Reducing Energy Waste is Least-Cost Option for Implementing Federal Clean Power Plan

Analysis using new Michigan model highlights important role for renewables, cogeneration, natural gas in meeting state targets

[Lansing and Washington, D.C.] – Reducing energy waste, using more renewable energy sources like solar and wind, cogeneration fueled by natural gas and, depending on long-term price projections, an appropriate amount of natural gas-fired combined cycle generation can help Michigan comply with the federal Clean Power Plan at lowest cost. Those are among the findings of an Institute for Energy Innovation (IEI) analysis using the new State Tool for Electricity Emissions Reduction (STEER), a model commissioned by the Advanced Energy Economy Institute and developed by Michigan-based 5 Lakes Energy in partnership with researchers at the University of Michigan.

"Finding the least cost options for implementing the CPP is in everyone's best interest," said IEI President Dan Scripps. "Our analysis outlines those options, many of which are fully consistent with Governor Snyder's priorities that make a cost-effective implementation strategy the centerpiece of any effort to develop a 'no regrets' energy policy for Michigan."

Among the IEI findings:

- Reducing energy waste is Michigan's least-cost option for complying with the Clean Power Plan. Energy efficiency measures can account for 35 percent of the total greenhouse gas emission reductions likely to be required based on the draft federal plan and, because they result in net savings, should be pursued even absent the new federal regulations.

- Least-cost electricity generation options involve tradeoffs between natural gas, cogeneration and renewable energy, depending on the long-term projected cost of natural gas. Even relatively modest increases in the 30-year cost of natural gas can dramatically change the economics of power generation. If natural gas prices approach the U.S. Energy Information Administration's 2030 projection, wind and solar displace natural gas on purely economic grounds. Using natural gas in high-efficiency cogeneration systems at industrial facilities, not just electric-only power plants, also becomes more favorable at higher natural gas prices.

- A strategy that simply shifts from coal to gas would be imprudent based on the underlying volatility and long-term trajectory of fossil fuel prices. The long-term hedge value of fixed-price power purchase agreements using fuel-less generation

technologies outweighs the difference in cost between natural gas and renewable energy – even at today's low natural gas prices.

The STEER Model, which can be downloaded for free at the Advanced Energy Economy website, finds the least-cost compliance portfolio based on a comparative evaluation of available generation, efficiency, storage, and grid management options. In applying the model to Michigan, IEI identified a number of key points for consideration in developing a compliance plan for the state:

- **Energy Efficiency Improvements in Homes and Businesses**: A starting point for any cost-effective compliance strategy needs to be expanding energy efficiency in Michigan homes and businesses, a strategy that could reduce overall load 20 percent by implementing all cost-effective energy efficiency opportunities at a projected annual savings of $811 million for Michigan ratepayers.

- **Network and Grid Efficiency Options**: Network efficiency such as smart meters and similar devices has the potential to save approximately $110 million in CPP compliance costs, making it the most cost-effective carbon mitigation measure in the model under all scenarios and should be pursued even in the absence of the CPP requirements.

- **Generation Tradeoffs**: While energy efficiency can satisfy a significant portion of Michigan's carbon reduction requirements, additional generation is necessary for any CPP compliance strategy. Despite today's low natural gas prices, conservative forecasts of natural gas prices and the fuel's history of price volatility make renewable energy an attractive complement to natural gas for investment in future generating capacity.

The open-source STEER Model is designed to provide state lawmakers, air and utility regulators, and others who will be responsible for meeting the CPP requirements with access to data and integrated resource planning analysis. It automatically calculates least-cost compliance and implementation strategies given policy options, load and price forecasts. All data, inputs, and formulae are visible to and changeable by the user, including a broad array of compliance options, allowing for greater precision in identifying those technologies and other compliance mechanisms that are most cost-effective.

Finally, IEI identified a number of obstacles that stand in the way of some compliance measures and is calling for a number of statutory and regulatory changes, such as:

- Eliminate expenditure cap for energy efficiency improvements.
- Make cost-effective efficiency investments as attractive to utility investors as new generation.
- Authorize the Michigan Public Service Commission (MPSC) to require cost-effective energy efficiency measures – both network efficiency and customer

efficiency measures – as part of any future integrated resource planning or certificate of necessity proceedings.

- Remove barriers to deployment of combined-heat-and-power systems, including excessive stand-by charges, interconnection roadblocks, and other disincentives for cogeneration.
- Ensure meaningful growth in renewable energy, either through continuance of current renewable portfolio standard or through incorporation of risk considerations and hedge value of fuel-less technologies as part of MPSC review of utility plans.

The IEI report can be found at http://bit.ly/1OupeOp

Background: AEE has prepared a backgrounder with a handy graphic depicting the state's current sources of electricity generation. The backgrounder shows Michigan is well on its way to reducing emissions and meeting targets, and has an opportunity to modernize its electric grid for the benefit of consumers and the economy in the course of complying with the EPA rule. http://bit.ly/1KkUjTL

The U.S. Environmental Protection Agency (EPA) is expected to release the final rule for carbon emissions from existing power plants, called the Clean Power Plan (CPP), this summer. The final rule represents the next step in the process of carbon regulation that began with the Supreme Court's determination in 2007 that carbon dioxide (CO2) qualifies as an air pollutant subject to regulation by EPA under the Clean Air Act.

Under Section 111(d) of the Clean Air Act, EPA will set air pollutant standards for each state based on what EPA determines to be the "best system of emission reduction" (BSER). In the draft rule issued in June 2014, EPA determined the BSER based on state specific potentials for emission reductions utilizing four "building blocks" that include both traditional smokestack controls as well as "beyond the fence line" measures, namely improving the efficiency of coal plants, increasing dispatch of existing natural gas plants, deploying renewable and nuclear power generation, and reducing demand by means of energy efficiency.

Although Michigan's emission rate target is set by the building blocks, there is no requirement that the state use those specific measures for compliance. Rather, in developing a compliance plan to achieve interim and final targets, the state is free to use other technologies and policy tools, allowing for states to choose from a variety of options for meeting the targets based on their particular resources and policy goals.

In addition to Michigan, 5 Lakes Energy is also developing versions of the STEER model for Arkansas, Georgia, Illinois, North Carolina, Pennsylvania and Virginia.

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About the Institute for Energy Innovation

The Institute for Energy Innovation is a Michigan non-profit corporation registered under Section 501c3 of the Internal Revenue Code. IEI's mission is to promote greater public understanding of advanced energy and its economic potential for Michigan, and to inform the public and policy discussion on Michigan's energy challenges and opportunities. IEI's activities are focused on three primary areas: policy development and research; community-based energy programs; and industry engagement activities. IEI is a state partner organization of Advanced Energy Economy.

About Advanced Energy Economy Institute

The Advanced Energy Economy Institute (AEEI) is a 501 (c)(3) charitable organization whose mission is to raise awareness of the public benefits and opportunities of advanced energy. AEEI provides critical data to drive the policy discussion on key issues through commissioned research and reports, data aggregation and analytic tools. AEEI also provides a forum where leaders can address energy challenges and opportunities facing the United States. AEEI is affiliated with Advanced Energy Economy (AEE), a 501(c)(6) business association, whose purpose is to advance and promote the common business interests of its members and the advanced energy industry as a whole.