



ENERGY EFFICIENCY IN THE SOUTH

APPENDIX G

STATE PROFILES OF ENERGY EFFICIENCY OPPORTUNITIES IN THE SOUTH: LOUISIANA

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A Profile of Energy-Efficiency Opportunities in Louisiana

The economic recession, climate change concerns and rising electricity costs have motivated many states to embrace energy efficiency as a way to create new local jobs, lower energy bills and promote environmental sustainability. With this surge of interest in energy efficiency, policymakers are asking: “how much energy can be saved?” This profile addresses the opportunity for energy-efficiency improvements in Louisiana’s residential, commercial and industrial sectors. It draws on the results of a study of *Energy Efficiency in the South* conducted by a team of researchers at the Georgia Institute of Technology and Duke University. The study presents primary and in-depth research of the potential for energy-efficiency improvements, using a modeling approach based on the EF-NEMS (National Energy Modeling System).¹

With a population of about 4.3 million people,² Louisiana represents about 1.4% of U.S. population, 1.5% of the nation’s GDP, and 3.7% of U.S. energy consumption (Figure 1). Thus, compared to the rest of the nation, Arkansas has a higher-than-average level of energy intensity (that is, it consumes more energy per dollar of economic activity than most other states). Louisiana’ consumption of industry energy as a percentage of its overall energy budget exceeds that of the nation and the rest of the South (Figure 2).

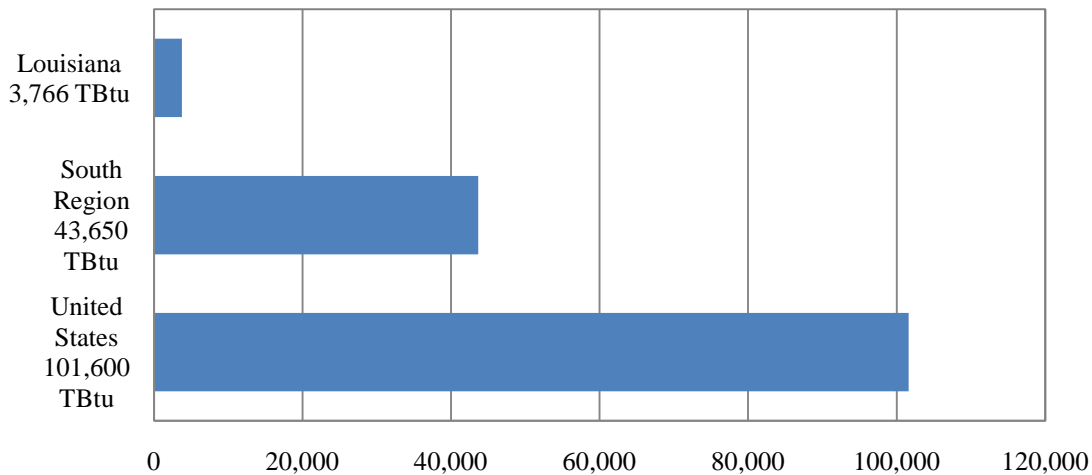


Figure 1: Louisiana, South, and United States Energy Consumption, 2007³

The state consumes more petroleum and natural gas fuel than the nation with energy consumption focused in the industry sector with predominance of petroleum industries and natural gas production ranking fourth in the Nation (Figure 3).

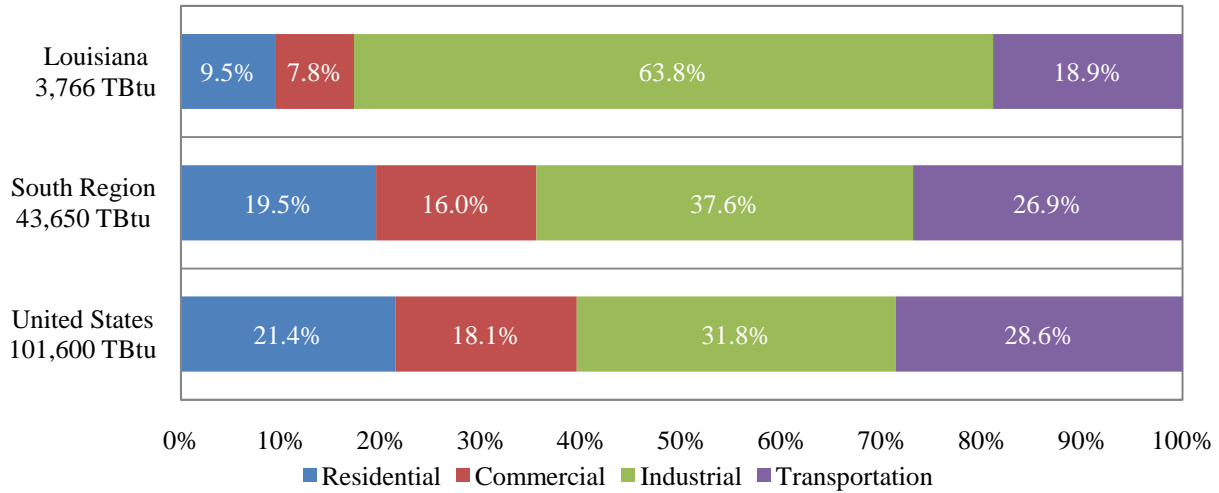


Figure 2: Louisiana, South, and United States Energy Consumption by Sector, 2007

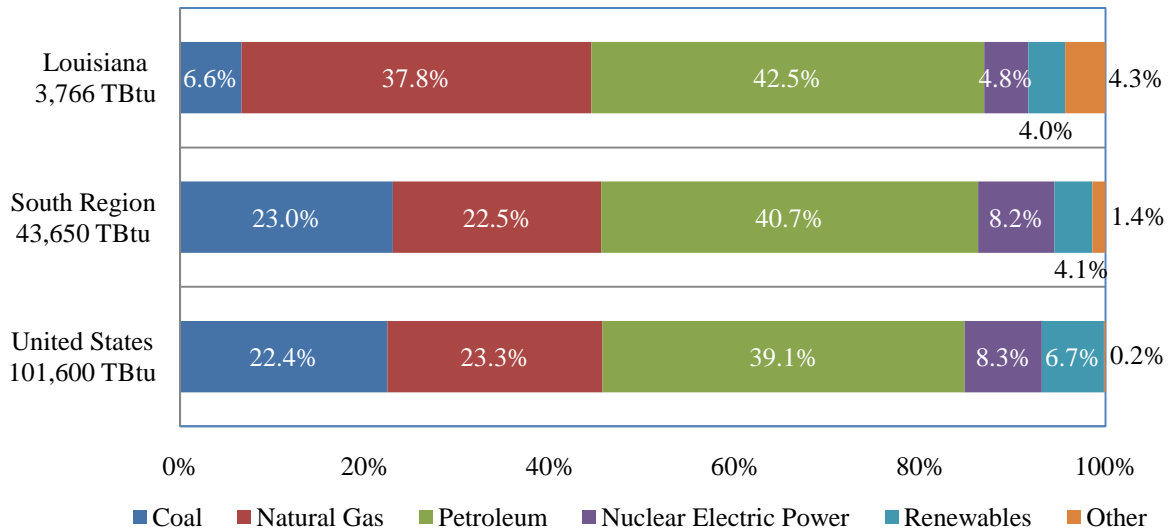


Figure 3: Louisiana, South, and United States Energy Consumption by Fuel Type, 2007

Louisiana has a number of energy efficiency policies already in place, which includes Combined Heat and Power applications, technologies, and low-income home energy assistance, such as codes and standards. In the industrial sector, for instance, Louisiana offers initiatives include Sales tax exemption for power produced with alternative fuels and for bio-diesel production and cogeneration of electricity.⁴

Nevertheless, the *2009 State Energy Efficiency Scorecard* from the American Council for an Energy Efficient Economy suggests that additional policy initiatives are needed in the State to encourage households, businesses, and industries to utilize energy more effectively. Specifically, the ACEEE study rated Louisiana 41st of the 50 states and DC for its adoption and

implementation of energy efficiency policies. This score is based on the state’s performance in six energy efficiency policy areas: utility and public benefits, transportation, building energy codes, combined heat and power, state government initiatives, and appliance efficiency standards.⁵

Chandler and Brown reviewed Louisiana’s energy-efficiency studies in the *Meta-Review of Efficiency Potential Studies and Their Implications for the South* (2009). Maximum Energy savings for the Appalachian regions is about 24% from projected energy consumption under a moderate pursuit of achievable savings in these studies.⁶ Louisiana’s energy-efficiency potential would be higher than this range with the implementation of all cost-effective opportunities, but the number of studies with such estimates is limited.

Energy Efficiency Potential by Sector

The State’s total energy consumption (residential, commercial, industrial, and transportation sectors) is projected to decrease by 11% from 2010 to 2030. This profile describes the ability of nine energy policies to further reduce the state’s energy use by accelerating the adoption of cost-effective energy-efficient technologies in the residential, commercial, and industrial sectors of Louisiana. Altogether, these policies offer the potential to reduce Louisiana’ energy consumption by approximately 17% of the energy consumed by the State in 2007 (653 TBtu in 2030) (Figure 4). With these policies, Louisiana’ energy consumption could drop significantly over the 20 year period.

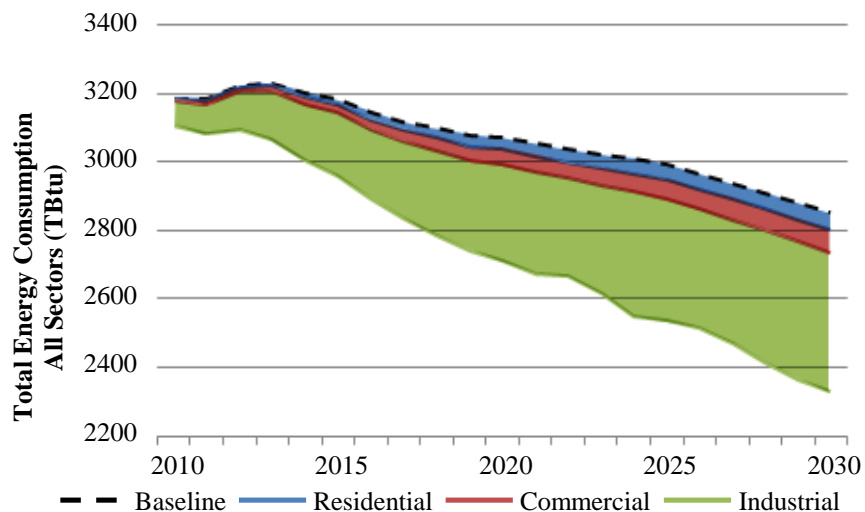


Figure 4: Energy Efficiency Potential in Louisiana

The industry sector offers the greatest energy efficiency potential in Louisiana (Figure 5). In 2020, the potential for energy savings across all three sectors is about 11% (425 TBtu) of the total energy consumed by the State in 2007. Electricity savings constitute 184 TBtu of this

amount. With these policies, the construction of 3.7 new power plants to meet growing demand by 2020 could be avoided in the year 2020.⁷

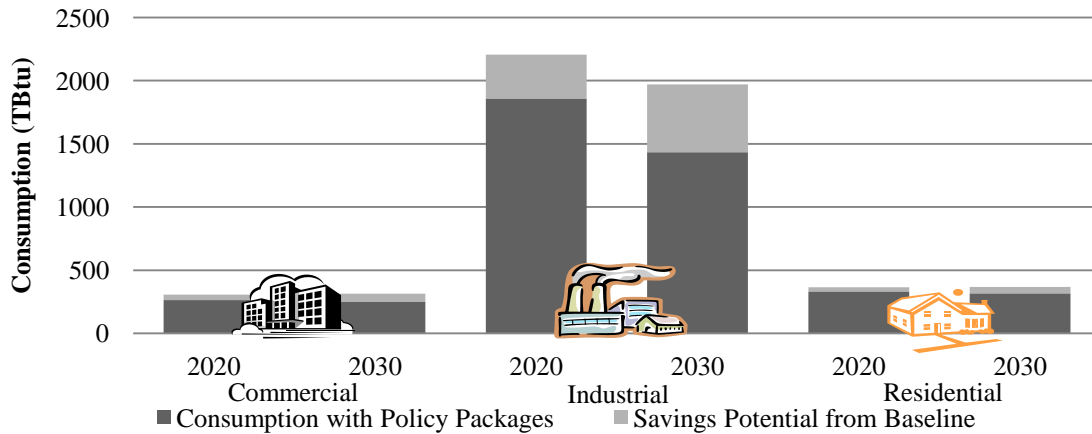


Figure 5: Energy Efficiency Potential by Sector in Louisiana, 2020 and 2030

Residential Sector

Four residential energy-efficiency policies were examined: more stringent building codes with third party verification, improved appliance standards and incentives, expanding the Weatherization Assistance Program, and retrofit incentives with increased equipment standards. Their implementation could reduce Louisiana’s projected residential consumption by about 9% (34 TBtu) in 2020 and 14% (51 TBtu) in 2030 (Figure 6).

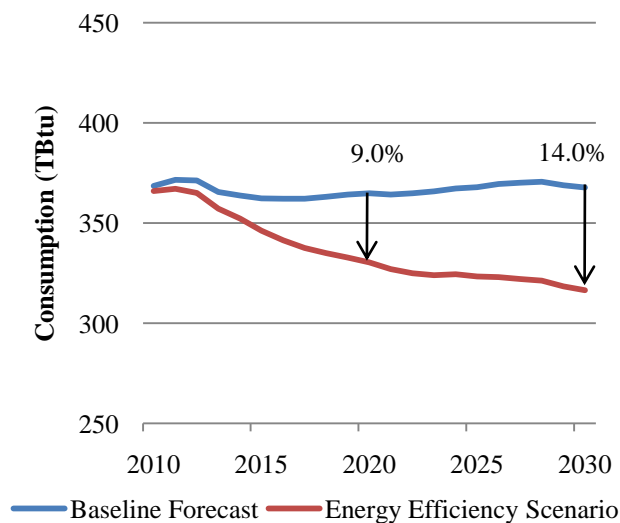


Figure 6: Residential Sector Savings

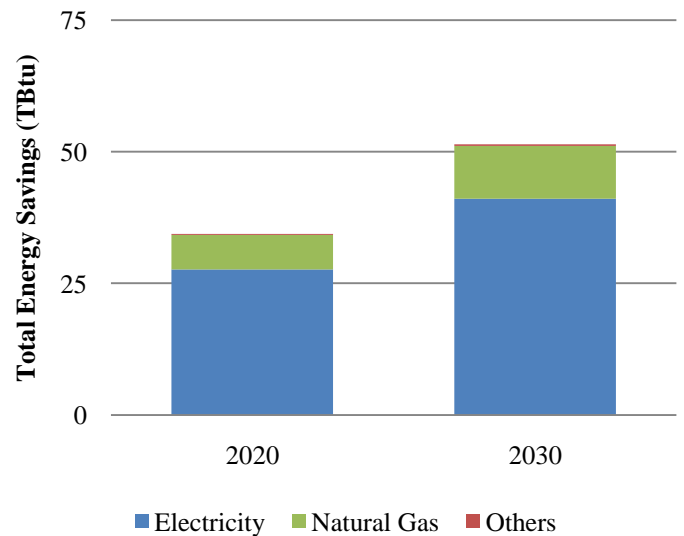


Figure 7: Residential Sector Savings by Fuel Type

The principal energy savings are from electricity, but significant natural gas savings could also occur (Figure 7). In 2020, the residential energy required by about 150,000 Louisianan households could be avoided, yielding annual energy bill savings of \$330 per household. Implementing these energy efficiency programs would reduce significantly residential energy consumption in Louisiana over the next two decades.

Commercial Sector

The implementation of energy efficiency policies in Louisiana’s commercial sector can reduce projected consumption in 2020 by about 14% (42 TBtu), and by about 21% (65 TBtu) in 2030 (Figure 8). In 2020, the commercial energy required by about 1,840 Wal-Mart stores can be saved or about \$24,000 in bill savings per retail establishment. The principal energy savings are from electricity (Figure 9). The rapid growth of commercial energy consumption forecast for Louisiana could be constrained to below the baseline line with these two energy-efficiency policies.

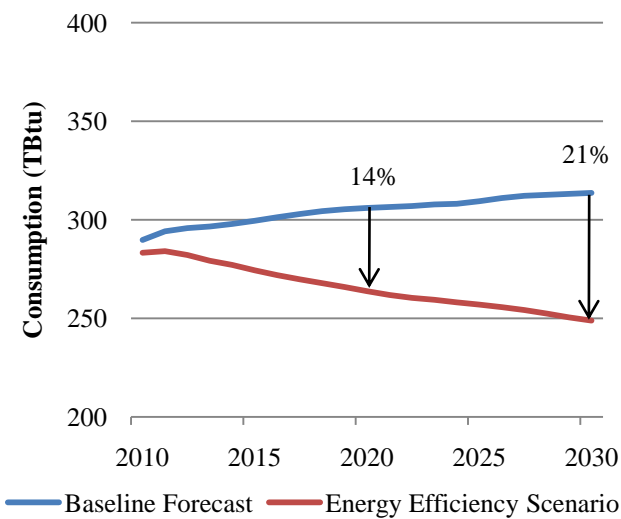


Figure 8: Commercial Sector Savings

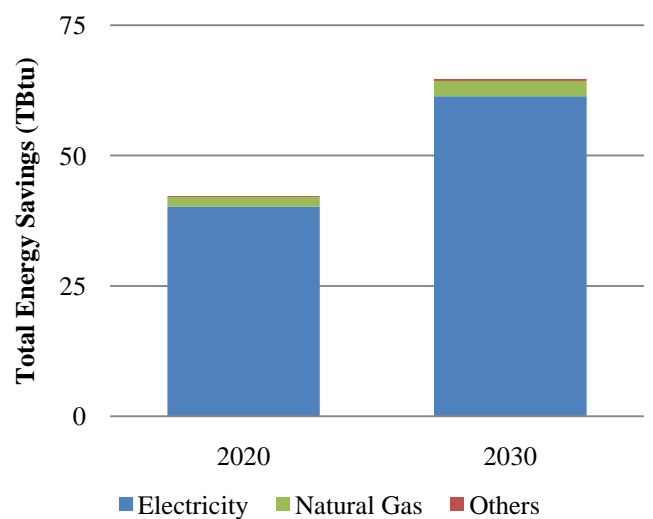


Figure 9: Commercial Sector Savings by Fuel Type

Industrial Sector

The implementation of plant utility upgrades, process improvements, and combined heat and power policies in Louisiana’s industrial sector can reduce projected consumption by about 15.8% (349 TBtu) in 2020 and 27.3% (537 TBtu) in 2030 (Figure 10). The industrial energy required by about 406 average industrial facilities is avoided in 2020, or about \$807,000 per industrial facility. The principal energy savings are from natural gas, but significant electricity savings could also occur (Figure 11). These three energy efficiency policies could significantly reduce the growing consumption of industrial energy over the next two decades.

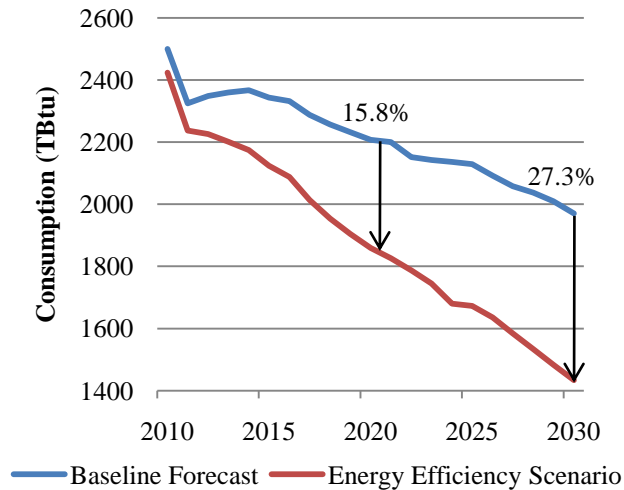


Figure 11: Industrial Sector Savings

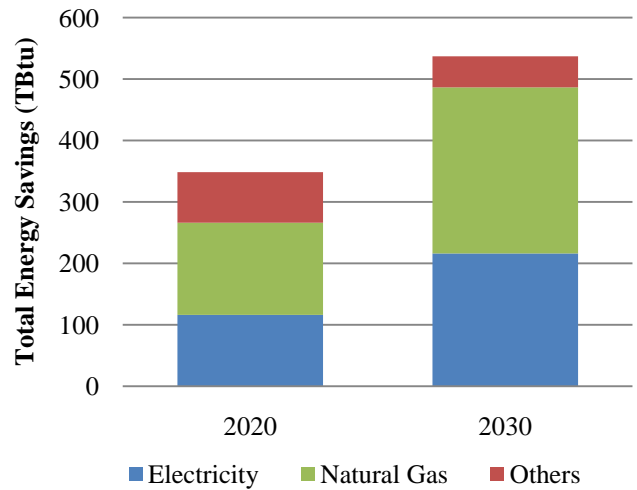


Figure 12: Industrial Sector Savings by Fuel Type

Efficient Technology Opportunities

The projected energy efficiency potential can be realized through an array of new and existing technologies. *Energy Efficiency in the South* enumerates a number of these.

New residential products can provide greater energy savings without sacrificing performance. For instance, recently available heat pump water heaters can cut annual energy costs for water heating from 50-62% and pay back initial costs within three years.⁸

Opportunities for commercial energy efficiency may be obtained through technologies like the geothermal heat pump (ground-source heat pump), which can reduce energy consumption by up to 44% when compared to air-source heat pumps and by up to 72% when compared to electric resistance heating with standard air-conditioning equipment. Though the installation cost is higher, the long lifetime of 20-25 years ensures energy bill savings.⁹

Super boilers, which represent over 95 percent fuel-to-steam efficiency, can be implemented in the industrial sector. This technology is able to improve heat transfer through the use of advanced firetubes with extended surfaces that help achieve a compact design through reducing size, weight, and footprint. The advanced heat recovery system combines compact economizers, a humidifying air heater, and a patented transport membrane condenser.¹⁰

These technologies are illustrative. Please refer to *Energy Efficiency in the South* for additional technology descriptions and examples.

Economic and Financial Impacts

The nine energy efficiency policies evaluated in *Energy Efficiency in the South* would reduce energy costs for Louisiana consumers and would generate jobs in the State (Table 1). Residential, commercial and industrial consumers could benefit from total energy savings of \$3.7 billion in 2020 (\$1 billion of which is specific to electricity), and \$4.8 billion in total energy savings in 2030. In comparison, the State spent \$6.5 billion on electricity in 2007.³ Louisiana could gain more from natural gas savings, of \$1.1 billion in 2020 and \$1.9 billion in 2030.

Using an input-output calculation method from ACEEE – with state-specific impact coefficients and accounting for declines in employment in the electricity and natural gas sectors – we estimated that Louisiana would experience a net gain of 17,900 jobs in 2020, growing to 22,400 in 2030. In comparison, there were over 151,000 unemployed residents of Louisiana at the end of 2009.¹¹ As is true for the South at large, the policies would also lead to an increase in Louisiana's economic activity. Specifically, its Gross State Product would increase by an estimated \$8 million in 2020. This change is a small fraction of Louisiana's \$ 222 billion economy.¹²

Table 1: Economic and Employment Impacts of Energy Efficiency

Indicator	2020	2030
Public Sector Policy Financial Incentives (in million \$2007)	420	591
Private Sector/Household Productive Investment (in million \$2007)	821	726
Change in Electricity Costs (in million \$2007)	-1,049	-1,754
Change in Natural Gas Costs (in million \$2007)	-1,079	-1,859
Annual Increased Employment (ACEEE Calculator)	17,900	22,400
Change in Gross State Product (in million \$2007)	8	0

Conclusions

The energy-efficiency policies described in this report could set Louisiana on a course toward a more sustainable and prosperous energy future. If utilized effectively, the State's substantial energy-efficiency resources could reverse the long-term trend of ever-expanding energy consumption. With a concerted effort to use energy more wisely, Louisiana could grow its economy, create new job opportunities, and reduce its environmental footprint.

For more information on the methodology used to derive this state profile, please see *Energy Efficiency in the South*.

Acknowledgements

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Footnotes and References

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