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Chairman Upton, Ranking Member Rush, and members of the Subcommittee, thank you for inviting me to submit testimony regarding Michigan's energy assurance planning and preparedness efforts.

I am Valerie Brader, Executive Director of the Michigan Agency for Energy. The Michigan Agency for Energy's mission is to advance an adaptable, affordable, reliable, and environmentally-protective energy future for Michigan. A core focus of that mission is ensuring that Michigan is prepared for any energy emergency – to keep our families safe and warm, our transportation running, and our businesses operating.

Across the country, states are working hard to not only contend with traditional threats to energy security, such as severe storms or aging and outdated infrastructure, but also with physical and constantly evolving cyber threats. In Michigan, we've witnessed all of these threats firsthand in the past few years. We have had storms that caused more than a million homes and businesses across the state to lose power, and many people were out for days. We have seen attempts to place explosive devices at key infrastructure locations and a successful ransomware attack on the customer service systems of the utility that serves our state's capital. These threats underscore the vital need for emergency response planning and preparedness.

This is why, in cooperation with our local, state, federal, and private partners, Michigan is taking strategic action to prepare for these and other threats which can disrupt the production, transmission, and distribution of energy resources.

Michigan's primary preparedness strategy for such threats is our energy assurance planning process. Planning efforts supported by a long list of federal partners – notably including the Department of Energy (DOE) and the National Labs, as well as the Federal Emergency Management Agency (FEMA) and various military branches – have been extremely educational for Michigan and prompted us to take action in a number of arenas (as I will discuss more below). Because of what we learned in those federally-led activities – which involved the participation and leadership of many federal agencies – Michigan put hundreds of thousands of dollars of our own resources into this area, which led to tangible improvements for our citizens even before the evaluation was completed.

Planning is at the heart of our emergency response efforts. Through this process, we identify vulnerabilities in our energy system and develop mechanisms to mitigate the risks they pose to Michigan and our neighboring states. The process supports the development of relationships and trust between public and private sector partners; defines roles, responsibilities, and responsive actions should an incident occur; and helps to identify new threats and system vulnerabilities before we discover them the hard way.

Because energy assurance and security are of a local, state, regional, and national concern, it is essential to have good partnerships with public entities at all levels. One key partner for Michigan is the DOE. To give just one example, we've developed long-term relationships with deliverable fuel companies through the State Heating Oil and Propane Price (SHOPP) survey.

These relationships helped Michigan protect its citizens from the propane crisis of the winter of 2013-14 that threatened the ability of rural Michiganders to keep their families warm. We also developed Michigan-specific energy supply and demand forecasts using Energy Information Administration (EIA) data to identify potential energy market issues. Finally, I want to highlight one particular way DOE's partnership has helped to protect Michigan's citizens, as well as those of surrounding states.

In 2011, the DOE held a series of regional energy assurance exercises. One of them, White Prairie, focused on the Midwest region and was designed to help the region's state and local participants evaluate their energy assurance plans. The regional exercises proved highly useful in examining our preparation for, and response to, energy infrastructure and supply disruptions, and identifying gaps where further planning and process improvements were needed. The four exercises also helped to build emergency planning capacity and situational awareness while fostering a greater understanding of new energy technologies, and creating opportunities to include those technologies in energy assurance planning. Similarly, the exercises were used to discuss evolving vulnerabilities, such as cyber and physical security, and the importance of addressing those vulnerabilities in the energy assurance planning process.

The lessons learned and relationships built during the 2011 regional exercises were employed just two years later when a culmination of events led much of the United States to experience a propane crisis in the winter of 2013-14, the worst in over a decade. Extreme temperatures, infrastructure outages, and supply imbalances led to unexpected price volatility and regional shortages. Michigan used our planning experience to take a number of helpful steps: we increased monitoring of propane supply and price data (through expanded weekly

SHOPP calls to propane dealers, outreach to wholesale terminals, etc.); declared energy emergencies to allow for waivers of federal motor carrier safety regulations (hours of service); and coordinated multi-state calls with public and private counterparts across the Midwest to gain situational awareness of the propane supply emergency. Partners in these efforts included the propane industry, state energy offices/public utility commissions, law enforcement, propane associations, and the federal government (DOE, FERC, Federal Motor Carrier Safety Administration (FMSCA), and DHS). The crisis eased toward the end of February and the beginning of March 2014, but the emergency highlighted the very real nature of the energy supply threats we face and the importance of interstate and private sector coordination and relationship building. I can't emphasize enough how important these well established, cross-jurisdictional relationships were when our state was faced with an energy crisis.

While we engage in energy assurance planning in Michigan for all types of energy resources, I'd like to now focus specifically on what we've been able to do in the petroleum sector.

Michigan is one of a very few states outside the traditional hurricane zone which has an organized plan to respond to petroleum emergencies. The Michigan Petroleum Shortage Response Plan (the plan) was developed following the oil crises of the 1970s and updated with DOE guidance and support in 2012. The plan is comprised of supply and demand response measures to help Michigan's citizens, businesses, and first responders navigate fuel supply disruptions while maintaining access to critical petroleum resources.

In particular, the plan describes procedures to set aside petroleum resources and, when necessary, to release these resources to areas where an acute fuel shortage is occurring. It details measures to efficiently allocate available petroleum resources to entities who provide

essential community services, and provides a host of strategies to encourage fuel conservation and to ease certain regulatory restrictions which can slow recovery. Governor Snyder declared an energy emergency and activated measures from the plan as recently as 2016, when a key fuel pipeline in Wisconsin was unexpectedly closed and caused severely constrained gasoline supplies in Michigan's Upper Peninsula and secondary effects throughout the Midwest. These emergency measures were effective and Michigan residents did not experience shortages at the pump and prices remained relatively stable.

The energy assurance process has also exposed to state officials vulnerabilities from threats beyond severe weather within Michigan's petroleum sector. Chief among them is the heavy reliance by petroleum facilities on electricity. Petroleum pipeline pumps run on electricity, and they generally lack sufficient backup power supplies to continue operating in a prolonged outage. Most fueling stations and petroleum terminals in Michigan do not have backup power supplies, nor are they pre-wired for generator usage – increasing the risk of not being able to fuel emergency response vehicles, aircraft, or backup generators at critical infrastructure locations, such as hospitals, water treatment facilities, and communications facilities.

Furthermore, the petroleum market is highly interconnected. We rely on products produced or refined out of state or across the border in Canada, and other states and Canadian provinces rely on products produced in, or transported through, Michigan. For example, natural gas liquids such as propane are procured in part from western Canada; products are refined in neighboring states and shipped to Michigan via rail, truck, and pipeline; and Ontario's crude oil supplies are largely supplied via pipelines in Michigan. The interconnectivity of the petroleum market means that small events can create regional price shocks, and larger events

can quickly cascade into a national crisis requiring federal action and assistance. Without state energy supply monitoring and assurance planning, state officials would not have the venue to collaborate with the many federal and private parties who are all critical in identifying vulnerabilities, establishing procedures for emergency response, and carrying out response plans in the event of an emergency. Awareness of that vulnerability, which was made clear to us in federally supported exercises, led our state to put dollars into an effort to increase our awareness and improve our plans. We are also separately seeking a better understanding of what both the environmental and energy economics would be of catastrophic vulnerabilities and what alternatives may be available. While Michigan has undertaken significant work to develop and improve our Petroleum Shortage Plan, the interconnectedness of the petroleum system gives rise to a vulnerability which any one state is unable to address alone: the resiliency of the petroleum system is only as strong as the weakest response plan. In this, Federal support to ensure that each state has a robust and compatible response plan to address petroleum emergencies would be most welcome.

A great example that highlights how the energy assurance and the petroleum shortage planning process played a critical role in heading off a substantial supply disruption occurred in Michigan earlier this year. In March, sustained, near hurricane-force winds struck both peninsulas – and for hundreds of thousands of customers, those outages stretched over many days. Using critical relationships established through the energy assurance process – and the plan improvement process that was well underway – the state was able to address, within minutes, a situation that might have otherwise taken crucial hours just a year before. In this instance, a key supplier of jet fuel to Detroit Metropolitan Airport was out of power for some

days and needed rapid restoration to keep fuel deliveries on track. However, the utility did not have the supplier on a list of restoration priorities because we had not been aware of the vulnerabilities prior to undertaking the process to evaluate and improve our plans. Because of our work, all it took was a few quick phone calls to already known individuals and the supplier was moved up on the priority list. Because of our planning, and the excellent execution and response from our utility partner, there was no disruption to state, regional or national commerce from the loss of a major hub airport. That petroleum facility is now designated as a priority to be returned to service in the event of a power outage.

While it is important to celebrate the planning successes, it is vital that the sense of urgency that has guided us in the past continue to push us in the future. Michigan still has much to do to protect our citizens. The Michigan Agency for Energy and Michigan State Police commissioned an independent energy assurance study to analyze the state's ability to respond to, and recover from, long-term power outages. Additionally, the study examined Michigan's energy assurance plans, assessed the resiliency of three critical sectors (petroleum fuels, medical care, and water), evaluated ways to improve critical energy infrastructure information sharing, and investigated capabilities for assisting medically fragile households during long-term electrical outages.

This study revealed to us that, while our plans had made great progress following update efforts in 2010-2012, continued updating was necessary to keep abreast of the changing threat landscape, including a greater emphasis on cybersecurity. The study also revealed a general lack of resiliency to long-term electrical outages in all facets of the petroleum industry (gas station to terminal to pipeline to refinery). Suggestions were offered to gather more in-depth

operational data on energy infrastructure, and to test response procedures more thoroughly, specifically the Supply Management Measures, as outlined in the Michigan Petroleum Shortage Response Plan.

Further action we are currently taking includes filling in information gaps uncovered through the energy assurance process related to geospatial data for critical petroleum infrastructure and the associated flow directions and operational constraints. This information could be very useful in emergency planning to facilitate cooperation with local utilities to identify and prioritize restoration of infrastructure in long-term outages. Having this data readily available is essential to quickly assessing the extent of a shortage and identifying options to mitigate the situation. However, acquiring and updating this information can be a challenge in itself as facility operators are wary of providing detailed information for fear that it would be subject to the state's Freedom of Information Act (FOIA) disclosures and could end up in the wrong hands.

In Michigan, we are also making efforts to integrate energy related themes and challenges into state level emergency exercises more broadly, and exploring new and innovative resiliency initiatives. This could include combined heat and power systems for critical facilities, surveying fueling stations for the existence of, or capacity for, backup power, or identifying gas stations along major evacuation routes, just to name a few.

In closing, Michigan's Governor, the Michigan Agency for Energy, the Michigan State Police, and many others place a very high priority on energy assurance and preparedness planning. We continue to invest our own resources into energy assurance planning to ensure long-term economic strength based on a reliable and resilient energy system to power our lives and

businesses. We are committed to ensuring this process is strategic, effective, and fiscally responsible. It is important to us, as you continue your evaluation of state energy assurance planning and energy programs, that the process can adapt to and support different states needs and priorities, while allowing for enhanced collaboration with local partners, other states, the federal government, and industry partners. This is particularly critical as we attempt to prevent and prepare for low-frequency/high-impact physical or cyber-attacks on the energy system by actors who aim to disrupt and harm our way of life. Your support, and the support of our public and private sector partners, will position Michigan, and the rest of the country, to find new ways to identify and mitigate vulnerabilities while adapting to ever-evolving energy security challenges.

Thank you for taking the time to study and highlight the importance of energy planning, and allowing Michigan the opportunity to be part of that conversation.