



Comprehensive Energy Plan: Energy Efficiency

Stakeholder Meeting
June, 2015

Presentation Overview

- ▶ Current Statutes
- ▶ Possible Energy Use Reduction Goal and Efficiency's role in meeting Renewable Energy goals
 - Informed by Total Energy Study modeling
- ▶ Current Energy Efficiency Programs
- ▶ Other Choices

Energy Efficiency – Relevant Statutes

30 V.S.A §218c and §209(d)

- ▶ §218c Least Cost Integrated Planning
 - Regulated Utilities must meet the public’s need for energy services at lowest present value life cycle costs
- ▶ §209(d)(4) “all reasonably available, cost-effective energy efficiency savings”

§202(a): State Energy Policy

- ▶ To assure, to the greatest extent practicable, that Vermont can meet its energy service needs in a manner that is adequate, reliable, secure and sustainable; that assures affordability and encourages the state's economic vitality, the efficient use of energy resources and cost effective demand side management; and that is environmentally sound.
- ▶ (2) To identify and evaluate on an ongoing basis, resources that will meet Vermont's energy service needs in accordance with the principles of least cost integrated planning; including efficiency, conservation and load management alternatives, wise use of renewable resources and environmentally sound energy supply.

§581

- ▶ Weatherize ~80,000 housing units by 2020 (25%)
- ▶ Reduce annual fuel needs and fuel bills by an average of 25% in the housing units served
- ▶ Reduce total fuel usage by 10% annually by 2025
- ▶ Increase low income weatherization services

§581 – Status

| Thermal Efficiency Retrofits: Units completed by Program/Entity | | | | | | | | |
|---|-------|-------|-------|-------|--------|--------|--------|-------------------------------|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Program Total (as of 2014) |
| EVT | 298 | 480 | 644 | 952 | 1,132 | 1,162 | 1,081 | 5,749 |
| BED | | 3 | 2 | 8 | 7 | 2 | 13 | 35 |
| VGS | 164 | 239 | 176 | 171 | 214 | 207 | 223 | 1,394 |
| WAP | 1,427 | 1,570 | 1,832 | 1,722 | 1,773 | 1,100 | 1,281 | 10,705 |
| VFEP | 0 | 0 | 16 | 253 | 87 | 42 | 11 | 409 |
| Statewide Total (Annual) | 1,889 | 2,292 | 2,670 | 3,106 | 3,213 | 2,513 | 2,609 | |
| Statewide Total (Running) | 1,889 | 4,181 | 6,851 | 9,957 | 13,170 | 15,683 | 18,292 | |

Energy Use Reduction Goal?

- ▶ The 2015 CEP could establish a goal of reducing total energy consumption by ~33% or more by 2050, from our current level.
- ▶ Accomplished through increased efficiency in energy production and use.
- ▶ For context, Vermont's total energy consumption has declined about 7% from a peak in 2004.

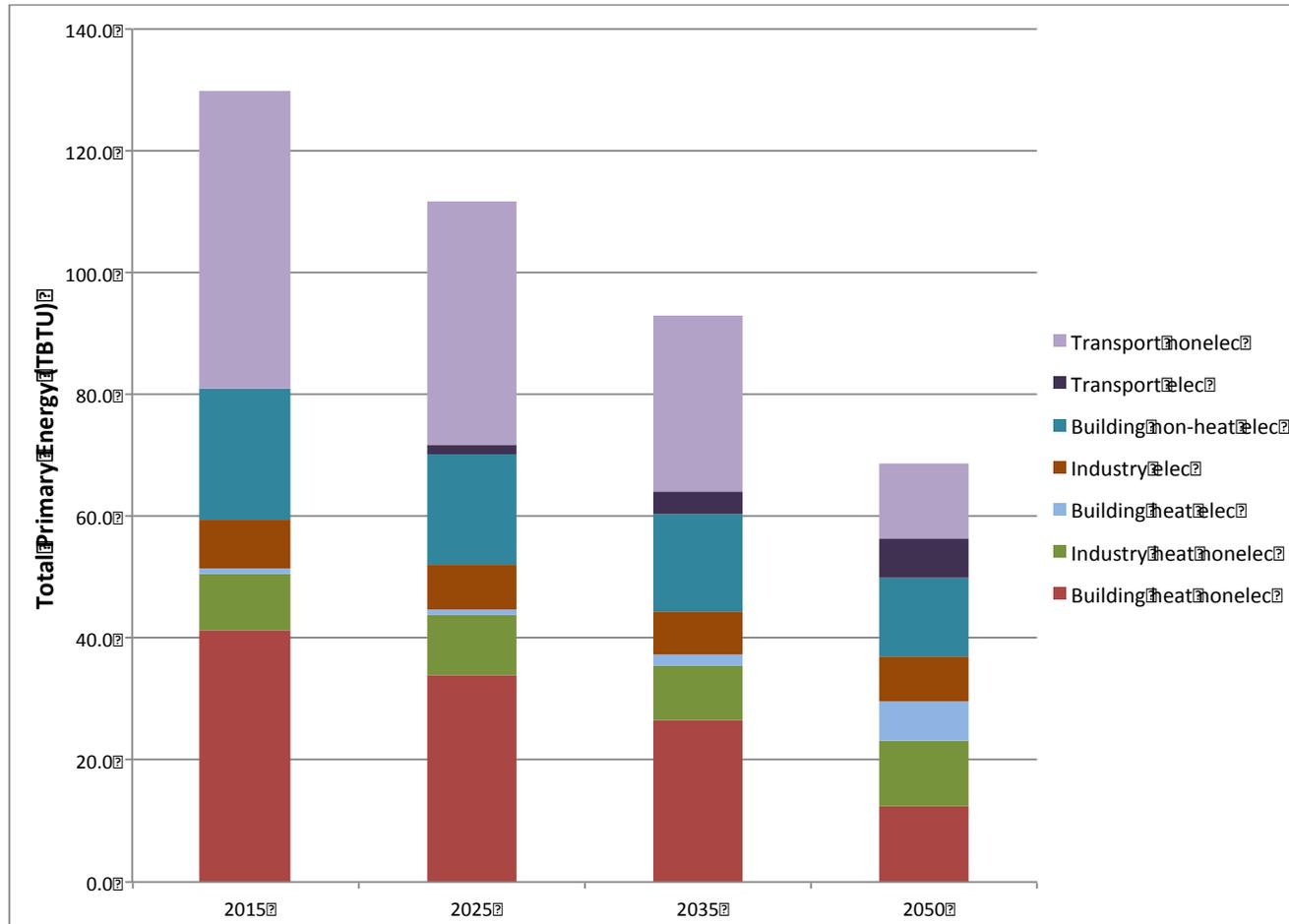
Two Types of Energy Efficiency

- ▶ Expending less energy to perform the same end use services
 - Also includes switching to new fuels/technologies that are fundamentally more efficient (e.g. EVs, heat pumps)
- ▶ More efficient production
 - Avoid the lost heat that comes from combustion and conversion to electricity

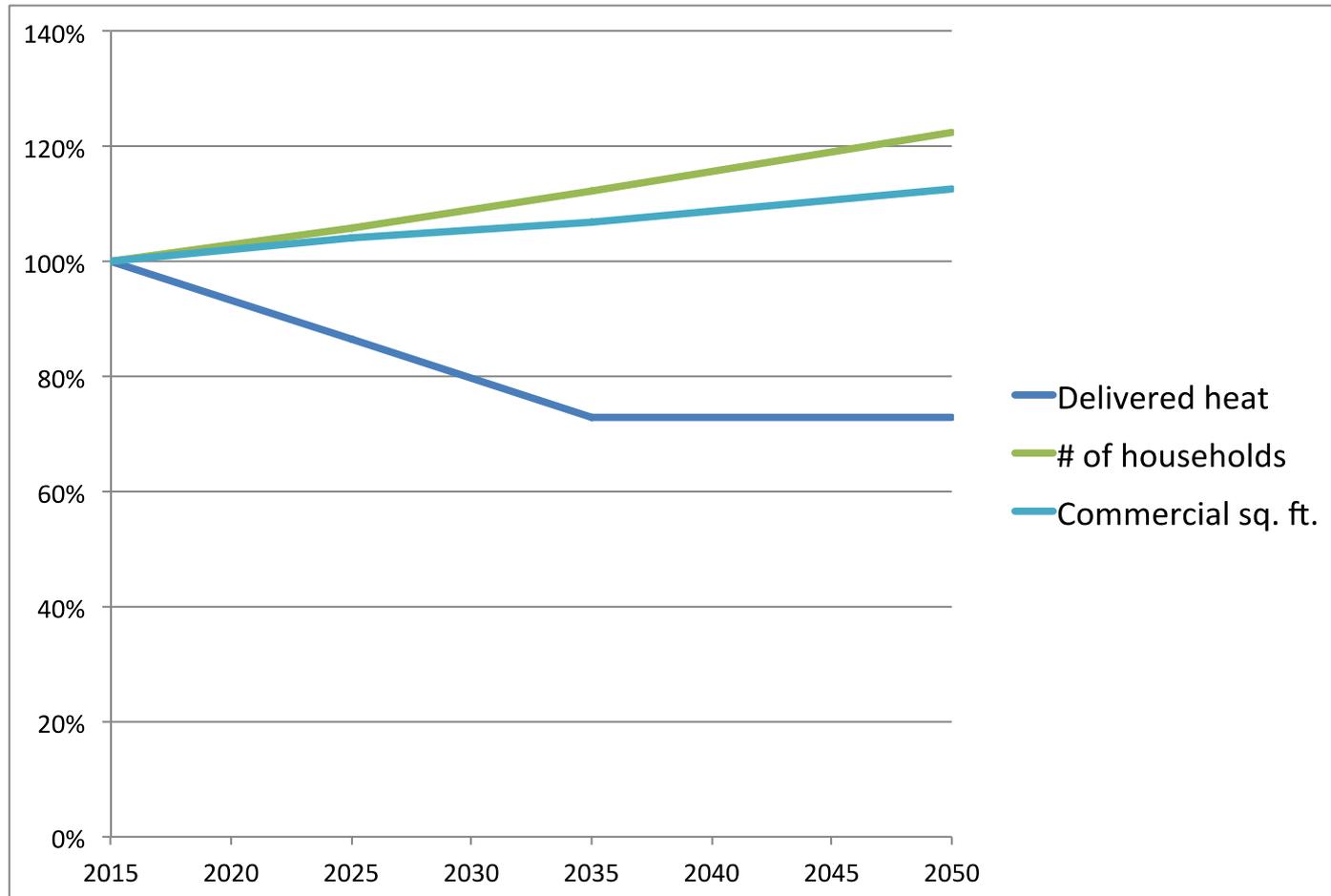
Energy Efficiency Example – Buildings

- ▶ 35% renewable overall and 30% renewable heat could look like this...
 - 1) Maintain current electric use in buildings level for purposes other than heat while the number and total size of buildings grow.
 - 2) Improve the energy efficiency of building shells so that the required heat delivered falls by 14% on average.
 - 3) Use 35,000 cold-climate heat pumps (using an assumption that each displaces the equivalent of 350–400 gallons of heating oil per year).
 - 4) Increase use of renewable bio-derived fuels by 20%, though a mix of increased use of wood and increased use of liquid biofuels blended into heating oil.

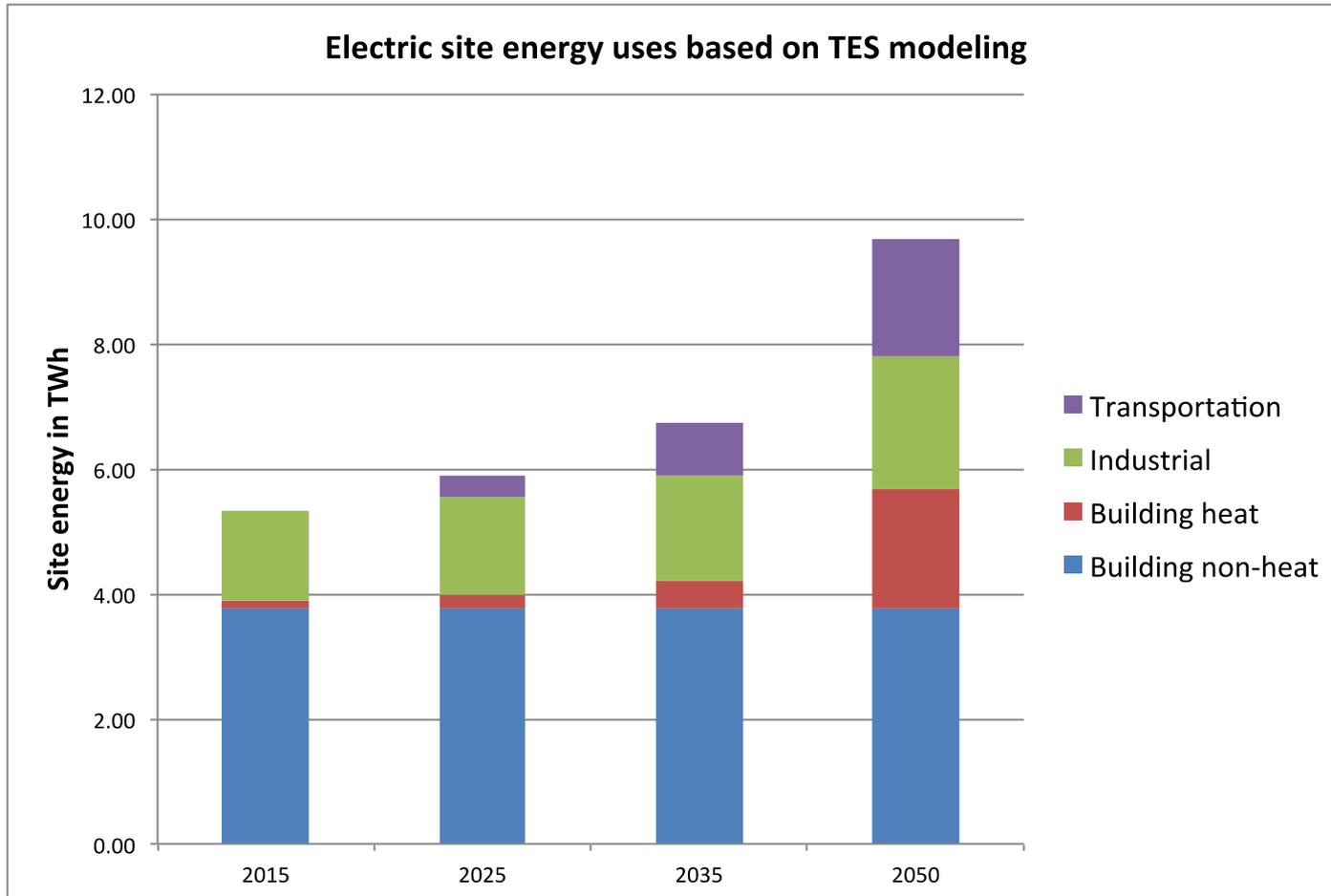
TES-based total primary energy



Heat requirements to fall, in spite of population and building growth?



TES-based electric site energy



Current EE Programs

| EE Service Provider | Funding Source |
|--|-----------------------------|
| Efficiency Vermont | EEC, FCM, RGGI (Ratepayers) |
| Burlington Electric | EEC, FCM, RGGI (Ratepayers) |
| Vermont Gas Systems | Natural Gas Ratepayers |
| OEO Weatherization | Gross Receipts, DOE |
| GMP CEED | Ratepayers |
| Self-Managed EE | SMEEP participants |
| DPS and other Direct Grant Recipients | SEP, CEDF |
| Distribution Utilities (Future, under H.40 – Tier III) | Electric Rates |

EE Utilities Electric and Thermal

- ▶ 2015 Budgets
 - Electric: \$48.5 m (Energy Efficiency Charge)
 - Unregulated Fuels: ~\$6m (FCM and RGGI)
 - Natural Gas: ~2.5m
- ▶ Residential Examples
 - Upstream lighting and appliances
 - Home Performance with Energy Star
- ▶ Commercial Examples
 - Variable Frequency Drive
 - Boiler replacement

H.40 / Act 56 Tier III

- ▶ Electric Distribution Utility obligation
 - Starts 2017 for all but small municipal utilities; 2019 for small munis
- ▶ Known ramp of fossil fuel use reduction
- ▶ Uncertain exactly what programs will look like
- ▶ Expect some focus on responsible fuel shifting
 - Implications for both efficiency and energy supply planning

Other Methods for Encouraging EE

▶ Building Codes

- Res/Commercial Energy Codes in effect based on IECC 2015
- Contractors must certify compliance with code

▶ Voluntary Standards (LEED, Green Building)

▶ Act 250

- Stretch Res Code and Commercial Guidelines in effect December 2015 for Act 250 projects.

What's next?

- ▶ Hear your input
- ▶ What works? What doesn't?
- ▶ What is missing?
- ▶ What should we include in the CEP going forward?

Small Group Discussions

Break out groups:

- Thermal Efficiency – Residential
- Electric Efficiency – Residential
- Low-income Wx/Affordable Housing /Healthy Homes
- Thermal Efficiency – Commercial
- Electric Efficiency – Commercial
- Financing Efficiency

General Discussion Questions for ALL Small Groups:

- There are a variety of energy efficiency related goals and targets to consider (80,000 homes weatherized by 2020; all new buildings built to net-zero design by 2030; 14% reduction in heat usage by 2050; and keeping future electric use in buildings at the current level).
 - Are these targets reasonably achievable (focusing on those goals of particular interest to individuals in the group)? How would goals such as these impact your organization/ work?
 - Should there be different target/goals?
 - If so what should they be or where would you shift emphasis? (For example: more emphasis on the use of biofuels and less on electrification/cold-climate heat pumps)
- Given the existing state goals and targets to reduce energy demand for both electricity and heat/process fuels, what strategies would you propose to best achieve these goals? Consider a variety of lenses; program, policy, awareness, etc.
 - In terms of implementation, what is working now that needs more support, what is not working, and what new initiatives are needed?