nox emissions
Local pollutants	Benefit	EPA's AVERT/COBRA	Moderate	Value of avoided additional pollutants
RE development land use	Cost (not monetized)	Various		Acres of land associated with resources in RES portfolio
Fossil fuel water use	Benefit (not monetized)	Various		Gallons of water consumption and withdrawal reduced through RES portfolio

# 3: Policy Questions from Follow Up Survey



Questions asked on the follow up survey were (results indicated left to right on the bar chart):

1. How much would you support or oppose Vermont requiring utilities to purchase low carbon electricity, in addition to its renewable requirements?
2. As we discussed tonight, Tier I of the Renewable Energy Standard requires that Vermont utilities purchase at least 75% of their electricity from renewable sources by 2032. How much would you support or oppose increasing that requirement beyond 75%?
3. Tier II of the Renewable Energy Standard requires that 10% of electricity must come from new renewable sources within Vermont by 2032. How much would you support or oppose increasing that requirement beyond 10%?
4. How much would you support or oppose Vermont using electricity from new renewable sources outside of the state, like off-shore wind?
5. How much would you support or oppose Vermont helping historically disadvantaged Vermonters better afford renewable electricity, for instance by helping them participate in community solar programs that would lower their electric bill?

# Appendix B

[Access the Public Comment  
Summary Here](#)

# Appendix C

Proposed Edits to Title 30 to Implement the  
Department's Proposed Clean Energy Standard  
& Related Program Recommendations

[Available For Review Here](#)