Missouri Comprehensive State Energy Plan

DEPARTMENT OF ECONOMIC DEVELOPMENT
DIVISION OF ENERGY

OCTOBER 2015

EXECUTIVE SUMMARY

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Missouri requires abundant, affordable, sustainable, and secure supplies of energy to power homes and businesses, to fuel transportation systems, and to advance opportunities for economic development and growth.

In 2010 the Department of Economic Development's Strategic Initiative for Economic Growth identified "Energy Solutions" as one of seven targeted industry sectors with the greatest potential for new job growth. In recognition of this opportunity Governor Jeremiah W. (Jay) Nixon transferred the Division of Energy (the Division) from the Department of Natural Resources to the Department of Economic Development[i] to better align the goals of promoting the development, security, and affordability of diverse energy sources.

With growing recognition of the need for a strategic and comprehensive energy plan for the state, and the strong stakeholder support that is required to undertake such an effort, Governor Nixon signed Executive Order 14-06 in June 2014. The Executive Order directed the Division to lead the development of a Comprehensive State Energy Plan (the Plan) for Missouri that would put our state on the path toward a sustainable and prosperous energy future. The Executive Order guided the creation of the Plan by requiring an inventory and assessment of the current way we consume energy in our state, an analysis of Missouri's resources, an examination of existing energy policies, and the identification of emerging opportunities and challenges associated with further development of energy resources and infrastructure.

To ensure the Plan was informed and guided by Missouri's top energy experts, professionals, and thought leaders, a group of more than 50 leaders in business, labor, education, and energy participated on a Steering Committee for the Plan. The Division also sought input from stakeholders including interested parties, legislators, regulators, and members of the public through a series of public meetings and an online comment forum.

Missouri has already taken numerous steps to adopt sound energy policy, invest in education and workforce development opportunities, encourage the use of new energy technologies, and pursue the economic development that will be associated with these efforts. Because of this solid foundation, this Plan does not recommend sweeping changes to our energy framework; however, there are significant improvements that can and should be made.

In order to understand the possibilities for our future it is important to first evaluate the current state of Missouri's energy resources. Overall, through a better understanding of the resources available, Missourians can plan how to most effectively utilize these resources and also determine what new assets must be developed to ensure reliable and affordable energy for all. Chapters 1 through 6 of Missouri's Comprehensive State Energy Plan provide background information on the energy industry in Missouri and were used as the foundation and analysis for the recommendations in Chapter 7: Our Vision for the Future, which are summarized in this Executive Summary.

Based on the input of Missouri's energy professionals and engaged citizens the Plan provides insight into the potential for job creation and economic development, as well as the impact of energy activities on our environment, and offers a series of next steps and recommendations for action designed to meet Missouri's short- and long-term needs for clean, reliable, affordable, and abundant energy. By addressing these recommendations we can create more 21st century jobs, grow our economy, improve the reliability and resilience of our energy systems, and keep utility bills affordable.

Our state has significant resources, human capital, and innovative and world-class businesses and institutions that serve as the foundation needed to achieve these goals. In conducting our analysis and soliciting public input during the Plan development process it became apparent that Missouri's pathway to achieving these goals is grounded on:

- **Promoting Efficiency of Use:** Energy efficiency leverages all forms of supply by stretching the value of a given unit. Using energy more wisely is a first step in optimizing Missouri's energy system.

- **Ensuring Affordability:** A focus on providing reliable energy at prices that are fair and reasonable for consumers and businesses will support Missouri's continued economic success. It is essential that the state's energy system meet the health, welfare, and economic needs of its citizens with particular emphasis on vulnerable populations.

- **Diversifying and Promoting Security in Supply:** Missouri must identify and capitalize on opportunities to maximize in-state clean energy resources and decrease dependence on imported fossil fuel energy sources.

- **Undertaking Regulatory Improvements:** Modifications to our state's energy laws and regulations are necessary to expand opportunities, deliver enhanced benefits to Missourians, and guide Missouri into our energy future.

- **Stimulating Innovation, Emerging Technologies, and Job Creation:** Missouri can be an energy innovation leader through the creation of research initiatives, development of a skilled and dedicated workforce, education of the public, support of local industry, and fostering a business climate that attracts innovation and creativity.

Recommendations for action were developed through the analysis of Missouri's current energy outlook, potential for the future, and input gathered from the Plan's comprehensive, transparent, and collaborative stakeholder engagement process. These recommendations include national best practices and reflect the views and opinions of numerous business leaders, energy innovators, and members of the public.

1. Efficiency of Use

Efficiently using available energy resources could be the most cost-effective method of meeting the state's energy needs. Many states have already established thoughtful energy efficiency policies and goals, and lessons learned elsewhere can help Missouri to use electricity, natural gas, transportation fuels, and other resources more efficiently. Here are some ways our state can strengthen its investment in energy efficiency:

1.1 Modify the Missouri Energy Efficiency Investment Act (MEEIA) to achieve greater levels of electric, gas, and water savings while increasing cost-effective energy savings for utility customers and creating additional local jobs in energy efficiency. This could be accomplished by making MEEIA mandatory for electric investor-owned utilities and by expanding voluntary partnerships with natural gas and water utilities.

1.2 Improve Missouri's approach to Evaluation, Measurement, and Verification of energy efficiency programs in order to provide utilities with greater certainty and encourage additional investments in customer programs. A comprehensive, statewide Technical Reference Manual would standardize and streamline the approach used to determine energy savings while the incorporation of non-energy benefits in cost-effectiveness tests would properly account for quantifiable non-energy benefits and could increase the range of cost-effective energy efficiency measures incentivized by energy programs.

1.3 Prioritize water infrastructure projects that lower the energy intensity of water and wastewater treatment operations and reduce the high costs associated with the supply, distribution, and treatment of Missouri's drinking water and wastewater. To accelerate project completion, minimum standards for water infrastructure projects funded by the Missouri Department of Natural Resources should be established and opportunities to better leverage existing funding streams should be identified.

1.4 Revise the standards for Missouri's state vehicle fleet by eliminating the technology-specific procurement policies for new vehicles and, instead, require adherence to fleet performance goals. This would provide state government greater flexibility to adapt to and integrate various technologies, while improving overall fleet performance and maximizing taxpayer funds.

1.5 Improve marketing efforts and technical assistance for Missouri's Property Assessed Clean Energy (PACE) program to increase participation rates, lowering costs to individuals and businesses and expanding opportunities for clean energy

jobs. Missouri's PACE program offers a simple and effective way to finance energy efficiency, renewable energy, and water conservation upgrades to both residential and non-residential buildings by eliminating cost barriers for property owners.

1.6 Ensure a base level of energy efficiency in all newly built or substantially renovated buildings through the enactment of a statewide building energy code applicable to Class 1 and 2 counties, for both residential and commercial buildings. In addition, allow Class 3 and 4 counties to adopt energy codes for residential and commercial new construction activities. Because incorporating energy efficiency measures can be less expensive than retrofitting an existing building, requiring new buildings to meet an energy code produces energy efficiency benefits at lower costs. Building energy codes can achieve economic, infrastructure, environmental and energy security benefits, saving consumers and businesses utility costs. Educational efforts delivered at the local level can inform local government officials of the benefits of energy codes and how to enforce them.

1.7 Expand Missouri's Energy Loan Program to include industrial energy users as eligible participants and thus provide Missouri industries greater opportunities to increase energy efficiency and reduce the cost of doing business. Establishing additional financing options, such as green banks and a warehouse for energy efficiency loans, would further expand the opportunities to support economic development of Missouri businesses through energy efficiency improvements.

1.8 Partner with the Missouri State Treasurer's Office to increase promotion of Missouri's Linked Deposit Program to drive participation and expand energy savings and clean energy projects that create additional local jobs and benefit the economy. The program provides below-market rate loans to small businesses creating jobs, alternative energy producers and consumers, agriculture operations, and local governments.

1.9 Build upon current efforts to improve the energy efficiency of Missouri government-owned facilities to save additional taxpayer dollars through a number of "leading by example" efforts ranging from benchmarking and energy management activities, to leveraging private sector financing that contributes to economic growth.

1.10 Expand the Division of Energy's activities and available resources to provide additional opportunities to assist, educate, and encourage Missourians to advance the efficient use of diverse energy resources with the goal of achieving economic and environmental benefits.

2. Energy Affordability

The affordability of energy rates significantly impacts the safety, health, and economic well-being of Missouri's families. This is particularly true for vulnerable households and groups such as low-income families and the elderly. Low-income households face disproportionately high energy burdens and greater incidence of late payment, disconnection, and unpaid balances. Collection activities and high rates of disconnect also impact utilities by increasing operating costs, which in turn results in higher bills to all ratepayers.

Affordable energy costs are crucial to retaining and growing existing businesses, attracting new industry, and providing a better quality of life to Missouri citizens. The recommendations that follow address the issue of affordability and provide actions for ensuring affordable rates and support for programs for vulnerable sectors.

2.1 Require that a portion of Missouri's Low Income Home Energy Assistance Program (LIHEAP) funding, that assists low-income households in meeting their immediate home energy needs and paying utility bills, be allocated to the Low-Income Weatherization Assistance Program (LIWAP), which focuses on home weatherization improvements that result in ongoing energy savings and lower utility bills, improved comfort, and health and safety. Although they serve the same customers, currently LIHEAP and LIWAP operate somewhat independently in Missouri and encouraging cross-participation would result in efficiencies in program delivery that maximize energy affordability resources.

2.2 Authorize and adequately appropriate Missouri's Utilicare Program on an annual basis. The Program provides financial support to eligible low-income, disabled, or elderly citizens to make utility bill payments. Although the Program has been in existence for over 30 years, funding through the years has been inconsistent. In addition, establish a requirement that a portion of the state's Utilicare funding be allocated to the state's LIWAP Program to provide longer-term solutions that reduce the need for future energy assistance as a result of ongoing energy savings.

2.3 Apply performance-based energy efficiency requirements to all Federal Low-Income Housing Tax Credit allocations that provide a transferable federal and state tax credit to owners of affordable housing developments, ensuring the efficient and effective use of public funding for preservation and rehabilitation projects. Where prescriptive requirements may result in developers

pursuing the incorporation of particular building products, performance-based requirements allow flexibility to meet energy savings goals in the most efficient manner possible.

2.4 Clarify and make explicit that the Public Service Commission (PSC) has statutory authority to consider rates specific to low-income utility customers. The PSC is uniquely positioned to evaluate affordability relative to the cost of service and other issues related to rates specific to low-income customers.

2.5 Expand the scope of residential energy efficiency programs to specifically target hard-to-reach customers, including multifamily properties and manufactured homes. Improving the energy efficiency of multifamily housing and manufactured homes can lead to improved stability of vulnerable households, most of which consist of renters whose annual income is typically lower than that of homeowners and therefore spend a higher percentage of their income on energy.

2.6 Determine how to better align business attraction and retention incentives by incorporating energy efficiency strategies designed to increase energy savings and company competitiveness. Continue to review and recommend revisions to regulated utility tariffs in order to eliminate barriers for onsite generation of electricity for business customers.

3. Diversity and Security of Supply

Investors, from individuals to large institutions, know that a diversified portfolio reduces risks and, over time, enhances results. The same is true for a state's energy portfolio: an overreliance on any single energy source creates unnecessary risk. Diversified energy portfolios allow for flexibility to respond to price dynamics, supply constraints, energy emergencies, and changing regulatory requirements. Strategies that diversify a state's energy supply through the support of new infrastructure, technologies, and markets mitigate risk and have proven to increase in-state economic development.

Diversifying the energy sources utilized and consumed in Missouri will make the state less reliant on imported energy, increase economic development, and provide a hedge against future price volatility. The state should make efforts to diversify its energy portfolio, using existing processes and establishing new opportunities for discussion and planning. Recommendations include expanding standards and policies that support renewable and alternative energy and other in-state resources, fostering the growth of technologies and systems that contribute to resilience and reliability, and building upon current successful collaborations related to energy assurance and emergency planning.

3.1 Strengthen Missouri's Renewable Energy Standard (RES) to require that 20 percent of annual retail electricity sales be met through eligible renewable energy technologies by 2025. Establishing voluntary RES goals for non investor-owned electric utilities could provide opportunities for environmental compliance, further diversify the energy resources utilized within Missouri, and result in additional economic development.

3.2 Improve Missouri's Net Metering and Easy Connection Act by increasing the size of net-metered systems to a maximum of 500 kW, requiring netting on an annual basis rather than on a monthly basis, and incorporating other flexibility mechanisms so that more distributed renewable generation systems contribute energy to the electric grid resulting in additional economic, infrastructure, environmental and energy security benefits.

3.3 Preserve private property rights by ensuring that no rule or regulation encroaches or infringes on existing solar energy property statutes or prevents the installation and reasonable operation of solar energy systems on private property. In the event of conflicts, the Missouri Office of the Ombudsman for Property Rights should be responsible for dispute resolution.

3.4 Fund Missouri's Alternative Fuel Infrastructure Tax Credit that provides tax credits to business owners and private citizens for installing and operating alternative fueling stations that use ethanol, some forms of natural gas, biodiesel, and hydrogen, as well as electric charging stations. The Tax Credit has played a significant role in furthering the development of alternative fuel vehicle infrastructure in our state; however, it is subject to appropriations and will sunset in 2017. Annual funding would add to

overall domestic capacity and economic productivity and contribute to diversifying Missouri's energy supplies, limiting reliance on imported fuels, and reducing environmental emissions.

3.5 Adopt policies that support the development of renewable thermal technologies, which would provide significant opportunities for market growth, greenhouse gas emissions reduction, green job creation, and economic development in Missouri. These policies could include establishing a thermal energy standard and providing financial support for this market.

3.6 Support Combined Heat and Power (CHP) applications through the development of a statewide CHP potential study that fully assesses the technical and economic potential of CHP opportunities. In addition, the establishment of cost-based standby rates and standardized interconnection practices will promote efficient utilization of what would otherwise be waste heat, which reduces energy costs for businesses and institutions and contributes to economic, environmental, and security benefits.

3.7 Encourage the development of microgrids through the adoption of standardized microgrid interconnection requirements and development of clear rules for how microgrid owners interact with utilities. Establishing special microgrid tariff structures should encourage the development of these systems, especially in areas of the grid that are congested or experiencing rapid demand growth and can play an important role in transforming Missouri's electric grid and reducing impacts of emergency events by strengthening grid resilience. Microgrid

owners and operators should be required to provide utilities with information relevant to their planning efforts.

3.8 Establish an energy assurance working group to enhance participation in the overall energy emergency planning process at the local, state, regional, and national level in order to more effectively identify and prepare for threats, reduce vulnerabilities, and mitigate the potential consequences of adverse events that do occur.

3.9 Establish a vulnerability assessment working group to identify critical gaps and risks to systems and facilities and determine which vulnerabilities to mitigate and in which priority. The working group could help critical infrastructure decision makers and community leaders to understand the most likely and severe incidents that could affect their operations and communities and use this information to support planning and resource allocation.

3.10 Continue collaboration and coordination on cybersecurity and perform a statewide risk assessment of public and private energy-related systems and facilities to mitigate against potential cyber attacks.

3.11 Plan for the deployment of smart grid technologies that use computer-

based remote control and automation to modernize utility electricity infrastructure which would improve the reliability and resilience of electric service, enhance safety and security, and contain energy costs. Planning efforts should include a working group comprised of smart grid stakeholders and industry experts that are focused on developing an integrated smart grid vision and plan for Missouri.

3.12 Enact legislation that provides for accelerated grid modernization through expedited cost recovery for utilities making cost-effective grid modernization improvements that go beyond regular repair and replacement activities. The policy should include performance metrics that protect the consumer and ensure that the improvements benefit the public. Grid modernization in which communication occurs in a two-way fashion would benefit customers by empowering them to make cost-saving decisions, at the same time as it benefits utility and industry stakeholders, and generates economic growth.

3.13 Establish an expedited process to review proposed grid modernization projects and encourage all utilities to continue to investigate and invest in new technologies that improve the performance and capabilities of the distribution grid to further improve reliability, resilience, and operating efficiencies in centralized generation and delivery infrastructure.

3.14 Implement changes to Missouri's propane storage and distribution infrastructure by encouraging enhancements to bulk terminal storage facilities to avoid or mitigate future supply disruptions, which would help assure public health and safety as well as uninterrupted agricultural and business operations that are dependent on propane. In addition, the state should encourage propane companies to move to metered service arrangements for customers, and provide financing opportunities for customers.

3.15 Examine and recommend viable Missouri tax policies to create stronger incentives for wind development and to maximize supply chain development for renewable energy equipment. Special property tax treatment for wind farms can further encourage development, and other tax rules applicable to property, generation or sales of equipment can also impact decisions by a developer when considering one state over another.

4. Regulatory Improvements

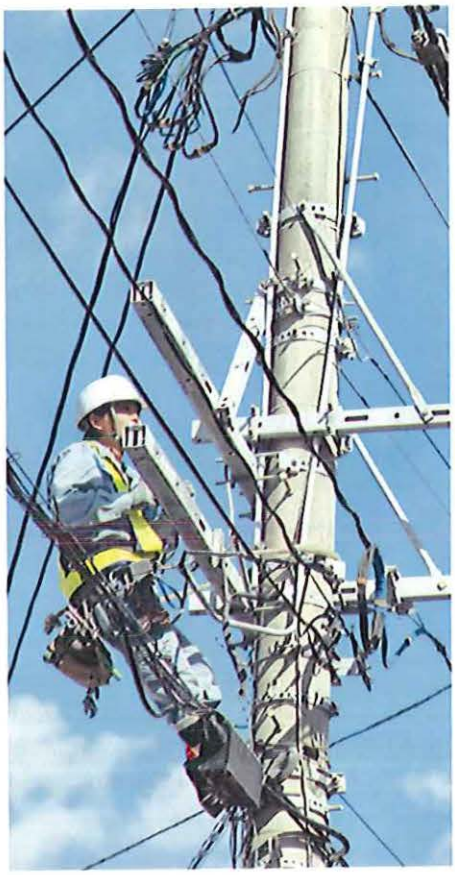
Modifications to our state's energy laws and regulations may be necessary to expand opportunities, deliver enhanced benefits to Missourians, and further advance our progress to meeting the goals of this Plan. Policymaking that is grounded in analysis and that incorporates the perspectives of our citizens and business sector will guide Missouri into our energy future.

4.1 Reform Missouri's utility ratemaking process by convening interested stakeholders for an in-depth examination of current ratemaking practices with a goal of making feasible improvements and exploring items such as: time-differentiated rates, a forward test year for expense items, decoupling, performance-based rates, street lighting rate reform, a recovery mechanism for grid modernization activities, and new utility business models.

4.2 Develop standardized terms and conditions through which green power plans can be offered to electric utility customers to promote fair, accurate, and consistent marketing of green power plans. Currently, it is often unclear to a customer what types of renewable energy sources are supported by the utility's green power plans and where the energy is produced.

4.3 Determine the overall net costs and benefits of setting Missouri-specific standards for certain appliances and equipment (such as televisions, water dispensers, and audio equipment) that are not regulated at the federal level, or at levels that are more stringent than federal requirements. In addition, the length of the annual, one-week "Show-Me Green" sales tax holiday that waives sales tax on ENERGY STAR® appliances should be extended.

4.4 Establish a "bill neutral" on-bill financing program applicable to investor-owned utilities to allow customers to receive upfront funding from utilities or third parties for energy efficiency improvements that is conveniently repaid to the lender on the customer's monthly utility bill. Methods that would allow municipalities and cooperatives to offer on-bill financing to their customers should also be considered.



5. Innovation, Emerging Technologies, and Job Creation

Investing in energy innovation through the creation of research initiatives, continued development of our skilled and dedicated workforce, fostering education of the public, and supporting local industry will position Missouri to meet the goals outlined in this Plan. The following recommendations are intended to foster a business climate of innovation and creativity in order to attract new businesses that focus on clean technologies that bring jobs to our state.

5.1 Facilitate public-private investments in resources and technology through the development of a comprehensive economic development proposal that includes resource extraction, processing, product development and manufacturing, research and development, as well as end of life recycling for the advancement of lead-acid batteries, utilizing an abundant Missouri resource. In addition, public and private institutions should work together to identify resources and invest in technologies that make the electricity sector more resilient.

5.2 Pursue economic development opportunities resulting from the research, development, and production of small modular reactors in Missouri through the continued broad collaboration of utilities, universities, government, and others.

5.3 Monitor the status of Carbon Capture and Storage pilot projects and support research and development on this topic through Missouri's universities in order to expedite clean technologies related to the use of fossil fuels.

5.4 Monitor future evaluations from the U.S. Department of Energy on the economic potential and other considerations for development of

hydropower from non-powered dams that could benefit Missouri.

5.5 Create a biopower stakeholder working group to investigate and solve issues around biomass co-firing such as feedstock logistics, forest management, and environmental and public health concerns, and propose policy changes that encourage biopower development.

5.6 Facilitate collaboration between the Division of Energy, the Department of Elementary & Secondary Education and other stakeholders to develop a joint energy-related curriculum offering for varying grade levels. These offerings should provide a balanced and broad understanding recognizing that education is vital to economic development and our energy future.

5.7 Develop a "Best Practices for Energy Education in Missouri Institutions of Higher Education" program through collaboration between the Division of Energy, the Department of Higher Education and other stakeholders including the Department of Labor and Industrial Relations and the Division of Workforce Development. Job training and retraining can help workers master the increased use of computers, automation, data management, and smart technology common in energy-related fields.

Roadmap for Implementation

In order to meet the goals identified in the Executive Order of promoting the development, security, and affordability of diverse energy sources, the recommendations identified above must be assessed to further understand feasibility, costs and benefits, and timelines for implementation. This assessment can then lead to a prioritization of efforts and development of action plans that provide a concrete path for moving forward.

With a recognition that state energy policy needs to be progressive and remain flexible so as to adapt to today's ever-changing energy industry, Missouri's Comprehensive State Energy Plan will be a living document that serves as a reference point for the state's elected officials, communities, businesses, and all Missourians. Local communities can use this Plan as the basis for developing their own plans that highlight the unique resources and priorities of their region. Additionally, we encourage all Missourians to support our efforts through individual action.

[1]Office of the Missouri Governor, Jay Nixon. "Executive Order 13-02". 2013. http://governor.mo.gov/news/executive-orders/executive-order-13-02