Optimal ENERGY Integrated Energy Resources

Study of Potential for Energy Savings in Delaware

December 4, 2014

Agenda

- Overview of Potential Studies
  - Definition
  - Types of Potential
- OEI Potential Study
  - Characteristics
  - Results
  - Methodology
  - Conclusions
- Comparison with CEEP Potential Study

What are Potential Studies?

- Quantify opportunities for energy savings
- Evaluate possible efficiency “measures” (actions taken to improve efficiency, such as changes in equipment)
- Are conducted in many jurisdictions to inform and support goal-setting and policy-making efforts

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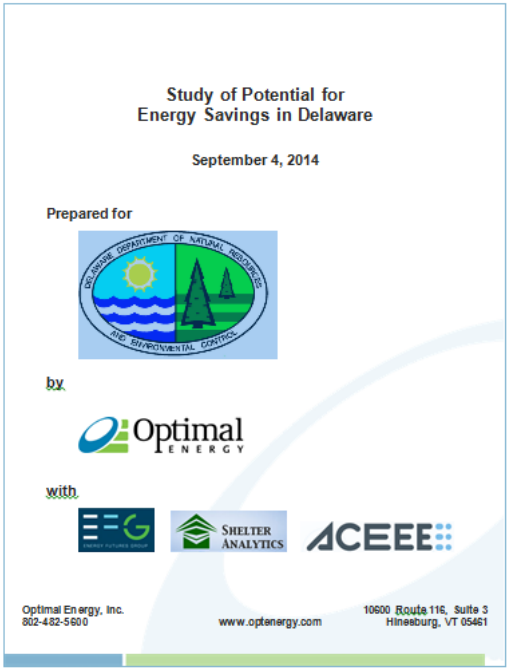
Types of Energy Efficiency Potential

Economic	Maximum Achievable	Program Achievable
Everything cost-effective, assuming no or limited market barriers	Maximum level of program activity and savings that is possible given the market barriers	Level of possible savings given a specific set of programs targeting specific markets.

Characteristics of Optimal's 2013 DE Potential Study

- Includes building sector electricity, natural gas and petroleum fuel usage
- 12-year study period (2014-2025)
- Collaborative effort between the Optimal Team, DNREC, Delaware utilities, and other stakeholders
- Includes "proxy" set of programs to achieve potential savings and the associated costs



Cost-Effectiveness Assessed with TRC Test

- TRC used to determine both measure and program cost-effectiveness
- Estimates costs and benefits of efficiency measures from the perspective of society as a whole
- Costs for market-driven measures are incremental costs of high-efficiency equipment
- Full cost of equipment and labor used for retrofit measures
- Measure benefits primarily derived from energy savings over measure lifetime, but include other non-energy benefits.

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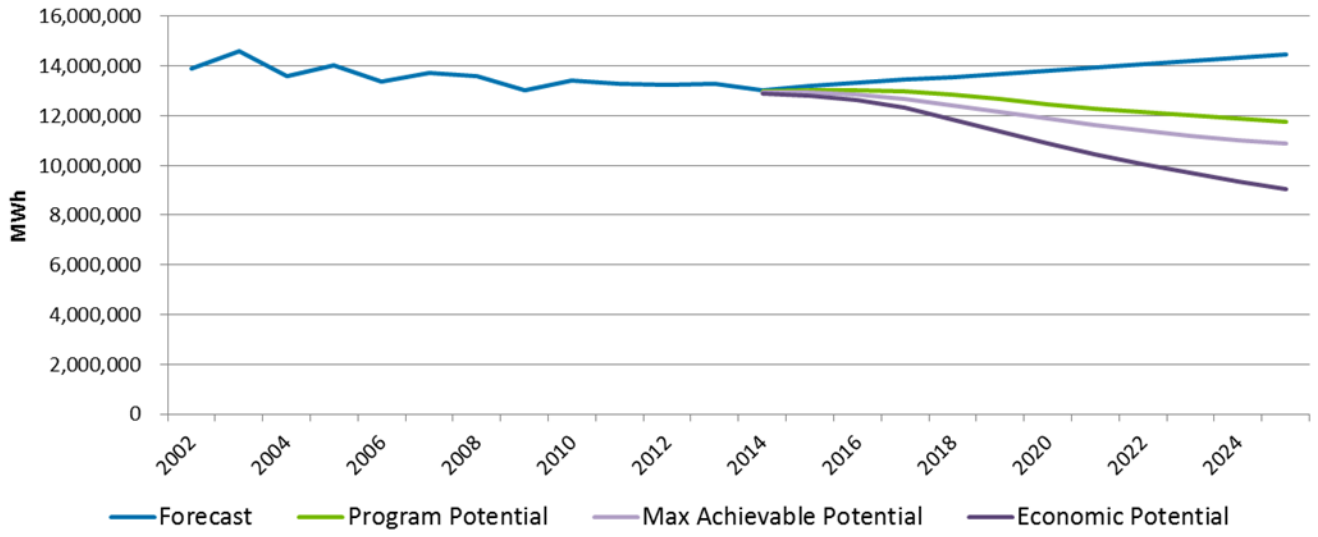
Substantial Savings Exist in all Fuels

Cumulative Annual Energy Savings Potential Relative to Sales Forecast, 2025

	Electric		Natural Gas		Petroleum Fuels	
	GWh	%	BBtu	%	BBtu	%
Program Potential	2,708	19	4,319	9	1,203	12
Max Achievable Potential	3,620	23	5,904	13	1,913	20
Economic Potential	4,670	30	8,561	18	2,391	25

Example: Electric Energy Savings Relative to Sales Forecast



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Program Potential is Highly Cost-Effective

Program Potential TRC Economics by Fuel, through 2025

Source Fuel	NPV Costs (Million 2013 $)	NPV Benefits (Million 2013 $)	NPV Net Benefits (Million 2013 $)	Benefit-Cost Ratio
Electric	1,438	3,424	1,987	2.4
Natural Gas	148	324	177	2.2
Petroleum Fuels	89	280	191	3.2
Total	**1,674**	**4,029**	**2,355**	**2.4**

- For every dollar invested in EE, the return is $2.40 for electric and even higher benefits for other fuels

GHG and Other Emissions Reductions Equivalent to:

- Taking a 170 MW power plant offline (i.e. the Indian River Unit 3 coal plant in DE)
- Having 36,000 fewer cars on the road each year

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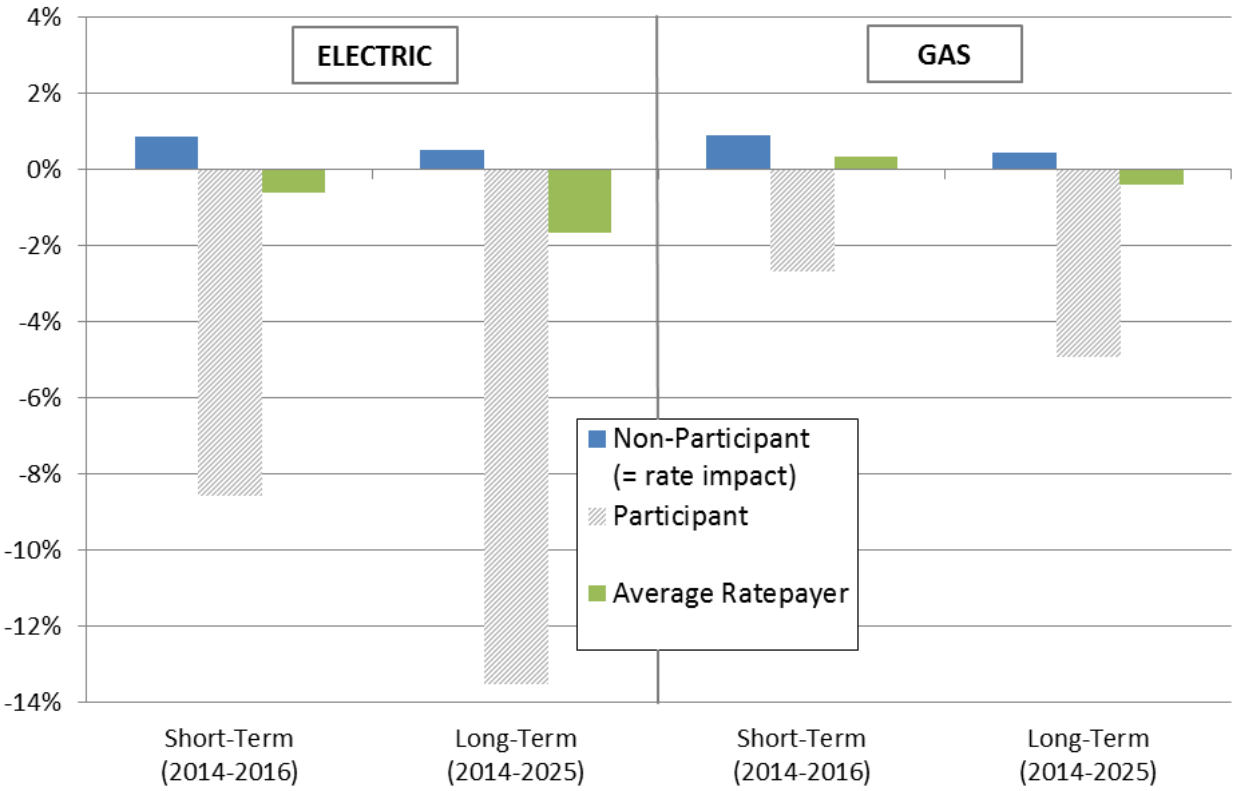
Average Ratepayer sees Reduced Energy Bill



- Installing three CFLs would overcome the typical residential customer bill impact

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Efficiency Investment Creates Jobs

- Shifts spending to more local and labor intensive industries like construction
- Energy bill savings are invested in other areas of the economy
- EE at levels forecasted in the potential study will support between **3,000 and 4,800** net job-years annually

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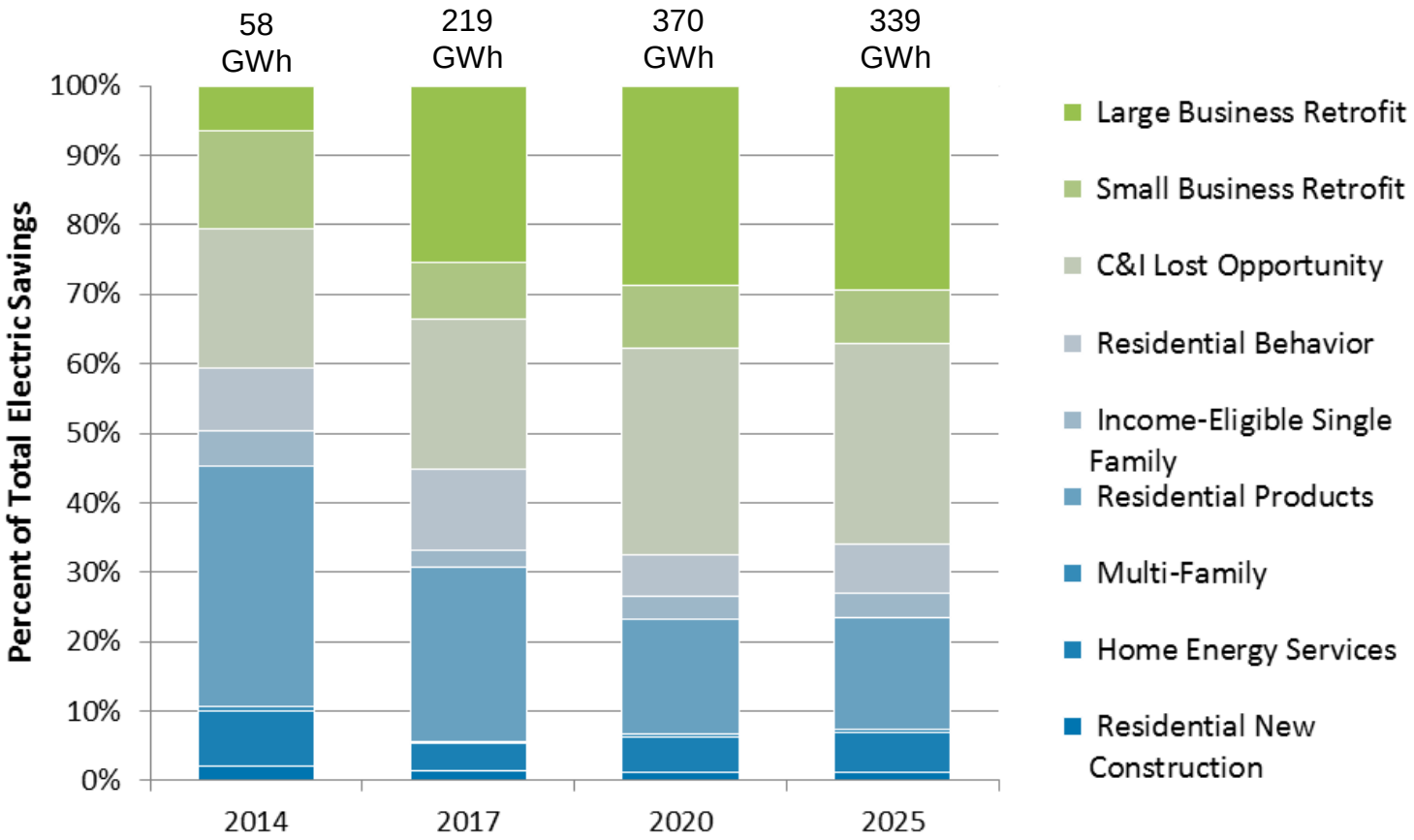
Modeled Efficiency Program Portfolio

Customer Sector	Market Segments
Residential	• New Construction • Retrofit/Home Energy Services • Multifamily • Efficient Products • Income-Eligible Services • Behavior
Commercial and Industrial	• Lost Opportunity • Small Business Retrofit • Large Business Retrofit

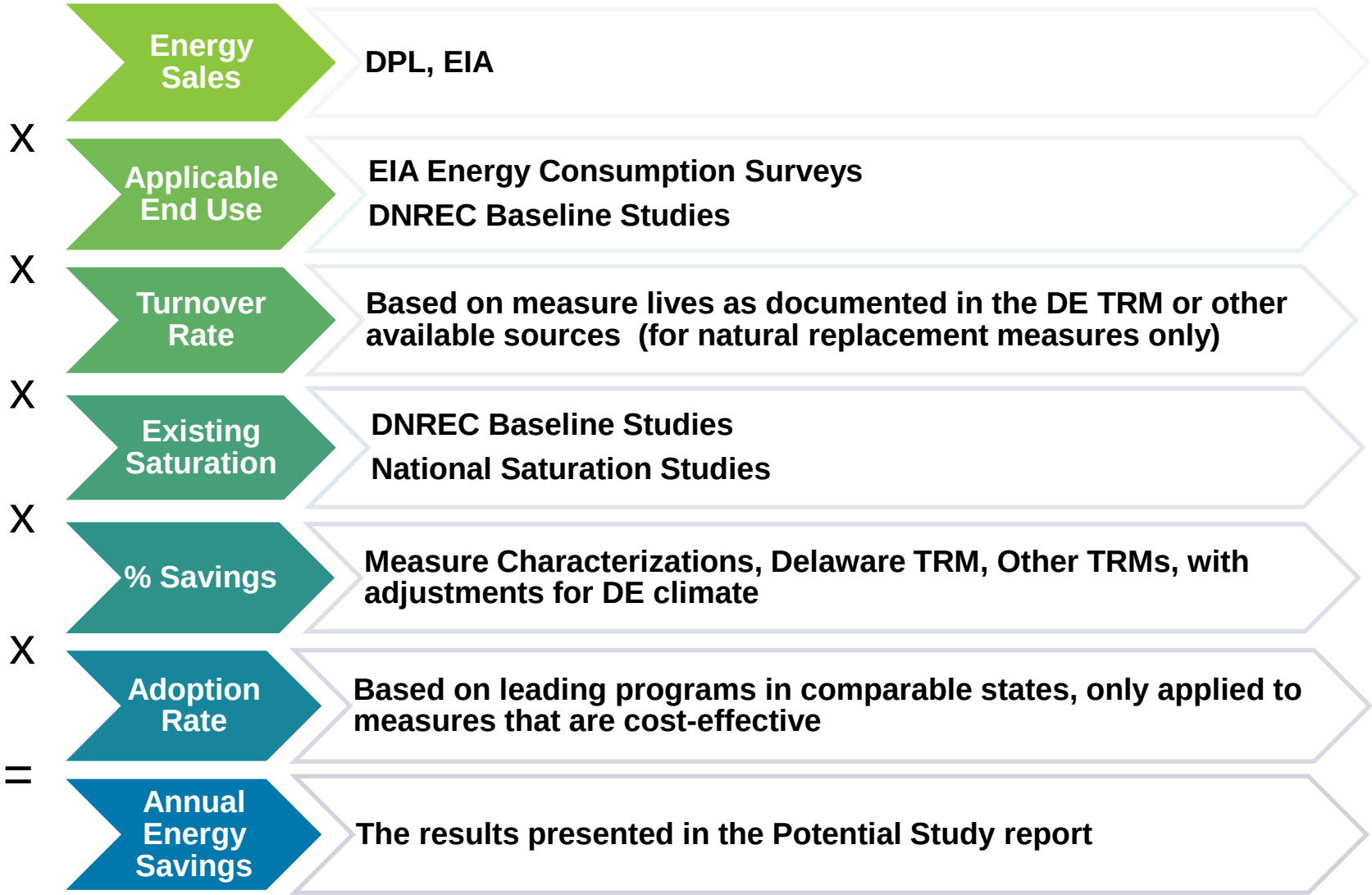
Program Development Over Time



Methodology

- General approach is “top-down”
  - Starts with the energy sales forecast and disaggregation
  - Disaggregate forecast by end use, building type, and market
  - Map efficiency measures to applicable end use energy to determine savings potential
- Measures are then screened for cost-effectiveness (TRC test)
- Cost-effective measures are then assigned an adoption rate
- Savings are aggregated into programs
  - Program non-incentive costs based on leading programs
- Programs are aggregated into sectors to report full potential

Methodology and Sources of Information



Conclusions

- Substantial savings exist in all fuels in DE
- Program potential is highly cost-effective
- Investments in efficiency will benefit the environment and economy in the form of emissions reductions and job creation
- In the long-term energy savings will reduce the average customer bill
- Well designed programs will help to maximize customer participation across all sectors
- **Savings levels identified in this study are already being achieved in other jurisdictions**

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Comparison Metrics Between OEI and CEEP Potential Studies

- General characteristics
- Source data vintage
- Level of analytical detail provided
- Program design assumptions
- Cost-effectiveness criteria
- Program potential assessment methodology

Potential Study Results Comparison

		CEEP (2011)	Optimal (2013)
	Years	5	12
Program Potential (Full Study Period)	Electric Potential (GWh)/ % Savings	797-1190 (6.8-10.1%)	2709 (18.7%)
	Gas Potential (MMBtu)/ % Savings	1021-1794 (2.9-5.1%)	4319 (9.1%)
	Petroleum Potential (MMBtu)/ % Savings	N/A	1203 (12.4%)
	Program Cost ($million)	198-362	839
	Emissions Savings (Thousand MTCO2)	786-1177	2102
Program Potential (Annual Average)	Electric Potential (GWh)/ % Savings	159-238 (1.4-2.0%)	226 (1.6%)
	Gas Potential (MMBtu)/ % Savings	204-359 (0.6-1.0%)	360 (0.8%)
	Petroleum Potential (MMBtu)/ % Savings	N/A	100 (1.0%)
	Program Cost ($million)	40-72	70
	Emissions Savings (Thousand MTCO2)	157-235	175

On an annual basis, results fall in a similar range

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Questions?

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Appendix A: Cost-Effectiveness Test Matrix

Implications of the Five Principal Cost-Effectiveness Tests

Test	Key Question Answered	Summary Approach	Implications
Societal Cost	Will total costs to society decrease?	Includes the costs and benefits experienced by all members of society	Most comprehensive comparison
Total Resource Cost	Will utility costs and program participants' costs decrease?	Includes the costs and benefits experienced by all utility customers, including energy efficiency program participants and non-participants	Includes the full incremental costs and benefits of the efficiency measure, including participant and utility costs and benefits
Program Administrator Cost	Will utility costs decrease?	Includes the costs and benefits experienced by the energy efficiency program administrator	Limited to impacts on utility revenue requirements; indicates net impact on utility costs and utility bills
Participant	Will program participants' costs decrease?	Includes the costs and benefits experienced by the customer who participates in the efficiency program	Provides distributional information; useful in program design to improve participation; of limited use for cost-effectiveness screening
Rate Impact Measure	Will utility rates decrease?	Includes the costs and benefits that will affect utility rates, including program administrator costs and benefits as well as lost revenues	Provides distributional information; useful in program design to find opportunities for broadening programs; should not be used for cost-effectiveness screening

Adapted from NAPEE, 2008, p. 2-2, with modifications.

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