Affordable Heat: Lowering Vermont’s Fuel Bills -- and Greenhouse Emissions

Carsey Institute – New England Center
October 29, 2008
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Two Themes Today

1. Vermont’s “all-fuels/whole buildings” program for thermal efficiency (S.209, 2008)
   - Statewide goals, may triple Vermont Gas EE programs, extend WAP and electric EE programs
   - New funding for liquid fuel efficiency: from RGGI & ISO-NE Forward Capacity Market revenues –
   - BUT: New revenue not adequate to meet adopted goals – no new tax $$
   - Comprehensive, not low income alone

2. Efficiency and Climate Strategy
   - Top-down, price-driven GHG reduction is the expensive way to go!
   - NOT “Cap and Give” or “Cap and Dividend”
   - BETTER: “Cap and Invest”
Affordable Heat: The Challenge

Fossil Fuel Bill: $~800M per year
up $340M in 4 years
Fossil fuels for buildings are VT’s second-largest source of GHG emissions
Future risks of price increases and carbon policy costs
Fuel dollars quickly leave Vermont
Framing: The High Cost of Importing Carbon

Wholesale Fossil Fuel Expenditures

Total New England Fossil Fuel Expenditures in 2004 = $21 Billion

Source: EIA data
Framing: Affordable heat is a cost-effective investment opportunity

Report recommended:
- **20%** of housing stock treated in 2017 (60,000 units)
- In treated households, lower fuel bills by average **25%**
- Fuel savings would exceed **$1.5 Billion** from measures installed over 10 years
- Reduce Vermont’s annual fuel use by **6%** by 2017

**Figure 7-1: State Energy Efficiency Services: Total Benefits and Total Costs, 2008-2028**

Save **$100 million per year**
Goal: 60,000+ Buildings

- Low income Weatherization
- Res and Comm Building Efficiency
- New Construction
- Vermont Gas
- Plus effect of building energy codes
- Total cost: $400 million over ten years

Phase in: 2300 buildings in 2008; 9600 buildings in 2017

Benefit/Cost: 2.64 Considering Public and Private Costs
Proposed: Double the low-income weatherization program

- Need: 50,000 eligible low-income HH
- WAP today serves ~1450 units/year
- Average fuel savings: 21% plus health, comfort, life safety, reduced public assistance & bad debt. $2 to $5 saved for each dollar invested
- Average cost/unit: ~$5300
- Goal: ramp up to 3050 units/year by 2016
- 10-year goal = 23,875 units total
Funding Affordable Heat--
Where would $400 million come from?

- ~50% Private capital leveraged with loans and incentives
- Existing sources: Gross Receipts Tax, VGS and existing Efficiency Vermont: ~25%
- RGGI and FCM revenues: 10%
- New public revenues needed (GRT increase or General Fund, etc.) 15%
Vermont Energy Efficiency and Affordability Act (S.209, 2008)

- Sets thermal efficiency goals (units and %s)
- Tightens building codes
- Creates Fuel Efficiency Fund, administered by DPS and PSB, funded by RGGI allowance proceeds
- Adds FCM $ to Efficiency Vermont revenue pool for “whole buildings” EE
- Encourages PSB and Vermont Gas to expand natural gas DSM
- Studies (only) increase in Energy GR Tax
- (Also: net metering, green pricing, renewables)
Resisting temptation

WE'RE RUNNING OUT OF OIL. WHAT DO WE DO?
GIVE EVERYONE $100.
“Top down” cap and trade relying on price alone is more expensive, less likely to succeed than a portfolio-based policy menu (plus a cap);
Carbon allocation can accelerate cap/trade success, lower program costs – build EE into national programs;
State policies (EE, codes, portfolio mgt, RPS, etc.) are crucial to success;
Low-income EE can serve both climate and equity goals.
Why carbon taxes and auctions create “high cost tons”

- Carbon price must be very high to save many tons (for gas to displace coal, etc.)
- Fossil units almost always set the clearing price
- Short-term clearing price provides the benchmark for longer-term and bilateral contracts
- SO: Carbon penalty on sellers raises prices generally
- Inframarginal rent a/k/a “windfall gains” to generators paid for by consumers
Problem #1: Carbon taxes and auctions to sources can increase wholesale power prices with little effect on dispatch or emissions

Source: “The Change in Profit Climate: How will carbon-emissions policies affect the generation fleet?” Victor Niemeyer, (EPRI) -- Public Utilities Fortnightly May 2007 <some captions, demand and price lines added>
Americans need help when it comes to energy efficiency
Efficiency programs can save 7 times more carbon per consumer $ than carbon taxes

**Annual CO₂ Emissions Saved by: Increasing Rates 3%; and Increasing Rates 3% to Fund Energy Efficiency (Ohio Example)**

- **Blue Line**: Annual carbon dioxide emissions avoided from raising rates 3% and funding EE.
- **Green Line**: Annual carbon dioxide emissions avoided from raising rates 3%.

**Cumulative CO₂ emissions avoided from raising rates 3% and funding EE, 2006-2026: 1,557 million tons**

**Cumulative CO₂ emissions avoided from raising rates 3%, 2006-2026: 209 million tons**

Assumptions: Electricity use increases by 1.7% per year; Retail electric sales increase by 3%; Price elasticity is -0.25 (-0.75 for a 3% increase), distributed over 5 years; Carbon dioxide emissions are 0.915 tons per MWh in Ohio; Cost of EE is 3 cents per kWh; Average EE measure life is 12 years.
Response #1: Efficiency is the low-cost “carbon scrubber”

Source: McKinsey analysis
Note: The McKinsey report only examines a scenario through 2030. NRDC recommends a goal of 80 percent emissions reductions by 2050.
Lots of Low-hanging fruit: Efficiency Vermont
Savings Yield Rates (MWh per $10,000 invested)

2006-2008 values are estimates
Lessons for national legislation -- Carbon credit allocation can mobilize efficiency

Key point: A carbon program that directly mobilizes end use efficiency will cost less and achieve more than one that focuses only on smokestacks.

- Lower cost attainment – that’s the whole point of cap and trade in the first place

Cap/trade techniques can tap the carbon value of efficiency:

- Consumer allocation (RGGI region)
- Load-side caps – carbon budgets for utility companies, akin to Renewable Portfolio Standards
- National Efficiency Allocation (RAP & ACEEE proposal)
National Efficiency Allocation*

- Proposal: Allocate a pool of carbon allowances to states or LSEs to promote end-use efficiency

- Allocation should be performance-based:
  - Reward actual EE success, not expenditures or particular policy approaches

- How to measure EE success?
  - Key feature: % improvement compared to a baseline
  - Each state (or LSE) has its own baseline
  - *Indiana compared to Indiana, not Indiana compared to California*
  - Sets up a “virtuous circle” of competition among entities – those who improve faster earn a bigger fraction of the pool.

*As proposed by R Cowart (RAP) and S Nadel (ACEEE) March 2008 – comments and improvements are welcome
Is allocation just “distributional”? DC version: allocation for 60 votes
For more information…

• “Affordable Heat: A Whole-Buildings Efficiency Service for Vermont Families and Businesses” (RAP study for Vermont Legislature January 2008)


• “Another Option for Power Sector Carbon Cap and Trade Systems – Allocating to Load” (May 2004)

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