

2022 Vermont Comprehensive Energy Plan

TJ Poor

Director of Planning

Department of Public Service

Before House Energy & Technology Committee

Jan 21, 2022

Energy Plan Rooted in Vermont Energy Policy

Title 30, Section 202a:

- To ensure, 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**

Energy Plan & Climate Plan

Overlap

Climate Action Plan

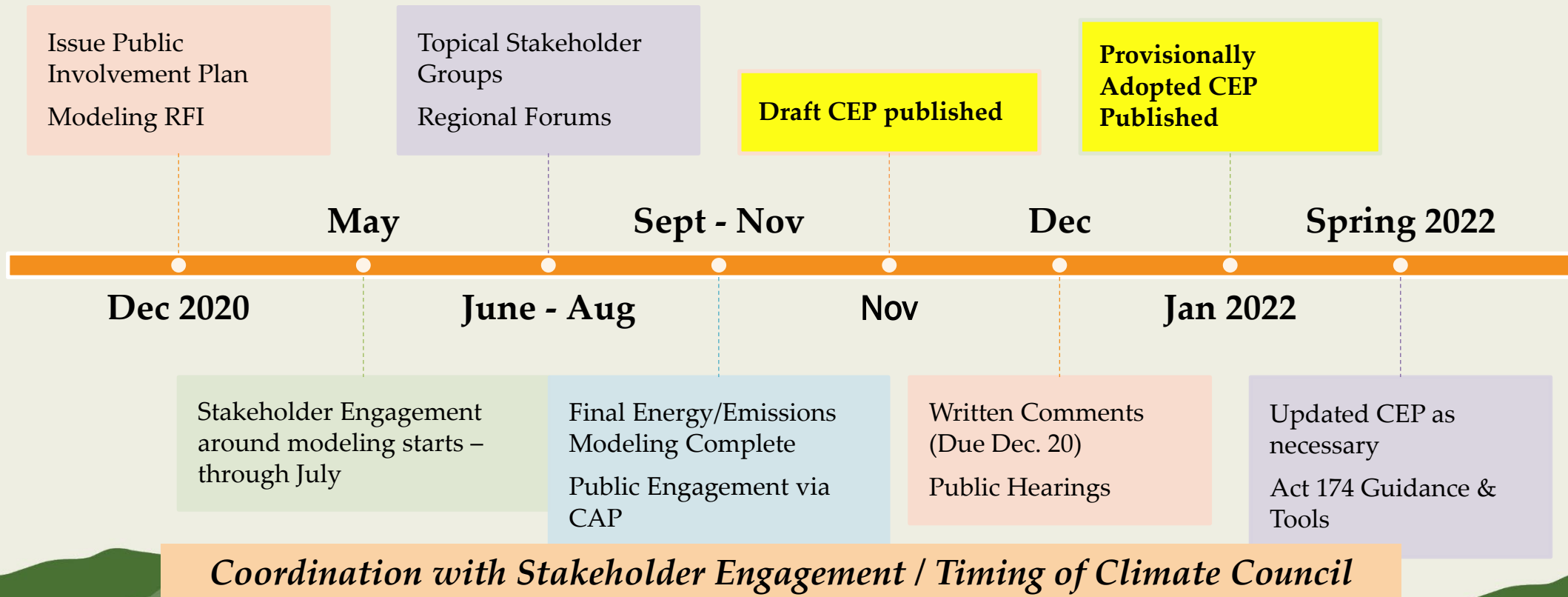
- Climate Adaptation
- Non-Energy GHG Emissions: Agriculture, Waste, etc.
- Sequestration
- GHG Inventory Review

- Cost-effective GHG Reduction Requirements
- Energy Sector Analysis incl. policy & technology scenarios & pathways
- Public Engagement & Modeling Efforts
- Equitable Transitions

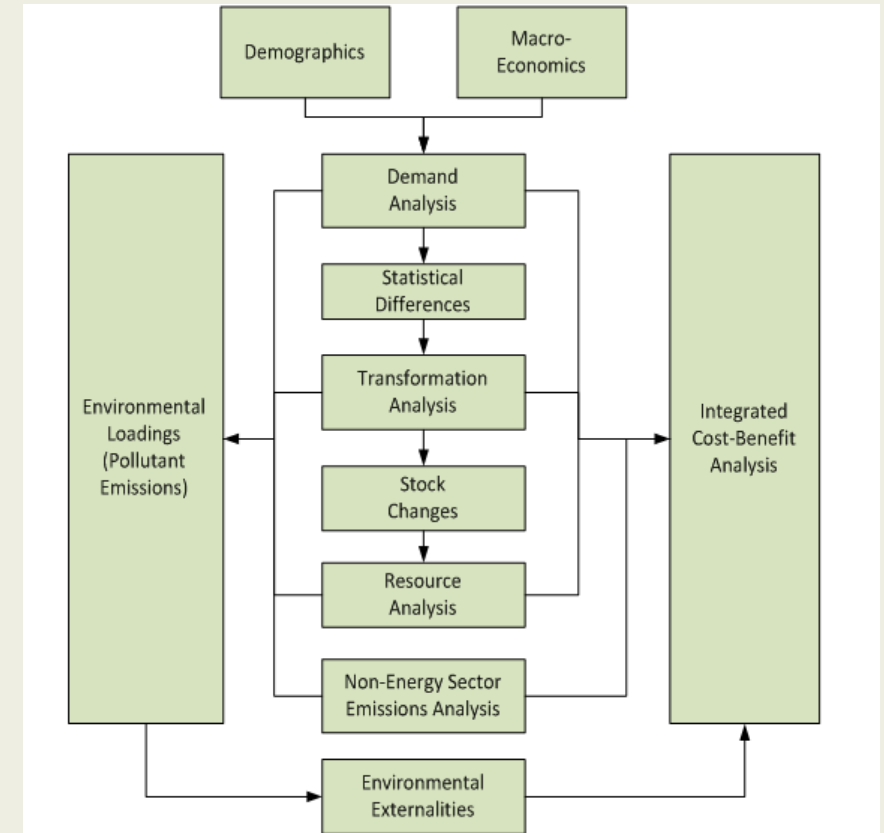
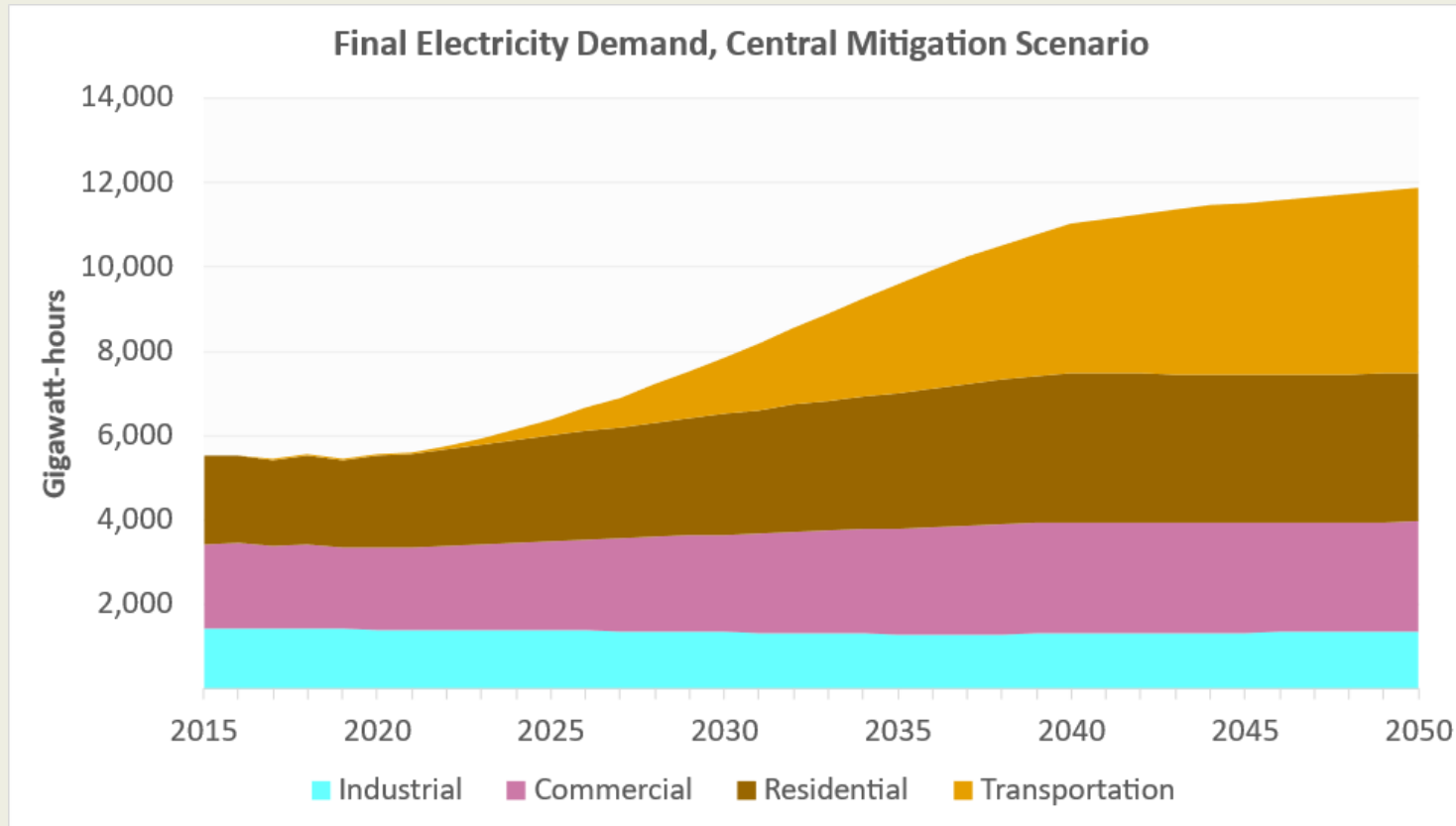
Comprehensive Energy Plan

- Renewable Energy Development
- Electric Plan including Reliability
- Energy System Planning: Adequacy, security, sustainability, Affordability, Economic vitality
- Standards for Local Planning (Act 174)

2022 CEP Engagement Timeline



2022 CEP (& CAP) Modeling



CEP Structure

Theme:
Equity

RECOMMENDATIONS: E.g., Explore opportunities for collaboration with insurance industry stakeholders

Theme: Grid Evolution

STRATEGIES: For Example, Weatherization at Scale

PATHWAYS: For example, Reduce Energy Use in Buildings

PRINCIPLES & GOALS: 2016 CEP Renewable Targets, GWSA GHG Reduction Requirements, §202a (Affordability, Cost-effectiveness, Reliability, Security, Econ Development etc.), Equity, Transparency

CEP Theme: Equitable Transitions

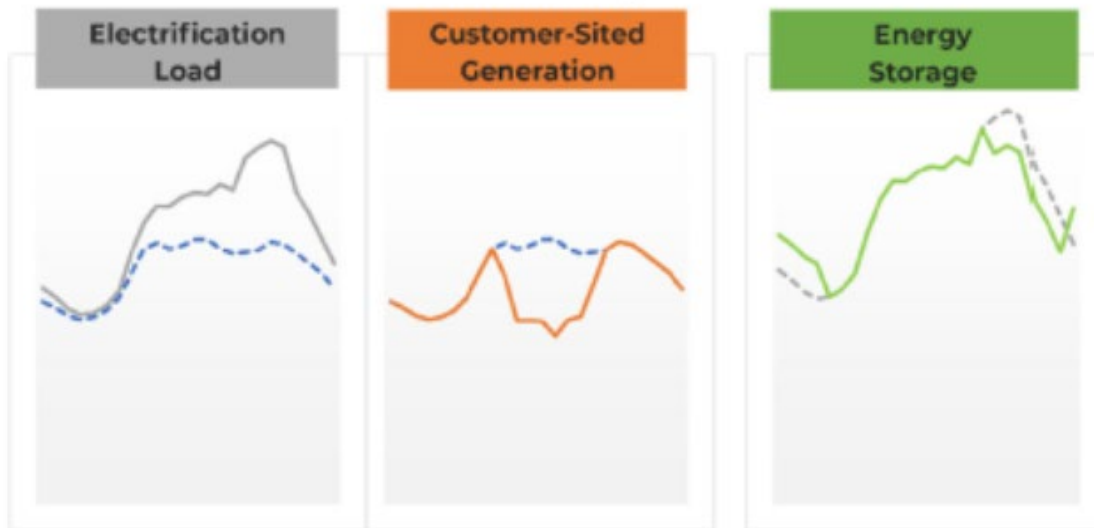
“Every one of us benefits when we make society fairer and more just”

Xusana Davis, Vermont’s Executive Director of Racial Equity, in her 2021 Report to the Legislature.

CEP Theme: Grid Evolution



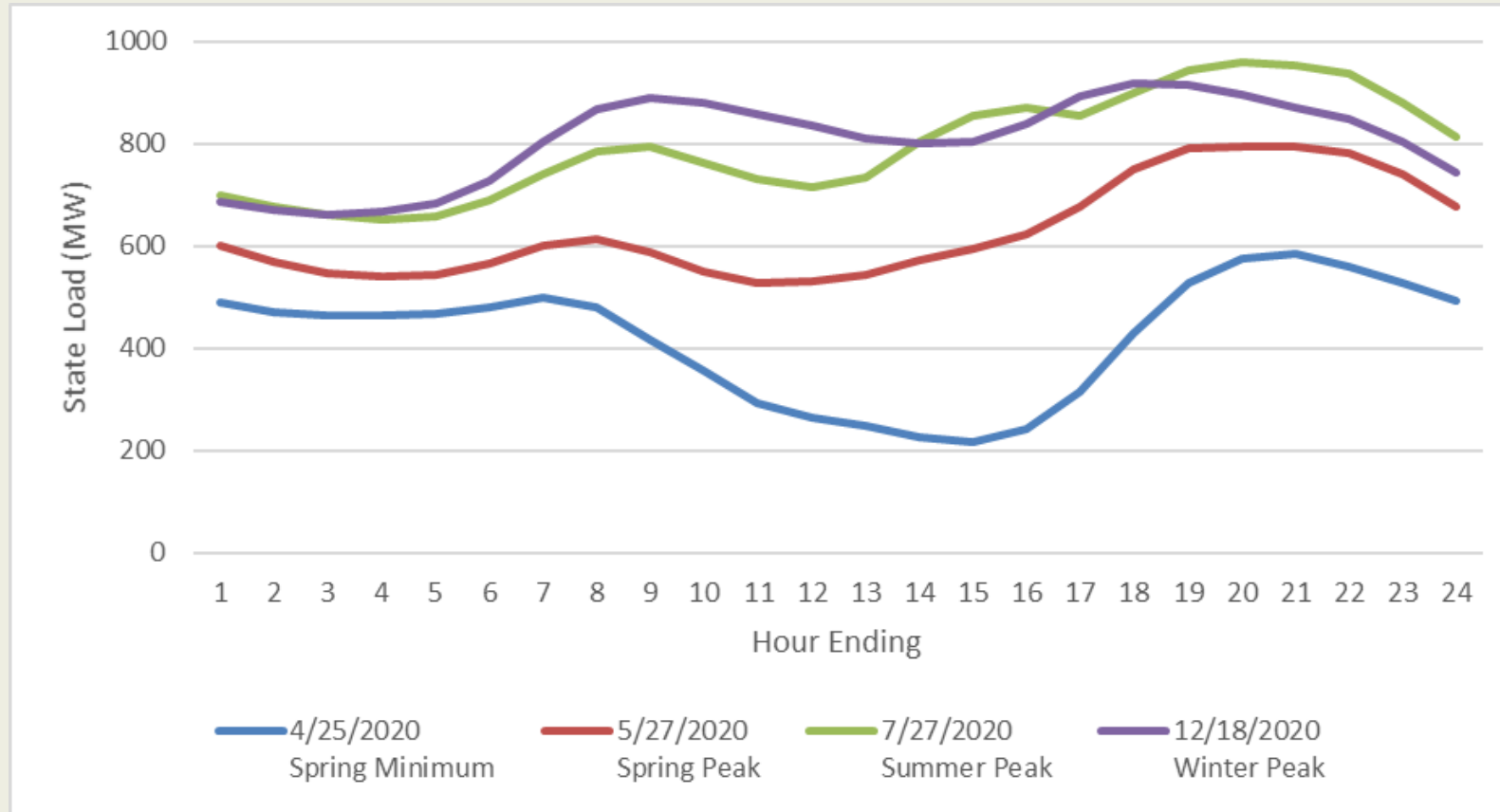
Load Shapes



CEP Vision for Optimized Grid:

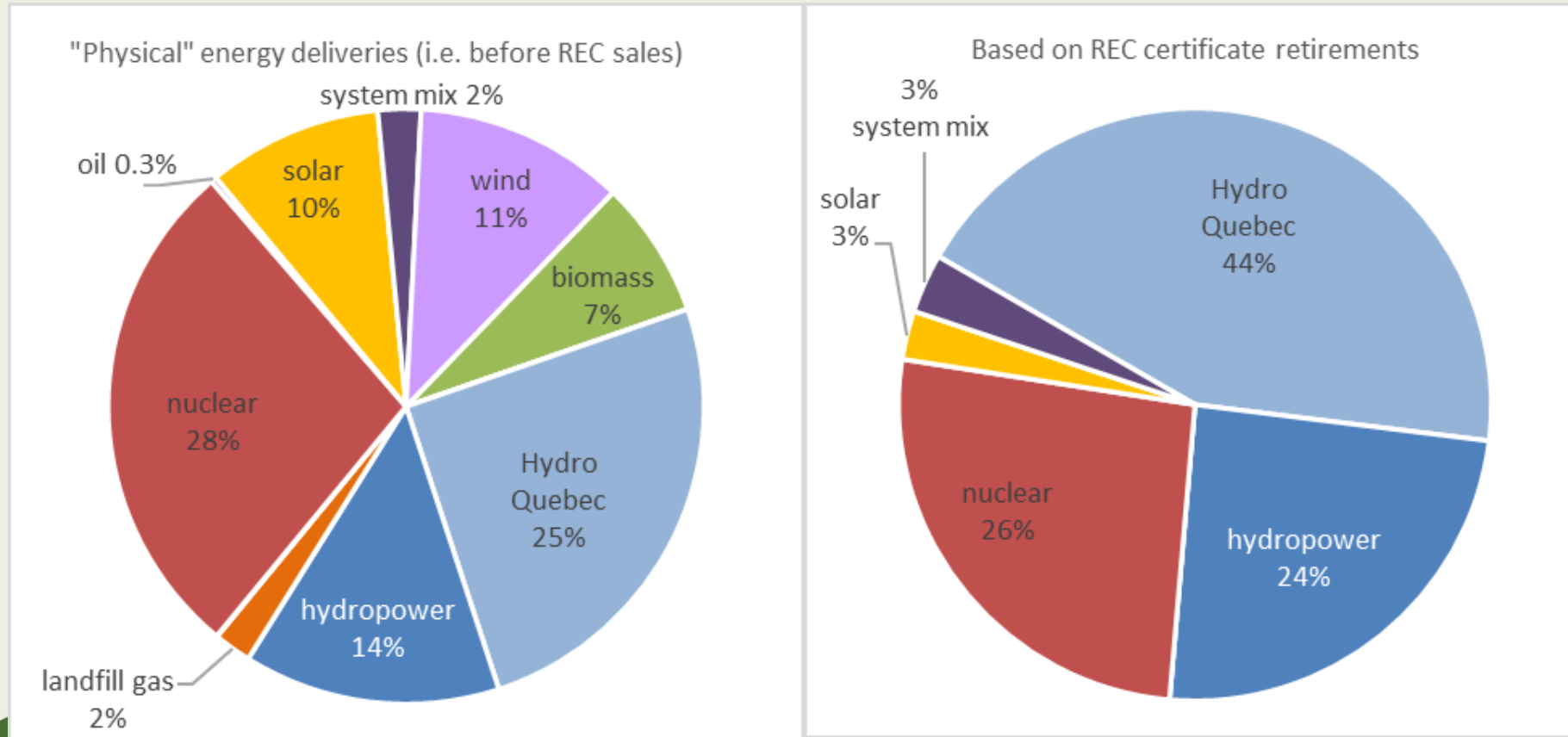
- A secure and affordable grid that can efficiently integrate, use, and optimize high penetrations of distributed energy resources to enhance resilience and reduce greenhouse gas emissions.

Vermont Load Shapes

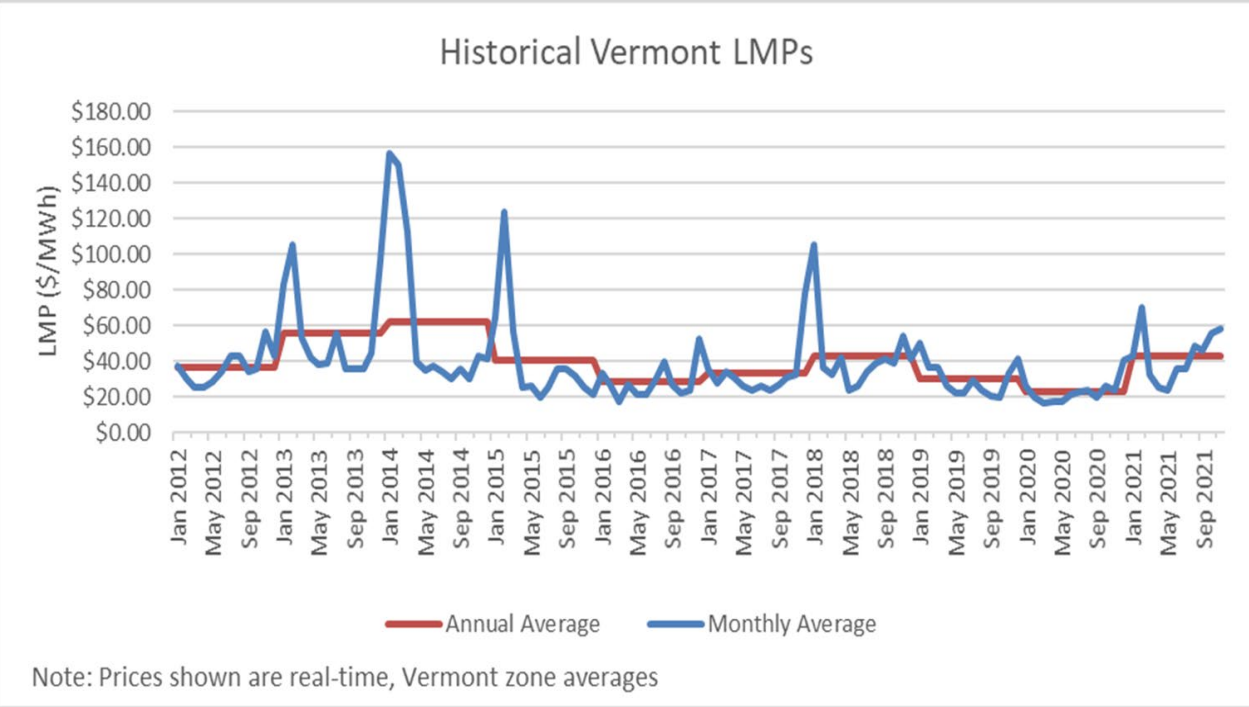
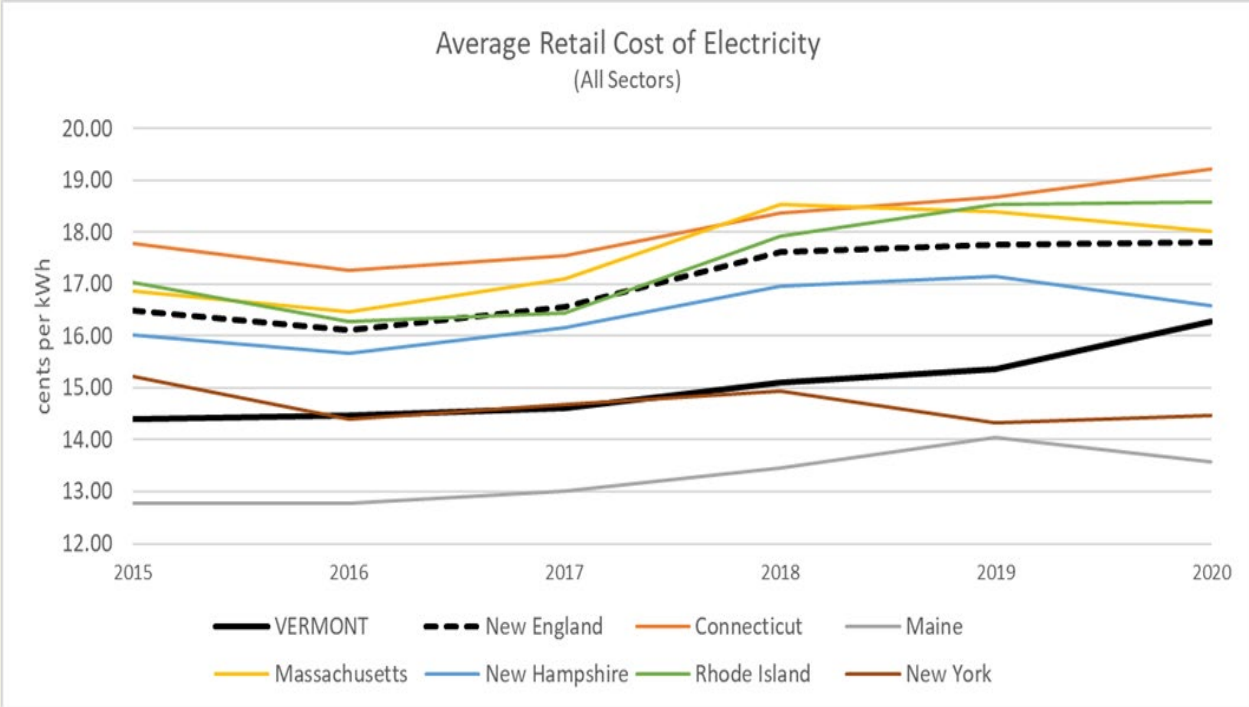


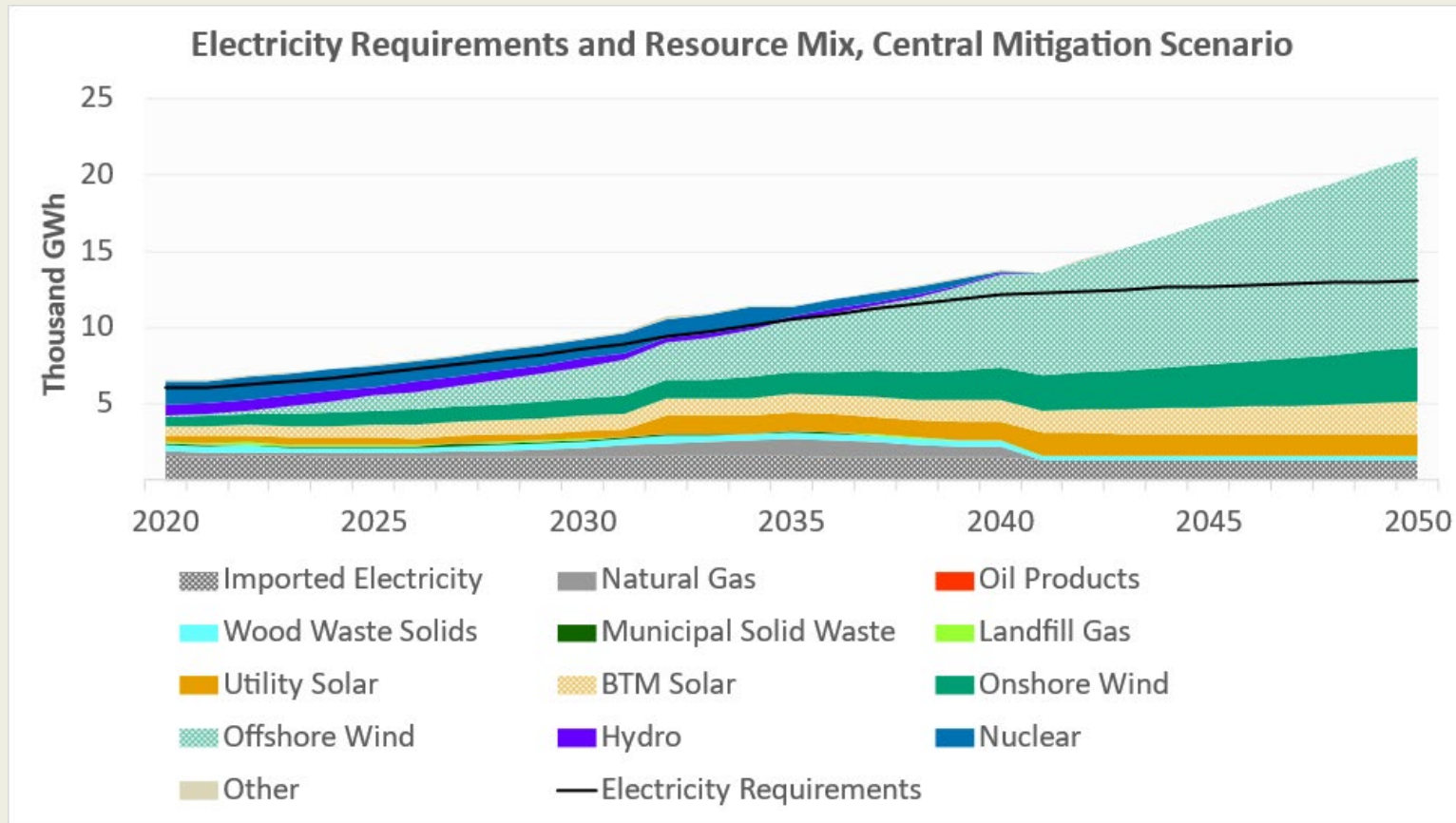
Sector Summaries

Vermont 2020 Electric Energy Supply



Retail and Wholesale Elec. Costs





- Limited Load and Resource Management modeled = Opportunity

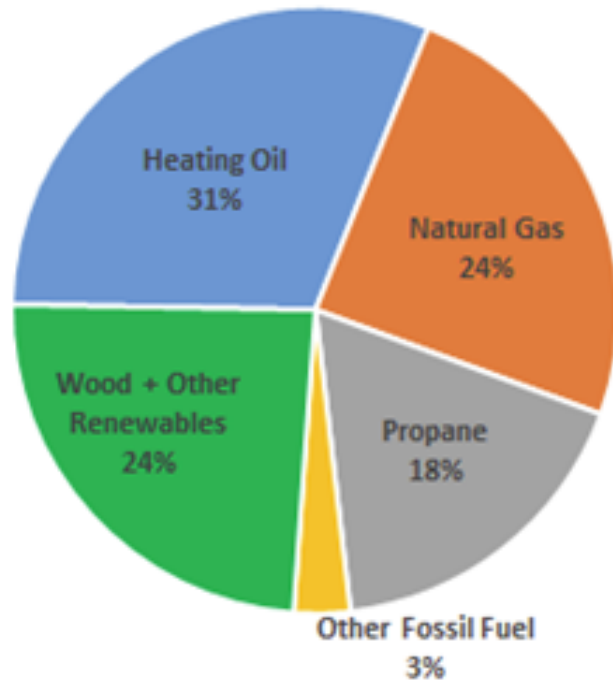
CEP Electricity: 100% carbon-free by 2032

Pathway: Comprehensive PUC Review of RES Design and Complimentary programs – Options to meet

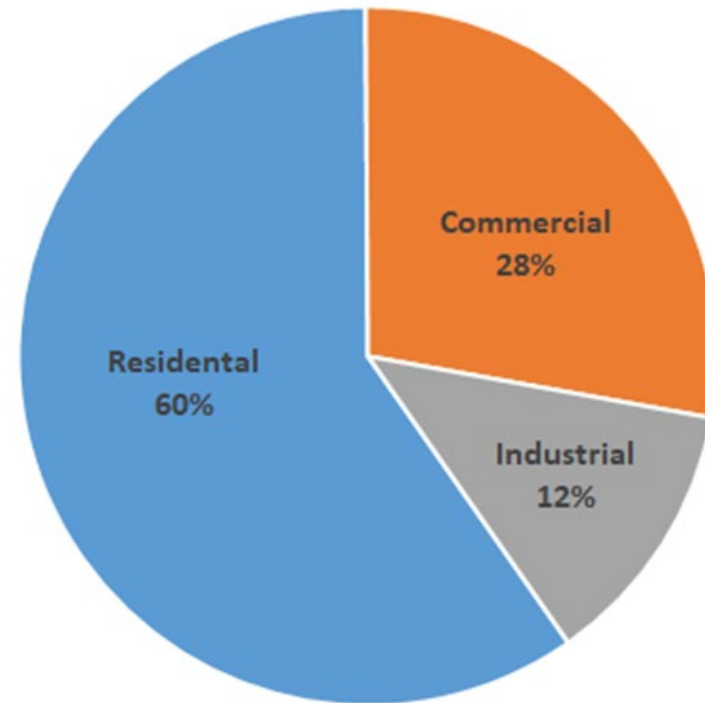
- Current Programs
 - Net Metering
 - “Community Solar”
 - Standard Offer Program
- Time & Locational Values
- New versus existing generation
- In-state vs. Out-of-State generation

Thermal & Process Supply

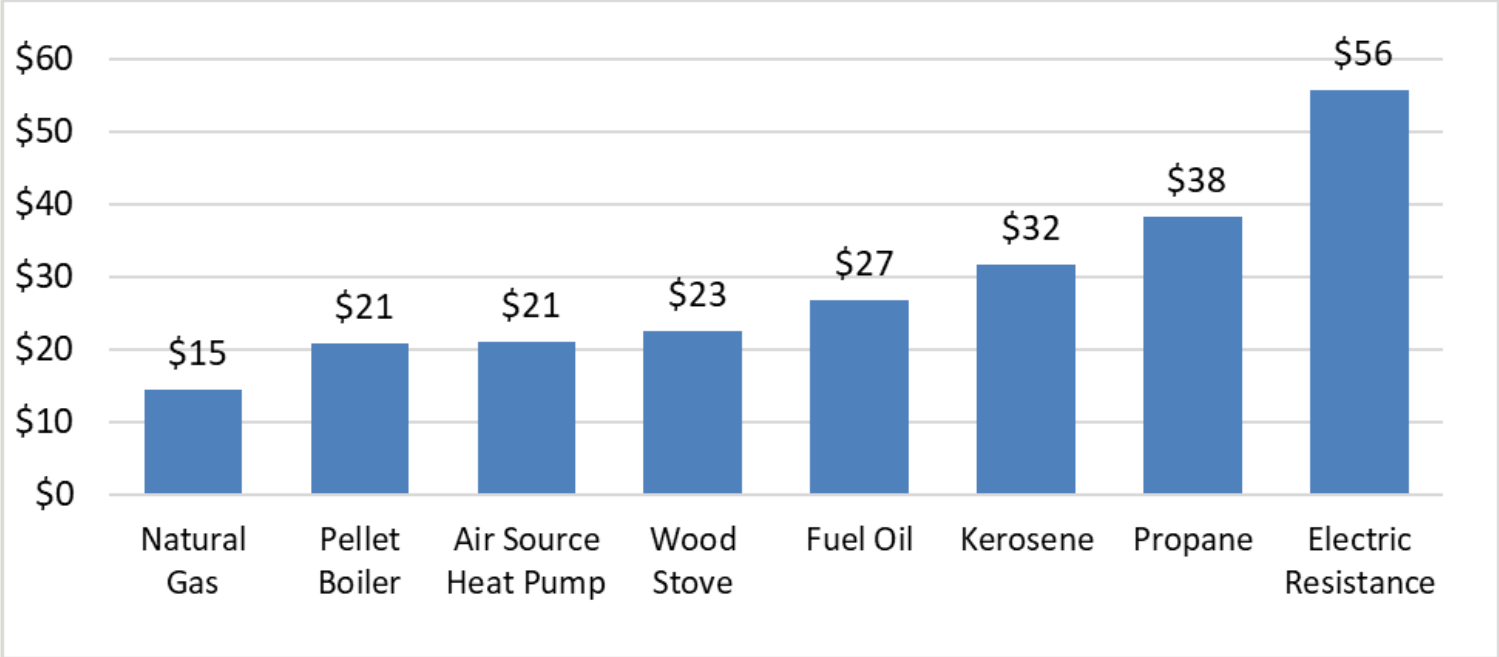
Renewable and Fossil Fuel Heating in 2019



Thermal Use by Sector

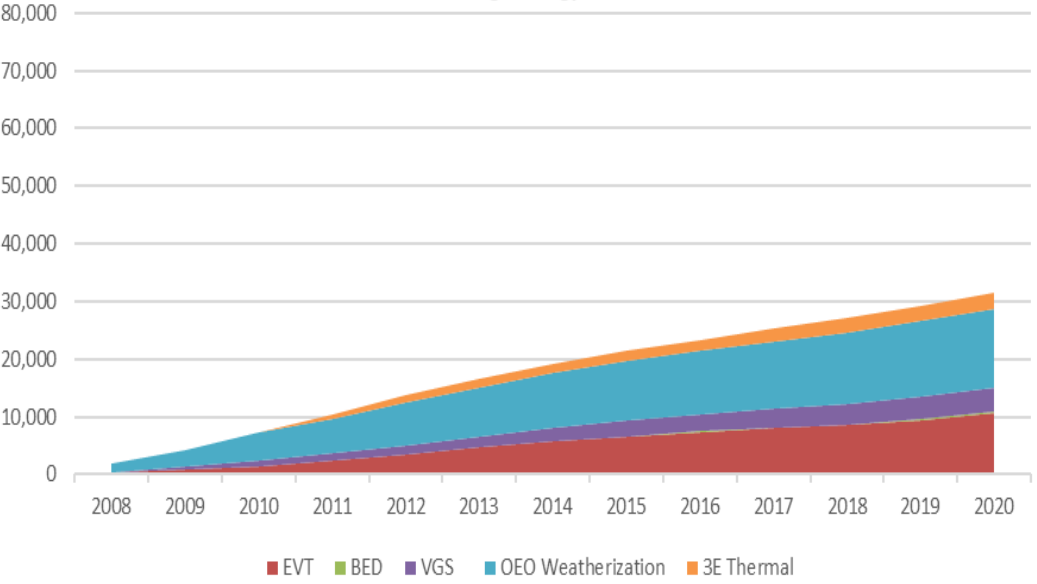


Residential Retail Fuel Prices (\$/MMBtu)

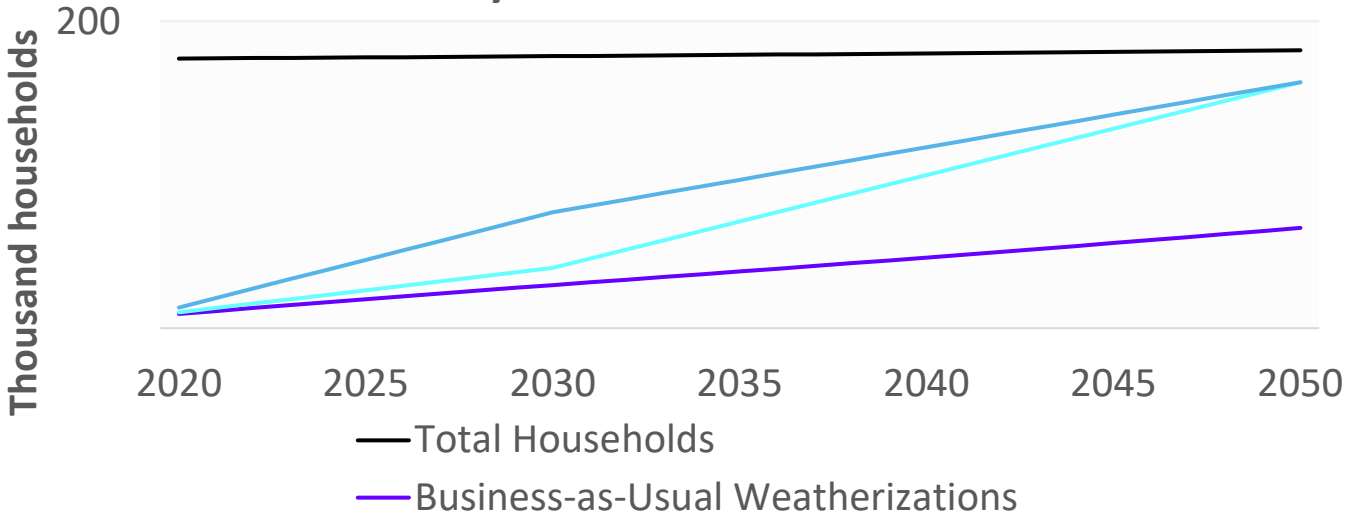


Cumulative Residential Weatherization 2008-2020

Cumulative Building Energy Retrofits



Sample Weatherization Retrofits for Rural Single-Family Detached Homes



CEP Thermal & Process: Goal Increase Renewable Supply to 30% by 2025, 45% by 2032, and 70% by 2042

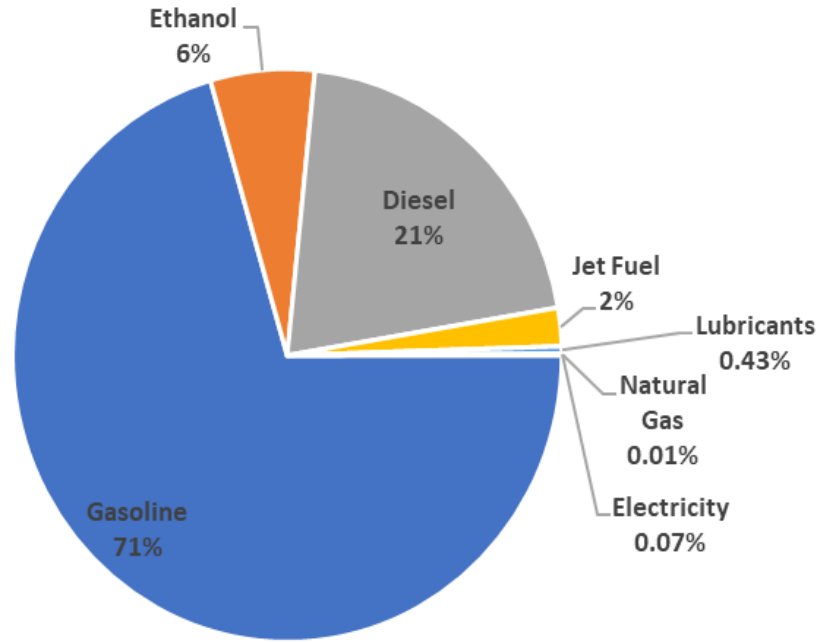
Pathway: Reduce Energy Demand

- Weatherization at Scale
 - WAP, EEU's, Sustainable Funding, Counseling, Workforce
- Efficient Buildings
 - Building Energy Standards (Net Zero Ready by 2030)
- State Energy Management Program Enhancements

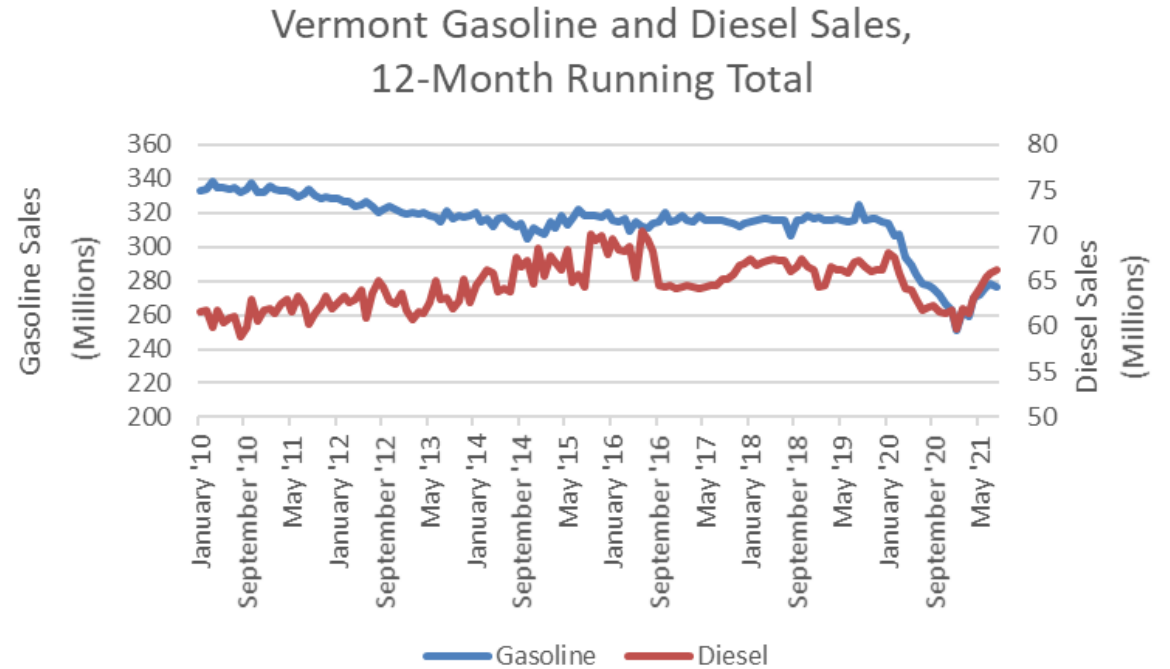
Pathway: Low Carbon Tech & Fuel Choices

- Consider Clean Heat Standard
 - Study, if reasonable then authorization for PUC
- Clean Fuels & Tech
 - ccHP, GSHP
 - Advanced Wood Heat, District Heat
 - Biofuels
 - RNG

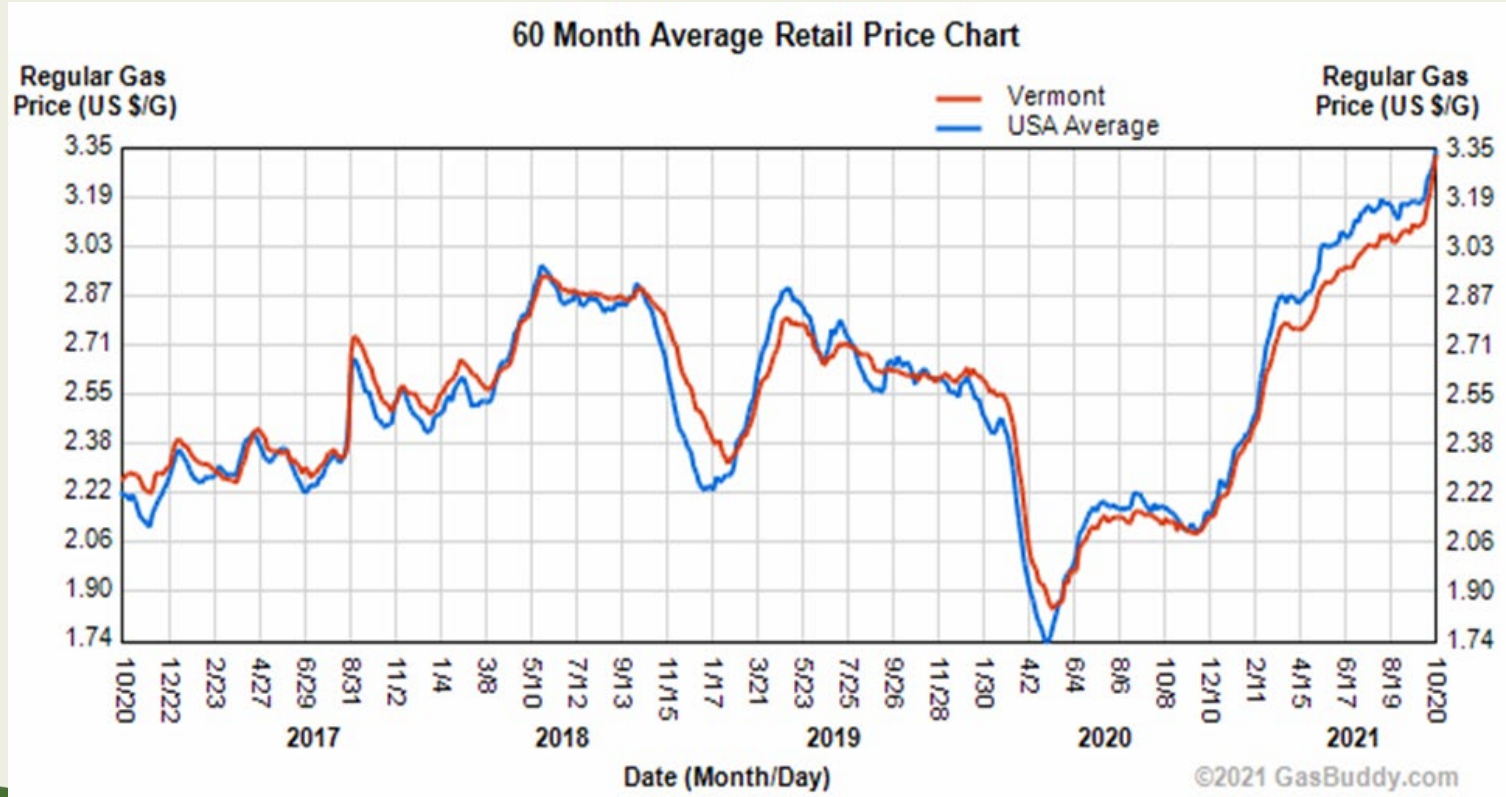
Transportation Currently



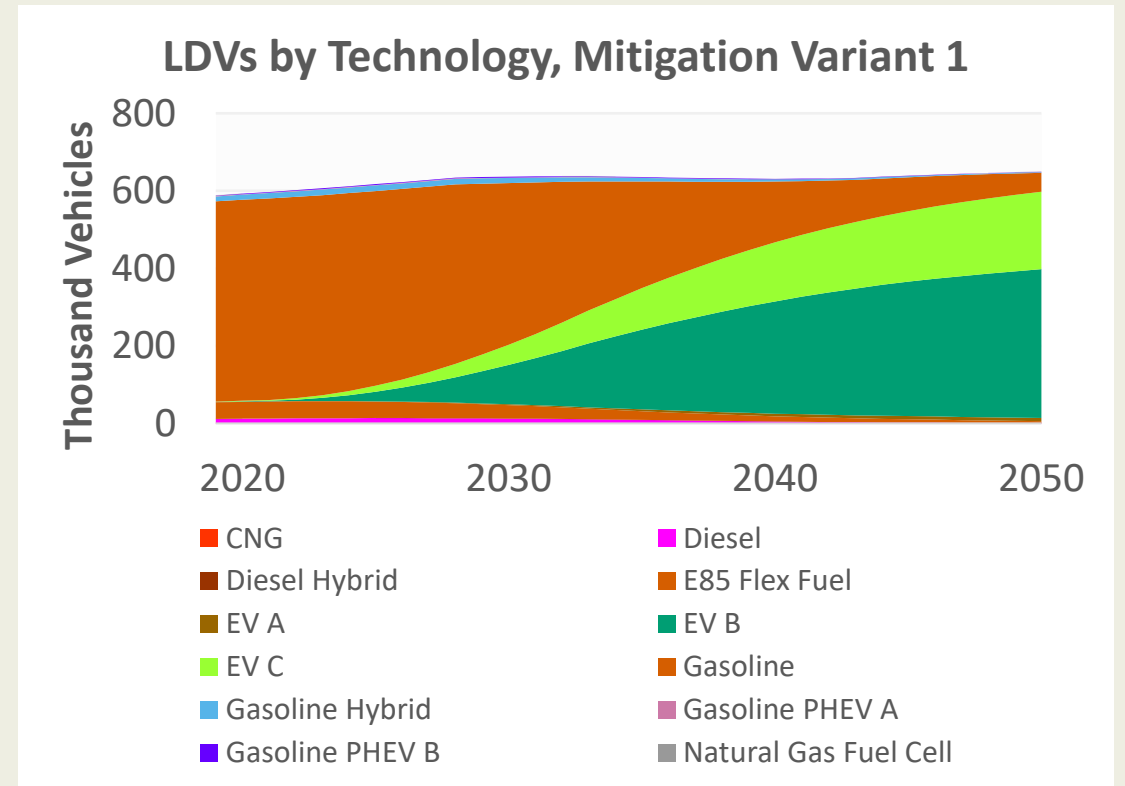
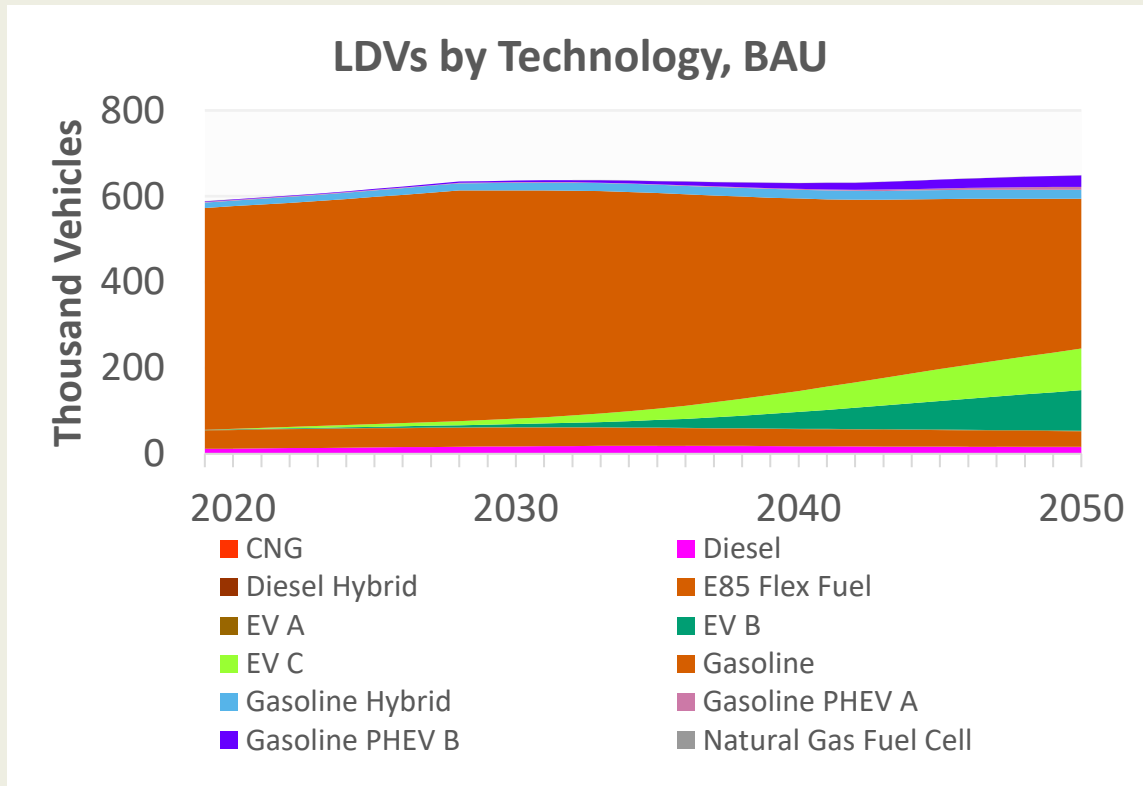
2019 Transportation Energy Consumption by Fuel Type



Avg Vermont & National Fuel Prices



Light-Duty Cars and Trucks by Technology



EV A/B/C = battery electric vehicles with range up to 100/200/300+ miles.
 PHEV A/B = plug-in hybrid vehicles with electric range 10+/40+ miles

CEP Transportation & Land Use (1): GHG Reductions

Proportional to GWSA, 100% LD vehicle Sales ZEV by 2035

Pathway: Vehicle Electrification

- Vehicle Incentives (new & used)
 - Light Duty, Medium Duty, Heavy Duty
 - MileageSmart, Replace Your Ride, etc.
- Infrastructure & Policy
 - **Rate Design & Load Control**
 - EV charging price transparency (via AAMF)
 - Dealer Awareness
 - Zero Emission Vehicle MOU
 - Road user charge/T-fund impacts discussed but awaiting VTrans study result

Pathway: Cleaner Vehicles & Fuels

- Participate in regional discussions on federal emissions and fuel economy standards
 - **CA Advanced Clean Cars II Regulations** (100% ZEV sales requirement by 2035)
- Monitor biofuels and low-carbon fuel development

CEP Transportation & Land Use (2): GHG Reductions

Proportional to GWSA, 100% LD vehicle Sales ZEV by 2035

Pathway: System Efficiency via Land Use Settlement Patterns

- Integration of Land Use Planning into Trans Decision Making Frameworks
 - Aligning planning across government agencies
 - Compact Development support
 - Smart Growth Designation programs

Pathway: Increasing Transportation Choices

- Public & Active Transportation Options
 - Public Transit, Rail, Biking & Walking, etc.

More CEP Components

- Energy Finance
- State Agency Energy Plan
- Act 174 Enhanced Energy Planning Standards
- Modeling Appendices
- RES Report

Thank You!