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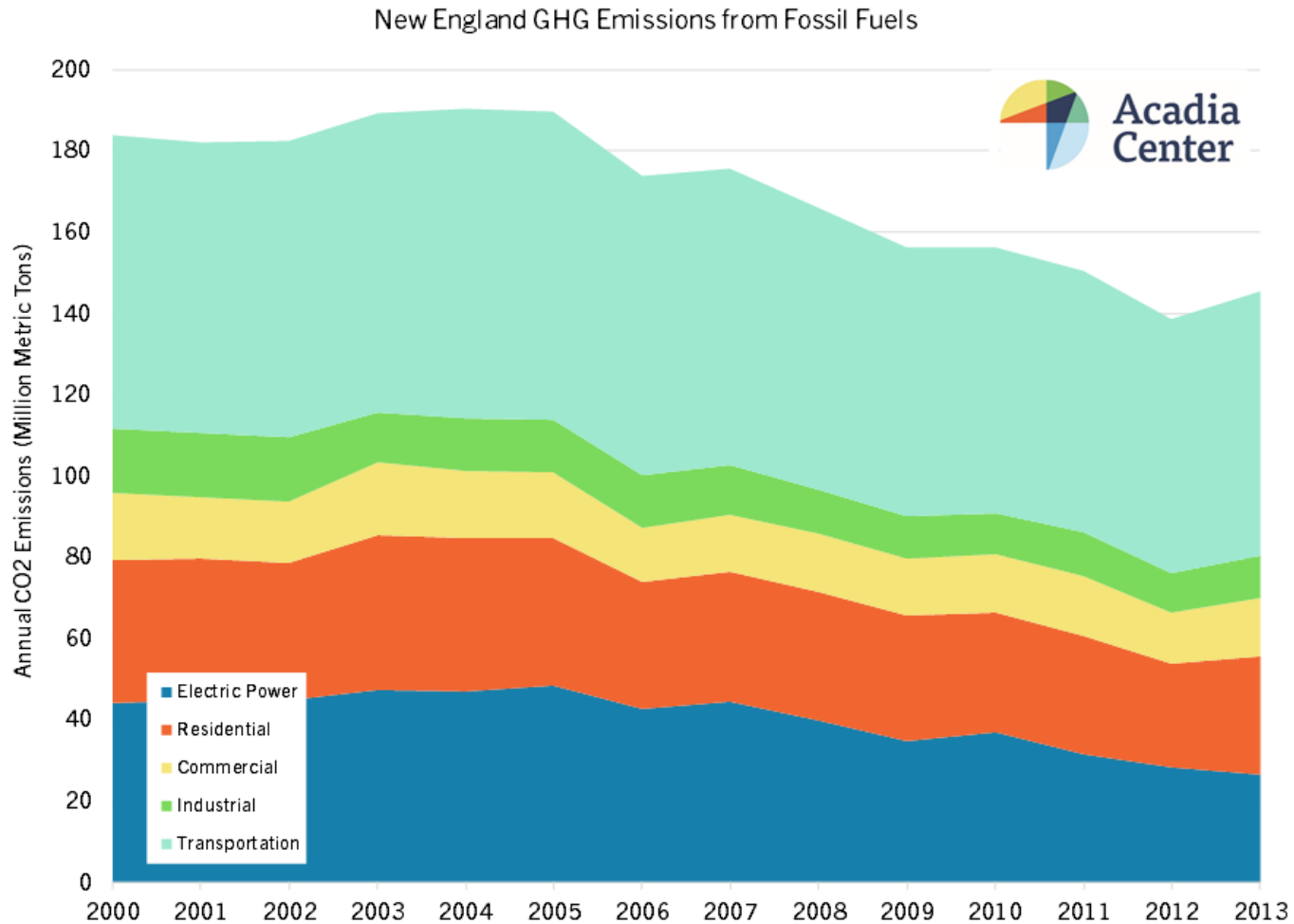
Towards a Low Carbon, Consumer Friendly and Lower Cost Energy Future: Three Themes

- I. Emission Trends Are Falling in the Power Sector: We Need to Keep Going and Apply Low Carbon Electricity to Transportation and Building Technologies
- II. Technology Advancements, Cost Reductions, Economic Gain, Greater Consumer Control and Emissions Reductions are Aligning:
 - Envisioning a Consumer Friendly, Community Oriented and Low Carbon Energy Future
- III. To Get There, We Need to Undo Outdated Approaches and Realign Incentives, Revenue and Fairly Value Diverse Energy Resources

ClimateVision2020

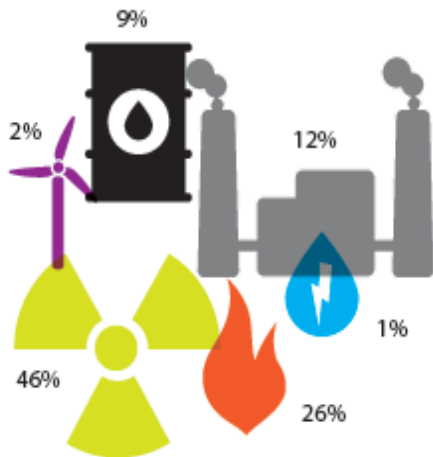


Emission Trends 2000-2013

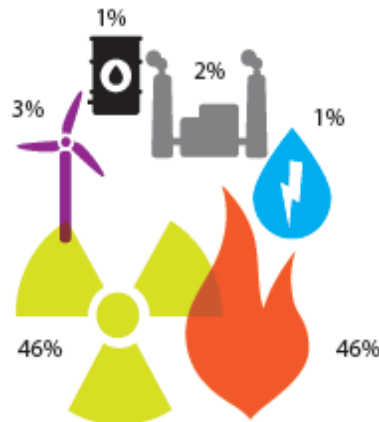


Connecticut Generation Mix Trend 2005:2015

Power Generation



2005 Generation Mix



2015 Generation Mix

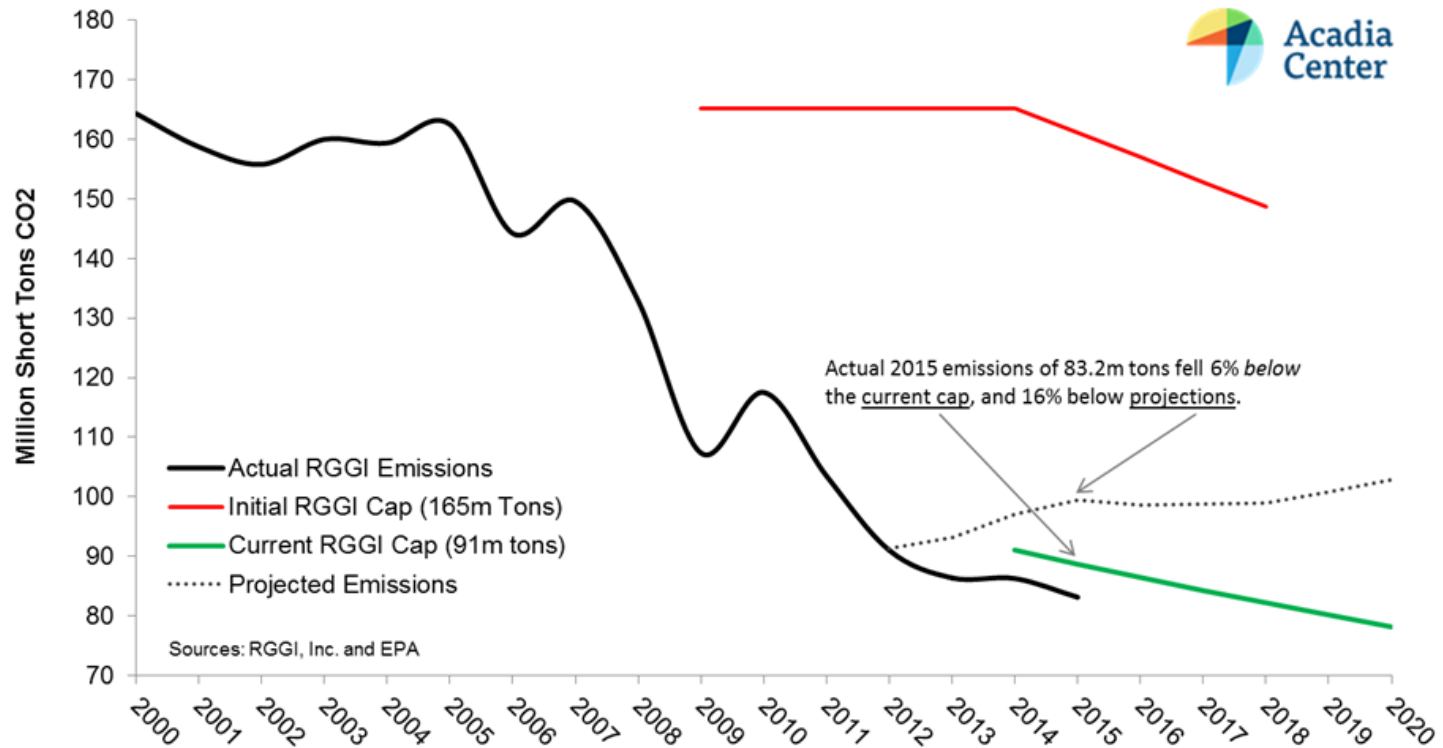


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Advancing the Clean Energy Future

| | 2005 | 2015 |
|------------------------|------|------|
| Coal | 12% | 2% |
| Oil | 9% | 1% |
| Natural Gas | 26% | 46% |
| Nuclear | 46% | 46% |
| Hydroelectric | 1% | 1% |
| Renewables (non-hydro) | 2% | 3% |

RGGI Cap and Emissions



Boston After Sandy Storm Surge

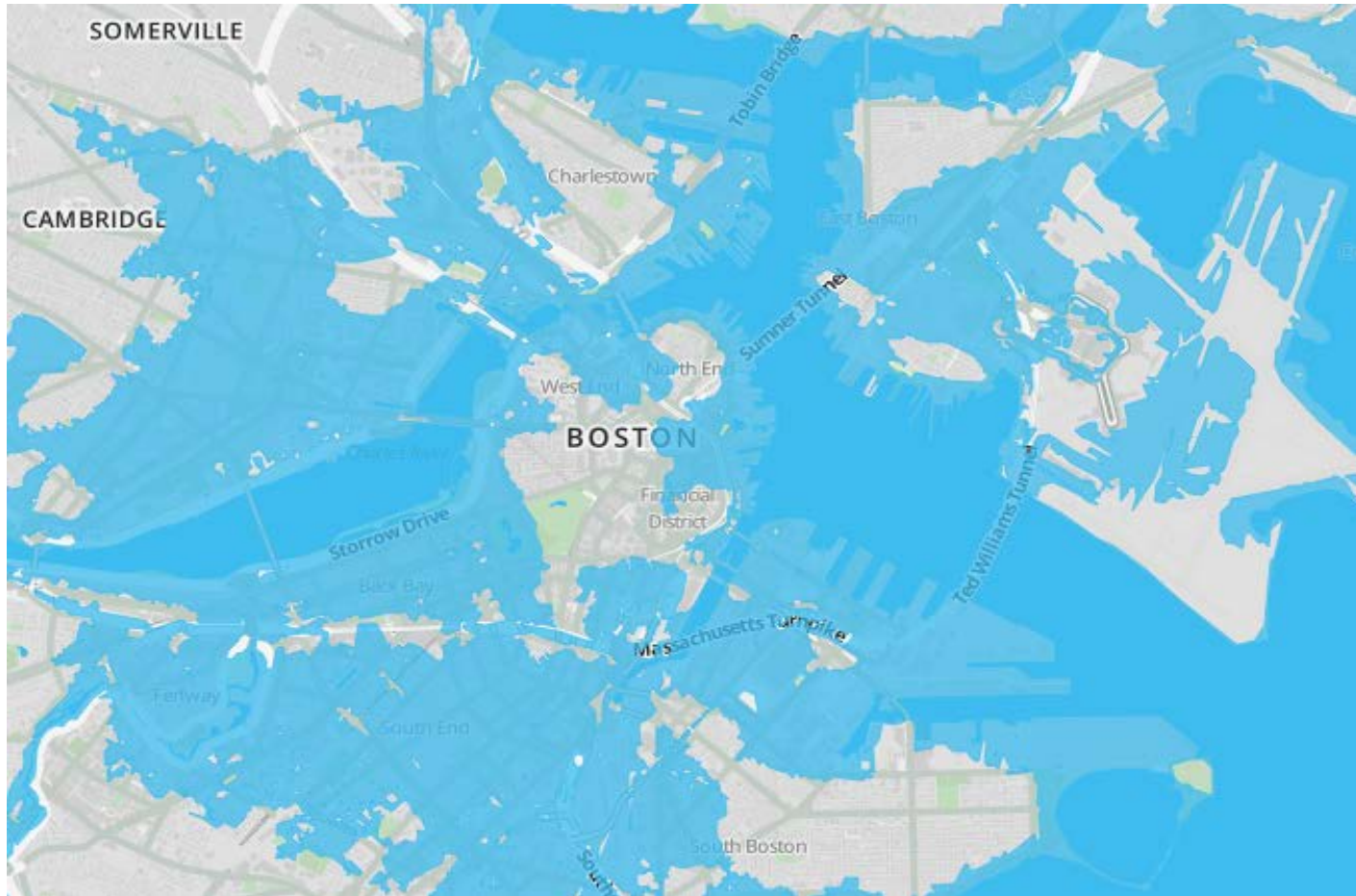
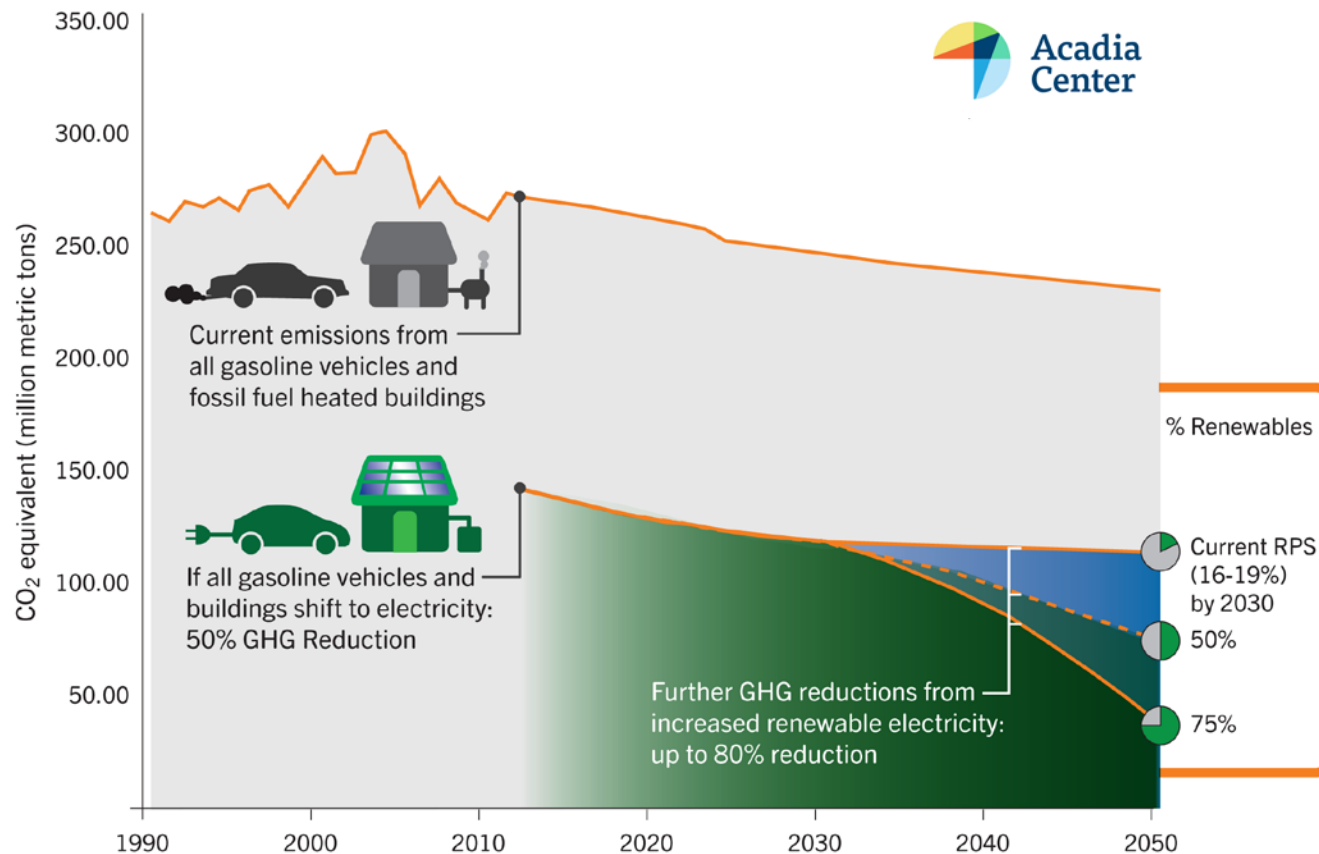


Image from [WGBH](#), based on a Boston Harbor Association [report](#) depicting the impacts of 7.5-foot storm surge (similar to what parts of New York City experienced during Sandy).

Pathway to Deep GHG Reductions: Electrification Using Low Carbon Generation

Full Electrification Illustration



EnergyVision



Electrify Buildings
and Transportation



Modernize the Grid



Clean Electric Supply



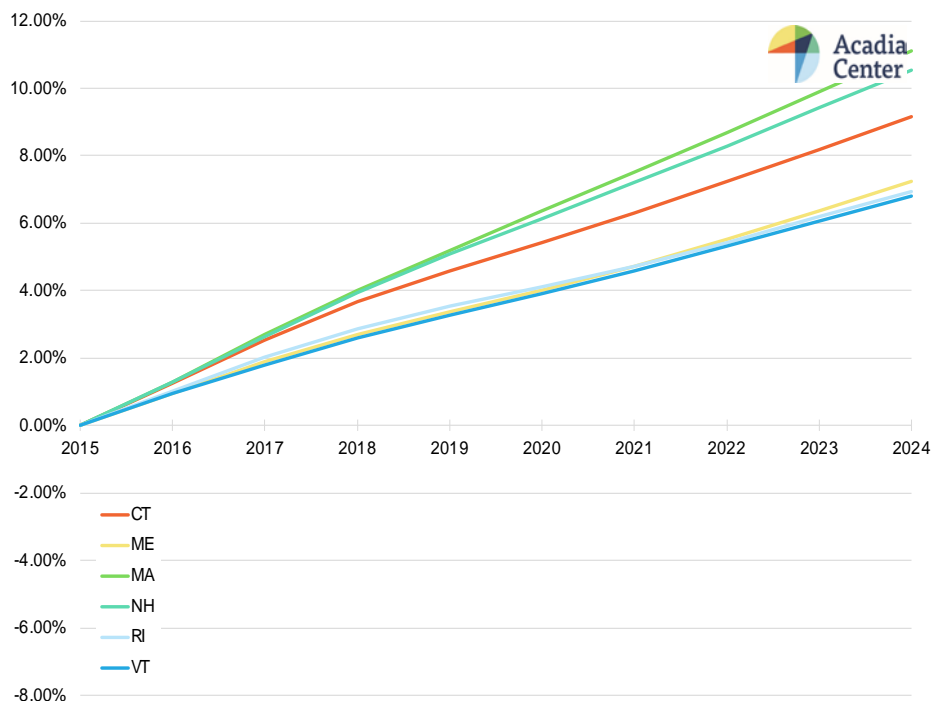
Maximize
Energy Efficiency

Low Carbon Power + New Electric Technologies = Pathway to Deep GHG Reductions

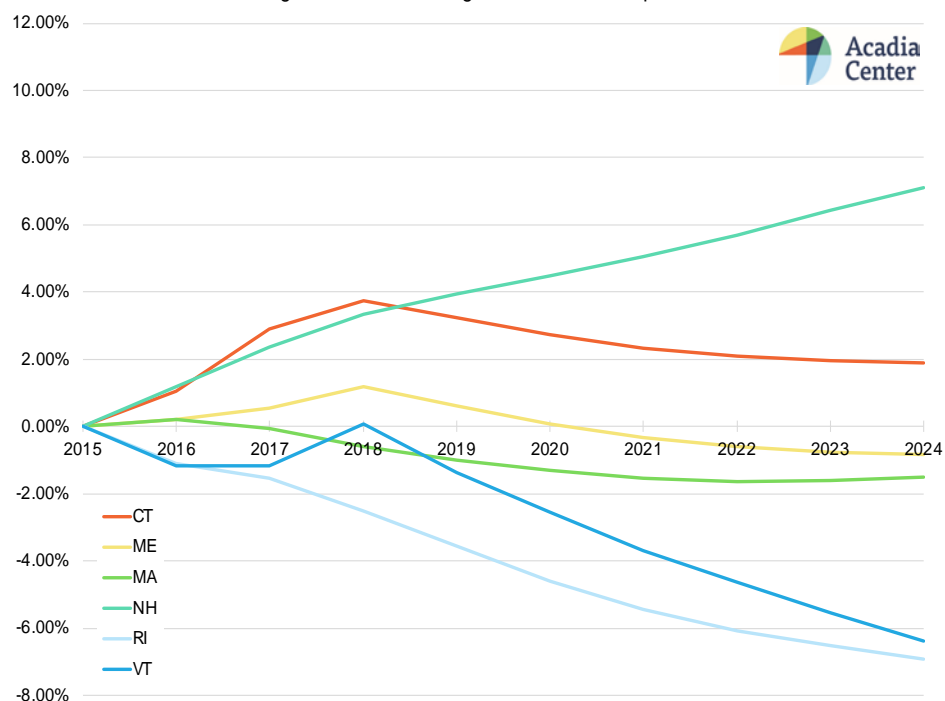


Maximize Energy Efficiency

ISO New England Forecast - Change in Electric Consumption from 2015

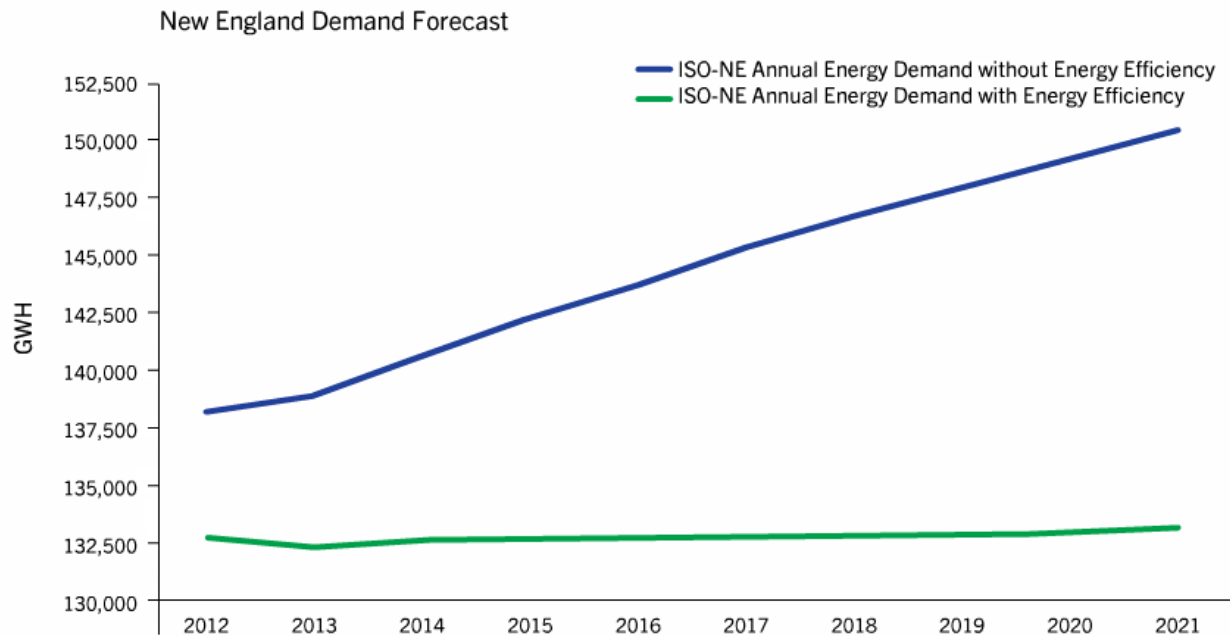


ISO New England Forecast - Change in Electric Consumption from 2015



Impact of Efficiency on Overall Load Forecast

Efficiency Reduces Power Grid Costs

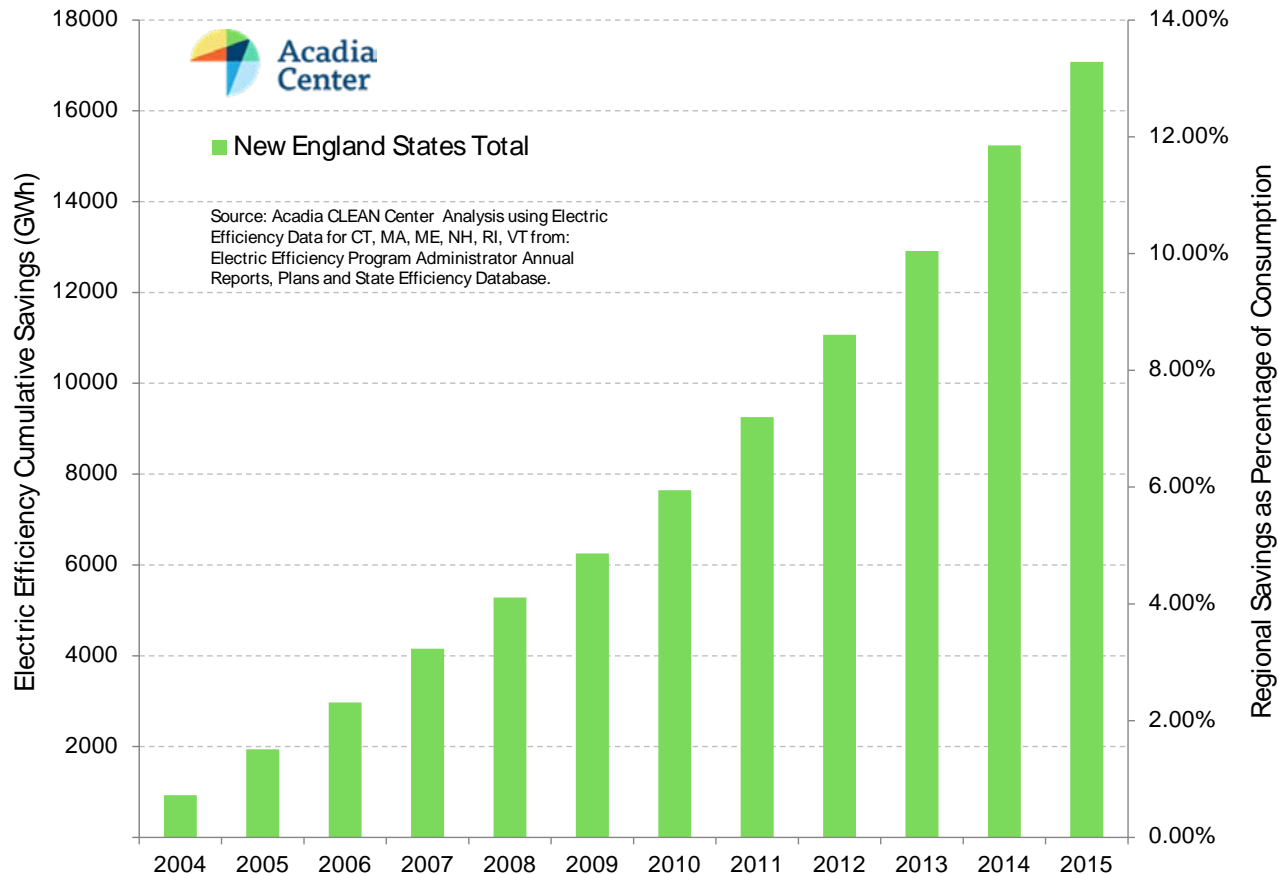


Energy efficiency investments have deferred \$416 Million of transmission investment in Vermont and New Hampshire

Source: ISO-NE Data.

State Trends:

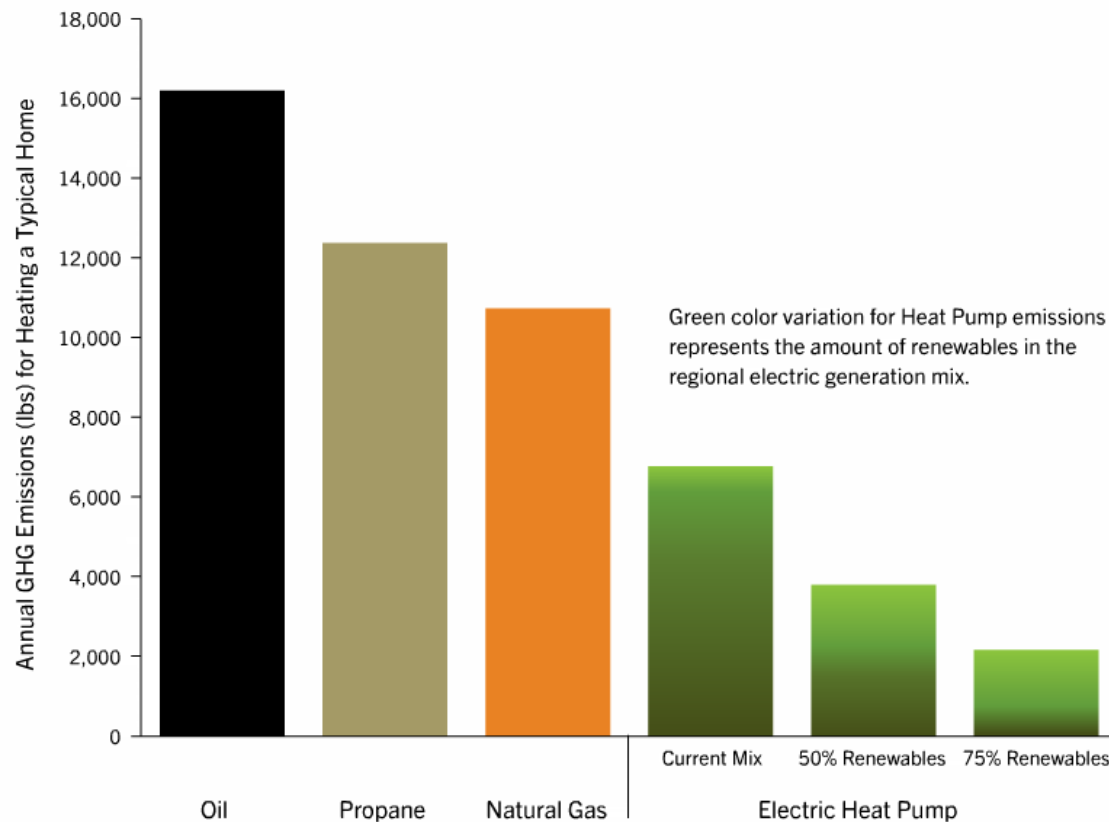
Cost-effective EE is meeting ~13% of regional electric consumption





Electrification: Buildings

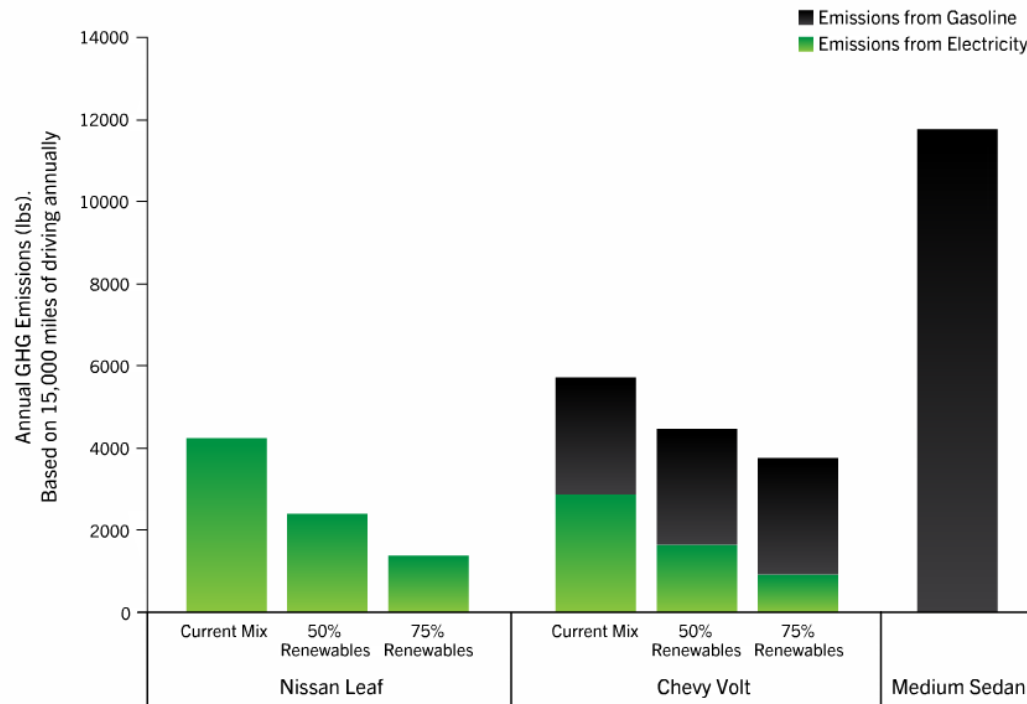
Emissions from Heating Sources





Electrification: Transportation

Emissions from Vehicles

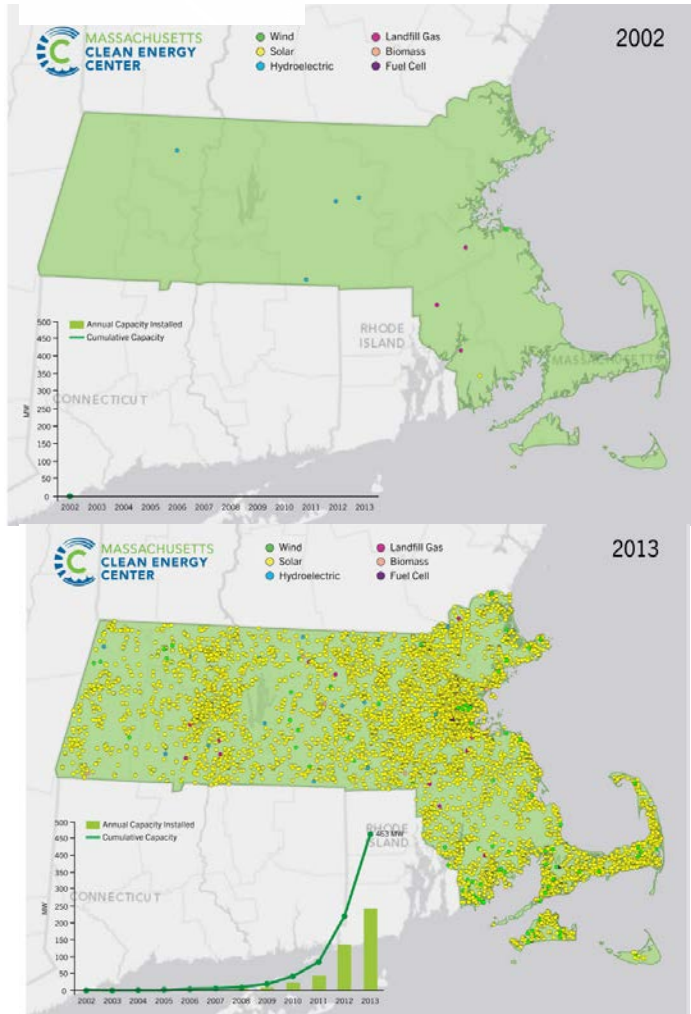


Sources: ENE Analysis, based on: Independent System Operator - New England, fueleconomy.gov, U.S. EPA, Bureau of Transportation Statistics

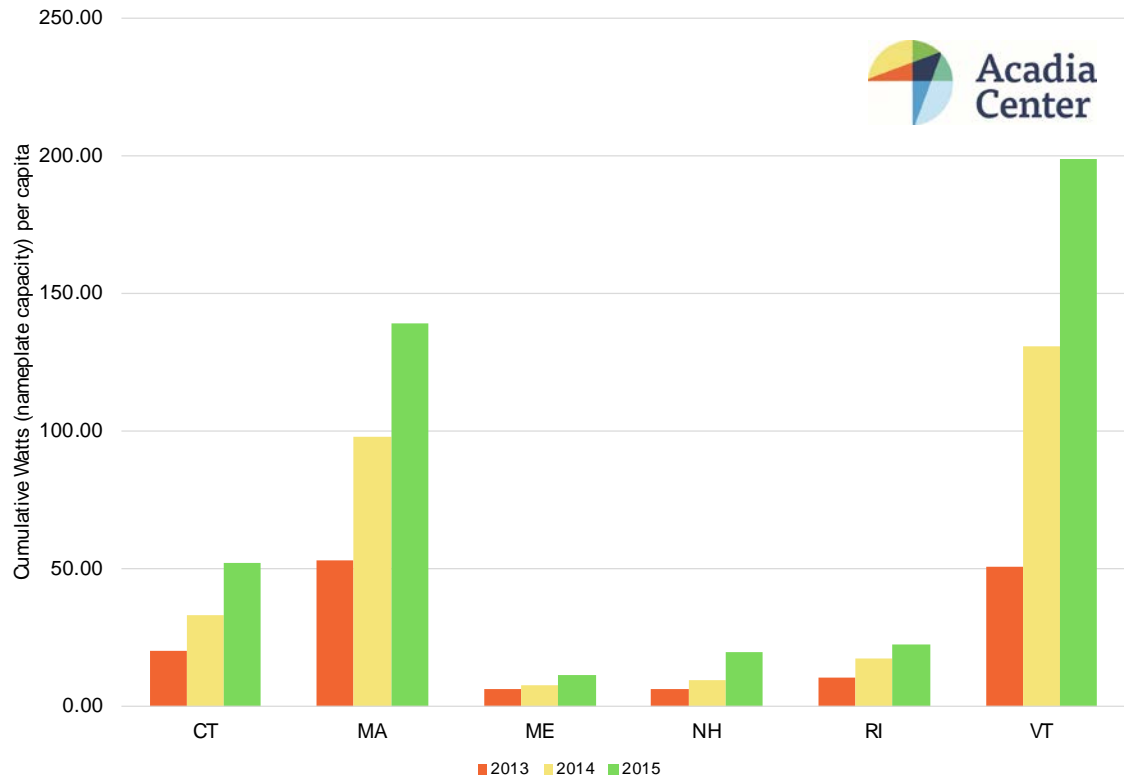




Clean Energy Supply

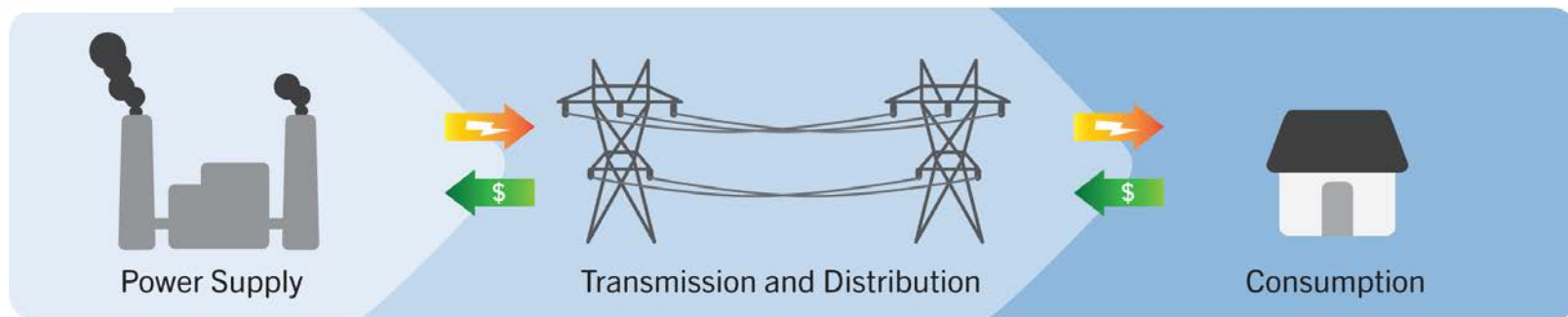


New England per capita PV Installed



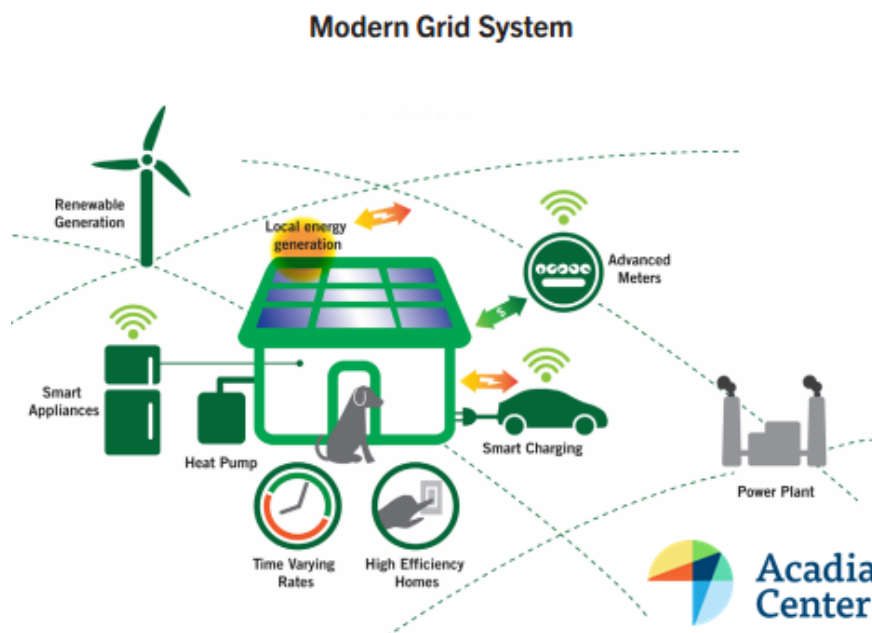


Modernize the Grid: Adapt from One Way to Two Way



Power Flows One Way;
Dollars Flow the Other

Power and Dollars
Flow Two Ways



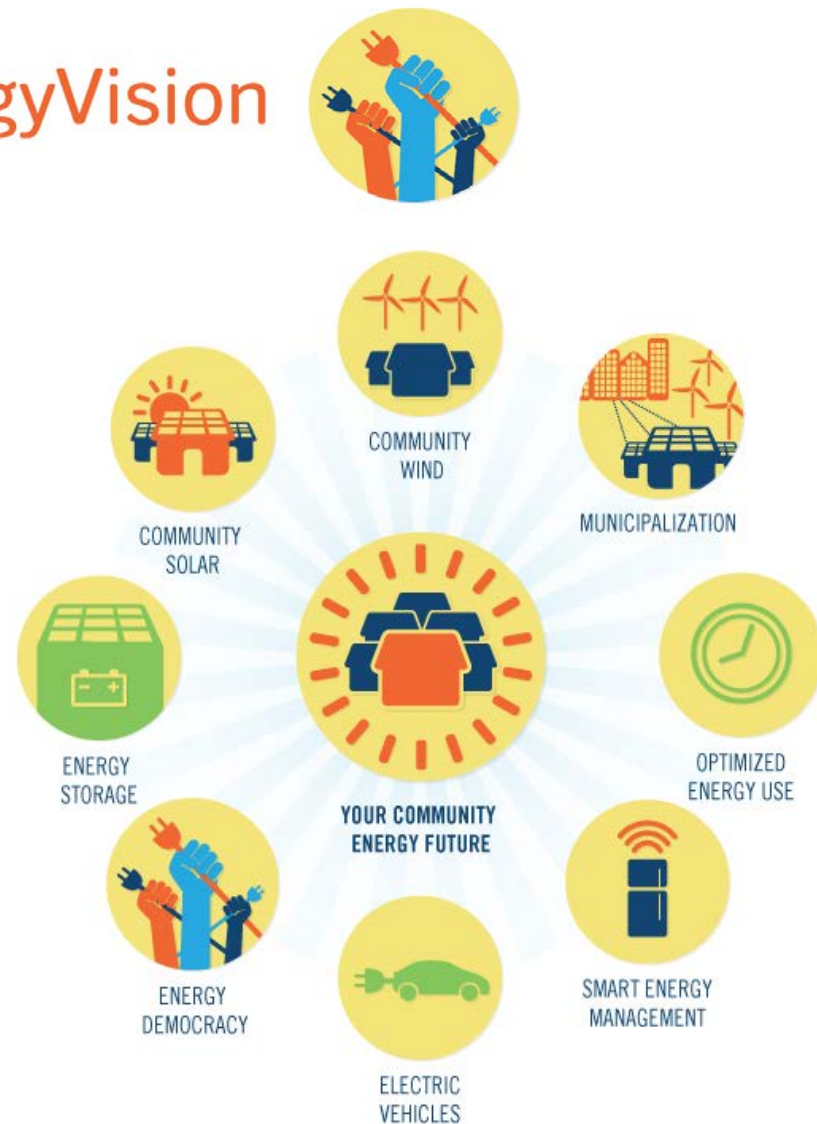
Empowering the Modern Energy Consumer



- Consumer control
- New opportunities
- Embrace innovation
- Remove barriers to new technologies
- Protect consumers
- Fair rates

Community EnergyVision

- Opportunities for communities to take control of their energy future
 - Community solar
 - Leveraging residents' buying power for clean energy resources
 - Geographically targeted energy efficiency
 - Strategic use of storage, electric vehicles, distributed generation
- Economic, regulatory, legal, information, barriers



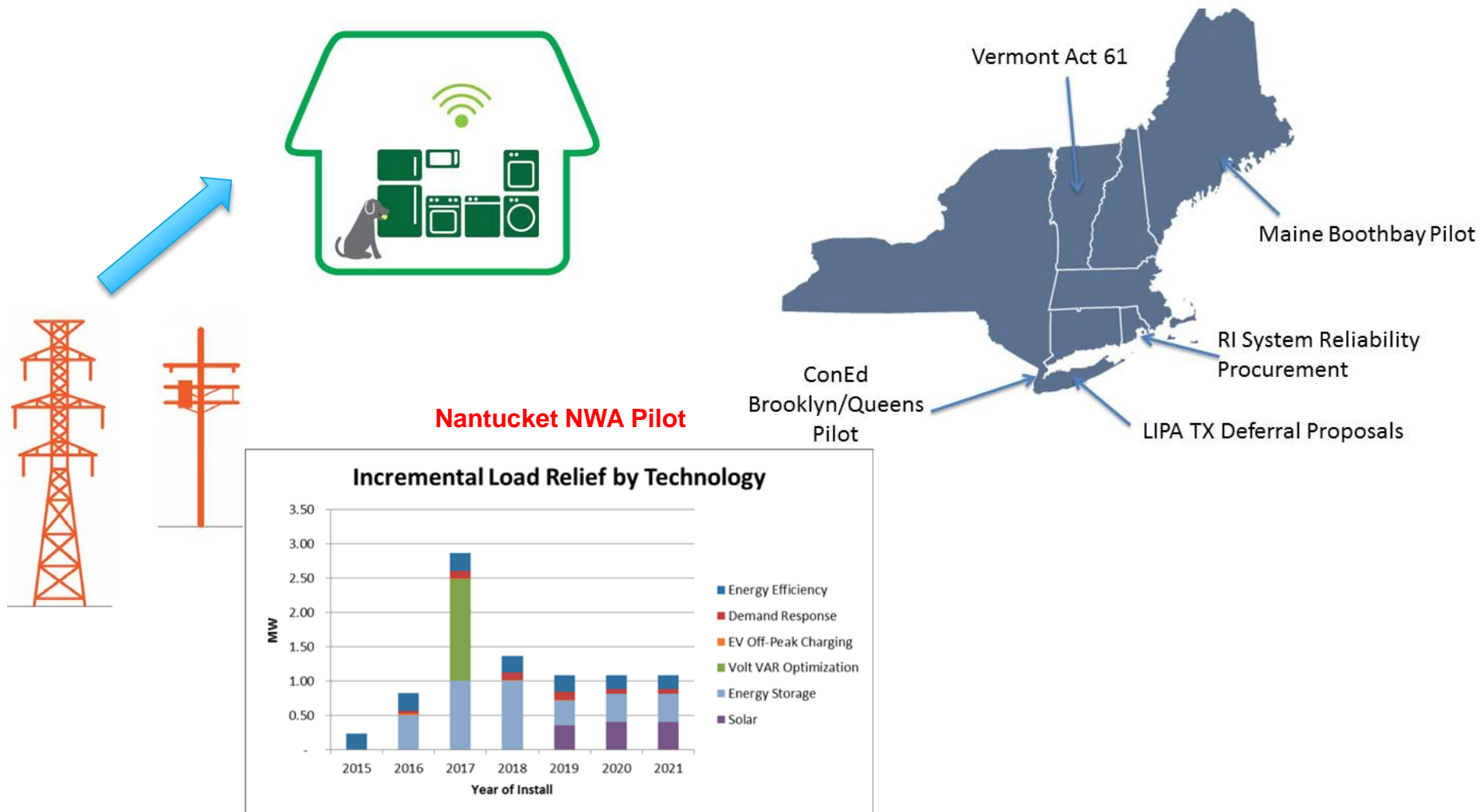
Self-Reliance / Local Control / Consumer Oriented / Improving Neighborhoods / Cleaner Air

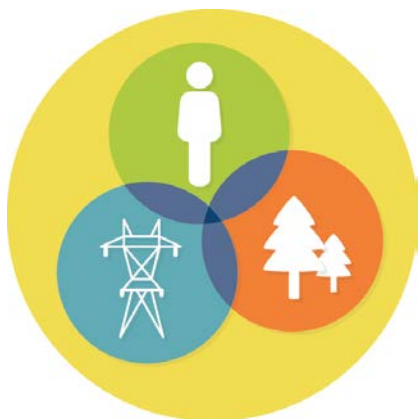
Community Energy Future



State Trends:

Pilots deploying local energy resources as substitutes for T&D infrastructure





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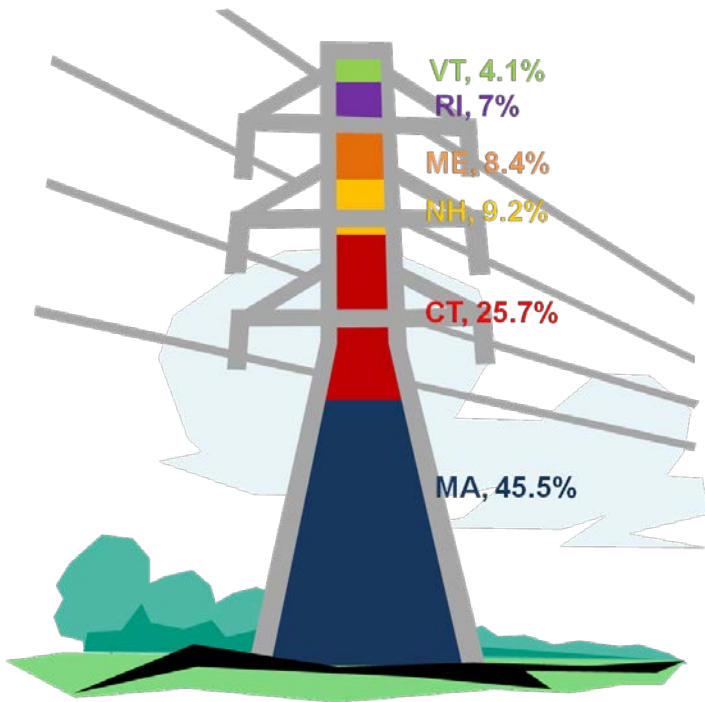
UtilityVision

- **Align utility incentives and earnings and grid planning** with consumer and environmental goals and technology advancements.
- **Level the playing field for customer-side resources** to ensure that the best options for the environment and consumers are selected.
- **Maintain the best of what we have** – energy efficiency investments, moving to clean power, reliability – while evolving to a more modern energy system.

Modernize Outdated Rules as New Technologies Change the Energy Landscape

Transmission Line Costs
Cost Shared by States

vs. Non-transmission Alternative
Costs Borne by One State



**Transmission investment drivers:
follow the money: 11% v. 0-4%**

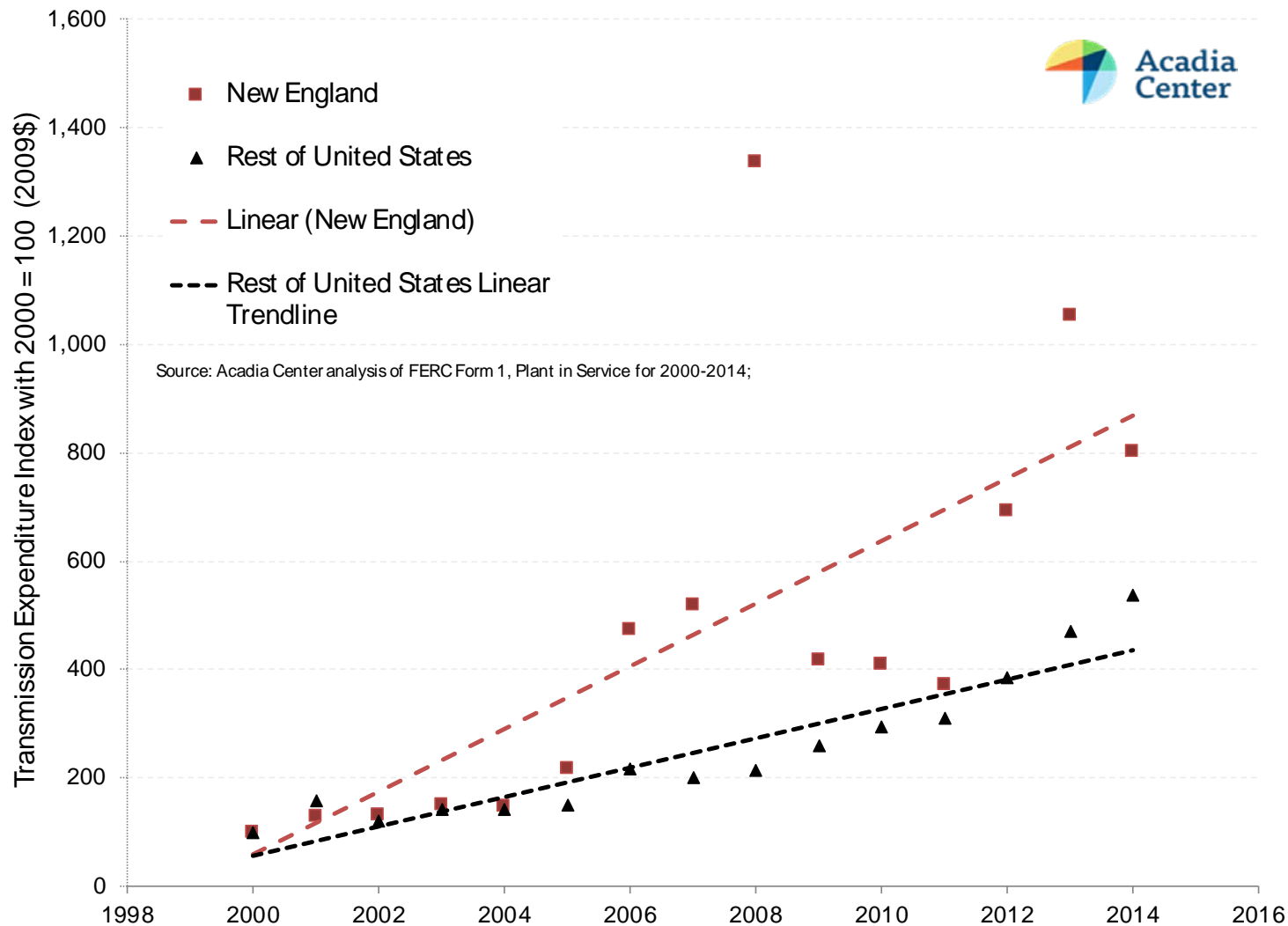
Cost Allocation for Local Energy Resources

Maine Power Reliability Program: Economic Incentives Lead to More Costly Decisions

| Options | Project cost | Cost to Maine | Cost to Massachusetts |
|--|----------------|------------------------------|--------------------------------|
| 1) MPRP (regionally allocated) | \$ 1.4 Billion | \$ 118M (8.4% of \$1.4B) | \$ 637M (45.5% of \$1.4B) |
| 2) Local Energy Resources | \$ 800 Million | \$ 800M (100% of \$800M) | \$ 0 Million (0% of \$800M) |
| 3) If local energy resources had been regionally allocated | \$ 800 Million | \$ 67.2M (8.4% of \$800M) | \$364M (45.5% of \$800M) |

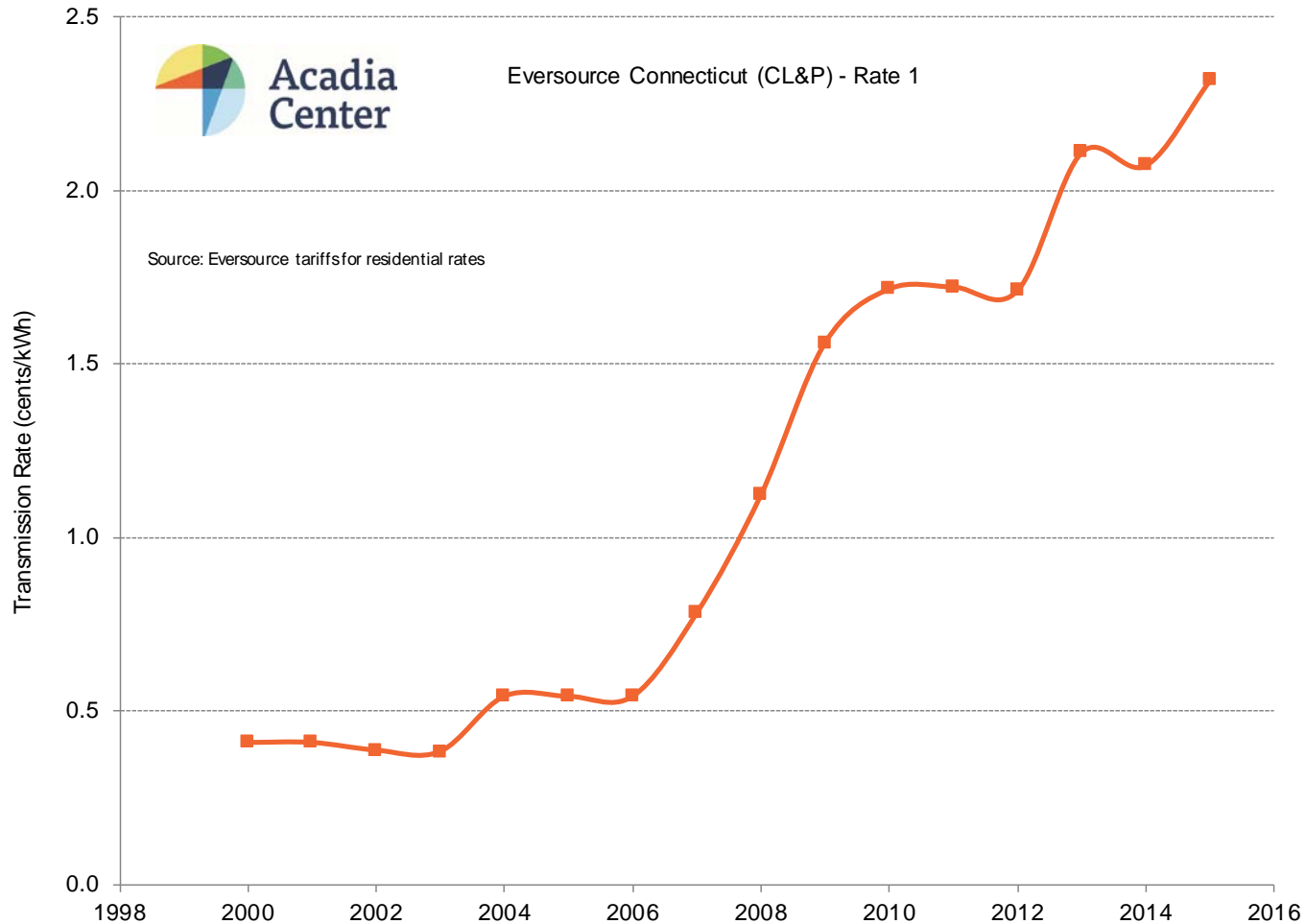
- Transmission: 11.74% ROE
 - Distribution: 7-8% ROE
 - Local energy resources: 0%
- Regional expenditure on transmission for reliability continues to grow vs. state priorities for increasing energy efficiency, distributed energy resources, large-scale renewables.

Disconnect between Transmission System and State Priorities

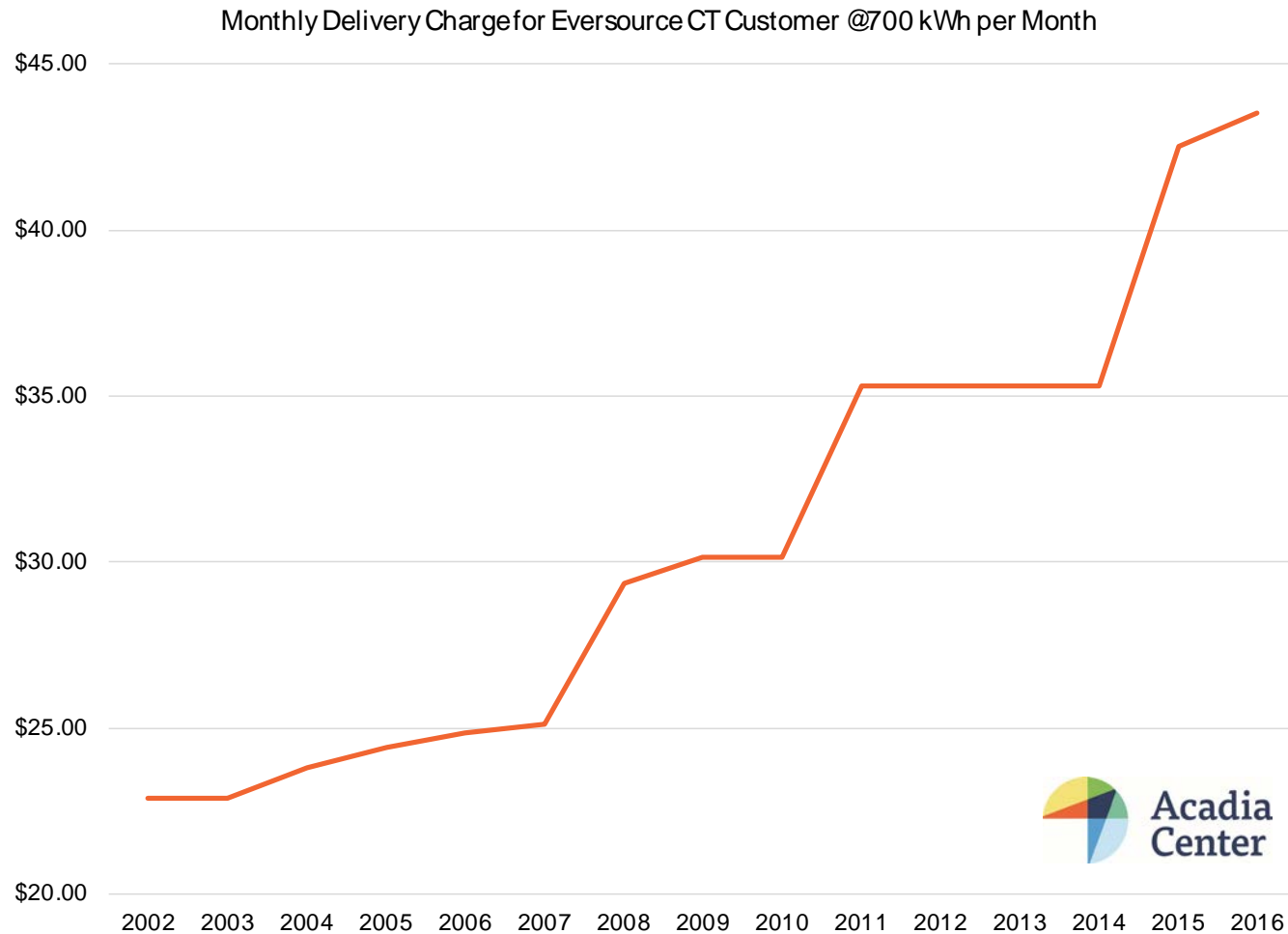


Transmission System Trends:

Residential transmission rates are escalating dramatically



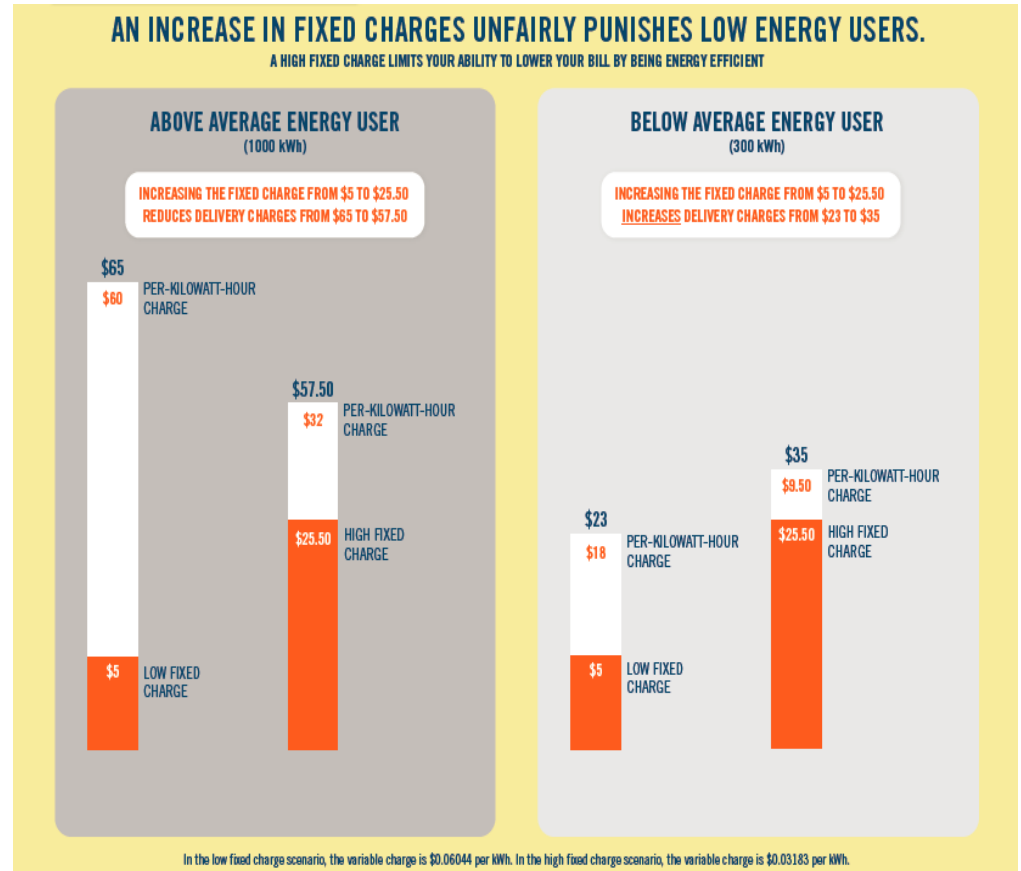
Distribution Rates Rising 2002-2016



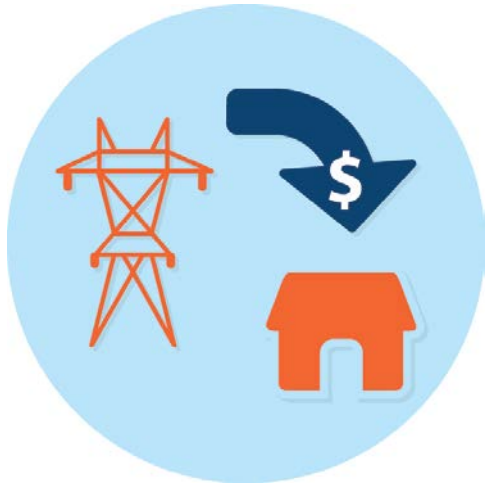
How Consumers Pay for the Power They Use



Flat rates do not reflect underlying cost or value structures. Electric rates should allow us to make smart economic & energy decisions to save money and energy.

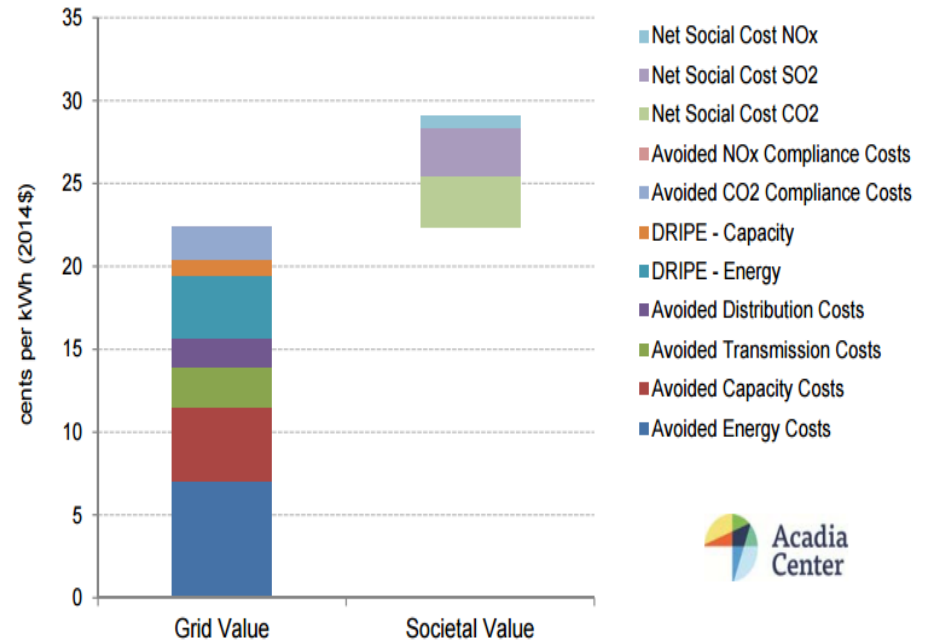


How Consumers Get Paid for the Power They Produce

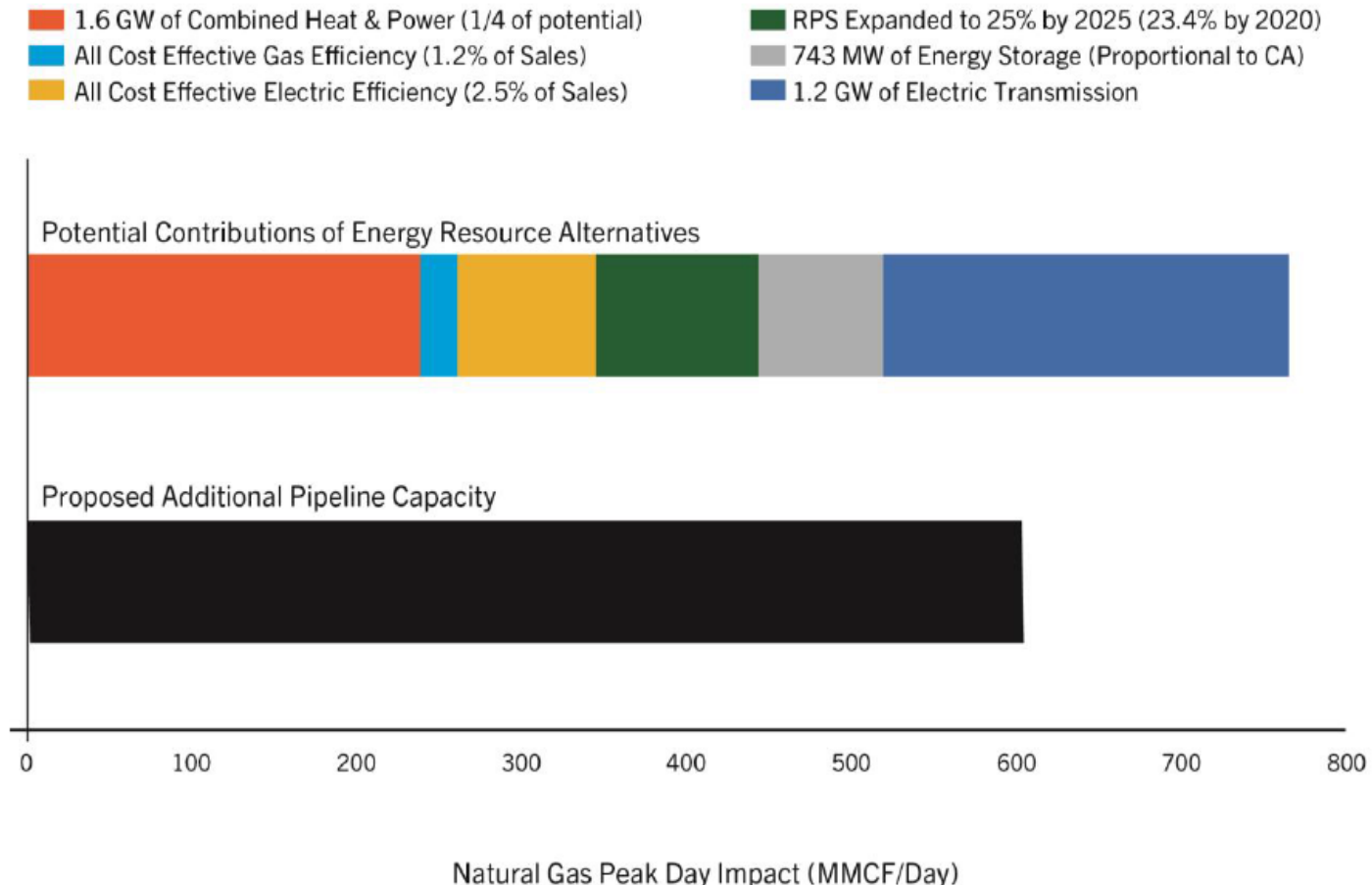


Customers should pay the right value for staying connected to the grid and get paid the right value for the services they provide.

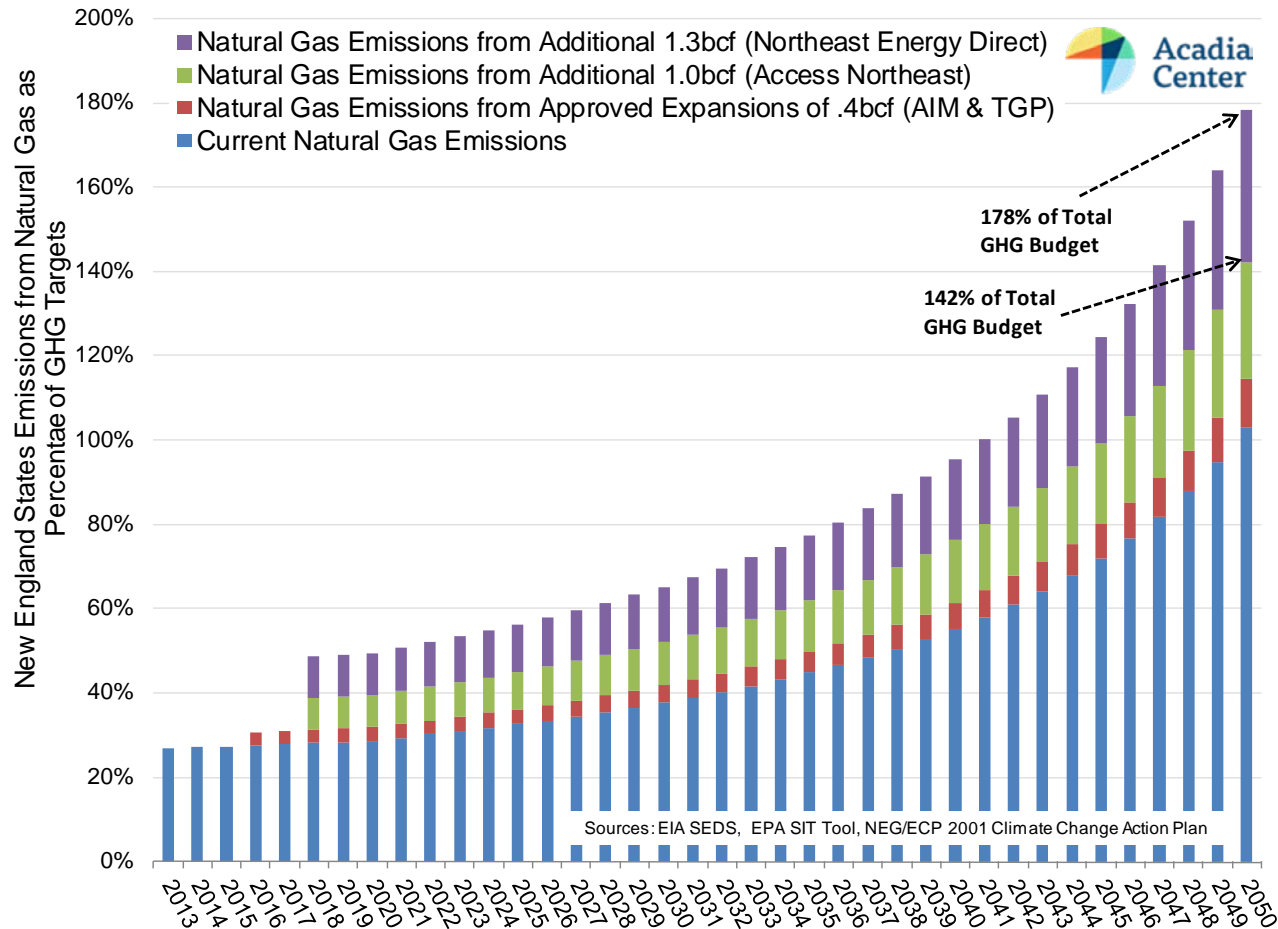
Value of Solar Generation



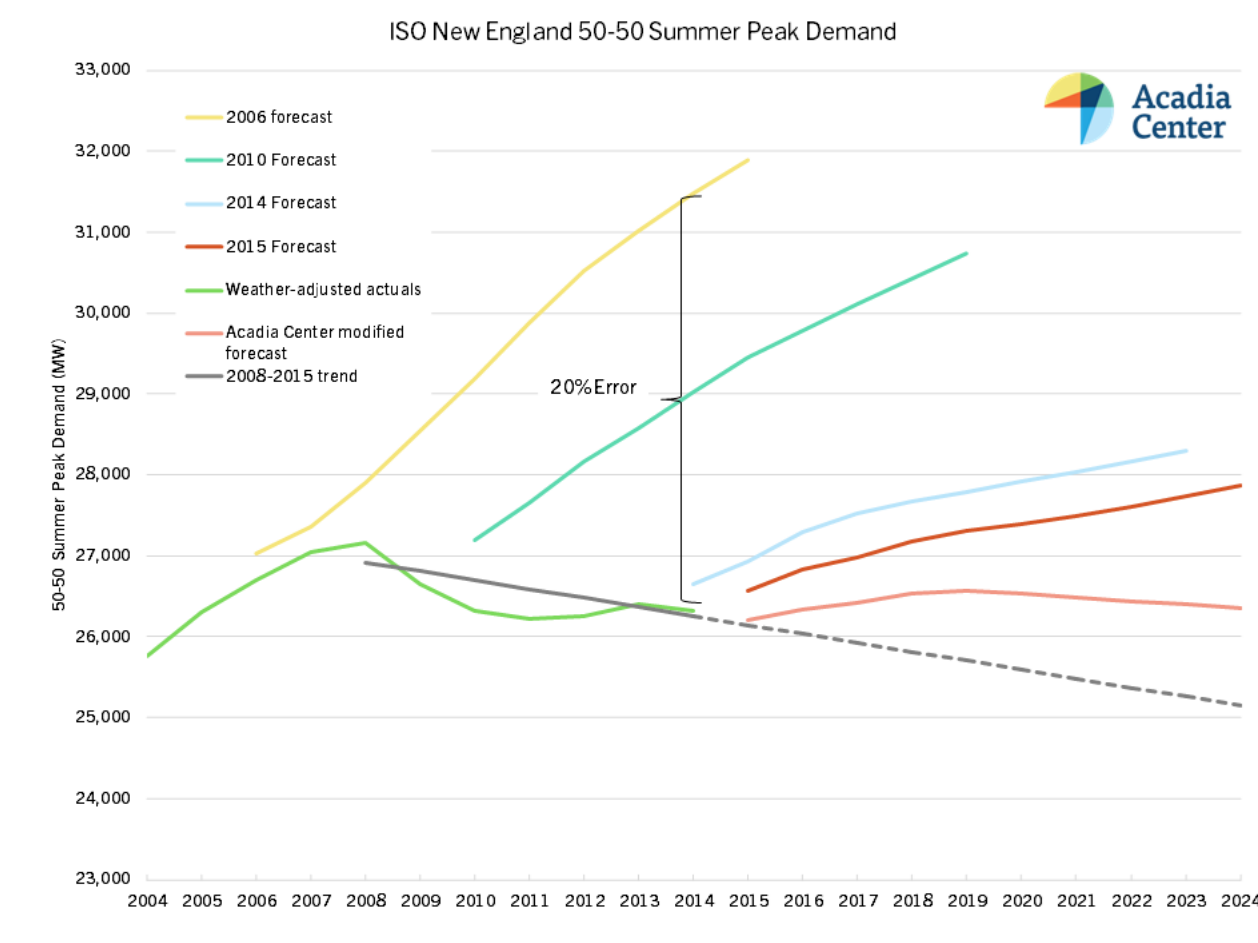
Today's Decisions Will Determine Our Energy Future



Share of Regional GHG Budget Consumed by Natural Gas With Pipeline Additions



Continue to Improve ISO-NE Forecasts



Fully and fairly incorporating DER
Will Impact Energy Infrastructure

Task Ahead to Embrace a Low Carbon Energy Future Involves Updating the Rules that Govern Energy System Revenues and Planning:

Is There a Win Win Result?



- Pro-consumer incentives for utilities
- Rates that help customers
- Make unequal cost sharing fair
- Adjust monopoly control
- Remove limits on customer generation
- Advancing community engagement
- Integrating community energy technologies
- Providing consumers with the information they deserve
- Only grant additional incentives for additional risk.
- ISO-NE should consider requiring guaranteed cost bids.
- Improve accuracy of project cost estimates to allow meaningful comparison.
- Don't pay incentives on cost over-runs.



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