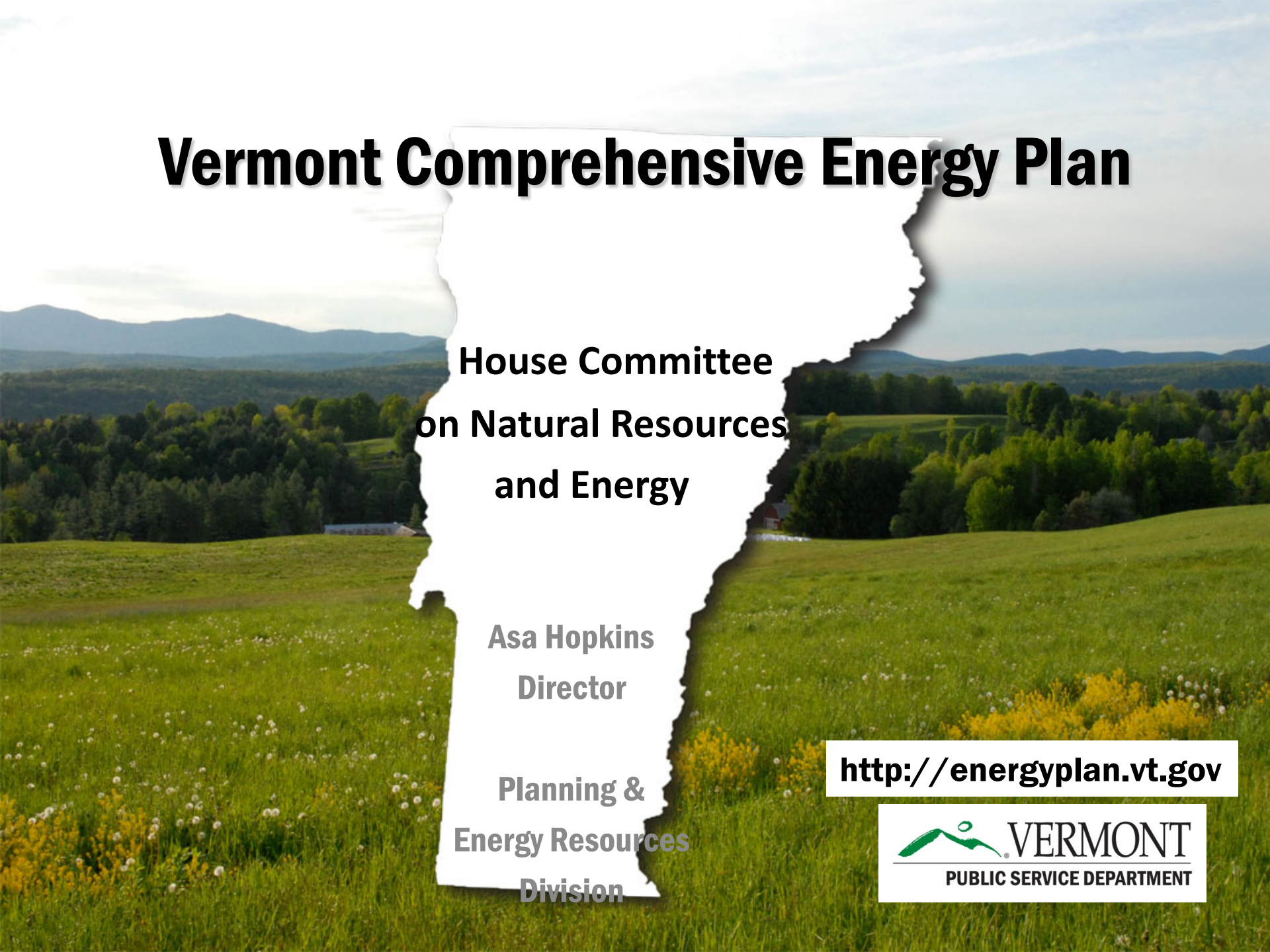
Vermont Comprehensive Energy Plan



House Committee
on Natural Resources
and Energy

Asa Hopkins
Director

Planning &
Energy Resources
Division

http://energyplan.vt.gov

VERMONT
PUBLIC SERVICE DEPARTMENT

Comprehensive Energy Plan

Team Effort

State Government

- Public Service Dept.
- Agency of Natural Resources
- Agency of Transportation
- Agency of Agriculture, Food, & Markets
- Agency of Commerce & Community Development
- Agency of Human Services
- Dept. of Bldgs & General Services

Community & Business Partners

- Public Comments
- Utilities
- Energy Services Companies and Consultants
- Public Interest Organizations and Community Groups
- Business Community
- Town Energy Committees

State Energy Policy

202(a):

1) 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.

Quantified Statutory Goals

- **25% renewable by 2025** (10 V.S.A. § 580(a))
- **50% GHG emission reduction by 2028, and 75% (if practicable) by 2050** (10 V.S.A. § 578(a))
- **Renewable Energy Standard requires electric power to be:**
  - 55% renewable in 2017, rising 4% every three years to 75% in 2032; and
  - 1% from distributed generators connected to Vermont's electric grid in 2017, rising 0.6% per year, to 10% in 2032.
- **Building efficiency**
  - 25% of the state's housing stock by 2020 (approximately 80,000 housing units)
  - Reduce annual fuel needs and fuel bills by an average of 25% in the housing units served.

Guiding goals

- **A vibrant and equitable economy**
- **Healthy ecosystems and a sustainable environment**
- **Healthy Vermonters**

Economic, environmental, and human health ideals can be in conflict and implementation of a particular policy or program requires striking balances.

When there is consistency and an action positively impacts all of these areas, it deserves greater priority.

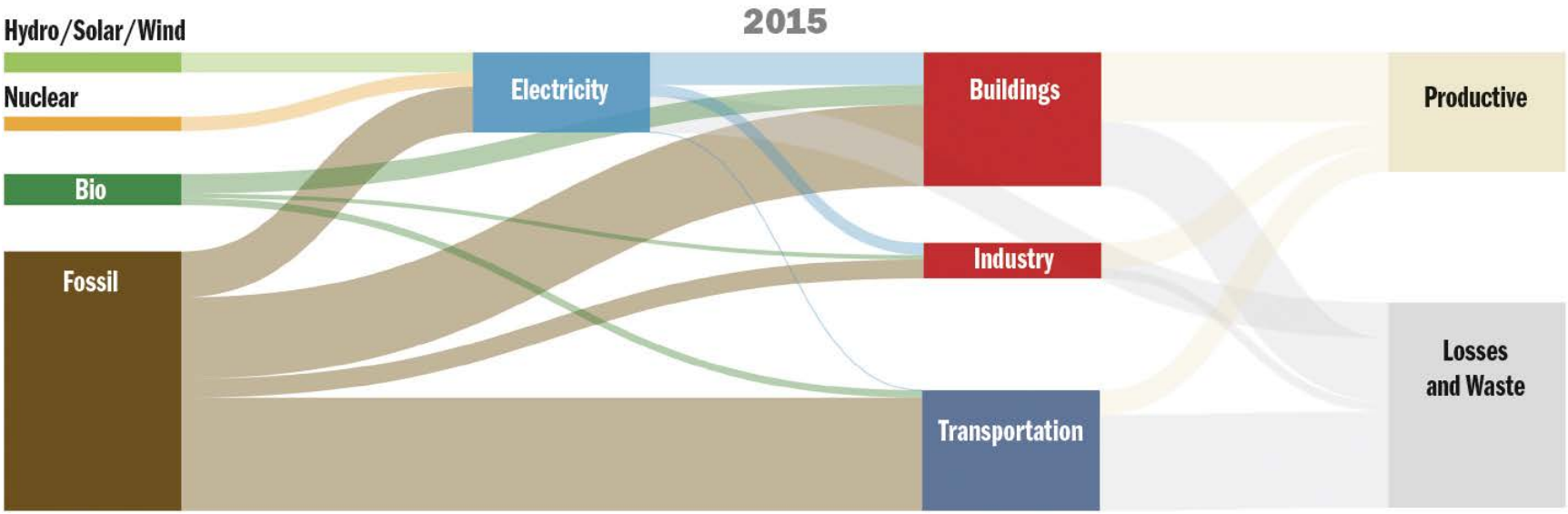
Goals for 2025 and beyond

- Reduce total energy consumption per capita by 15% by 2025, and by more than one third by 2050.
- Meet 25% of the remaining energy need from renewable sources by 2025, 40% by 2035, and 90% by 2050.
- Reduce energy GHGs by 40% by 2030 and 80-95% by 2050.

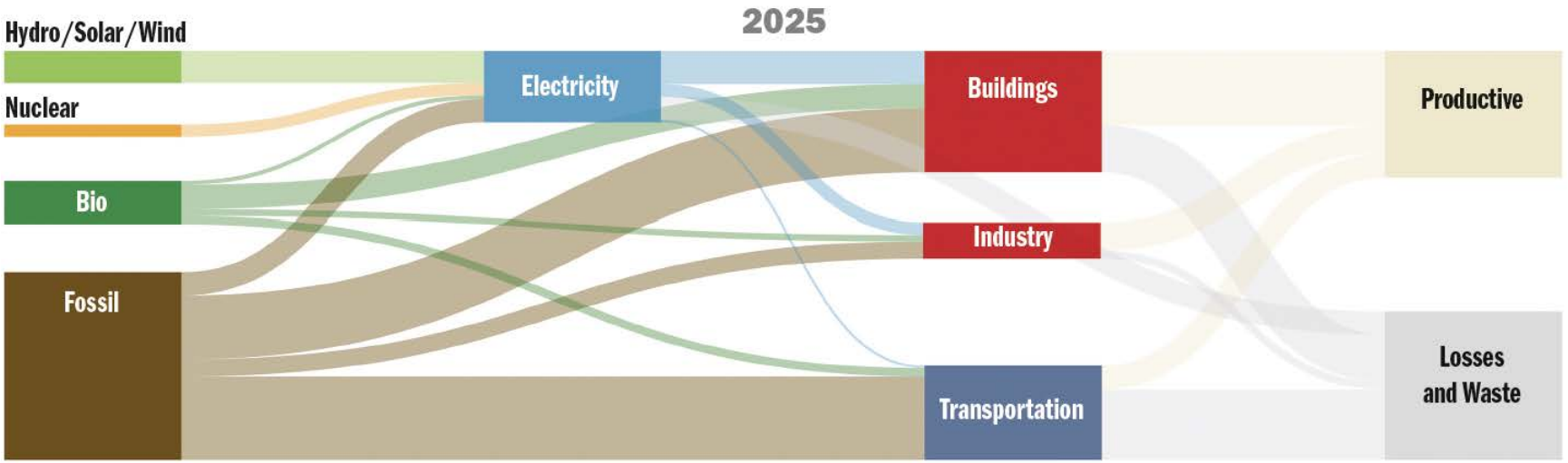
Efficiency – 3 ways

- Continuing improvements in thermal and electric efficiency
- Fuel switching away from combustion technologies to more efficient electric powered technologies
- Declining source energy requirements of electricity generation

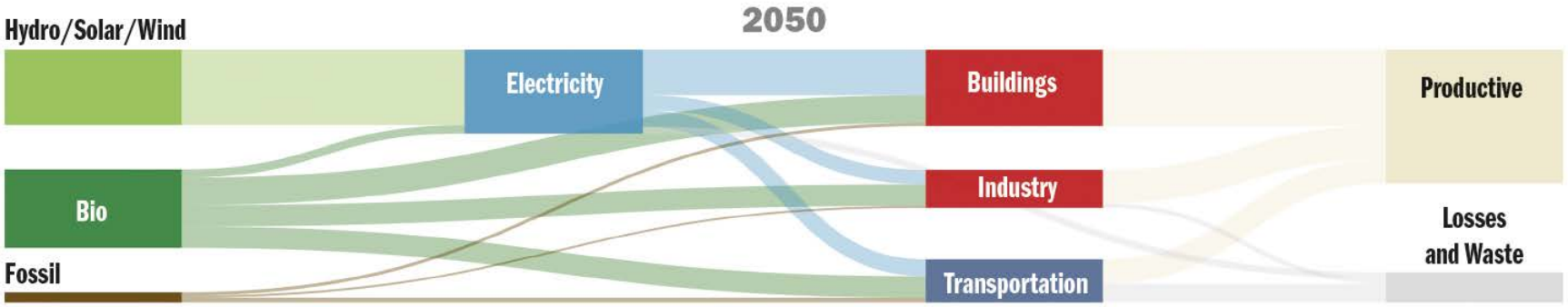
Energy Flows: 2015



Energy Flows: 2025



Energy Flows: 2050



Other themes

- Infrastructure matters
- A distributed and connected energy future
- Fostering innovation and entrepreneurship
- Importance of public engagement and support

Market-based policies

Vermont should work with other states and provinces in our region, building upon existing regional initiatives, to investigate and pursue options for market-based GHG emission policies that integrate with the other approaches described in this CEP, and consistent with the principles regarding revenue recycling, pace, equity, and competitiveness detailed in this plan.

Other kinds of policy levers

- Information and access
  - Information, technical assistance
  - Access to capital, financing
- Strategic investment
  - Foster new technologies and industries
- Codes and standards
  - Building codes, appliance standards
  - Vehicle fuel economy
  - Land use plans

Buildings

Goals:

- **30% renewable by 2025**
  - **One way to get there:**
    - Building shell improvements reduce heat demand by 14%
    - 35,000 heat pumps
    - Increase use of wood or bioheat by 20%
- **All new buildings net zero by 2030**

Strategies:

- Take a whole-building approach to buildings as systems
- Better information and coordination:
  - "One-stop shop" for customers; information "clearinghouse"
  - Building labels
- Fully fund and maximize the impact of thermal efficiency programs, particularly those serving low-income populations, as well as new RES utility programs

Transportation

Goal: 10% renewable by 2025

One way to get there:

- Keep VMT per capita at or below 2011 levels
- 10% of all light-duty vehicles plug in
- 10% average bio-content in diesel

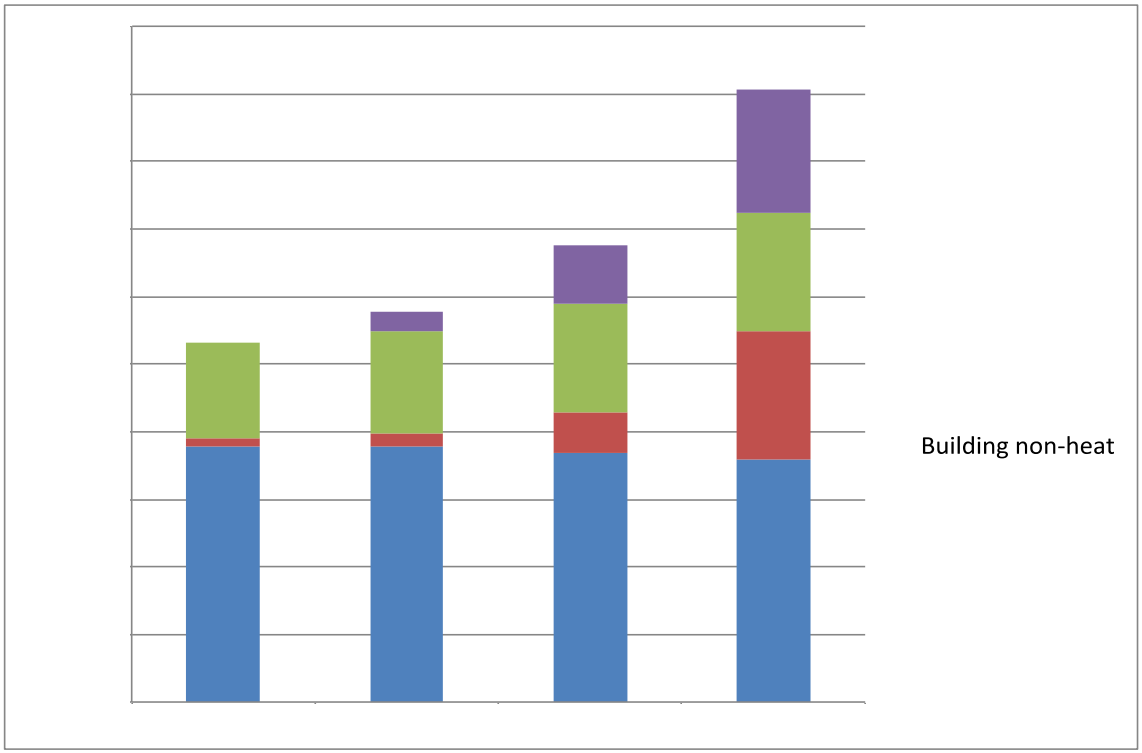
Strategies:

- Reduce transportation energy demand through smart land use
- Shift transportation away from single-occupancy vehicles through the promotion of other options
- Electrify and increase the efficiency of light-duty vehicles
- Increase the efficiency of heavy-duty vehicles and power them with renewable fuels

Electric Power

Goal: 67% renewable by 2025

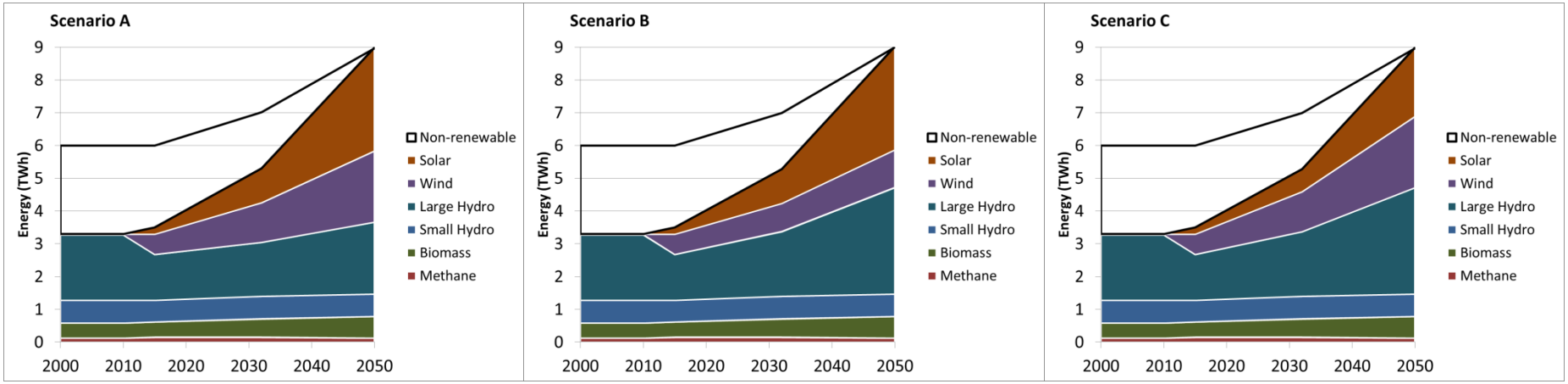
Electrifying heat and transport will increase electric energy demand:



2032 and 2050 Scenarios

Three illustrative 100% renewable scenarios for 2015 to 2050.

- 75% renewable (with 10% DG) in 2032
- 100% in 2050



Electric Strategies

- All reasonably available cost- effective energy efficiency.
- Manage load using active means
  - New control technologies; smart rates
- Plan carefully to meet the RES in a least-cost manner. Strive to lower both energy *bills* and electric *rates*.
- Engage actively in New England grid planning and policy-making
- Encourage siting of renewable energy on the built environment, in already disturbed areas, or co-located with other uses
- Incrementally transform our utility regulations to reflect the reality of distributed energy resources and an integrated grid.
- Explicitly welcome innovation and entrepreneurship by utilities and their partners.

Energy Resources

- Solar
- Wind
- Solid biomass
- Liquid biofuels
- Farm and Landfill Methane
- Hydroelectric
- Petroleum
- Natural Gas
- Coal
- Nuclear

About each:

- Overview
- State of the Market
- In-State Resources
- Out-of-State Resources
- Siting and Permitting
- Benefits
- Challenges
- Strategies and Recommendations

For more information on the energy plan go to:

http://energyplan.vt.gov

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