New Hampshire State Energy Program Competitive Grant –

Energy Efficiency Resource Standard Study

New Hampshire Energy Efficiency & Sustainable Energy Board

November 8, 2013

Christine Donovan
Team Lead, VEIC

Scott Albert, GDS
Shawn Enterline, VEIC
Jeffrey Taylor, JHTA

Agenda

1. Study History, Purpose, & Context – Christine
2. Stakeholder Input & Design Criteria – Christine
3. EERS Recommended by Study Team – Shawn
4. 6 Strategies Recommended for Achieving EERS - Shawn
5. Study Methodology & Results – Scott
6. Economic Impacts – Shawn
7. Funding Sources & Bill Impacts – Shawn
8. Next Steps – Christine

1. History, Purpose, & Context

History

Through a **competitive solicitation**, NH OEP sought assistance to:

"Assess the economic feasibility of increasing investment in EE thru adoption of an Energy Efficiency Resource Standard (EERS) and/or other policy mechanisms."

History (con't)

Building on studies **commissioned by NH PUC**:

- Additional Opportunities for Energy Efficiency in NH
  "GDS Potentials Study" – 2009

- Independent Study of Energy Policy Issues -
  "SB 323 VEIC Study" – 2011

- 1 of 3 Priority Recommendations from EESE Board review - 2012

Our Assignment

1. What is an EERS and what is experience in other states?
2. What would it take to increase EE from 0.6% of electric sales to 1.6% (or more)?
3. What are key EE saving strategies for achieving a goal?
4. What would the economic & bill impacts be?
5. What legislative and/or regulatory action is needed in NH?

And How we Modified It …

- Detailed review of Tech Potential Study indicated cost-effective EE savings = 751.4 Million kWh energy equivalent
- Includes EE that would reduce electricity, natural gas, & liquid heating fuels - converted to common unit
- Value happens to = 6.6% of 2012 retail electric sales
- We revised study question to –

What would it take to achieve all cost-effective EE?

NH Economic Context

- Energy is the **lifeblood of the economy**
- As northern NE state, **heating, cooling, electricity, & transportation** are all essential in New Hampshire
- Reliable, affordable energy **critical** to citizens, business, and industry
- NH households spend **10-50% of income** on energy
- **Energy costs** affect business & industry profitability, and factor into location & expansion decisions

Economic Impacts

- NH 2011 Energy Bill - $6 Billion (and rising)
- $3.9 Billion (65%) leaves the state immediately
- Represents about 6.5% of NH annual GDP
- Efficient use of clean local, indigenous energy makes good economic and business sense for all!

Choices

- **Energy conservation –**

  Doing the same or more with **no** energy

  (Turning off lighting and equipment when not needed, etc.)

- **Energy efficiency (EE) –**

  Doing the same or more with **less** energy

  (e.g. using CFL in lighting, improving process efficiency, using more efficient pumps and motors, etc.)

- **Using local, indigenous resources –**

  Unlike oil or gas states, in NH these include:

  Biomass, hydro, wind, solar, geothermal, landfill gas,etc.

All of NH's indigenous energy resources happen to be clean, sustainable energy (SE)

Why EE?

- **EE = good business sense**
  - Reductions in energy bills = improved “bottom line”
- **EE often = lowest cost energy choice**
- **EE = reduces need for new power plants and/or Transmission & Distribution (T&D) upgrades**
- **Positive environmental impacts**
- **Creates local jobs**
- **Support corporate sustainability/”green” goals**

Context for Study

- US Department of Energy – Cost-effective nationwide to achieve EE = to 20-30% of energy use
- After > decade of NH EE:
  - SBC & other funding results in EE savings = 0.6% of 2012 retail sales
  - Well below what is cost effective & EE in other states
  - Big swings in public funding (eg ARRA) result in widely varying type and scale of services & programs
  - Programs sometimes run out of funding before serving all customers
  - "Stop & start" dynamic works against true market transformation

A root cause - No single, clear, statewide goal & commitment to EE

2. What is an EERS &

What is the Experience in Others States?

What is an EERS?

- Clear, specific statewide energy savings goal(s)
- Developed via legislation and/or regulation
- Requires utilities and/or third party PAs to achieve specific amount of EE savings
- Goal often expressed as % annual retail sales
- Is both aspirational & ***directive***
- Both establishes goal & ***delegates authority***

"Secret sauce" – Sustained political will & commitment

Overview of EERS Experience

- 25 states have EERS in place
- 13 states = 100% or more of goals
- 3 states = >90% of goals
- Average savings:
  - 77 kwh/capita for legislatively set goals
  - 86 kwh/capita for regulatory enforced goals
- NH only state in Northeast with no EERS or equivalent

Components of Successful EERS

- Clear statement of EE goal(s)
- Clear statement requiring “all cost effective EE”
- Clear direction to appropriate public entity for implementation & oversight
- Complimentary& supportive regulatory policies:
  - Decoupling or other approaches for addressing lost revenue issue
- “Collaborate vs litigate” approach
  - Involves key stakeholders in goal setting, planning, & budgeting prior to formal dockets
- Rigorous, independent EM&V

Effective Elements for Meeting EERS

- Establishing performance-based goals providing implementers flexibility to change program design & offerings without adjudicated approval
- Offering fuel blind programs
- Allowing savings from EE due to Codes and Standards
- Using TRM's as basis for anticipating savings, until replaced by smart grid data

Factors that can Limit Achieving Goals

- Stop and start EE program funding
- Opt-outs for industrial customers
- Focus limited only to ratepayer funded, utility administered programs

3. Stakeholder Input & Design Criteria

Key Stakeholders

- Business & Industry
- Utility Managers & Program Administrators
- State Regulators & Regulatory Staff
- NGO's, Advocates
- Policymakers

Key Stakeholder Input

1. Establish clear baseline year & 3 year ramp up plan.
2. Seek both electric & thermal savings.
3. Identify range of options including (but not limited to) utility-administered CORE programs.
4. Do not plan for same savings from residential & C&I sectors.
5. Examine what works in nearby states, consider “fit” in NH.
6. Increase stability and predictability in policy direction.
7. Consider issue of utility lost revenue from EE.

Design Criteria

#	Design Criteria	Implication for a NH EERS
1	Make use of Best Practices	The EERS should be informed by experience and success in other jurisdictions.
2	Be Tailored to New Hampshire	The EERS should build upon and compliment New Hampshire's existing laws and regulations.
3	Build on Existing Success	The EERS should build upon the success to date with existing programs in NH (CORE, state government leading-by-example, Building Energy Code Collaborative Project, etc.)
4	Promote Competitive Market Activity	The EERS should enable a blend of policy and regulatory initiatives that help stimulate competitive market activity and can sale up with increased private investment over time.
5	Create Sustainable Funding	The EERS should create a mechanism for sustainable investments in energy efficiency..
6	Increase Certainty	The EERS should articulate a stable and predictable set of policies and rules that endure over time.
7	Recognize and Address the Issue of Lost Revenue	The EERS should recognize deep concern about lost revenue from decreased sales by energy suppliers. EERS implementation will likely require decoupling revenue from sales for regulated utilities.

4. EERS Recommended by Team

EERS Recommended by Team

- Short Term (Five Year) Energy Efficiency Standard
  - Achieve all cost-effective EE
  - Study assumed 5 year period (2013 – 2017)
    - % of Sales: 6.6% of 2012 electric energy sales
    - CORE Programs: 1.6% thru expanded & enhanced CORE programs.
    - Other Strategies: 5.0% thru combination of public & private initiatives

- Long Term Benchmarking Standard
  - By 2025, NH building stock will be among most energy efficient in the nation, ranked in the top quartile as measured by kWh/sq. ft. per capita

4. Key Strategies for Achieving EERS

NH Strategies for Achieving EERS

1. State & Local Governments Lead by Example
2. Enhance & Expand the CORE Programs
3. Establish Supportive Regulatory Policies &
   Enable Investment/New Business Approaches by Utilities
4. Implement the NH Roadmap to Building Code Compliance
5. Track, Report, Benchmark, & Promote All Results
6. Scale Up Competitive Private Market Activity

1. Government Leads by Example

- Rationale
  - State Government is single largest energy consumer.
  - Municipal Government increasingly focused on EE.
  - Existing policies support investment, and results are applicable to achieving the EERS.

- Strategy
  - Attribute energy savings from existing legislation and Executive Orders to the EERS.
  - Inspire additional effort beyond business-as-usual.

2. Expand/Enhance CORE Programs

- Rationale
  - Build upon the existing, cost-effective portfolio of regulated EE programs.

- Strategy
  - Ramp up funding from '13-'14 over three years.
    - 1/3, 1/3, 1/3
  - Results in doubling the EE portion of the SBC by 2017.

3. Establish Supportive Policies & Enable Utility Investment/New Models

- Rationale
  - Utilities already invest in energy infrastructure.
  - Utilities have a direct relationship with the customer.
  - Cost-of-service regulation coupled with on-bill financing are existing investment pathways that could create a win-win.
- Strategy
  - Expand utility's investments in energy infrastructure to include behind-the-meter investments in EE.
  - Conduct PUC docket to set the rules for behind-the-meter EE infrastructure investments.

Address Lost Revenue Issue

- Rationale
  - Maintain utility financial health as EE reduces sales.
  - Neutralize the disincentive to invest in efficiency.
  - Create a positive *incentive* to increase investment in traditional/CORE and behind the meter EE measures.

- Strategy
  - Open a docket to implement new policy and regulatory framework – decoupling or results-based regulation, or other approaches TBD.

Req. for Utility Investment

- Applies only to measures that are permanently affixed to the building
  - Shell, HVAC, Hot Water, Etc.
- PUC would apply existing regulatory principles
  - Prudency and Used and Useful principles
- Recover costs thru OBF or other mechanism
  - Customers could be offered a voluntary tariff rider that recovers cost of EE measure, and is attached to meter, not building owner.

4. Implement Code Compliance Roadmap

- Rationale
  - Energy code compliance is the #1 step to reduce energy use, according to the US DOE
  - Supports the existing 90% compliance by 2017 goal
  - CORE programs are already working on codes
- Strategy
  - Leverage building permit activity
  - Strengthen collaboration with municipalities
  - Additional training for key market actors
  - Attribute code savings to EERS & CORE goals

5. Track, Report, Benchmark, & Promote

- Rationale
  - Timely, accurate information is a prerequisite for making sound investment decisions.
  - Lack of quality information is a long-standing barrier to competitive markets for energy efficiency.
  - EM&V on all EE activities is essential, and provides the basis for education and outreach.
- Strategy
  - Identify program-specific performance metrics.
  - Fund EM&V to yield valid & credible results.
  - Promote results to increase awareness & demand.

6. Stimulate Competitive Mkt. Activity

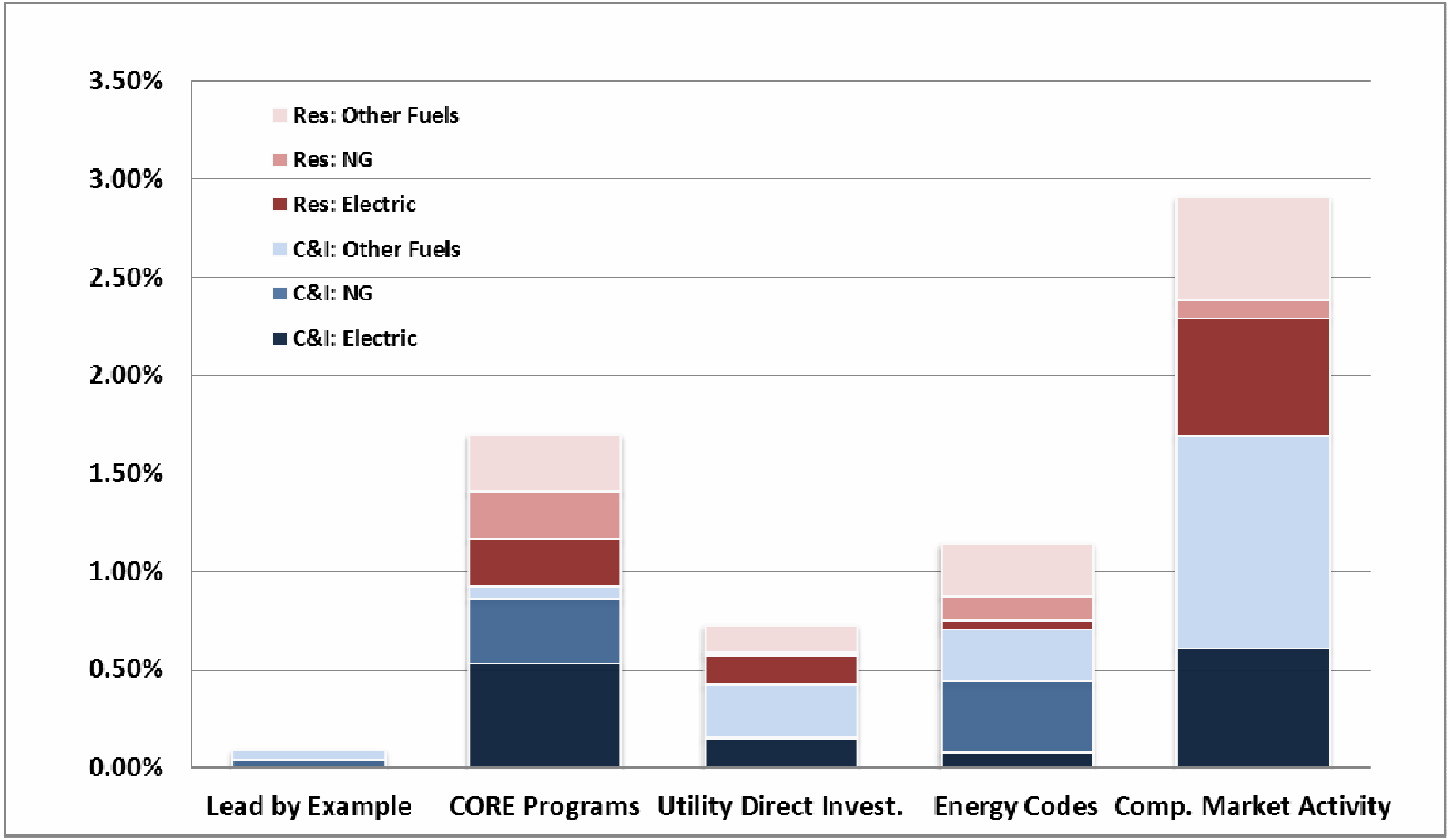
- Rationale
  - Represents cost-effective savings not otherwise realized through other strategies.
  - To be achieved through competitive market activity.
- Strategy
  - Achieve market transformation…new private investment.
  - Develop metrics for assessing participation levels, engagement of market actors, innovation in program offerings, incorporation of emerging technologies, etc.
  - Recognize and reward initiatives that engage key market actors and result in long-term market activity not reliant on public subsidy.

5. Study Methodology & Results

Overview of Results – by Strategy

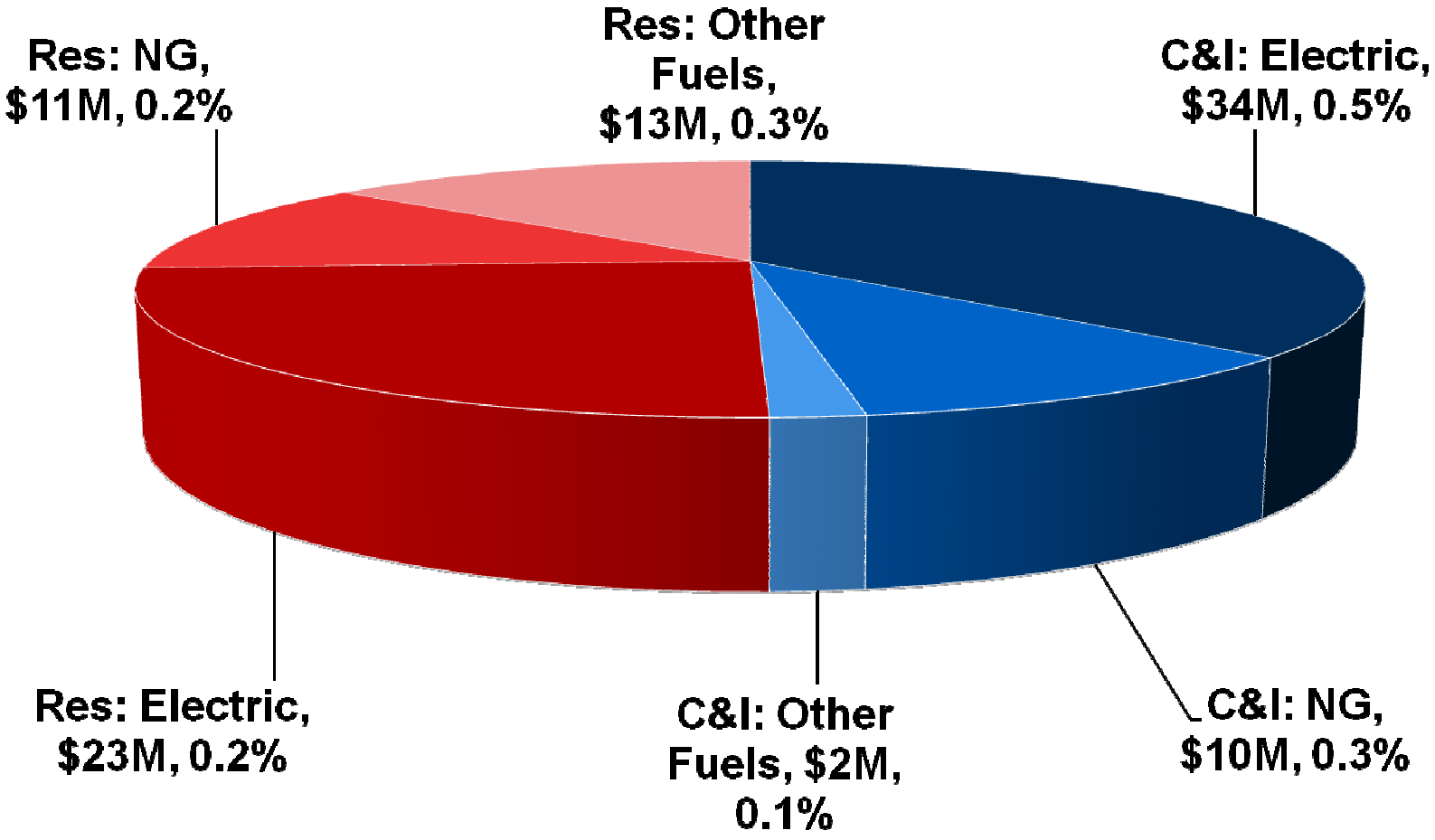
	% of 2012 Electricity Use					Cost Estimate ($M/Year)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
1 Lead-by-Example	0.0%	0.1%	0.1%	0.1%	0.1%	$0	$12	$7	$7	$7.1
2 CORE Programs	0.9%	0.9%	1.2%	1.4%	1.7%	$54	$52	$66	$80	$93.6
3 Behind-the-Meter Inv.	0.0%	0.3%	0.5%	0.7%	0.7%	$-	$14	$26	$34	$38
4 Code Compliance	0.0%	0.0%	0.1%	0.7%	1.1%	$-	$11.4	$11.9	$12.5	$13.2
5 Track, Report…	0.0%	0.0%	0.0%	0.0%	0.0%	$5.4	$11.3	$17.8	$22.9	$28.1
6 Comp. Pvt. Mkt.	0.0%	0.5%	1.6%	2.2%	2.9%	$-	$24	$67	$96	$129
Grand Total	**1.0%**	**1.9%**	**3.4%**	**5.0%**	**6.6%**	**$60**	**$124**	**$196**	**$252**	**$309**

2017 Energy Savings (% of '12 Sales)



CORE Program Break Out

(Millions of $ in 2017, % of 2012 kWh)



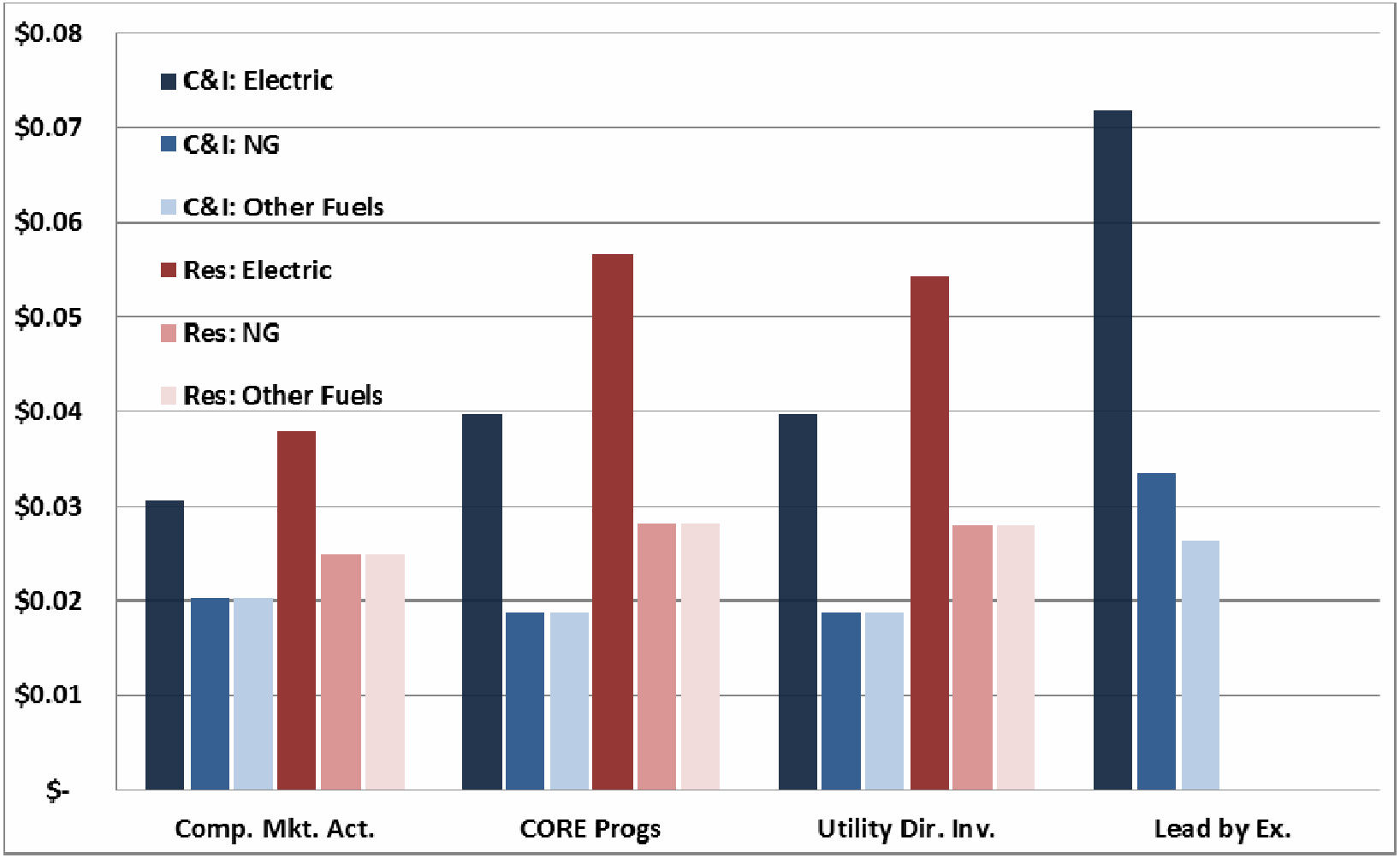
Total Investment/Year in EE by 2017

Unit ($M/Yr)	Comp. Mkt. Act.	CORE Programs	Energy Codes	Utility Direct Investment	Gov't Lead-by Example	Total
C&I: Electric	$30.6	$34.4	$1.6	$9.9	$2.2	$79
C&I: NG	-	$10.1	$3.3	-	$2.0	$15
C&I: Other Fuels	$35.9	$1.9	$1.6	$8.3	$2.9	$51
Res: Electric	$37.0	$23.0	$1.6	$13.2	-	$75
Res: NG	$3.7	$11.1	$1.6	$1.1	-	$18
Res: Other Fuels	$21.5	$13.1	$3.3	$6.0	-	$44
Total	**$129**	**$94**	**$13**	**$38**	**$7**	**$281**
			Track, Report, & Promote			**$28**
			Grand Total			**$309**

2017 Energy Savings (Millions of kWh)

Unit (Millions kWh)	Comp. Mkt. Act.	CORE Programs	Energy Codes	Utility Direct Investment	Gov't Lead-by-Example	Total
C&I: Electric	66.3	57.9	8.8	16.6	1.4	151
C&I: NG	-	36.0	39.2	-	3.0	78
C&I: Other Fuels	118.3	6.8	29.0	29.6	5.6	189
Res: Electric	64.8	26.5	4.4	16.2	-	112
Res: NG	10.0	26.5	14.0	2.5	-	53
Res: Other Fuels	57.5	31.2	29.0	14.4	-	132
Total	317	185	124	79	10	715

Average Lifetime Cost ($/kWh)

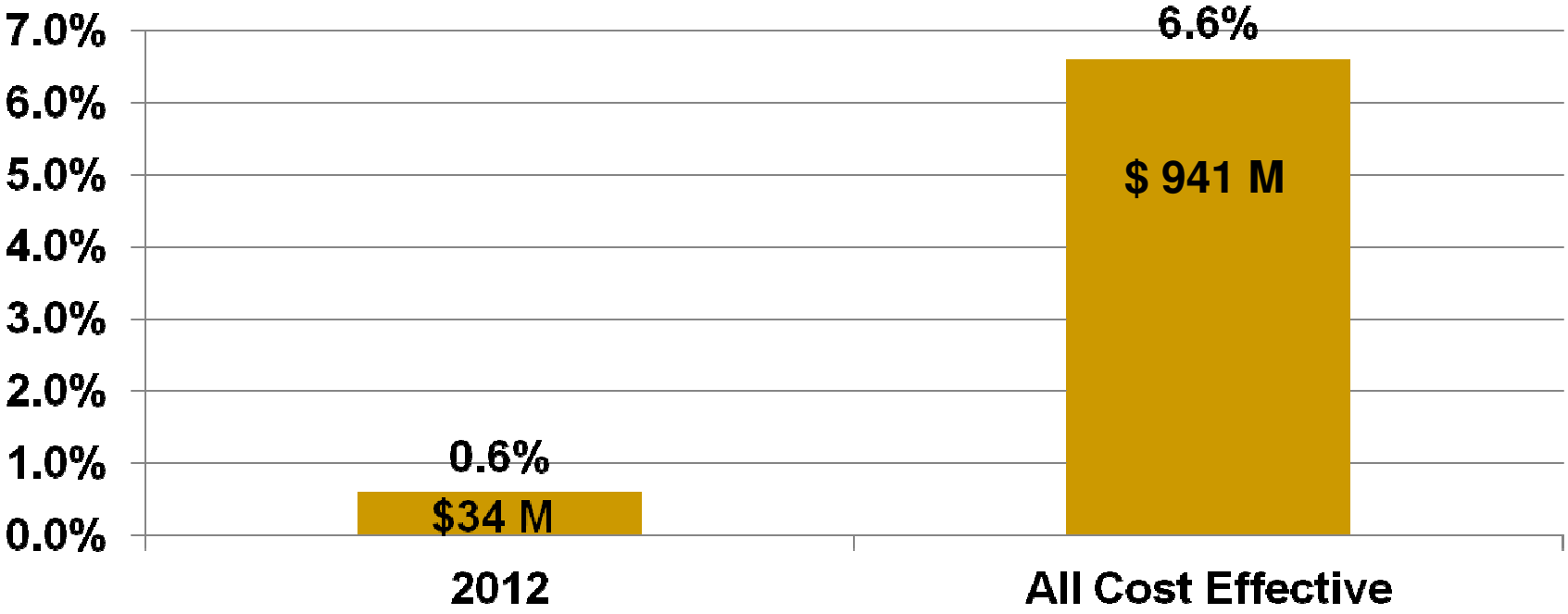


Key Elements

#	Element	Description
1	Five -Year Energy Efficiency Standard	Metric: Ratio of energy savings to energy sales in %. Base Year: Calendar 2012. Ramp Up: Three years; 2015 thru 2017 (CORE Programs) Applicability: Electric & thermal energy expressed in kWh.
2	Intermediate Market Progress Indicator	Metric: Program awareness, # of completed projects, workforce training/skills, etc. Base Year: 2014, measured every two years Applicability: Electric & thermal customers, contractors, & general public
3	Long-Term Energy Benchmarking Standard	Metric: Top quartile as measured by intensity of use (IOU) kWh/sq. ft. per capita Deadline: 2025 Applicability: Electric & thermal energy expressed in kWh

6. Economic Impacts

A Large, Cost Effective Opportunity



- Cost effective EE is 10X > than 2012 investment & results
- Societal Cost to Achieve = $941M

Cost Effective EE = Financial Return

- MACE Cumulative Total Societal Cost = $941M
  - Energy Savings = $195M for 15 years ($2.9B total)
- Payback Period = 4.8 Years
  - Cost / Savings = ($941M) / (195M) = 4.8 Years
- Return on Investment = 210%
  - ROI = (Return – Cost)/(Cost) =
  - ($2.9B - $941M) / ($941M) = 210%

All Cost Effective EE: Jobs & Income

- New Jobs
  - 2,380 Jobs
    - 34% of all jobs that were created between 2010-2011.
    - Change in Total Employment 2010 - 2011 = 6,996 jobs.
- New Income (NH's GDP)
  - $160M/Yr
    - 7.3% of all income that was created between 2010-2011.
    - Change in GDP 2010 - 2011 = $2,186 million.
- Assumptions
  - Baseline for comparison is 2013 spending levels and energy policy.
  - Incremental Impacts from new spending on the 6 strategies.

7. Funding Sources & Bill Impacts

Funding Sources – Current & Potential

- Current Sources
  - SBC, Customer Contributions, RGGI, FCM, Other Federal/State $
- Potential Sources
  - State treasury funds
  - State bonding authority, eg BFA tax exempt bonds
  - Business tax credits, eg CDFA funds
  - Community Development Block Grants
  - Property Assessed Clean Energy (PACE) Funds
  - Energy Service Companies (ESCo) – For Profit + Public Purpose
  - Private investment funds

System Benefits Charge (SBC)

- Current SBC = $0.0033/kWh
  - $0.0018/kWh for regulated EE programs (= $18.5M)
  - $0.0015/kWh for Electric Assistance Program (EAP)

- SBC needed to increase Core Program EE to 1.6% by 2017 = $0.0051/kWh
  - **$0.0036/kWh for regulated EE programs (= $39M)**
  - $0.0015/kWh for Electric Assistance Program (EAP)

- If doubling EE portion SBC not favored, consider allocating RGGI funds to EE rather than rebates
  - Provides better ROI (per UNH assessment)

Bill Impacts (2017)

	Participant		Non-Participant		Average Customer	
	%	$/Year	%	$/Year	%	$/Year
Res. Elec.	-1.4%	$-18	0.8%	$11	-0.4%	$-5
C&I Elec.	-26%	$-1,936	1.1%	$79	-0.9%	$-70
Res. Gas	-10%	$-97	3.1%	$30	0.7%	$7
C&I Gas	-7.3%	$-674	1.6%	$150	0.1%	$6

* Participating residential customers save 2.5X more than non-participating customers pay into the programs.

* Participating C&I customers save 14X more than non-participating customers pay into the programs.

8. Next Steps

Next Steps

- Conduct Outreach about Study – Fall 2013
- Work with Key Stakeholders – Fall 2013
- Meet with Legislative Committees – Fall/Winter 2013-14
- Develop Legislation & Seek Passage – Winter 2013-14

Q&A and Discussion

For More Information

Christine Donovan, Team Lead
VEIC
128 Lakeside Avenue,
Burlington, Vermont 05401
802-540-7801
cdonovan@veic.org