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MISSOURI PUBLIC SERVICE COMMISSION

FILE NO. EA-2018-0202

DIRECT TESTIMONY

OF

AJAY K. ARORA

ON

BEHALF OF

UNION ELECTRIC COMPANY

d/b/a Ameren Missouri

*****DENOTES HIGHLY CONFIDENTIAL INFORMATION*****

****DENOTES CONFIDENTIAL INFORMATION****

**St. Louis, Missouri
May, 2018**

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DIRECT TESTIMONY

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I. INTRODUCTION

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Q. Please state your name and business address.

A. Ajay K. Arora, Union Electric Company d/b/a Ameren Missouri ("Ameren Missouri" or "Company"), One Ameren Plaza, 1901 Chouteau Avenue, St. Louis, Missouri 63103.

Q. What is your position with Ameren Missouri?

A. I am the Vice President of Power Operations and Energy Management.

Q. Please describe your educational background and employment experience.

A. I received my Bachelor of Science Degree in Chemical Engineering from Panjab University (India) in May 1992. I received my Master of Business Administration degree from Tulane University in May 1998. I joined former Ameren Corporation subsidiary, Ameren Energy, in June 1998 and held trading and structuring positions in Ameren Energy before supervising the group that priced structured energy products for former Ameren Corporation subsidiary Ameren Energy Marketing Company's wholesale and retail customers from 2002 to 2004. From 2004 to 2007, I was responsible for the analytical group supporting Ameren Missouri's transition into the Midwest Independent Transmission System Operator, Inc. ("MISO"), including reviewing specific market design issues in MISO.¹ In 2007, I led the Ameren Missouri Regional Transmission Organization cost-benefit study that was filed with the

¹ MISO is now known as the Midcontinent Independent System Operator, Inc.

1 Missouri Public Service Commission ("Commission") in File No. EO-2008-0134, and I assumed
2 responsibility for the Quantitative Analysis, Integrated Resource Planning, Load Analysis, and
3 Operations Analysis groups. In January 2008, as part of my role as Director of Corporate
4 Planning, I assumed the additional responsibility for the Asset and Trading Optimization group
5 supporting Ameren Missouri. In November 2011, I assumed additional responsibilities for the
6 corporate Project Management Oversight and Market Risk Management groups. These groups
7 oversee large utility capital projects and commodity risk management. In November 2014, I
8 assumed responsibility for the Environmental Services department as Vice President of
9 Environmental Services and Generation Resource Planning. The Environmental Services
10 department develops environmental policy and provides environmental compliance support,
11 which includes the areas of energy delivery, generation, and transmission. In March 2018, I
12 assumed leadership responsibility for Ameren Missouri's entire non-nuclear generation
13 operations and energy management function in my current role as Vice President of Power
14 Operations and Energy Management.

15 **Q. What is the purpose of your direct testimony in this proceeding?**

16 A. The purpose of my direct testimony is to support the Company's application for a
17 certificate of convenience and necessity ("CCN") for a wind generation project that is necessary
18 to comply with the renewable energy portfolio requirements contained in the Missouri
19 Renewable Energy Standard ("RES").² My direct testimony addresses the details of one of the
20 projects being undertaken by the Company to meet those requirements. Ameren Missouri
21 witness Matt Michels is filing direct testimony outlining the applicable RES requirements,
22 Ameren Missouri's need for 700 megawatts ("MW") to 800 MW of Company-owned wind

² As addressed further below and in the Company's application in this case, the Company is also seeking certain other approvals, including merger approval, due to the commercial structure of the project.

1 generation to meet those requirements, and the economics and customer benefits supporting the
2 High Prairie Wind Project (the "Project") that is the subject of this case as the means to meet
3 those RES requirements. My testimony describes the request for proposal ("RFP") process that
4 was utilized to obtain the needed resources. I also outline the need for an overall portfolio of
5 wind generation projects required for compliance with the RES, which includes the Project, and
6 address how the Project is an essential part of that portfolio. Last, I discuss the specifics of the
7 Project, the contractual agreement structure used to acquire the Project, and the Ameren Missouri
8 customer protections and value inherent in the Project structure.

9 **Q. Please summarize the key conclusions in your testimony.**

- 10 A. 1. The Project is the first in a series of wind generation projects required for RES
11 compliance and is an essential part of the Company's overall RES compliance
12 strategy. The Project is also the largest of any projects the Company will utilize
13 for RES compliance.
- 14 2. The Project is a cost-effective means of meeting a part of the RES requirements
15 and provides long-term benefits to Ameren Missouri customers.
- 16 3. The build transfer agreement ("BTA") structure allows Ameren Missouri to
17 leverage the developer's expertise with wind generation construction and acquire
18 a late-stage wind project in Missouri.
- 19 4. The BTA arrangement is the best structure for capturing the entire value of the
20 approximately \$400 million in Production Tax Credits ("PTCs") the Project will
21 generate and to provide all of the cost savings to Ameren Missouri customers.

1 load via the Project's connection to the new 345-kV Mark Twain Transmission Line, for which a
2 CCN was recently granted in File No. EA-2017-0345. I would also note that since the Project is
3 located in Missouri, the Company and its customers will benefit from the 1.25 multiplier applied
4 to Missouri wind for purposes of determining the number of renewable energy credits ("RECs")
5 obtained by the Company for RES compliance purposes.

6 **Q. Why is Ameren Missouri seeking a CCN for the Project if Terra-Gen is**
7 **constructing it?**

8 A. While it is true that Terra-Gen will construct the Project and that it will then be
9 immediately acquired by Ameren Missouri upon completion, functionally, the Project is in many
10 respects no different than if Ameren Missouri had itself purchased the equipment from the
11 vendors, purchased or leased the land and easements needed to construct, own, and operate the
12 Project, and signed the contracts with the construction firms. Consequently, while I am not an
13 attorney, it is my understanding that it is the Company's view that the spirit of the CCN statute's
14 requirement that an electrical corporation obtain a CCN prior to construction applies, even if by
15 the letter of the statute it arguably may not apply.

16 **Q. Is there a name for a project of this type?**

17 A. Yes. The Project is being constructed under a "build transfer agreement." Under a
18 BTA, a wind developer builds the project, but the ultimate owner has contractual rights both
19 before and during construction to ensure that the project is built to the ultimate owner's
20 specifications and will otherwise meet the ultimate owner's needs. Some might call this a
21 "turnkey" project in that the developer will build it to the ultimate owner's requirements at a
22 contractually agreed upon cost and completion schedule, assume many of the risks during

1 construction, and then hand the keys to the ultimate owner with the project in fully-completed
2 and operable condition.

3 **III. PROJECT STRUCTURE**

4 **Q. Are there important advantages of the Company using the BTA structure for**
5 **the Project for RES compliance?**

6 A. Yes. The BTA approach currently carries with it certain important advantages for
7 RES compliance for Ameren Missouri customers.

8 **Q. What are some of those advantages?**

9 A. The first advantage is that Ameren Missouri will be able to utilize the full value of
10 the federal PTCs and pass the significant cost savings those PTCs will produce on to its
11 customers. Ameren Missouri will be able to capture and pass those PTC benefits through to
12 customers due to the stage in project development Terra-Gen has achieved at this time, which
13 will enable the Project to be completed by 2020.

14 **Q. Please elaborate.**

15 A. In the current wind development environment in this country, a key part of the
16 value of any wind generation project is its ability to take full advantage of the PTCs. As the
17 name implies, PTCs are credits against the owner's tax liability arising from production of energy
18 from the wind facility. In the case of Ameren Missouri, lower tax liability will manifest itself as
19 lower costs for the Project (and for RES compliance). Those lower costs will then be passed
20 through to Ameren Missouri's customers under the RESRAM⁵ discussed in the direct testimony
21 of Ameren Missouri witness Steven Wills.

⁵ Renewable Energy Standard Rate Adjustment Mechanism.

1 To obtain the full value of the PTCs, a project must meet several important and time-
2 critical milestones that a self-built project starting today would be unable to achieve. First, the
3 project must have incurred, by the end of 2016, at least 5% of qualifying project costs to satisfy
4 the PTC "safe harbor" rule. One means to meet this requirement is for the wind project developer
5 to purchase PTC-qualified "safe harbor" equipment before the end of 2016 and to obtain title to
6 and delivery of the equipment within a specified time period. As confirmed by *** _____
7 _____*** and Ameren Missouri's external legal due diligence, Terra-Gen successfully safe
8 harbored equipment in 2016 and thus has met the 5% requirement for the Project.

9 Second, to fully qualify for the PTCs, the Project must be constructed, tested, and
10 commissioned by the end of 2020. To achieve Project completion in 2020, the land rights needed
11 for the Project must be acquired and transmission agreements must be executed. Terra-Gen
12 already has more than ** _____** of the land rights needed for the expected wind turbine
13 locations for the Project and expects to obtain the remaining land rights shortly. Furthermore,
14 Terra-Gen has secured a spot in the MISO queue that will allow transmission agreements to be
15 put in place in time to meet the 2020 in-service deadline. We believe Terra-Gen has reached a
16 stage of development of the Project that would allow the Project to be completed by the end of
17 2020 to realize the full value of the PTCs. Achievement of the 2020 deadline is a closing
18 condition of the BTA. Failure to do so prevents Ameren Missouri from closing the transaction.

19 **Q. What are some of the other advantages?**

20 A. Developers such as Terra-Gen have developed and maintain expertise in
21 executing the many steps needed to expeditiously and cost-effectively locate wind projects,
22 obtain needed property rights, complete required environmental and transmission studies, and
23 build, test, and place into operation projects of this type. This is expertise that Ameren Missouri

1 intends to develop over time, but is not expertise that Ameren Missouri possesses today. As
2 discussed above, Terra-Gen's expertise can be leveraged through its completion of this Project in
3 a shorter time frame than the Company could achieve if it used a self-build approach; that is, by
4 the approaching 2020 deadline to take full advantage of the PTCs.

5 **Q. How valuable are the PTCs?**

6 A. For the Project, the value of the PTCs is expected to be approximately \$400
7 million over 10 years.

8 **Q. Please elaborate on how the BTA structure maximizes the probability of**
9 **being able to capture that value.**

10 A. Under the BTA structure, the developer (Terra-Gen here) takes on the
11 construction and schedule risk, including the risk that the Project is not constructed and
12 transferred to the Company in time to qualify for the full PTC value. Terra-Gen is well suited to
13 take on that risk because of advantages it possesses due to (a) having already built good
14 community relations in the Project area, (b) having acquired **** _____ **** the land rights
15 needed for the Project, (c) having participated in the lengthy MISO transmission interconnection
16 queue process, and (d) having acquired safe harbor wind generation equipment.

17 **Q. Please outline the basic contractual arrangements between Ameren Missouri**
18 **and Terra-Gen in more detail.**

19 A. Attached to my testimony as Highly Confidential Schedule AKA-D1 is a
20 summary of the build transfer agreement. The entire agreement is also attached as Highly
21 Confidential Schedule AKA-D2. Key terms are as follows:

- 22 • The BTA is between Ameren Missouri and TG High Prairie Holdings, LLC ("TG
23 Holdings"). TG Holdings is the parent company of a special purpose limited

1 liability company, TG High Prairie, LLC (the "LLC"), which is the owner of the
2 Project.

3 • The LLC will ultimately acquire all of the property and other rights needed for the
4 Project, including equipment, land rights, transmission agreements and permits
5 needed for the construction and operation of the Project. More than ** ____** of
6 the land rights for locations where the wind turbines are expected to be placed
7 have already been acquired.

8 • Upon completion of the Project's construction (expected by ** _____**, but
9 no later than December 20, 2020), the ownership interests of the LLC will be
10 acquired by Ameren Missouri. The LLC will then immediately be merged into
11 Ameren Missouri and will, by operation of law, consequently cease to exist
12 leaving Ameren Missouri as the owner of all rights and obligations of the Project.

13 • The purchase price for 100% of the ownership interests in the LLC consists of a
14 base price of *** _____*** subject to certain adjustments outlined in the
15 BTA, plus additional minimal project diligence, governance, quality assurance
16 and oversight costs to ensure the Project is being built to Ameren Missouri's
17 specifications for an asset life of 30 years or more.⁶ This figure does not include
18 transmission interconnection costs which are yet to be determined.⁷ While we do
19 not expect the transmission interconnection costs to be this high, under the BTA,
20 the transaction will proceed so long as those transmission costs are *** ____
21 _____*** or less. The *** _____*** cap was imposed through the BTA

⁶ The base price will be reduced by *** _____*** per kilowatt ("kW") if the Project's capacity is less than 400 MW.

⁷ Transmission interconnection costs will be estimated after the MISO interconnection study process is complete.

1 to ensure the Project remains a cost-effective means of meeting the Company's
2 RES obligations even in the unlikely event that transmission interconnection costs
3 were to reach above that level.

- 4 • Terra-Gen is to commence construction after a number of conditions provided for
5 in the BTA are satisfied, including:

- 6 ○ Issuance by the Commission no later than January 31, 2019, of a final, un-
7 appealable CCN and a RESRAM without any conditions or requirements
8 that, in Ameren Missouri's sole discretion, are unacceptable;

- 9 ○ The Federal Energy Regulatory Commission's ("FERC") approval, no
10 later than January 31, 2019, to close the transaction under the BTA under
11 Section 203 of the Federal Power Act;⁸

- 12 ○ Completion of MISO interconnection studies by January 31, 2019,
13 indicating that the interconnection costs associated with the Project will
14 not exceed *** _____ ***, and

- 15 ○ Execution by the LLC by February 28, 2019, of a formal Interconnection
16 Agreement with MISO and Ameren Transmission Company of Illinois,
17 which owns the Mark Twain Transmission Line.

- 18 • The schedule for the Project estimates construction to commence by May 2019,
19 but no later than October 2019, and for it to be completed by ** _____ **, but
20 calls for the Project to be completed no later than December 20, 2020 so that full
21 advantage of available federal PTCs can be taken.

⁸ Ameren Missouri must secure FERC approval pursuant to Section 203 of the Federal Power Act to merge or consolidate the facilities into Ameren Missouri.

1 • There are certain provisions of the BTA that address the situation where the
2 Project capacity is less than 400 MW, but at least *** _____ ***, and options if
3 the Project's capacity is less than *** _____ ***, which I will discuss further
4 below.

5 • The BTA includes a number of provisions that protect Ameren Missouri and,
6 ultimately, its customers, including:

7 ○ *** _____
8 _____

9 ○ _____
10 _____

11 ○ _____
12 _____

13 ○ _____
14 _____

15 _____

16 ○ _____
17 _____

18 _____ ***

19 **Q. What are the main drivers of the Project schedule?**

20 A. The two main drivers are the increase in the RES portfolio requirements effective
21 in 2021 (an increase from 10% to 15%) and the annual reduction in the value of the PTC for
22 wind generation at the end of 2020. Consequently, we have outlined a schedule that is designed
23 to ensure that the Company is able to meet the RES portfolio requirement using wind from the

1 Project (and other projects for which we expect to file CCN applications soon), and that can take
2 maximum advantage of the PTCs, which results in lower RES compliance costs and therefore
3 lowers rates for our customers.

4 **Q. Why does the schedule estimate completion of the Project and closing by**
5 **** _____ ** when the full PTC is available so long as the Project is in-service by the**
6 **end of 2020, and the RES portfolio requirement does not increase to 15% until 2021?**

7 A. There are two primary reasons. First, there is always the potential for delay due to
8 unforeseen construction conditions or events outside the control of the developer that is
9 associated with any large, complex construction project. We would not want to pursue a schedule
10 that is so "tight" that we run a material risk of it not being placed in service by the end of 2020.
11 Missing that date would cause us to potentially lose the huge benefits the PTCs provide, which
12 as earlier noted, total approximately \$400 million. Second, once construction is done but before
13 we close (acquire the LLC interests), Terra-Gen has to satisfy *** _____
14 _____ ***, and it needs some time to do so. The schedule will provide time for *** _____ ***/br/>15 to be completed.

16 **IV. THE REQUEST FOR PROPOSALS PROCESS**

17 **Q. Please provide the background for the RFP process that led to selection of**
18 **the Project.**

19 A. In December 2015, Ameren Missouri issued a RFP for wind generation projects
20 that could begin producing energy in the 2018-2020 timeframe. Because each megawatt-hour
21 ("MWh") of Missouri wind counts as 1.25 MWh for RES compliance, the RFP stated a
22 preference for Missouri-based wind projects and for projects that would be interconnected with
23 the MISO system and deliverable to Ameren Missouri load without incurring additional "through

1 and out" transmission charges. The RFP sought bids under which Ameren Missouri could
2 acquire the wind.

3 **Q. What responses were received?**

4 A. In January 2016, the Company received responses from seven bidders, including
5 Terra-Gen, for the Project that is the subject of this case. The seven bidders proposed a total of
6 13 different projects, the aggregate capacity of which was in excess of 2,000 MW. The projects
7 were located in Missouri, Illinois, and Iowa.

8 **Q. How did the RFP process proceed after the bids were received?**

9 A. From approximately January 2016 to April 2016, the Company examined the bids
10 for the 13 projects for compliance with the RFP and engaged in a screening evaluation of each
11 response using certain selection criteria.

12 **Q. What were the selection criteria Ameren Missouri used in this initial
13 screening evaluation of the bids?**

14 A. In general, we evaluated and screened all 13 projects on technical, commercial,
15 and economic criteria, including the following key project elements: site control, wind
16 assessment, interconnection studies timeline, wind turbines offered in the project, environmental
17 assessment, and developer experience. Later in my testimony, I provide a more detailed
18 discussion of the specific criteria we used. As a result of this process, we narrowed our
19 consideration to a total of six projects proposed by four different developers: Terra-Gen High
20 Prairie; *** _____

21 _____ ***.

22 **Q. How did the RFP process proceed after you had narrowed the projects down
23 from 13 to 6?**

1 A. While evaluating the 13 projects and after narrowing the list to 6, we met with the
2 shortlisted developers in the summer of 2016, and each of them made a detailed presentation of
3 their project(s) and answered our questions.

4 In the fall of 2016, without Ameren Missouri's full due diligence and financial evaluation
5 being complete, the BTA pricing for Missouri wind generation projects without transmission
6 upgrade costs was generally in the range of *** _____ ***. As earlier noted,
7 the BTA for the Project is at a significantly lower price of approximately *** _____ **
8 (without any transmission upgrade costs), reflecting an almost 16% to 20% decline in price from
9 other Missouri wind projects offered in the initial RFP.

10 **Q. What led to the price decline?**

11 A. In order to fully maximize the value for Ameren Missouri customers, we
12 continued to engage in an ongoing price discovery process through discussions with the four
13 remaining bidders and with others, which included other wind developers that provided us with
14 unsolicited proposals. Through these ongoing evaluations and discussions, by the second half of
15 2017, we were able to determine that significant declines in wind project development pricing
16 were possible, particularly driven by lower wind turbine prices (wind turbines are a significant
17 component of a wind project's cost). We continued to discuss with the remaining bidders the
18 need for them to revise and refine their bids in light of these lower costs.

19 Our ongoing analyses and discussions also led us to the conclusion by the second half of
20 2017, that as a result of lower prices for wind generation, Ameren Missouri could utilize at least
21 700 MW of new Company-owned wind generation for RES compliance while also staying below
22 the 1% rate cap contained in the RES.

1 Our ongoing RFP evaluation, detailed financial diligence, and advances in the
2 development of wind turbine technology led us to conclude that a portfolio of at least 700 MW
3 of new Company-owned wind generation would be a cost-effective means to comply with the
4 RES requirements. Having quantified how much wind generation we would need, we proceeded
5 to narrow our options, including by accounting for the 1.25 multiplier for renewable energy
6 generated in Missouri (the multiplier is not available for projects outside Missouri, and without
7 it, we would need more than 800 MW of new wind). As part of that process, it became apparent
8 that the Project, in addition to being cost-effective on its own, would play an essential role in the
9 larger RES compliance portfolio that we needed. Since we need at least 700 MW, but the Project
10 only meets 400 MW of that need, we are continuing to negotiate for other projects and plan to
11 seek CCNs for additional projects for RES compliance in the near future.

12 **Q. Before the Company finalized its selection of Terra-Gen as the developer for**
13 **this project, were the major developers of wind projects in the United States afforded the**
14 **opportunity to provide bids for other projects in Missouri, Illinois, and Iowa for Ameren**
15 **Missouri's RES compliance?**

16 A. Yes. Between the seven bidders who initially responded to the RFP and the
17 additional developers who provided us with unsolicited proposals which I previously discussed,
18 the major wind developers in the U.S. have had the opportunity to bid projects in Missouri,
19 Illinois, and Iowa for RES compliance.

20 **Q. You mentioned earlier that you applied certain specific criteria when**
21 **evaluating the projects. What were the selection criteria that you used?**

22 A. The complete list of the criteria we applied for in the selection of projects to be
23 included in the RES compliance portfolio are project costs, PTC qualification and retention,

1 status of participation in the MISO queue, status of acquisition of required land rights, status of
2 environmental studies, wind conditions and expected capacity factor, turbine selection for
3 reliability of generation for the project, operations and maintenance costs and expected locational
4 market prices. As earlier noted, we applied all, or nearly all, of these to the 13 projects that were
5 initially bid, but with regard to the subset of 6 projects that were selected as part of the initial
6 screening process discussed earlier, we applied these criteria with more rigor. Since wind
7 projects can be meaningfully different in terms to these criteria, it is important to consider and
8 evaluate the impact on customers of all factors as an overall package resulting in an evaluation of
9 the total net revenue requirement before a project is selected.

10 I should also note that while we looked at numerous factors as listed above, no one factor
11 can be considered in isolation in the selection of a wind project, and the overall economics of a
12 project has to be considered. The overall economics of a project is a function of the total cost of
13 ownership over the asset life, expected generation, and market price of power as well as the net
14 benefits of a project to the Company's customers (reflected in its revenue requirement), which
15 are equal to the realized market price for the project's power, minus the project's revenue
16 requirement net of the PTCs. As outlined in Mr. Michels' testimony, the Project is expected to
17 result in hundreds of millions of dollars in net customer benefits over the life of the Project.

18 It is also important to note that because the Project will connect to the new Mark Twain
19 Transmission Line, which itself is within or near Ameren Missouri's load, the market price
20 differentials of wind energy from the Project in relation to market prices for Ameren Missouri's
21 retail load caused by transmission losses or constraints are expected to be negligible. This means
22 that the market prices realized for the Project's energy as a result of connection to the Mark

1 Twain Transmission Line are expected to be among the highest in Missouri, which provides
2 further benefit to customers by lowering the Project's revenue requirement.

3 **V. ADDITIONAL PROJECT RISKS, RISK MITIGATION, AND DETAILS**

4 **Q. Please outline the main risks associated with development and construction**
5 **of wind projects and how Ameren Missouri customers are protected through the BTA**
6 **structure for the Project.**

7 A. All projects of this magnitude carry risks, and that is true of the Project as well.
8 The main risks associated with this Project are as follows:

- 9 1. Transmission system interconnection;
- 10 2. Land control;
- 11 3. PTC value qualification;
- 12 4. Construction and PTC value retention; and
- 13 5. Conservation of endangered species.

14 **Q. Please explain the first risk relating to transmission system interconnection.**

15 A. Transmission system interconnection costs (here, from MISO) are an unknown
16 component of any wind generation project until the Generator Interconnection Agreement
17 ("GIA") is fully tendered to the project developer and the transmission owner. MISO has a
18 detailed and defined process to determine the transmission system interconnection costs through
19 various phases of transmission studies in the MISO queue process. The transmission
20 interconnection costs are a function of the MISO queue that a project is placed in, which also
21 includes all the other projects in the MISO footprint that are seeking interconnection agreements.
22 This includes other projects that are ahead of the project under consideration in the queue, as
23 well as all the other projects that are in the queue behind the subject project. Ultimately, the

1 transmission interconnection costs depend on how many projects in the queue process actually
2 proceed to complete construction and commissioning. For all these reasons, interconnection
3 costs remain an unknown cost even at this stage of developing the Project.

4 **Q. From a practical perspective, what does this mean for the Project?**

5 A. The MISO queue process has three phases before the final generation
6 interconnection costs are known. The Project is currently in the early stages of the first phase. As
7 each phase is completed, additional study deposits must be paid – and after the second phase, on
8 a non-refundable basis. After the second phase is completed, which for the Project is expected by
9 early fall of this year, a non-refundable guarantee payment to MISO equal to 20% of the then-
10 expected transmission interconnection costs is due to cover further study costs and to prove the
11 developer is serious about continuing to pursue the Project. This sum is non-refundable and it
12 must be timely paid; otherwise, the Project will lose its place in the MISO queue and the
13 developer will lose any realistic chance of completing the Project on time to capture the full
14 value of the PTCs. The final estimated costs are known after completion of the third phase, after
15 which the GIA is tendered. Therefore, typically for a wind project, transmission interconnection
16 costs become known before project construction starts and when the GIA is signed. We expect
17 the third phase to be completed in early 2019.

18 **Q. How has the Company mitigated the risks relating to transmission**
19 **interconnection in the BTA?**

20 A. *** _____
21 _____
22 _____
23 _____

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____ ***

8 **Q. What do you expect both of these non-refundable payments and the ultimate**
9 **interconnection costs for the Project to be?**

10 A. As I mentioned, we cannot know for sure, but we have performed sensitivity
11 studies to determine the range of transmission interconnection costs that are cost-effective for
12 customers for Ameren Missouri RES compliance purposes. Those studies indicate that even if
13 the transmission interconnection costs were as high as *** _____ ***, the Project remains
14 cost-effective for customers. While we do not expect the costs to approach the *** _____
15 _____ *** figure as outlined in Mr. Michels' testimony, RES compliance costs are not expected
16 to exceed the 1% cap for RES compliance even when we stress the financial assumptions for the
17 Project to reflect such an amount for transmission interconnection costs.

18 **Q. With the Commission's approval of the Mark Twain Transmission Line, why**
19 **would transmission interconnection costs potentially be as high as *** _____ ***?**

20 A. Again, we do not believe they will be, but we set a *** _____ *** limit in
21 the BTA because the sensitivity analysis results indicated that the Project is worth doing even if
22 the costs were that high. In response to your specific question, it is important to note that
23 transmission interconnection costs may consist of costs that are not strictly "interconnection"

1 costs in the sense of needing to upgrade the transmission line to which the wind project
2 physically connects. We do not expect any upgrade costs will be required for the Mark Twain
3 Transmission Line. However, the interconnection of generation at any point within the MISO
4 footprint can cause impacts elsewhere on either the MISO's system or on a neighboring
5 transmission system. This could necessitate upgrade costs elsewhere. Such costs also fall within
6 the "interconnection cost" category.

7 **Q. I understand that you expect the interconnection costs to be much less than**
8 ***** _____ ***, but what happens if they exceed *** _____ ***?**

9 A. Ameren Missouri can choose at that time whether or not to proceed with the
10 Project. Consequently, the BTA protects Ameren Missouri in the unlikely circumstance that
11 interconnection costs are so high that a different means of complying with the RES may be
12 appropriate.

13 **Q. Please address the risks associated with land control.**

14 A. Land control is an essential component of developing the optimized site layout for
15 a wind generation project. Until land control is complete, it is not possible to finalize the optimal
16 layout and configuration of the towers, nor can each tower be "micro-sited" in a manner to
17 optimize each turbine's energy production and capacity factor.

18 **Q. How has the Company mitigated that risk?**

19 A. As part of the selection of the portfolio of projects chosen for compliance with the
20 Missouri RES, the Company has only chosen projects that are expected to have substantial land
21 control complete before the CCN is filed or, at the latest, by the time the CCN is approved. In the
22 case of the Project, Terra-Gen has already acquired more than approximately **** _____ **** of the
23 land rights needed for expected wind turbine locations for the Project. The rest of the land rights

1 acquisition is expected to be completed shortly after the CCN filing. Once land control is
2 complete, a normal part of the development process is to reconfirm the locations of all wind
3 turbines (i.e., micro-site them) to fully optimize the site layout consistent with any requirements
4 in the applicable agreements. Moreover, under the BTA, Terra-Gen cannot achieve Project
5 completion and Ameren Missouri does not have to close if Terra-Gen does not have all of the
6 necessary land rights. ***

8 ***

9 **Q. Please address the risks associated with PTC value qualification.**

10 A. As mentioned earlier in my testimony, an important step to qualify for the full
11 PTC value is to incur by no later than December 31, 2016, 5% of the qualified value of the
12 project, including through the purchase of wind generator components that will be used in the
13 Project and having title transferred and delivery within a specified time period. The other main
14 aspect of receiving 100% of the PTC value is that the Project must be commercially operational
15 and placed in service by December 31, 2020.

16 **Q. How has the Company mitigated that risk?**

17 A. In addition to its internal due diligence, the Company has also hired a reputable
18 external law firm to provide a legal opinion that the Project meets the requirements of
19 qualification for the full PTC value including the timely purchase of 5% of the qualified project
20 value in wind generator components. As a condition to the Company's entering the BTA, that
21 law firm must have been able to issue a legal opinion confirming that Terra-Gen has completed
22 all steps for the Project to qualify for the 5% safe harbor to receive full value for the PTCs. We
23 have that legal opinion.

1 **Q. Please address the risks associated with project construction and PTC value**
2 **retention.**

3 A. Wind generation is no longer a nascent industry in the United States given that
4 approximately 89,000 MW of projects have already been constructed. The construction process
5 is therefore well known. However, as with any large construction project, there are sometimes
6 issues that need to be resolved. In the case of wind generation, these issues may include concerns
7 from specific land owners, differences regarding scope of work, force majeure, delay in
8 transmission studies, permitting, negotiating project procurement and construction agreements,
9 procurement of long lead time materials, etc. An important aspect of receiving full PTC value is
10 that the Project must be completed by the end of 2020, unless certain events occur that are
11 excusable under the Internal Revenue Service Code. The main difference in constructing a wind
12 generation project in the normal course as compared to completing one by the end of 2020, is the
13 schedule risk associated with ensuring that the Project is commercially operational by the end of
14 2020.

15 **Q. How has the Company mitigated that risk?**

16 A. The BTA places the construction and schedule risk for completion of the Project
17 by the end of 2020 on Terra-Gen. The Project must have a capacity of at least *** _____**⁹
18 for Ameren Missouri to close by buying the LLC interests. As for any wind turbine generators
19 ("WTGs") that do not meet the BTA's requirements to achieve Project completion by that date,
20 Ameren Missouri has no obligation to buy them.

21 **Q. I thought the Project was for 400 MW. Are you saying it might be a *** _____**
22 ***** project instead?**

⁹ The BTA allows for the project's aggregate nameplate capacity to be less than *** _____** in certain circumstances such as force majeure.

1 A. The Project specifications are to construct a 400 MW wind farm. However, the
2 BTA's terms provide that if by the project completion deadline *** _____ *** or more of
3 generation are built according to the specifications, Ameren Missouri will buy the LLC and close
4 the transaction. However, Ameren Missouri will not pay for the remaining WTGs (i.e., the other
5 *** _____ ***) unless and until they too are operable by *** _____ ***. If that
6 happens, Ameren Missouri will release purchase price funds withheld at closing, *** _____
7 _____ ***, and those additional WTGs (which will have then become
8 "compliant") will be part of the larger wind farm and used for RES compliance. This is why we
9 are asking the Commission, in its order in this case, to include permission to buy those additional
10 WTGs if they become compliant by the *** _____ *** deadline.

11 **Q. Please address the risks associated with conservation studies.**

12 A. Part of the development of a wind generation project is a conservation study of
13 the impact of the project on endangered species. Based on the results of the study, the wind
14 generation owner and operator may need to take certain measures to minimize the impact of the
15 wind farm operations on endangered species.

16 **Q. How has the Company mitigated that risk?**

17 A. Terra-Gen is already working with the U.S. Fish and Wildlife Service ("USFWS")
18 and state agencies (such as the Missouri Department of Conservation) that are included in the
19 USFWS process to determine if any mitigation measures may be required, and what those
20 measures might be. Ameren Missouri will also cooperate and provide input to Terra-Gen as it
21 works through these regulatory processes. In addition, as outlined in the BTA, the majority of the
22 cost of any such measures would be borne by Terra-Gen.

1 **Q. Are any permits needed with respect to endangered species in order to**
2 **construct the Project?**

3 A. No. The Project can be constructed without any such permits.

4 **Q. When you earlier described the contract, you stated that Ameren Missouri**
5 **would acquire 100% of the ownership interest in the LLC and would then merge the LLC**
6 **into Ameren Missouri. Does this approach pose any risks to Ameren Missouri or its**
7 **customers?**

8 A. No, it does not.

9 **Q. Please explain.**

10 A. As I stated earlier, the LLC is a special purpose entity owned solely by TG
11 Holdings. Its only assets and liabilities will be those acquired or incurred to construct and operate
12 the Project. Consequently, it has no exposure to liabilities of any other project or to the
13 operations of Terra-Gen or to any of its affiliates. Moreover, under the terms of the BTA, the
14 LLC is contractually required not to acquire any asset that is not necessary or otherwise relevant
15 for the construction, ownership, or operation of the Project. The LLC must have fully performed
16 all of its obligations under the BTA, including satisfaction of a number of conditions precedent,
17 before Ameren Missouri has an obligation to buy the LLC.

18 **Q. Why wouldn't Ameren Missouri simply buy the assets that make up the wind**
19 **generation project from the LLC?**

20 A. Buying the assets would be far more cumbersome, would create a greater
21 likelihood of making a mistake (overlooking assets, etc.) and causing potential delays, and would
22 provide no advantages whatsoever. As noted, the LLC was formed solely to hold the Project

1 assets and rights. By buying the ownership interests in the LLC, Ameren Missouri will, of
2 necessity, acquire the entire Project via a straightforward and less risky process.

3 **Q. Will merging the LLC into Ameren Missouri pose any regulatory issues?**

4 A. No. The merger is a rather simple "paper exercise" that will be accomplished by a
5 standard agreement of a merger between the LLC (*after* Ameren Missouri has acquired it) and
6 Ameren Missouri, coupled with appropriate filings with the Secretaries of State in Delaware and
7 Missouri. Upon the making of those filings, the LLC will cease to exist and Ameren Missouri
8 will own the LLC's assets (the Project) just as if Ameren Missouri had bought the assets, but
9 without the more involved steps and risks an asset purchase can pose. Moreover, the book value
10 of the assets on Ameren Missouri's books will be exactly the same as it would have been had
11 Ameren Missouri simply bought the assets. And the same property accounting records will also
12 be available for audit during all regulatory and ratemaking proceedings.

13 **Q. I note that the Project that is the subject of this case is an approximately 400**
14 **MW project, but that the Company needs approximately 700 MW to 800 MW for RES**
15 **compliance once the RES portfolio requirement increases to 15% in 2021. How will the**
16 **remaining capacity be obtained?**

17 A. As discussed earlier, we are continuing to negotiate with developers for additional
18 projects arising from the RFP process and presently expect to file one or two additional CCN
19 applications in the near future.

20 **VI. ECONOMIC DEVELOPMENT**

21 **Q. Does the Project represent an economic development opportunity for the**
22 **State of Missouri?**

1 A. Yes, the economic impact of the Project on the state will be substantial. We
2 anticipate that over 400 high-quality construction jobs will be created while the Project is being
3 constructed. After construction is complete, approximately 15-20 permanent jobs will be
4 required to operate the Project. In addition, landowners in Schuyler and Adair counties will
5 receive *** _____ *** in lease payments over the period of the Project's
6 operation. And finally, tax collections by state and local governments will all increase as a result
7 of the Project. In addition to these direct economic benefits, significant indirect benefits will be
8 realized by restaurants, gas stations, hotels, stores and other businesses in the vicinity of the
9 Project.

10 **VII. TIMING AND SUMMARY OF RELIEF REQUESTED**

11 **Q. Please summarize the Company's request in this case.**

12 A. The specific relief requested is set forth in the Company's Application filed
13 concurrently with the filing of my direct testimony. In that Application and a separate Motion to
14 Adopt Procedural Schedule, the Company proposes a schedule driven primarily by (a) the need
15 to pay, by early fall 2018, a non-refundable deposit to MISO relating to transmission
16 interconnection studies, and (b) the need to be able to satisfy a condition precedent to proceeding
17 as reflected in the BTA relating to obtaining the requested CCN and RESRAM in time for
18 construction to proceed on a schedule to be sure the full PTC value can be captured. In those
19 filings, the Company proposes shortened response times for responding to discovery and other
20 procedural milestones designed to facilitate understanding of the Project and Application by the
21 parties and hopefully the ability to resolve this case without a contested hearing.

22 **Q. Does this conclude your direct testimony?**

23 A. Yes, it does.

