

Adding Thermal Energy to State Renewable Energy Standards: *Opportunity, Status, and Challenges*



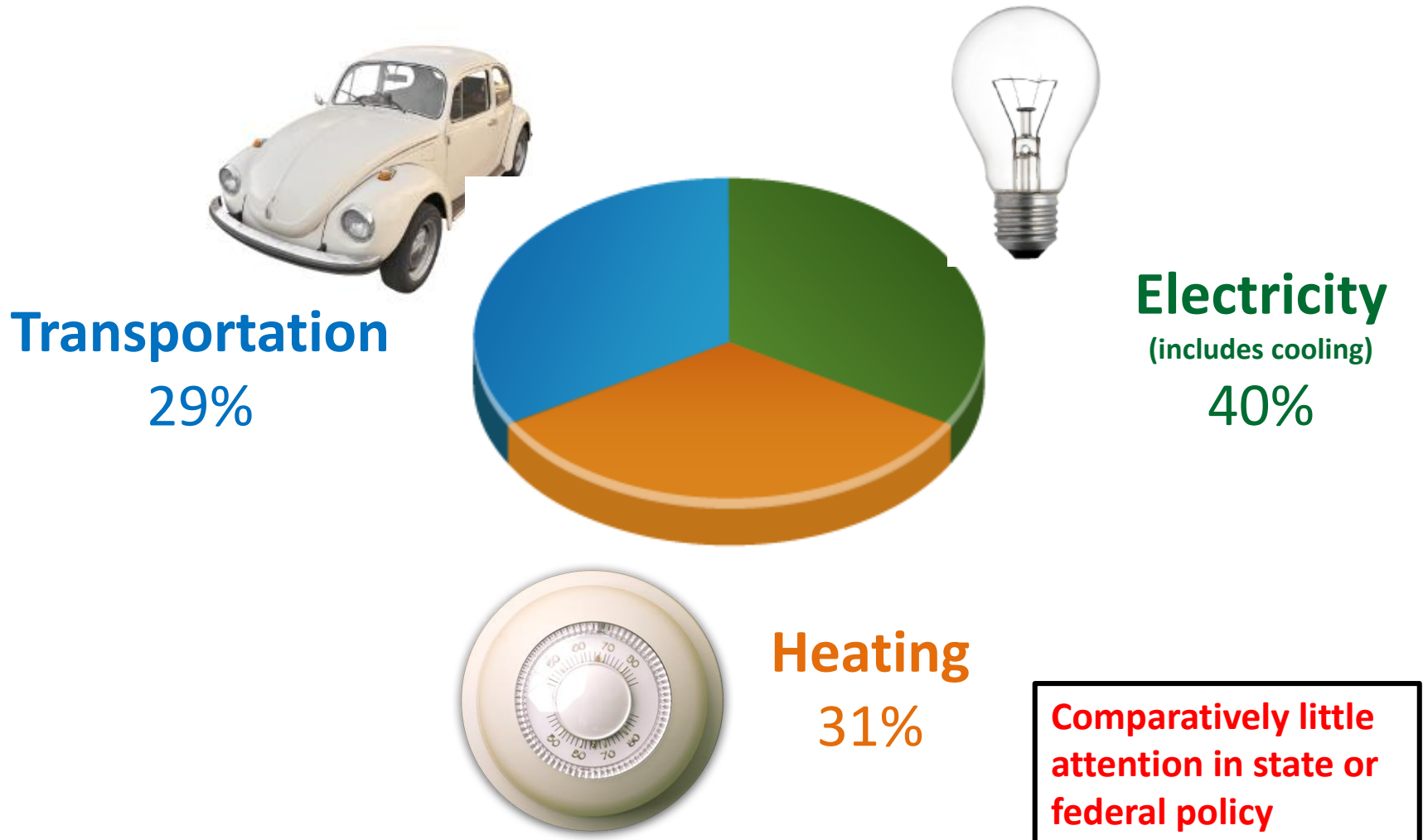
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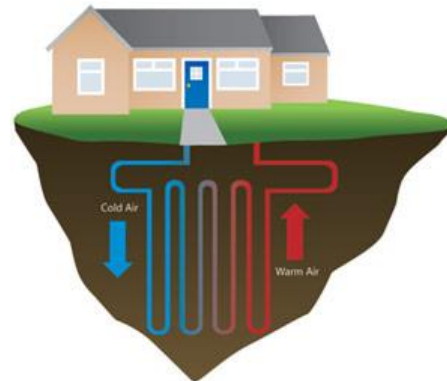
America's Energy Usage Has Three Major Slices





















Source: USDOE, EIA

Renewable Thermal Technologies

- **Biomass:** solid (pellets, chips), liquid (biodiesel, pyrolysis oil, ethanol), gas (renewable natural gas, biogas)
- **Solar Thermal:** air, water
- **Geothermal:** air, water and ground source



Public Benefit Basis for Renewable Energy Incentives

	Liquid	Electric	Thermal
Reduce reliance on foreign fossil energy; enhance national & regional energy security			
Conserve energy through increased efficiency			
Reduce air emissions (e.g. PM, SO2, Hg)			
Reduce greenhouse gas emissions			
Local <u>sustainable</u> economic development; JOBS			
Save people \$\$\$; retain wealth in region			

Policy Options to Support Renewable Thermal Energy

Adapted from MA DOER Thermal APS Study Report, January 2013

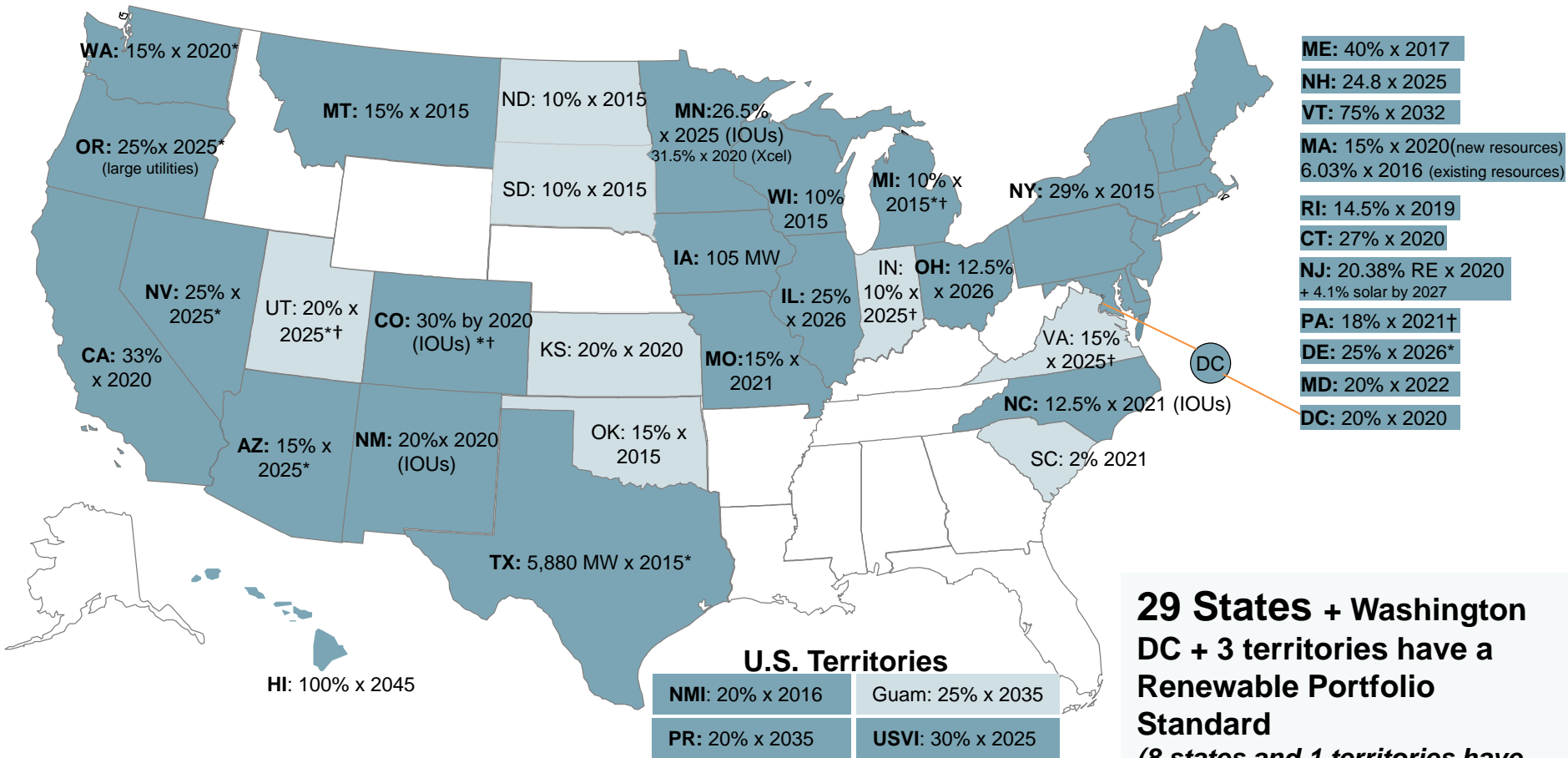
	Precedent	Opportunity	Concerns
Fees on unregulated heating fuels	“System Benefit Charges” in many states, but electricity/NG only	Revenues could fund incentives for RE, also help oil/propane dealers	Tax on heating oil and propane – tough to sell politically
Tax incentives	State and federal (SHW, Geo, but NOT biomass)	Ease capital costs	New tax incentives hard to pass; reduce revenues
Rebates and competitive grants	MA, NH have rebates and grants, from ACP/RGGI \$	Ease capital costs	Electric and gas ratepayers asked to finance thermal
Renewable energy mandates	Some EU countries – new building mandates	Mandated market share (Fed. Exec. Order?)	Tough to implement in U.S.
Renewable Energy Standards	12 states and DC recognize thermal, mostly SHW. NH full thermal provision.	Performance-based incentive	Ratepayers bear costs; impact on other RPS technologies

Why *not* RES for Thermal?

- ✓ **Achieves all policy goals of electric**
- ✓ BTU-MWH conversion straight
- ✓ Heat can be metered just like electricity
- ✓ RECs completely fungible in marketplace whether electric or thermal
- ✓ Encourages CHP
- ✓ Do not need as high REC prices to be viable incentive – can save ratepayers \$ vs. electric
- ✓ Helps move policy toward fuel/technology neutrality
- ✓ States better able to tailor programs to unique circumstances than federal govt
- ✓ Is bringing together thermal renewable interests!!

Renewable Portfolio Standard Policies

www.dsireusa.org / June 2015



- ME: 40% x 2017
- NH: 24.8 x 2025
- VT: 75% x 2032
- MA: 15% x 2020 (new resources)
6.03% x 2016 (existing resources)
- RI: 14.5% x 2019
- CT: 27% x 2020
- NJ: 20.38% RE x 2020
+ 4.1% solar by 2027
- PA: 18% x 2021†
- DE: 25% x 2026*
- MD: 20% x 2022
- DC: 20% x 2020

**29 States + Washington
DC + 3 territories have a
Renewable Portfolio
Standard
(8 states and 1 territories have
renewable portfolio goals)**

Renewable portfolio standard
 * Extra credit for solar or customer-sited renewables
 Renewable portfolio goal
 † Includes non-renewable alternative resources

Status of Thermal in RES Programs



- ARIZONA
- DISTRICT OF COLUMBIA
- INDIANA
- MARYLAND
- MASSACHUSETTS
- NEVADA
- NEW HAMPSHIRE
- NORTH CAROLINA
- PENNSYLVANIA
- TEXAS
- UTAH
- VERMONT
- WISCONSIN

Thermal in New Hampshire RPS



- **Authorized for 2014-2025 “and thereafter”**
- **RECs awarded on MWH-BTU conversion basis, based on output of “useful thermal energy”; metering to verify**
- **RECs valued at up to \$29/MWH by 2025**
- **\$63 million in direct incentive payments based on maximum REC value through 2025**
- **One ton pellets = 3.8 MWHs (@ 80% output efficiency)**
- **One ton pellets = \$87/ton or about 30-40% discount on operating cost**
- **No minimum efficiency requirement so all biomass fuel systems and technologies have access**
- **Funded by electric ratepayers; utilities supported because it lowered compliance cost by structuring as “carve-out”**
- **About 25 participants (23 biomass, 2 geothermal): hospitals, schools, manufacturers**

Vermont Act 56

Renewable Energy Standard



- **Tier III**
- DUs must acquire fossil-fuel savings through energy transformation projects.
- Energy transformation projects are those that reduce the fossil-fuel consumption of a DU's customers and the greenhouse gas emissions associated with that consumption.
- Must procure either the amount of distributed renewable energy or fossil-fuel savings equivalent to 2% of their annual retail sales in 2017, increasing by two-thirds of a percent each year until reaching 12% in 2032.
- 2% of 2015 retail sales (EIA) was **110,400 MWH**
- = **29,000 pellet tons today, and 174,000 pellet tons in 2032**
- Value of MWH incentive?

Challenges

- **Defining “sustainable biomass”** for purposes of RES qualification; **carbon accounting to verify GHG reductions**
- **Heat metering** – expensive requirement that may exclude smaller systems; are there other approaches that will provide needed accountability?
- **REC transactions/negotiating with utilities** – complex undertaking beyond capacity of smaller project owners/operators
- **How to translate performance incentive into bankable security for financing capital** (e.g. [T-RECs Enterprise Fund](#))
- **Impact on electric ratepayers**, who are being asked to finance thermal incentives.

Thank you



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