Synapse
Energy Economics, Inc.

The Business Case for Energy Efficiency: How to Bend the Curve

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Background / Overview

- New England: 14 million people
- Peak electric demand: 30,000 MW
- Electrically connected to NY, NB, QC
- Largest system contingency: DC inter-tie to Hydro Quebec

NE-Canada: Long History of Cooperation

- New England Governors/ Eastern Canadian Premiers: >30 years collaboration on environmental, energy and economic issues
- Environmental: acid rain, mercury, global warming
- Energy: grid stability, new renewable resources

NE Electric Market

- Summer peaking system: A/C is the driver
- Peak demand growing faster than base
- Capacity factors slowly decreasing

NE Focus is Not on New Central Power Plants

Rationale

- Environmental impacts: NOx, PM, CO2
- Do not provide for energy security
- Economics are poor and not improving

Plant Construction Costs have Significantly Increased

- Why? Global energy demand, energy costs high and will remain so.
- Materials used in new plant construction are energy intensive to extract.
- Weak and weakening dollar.
- Decentralized mining companies, very centralized railroad industry (some existing coal plants have had fuel supply problems which have affected plant reliability).

Supporting Data

- Capital costs for baseload coal have increased $20/ MWh (2c/kWh)
- Big Stone II, SD: initial cost $1.2 billion including transmission upgrade. Raised to $1.6 billion. Chief backers recently withdrew
- Duke: Cliffside, NC: 2@800 MW. Initial filing June 2006 @$2 billion for both, raised to $3 billion (50% increase) in November 2006. NCUC approved only one plant. That unit is now at $1.8 billion (80% increase)
- Westar Energy deferred 400 MW plant due to 40% estimated cost increase in one year

Costs Have Increased for Materials and Labor

All data for 2003-2006

- Iron ore +60%, steel scrap +150%, aluminum +100%, copper +400%, nickel +350%, cement +30%, electrical wire and cable +240%
- Labor up twice the rate of inflation
- US dollar down 20% and weakening further
- Backlogs at engineering firms decrease competitive bids

EPRI Report on Paths to Reduce GHG

- States that costs to meet GHG reductions will be $600 billion to $1.8 trillion
- This **seems** high, but these costs are for over a 40 year period
- Amount to 0.1 to 0.6% of GDP
- EPRI does not mention the significant and less expensive opportunities from demand side resources

Comparison to Other Costs United States is Already Paying

- Katrina alone cost 1% of GDP
- US Iraq war > $600 billion and rising
- US spends $60 billion per year to protect our oil supply

We Can Get Off This Train…Anytime We Like

- US wastes more energy than Japan uses
- For each 100 units of fuel combusted, 7 units of useful work are produced (thermal losses, line losses, heat lost through incandescent light bulbs etc.)

New England: Bending the Curve

- CT, ME, RI laws now require that all cost-effective energy efficiency be procured.

  This means that energy efficiency is a resource of first choice.

- NE forward capacity market treats demand side and generation equally. Both are paid the same for providing capacity.

- CT's energy efficiency program #1 (tie with CA and VT) in 2006 per ACEEE

Energy Efficiency: the Cheapest Resource is that which is Not Used

- CT program: current funding $70 million/year, produces ~50 MW of savings each year.
- Average cost is less than 3c/kWh.
- Energy efficiency is a cumulative resource: 50 MW in year 1, another 50 MW in year 2 = 100 MW and so forth.
- EE is the first fuel now (also affirmed by the NEG/ ECP in 2006).

Energy Efficiency: Adds Value to the Local Economy

- EE produces jobs locally, builds industries locally, keeps revenue in your state or province.
- Also link to trade schools and colleges: curriculum, training. EE jobs pay better.

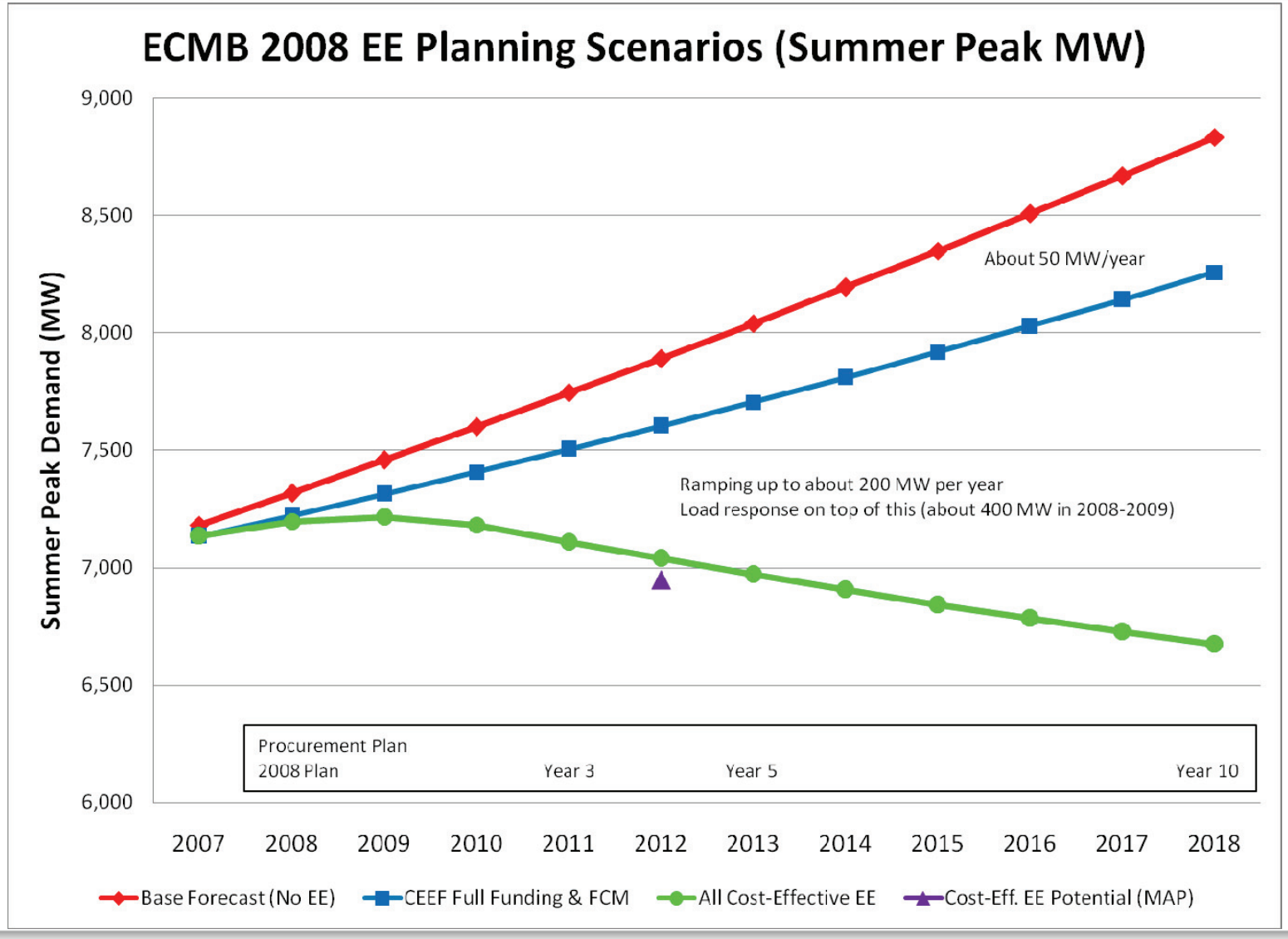
Achieving GHG Reductions can Boost the Economy and Create Jobs

- LBL 2003: Estimate $40-57 billion savings by 2010.
- WWF 2001: US jobs increase by 700,000 by 2010, with 8.5% GHG decrease
- 2005 study for Congress: jobs created outweigh jobs lost 5:1 by 2015, and 7:1 by 2025

77% of US Energy Growth Since 1970 is Energy Efficiency

- Most economic models overestimate costs and underestimate gains achievable through energy efficiency*
- Result is inaccurate picture of what productivity gains can be achieved through energy efficiency
- Good news: we now know these flaws and how to make corrections
- New England has started to figure this out

Connecticut ECMB 2008 EE Planning Scenarios (Summer Peak MW)



Energy Efficiency Value as a Resource: The Business Case

- Several factors now in play that make efficiency the most attractive and cost-effective resource
- ISO-NE forward capacity market
- Regional Greenhouse Gas Initiative (RGGI)
- “white tags”: MWh from energy efficiency worth $ in three states now
- NOx allowance set aside in state air quality programs
- Innovative financing

Value of 1 MW of Energy Efficiency

- ISO-NE forward capacity market. Period from 2007-2010: $36,000 - $48,000. Period after 6/1/10: $60,000 - $96,000
- White tags: $15,000
- NOx allowance: $10,000
- Proceeds from FCM and white tags are returned to ratepayer funds and re-invested in additional EE

Regional Greenhouse Gas Initiative (RGGI)

- Ten state effort to reduce GHG from power plants 10% by 12/31/18
- RGGI budget 188 million allowances (one allowance = one ton of CO2e)
- Most will be auctioned and re-invested in energy efficiency and renewable energy
- CT's RGGI budget =10.9 million allowances. Each allowance will sell for est. $3-5.
- CT will split proceeds 75/25 between EE and RE. This = $24-42 million additional per year for EE, or another 16-28 MW of EE.

All the Dots are There, We Just Have to Connect Them

- To achieve all cost effective EE per slide 15 (or 170-200 MW of EE per year), estimated cost of $250-300 million
- Existing pieces: EE fund $90 million/ year, RGGI $25-40, ISO FCM $2-4, white tags $1. Need another $100 million of financing annually to achieve goal to procure all cost-effective EE These other sources could include:
- Treasurer: state pension funds
- Economic development authority
- Insurance/banks: new product lines, energy savings insurance
- Venture capital/ hedge funds

Data Sources

- www.ctsavesenergy.com/ecmb (all lower case)
- www.aceee.org
- www.synapse-energy.com
- www.rggi.org
- www.iso-ne-com (then search under forward capacity market, demand resources)

Contact Information

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Thank You!

