Gas Demand Side Management in New England

Presentation to

ISO-New England Planning Advisory Committee Meeting

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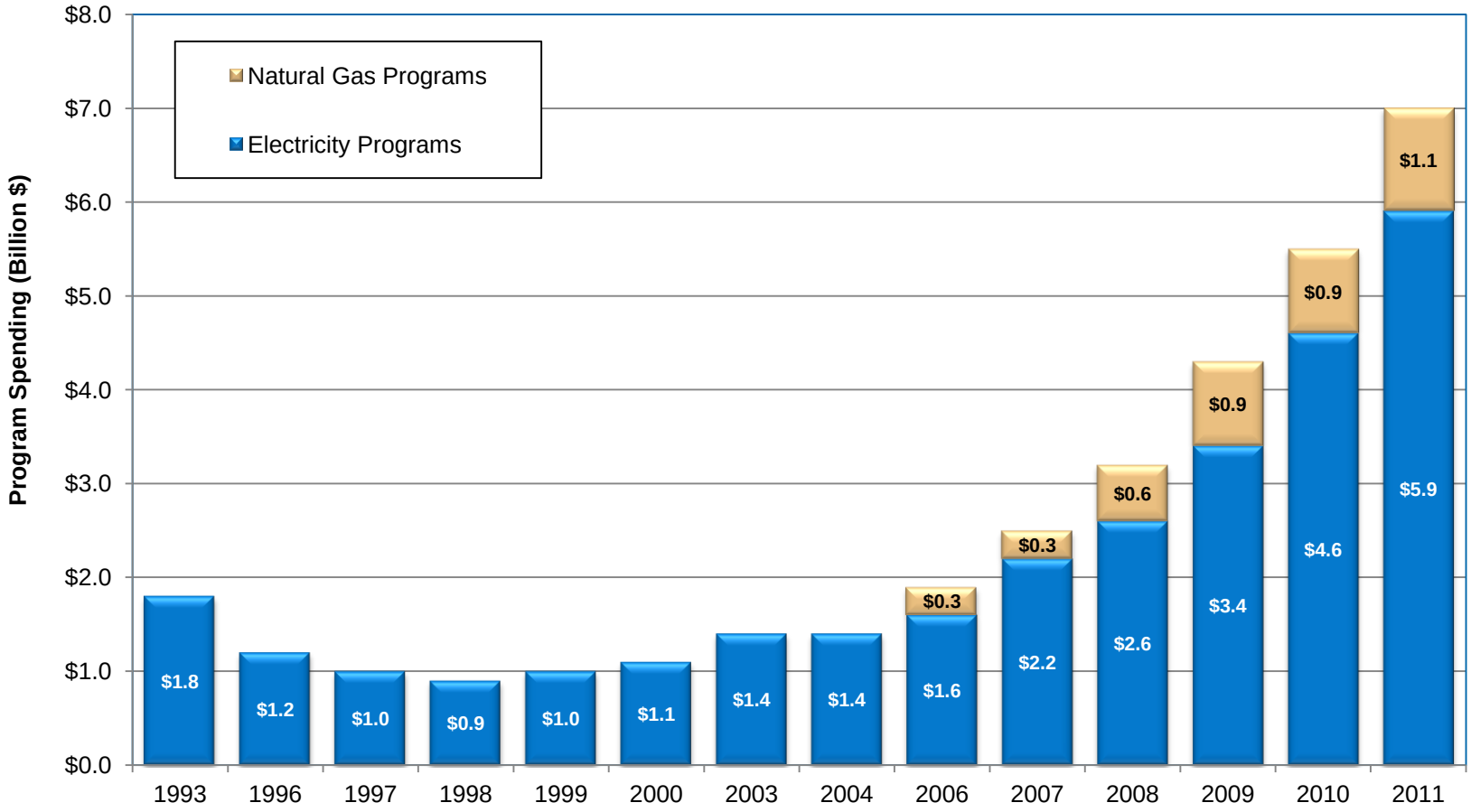
Key Questions

- What is the role of Demand Side Management (DSM) in reducing gas demand in New England?
  - How have the State programs been implemented?
  - What are the effects of DSM on the gas market?
- What is the role of combined heat and power on gas demand and energy markets in New England?

Key Findings

- All of the states in New England offer some gas DSM programs, but there has been much more emphasis on electric DSM.
- Gas DSM programs have had a relatively minor impact on total consumption.
  - Estimated gas DSM savings in 2013 were less than 1% of total LDC loads.
- The majority of residential and commercial buildings in New England still use No. 2 fuel oil for space heating.
- While the gas DSM programs are aimed at reducing the per customer use of natural gas, they are also likely to result in increased customer growth over time, because they encourage consumers to switch to gas from other fuels.

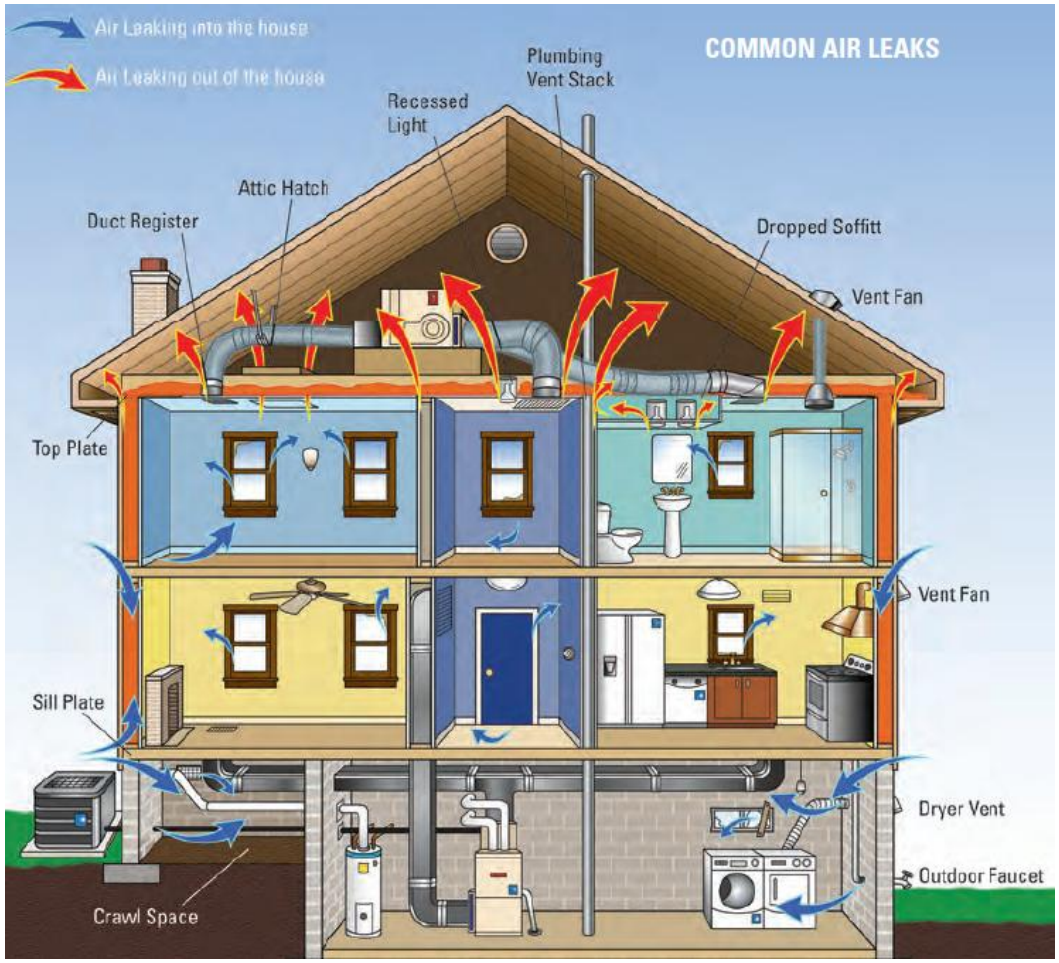
Electricity DSM has Dominated the Policy Agenda in New England



Source: American Council for an Energy-Efficient Economy (ACEEE).

Gas DSM has Focused on Reducing Consumption Through Building and Equipment Efficiencies

- **Relatively high and volatile natural gas prices in the prior decade have created interest in gas DSM**
- **Principal tools for reducing consumption include:**
  - Promotion of high efficiency furnaces and water heaters.
  - Promotion of high efficiency boilers and cooking equipment.
  - Promotion of Energy Star washing/drying machines.
  - Installation of better insulation, multi-paned windows, and sealing ducts and pipes.
  - Installation of programmable thermostats.
  - Insulation of water heating tanks, and promotion of pilotless gas stoves.



Summary of State Programs

- All gas DSM programs across New England have been established within the past 30 years – Massachusetts first established gas DSM programs in the 1980s.
  - A couple states have established programs much more recently (i.e., during the past decade).

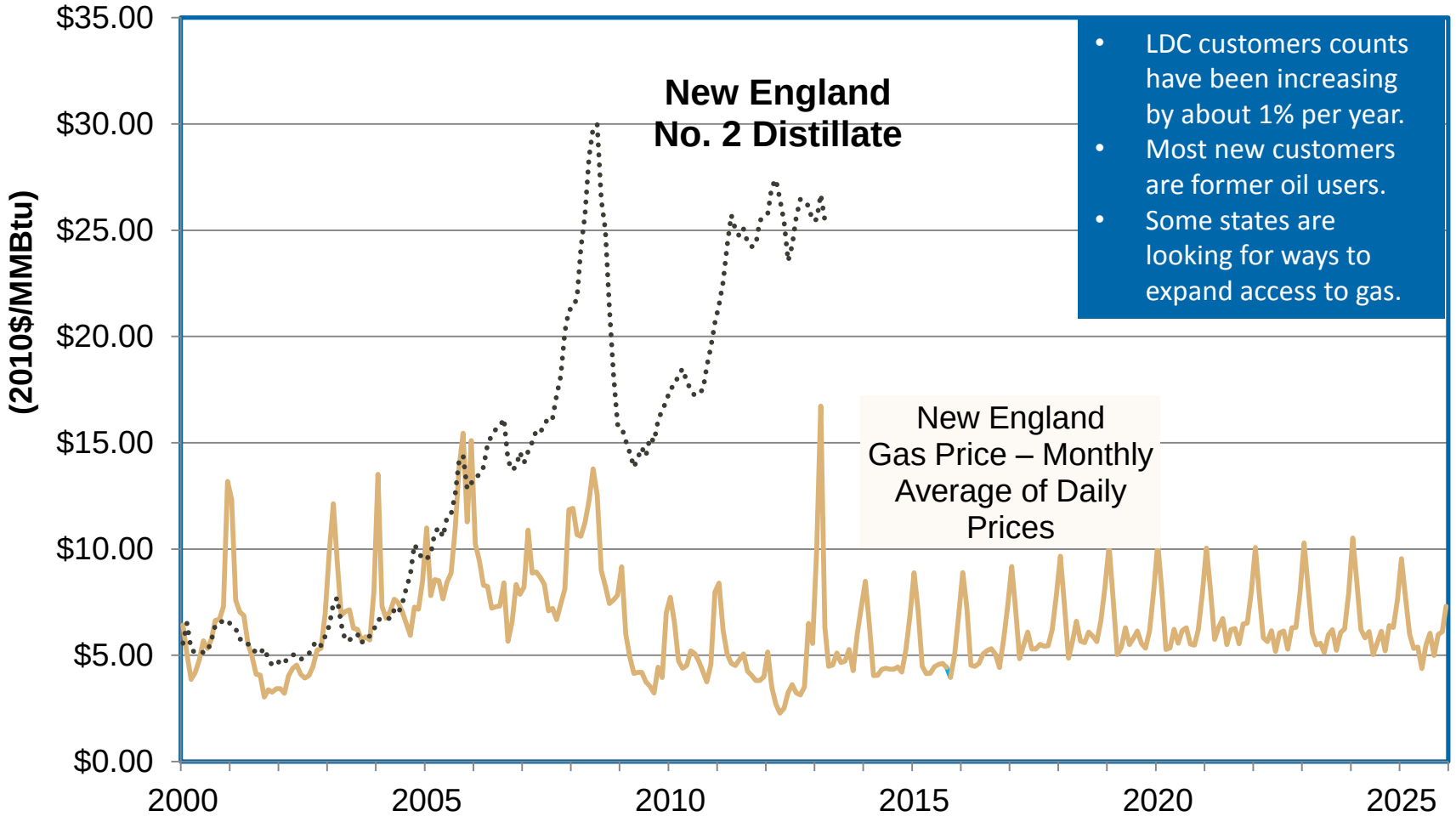
- All of the New England states have state-wide programs, except Maine.
  - Impacts of the programs are relatively modest.
  - Even though Maine doesn't have a state-wide program, its policy requires that all natural gas utilities with more than 5,000 residential customers have a natural gas energy efficiency program.
  - The Connecticut Energy Efficiency Fund (CEEF) was created to slow the state's increasing energy demand by providing monetary assistance for energy efficient projects.
  - According to the ACEEE's 2012 State Scorecard Rankings, Massachusetts placed first in the United States for its energy efficiency programs.
  - New Hampshire offers the same suite of gas DSM programs that are offered in Massachusetts by GasNetworks.
  - Rhode Island offers a reward program where utilities may receive a percentage of their gas DSM program budget back if savings goals are met.
  - Vermont is the original creator of the "energy efficiency utility" concept.

Gas DSM Savings are Relatively Small

State	2013 Estimated DSM Savings (MMcf)[1]		2013 Estimated Gas Demand (MMcf)[2]		DSM Savings' Share of Annual Gas Demand (%)	
	Residential	Commercial & Industrial	Residential	Commercial & Industrial	Residential	Commercial & Industrial
Connecticut	293	194	46,766	68,268	0.6%	0.3%
Maine	14	35	1,473	35,742	1.0%	0.1%
Massachusetts	1,034	1,105	135,132	134,979	0.8%	0.8%
New Hampshire	41	48	7,273	16,322	0.6%	0.3%
Rhode Island	114	166	17,636	19,627	0.6%	0.8%
Vermont	4	1	3,361	5,673	0.1%	0.0%
New England Total	1,500	1,549	211,641	280,611	0.7%	0.6%

1. Savings estimates from State DSM program administrators.
2. ICF projected end use gas demand by sector based on normal weather.

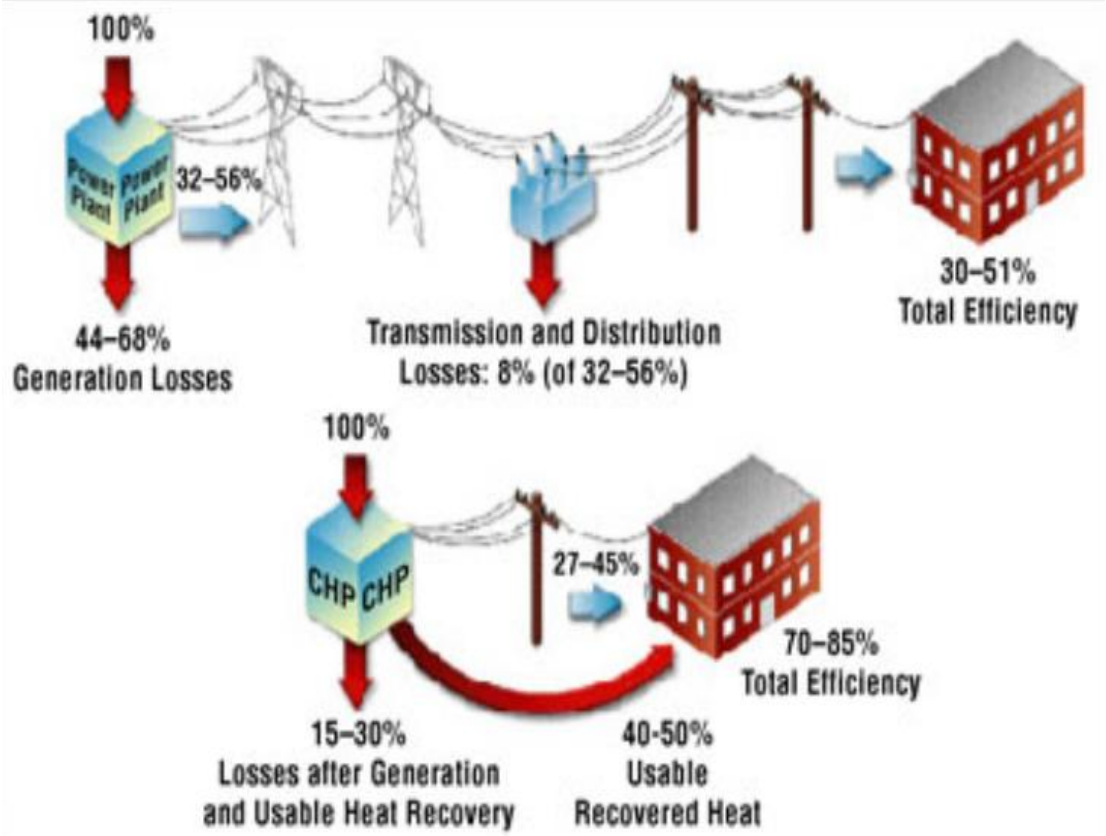
With Today's Oil-Gas Price Relationship, Gas DSM Complements Efforts to Expand Gas Use and Fuel Switching



Note: Projected gas prices from ICF's gas market base case.

CHP Improves System Efficiency

- CHP makes use of "waste heat" for heating, cooling, dehumidification, or other processes.
- Avoids electricity losses that occur during electric transmission.
- CHP facilities are typically 70 percent to 85 percent efficient in raw fuel use, compared with 30 percent to 50 percent for traditional power generation through centralized utilities



Source: U.S. Department of Energy (DOE). "Combined Heat and Power Basics." DOE, February 2012: Washington, D.C. Available at: https://www1.eere.energy.gov/femp/technologies/derchp_chpbasics.html

Current CHP in New England is 2.2 GW and 310 MMcf/d

State	Capacity (MW)			Gas Use (MMcf/Yr)			Sites (#)
	Industrial	Commercial	Total	Industrial	Commercial	Total	
Connecticut	270	210	480	14,465	9,359	23,824	161
Massachusetts	960	477	1,437	51,453	21,310	72,764	155
Maine	176	16	192	9,430	726	10,156	8
New Hampshire	9	13	23	493	587	1,080	6
Rhode Island	76	23	99	4,062	1,023	5,085	23
Vermont	8	1	9	447	38	485	8
New England Total	1,499	740	2,240	80,350	33,043	113,394	361

… but, the Potential is Almost Three times as Great

State	Capacity (MW)			Share of Total State Capacity (%)*	Gas Use (MMcf/Yr)		
	Industrial	Commercial	Total		Industrial	Commercial	Total
Connecticut	567	866	1,433	16%	30,380	38,667	69,047
Maine	501	323	824	18%	26,844	14,422	41,266
Massachusetts	1,135	1,727	2,862	21%	60,814	77,111	137,925
New Hampshire	272	305	577	14%	14,574	13,618	28,192
Rhode Island	175	266	441	25%	9,377	11,877	21,254
Vermont	135	161	296	25%	7,233	7,189	14,422
New England Total	2,785	3,648	6,433	19%	149,222	162,884	312,106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