



May 31, 2018

Ms. Steffany Powell Coker  
Secretary to the Commission  
Public Service Commission of Wisconsin  
4822 Madison Yards Way  
Madison, WI 53705-9100

**Re: Docket 5-BS-228: Joint Application of Wisconsin Public Service Corporation and Madison Gas and Electric Company for Approval to Acquire Ownership of Solar Generating Facilities**

Dear Ms. Powell Coker:

In the enclosed Application, Wisconsin Public Service Corporation and Madison Gas and Electric Company (the "Joint Applicants") seek approval under Wis. Stat. § 196.49 to acquire ownership of 300 Megawatts of solar photovoltaic generating capacity being developed by Badger Hollow Solar Farm LLC, an affiliate of Invenergy, LLC, and Two Creeks Solar, LLC, an affiliate of NextEra Energy, Inc. (the "Solar Facilities"). Wisconsin Public Service Corporation also seeks approval of an affiliate arrangement with its sister company, Wisconsin Electric Power Company, pursuant to Wis. Stat. § 196.52(3).

The Solar Facilities will mark the first utility-scale solar photovoltaic projects in Wisconsin and present an opportunity for the Joint Applicants to take advantage of a cost-effective and zero-emissions solution to their capacity needs. The Solar Facilities will also provide energy for generations to come with no fuel costs. Purchasing the Solar Facilities will have little impact on customer bills and represents the least-cost means for the Joint Applicants to secure needed capacity, as set forth in the economic analyses accompanying the Application.

Respectfully submitted,

/s/ Theodore T. Eidukas  
Theodore T. Eidukas  
Vice President -  
State Regulatory Affairs  
WEC Energy Group  
Wisconsin Public Service Corp.

/s/ Scott R. Smith  
Scott R. Smith  
Assistant Vice President -  
Business and Regulatory Strategy  
Madison Gas and Electric Co.

**BEFORE THE  
PUBLIC SERVICE COMMISSION OF WISCONSIN**

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Joint Application of Wisconsin Public Service  
Corporation and Madison Gas and  
Electric Company for Approval to Acquire  
Ownership of Solar Generating Facilities

Docket: 5-BS-228

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**I. INTRODUCTION**

Wisconsin Public Service Corporation (“WPS”), and Madison Gas and Electric Company (“MGE”) (collectively, the “Joint Applicants”) apply for approval under Wis. Stat. § 196.49 to acquire Two Creeks Solar (“Two Creeks”) and a portion of the Badger Hollow Solar Farm (“Badger Hollow”) (collectively, the “Solar Facilities”), two utility-scale solar-powered electric generating facilities proposed to be built by experienced, U.S.-based solar developers. In total, the Joint Applicants propose to acquire 300 MW of solar generating capacity – 200 MW by WPS and 100 MW by MGE.

The Joint Applicants propose to acquire the Solar Facilities because they offer a cost-effective solution to the Joint Applicants' electric capacity and energy needs and a clean source of electric generation. Due to several cost advantages, including zero fuel costs, the Solar Facilities will save WPS customers approximately \$124 million and MGE customers approximately \$57 million on a net present value basis, when compared to available alternatives for supplying similar amounts of capacity and energy.

In addition, in conjunction with the retirement of older generating units and the expiration of power purchase arrangements, acquiring the Solar Facilities will have little impact on customer bills. WPS's customers' bills will decline by almost 1% and MGE's bills will increase by approximately 1% in the first year of operations; in both cases customer savings will increase over time as the assets are depreciated. These acquisitions will also deliver a number of additional quantitative and qualitative benefits

to the Joint Applicants' customers, including reducing the Joint Applicants' use of fossil fuels and the associated environmental impacts.

By joining together to acquire two separate facilities in different parts of Wisconsin, the Joint Applicants will take advantage of economies of scale while mitigating utility risk through further geographical and technological diversification of their respective generation holdings.

The Solar Facilities will have a combined total of 450 MW in nameplate capacity. The Joint Applicants propose to own 300 MW of these resources – 150 MW from each of the Solar Facilities in the following amounts:

- WPS: 200 MW (66.7%)
- MGE: 100 MW (33.3%)

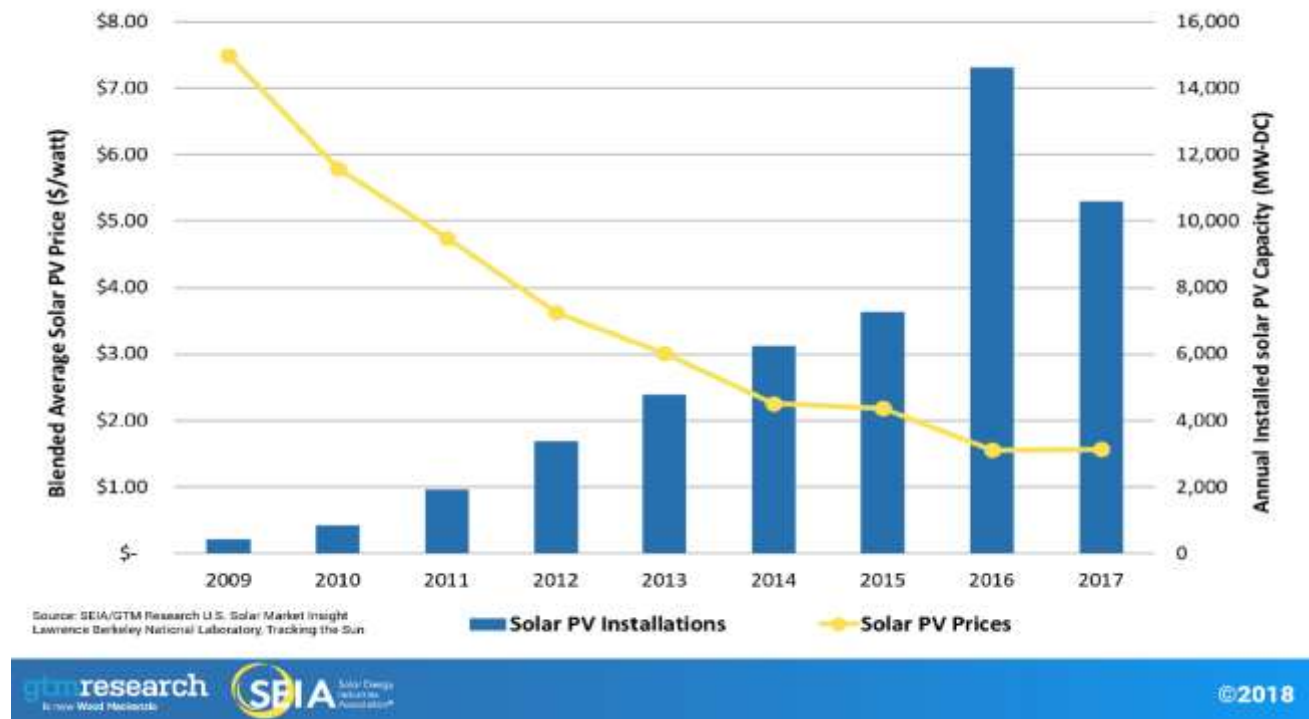
Badger Hollow will be located in southwestern Wisconsin in Iowa County, near the Villages of Montfort and Cobb. Badger Hollow will have a total nameplate capacity of up to 300 MW (Alternating Current, or “AC”). Badger Hollow will be constructed by an affiliate of Invenergy, LLC (“Invenergy”) called Badger Hollow Solar Farm LLC. Badger Hollow is the subject of the application for a Certificate of Public Convenience and Necessity (“CPCN”) in Docket 9697-CE-100 and its associated generation-transmission tie line will be the subject of a CPCN application in Docket 9697-CE-101. The Joint Applicants propose to acquire 150 MW of Badger Hollow’s capacity. As stated in the Badger Hollow CPCN application, Invenergy will market Badger Hollow’s remaining capacity to other potential customers.

Two Creeks will be located in the Town of Two Creeks and the City of Two Rivers in Manitowoc and Kewaunee Counties near the Point Beach Nuclear Power Plant. Two Creeks will have a total nameplate capacity of 150 MW (AC). Two Creeks will be constructed by an affiliate of NextEra Energy, Inc. (“NextEra”) called Two Creeks Solar, LLC. Two Creeks is the subject of an application for a CPCN in Docket 9696-CE-100 and its associated generation-transmission tie line is the subject of a separate CPCN

application in Docket 9696-CE-101. The Joint Applicants propose to acquire Two Creeks in its entirety.

The Joint Applicants propose to acquire the Solar Facilities at a total cost of approximately \$389.7 million, or \$1,299/kW. This price includes the capital cost of the Solar Facilities, transmission tie-in equipment and owners' costs. Independent analysis conducted by DNV GL, a highly-regarded consultant in the field of renewable energy, shows that this price is highly competitive with what is currently available in the solar market.

As shown below, technological advances have resulted in a sharp decline in the cost of solar photovoltaic ("PV") generation over the past ten years. This decline in cost, paired with the Investment Tax Credit ("ITC"), allow utility-scale PV to be competitive with fossil-fueled electric generation. This price decline has led to a dramatic increase in the amount of solar PV generation being installed in the United States, much of it being utility-scale installations:

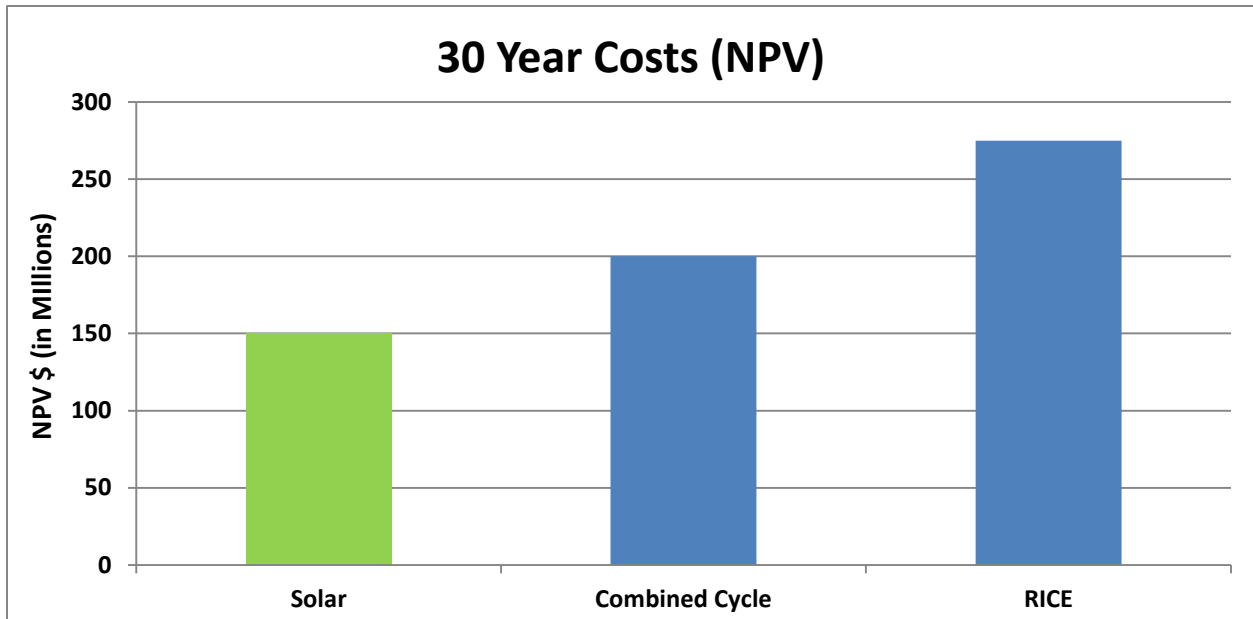


Acquiring the Solar Facilities now will allow the Joint Applicants and their customers to take advantage of solar PV technology as the price curve is flattening. The Solar Facilities will provide low cost capacity and energy, with zero fuel cost and zero air emissions, for the Joint Applicants' customers for decades to come.

When compared to alternative generation sources, the Solar Facilities will save customers money over the 30-year economic life of the assets. The Joint Applicants' analysis demonstrates that acquiring the Solar Facilities presents the least cost alternative when compared to securing needed capacity and energy from generating technologies that use other fuel sources. This cost advantage represents the difference between: (i) the forecasted revenue requirement to acquire and operate the Solar Facilities on a net present value basis; and (ii) the net present value revenue requirements associated with instead meeting capacity needs by purchasing a different generating asset – natural gas combined cycle (“NGCC”) or reciprocating internal combustion engine (“RICE”).<sup>1</sup> The chart below shows the expected net present value advantage for solar PV. This comparison is limited to WPS's generating fleet, but is indicative of the cost advantage across both Joint Applicants.

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<sup>1</sup> Wind is not an appropriate generation resource for meeting the Joint Applicants' capacity needs. While the capacity factor (*i.e.*, (annual energy output) / (nameplate capacity \* 8760)) for solar PV generation in Wisconsin is lower than wind, its “accredited” capacity for purposes of meeting peak load — what MISO refers to as the “Solar Capacity Credit” — is much higher (*i.e.*, in the range of 70% of nameplate capacity, compared to approximately 15% for wind, which reflects its higher value to customers). This is because peak production from solar PV generation strongly corresponds with peak demand in Wisconsin – both occur on hot summer afternoons.



This opportunity to acquire new solar facilities in Wisconsin will deliver value for the Joint Applicants' customers beyond these cost advantages. There are a number of qualitative and quantitative benefits to be gained from adding solar facilities to the respective Joint Applicants' generation fleets, including:

- Further diversification of the Joint Applicants' fuel and technology portfolios and serving as a price hedge against future fossil fuel costs.
- Geographic diversification of solar resource and generation. These two Wisconsin projects will be located approximately 150 miles from each other. This physical separation will provide the owners with more consistent generation than a single site as weather conditions will be unique to each location. Siting diversity will also mean that the solar generation will have unique locational marginal prices as the energy will be inserted into separate locations on the transmission system.
- Mitigation of the risk of costs imposed by future, but currently unknown, carbon restrictions for electric generators.

- Delivery of additional benefits that would not be available under a Power Purchase Agreement (“PPA”). Examples of additional benefits the Joint Applicants’ customers could realize through utility ownership include, but are not limited to:
  - An option to repower the sites when the equipment reaches the end of its useful life while leveraging the Solar Facilities’ existing Generation Interconnection Agreement, substation equipment, roads and buildings, leasing arrangements and siting studies, all of which will have already been fully paid for.
  - An option to take advantage of extremely low cost capacity and energy by continuing to operate the Solar Facilities after they are fully depreciated.
  - The opportunity to take advantages of future technological development and cost reductions which are expected during the life of the Solar Facilities.
  - Avoidance of additional costs to utility customers due to debt-like PPAs on the Joint Applicants’ balance sheets and capital structures.

## **II. BACKGROUND**

### **A. Developers**

Badger Hollow will be developed by Badger Hollow Solar Farm LLC, a wholly-owned subsidiary of Invenergy, North America’s largest independent, privately-held renewable energy provider. Headquartered in Chicago with regional development offices in the United States, Canada, Latin America, Japan and Europe, Invenergy develops, builds, owns and operates large-scale energy facilities across four core technologies: wind (92 projects; 13,246 MW), natural gas (12 projects; 6,127 MW), solar (15 projects; 565 MW), and battery storage (6 projects; 94 MW). Invenergy’s projects are mainly located in the United States, with other projects located in Japan, Poland, Scotland and Uruguay.

Two Creeks will be developed by Two Creeks Solar, LLC, a wholly-owned indirect subsidiary of NextEra Energy Resources, LLC (“NEER”), which is headquartered in Juno Beach, Florida. NEER has a proven record of successful renewable generation project development, having effectively managed the design, construction, commissioning and operation of over 115 wind facilities totaling almost 14,000 MW and 30 solar projects totaling over 2,260 MW and 149 operating assets in 33 states and Canada.

Invenenergy and NextEra both have extensive experience in the development of renewable energy projects, including experience with utility-scale solar PV generation in particular. Both have prior experience developing, constructing and operating generation projects in Wisconsin and have well-developed operations and maintenance functions, including the ability to remotely monitor renewable assets from a central location. Each is well-capitalized and have proven development records, which provides a measure of assurance that they will deliver quality projects within required project timelines and budgets.

## **B. Description of Solar Facilities**

Badger Hollow will be located entirely within Iowa County in Southwest Wisconsin. Badger Hollow will cover approximately 2,600 acres of leased land within a 3,500 acre project site in the Villages of Montfort and Cobb, directly south of U.S. Highway 18 and east of County Highway 80. Badger Hollow will generate up to 300 MW using over one million silicon PV modules fixed to horizontal single-axis solar trackers.

Two Creeks will be a 150 MW solar PV project comprised of approximately 500,000 panels, located on approximately 800 acres within a 1,300 acre project area in the Town of Two Creeks and the City of Two Rivers, in Manitowoc County, Wisconsin, southeast of the intersection of Nuclear Road and State Highway 42. The collector system for Two Creeks will extend into Kewaunee County, Wisconsin. Like Badger Hollow, Two Creeks will utilize a single-axis tracking system.



In addition to the solar modules themselves, the Solar Facilities will include:

- Electric collector systems consisting of above- and below-ground cabling;
- Power Conversion Stations including inverters, step-up transformers and monitoring and communications equipment;
- Access roads;
- A substation with one or more 34.5 kV to 138 kV main power transformers, breakers, buswork, protective relaying and associated substation equipment, communications equipment and a control enclosure;
- A 138 kV transmission line and interconnection switchyard connecting the project substation to the electric grid; and
- An operations and maintenance area, including maintenance buildings, parking and associated facilities.

Battery storage technology continues to evolve and develop, as do the markets for such storage capacity. The Joint Applicants will continue to study the economics of battery storage and may, in the future, install battery storage equipment at the Solar Facilities. Both the Badger Hollow and Two Creeks sites contain ample space for future battery storage facilities.

Construction of Badger Hollow is expected to begin in 2019, and the construction of the Joint Applicants' portion of the project is expected to be completed by late 2020 or early 2021. Construction of Two Creeks is expected to begin in 2019, and is expected to be completed by late 2020. Construction will require managers, heavy equipment operators, licensed journeymen electricians and laborers. Invenergy estimates that 500 workers will be on site during peak construction periods, and five workers will be permanently employed. NextEra estimates that 300 workers will be needed during construction, with three full time personnel to operate the facility after it is placed in operation.

### **C. Operations of the Solar Facilities**

Under Operation and Maintenance Agreements with the Joint Applicants, Badger Hollow will be operated by Invenergy Services, LLC (“Invenergy Services”) and Two Creeks by NextEra Energy Operating Services, LLC (“NextEra Services”) (together, the “Solar Facility Operators”). The Solar Facility Operators are staffed with experienced industry personnel and combine asset management, operations, maintenance and commercial execution functions to provide a single, comprehensive solution to asset management.

Invenergy Services’ experienced and highly-skilled personnel operate 8,680 MW of wind, solar and energy storage projects in North America. Invenergy’s fleet-wide availability was more than 97% for 2015 and 2016 – among the best in the industry in North America.

NextEra Services operates over 115 wind facilities totaling almost 14,000 MW and 30 solar projects totaling over 2,260 MW and 149 operating assets in 33 states and Canada.

### **III. REQUESTED AUTHORIZATION**

The Joint Applicants request approval to acquire the Solar Facilities following Commission approval of the developers’ CPCNs. Because each Joint Applicant is a “public utility” as defined in Wis. Stat. § 196.01(5), the proposed transaction may not take place without the Commission’s approval. In particular, Wis. Stat. § 196.49(3)(b) provides that the Commission “may require that no project may proceed until the Commission has certified that public convenience and necessity require the project.”

Badger Hollow and Two Creeks filed CPCN applications on May 31, 2018 seeking permission to construct the Solar Facilities. In those filings, the developers asked the Commission to find that the projects are “reasonable and in the public interest after considering alternative locations, individual hardships, safety, reliability, and

environmental factors.” The CPCN applications contain comprehensive discussions of the technical aspects of the Solar Facilities, as well as expected environmental impacts.

This request for Certificates of Authority focuses on the Joint Applicants’ need for the capacity and energy that will be produced by the Solar Facilities, as well as the economic justification for acquiring the Solar Facilities.

The Solar Facilities will provide a low-cost, zero-emissions source of electricity for Wisconsin customers for decades to come. Wisconsin Stat. § 196.49(3)(b) states that the Commission may refuse to certify a project only if it appears that the the project will do any of the following:

1. Substantially impair the efficiency of the service of the public utility.
2. Provide facilities unreasonably in excess of the probable future requirements.
3. When placed in operation, add to the cost of service without proportionately increasing the value or available quantity of service.

The Joint Applicants' acquisition of the Solar Facilities will have none of these consequences.

The acquisitions will not impair the efficiency of the utilities’ service. In fact, the acquisitions will enhance efficiency by providing a highly-reliable, high capacity-accredited renewable resource, significantly improving the Joint Applicants’ resource diversity.

The acquisitions will not provide facilities unreasonably in excess of probable future requirements. The Joint Applicants need capacity to meet current and anticipated future customer requirements.

As the result of planned retirement of aging and relatively inefficient coal-fired generating units (Pulliam 7 and 8 and WPS's share of Edgewater 4), WPS will need 150 MW of capacity beginning in 2020. Based on its accredited capacity value

(approximately 70% of 200 MW), this acquisition will approximate WPS' anticipated capacity needs.<sup>2</sup> Likewise, MGE will need over 80 MW of new capacity by 2022 due to previously announced retirements of legacy assets and expiration of PPAs. This supports MGE's acquisition of 100 MW of solar capacity.

Further, the Solar Facilities will provide energy at no additional cost (*i.e.*, no fuel cost). Though energy is currently available in the market at relatively low cost, the Solar Facilities will provide a valuable hedge against the potential for higher energy costs in the future.

The acquisitions will not add to the cost of service without proportionately increasing the value or available quantity of service. The Joint Applicants independently evaluated the expected costs of acquiring the Solar Facilities to the alternative of meeting energy and capacity needs through market purchases or alternative technologies, including NGCC or RICE.

The Joint Applicants' analyses demonstrate that the cost of owning the Solar Facilities is substantially less than these alternatives and is also less than acquiring capacity and energy from the market.

Moreover, in conjunction with the retirement of older generating assets and the expiration of PPAs, the Joint Applicants can accomplish the acquisitions with little or no rate impact in the first year of project operation. Each of the Joint Applicants will reflect its portion of the approximately \$389.7 million acquisition price in its rate base.<sup>3</sup> For WPS, the net effect of owning and operating the Solar Facilities will be a reduction in

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<sup>2</sup> The Joint Applicants' respective detailed capacity needs forecasts are confidential, and therefore are being submitted in individual filings by each utility. See Appendix A for WPS's confidential analysis, and Appendix B for MGE's confidential analysis.

<sup>3</sup> Including AFUDC calculated at 100% of CWIP, the total cost of the acquisitions will be approximately \$405.1 million. The Joint Applicants seek approval to acquire the Solar Facilities at a cost of up to 110% of this amount. To the extent the cost of the Solar Facilities exceed this threshold, the Joint Applicants propose that they be required to promptly notify the Commission and seek further Commission review and approval.

rates by nearly 1% in the first year of operation. For MGE, the net rate effect in the first year will be to increase rates by approximately 1%.

The Joint Applicants submit that the proposed transaction is consistent with the public interest and should be approved. Further, the Joint Applicants ask the Commission to provide a written Order approving this request by November 1, 2018, which will allow the developers to finalize engineering and procurement and ensure construction in time to capture for ratepayers the full benefit of the federal ITC.

#### **IV. JUSTIFICATION FOR TRANSACTION**

Each of the Joint Applicants have a need for long-term capacity resources. Due to the complementary timing of the Joint Applicants' needs, they were able to take advantage of the scale and scope of larger generating solutions to achieve cost-saving efficiencies for the benefit of their respective customers.

Potential options for filling the Joint Applicants' needs include purchasing energy and capacity under a PPA or building new generation, whether NGCC, RICE or solar. The Joint Applicants chose the Solar Facilities to address their future energy and capacity requirements because these facilities represent the least-cost alternative, will be constructed at attractive project sites and are being offered by highly-experienced solar developers with long track records of success in the industry.

The Joint Applicants also evaluated purchasing capacity and energy from the day-ahead energy market and/or capacity from the annual capacity market, but do not consider these to be viable options for meeting their customers' long-term needs. Although there is currently a surplus of capacity in the MISO market, including in Zone 2, which covers Wisconsin and the Upper Peninsula of Michigan, and energy prices are relatively low due to the boom in fracking technology and extraction, the ongoing trend of retirements of coal-fired plants and older gas-fired generation pose substantial risks to the long-term supply of capacity and market stability. Because of these risks, and because decisions about adding new generation to a utility's portfolio are made over a long planning horizon — 30-50 years in the case of the Solar Facilities — the Joint

Applicants determined that relying on the short term market for energy and capacity over the long term is simply too risky for their customers.<sup>4</sup>

**A. Economic Analysis**

The Joint Applicants compared the relative cost of the viable alternatives to meet their customers' long-term capacity needs. That analysis revealed that acquiring 300 MW of utility-scale solar PV generation is substantially less expensive, on a net present value basis, than building equivalent amounts of NGCC or RICE capacity.

	<b>Solar Facilities</b>	<b>NGCC</b>	<b>RICE</b>
<b>Difference compared to solar</b>	--	+ \$50 million	+ \$124 million

\* Net present value of capital expenditures, operations and maintenance expense, fuel expense, and avoided capacity costs

Utility-scale solar PV generation is less expensive than building NGCC or RICE units largely because its fuel cost is zero, and its operations and maintenance costs are much lower. Looking at estimated annual costs for each technology in 2021 and 2031 demonstrates the relatively low cost of solar PV generation as compared to other technologies.

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<sup>4</sup> The economic comparison between acquiring the Solar Facilities and relying on the market for capacity and energy is discussed in greater detail in Section V, below.

	<b>Solar</b>	<b>RICE</b>	<b>NGCC</b>
<b>2021 “all in” annual cost (millions)*</b>	\$29.73	\$49.68	\$54.88
<b>2031 “all in” annual cost (millions)</b>	\$7.52	\$27.17	\$36.82

\* Annual cost estimates include depreciation, return on, avoided capacity costs, fuel costs, operations and maintenance costs (fixed, variable, pipeline costs) and ITC/PTC amortization.

The Joint Applicants’ full technology selection analysis is presented in Appendices A and B.

### **B. Utility Ownership Versus PPA**

One option for securing solar capacity would be to enter a PPA with a developer. However, doing so would deprive utility customers of several important benefits of utility ownership. With utility ownership of the Solar Facilities, customers will benefit from Joint Applicants’ ability to avoid future site development costs, hedge energy costs and take advantage of future technology improvements in solar and storage technology.

First, ownership of the Solar Facilities will offer a continuing source of renewable energy for an extended period of time – at least through the 50-year terms of the land rights being negotiated by the developers, which will be transferred to the Joint Applicants. Given potential future siting and permitting challenges for solar facilities, the existing project — with the necessary interconnection agreements, facilities and other reusable infrastructure in place — can be re-utilized to provide extended service. In addition, the Solar Facilities will have an advantage over new potential greenfield projects because redeveloping the site will not require outlay of development costs prior to assurance of approval by regulators and transmission providers.

Second, owning the Solar Facilities will allow the Joint Applicants to hedge against an uncertain energy future. The Joint Applicants will be able to “repower” the Solar

Facilities by installing new solar panels and inverters at the sites after the equipment reaches the end of its economic useful life if future technology gains make this advantageous. This would require a new capital investment but would improve the energy output and capacity for the Solar Facilities. Alternatively, if degradation and technology gains were modest, the Joint Applicants could simply continue to take very inexpensive energy from the panels — albeit at a lower output — once they are fully depreciated. While not included in their base economic analysis, the Joint Applicants estimate that the value of repowering the Solar Facilities sites could range from approximately \$90 million to \$180 million in today's dollars. Without repowering the Solar Facilities, the Joint Applicants estimate the value, in today's dollars, of continuing to take energy and capacity to be between \$70 million and \$120 million. By owning the Solar Facilities, the Joint Applicants will control such decisions and their customers will get the economic benefit of future redevelopment.

A third benefit of utility ownership is the ability to add new technologies — such as battery storage — to the Solar Facilities without limitation. Under a PPA, should the Joint Applicants wish to add storage to the site, they would presumably need to seek permission from the developer/PPA holder. Also, a PPA would require the site developer to be a party to any storage or new technology addition to the project, which would increase complexity, uncertainty and potentially customer costs.

Finally, utility ownership will allow customers to avoid additional costs related to offsetting the negative impacts of the debt-like PPAs on the respective Joint Applicants' balance sheets.

### **C. Choice of Projects**

Because the Joint Applicants' analysis identified solar PV as the appropriate technology to meet their capacity needs, the Joint Applicants next sought to identify the appropriate solar PV projects in which to invest. The Joint Applicants are regularly approached by local, regional and national developers seeking to build utility-scale solar PV facilities. The Joint Applicants focused on finding cost-competitive projects, at premier sites,



offered by highly-experienced developers with track records of success in such projects. Badger Hollow and Two Creeks were identified as such projects, and Invenergy and NextEra were determined to be appropriate partners based on their:

- Significant solar development experience;
- Effective land owner/public relations functions;
- Wisconsin permitting experience;
- Large utility-scale solar experience;
- Identification of high quality Wisconsin site location(s);
- Ability to obtain timely site control;
- Ability to proceed on schedule to achieve full ITC benefit;
- MISO queue position;
- Company longevity;
- O&M capabilities and experience;
- Remote monitoring capabilities;
- Battery storage experience; and
- No third party financing or foreign ownership.

**D. The Price of the Solar Facilities is Competitive in the Market**

The Joint Applicants also confirmed that the Badger Hollow and Two Creeks projects were competitive within the broader market for utility scale PV development. There is an active market for solar PV projects, and Badger Hollow's and Two Creeks' economics compare favorably to the offers that have been presented to the Joint Applicants. The Joint Applicants retained DNV GL, which is a global engineering and

consulting firm with decades of experience assisting with solar facility diligence, economic forecasting and development. DNV GL's analysis confirmed that the proposed pricing for the Two Creeks and Badger Hollow facilities compares very favorably to recent pricing for solar PV facilities around the country.

#### **E. Acquisition of the Solar Facilities will Deliver Important Qualitative Benefits**

In addition to the quantifiable economic benefits of acquiring the Solar Facilities, the transaction will provide other benefits to customers by enhancing the technological and fuel diversity of their electric generation resource portfolios. The addition of these no-fuel and zero emission resources serve as a price hedge against future increases in fossil fuel costs and the cost of complying with future environmental regulations. Additionally, acquiring the Solar Facilities will allow the Joint Applicants and their customers to mitigate the risk of any future potential and currently unknown costs associated with fossil fuel based electric generation facilities, including the risk of future carbon pricing, taxes or other regulation over the life of the Solar Facilities.

#### **V. RATE ANALYSIS**

As described below, using reasonable assumptions described below, the Joint Applicants forecast that acquiring the Solar Facilities in conjunction with the operational savings achieved from retiring older, less efficient generating units, will initially lower customer bills by nearly 1% at WPS and raise them by approximately 1% at MGE. The degree to which the acquisitions lower the Joint Applicants' rates will increase over time as their investments in the Solar Facilities are depreciated.

Based on the same set of assumptions, compared to the Joint Applicants' alternatives for supplying similar amounts of capacity and energy from the market, the Solar Facilities will provide savings of approximately \$124 million for WPS customers and approximately \$57 million for MGE customers on a net present value basis over their economic lives.

The Joint Applicants' economic analysis, summarized below, is provided in Appendix C.

## **A. Modeling Assumptions Underlying Rate Analysis**

The Joint Applicants made certain assumptions when modeling the rate impact of their acquisition of the Solar Facilities, which are described below.

### **1. Capital Cost**

The total capital cost for the Solar Facilities is \$389.7 million. The Solar Facilities are eligible for the federal ITC, which will be normalized over 30 years as required by the IRS.

### **2. Plant Life**

The Joint Applicants assumed a base plant life of 30 years for purposes of calculating amortization and revenue requirements.<sup>5</sup>

### **3. Capacity Factor**

The capacity factor for the Solar Facilities will begin at approximately 24% and decline slowly over time due to anticipated degradation of the solar panels from exposure to ultraviolet light and weather. Energy output (MWh) for each year is calculated from the capacity factor and nameplate capacity as adjusted for degradation.

For summer peaking utilities like the Joint Applicants, the time when solar PV resources are generating the most energy is highly correlated with peak load, which makes them particularly valuable from customers' perspective. Additionally, a high percentage of nameplate capacity is creditable for meeting MISO capacity requirements. In the case of the Solar Facilities, approximately 70% of their nameplate capacity is expected to be

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<sup>5</sup> While not included in base modeling assumptions, the Joint Applicants also analyzed the impact of a 20-year extended life period and/or repowering. This assumption was based on the negotiated 50-year terms for land rights for the projects and considerations of repowering the site as discussed in Section IV.B.

accredited for peak load. Again, this accredited capacity value will decline over time due to panel degradation at the same rate as the capacity factor. This accredited capacity value is used for purposes of calculating avoided capacity costs in the Joint Applicants' economic modeling.

#### **4. Energy Value and Capacity Value**

The economic analysis assumes the locational marginal prices will escalate 2 - 4% annually from a starting point of \$32.94/MWh in 2017. This starting point is based on the average LMP over the past five years at the Kewaunee injection point near Two Creeks, load-weighted for the Solar Facilities' projected output profiles. The load-weighted LMP for the Eden injection point near Badger Hollow for the same period is \$36.53. Eden has experienced significant congestion over the last five years, which may or may not persist. Using Kewaunee LMPs for the economic modeling results in a likely conservative value for LMPs. The base case with 2% escalation results in a 2028 LMP of \$40.95/MWh. Using the 4% sensitivity results in an LMP of \$50.70/MWh in 2028. This range reflects the uncertainty of natural gas prices and electric market supply and demand changes over the next ten-plus years.

The value of capacity was assumed to be the long-run marginal cost of new generation, often referred to as the Cost of New Entry ("CONE"). The economic analysis assumes annual 2% escalation of CONE from current values.<sup>6</sup>

#### **5. Revenue Requirement – Rate Base**

The revenue requirement for return on investment is based on the cost of capital for each Joint Applicant. Depreciation costs are based on straight line depreciation for the assumed remaining useful life of approximately 30 years.

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<sup>6</sup> These same energy and capacity value projections were carried forward into the 20-year extension period for purposes of economic modeling.

## **6. *Operation and Maintenance Expense***

Operation and maintenance expenses were based on estimates that include costs negotiated with Invenergy Services and NextEra Services and owners' costs.

Operations and maintenance expenses are very low for solar PV when compared to other generation technologies.

## **VI. SIGNIFICANT CONTRACTS**

Upon the developers' receipt of CPCNs, Joint Applicants will acquire Two Creeks and a portion of Badger Hollow. To that end, the Joint Applicants are in the process of negotiating Asset Purchase Agreements with the project developers.

Under the Two Creeks Asset Purchase Agreement, the Joint Applicants will acquire the entire project. The acquired assets will include all solar modules and transmission interconnection equipment, the real property rights necessary to site the Solar Facilities; all permits including the CPCNs and other federal, state and local permits; contracts relating to the ownership, leasing, licensing, construction, operation and maintenance of the Solar Facilities; books and records; any causes of action relating to the Solar Facilities; certain intellectual property rights; the applicable MISO queue positions; interconnection reports and studies; renewable energy credits and insurance proceeds and rights of action relating to the Solar Facilities.

Under the Badger Hollow Asset Purchase Agreement, the Joint Applicants will acquire ownership of a number of solar generation modules with total AC generating capacity of 150 MW, together with the property rights associated with those modules, including those listed above. The Joint Applicants will acquire undivided ownership interests in Badger Hollow's common facilities and other assets proportional to the Joint Applicants' share of the project's total generating capacity.

Receipt of the CPCNs and other necessary governmental approvals will be a precondition to closing on the acquisitions of the Solar Facilities.

To address construction of the Solar Facilities, the Joint Applicants are negotiating Engineering, Construction and Procurement contracts with Badger Hollow Solar Farm LLC and Two Creeks Solar, LLC. Under these contracts the developers will construct the Solar Facilities according to specifications developed by the Joint Applicants.

The Joint Applicants are also negotiating Operations and Maintenance Agreements with the Solar Facility Operators. Under these agreements, the Solar Facility Operators will provide the vast majority of day-to-day operations and maintenance services for the Solar Facilities.

The Engineering, Procurement and Construction Agreement and Operations and Maintenance Agreements will be between the developers and WPS, and WPS will act as the agent for both WPS and MGE under those agreements. Since the Joint Applicants are purchasing only part of the Badger Hollow project, they will negotiate and enter a shared services agreement that will apportion the cost of shared facilities.

Finally, the Joint Applicants will jointly own and operate the Solar Facilities under Joint Ownership Agreements.

The Joint Applicants expect to finalize all of these agreements during the summer of 2018.

## **VII. OTHER CONSIDERATIONS**

### **A. Benefits to the Local Community**

Local communities will benefit from Wisconsin shared revenue payments received by the towns and counties where the Solar Facilities are located. Further, the Solar Facilities will boost employment in the project areas, both during and after construction.

### **B. Wisconsin Environmental Policy Act**

This action is subject to the terms of the Wisconsin Environmental Policy Act, Chapter 274, section 1, laws of 1971 and Wis. Stats. §1.11. The proposed acquisition is categorized as a Type III action under § PSC 4.10(3), Wis. Adm. Code, and does not

normally require the preparation of an Environmental Assessment or Environmental Impact Statement by Commission staff. See Wis. Admin. Code, Ch. 4, Table 3 (listing “Purchase, sell or transfer utility property” as a Type III Action).

Type III actions are proposed actions involving request for Commission approval that do not have the potential to significantly affect the quality of the human environment within the meaning of Wis. Stat. § 1.11 (2)(c). As such, they do not normally require an environmental impact statement. See Wis. Admin Code § 4.10(3). Therefore, environmental screening information is not included with this application. In any event, the project developers are seeking Certificates of Public Convenience and Necessity, which will include a full consideration of environmental issues.

### **C. Energy Priorities law**

Wis. Stat. § 196.025 states "To the extent cost-effective technically feasible and environmentally sound, the Commission shall implement the priorities under § 1.12 (4) in making all energy-related decisions." Wis. Stat. § 1.12 (4) establishes the following priorities:

(4) PRIORITIES. In meeting energy demands, the policy of the state is that, to the extent cost-effective and technically feasible, options be considered based on the following priorities, in the order listed:

(a) Energy conservation and efficiency.

(b) Noncombustible renewable resources.

(c) Combustible renewable energy resources.

(d) Nonrenewable combustible energy resources in the order listed:

1. Natural gas.

2. Oil or coal with sulfur content of less than 1 percent.
3. All other carbon-based fuels.

In a proceeding in which an investor-owned electric public utility is a party, the commission shall not order or otherwise impose energy conservation or efficiency requirements on the investor-owned electric public utility if the commission has fulfilled all of its duties under § 196.374 and the investor-owned electric public utility has satisfied the requirements of § 196.374 for the year prior to the commencement of the proceeding, as specified in § 196.374 (8).

The Joint Applicants have satisfied all the requirements of Wis. Stat. § 196.374(8). Therefore, the Commission may not require energy efficiency or conservation in connection with the Solar Facilities. The Solar Facilities are noncombustible renewable resources, which is the second-highest energy priority. Thus, the Joint Applicants' acquisition of the Solar Facilities satisfies Wisconsin's Energy Priorities Law.

#### **D. Affiliated Interest Issues**

WPS seeks approval of an affiliated interest arrangement with its sister company, Wisconsin Electric Power Company ("Wisconsin Electric"). Part of the Two Creeks project will be located on land owned by Wisconsin Electric. Wisconsin Electric will lease this land to NextEra at cost to develop Two Creeks. NextEra will, in turn, assign its land rights to WPS and MGE, again at cost, when the parties close on the Asset Purchase Agreement.

The assigned contract between WPS and Wisconsin Electric will be an affiliate transaction, which will require Commission approval under Wis. Stat. §196.52(3). The proposed transaction meets the standard for approval under this statute. It is reasonable and in the public interest.



Second, the Solar Facilities will require a Generation Interconnection Agreement (“GIA”) with the American Transmission Company, LLC (“ATC”). While the GIA will be a jointly-owned asset, a GIA with ATC can only have one counterparty, which will be WPS as project manager. Because ATC is an affiliate of WPS, under Wis. Stat. § 196.52(3), this arrangement will require Commission approval as an affiliate transaction, which will be requested in a separate application.

#### **E. Effect on Wholesale Energy Competition**

Construction of the Solar Facilities will have no effect on wholesale market competition. The proposed projects are located in the MISO energy market, which includes over 140,000 MW of generation. The proposed project is 300 MW. The amount of generation owned by the Joint Applicants will actually be reduced – WPS is retiring 270 MW of capacity at the Pulliam and Edgewater 4 units, and MGE is retiring approximately 75 MW of capacity at combustion turbine sites located throughout the utility’s service territory.

#### **F. Decommissioning and Restoration**

Decommissioning will focus on removal of posts and foundations to four feet below grade. Decommissioning may also require removal of the service buildings located at the Solar Facilities. Alternatively, the service buildings may have some nominal value when the project is decommissioned. Underground cables will likely be left in place because removing them would cause more disruption to the land than abandoning them in place. The land used for the solar PV and associated equipment will be restored to its original condition. Roads may be left intact at the landowner's request, or they may be removed.

Restoration typically includes grading and replanting areas where foundations, roads and buildings were located after they have been removed. Removed parts can either be sold into the used equipment market, sold for their scrap value or disposed of. If a secondary market for the used equipment is not available, it would be typical for the equipment to be sold as scrap where possible.

The Joint Applicants estimate the cost of decommissioning the solar PV equipment will be negligible, net of scrap value.

#### **G. Method of Financing**

The cost of the project will be met from internal sources or the issuance or sale of securities by each of the Joint Applicants.

### **VIII. SCHEDULE**

- May, 2018
  - File Application with PSCW
- November, 2018:
  - Receive PSCW authorization and written Order
- December, 2018:
  - Close on Acquisition of Solar Facilities and execute Engineering, Procurement and Construction and Operations and Maintenance Agreements
- End of 2020:
  - Solar Facilities achieve Commercial Operation

### **IX. CONCLUSION**

As explained in this Application, the Solar Facilities will provide a zero-fuel-cost, zero-emission capacity and energy resource for the Joint Applicants for generations to come. The Solar Facilities represent the most cost-effective means of meeting the Joint Applicants' long-term capacity needs, and utility ownership of the Solar Facilities will deliver value to customers.

As such, the Joint Applicants request that the Commission grant the necessary approvals under Wis. Stats. §196.49(3)(b) and any other necessary consents and approvals, including:

- 1) Authorizing the Joint Applicants to acquire the Solar Facilities and include in the rate base of each Joint Applicant their respective ownership share of the Solar Facilities; and
- 2) Authorizing the affiliate transaction between WEPCO and WPS for the land for the the Two Creeks project.

The Joint Applicants request that a written Order including those requested approvals be received no later than November 1, 2018 in order to allow construction to begin in 2019.

**APPENDIX A**

**WPS Needs and Technology Selection Analysis**

**FILED SEPARATELY**

**APPENDIX B**

**MGE Needs and Technology Selection Analysis**

**FILED SEPARATELY**

## **APPENDIX C**

### **Summary of Financial Analysis**

- **Base Case**
- **Extended Life Case**
- **Re-Power Case**

**FILED SEPARATELY**