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EXECUTIVE SUMMARY
LOUISIANA'S 2030 ENERGY EFFICIENCY ROADMAP: SAVING ENERGY, LOWERING BILLS, AND CREATING JOBS
May 2013

Executive Summary

Louisiana stands at a turning point in its energy future. By 2030, Louisiana expects that future population and economic growth will require new energy resources. Energy efficiency – the energy we do not need to use as a result of improved technologies and practices – can play an important role toward meeting this need as the least-cost component of a well-diversified energy resource portfolio. As the least-cost resource, efficiency investments have the universal effect of lowering energy costs for all customers. Furthermore, investments in efficiency foster economic development in the state and create local jobs. The lower energy bills free up money that customers can use to invest in the local economy and help businesses to remain competitive in the global marketplace. Energy efficiency is the cheapest, cleanest, and lowest-risk solution to meet rising energy demand in Louisiana. How much energy efficiency potential is available in Louisiana, and what specific steps can stakeholders take to harness this potential through policies and programs? We explore these questions in this report, and examine the financial and macro-economic impacts of improved energy efficiency on Louisiana's economy. We find that Louisiana has large, untapped potential for cost-effective energy efficiency that can save consumers billions in lower energy bills and bolster the local economy.

KEY FINDINGS

Here, we present several key findings of our analysis:

- A comprehensive portfolio of energy efficiency policies, such as building energy codes, and utility customer efficiency programs have the potential to cost-effectively meet 5% cumulative of statewide electricity needs by 2020, increasing to 16% cumulative by 2030; and 3% cumulative of natural gas needs by 2020, increasing to 12% cumulative by 2030.
- Energy efficiency programs are the lowest-cost option to meet Louisiana's future electricity demand compared with supply-side alternatives. Efficiency program portfolios cost about $0.02–0.04 per kilowatt-hour (kWh)-saved[1] compared with the avoided cost of supply in Louisiana of about $0.03–0.07 per kWh through 2030. Efficiency also has avoided peak demand and avoided T&D benefits. Energy efficiency rate impacts are thus far lower than rate impacts from building new power plants or transmission infrastructure.
- The set of recommended efficiency policies and programs in this report can reduce Louisiana's energy costs by a net $4.2 billion over the life of the energy-saving measures, which is the total resource cost (TRC) test net reduction to all customers.

[1] While some programs and measures are more cost-effective than others, efficiency program portfolios on average across the country cost in this range, based on a forthcoming ACEEE review of efficiency program costs in about 20 states.

- Louisiana businesses are interested in achieving more energy efficiency, but face barriers such as high up-front costs and lack of technical expertise. Businesses that take advantage of energy efficiency upgrades can lower their energy bills as a way to improve their bottom line and remain competitive in the global marketplace.
- Combined heat and power (CHP) has the potential to cost-effectively provide an additional 600 MW of capacity in Louisiana by 2020, and 1,500 MW by 2030, equivalent to 5% and 12% of retail electricity sales, respectively. CHP can also serve a strategic role in improving reliability of the electric power system.
- The macroeconomic assessment finds that in 2030, the portfolio of residential and commercial efficiency programs will result in about $3 billion in net economic output, including $1 billion in wages, and $663 million in business income to small business owners, 27,100 person-years of employment, and increased state and local tax revenue by $114 million.
- There has been growing momentum toward energy efficiency among stakeholders in Louisiana, particularly in New Orleans, but the existing policies and regulations in place are far from sufficient to drive major investments in energy efficiency. Regulatory and policy changes will be needed to reduce the major market barriers to energy efficiency. Our report offers several program and policy options.

BACKGROUND

Louisiana ranked 43rd on ACEEE's *2012 State Energy Efficiency Scorecard* (Foster et al 2012), reflecting the state's fairly limited efforts to improve energy efficiency and that most consumers and businesses in the state do not have access to energy efficiency options and services to help lower their energy bills. But if Louisiana takes advantage of recent momentum toward efficiency in the state, especially in New Orleans, and elsewhere in the Southeast, such as in Arkansas, it can vastly improve economic benefits to the state. Within Louisiana, the New Orleans City Council has developed *Energy Smart* energy efficiency programs in partnership with Entergy New Orleans, has introduced an integrated resource planning (IRP) process to its electric utility planning, and has promoted the development of a skilled energy efficiency workforce through both the *Energy Smart* and the *NOLA Wise* programs. The Louisiana Public Service Commission (LPSC) has also established an IRP process for electric utilities, which establishes a framework for analyzing least-cost resource options, including demand-side energy efficiency, in utilities' long-term planning structures.

The Southeast region as a whole is also trending toward greater interest in and commitment to energy efficiency. For example, in 2010 the Arkansas PSC (APSC) established annual electricity savings goals that ramped up to 0.75% of sales per year by 2013, making Arkansas the first state in the Southeast to adopt long-term efficiency targets. Overall, the programs geared up and hit their targets in 2012 at a net benefit to all customers. Given the overall success of programs, the APSC is looking to continue ramping up, and recently issued an order recommending new targets for the next 3 years. Louisiana stakeholders can look to the successes, challenges, and lessons learned from Arkansas to help shape the state's investment in energy efficiency resources.

But while there has been some recent momentum on energy efficiency in Louisiana, there have also been setbacks, which appear to stem largely from misconceptions about energy efficiency.

In December 2012, the LPSC approved rules that would set up a framework for energy efficiency programs offered by investor-owned electric and natural gas utilities, and a diverse set of stakeholders agreed to the structure of these rules as a good first step toward improved efficiency. But in late February 2013, the LPSC under new leadership overturned those rules. Some Commissioners misjudged the efficiency programs as costly to customers, but, as our analysis shows, the benefits from energy efficiency accrue to all customers in lower energy bills, avoided energy supply costs, and economic development, and these benefits dwarf the small up-front rate impacts.

Given the potential economic benefits of efficiency there is a need for much more investment in energy efficiency in Louisiana. Both sustained leadership and effective implementation will be critical measures of success in tapping into the state's energy efficiency potential.

METHODOLOGY

This report provides a detailed, quantitative analysis of cost-effective energy efficiency potential in Louisiana's buildings and industrial sectors, focusing on end-use electricity and natural gas usage. We organized the analysis, which covers the period 2011–30, into four overall parts:

1. *Reference Case*: Develop a baseline reference case scenario of statewide forecast electricity and natural gas consumption data and prices by customer class.
2. *Cost-Effective Energy Efficiency Potential*: Estimate cost-effective resources potential in each sector using a bottom-up assessment of individual measures within each customer class.
3. *Program and Policy Potential:* Analyze a comprehensive set of program and policy options that Louisiana can adopt or expand to develop its energy efficiency potential.
4. *Macroeconomic Assessment:* Analyze the macroeconomic (jobs, gross state product, tax revenue) impacts from the program and policy scenario.

OVERVIEW OF FINDINGS

Our analysis presents two levels of energy efficiency potential: (1) *cost-effective* or *economic* potential and (2) *program and policy* or *achievable* potential. The program and policy potential is a *subset* of the cost-effective potential. The cost-effective energy savings potential provides an estimate of the overall energy efficiency resource available, but many market barriers and program infrastructure requirements exist that prevent all of the cost-effective resource potential savings identified from immediately being captured. Toward this end, the program and policy analysis is an estimate of the portion of the cost-effective resource potential that can be captured through energy efficiency policies and programs, given customer acceptance (i.e., program participation rates) and the time it takes to ramp up program infrastructure.

Cost-Effective Resource Potential

Our analysis finds that by 2030, there will be enough cost-effective energy efficiency potential to meet about 27% of the state's electricity needs and 19% of the state's natural gas needs (Table ES-1).

Table ES-1. Summary of Cost-Effective Energy Efficiency Resource Potential Results in 2030

Customer Class	Electricity		Natural Gas	
	GWh	%*	MMCF	%*
Residential**	8,253	29%	8,168	34%
Commercial	9,362	33%	9,879	35%
Industrial	6,892	20%	19,855	16%
Total	24,507	27%	37,902	19%

Notes: GWh = gigawatt hours. MMCF = Million cubic feet. *Percentages for each customer class are expressed as a portion of reference case for that customer class in 2030. **Residential analysis includes only single-family homes due to the scope of the building modeling software we used; efficiency potential from multi-family homes is included in the policy and program analysis.

Policy and Program Potential

The policy and program analysis considers the portion of the cost-effective potential that could be achieved through the adoption of several statewide policy options (Table ES-1) and the widespread adoption of tailored customer energy efficiency programs (Table ES-2).

Table ES-2. State Energy Efficiency Policy Options for Louisiana

Statewide Policies, Programs, and Initiatives	*Summary of Analysis Recommendation*
Integrate Energy Efficiency into Resource Planning and Set Energy Savings Targets	Successfully incorporate energy efficiency as least-cost resource into the integrated resource planning process, making an energy efficiency program portfolio considered on par with supply-side resources. Set incremental annual electricity savings targets ramping up to about 1%/year over 6 years and natural gas targets ramping up to 0.7%/year over 6 years (see Table ES-3 program options that together can reach these target levels, our analysis finds).
Utility Performance Incentives and Cost Recovery	Adopt energy efficiency rules that better align a utility's financial motivations with energy efficiency improvements; measures include timely cost recovery, performance incentives, and removal of the throughput incentive.
Updated Building Energy Codes for Residential and Commercial	Adopt at least 2009 IECC for Residential and ASHRAE 90.1-2010 for Commercial buildings
Lead by Example in State and Local Government Facilities	Benchmark energy usage in public buildings, streamline energy service company (ESCO) options and rules, and set public facility energy savings targets
Low-Income Weatherization	Coordinate state weatherization and utility program offerings
Combined Heat and Power (CHP)	Establish regulatory mechanisms to reduce market barriers to CHP, and explore utility participation in CHP markets

Table ES-3. Tailored Energy Efficiency Program Options by Customer Segment

Residential	Commercial	Industrial
New Construction and Building Energy Code Support	New Construction and Building Code Support	Strategic Energy Management
Multi-Family Buildings	Retrocommissioning and Monitoring-Based Commissioning	Custom Incentives for Retrofits
Home Energy Retrofits	Small Business Direct-Install	Prescriptive Equipment Rebates
Upstream Retail Appliances and Electronics	Custom Incentives for Retrofits	Combined Heat and Power
Lighting	Prescriptive Equipment Rebates	Self-Direct Option
Air-Conditioning	Computer and Plug Load Efficiency	Standard Offer or Reverse Auction
Water Heating	Combined Heat and Power	
Low-Income Weatherization		
Information Feedback		

Our review of national best-practice program deployment finds that it takes time to ramp up programmatic infrastructure and to roll out effective customer education and marketing efforts, which means that Louisiana should expect similar needs to ramp up savings over time. Our analysis of energy efficiency program potential in Louisiana finds that this combined set of energy efficiency policies and programs in the state could reach 5% cumulative electricity savings by 2020, increasing to 16% in 2030, and 3% cumulative natural gas savings by 2020, increasing to 12% by 2030 (Table ES-4 and Figures ES-1 and ES-2). In addition, the electricity efficiency gains will also have the impact of reducing peak demand.

Table ES-4. Summary of Customer Energy Efficiency Program and Policy Potential for 2030

Customer Class	Electricity		Natural Gas	
	GWh	%*	MMCF	%*
Residential	6,391	17%	6,850	16%
Commercial	6,658	24%	6,388	22%
Industrial	3,028	9%	10,205	8%
Total	16,078	16%	23,442	12%

Combined heat and power (CHP) also has significant potential to cost-effectively meet an additional 12% of electricity needs (Figure ES-1). Our assessment of CHP is based on a previous study that examined Louisiana potential (Chittum & Sullivan 2012), and considers two areas of potential CHP growth: (1) industrial or institutional CHP systems that are operated on-site at facilities, and (2) utilities that make investments in CHP and become full or partial owners in CHP systems as assets in their portfolio of energy capacity. The analysis finds that Louisiana has the potential to add about 600 MW of cost-effective CHP capacity by 2020 and 1,500 MW by 2030.

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Figure ES-1. Electricity Energy Efficiency (EE) and CHP Program and Policy Potential by 2030

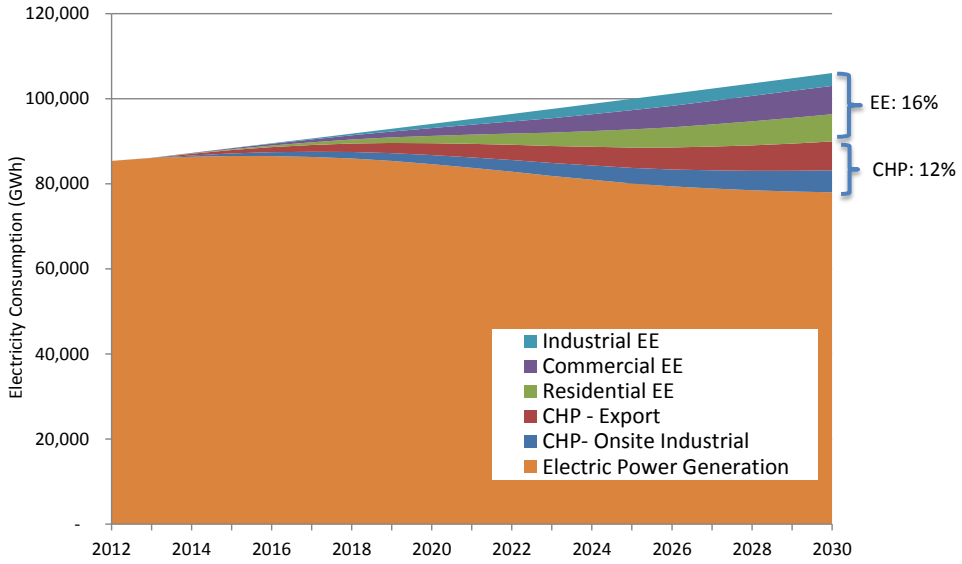
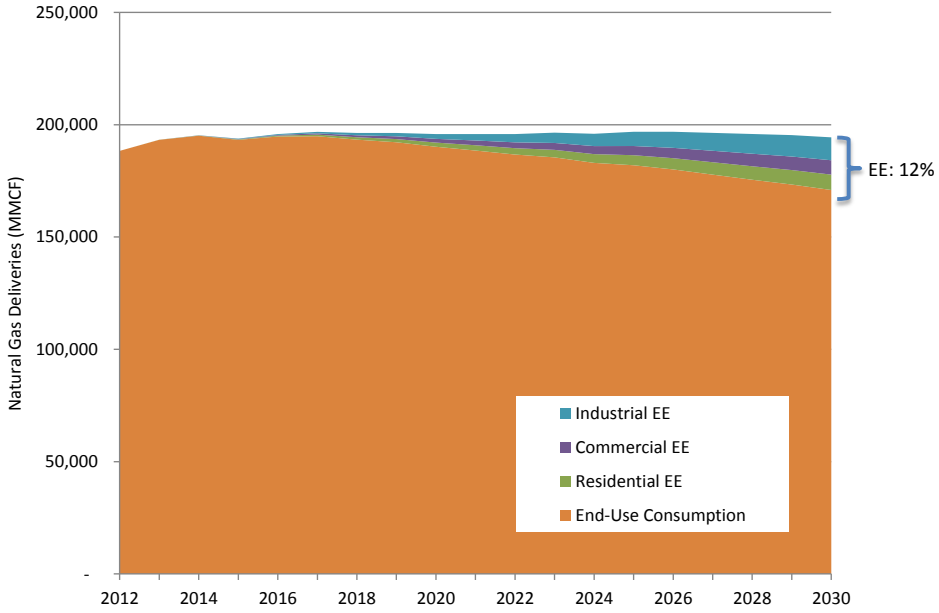


Figure ES-2. Natural Gas Energy Efficiency Program and Policy Potential by 2030



Costs and Benefits

Efficiency measures continue saving energy over the lifetime of the upgrades, which can add up to significant savings over the long term and delay or avoid the need to build new power generation. Investments in new power plants or power purchases can be costly and risky long-term investments, which means that the benefits of efficiency to the utility system, and ultimately to all Louisiana ratepayers, can be significant. A recent analysis finds that energy efficiency is the least-risk resource compared with other energy resource options.[2]

[2] See Binz et al. 2012. *Practicing Risk-Aware Electricity Regulation.* CERES.

Our analysis finds that the set of recommended policies and programs can reduce Louisiana's energy costs by $4.2 billion net over the life of the energy savings measures. The estimated total resource cost (TRC) ratio is 1.8; i.e., each $1 invested in efficiency upgrades and programs (customer and program cost) would yield $1.80 benefits in avoided energy costs to the whole system. These impacts would benefit all ratepayers, because utilities could delay or avoid costlier investments in energy supply and in T&D.

Efficiency programs cost about $0.02–0.04 per kWh-saved, which is lower than the avoided cost of energy in Louisiana of about $0.03–0.07 per kWh through 2030. Efficiency also contributes avoided peak demand and avoided T&D benefits. Thus, energy efficiency rate impacts are far lower than rate impacts from building new power plants or transmission infrastructure. A modest energy efficiency program portfolio such as the quick-start proposal could cost a Louisiana residential customer about $0.47 per monthly bill and a commercial customer about $5.41 per month.[3] Rate increases from fuel price volatility or new supply or transmission needs can be far higher. As an illustrative example for comparison, the recently proposed rate increases by Entergy Louisiana could mean the same residential customer would see an increase of about $7.56 per monthly bill and the same commercial customer would see an increase of about $76.81.[4] Stakeholders should be careful not to let the short-term rate impacts from energy efficiency detract from the medium- and long-term benefits of energy efficiency that accrue from delaying or avoiding the need for supply investments. Energy efficiency is a least-cost and least-risk option that should be considered as part of a diversified energy portfolio.

Macroeconomic Analysis

The final component of our study is a macroeconomic assessment of the impacts of the set of programs and policies, conducted by Evergreen Economics. This comprehensive, analysis finds that the portfolio of efficiency programs and policies would result in the following annual benefits by the year 2030: $3 billion in net economic output, including $1 billion in wages, and $663 million in business income to small business owners, 27,100 person-years of employment, and increased state and local tax revenue by $114 million.

Conclusion

Our analysis finds that energy efficiency can play a critical role in Louisiana's energy future as a least-cost resource that benefits all customers and as an economic development tool. The state's current policies and programs, however, are not sufficient to take advantage of the full energy efficiency potential. The suite of program and policy options presented in this report can help the state improve its energy efficiency, lower energy bills for all customers, and foster economic growth. Both sustained leadership and effective implementation will be critical measures of success in tapping into the state's energy efficiency potential.

[3] This assumes an efficiency program portfolio budget equivalent to 0.5% of revenue, an average residential customer in Louisiana using 1,000 kWh per month, and an average commercial customer using 12,500 kWh per month.

[4] This is for illustrative purposes only, to put the relative size of the rate impact in perspective. The Entergy Louisiana proposed rate increase estimates are from: http://www.entergy-louisiana.com/content/2013ratecase/RateCase_FactSheet.pdf