STATE OF IOWA
BEFORE THE IOWA UTILITIES BOARD

IN RE:	**)**	
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DISTRIBUTED GENERATION	**)**	**DOCKET NO. NOI-2014-0001**
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INITIAL COMMENTS OF THE ENVIRONMENTAL LAW & POLICY CENTER, IOWA ENVIRONMENTAL COUNCIL, SIERRA CLUB, IOWA SOLAR ENERGY TRADE ASSOCIATION (ISETA), SOLAR ENERGY INDUSTRIES ASSOCIATION (SEIA), THE VOTE SOLAR INITIATIVE, AND INTERSTATE RENEWABLE ENERGY COUNCIL, INC. (IREC)

Dated: February 26, 2014

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EXECUTIVE SUMMARY

Iowa's distributed generation market is an untapped resource for the state. Iowa's technical potential for solar PV is over 4,000 gigawatts (GW), enough to meet Iowa's total annual electric needs more than 150 times over, but Iowa has installed only about 5 megawatts (MW) to date. Iowa's technical potential for combined heat and power (CHP) is at least 1,675 MW, but only 27 MW have been built in the past decade. Iowa's technical potential for distributed wind is in the tens of thousands of megawatts, but again only 120 MW have been installed to date.

Distributed generation provides significant benefits that extend far beyond the location of a project. Distributed generation uses energy near where it is produced, thereby saving energy losses over transmission and distribution lines and making our energy production more efficient. Distributed generation diversifies our energy, helps with the reliability of the grid, and serves as a hedge against potential future fuel increases and environmental costs. Distributed generation provides environmental and health benefits by reducing emissions, keeping our air and water clean, and conserving limited water resources. Customer-owned distributed generation provides energy and capacity with private investment that offsets the costs we all would pay for new utility-owned generation and capacity. Finally, distributed generation provides economic benefits by creating local jobs and investment opportunities.

If Iowa falls behind on distributed generation, we will lose out on the diverse array of benefits provided by distributed generation. As a state, we can and should proactively take steps to catalyze the distributed generation market; if on the other hand, we erect unnecessary barriers that stand in the way of innovation and technological progress, we will cede the benefits of distributed generation to other states. Neighboring states are already taking aggressive action to develop distributed generation within their borders. If Iowa does not take action soon that scenario is likely to play out as the industry will locate elsewhere. It will make it difficult for Iowa to develop a distributed generation industry as resources and investment flow to states with supportive policy. The lag may become structural and permanent, much like Nebraska's lack of action caused that wind rich state to lag behind, and struggle to catch up with, states like Iowa that aggressively pushed policy to develop wind generation. Iowa should immediately take actions to catalyze the distributed generation market, while taking steps to properly value distributed generation and explore ways to integrate that valuation into rate design.

The following are the five most significant issues related to distributed generation that we discuss in more detail in our comments:

- Iowa policy makers must take steps to catalyze the distributed generation market – Distributed generation offers significant benefits, but we will not attain them without taking proactive policy actions to develop the distributed generation market. Without creating a robust distributed generation market, the rest of the discussion is moot.
- Preserve, expand and standardize the existing net metering policy to include all utilities, including consumer-owned utilities – If Iowa does not preserve existing net metering policy, we will be erecting an unnecessary barrier to developing a distributed generation market and ceding that market and investment to other states.
- Pass a strong "solar standard" with distributed generation carve-out to catalyze the market – This is one of the strongest proactive actions a state can take. Iowa's neighboring states are currently moving forward with this type of policy, and Iowa should as well or risk falling irreparably far behind.
- Prepare for the future with an independent valuation of the costs and benefits of distributed generation - It is absolutely crucial to accurately understand the costs and benefits of distributed generation. Iowa should conduct an independent valuation study to fully assess the costs and benefits of distributed generation, including the benefits to all ratepayers and society as a whole.
- Investigating rate design options that fairly compensate distributed generation customers for the services they provide, and ensure that all utility customers provide reasonable cost-based compensation for the utility services they use.

WHO WE ARE

The Environmental Law & Policy Center, Iowa Environmental Council, Sierra Club, Iowa Solar Energy Trade Association (ISETA), Solar Energy Industries Association (SEIA), the Vote Solar Initiative, and Interstate Renewable Energy Council, Inc. (IREC), jointly file these comments pursuant to the Iowa Utilities Board Order Opening Inquiry on Distributed Generation issued January 7, 2014.

The Environmental Law & Policy Center (ELPC) is a non-profit corporation with an office Des Moines, Iowa and members who reside in the State of Iowa. ELPC's goals include promoting clean energy development and advocating for policies and practices that facilitate the use and development of clean energy such as solar and wind power.

The Iowa Environmental Council (IEC) is a broad-based environmental policy organization with over 70 diverse member organizations and a mission to create a safe, healthy environment and sustainable future for Iowa. IEC's work focuses on clean water, clean air, conservation, and clean energy, including the promotion of policies that would facilitate the development of clean energy and clean energy jobs.

The Iowa Solar Energy Trade Association (ISETA) is a non-profit, professional organization for solar photovoltaic and solar thermal industries in Iowa. ISETA promotes the interests of its members through education and public relations about the economic and environmental benefits of solar. ISETA advocates for policies that will facilitate and promote the development of solar photovoltaic and solar thermal energy in Iowa.

The Sierra Club, the nation's oldest grassroots environmental organization, has a mission to explore, enjoy, and protect the planet. The Sierra Club works state-wide and nationally to advocate for clean, renewable energy to reduce air pollution, water pollution, and the effects of climate disruption resulting from fossil fuel extraction and combustion.

The Vote Solar Initiative is a non-profit grassroots organization working to foster economic opportunity, promote energy independence and fight climate change by making solar a mainstream energy resource across the United States. Since 2002 Vote Solar has engaged in state, local and federal advocacy campaigns to remove regulatory barriers and implement the key policies needed to bring solar to scale.

The Solar Energy Industries Association (SEIA)[1] is the national trade association of the United States solar industry. Through advocacy and education SEIA and its 1,100 member companies work to make solar energy a mainstream and significant energy source by expanding markets, removing market barriers, strengthening the industry and educating the public on the benefits of solar energy.

The Interstate Renewable Energy Council, Inc. (IREC) is a non-profit organization that has worked for three decades to accelerate the sustainable utilization of renewable energy resources through the development of programs and policies that reduce barriers to renewable energy deployment.

[1] The views represented in this filing are the views of the trade association and not necessarily any of its individual members.

I. INTRODUCTION

Iowa is a wind industry leader. Over 5,000 MW of wind energy have been built in the state with additional projects currently under construction. Iowa has received tremendous benefits from its position as a wind energy leader. The state has diversified its energy generation, transitioned to cleaner energy, and built an entire sector of the economy while maintaining some of the lowest electricity rates in the country. The economic impact is significant with over $16 million in lease payments to Iowa property owners each year, approximately $10 billion in cumulative investment, 6000-7000 jobs, and $2.6 billion in added property tax value. Iowa's wind energy leadership did not happen by accident. It took bi-partisan political leadership, an engaged and visionary Iowa Utilities Board, and stakeholders working together to innovate and remove barriers. Distributed generation, and in particular distributed solar generation, can and should be the next chapter in Iowa's energy success story.

Distributed generation provides significant benefits that extend far beyond the location of a project. Distributed generation uses energy near where it is produced, thereby saving energy losses over transmission and distribution lines and making our energy production more efficient and more secure. Distributed generation diversifies our energy, helps with the reliability of the grid, and serves as a hedge against potential future fuel increases and environmental costs. Distributed generation provides environmental and health benefits by reducing emissions, keeping our air and water clean, and conserving limited water resources. Customer-owned distributed generation provides energy and capacity with private investment that offsets the costs we all would pay for new utility-owned generation and capacity. Finally, distributed generation provides economic benefits by creating local jobs and investment opportunities.

Iowa has a tremendous opportunity to realize these benefits and be a leader in more than just wind energy. Unfortunately, Iowa is currently lagging behind the states leading the charge in distributed generation, and Iowa is not even keeping pace with its regional neighbors who are proactively taking steps to develop distributed generation and understand its impacts for the future. If Iowa does not act to build on the policies currently in place, Iowa will fall further behind and other states will fill the void.

Iowa should take steps now to catalyze the distributed generation market. The public policy goals incorporated in the Iowa Public Utilities Act strongly support the development of renewable energy and distributed generation.[2] In order to realize those goals, the Board should use this docket to prioritize ways to promote distributed generation and develop a robust solar market. In order to promote distributed generation, Iowa should take immediate steps towards the following actions:

- Preserve, expand, and standardize the existing net metering policy to include all utilities, including consumer-owned utilities;
- Pass a strong "solar standard" with a distributed generation carve-out to catalyze the market;
- Increase the program caps and expand the eligibility for existing state tax incentives;
- Update interconnection standards to reflect the latest best practices and updates to FERC rules, and ensure all utilities follow these standards; and
- Support all customer ownership models including third-party ownership for distributed generation.

Iowa's distributed generation market is currently quite small. These policies will help catalyze a distributed generation market in Iowa and allow the state to further diversify its energy generation, which will generate immediate benefits to Iowa's economy and the environment. Some parties may argue that high penetration of distributed generation may affect utility

[2] Iowa Code § 476.41

revenues, at least under current utility business models. To our knowledge, however, nobody has produced Iowa data to substantiate the scale or extent of these claims. It is likely that the distributed generation market in Iowa would need to experience significant and sustained growth before any impact on rates (positive or negative) would even be measurable. This provides the time needed for the distributed generation industry, utilities, and regulators to work together to grow the distributed generation market while at the same time looking for solutions to the larger business model challenges. We should take proactive steps now to develop the data and understanding necessary to evolve the regulatory framework for the future that includes:

- Conducting an independent valuation study to assess both the complete costs and benefits of distributed generation; and
- Investigating rate design options that (1) fairly compensate distributed generation customers for the services they provide, and (2) ensure that all utility customers provide reasonable cost-based compensation for the utility services they use.

These steps will prepare regulators, utilities, and the distributed generation industry to make informed decisions about the future without stifling important growth today.

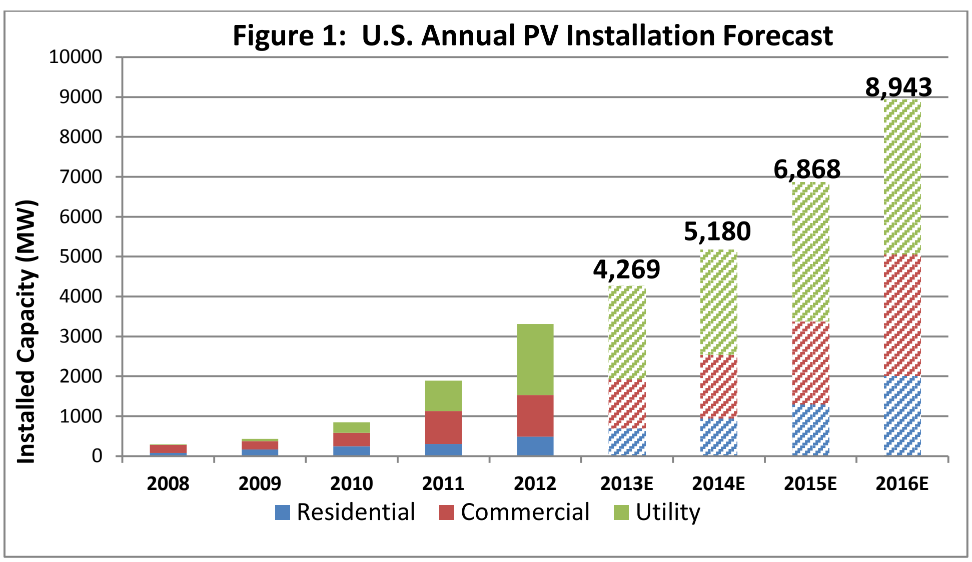
Iowa's distributed generation market is an untapped resource for the state. Every day, more Iowans want distributed generation for their homes and businesses. Distributed generation businesses stand ready to hire the workers and manufacture the systems to meet this demand. Iowa policymakers should help facilitate the development of distributed generation and resist efforts to create unnecessary barriers. This docket can and should positively and constructively engage utilities and the distributed generation industry to promote distributed generation while at the same time beginning a dialogue about the next generation of utility policies necessary for sustainable growth. If this docket can accomplish these essential tasks, the state will benefit from technological progress, clean energy jobs, and a cleaner environment.

II. DISTRIBUTED GENERATION HAS SIGNIFICANT POTENTIAL IN IOWA.

Iowa has significant potential for a variety of distributed generation technologies including solar photovoltaic (PV), combined heat and power, and wind. However, there has been little development of solar PV or CHP in Iowa compared to this potential or compared to progress in other states in the Midwest and nationally. Iowa has installed some distributed wind capacity, but again significant potential remains.

A. The U.S. and Iowa Solar Market.

From 2006 to 2013, U.S. solar PV installations have grown at a compound annual growth rate of 70%, with over 4 GW of capacity installed in 2013. States across the U.S. are recognizing the economic benefits of solar; eleven states[3] installed over 50 MW each in 2012, up from eight in 2011.[4] Figure 1 below shows the annual installations of PV in the U.S. from 2008 to 2012 and the estimated annual installations from 2013 to 2016.[5]



[3] These states include: Arizona, California, Hawaii, Maryland, Massachusetts, Nevada, New Jersey, New York, North Carolina, Pennsylvania, and Texas.

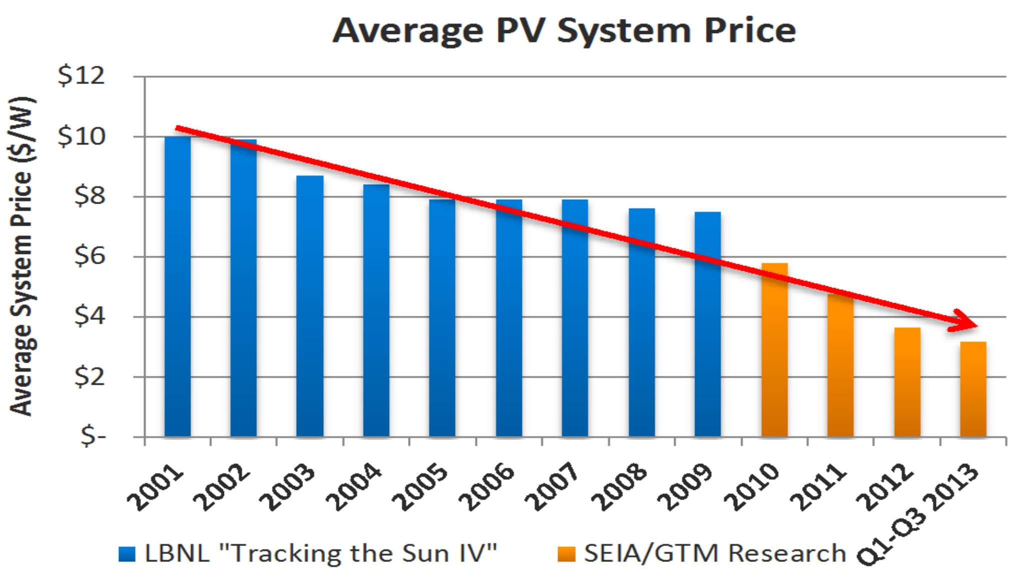
[4] Solar Market Insight Report, 2012 Year in Review. Greentech Media and SEIA

[5] Solar Market Insight Report, 2012 Year in Review. Greentech Media and SEIA. Webinar.

The U.S. solar industry is part of a rapidly growing global industry. The U.S. accounted for 11% of all global PV installations in 2012, with the global installed 2012 capacity just over 30 GW. Preliminary numbers indicate that approximately 28% of all new U.S. generation capacity installed in 2013 was from solar.

The solar industry has experienced dramatic cost declines, which are a key driver for this growth. Since 2008, weighted average installed costs across all segments have declined 61% – from $7.60/W to $3.00/W.[6] See Figure 2 for a chart depicting these cost declines in the U.S.

Figure 2



From Q3 2011 to Q3 2013, average residential installed solar prices ($/Wdc) fell 23% from $6.15 to $4.72, non-residential prices fell 19% from $4.90 to $3.96, and utility-scale prices fell 41% from $3.45 to $2.04.[7] System prices vary state to state and project to project; in addition to component costs, system price is a function of market maturity (more mature markets tend to attract larger, experienced project developers that can offer lower system prices), labor costs, soft

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[6] Solar Market Insight Report, Q3 2013. Greentech Media and SEIA.

[7] Solar Market Insight Report, Q3 2013. Greentech Media and SEIA.

costs (such as permitting, interconnection, financing, other fees), and system size (even within a market segment, larger projects tend to have lower per W installed cost). In general, larger, more mature markets enjoy lower installed costs. This discussion would benefit from better data collection on installed costs in Iowa. The Iowa Department of Revenue has cost information for installations that used the state tax credit and that information would be more useful if the Department collected total capacity of those projects as well. In addition, Interstate Power and Light Company (IPL) has information for projects that used the Efficiency First Renewable Program. Based on early information provided by IPL on the Efficiency First Renewable Program, the national downward trend of installed costs applies in Iowa, and there are a number of projects that were already installed by May 2013 at under $4.00 per watt.[8]

In contrast to the much larger cumulative installations seen nationwide, Iowa installed approximately 1.1 MW of solar PV capacity in 2012, for a total cumulative installed capacity of only approximately 1.2 MW.[9] Surrounding states, such as Illinois, Minnesota, Missouri, Michigan, and Wisconsin, have significantly larger solar markets than Iowa, although these markets are still small compared to the overall solar market. See Figure 3 below for a snapshot of installed solar capacity in Iowa and its neighbors.[10]

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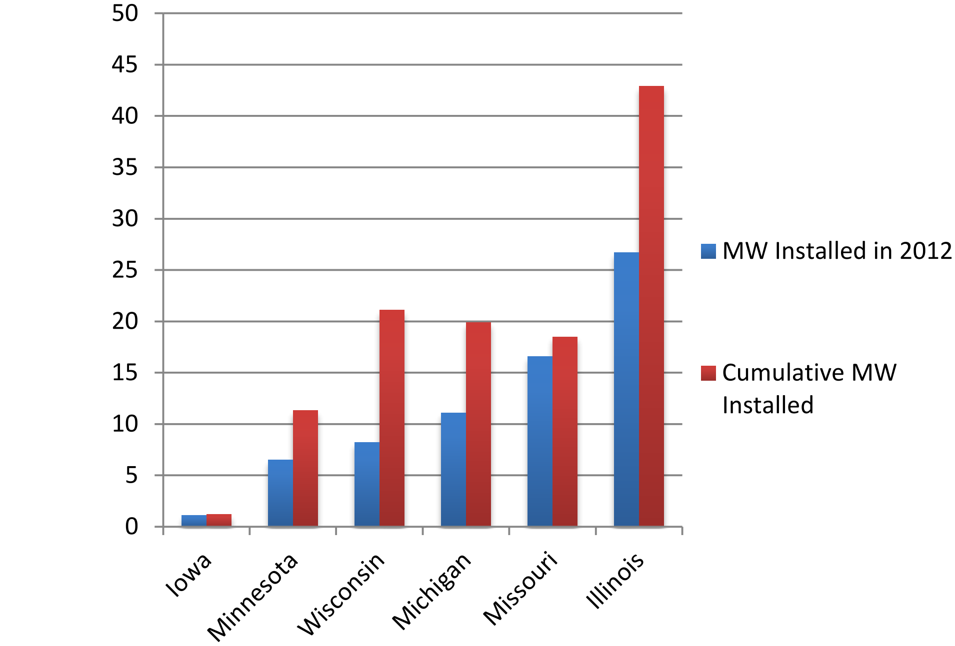
[8] Iowa Utilities Board, Docket No. EEP-2012-0001, Environmental Intervenors Brief at 32-33 (filed August 21, 2013) (citing Exhibit 210 for cost information).

[9] U.S. Solar Market Trends 2012. Interstate Renewable Energy Council, July 2013.

[10] Data from U.S. Solar Market Trends 2012. Interstate Renewable Energy Council, July 2013.

Figure 3
Comparison of solar market sizes, Iowa and surrounding states



Based on reported use of the Iowa solar tax credit[11] and anecdotal information reported by installers, installations in Iowa increased in 2013 compared to 2012 and may have brought Iowa's cumulative installed capacity closer to 5 MW by the end of 2013. This is good news. But Iowa's market remains comparatively small, especially compared to the policy-driven growth that is expected to occur in other Midwestern states. For example, Minnesota adopted comprehensive solar legislation in 2013 that enacted a 1.5 percent solar standard[12] for the state's investor-owned utilities that will create a projected 450 MW of capacity installed by 2020 as well as "community solar gardens" that will allow Minnesota residents to participate even if their own rooftops are unsuitable for solar. The Illinois' RPS and "solar carve-out" will require approximately 600 MW of solar by the end of 2015.

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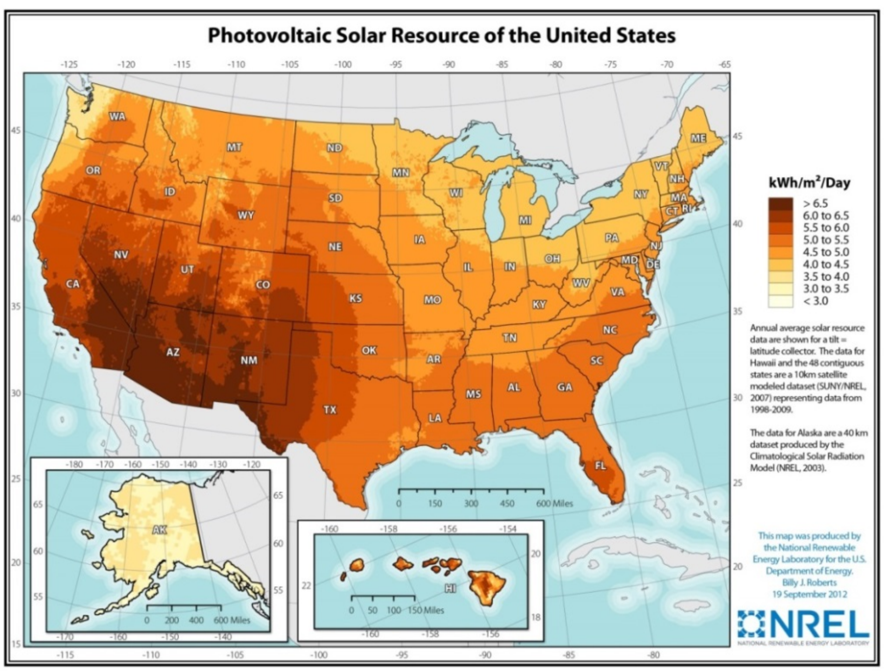
[11] Iowa Department of Revenue, Solar Energy System Tax Credits *at* http://www.iowa.gov/tax/business/solarcredits.html.

[12] Minnesota Statutes § 216B.1691(2f).

There's plenty of sun for a strong solar market in Iowa. In fact, the solar resource within Iowa is comparable to – or greater than – other states that have significant solar markets, such as New York, Pennsylvania, Massachusetts, and New Jersey. (See Figure 4 below.)

The National Renewable Energy Laboratory (NREL) estimated the technical potential for solar PV in Iowa in 2012.[13] According to this analysis, the total technical potential for solar PV in Iowa is 4,043 GW or 7,029,897 GWh. Of this, most is identified as urban or rural utility-scale PV while rooftop PV accounts for 7 GW or 8,646 GWh.[14] We have attached as Appendix A a recent publication from the Iowa Environmental Council that describes in more detail Iowa's potential for solar PV and the ways in which solar PV fits into Iowa's existing energy mix.[15]

Figure 4: PV Solar Resource in the US



[13] NREL, *Renewable Electricity Futures Study* (2012) and *U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis* (2012).

[14] The NREL study defined utility-scale PV as projects of 1 MW or greater. Many of these utility scale projects could still be considered distributed generation.

[15] Also available here: http://www.iaenvironment.org/solar.

B. Combined Heat and Power Potential in Iowa.

Combined heat and power (CHP) is a type of distributed generation technology that provides both electricity and thermal energy at an efficiency of 65% to 75% versus the combined efficiency of the conventional method of using electricity produced at central station power plants and burning fuel at furnaces or boilers on-site, which is approximately 45% efficient. In topping cycle CHP, fuel is used to generate electricity, and thermal energy that would otherwise be lost is recovered to provide process or space heating, cooling, and/or dehumidification. In bottoming cycle CHP, or waste heat to power, heat that is generated as part of the industrial process and is normally vented to the atmosphere is recovered to produce electricity or thermal energy.

The Energy Resources Center worked with ICF International recently to analyze the technical potential for CHP in MidAmerican and IPL's service territories. There is approximately 1,430 MW of technical potential in these service territories, of which roughly 772 MW are in the industrial sector and 658 MW are in the commercial sector.[16] Incorporating load factors specific to each SIC code and facility type, this translates into 8,846,004 MWh of energy technical potential, of which 5,639,133 MWh comes from the industrial sector and 3,206,869 MWh from the commercial sector.[17] This potential analysis only focused on the MidAmerican and IPL service territories, but is consistent with a 2010 analysis that identified 937 MW of

[16] Iowa Utilities Board, Docket No. EEP-2012-0001, Graeme Miller Direct Testimony at 9; Iowa Utilities Board Docket No. EEP-2012-0002, Graeme Miller Direct Testimony at 9.

[17] *Id.*

industrial potential and 738 MW of commercial potential statewide.[18] Notably, nearly all of the commercial sector potential consists of 50-1,000 kW and 1 to 5 MW CHP technologies.

Despite this significant potential, little CHP has been built in Iowa in recent years. Of the 35 CHP units listed for Iowa in the CHP database maintained by the Department of Energy and ICF International, the most recent was built in 2010 and only six have been built in the past decade (2004 to 2014).[19] These six account for about 27 MW of the 630 MW of CHP in Iowa.[20]

This docket provides another avenue to advance the CHP efforts of the Iowa NGA Policy Academy Action Plan submitted to the Governor and Lt. Governor on June 25, 2013.[21] The plan recommended that the Iowa Utilities Board continue to address CHP through dockets in front of the Board while the Iowa Economic Development Authority works to educate businesses interested in CHP and explore financial options including tax credits, grants, and low interest loans to help facilitate future projects. This docket can build on stakeholder interest to value the benefits of CHP and identify policy and regulatory changes that could remove barriers to CHP.

C. Distributed Wind Potential in Iowa.

Iowa has a substantial wind resource and a wind energy technical potential estimated at 571 GW or 1,723,588 GWh.[22] This potential was calculated by using assumptions for utility-scale wind turbines. More analysis is needed to better understand Iowa's potential for distributed

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[18] ICF International, *Effect of a 30 Percent Investment Tax Credit on the Economic Market Potential for Combined Heat & Power* (2010).

[19] Combined Heat and Power Units Located in Iowa *available at* http://www.eea-inc.com/chpdata/States/IA.html.

[20] *Id.*

[21] Iowa NGA Policy Academy (Iowa CHP Team), *Action Plan on Enhancing Industry through Combined Heat and Power in Iowa* (June 25, 2013).

[22] NREL, *Renewable Electricity Futures Study* (2012) and *U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis* (2012).

wind, since utility-scale and smaller scale wind turbines are both used in distributed wind applications. According to recent analysis from the Department of Energy, Iowa is a top U.S. state for distributed wind installations with 37 MW installed in 2012 and a cumulative capacity of almost 120 MW.[23] Notably, nearly all of Iowa's 2012 capacity consisted of utility-scale turbines (greater than 1 MW). While Iowa is identified as a leading state, the 120 MW of distributed wind is a fraction of Iowa's total installed wind capacity of over 5,000 MW or Iowa's technical potential of 571,000 MW.

III. DISTRIBUTED GENERATION PROVIDES SIGNIFICANT BENEFITS.

One of the most important parts of the discussion about distributed generation is the accounting for the costs and benefits of distributed generation. Too often, this discussion is simplified to the energy bill of the customer that wants distributed generation and the cost recovery of that customer's utility. This oversimplification fails to provide a complete picture of the costs and benefits of distributed generation. This docket provides an important opportunity to consider the full range of benefits that distributed generation can provide, as well as the actual costs of continuing to provide service to distributed generation customers.

Customer-sited distributed generation, and solar distributed generation in particular,[24] offers many benefits to the electric utility system, and by extension to non-distributed generation customers. There is a significant and growing body of studies on the costs and benefits of distributed solar generation. Many of these studies have been completed in the last several years.

[23] Department of Energy, *2012 Market Report on Wind Technologies in Distributed Applications* (2013).

[24] While many of the benefits of distributed generation reach across technologies, we acknowledge that there are differences in the benefits by technology. For purposes of this comments section, we focus on the benefits of distributed solar generation because the most work has been done in this area and the interest level in distributed solar technology is more significant than the other technologies.

As the results of some of the most prominent distributed generation valuation studies clearly demonstrate, the benefits of distributed solar generation are real and can be quantified. RW Beck's 2009 study for Arizona Public Service,[25] Austin Energy's solar value studies,[26] and Crossborder Energy's 2013 and 2014 studies of net metering in Arizona and Colorado[27] offer a few examples. In addition, the Rocky Mountain Institute (RMI) recently completed a meta-analysis of this body of work in order to assess the common features and most significant differences among such studies.[28] For its meta-analysis, RMI developed a list of the benefits of solar distributed generation typically analyzed in these studies including, but not limited to: reduction in utility energy and capacity generation requirements, particularly during high-load and peak periods; reduction in system losses; avoidance or deferral of distribution and transmission investments; localized grid support, including enhanced reliability benefits; fuel-price certainty; and reduction in air emissions and water use. Table 1 below provides a high level summary of the categories of benefits according to RMI.

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[25] RW Beck, *Distributed Renewable Energy Operating Impacts and Valuation Study* (January 2009) *available at* http://files.meetup.com/1073632/RW-Beck-Report.pdf.

[26] Clean Power Research has conducted extensive research for Austin Energy on the value of solar. In 2006, Clean Power Research conducted a study on *The Value of Distributed Photovoltaics to Austin Energy and the City of Austin*, available at http://www.cleanpower.com/wp-content/uploads/034_PV_ValueReportAustinEnergy.pdf. Austin Energy and Clean Power Research wrote a paper on *Designing Austin Energy's Solar Tariff Using A Distributed PV Value Calculator*, available at http://www.cleanpower.com/wp-content/uploads/090_DesigningAustinEnergysSolarTariff.pdf. Most recently, Clean Power Research released a presentation on *2014 Value of Solar at Austin Energy*, available at http://www.austintexas.gov/edims/document.cfm?id=199131.

[27] Crossborder Energy, *The Benefits and Costs of Solar Distributed Generation for Arizona Public Service* (May 2013) *available at* http://www.seia.org/sites/default/files/resources/AZ-Distributed-Generation.pdf; and Crossborder Energy, *Benefits and Costs of Solar Distributed Generation for the Public Service Company of Colorado* (December 2013) *available at* http://www.oursolarrights.org/files/5513/8662/3174/Crossborder_Study_of_the_Benefits_of_Distributed_Solar_Generation_for_PSCo.pdf.

[28] Rocky Mountain Institute, *A Review of Solar PV Benefit and Cost Studies* (July 2013), *available at* http://www.rmi.org/Knowledge-Center/Library/2013-13_eLabDERCostValue.

Table 1: *Summary of Benefits of DG that Should be Evaluated*

Benefits to Utility Ratepayers
Energy: • Avoided energy purchases (including fuel purchases) • Avoided transmission and distribution line losses
Capacity: • Avoided capacity purchases • Avoided transmission and distribution capacity investments, and operations and maintenance avoided costs
Grid Support Services: • Ancillary services, including reactive support and voltage control • Energy and generator imbalance • Synchronized and supplemental operating reserves • Scheduling, forecasting and system control and dispatch
Financial Risk: • Fuel price hedge • Avoided RPS generation purchases • Market price impacts (i.e. reduced market prices)
Security Risk: • Reliability benefits (e.g. electricity grid resiliency)
Environmental Risk: • Avoided costs of current or future NO_x, SO_x, PM, & CO_2 regulatory costs • Reduced water usage in power production • Avoided land cost of avoided transmission or generating infrastructure
Societal Benefits: • Economic development impacts, including, impact on local and state tax revenues • Job creation • Avoided health impacts

We have engaged Karl Rábago to provide additional context related to the benefits of distributed generation. Mr. Rábago brings a wide variety of energy industry experience to this docket having served over the past 20 years as a Commissioner on the Texas Public Utility Commission, Deputy Assistant Secretary with the U.S. Department of Energy, Vice President of Austin Energy, and as Regulatory Affairs Director at AES Corporation, among other positions. Rábago is considered to be one of the nation's preeminent experts on solar valuation studies and "value of solar" tariff design. His expert report is attached to our comments as Appendix B. We highlight in a bit more depth some of the key benefits of distributed generation mentioned in the Mr. Rábago's comments and the RMI report.

A. Distributed Generation Provides Energy, Capacity and Grid Service Benefits.

Distributed solar generation provides an energy value by displacing the need to produce energy from another source.[29] These energy benefits include the costs that would have been incurred to produce energy from another source including the fuel price, variable operation and maintenance costs and heat rate. Solar is a particularly effective resource during peak periods and will help reduce the need for some of the dirtiest, most expensive energy we use. Another component of the energy savings are reductions in line losses, which are worse when the grid is heavily loaded, that make our energy system more efficient. When distributed renewable systems put energy back on the grid that energy is frequently used nearby, even as close as across the street, saving energy losses that occur when electricity is transported along the transmission and distribution lines and further reducing load on the distributed edges of the grid system.

Distributed solar generation provides a capacity value that comes from deferring or avoiding the need for more investment in generation, transmission, and distribution assets.[30] Distributed solar generation helps meet demand locally. This can defer or avoid the need to build additional central station generation. The local power production can also relieve capacity constraints on the system and defer or avoid the need for transmission and distribution upgrades.

Distributed generation also provides a grid service benefit that comes from lowering the cost of support service to balance supply and demand.[31] The grid services that can be reduced by

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[29] *Id.* at 14.

[30] *Id.*

[31] *Id.* at 15.

distributed generation include reactive supply and voltage control, frequency regulation, energy imbalance, operating reserves and scheduling/forecasting.

B. Distributed Generation Enhances Energy Security Through Grid Reliability and Financial Benefits.

Distributed generation helps ensure grid reliability and resiliency adding to the security of the grid.[32] Distributed generation contributes to the security of the grid by reducing congestion along the transmission and distribution network, ensuring adequate supply when external forces threaten the flow of energy from distant central station power plants by increasing diversity of the generation portfolio with smaller generators that are geographically dispersed, and providing back-up power sources available during outages by using control technologies and storage. These benefits are highlighted by the fact that the U.S. military is increasingly deploying distributed generation to enhance the security and reliability of distribution grids and the resiliency demonstrated by microgrids and distributed generation during Hurricane Sandy.

Distributed generation provides a range of financial benefits. Customer-generators assume financing, insurance and operational risk for their distributed renewable energy generation systems, reducing the burden on utility capital and risk structures.[33] Distributed generation value analysis reveals that these resources often offer value far in excess of their cumulative costs. As a result, they create downward pressure on electric rates over the long term, and offer a superior economic value over resources that may offer lower upfront costs but higher operating, fuel, financial, operational, and environmental costs. In addition, distributed renewable energy generation offers an opportunity to install physical and financial hedges

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[32] *Id*. at 16.

[33] Rábago comments, Appendix B at 4-5.

against a whole range of risks associated with regulation, financing, operations, and cyclic economic conditions.

Finally, distributed generation resources, being modular in nature and with short development times, reduce development risk and offer an opportunity to diversify these risks for the utility and the broader electric generating sector in Iowa. Large central station generation facilities often do not expose their lack of financial viability until many years and millions of dollars have been spent on development—a phenomena frequently observed with nuclear and coal plant construction. In the marginal cost environment that characterizes energy development, development costs are truly sunk and generally unrecoverable if the project ends before commercial operation begins. With short procurement and development times, diverse funding sources, and granular development patterns, distributed generation imposes much less risk of sunk and unrecoverable development costs.

C. Distributed Generation is a Growing Sector of the Economy Providing Significant Job Creation and Economic Development Benefits.

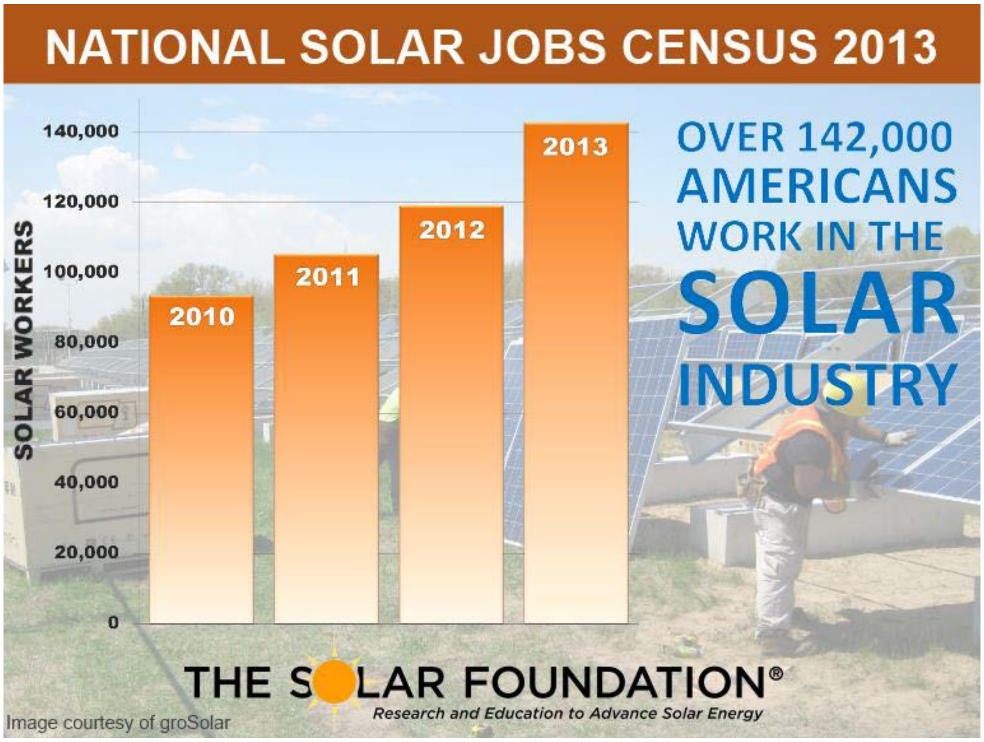
It is important for the Board to consider that in addition to the benefits that can be evaluated within a ratepayer impact test, distributed generation, in particular solar, offers tremendous societal benefits that can readily be quantified. The economic development value of distributed solar should be considered, which includes the creation of jobs, increases to Gross State Product (GSP) and to Real Disposable Personal Income (RDPI) of a state, and increases to state and local tax revenues.

The U.S. solar industry continues to remain a bright spot on the nation's employment landscape, providing opportunities for more than 142,000 workers at 18,000 locations in all 50 states and creating jobs at a rate ten times higher than employment growth in the overall economy.[34] Last year, employment in the U.S. solar industry grew by approximately 20%. Figure 5 illustrates U.S. solar job growth since 2010. Seventy-seven percent of the nearly 24,000 additional solar workers are in newly-created positions, rather than existing jobs that have added solar responsibilities.

Many employers remain optimistic about continued employment growth. Over the twelve months following the *Census 2013* survey period, 44.5% of solar firms expect to add solar workers, while fewer than 2% expect to cut workers. With the expected addition of over 22,200 new solar workers over the next year, employment in the solar industry is expected to grow by 15.6% during a period in which employment in the overall economy is expected to grow by only 1.4%. The majority of these new opportunities are expected in the installation sector (projected to grow by 21.1%), in "other" jobs that provide ancillary support to the solar industry (16.1%), and in solar sales and distribution (14.2%). Though domestic solar manufacturing has struggled in recent years, *Census 2013* estimates that employment in this sector will increase by 8.6% by November 2014.

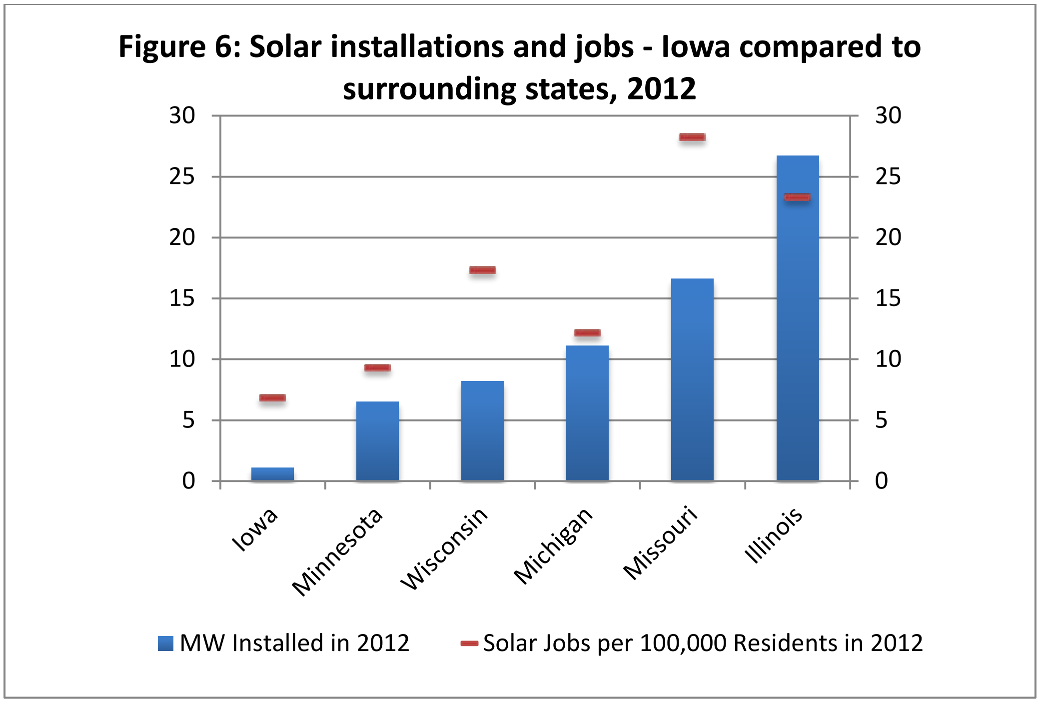
[34] Data in this section is from The Solar Foundation, *National Solar Jobs Census 2013: The Annual Review of the U.S. Solar Workforce* (January 2014) (hereafter '*Census 2013*').

Figure 5: U.S. Solar Jobs 2010-2013.



According to The Solar Foundations' State Solar Jobs Map, Iowa's solar industry employed 680 people in 2013, up significantly from 210 in 2012.[35] This is still substantially lower than solar employment in surrounding states such as Wisconsin, Missouri and Illinois. This disparity makes sense when viewed against the size of the solar markets in these states. Figure 6 below shows the number of MWs installed in Iowa and surrounding states in 2012, along with the number of solar jobs in that state per 100,000 residents.

[35] The Solar Foundation, *State Solar Jobs 2013* (Feb. 2014) *available at* http://thesolarfoundation.org/solarstates#ia.



Like neighboring states, Iowa can reap the economic benefit of solar development. For example, adding 300 MW of solar PV in Iowa over a five-year period would create an annual average of 2,500 jobs a year with a peak of 5,000 jobs in the year with the most activity.[36]

D. Distributed Generation Provides Environmental and Health Benefits by Helping Keep Our Air and Water Clean and Mitigating Future Regulatory Compliance.

The environmental value of distributed generation is significant, encompassing improvements in air and water quality and the reduction in future costs of mitigating environmental impacts of coal, natural gas, nuclear, and other fossil fuel resources. Generators must abide by the U.S. Environmental Protection Agency's standards for emissions (both carbon and criteria air pollutants), which represent a real cost to ratepayers. Environmental regulatory risk and siting risk is substantially reduced through increased use of clean, pollution-free distributed renewable generation. In addition, there is a real cost to ratepayers associated with water and land usage by thermal-based electricity generating facilities. Furthermore, the public

[36] Iowa Policy Project et al., *Shining Bright: Growing Solar Jobs in Iowa* (March 2011).

health benefits associated with reductions in asthma, and other respiratory health issues associated with poor air quality, could also be valued when assessing the true and full impact of adding more distributed generation to the grid. For example, a recent ELPC study found that two Chicago-area coal plants caused approximately $750 million to $1 billion in public health related damages since 2002.[37] All of these reduced environmental impacts should be included in the evaluation of benefits associated with distributed generation.

E. Iowa's Distributed Generation Market is Currently Too Small to Have a Significant Impact on Utility Revenues or Utility Cost Savings.

It is important to understand the issue of lost utility revenue and utility cost savings in the current context of Iowa's distributed generation market in order to appropriately react to the issue and not create other problems with an overreaction. Distributed generation in Iowa is currently a small market. Distributed solar generation represents about 5 MW in a system that is approaching 15,000 MW of generation. As Karl Rábago points out in his comments:

> The amount of revenue or earning impact to all the utilities in Iowa would be almost immeasurably small. Larger revenue and earning impacts are associated with the weather, the general state of the economy, changes in inflation, natural energy efficiency investments, and improvements in electricity-using technology.[38]

Distributed solar generation would have to grow exponentially for several years running before it would have a significant impact on utility sales or utility cost savings. The utilities have raised the issue of lost revenues as a potential challenge to integrating distributed generation in other dockets and likely will do so in this docket. The issue has been raised without any data and without looking at utility costs saved by distributed generation. It is an issue that is worth

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[37] ELPC, *Midwest Generation's "Unpaid Health Bills": The Hidden Public Costs of Soot and Smog from the Fisk and Crawford Coal Plants in Chicago* (October 2010) available at http://elpc.org/wp-content/uploads/2010/10/MidwestGenerationsUnpaidHealthBillsFormattedFinal.pdf.

[38] Rábago Comments, Appendix B at 6.

understanding in order to prepare for the future, but to do so requires accurately quantifying the potential impact of distributed generation including the costs saved by customer self-generation and contemplating a full range of options to address the issue. There are a number of solutions available as outlined in Mr. Rábago's Comments (Appendix B, pages 7-8).

F. Impacts of Distributed Generation on Non-participating Customers in Iowa are Currently Unknown and Should Not Be Assumed without Objective Data and Analysis.

In the order initiating this docket, the Board referenced the potential impact of distributed generation to non-participating ratepayers or customers. The Board also referenced non-participating customers and the potential need to protect those customers from "undue cost-shifting" in recent orders approving MidAmerican and IPL's energy efficiency plans.[39] Both the costs and benefits of distributed generation must be identified, evaluated objectively, and evaluated with real data in order to identify whether and how customers with distributed generation are impacting non-participating customers. As Mr. Rábago discusses in his comments:

> A number of studies of the benefits and costs of solar energy reveal value—long term avoided costs—that exceed their cost in lost revenues. Therefore, it is possible that short-term lost revenues will eventually be completely offset by long-term cost savings … [and] that customer-generators are subsidizing the utility and other customers on the grid.[40]

Rather than presuppose an adverse impact – or any type of impact – we recommend below that the Board initiate an independent distributed generation valuation study.

[39] Iowa Utilities Board, Docket No. EEP-2012-0001, Final Order at 36 (2013).

[40] Rábago Comments, Appendix B at 9.

IV. POLICY RECOMMENDATIONS

Iowa's distributed generation future is at a crossroads. If Iowa falls behind on distributed generation, we will lose out on the diverse array of benefits provided by distributed generation, from job creation and economic investment to enhanced security and reliability of the grid to cleaner air and water. As a state, we can and should proactively take steps to catalyze the distributed generation market and realize those benefits; if on the other hand, we do nothing or we erect unnecessary barriers that stand in the way of innovation and technological progress, we will cede the benefits of distributed generation to other states. Neighboring states are already taking aggressive action to develop distributed generation within their borders. If Iowa does not take action soon that scenario is likely to play out as the industry will locate elsewhere. It will make it difficult for Iowa to develop a distributed generation industry as resources and investment flow to states with supportive policy. The lag may become structural and permanent much like Nebraska's lack of action caused that wind rich state to lag behind, and struggle to catch up with, states like Iowa that aggressively pushed policy to develop wind generation. [41] Therefore, Iowa should immediately take actions to catalyze the distributed generation market, while taking steps to properly value distributed generation and explore ways to integrate that valuation into rate design.

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[41] *Compare* AWEA, State Wind Energy Statistics: Nebraska (2013) available at http://awea.rd.net/Resources/state.aspx?ItemNumber=5210 (noting Nebraska has the 4th best wind resource by MW, but is only 23rd for total MW installed with 459 MW and has less than a billion in invetestment) *to* AWEA, State Wind Energy Statistics: Iowa (2013) available at http://awea.rd.net/Resources/state.aspx?ItemNumber=5224 (noting Iowa has the 7th best wind resource and ranks 3rd with 5,133 MW installed and almost $10 billion in investment).

A. Catalyze the Market for Distributed Generation Through Supportive Policy.

The Board should make distributed generation a priority. The first step in prioritizing distributed generation in Iowa is to take steps to catalyze the market. While Iowa's distributed generation market has experienced significant growth in the past year compared to its starting point, Iowa's distributed generation market is still currently very small. If distributed generation is going to be a significant resource in Iowa's future, steps need to be taken to develop the market. Therefore, the Board's first focus should be consideration of policies that catalyze the market and remove market barriers to the development of a distributed generation market.

1. Preserve, Expand, and Standardize Iowa's Existing Net Metering Policy to Cover All Utilities Including Consumer-Owned Utilities.

Net metering is one of the most effective policies for supporting distributed generation, in particular distributed solar generation, and is currently enabling customer-sited generation in 43 states and the District of Columbia. The simplicity and intuitive nature of net metering has been pivotal in reducing barriers to consumer uptake of energy technologies such as solar. Indeed, net metering is arguably one of the most successful market transformation policies for the renewable energy economy.

Iowa currently has net metering for investor owned utilities, and it is one of the policies that is helping spur distributed generation growth in Iowa. We recommend that Iowa preserve, expand and standardize existing net metering policy to include all utilities, including consumer-owned utilities. Preserving the existing net metering policy will prevent Iowa from sliding backward in the development of distributed generation, and from expanding and standardizing the net metering policy to include consumer-owned utilities will remove a barrier for distributed generation in some parts of the state.

2. Encourage the Legislature to Pass a Strong Solar Standard with a Distributed Generation Carve-out.

Iowa should create a solar standard with a distributed generation carve out. Iowa has a strong wind industry in part because the state passed an early Renewable Energy Standard (RES). While Iowa's RES has long been exceeded and is not responsible for recent developments such as MidAmerican's 1050 MW investment in 2013, it catalyzed the wind industry in the state and sparked innovation and development. Neighboring states have recently passed solar standards to catalyze their solar markets. In 2013, Minnesota enacted a 1.5 percent solar standard[42] for the state's investor-owned utilities that will create a projected 450 MW of capacity installed by 2020. Illinois enacted a solar standard that requires 6 percent of the state's 25 percent renewable energy standard come from solar with 1 percent of the standard coming from distributed generation.[43] A solar standard in Iowa would spur solar and distributed generation development in much the same way that the early RES propelled wind growth. Iowa utilities would have an incentive to innovate related to solar generation and develop approaches that make sense for their service territory to meet the target. Businesses looking to invest in solar and distributed generation services would have some assurance that there would be a market and a return on that investment in Iowa. This approach would create a model that utilities could use beyond the initial investment in solar to meet the standard, and it would spur investment and development in businesses that would serve future development as well.

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[42] Minnesota Statutes § 216B.1691(2f).

[43] 20 ILCS § 3855/1-56.

3. Encourage the Legislature to Increase the Program Caps and Expand Eligibility for Existing State Tax Incentives.

Iowa currently offers several important and successful tax incentives for different renewable energy and distributed generation technologies, which help offset the upfront cost of distributed generation and can increase the ability to secure financing. Iowa's 476B program provides a production tax incentive for wind, while the 476C program provides a production tax incentive for wind, solar, and certain types of combined heat and power projects. Iowa also offers an upfront tax incentive for solar energy (PV and solar thermal) equivalent to 15% of the total cost of the system, with caps on the incentive of $3,000 for residential taxpayers and $15,000 for business taxpayers.

Each of these programs has an overall program cap, either in the amount of generating capacity that is eligible (476B, 476C) or the total dollars allocated to the incentives each year (upfront solar), and each program is near to or has exceeded the caps and has a waiting list. As a result, Iowans interested in investing in wind, solar, and CHP may be unable to access the incentives. Given the success and continued interest in these programs, we recommend significantly increasing the caps so that Iowans who invest in renewable energy can access tax incentives. Other improvements in these programs may be valuable as well, such as making them available for non-taxed entities (schools, churches, etc.). We recognize that many aspects of tax incentive programs, such as the caps, would require action by the Iowa legislature to change. The Board has an important role to play as the agency that implements and maintains information on the 476B and 476C incentive programs, and we hope the information collected in this docket can help support the expansion and improvement of tax incentives for renewable energy and distributed generation in Iowa.

4. Update Interconnection Standards to Reflect the Latest Best Practices and Current FERC Rules.

The Board adopted new interconnection rules in 2010 after conducting a multi-year rulemaking process prompted by the requirement in the Energy Policy Act of 2005 to consider adopting updated standards based on best practices. FERC adopted a best practice rule in 2005, known as the Small Generator Interconnection Procedures (SGIP), which provided for a tiered review process with several fast track review levels and a set of interconnection screens for those review levels.[44] The Board's rules are based largely on the FERC SGIP as the Board used Illinois rules, based on the FERC SGIP, as the starting point for its final rulemaking. After adopting new rules in 2010, Iowa's grade in *Freeing the Grid* improved from an "F" to a "B."[45]

Since 2010, best practices for interconnection standards have evolved, with particular attention to more efficiently accommodating higher levels of distributed generation. FERC updated the SGIP in November 2013 to reflect current best practices with several notable improvements.[46] First, the rules provide greater flexibility in the fast track size limit by allowing for consideration of different factors regarding the generator (such as type and location). Second, the rules provide supplemental interconnection screens to help improve the evaluation of a project's safety, reliability, and power quality. One important supplemental screen is the 100 percent of minimum load screen, which can supplement the 15 percent of peak load screen in the Iowa rules. The 15% of peak load screen has become an issue in some locations in Iowa, raising

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[44] Order No. 2006, *Standardization of Small Generator Interconnection Agreements and Procedures*, 18 CFR Part 35 (2005).

[45] http://freeingthegrid.org/#state-grades/iowa

[46] Order No. 792, *Small Generator Interconnection Agreements and Procedures*, 145 F.E.R.C. ¶ 61,159 (2013). See also http://www.irecusa.org/2013/12/improved-interconnection-procedures-coming-soon-to-a-state-near-you.

the need to evaluate alternatives. The Interstate Renewable Energy Council, Inc. (IREC) has compiled these and other best practices in its Model Interconnection Procedures.[47]

Several states, including Midwestern states, have adopted new interconnection rules based largely on the new FERC SGIP, such as Ohio,[48] or are in the process of doing so, such as Illinois.[49] Since Iowa's current rules are based on the now outdated FERC SGIP, Iowa should initiate a rulemaking to update its interconnection rules to reflect the best practices found in the new FERC SGIP and IREC's model procedures.

5. Support Third-Party Ownership as an Additional Financing Mechanism for Distributed Generation Projects.

Financing distributed generation projects can be a major barrier to building projects. Iowans who want to install a distributed generation system on their property have several options available to them now. The customer can pay for the distributed generation system themselves; they could get a loan to finance the system; and they could lease the system from a third party. A fourth financing option, third-party power purchase agreements (PPAs) is currently the subject of litigation pending a decision from the Iowa Supreme Court. Regardless of the financing mechanism used to pay for the system, the distributed generation system built would be exactly the same.

Third-party PPAs are common financing tools that are helping make renewable energy more affordable for cities, school districts, homes and businesses across the nation. The up-front cost of solar panels and wind turbines is a major barrier for many homeowners, businesses, and

[47] http://www.irecusa.org/wp-content/uploads/2013-IREC-Interconnection-Model-Procedures.pdf.

[48] http://www.irecusa.org/2013/12/ohio-joins-top-states-improving-interconnection-procedures-for-renewables.

[49] *See* Illinois Commerce Commission rulemaking docket, 14-0135.

municipalities. Under PPA financing, a third-party with greater access to capital makes the up-front cash outlay and the customer can compensate the third-party developer over time by paying for the energy that the renewable energy system produces.

PPAs make many renewable energy projects economically viable that otherwise would not be. Third-party financing is booming in many states across the nation. Over 70% of homeowners installing solar panels in several leading markets use third-party financing to eliminate the up-front cost of their investment. Commercial retailers like Kohl's, Wal-Mart, Staples, and Home Depot use PPAs to control their energy costs and reduce their environmental footprint. PPAs are particularly important for municipalities and other tax-exempt entities such as school districts, colleges, and other non-profit institutions because the financing allows them to take advantage of federal renewable energy tax credits and depreciation that would otherwise not be available to them.

Third-party PPAs are an important financing mechanism for distributed generation. It is our hope that the Supreme Court resolves this issue and makes clear that PPAs are legal under Iowa law. If the Court does not do this, many of the policy concerns raised during the procedural history of the PPA case can and should be addressed through this docket. This should allow policymakers to clarify the legality of PPAs in order to give consumers a choice as to how they finance distributed generation projects. Giving consumers this additional choice will help develop the distributed generation market in Iowa.

B. Properly Value Distributed Generation and Integrate that Valuation into Rate Design.

The key challenge related to distributed generation is for policy makers and stakeholders to prepare for a future with high penetration of distributed generation. Iowa has time to prepare for how it will integrate distributed generation into its electrical grid and utility framework, because Iowa's distributed generation market is relatively small and any major impact from distributed generation is still years away. While we take the urgently needed actions to catalyze the market and reduce market barriers, we can simultaneously take steps to make sure the state is well prepared to address the policy questions about the future benefits of distributed generation and costs of a mature distributed generation market.

1. Prepare for the Future by Conducting an Independent Distributed Generation Valuation Study.

It is absolutely crucial to accurately understand the costs and benefits of distributed generation. In order to develop this understanding, Iowa should conduct an independent valuation study to fully assess the costs and benefits of distributed generation, including the benefits to all ratepayers and society as a whole. The information from a comprehensive study can then be used to inform investigations into new rate designs that both allow utilities to recover their costs and compensate distributed generation customers for the value that they create.

We recognize and appreciate the need to assess the true and realized costs and benefits of DG. We recognize that high penetration rates of distributed generation may affect utility revenues under current utility business models. We should have an accurate understanding of the costs for service to distributed generation customers based on real data from the utilities. On the other side of the equation, however, the benefits of distributed generation are real, although not always quantified or given appropriate consideration in cost and benefit studies. The 2013 review of solar PV cost and benefit studies by RMI is a good resource for the Board.[50] Some of the studies in the review by RMI showed a blatant disregard for the benefits of distributed solar

[50] Rocky Mountain Institute, *A Review of Solar PV Benefit and Cost Studies, 2nd Edition* (September 2013) available at http://www.rmi.org/elab_empower.

generation. We recommend that the Board give appropriate weight to the benefits of distributed solar generation in addition to the costs of distributed solar generation.

Given our collective experience in a variety of forums convened in multiple states to assess the costs and benefits distributed generation, we strongly recommend the following process:

- *IUB and Stakeholder Oversight*: We strongly believe that the Board should convene a stakeholder forum. While we understand the resource constraints at the Board, we believe that the Board has appropriate authority to require that this study be ratepayer funded, and overseen by the Board in conjunction with stakeholders.

- *Independent Consultant*: The Board should choose a third-party consultant to undertake the study. Consultants that could be considered include Crossborder Energy, Clean Power Research, and Black & Veatch, all of which have experience with this type of evaluation effort.

- *Access to Data*: Regardless of the consultant, data from the investor-owned utilities, including system load profile data and statistically significant representative samples of hourly load profiles, must be made available to stakeholders. Data on distribution substations that serve a representative sample of residential, commercial, and industrial customers is especially critical in this regard. Access to this data is fundamental for a successful process and respected outcome.

- *Meaningful Stakeholder Engagement*: We recommend that the Board include the breadth of applicable stakeholders in the evaluation process. Limiting the participants in the evaluation will minimize the transparency and robustness of the study and, as a result, the value and acceptance of the study.

- *Scope and Methodology*: With the guidance of the Board, the stakeholder group should determine the scope and methodology of the study. Important initial considerations include the analysis period, i.e. the length of time that costs and benefits are to be reviewed, and the appropriate discount rates to use in order to properly express costs and benefits in current day terms.

As the Board considers a study, we recommend that the Board turn to IREC's publication *A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation*, as a roadmap.[51] *A Regulator's Guidebook*, coauthored by Mr. Rábago and cited in his comments, is an excellent resource that walks the user through each stage of a cost-benefit study, proposing appropriate methodologies, and answering common questions. IREC is a well-respected organization that provides regulators with unbiased information, and we believe that the Regulator's Guidebook will prove to be a valuable resource for the Board and Iowa stakeholders.

Once a complete and inclusive cost and benefits study is finalized, the Board will have a much better understanding of the rate ramifications of distributed generation on both participating and non-participating ratepayers.

2. Investigate Rate Design Options that Fairly Compensate Distributed Generation Customers for the Benefits They Provide and Ensure that All Customers Provide Reasonable Cost-Based Compensation for the Utility Services They Use.

Rate design is an important tool for addressing the challenges of properly balancing the benefits and costs of customer-owned distributed generation. The foundation of any investigation into rate design options is an independent valuation analysis that uses data to determine the costs and benefits of distributed generation in Iowa. This foundation will help make it possible to assess what is needed for utilities to recover actual costs for providing services while taking into account actual benefits provided by distributed generation. There are many different options for applying these principles in rate design, and we think that further exploration of rate design options would be valuable for all of the following: (1) net metering; (2) value of solar; (3) PURPA avoided cost rates; and (4) standby tariffs.

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[51] Interstate Renewable Energy Council, *A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation* (October 2013) available at http://www.irecusa.org/wp-content/uploads/2013/10/IREC_Rabago_Regulators-Guidebook-to-Assessing-Benefits-and-Costs-of-DSG.pdf.

a. Net metering updates and value of solar tariff should be informed by the independent valuation study of distributed solar generation.

The valuation of distributed generation is particularly important for any discussion about updating net metering tariffs or, alternatively, developing a value of solar tariff. Rates should provide an opportunity for the utility to recover its cost of providing service and earn an adequate return for shareholders while also avoiding cost shifts among and within customer classes. Similarly, customers with distributed generation that feeds into the grid should be compensated for the benefits that generation provides. Accordingly, distributed generation customers should pay for the utility services that they use and they should also be compensated for the benefits they provide. After accounting for all utility benefits and offsetting cost reductions due to distributed generation, any utility charges created specifically for the purpose of recovering embedded fixed costs from distributed generation customers should only recover those fixed costs that are above and beyond the off-setting benefits provided. Similarly, after accounting for all utility costs, any utility credits created for the purpose of assuring that the economic benefits resulting from the deployment of distributed generation are properly assigned back to the distributed generation customer(s) should include benefits above and beyond the costs incurred for service. The valuation study will provide the crucial information about the value of both the costs and benefits necessary to develop any rate that fairly compensates utilities and their distributed generation customers.

b. Avoided Cost Rates Should Reflect a Full and Fair Quantification of the Costs Avoided by Distributed Generation.

One of the important aspects for distributed generation in Iowa is the methodology used to develop PURPA avoided cost rates. The avoided cost calculation is particularly important for distributed wind and CHP projects in today's market in Iowa. PURPA requires FERC to prescribe and revise "such rules as it determines necessary to encourage cogeneration and small power production." 16 U.S.C. § 824a-3(a). The utilities' avoided cost rates frequently do not encourage this development. For example, there are 51 distributed wind projects larger than 100 kW that are not part of a large wind farm developed using PURPA avoided cost rates. Of those 51 projects, not a single one of those projects has been developed in MidAmerican's service territory.[52] MidAmerican's service territory has a good wind resource and a large number of utility scale wind farms. This would suggest that MidAmerican's PURPA avoided cost rates do not encourage development of distributed wind generation.

FERC rules implementing PURPA, and relevant FERC orders, give states discretion on the methodology used to determine avoided costs. While there are many ways to derive avoided cost rates that meet the broad statutory requirements, there are some methodologies that will be better than others at achieving the PURPA policy goals to encourage the development of renewable energy and meeting the rate making goals outlined in these comments of fairly compensating distributed generation for the benefits provided to the grid. There are several considerations that should be reflected in any avoided cost methodology, and many of these considerations track with factors that would be assessed in a comprehensive study that looked at the benefits and costs of distributed generation.

One methodology that has the potential to address many of these concerns is a proxy unit approach that focuses the determination of avoided costs on the levelized cost of a utility's next planned generating asset or on a generic generating asset, such as a combined cycle gas

[52] Iowa Utilities Board, EEP-2012-0002, Direct Testimony of Tom Wind at 3 (filed June 3, 2013).

turbine.[53] The proxy unit approach can also develop resource-specific avoided costs, another concept worth exploring.

This methodology is particularly important for achieving fairness in the avoided cost context. For example, MidAmerican's QF tariff is just above 2 cents per kWh. Distributed generation developers agree that this avoided cost rate is too low to justify investment in distributed generation. At the same time, MidAmerican has installed several billion dollars of wind generation and is in the process of installing several billion dollars of additional wind generation that will cost its customers much more than 2 cents per kWh. This large discrepancy between what MidAmerican offers for avoided cost rates and what MidAmerican charges its own customers represents more than a return on MidAmerican's investments and raises concerns of fairness and whether MidAmerican's avoided cost rates reflect actual avoided costs. The same questions arise in comparing IPL's proposed avoided cost rates with the cost of constructing the combined cycle natural gas plant in Marshalltown. IPL's proposed avoided cost rates includes several options that range in most cases from 3 to 4 cents per kWh.[54] The cost of constructing a natural gas combined cycle plant ranges from 6 to almost 9 cents per kWh.[55] Distributed generation that is combined heat and power is very similar to a combined cycle power plant, but IPL is offering those generators a rate that it is approximately half of its own cost to construct the plant in Marshalltown. The proxy unit approach may offer simplicity, transparency, fairness, and a rate that would be sufficient to encourage development of distributed generation.

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[53] Carolyn Elefant, *Reviving PURPA's Purpose: The Limits of Existing State Avoided Cost Ratemaking Methodologies in Supporting Alternative Energy Development and a Proposed Path for Reform*, at 17 (2011). States using the proxy unit approach include Oregon, Idaho, Montana, and Utah.

[54] Iowa Utilities Board, Docket No. TF-2012-0546, Interstate Power & Light, Cogeneration & Small Power Production – Distributed Generation Tariff (proposed).

[55] Lazard, *Levelized Cost of Energy Analysis – Version 7.0* (2013).

We recommend that Iowa develop an avoided cost methodology that is clear, transparent, and fair – one that allows interested third parties to determine whether those rates are, in fact, just, reasonable, in the public interest, and nondiscriminatory. Avoided cost rates should reflect the actual costs that a distributed generation project allows a utility to avoid. The investigative docket INU-2014-0001 will address some of these issues. That docket should be informed by the work and recommendations of this docket.

c. Standby Rates Should Be Designed to Reflect How Distributed Generation Customers Use the Grid.

Standby rates and tariffs provide an example of how rate design can create unnecessary and inappropriate barriers to distributed generation generally and combined heat and power specifically. Standby rates can create economic barriers to customer adoption of distributed generation when those rates are high, relatively fixed, and do not account for the actual costs distributed generation customers impose on the grid or reflect the services provided by these customers. Such rates reduce or eliminate the economic savings that should accompany lower electricity purchases from the grid. More specifically, analysis in Iowa and nationally has identified specific rate designs that can create barriers, such as demand ratchets (especially for long periods of time), high demand charges in proportion to energy charges, bundling of different types of demand charges and other customer charges, and high exit fees.[56] Most of this analysis has focused on impacts to CHP customers, but are likely to apply to customers with other distributed generation on those tariffs (e.g., larger-scale distributed wind).

[56] EPA, *Standby Rates for Customer-Sited Resources* (2009); Graeme Miller et al, Midwest Clean Energy Application Center, *Iowa On-Site Generation Tariff Barrier Overview* (2012).

There are rate design principles and options that can largely reduce or eliminate these barriers. These include the following[57]:

- Transparent rates that provide customers with information and price signals about the costs that they impose on the grid;
- Flexible rates that allow customers to minimize costs and charges when not using utility service or by operating in ways that benefit the utility;
- Rates that provide incentives for consuming utility services in economically efficient ways; and
- Rates that are determined by actual data and correlate with cost causation (as opposed to theoretical information and costs).

MidAmerican Energy's new proposed standby rates incorporate many of these rate design principles and represent a step in the right direction.[58] We recommend that the Board proactively address the issue of standby rates and tariffs.

V. CONCLUSION

Iowa has significant potential for distributed generation. If Iowa falls behind on distributed generation, we will lose out on the diverse array of benefits provided by distributed generation from job creation and economic investment to enhanced security and reliability of the grid to cleaner air and water. This docket provides an opportunity to catalyze the distributed generation market and develop a robust solar market while taking steps to prepare for a future with a mature distributed generation market by conducting an independent valuation of distributed generation. An independent valuation study will provide a firm foundation for investigations of rate design options that fairly compensate distributed generation customers for the benefits they provide while ensuring that all customers provide reasonable cost-based compensation for the utility services they use. We encourage the Board to further collaboration

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[57] Graeme Miller et al, Midwest Clean Energy Application Center, *MidAmerican Standby Rate Proposals* (2012).

[58] Iowa Utilities Board, Docket No. RPU-2013-0004, Graeme Miller Direct Testimony (filed September 10, 2013).

and dialogue between stakeholders and allow parties the opportunity to respond to the comments submitted by other parties. Through the Board's leadership, this docket can help make Iowa a leader in distributed generation.

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