

STATE OF IOWA
DEPARTMENT OF COMMERCE
BEFORE THE IOWA STATE UTILITIES BOARD

FILED WITH
Executive Secretary
April 30, 2015
IOWA UTILITIES BOARD

IN RE: :
: :
APPLICATION OF MIDAMERICAN : DOCKET NO. RPU-2015- 0002
ENERGY COMPANY FOR A : :
DETERMINATION OF RATEMAKING : :
PRINCIPLES : :
: :
:

DIRECT TESTIMONY
OF
ADAM L. WRIGHT

1 Q. Please state your name and business address.

2 A. Adam L. Wright. My business address is 4299 Northwest Urbandale Drive,
3 Urbandale, Iowa 50322.

4 Q. By whom are you employed and in what position?

5 A. I am the Vice President - Wind Generation and Development for MidAmerican
6 Energy Company (“MidAmerican” or “Company”).

7 Q. Please describe the responsibilities of your current position.

8 A. My responsibilities include all aspects of developing, constructing, operating and
9 maintaining wind generation assets for MidAmerican. I managed the development
10 and construction of the final 406.9 MW of MidAmerican’s Wind VII project, and
11 I am currently managing the 1,050-MW Wind VIII and 162-MW Wind IX
12 projects that were approved by the Iowa Utilities Board (“Board”) in August 2013
13 and January 2015, respectively. MidAmerican is now proposing to construct
14 additional economic wind generation—the Wind X Iowa Project (“Wind X” or
15 “Project”), under a new, but mostly similar, set of proposed ratemaking
16 principles, to be located at two Iowa sites discussed later in my testimony. We are
17 targeting up to 552 MW (nameplate capacity) of new wind generation assets
18 under Wind X.

1 **Q. Please describe your educational background and business experience.**

2 A. I received a Bachelor of Science degree in Civil Engineering from the University
3 of Nebraska-Omaha in December of 2002. In 2003, I joined Northern Natural Gas
4 Company (“Northern”), a subsidiary of Berkshire Hathaway Energy Company,
5 and held various positions within the company in the areas of pipeline safety,
6 compliance, project development and management and marketing. My last role at
7 Northern Natural Gas was Vice President, Marketing, which I held from 2010
8 through 2011. In 2012, I transferred to MidAmerican where I was named Vice
9 President –Wind Generation and Development, which is the position I currently
10 hold.

PURPOSE OF TESTIMONY

11 **Q. What is the purpose of your testimony?**

12 A. The purpose of my testimony is to address the following:

- 13 • Address project timing considerations MidAmerican must contend with,
14 including those relating to obtaining Production Tax Credit (“PTC”) benefits
15 for the Project.
- 16 • Explain how wind generation serves as a considerable economic development
17 asset for Iowa by helping to attract new businesses to our state and
18 encouraging existing businesses to expand.
- 19 • Review MidAmerican’s experience with constructing and operating wind
20 generation to demonstrate MidAmerican’s ability to successfully construct
21 and operate the Project.
- 22 • Address the following with respect to Wind X: ownership, site description,
23 general description, raw materials used and wastes created, financial and
24 contractual commitments, general contractor, operator, mitigation of
25 construction and operating risks, economic impact, and efficiency and control
26 technologies.
- 27 • Provide information supporting proposed ratemaking principles governing (i)
28 cost cap, (ii) size cap and (iii) the depreciation life of Wind X.
- 29 • Explain why MidAmerican believes no siting certificate is required for
30 Wind X.

1 **Q. Please summarize the key points of your testimony.**

2 A. Wind generation is great for our customers and in order to bring this renewable
3 resource to fruition MidAmerican must again act swiftly in order to capture the
4 on-again, off-again PTC. This Project, with its ability to be PTC-qualified,
5 presents another unique opportunity to add wind generation capacity and deliver
6 the associated benefits discussed in this Application at no net cost to customers.

7 Because MidAmerican is committed to delivering sustainable energy
8 solutions to our customers, MidAmerican put itself in position in December 2014
9 (after the PTC was extended to facilities that begin construction in 2014) to have
10 one or more wind projects qualify for PTCs. This was made possible as a result of
11 MidAmerican purchasing certain turbine equipment that could be deployed at a
12 wind site and brought on line by the end of 2016. However, in order to do so,
13 significant financial commitments must be made beginning in the first part of
14 September 2015. A Board decision before September 9, 2015¹ will allow
15 MidAmerican to move forward with those financial commitments without
16 imposing significant risk to our customers and the Company.

17 MidAmerican has been working in earnest since purchasing the turbine
18 equipment mentioned above to identify development sites and assess the site
19 characteristics, costs, risks and benefits to customers. MidAmerican believes it is
20 important to complete this detailed assessment and establish a general
21 understanding around the key contractual terms related to asset acquisition and
22 equipment procurement prior to filing for advance ratemaking principles. Filing

¹ MidAmerican respectfully requests that the Board act on this Application by August 15, 2015, to allow MidAmerican time to assess the Board's order, assess any impacts from the Order, and make a final "go-no go" decision prior to the key contractual decision dates discussed later in my testimony. An Order by September 9, 2015, is the latest an Order could be received to allow MidAmerican to make the appropriate notices under those contracts.

1 before the costs and benefits are better understood likely would result in data
2 becoming inaccurate or irrelevant during the course of the ratemaking proceeding.

3 We now are in a position to file for advance ratemaking principles and are
4 confident we can deliver the Project and the associated benefits based on the facts
5 contained in this Application and MidAmerican's extensive track record of
6 building and operating wind projects in Iowa.

PROJECT TIMING CONSIDERATIONS

7 **Q. Please address the timing considerations involved in MidAmerican's request**
8 **for approval of Wind X ratemaking principles.**

9 A. In Wind X, there are three main considerations with respect to timing. First, PTC
10 benefits are important to support the Project's economics. Without prompt action,
11 MidAmerican would not be in a position under certain Wind X-related contracts
12 to pursue the Project and to qualify the Project for the PTC. The inability to
13 timely obtain development sites that qualify for such PTC benefits changes the
14 risk and cost profile substantially, almost certainly resulting in a decision not to
15 proceed.

16 Second, the sooner MidAmerican proceeds and places the facilities in
17 service, the sooner the state of Iowa begins to realize the economic development
18 benefits and the sooner our customers will realize the benefits from the customer
19 revenue credit as discussed further in the testimony of MidAmerican witness
20 Specketer.

21 Third, MidAmerican is required to expend certain amounts prior to a
22 decision by the Board on the ratemaking principles in this proceeding (e.g. non-
23 refundable contract execution payments for the Project sites and costs for site due
24 diligence studies), and also will be exposed to termination costs under certain

1 contracts beginning in September 2015, with the amounts of any such termination
2 costs increasing over time. Therefore, if a decision by the Board on this
3 Application is not received in time to make key contractual decisions by the
4 deadlines agreed to in the respective contracts, MidAmerican would have to make
5 the tough choice of either abandoning pursuit of the Project or exposing itself and
6 customers to significant cancellation costs if the Project is pursued past the
7 contractual decision dates without approval of the Wind X ratemaking principles.

8 **Q. Please elaborate upon the PTC considerations involved in Wind X.**

9 A. Based on the recent one-year extension of the PTC that occurred in December
10 2014 (effectively the extension was only a few weeks given that owners were
11 required to begin construction of the wind facilities prior to the end of 2014),
12 projects that were under construction before January 1, 2015, will automatically
13 qualify for the PTC so long as the facilities are constructed and placed in service
14 before January 1, 2017². The IRS applies this standard in a way that allows a
15 developer to meet the “begin construction” requirement in more than one way.

16 First, developers may start physical construction of a significant nature at
17 the site before January 1, 2015. Second, as an alternative to commencing physical
18 construction, developers may satisfy the “begin construction” requirement by
19 incurring 5% of the total cost of the project before January 1, 2015, and thereafter
20 showing continuous efforts to advance towards completion.

21 The IRS guidance makes it clear that after “beginning construction” before
22 January 1, 2015, MidAmerican must make “continuous effort” to advance the
23 project in order to qualify for the PTC. Further guidance issued by the IRS in

² If the Project is not completed before January 1, 2017 as the result of a force majeure event or some other issue outside of MidAmerican’s control, there is reasonable basis to believe that MidAmerican would be able to demonstrate “continuous effort” to qualify the Project for the PTC.

1 2015 stated that projects meeting the “begin construction” requirement and that
2 are placed in service before January 1, 2017, will be deemed to have
3 automatically satisfied the “continuous effort” requirement.

4 Therefore, it is critical that certainty on ratemaking principles be provided
5 in time for the required investments and commitments to be made toward
6 completion of the sites before January 1, 2017.

7 **Q. How do these requirements impact MidAmerican’s desire to pursue**
8 **Wind X?**

9 A. In December 2014, MidAmerican put itself in position to take advantage of the
10 PTC by purchasing turbine equipment that would meet the 5% cost threshold to
11 satisfy the “begin construction” requirements (“Safe Harbor Equipment”) for up
12 to [REDACTED] MW³. Under the terms of the turbine supply agreement relating to the Safe
13 Harbor Equipment, with [REDACTED] (“Vendor A”), MidAmerican must make a
14 decision on the deployment of the Safe Harbor Equipment by [REDACTED] 2015
15 or assume significant financial risk. MidAmerican was able to negotiate this
16 commitment in a way to minimize financial risk should MidAmerican decide to
17 not pursue the Project further, including in the event Wind X did not obtain Board
18 approval by that date. Specifically, MidAmerican purchased the Safe Harbor
19 Equipment but retained the right to [REDACTED]
20 [REDACTED] if viable Wind X sites were not identified

³ Part of the evaluation for selecting sites was whether project developers possessed equipment purchased before the end of 2014 to meet the “begin construction” requirement. The Site A site contemplates using the Safe Harbor Equipment, while the Site B site contemplates using [REDACTED] (Developer) safe harbor equipment. “Developer” as used here means the project developer of the Wind X sites that MidAmerican plans to acquire.

1 or Board approval of the proposed Wind X ratemaking principles was not
2 received by [REDACTED] 2015⁴.

3 Turbine suppliers almost universally require notification to proceed with
4 manufacturing approximately eight to nine months prior to the first scheduled
5 delivery – the requirement for Wind X is no different. In order to ensure
6 completion of the Project by December 31, 2016, and based on expected
7 manufacturing plant loadings for the turbine suppliers, turbine deliveries are
8 planned to start around June 2016. The turbine supply agreement being negotiated
9 with [REDACTED] (“Vendor B”) contemplates a similar delivery
10 timeframe, also requiring a notice to proceed be given by [REDACTED], 2015.

11 Approximately [REDACTED] MW of Wind X’s wind turbines, including the Safe
12 Harbor Equipment⁵, would be placed at the [REDACTED] site (Site A), which is to be
13 located in [REDACTED] County just [REDACTED] and the
14 remaining approximately [REDACTED] MW of Vendor B turbines, including safe harbor
15 equipment that would be acquired from the developer of the sites (“Developer”),
16 would be placed at the [REDACTED] site (Site B) located in [REDACTED] County. These two
17 sites would be qualified for PTC based on incurring 5% of the estimated project
18 cost before January 1, 2015, through the MidAmerican purchase of the Safe
19 Harbor Equipment from Vendor A, and the safe harbor equipment from Vendor
20 B) purchased by Developer, as previously mentioned. MidAmerican must also act

4 MidAmerican is requesting Board approval of the ratemaking principles by [REDACTED] 2015, to allow time for the appropriate notifications to be made prior to the [REDACTED] 2015, turbine decision deadline.

5 MidAmerican is only utilizing [REDACTED] MW of its [REDACTED]-MW available quantity as the Project economics are improved by utilizing more Vendor B wind turbines, which have [REDACTED] than the Vendor A units. Developer’s contract with Vendor B also requires any site that utilizes the Developer safe harbor equipment to be fully built-out using other Vendor B equipment. Developer only offered enough safe harbor equipment to qualify up to a [REDACTED] MW site. Therefore, in order to maximize the use of the Vendor B equipment, the larger of the two sites, the Site B site, will utilize Vendor B equipment leaving the Site A site as the destination for the Safe Harbor Equipment and Vendor A units.

1 swiftly to ensure the Wind X sites can be fully developed and that construction is
2 completed before January 1, 2017. Specifically, MidAmerican must make
3 commitments to Developer such that they have an incentive to aggressively
4 pursue interconnection rights, landowner easements, environmental studies and
5 reports and county permits to allow development to be completed before spring
6 2016 so that balance of plant construction work⁶ can be started ahead of
7 anticipated turbine deliveries.

8 As it is, MidAmerican will incur some payments and assumption of risk
9 under current and future contracts, between now and September 2015, in
10 connection with site acquisition and development. However, before the “go or
11 no-go” deadline on the turbines—[REDACTED] 2015, which will require
12 significant cost commitments (cost commitments that are materially more
13 significant than payments that will be made in the interim period between the
14 filing of this Application and early September 2015), MidAmerican needs to
15 know the ratemaking principles that would apply if it were to undertake
16 construction of Wind X.

17 In order to provide the Board adequate time to complete the Board’s
18 review and issue an order, we are pursuing ratemaking principles now to receive
19 the Board’s decision by September 9, 2015⁷ so that MidAmerican and its
20 customers do not lose opportunities to take advantage of incremental economical
21 wind projects. Further, the ratemaking principles for which MidAmerican seeks
22 approval largely mirror past ratemaking principles that have been historically
23 supported by the Office of Consumer Advocate and approved by the Board.

⁶ Balance of plant construction work includes installation of access roads, foundations, crane pads and collection system cabling. The balance of plant contractor also completes the turbine erection scope of work.

⁷ Again, a decision by August 15, 2015, if possible, would be preferable.

1 **Q. Why did MidAmerican not file its Ratemaking Principles Application earlier**
2 **in 2015?**

3 A. MidAmerican could have filed earlier. However, had the Company done so there
4 would have been a much greater range of uncertainty as to whether it could
5 deliver a viable Project. Thus, MidAmerican, the Board and other parties likely
6 would have analyzed information that would soon become obsolete or inaccurate
7 as more precise information became known.

8 It takes considerable time to identify, investigate and evaluate sites for
9 potential development, not to mention the time it takes to understand and assess
10 the financial arrangements and risk allocations with MidAmerican's contractual
11 counterparties that are necessary to yield customer benefits. Since purchasing the
12 Safe Harbor Equipment discussed earlier, MidAmerican began earnestly
13 evaluating several sites totaling a couple thousand megawatts that were being
14 developed by multiple developers, but we have not until recently been able to
15 obtain enough information to be able to more thoroughly assess their viability.
16 Analysis during the first several months of 2015 has enabled MidAmerican to
17 hone in on the two above-mentioned sites. MidAmerican believes these sites can
18 be PTC-qualified, with construction completed before January 1, 2017.

19 Moreover, our analysis now concludes that the Project is likely to pass the
20 economic threshold of no customer harm, as discussed in the testimony of
21 MidAmerican witness Specketer. The Project's viability is based upon an
22 assessment of the permitting requirements, landowner support and environmental
23 sensitivities, and the economics of the sites taking into account the cost of the
24 development assets and the estimated energy production. All other sites reviewed
25 by MidAmerican were dropped because they either could not be PTC-qualified,

1 presented unacceptable environmental risks or they did not facilitate a site that
2 would pass the Company's economic test (no net cost to customers)
3 (MidAmerican witness Specketer addresses the Company's economic analysis
4 and the break-even point for customers).

5 It is now clear, based on the estimated development and construction costs
6 and risks, and the energy production for the targeted Wind X sites that we have a
7 viable Project to present to the Board.

8 Typically, cost uncertainty for a wind project is high and development
9 certainty low during the first few months of evaluation. As time passes and
10 additional information is gathered and contractual provisions are put in place, cost
11 uncertainty generally decreases and development certainty significantly improves.
12 Certainty regarding both cost and development continue to improve through
13 project completion.

14 MidAmerican values its reputational integrity and deems it prudent to only
15 file when it is more certain than not that Project site(s) can be delivered in line
16 with the economic assumptions and Project timeline.

17 **Q. Please address whether there is an optimal time for the Board's completion**
18 **of its review of MidAmerican's Ratemaking Principles Application.**

19 A. It would be ideal if the Board could rule on MidAmerican's Ratemaking
20 Principles Application no later than September 9, 2015. MidAmerican is already
21 holding discussions with Developer, Vendor B, and Midcontinent Independent
22 System Operator, Inc. ("MISO") (negotiations with Vendor A are complete), in an
23 effort to be in a position to deploy resources and turbines to complete construction
24 by the PTC deemed continuous construction deadline (i.e., before January 1,
25 2017).

1 As stated above, MidAmerican will incur some risk before obtaining
2 ratemaking principles, but we hope to mitigate those risks by obtaining
3 ratemaking principles before key financial commitments need to be made with
4 respect to the turbine equipment – which again represents the most significant
5 Project cost. Once ratemaking principles are put in place, MidAmerican can make
6 the very significant financial commitments that are needed to move Wind X
7 forward.

8 **Q. What other considerations factor into the optimal time for the Board’s**
9 **completion of its review of this case?**

10 A. MidAmerican believes the current market conditions for adding new wind
11 generation that can be qualified for the PTC under the 2014 extension of the PTC
12 are very limited in Iowa, and this opportunity would be lost if MidAmerican is not
13 able to make the contractual commitments described earlier in my testimony from
14 essentially [REDACTED] 2015 onward, in order to ensure: (1) development sites
15 are acquired and development activities are completed, (2) balance of plant
16 services are competitively bid in 2015 at an optimum time in the market (balance
17 of plant resources are expected to tighten when demand increases in 2016 as
18 developers push to bring projects on line in the last year of the PTC extension)
19 and (3) the wind turbine supply chain is formed to take full advantage of the
20 construction season that will begin in early spring 2016.

21 Thus, one can see that we have a tight timeline for developing Wind X to
22 deliver the stated benefits to customers. Approval by September 9, 2015, will
23 enable these investments and commitments to be made in line with Project
24 timeline requirements (e.g., Safe Harbor Equipment commitments, transformer
25 progress payments, acquisition closing payments, turbine shipment and delivery

1 payments).

2 **Q. Please provide additional details on your arrangement with Developer.**

3 A. MidAmerican has been working with Developer to agree to terms and conditions
4 for the acquisition of the development assets associated with the two Wind X
5 sites. MidAmerican would acquire the sites, fully developed, at a weighted-
6 average cost of approximately \$ [REDACTED]/kW, plus approximately \$ [REDACTED] for safe
7 harbor equipment to qualify the Site B project, and reimbursement for any
8 interconnection costs incurred by Developer prior to closing on the acquisitions.

9 Execution of the asset purchase agreements is expected to occur by mid-
10 June 2015, or MidAmerican may lose its ability to acquire the assets due to
11 competition for Developer's safe harbor equipment. A nonrefundable payment of
12 \$ [REDACTED] will be due at the time the asset purchase agreement is executed.
13 However, MidAmerican would not be obligated to close on the transaction and
14 would not be obligated to any further payments prior to [REDACTED], 2015, if
15 approval of the proposed Wind X ratemaking principles has not been received.
16 After [REDACTED], 2015, MidAmerican would be required to close on the
17 transaction and pay all remaining amounts due (including the \$ [REDACTED]
18 payment for Developer's safe harbor equipment) if Developer is able to deliver on
19 conditions precedent to closing, such as obtaining all necessary landowner
20 easements, interconnection rights, title insurance, environmental studies, etc.

21 In addition, MidAmerican is negotiating a [REDACTED] cost-sharing
22 provision that provides an additional \$ [REDACTED] of contingency toward the cost
23 cap. In other words, if the actual [REDACTED] costs exceed the level estimated
24 in the model, Developer would cover [REDACTED] of the overage up to \$ [REDACTED]

1 [REDACTED]⁸.

2 The total amounts expected to be paid to Developer have been reflected in
3 the economic model analyses supporting Wind X (and addressed by
4 MidAmerican witness Specketer), including in the calculation of the Project cost
5 cap.

ECONOMIC DEVELOPMENT BENEFITS

6 **Q. Please elaborate on the economic development benefits.**

7 A. These benefits arise in a number of ways over the 30-year life of the Project. First,
8 multiple communities will benefit from the added tax base. These benefits are
9 estimated to exceed \$160 million.

10 Second, landowners who host wind turbines or are otherwise included in
11 the Project will receive annual payments totaling more than \$115 million. This
12 additional revenue stream makes its way back into the local economy through
13 incremental purchases to improve farming operations and make home
14 improvements, or make other purchases that might have otherwise been deferred.

15 Third, renewable energy is a considerable economic development asset for
16 Iowa by helping to attract new businesses to our state and encouraging existing
17 businesses to expand. For example, recent decisions by Facebook to locate a new
18 facility in Altoona, Iowa, and by Google and Microsoft to expand their Iowa
19 facilities were heavily influenced by having a significant wind power portfolio on
20 the MidAmerican system.

21

⁸ [REDACTED] costs in the model are estimated at approximately \$ [REDACTED]. If the actual costs are \$ [REDACTED] for example, Developer will pay \$ [REDACTED] – making MidAmerican’s total obligation only \$ [REDACTED]. If the cost-sharing mechanism were not in place, MidAmerican’s total obligation would be \$ [REDACTED] higher, further eroding the space between the estimated Project cost and the Project cost cap.

1 Fourth, there will be benefits associated with the Wind X construction
2 workers in the communities where they spend money and in the communities
3 where wind generator components are purchased. Local spending in Iowa is
4 estimated to increase by more than \$200 million in 2016 during the construction
5 of Wind X through construction worker spending and purchases of wind
6 generator components from Iowa-based manufacturers.

7 Fifth, and lastly, there will be some additional new permanent jobs arising
8 from Wind X for maintenance professionals, approximately one for every 30
9 MW.

MIDAMERICAN'S CONSTRUCTION/OPERATING EXPERIENCE
WITH WIND POWER

10 **Q. Please describe the wind generation MidAmerican has developed pursuant to**
11 **prior Board ratemaking principles orders.**

12 A. Since 2004, MidAmerican has successfully constructed approximately 2,840 MW
13 of wind generation assets at 16 discrete locations in Iowa, and currently is
14 constructing another 657 MW at two new locations as follows: the remaining 495
15 MW under the Wind VIII project approved by the Board in 2013, and 161 MW
16 under the Wind IX project approved by the Board in 2015. In the remainder of my
17 testimony, I will refer to the aforementioned projects collectively as the "Wind
18 Power Projects".

19 **Q. Please describe MidAmerican's experience with the existing Wind Power**
20 **Projects, both in terms of construction costs compared to the pre-project cost**
21 **caps, and in terms of operating experience.**

22 A. MidAmerican has been successful managing construction costs and operations
23 activities. Furthermore, MidAmerican has been able to stay at or under the
24 respective cost caps in each of the prior filings. The table below provides a

1 summary comparison of MidAmerican’s actual or projected project costs relative
 2 to the cost caps approved by the Board in our prior Wind Power Projects.

<u>Project</u>	<u>MW</u>	<u>Cost Cap</u>	<u>Cost at 03/31/15⁹</u>	<u>Cost per MW</u>
Wind I	310.5	\$335,000,000	\$326,577,094	\$1,051,778
Wind II	50.0	\$62,900,000	\$62,814,217	\$1,256,284
Wind III	222.0	\$403,000,000	\$398,041,280	\$1,792,979
Wind IV	540.8	\$1,209,000,000	\$1,101,685,450	\$2,037,140
Wind V	108.0	\$248,000,000	\$247,419,240	\$2,290,919
Wind VI	52.5	\$120,000,000	\$115,123,779	\$2,192,834
Wind VII	1000.3	\$2,301,035,000	\$1,631,316,969	\$1,630,827
Wind VIII	1050.0	\$1,900,000,000	\$1,728,000,000	\$1,644,148
Wind IX	162.0	\$243,000,000	\$230,931,529	\$1,496,640
	<u>2284.1</u>		<u>\$5,841,909,558</u>	

3 The Wind Power Projects, after normal initial start-up and break-in periods, have
 4 performed as expected in terms of availability and energy production. With
 5 respect to Wind X, we are confident that if MidAmerican can get certainty on
 6 ratemaking principles prior to September 9, 2015, it can develop this latest
 7 tranche of economical wind power facilities, within the requested cost cap, that
 8 are projected to earn the cost of capital and provide benefits to our customers. Our
 9 projections show that Wind X will provide significant benefits to our customers
 10 with no net cost increase to our customers. Later in my testimony I will explain
 11 the basis of the Project estimate, and the estimated accuracy for any
 12 remaining uncommitted costs, relative to the cost cap.

PROPOSED RULES

13 **Q. What proposed rules are you addressing?**

14 A. The proposed rules that I address were proposed in Docket No. RMU-01-11, but
 15 were never adopted by the Board. However, the Board has recommended use of

⁹ Wind VIII and IX are still being completed, and the costs shown are the latest forecast of costs based on remaining work to be completed and outstanding amounts due under current or pending contracts.

1 the proposed rules for organizing filings for ratemaking principles. The proposed
2 rules that I cover are as follows:

- 3 ➤ Ownership (41.3(1)“a”),
- 4 ➤ Site description (41.3(1)“b”)
- 5 ➤ General Description (41.3(1)“c”),
- 6 ➤ Raw Materials Used and Wastes Created (41.3(1)“d”),
- 7 ➤ Financial and Contractual Commitments (41.3(1)“e”),
- 8 ➤ General Contractor (41.3(1)“g”),
- 9 ➤ Operator (41.3(1)“h”),
- 10 ➤ Mitigation of Construction and Operating Risks (41.3(3)),
- 11 ➤ Economic Impact (41.3(4)“a”), and
- 12 ➤ Efficiency and Control Technologies (41.3(4)“e”).

Ownership (41.3(1)“a”)

13 **Q. Please describe the current and proposed rights of ownership in the Wind X**
14 **project.**

15 A. MidAmerican will be the long-term owner/operator of the Wind X project.
16 MidAmerican will utilize the turbine vendor during the turbine warranty period
17 for the vast majority of the operation and maintenance requirements. In the
18 limited instances where the turbine vendor does not provide the operations and
19 maintenance services, a third-party service provider will be utilized. There are no
20 purchased power contracts associated with the Wind X project.

Site Descriptions (41.3(1)“b”)

21 **Q. Please provide site descriptions.**

22 A. Wind X will be sited at locations in Iowa where there is a good basis to believe
23 that development and construction can be timely completed in order to qualify for

1 PTCs, adequate wind resources exist, and that evidence acceptable transmission
2 capabilities and costs. As mentioned earlier, the Site A site is planned to be
3 installed in [REDACTED] County and the Site B site is planned to be installed in [REDACTED]
4 County. As with the prior Wind Power Projects, Wind X will be constructed in
5 rural agricultural areas.

6 **Q. What remaining work is needed to prepare wind generation sites for**
7 **installation of Wind X turbines?**

8 A. MidAmerican is committed to obtain all necessary environmental permits and
9 authorizations required by law or regulation for construction and operation of
10 Wind X. Similarly, MidAmerican will obtain all appropriate transmission
11 interconnection, transmission service and other transmission related
12 authorizations currently and prospectively required prior to operating Wind X on
13 the transmission system.

14 To that end, certain environmental studies, assessments and permits,
15 landowner easements and easement amendments, county permits and
16 authorizations, and interconnection agreements are required to be completed or
17 obtained in order for the sites to reach construction-ready status. Balance of plant
18 work, such as installing access roads, collection system cable and wind turbine
19 foundations, would precede installation of turbines. MidAmerican has
20 successfully performed these tasks in its prior Wind Power Projects as I
21 previously described. Absent force majeure circumstances, I am confident
22 MidAmerican can be similarly successful with respect to Wind X.

23 **Q. Has any transmission analysis of the Project sites already been completed?**

24 A. Yes. The Site A site obtained a MISO queue position ([REDACTED]) on [REDACTED],
25 and entered the MISO Definitive Planning Phase (DPP) study process in [REDACTED]

1 [REDACTED]. The Site B site obtained a MISO queue position ([REDACTED]) on [REDACTED]
2 [REDACTED] and entered the MISO DPP study process in [REDACTED]. An Optional
3 Study to provide an initial assessment of the network upgrade costs and potential
4 injection limits was requested in [REDACTED], and results are
5 expected to be received by [REDACTED]. MidAmerican witness Gust
6 addresses general transmission interconnection requirements in his testimony.

7 **Q. How did MidAmerican quantify the impact of transmission interconnection**
8 **uncertainties on the capacity factor assumed for Wind X?**

9 A. To determine the estimated net capacity factor, MidAmerican utilized wind
10 resource and energy analyses from third-party engineering firms, actual operating
11 data from MidAmerican's expansive wind generation fleet, and Project
12 performance estimates from Vendor A and Vendor B based on the respective
13 turbine technology to be deployed relative to historical wind speeds at the sites.
14 MidAmerican then compared the results to MidAmerican's historical view of
15 capacity factors for similarly situated wind sites in its wind generation fleet, and
16 reduced the net capacity factors to more closely match historical performance.
17 Capacity factors for MidAmerican's prior Wind Power Projects include impacts
18 from real-time curtailments related to transmission congestion and economic
19 dispatch, and/or related to Quarterly Operating Limits (QOL) being applied to
20 projects operating under Provisional or Conditional Generator Interconnection
21 Agreements. Therefore, comparing the capacity factors for Wind X against those
22 projects provides a reasonable proxy to the types of interconnection limits the
23 Project might experience during operation and validates the net capacity factors
24 used in the economic model.

25 **Q. What are the risks to customers if this Project is approved without final**

1 **interconnection studies and approval from MISO, and how will**
2 **MidAmerican manage/mitigate the risks?**

3 A. Board approval of Wind X, prior to final interconnection studies and execution of
4 final interconnection agreements with MISO, does not present a significant or
5 unique risk to customers. Final System Impact Studies and final Generator
6 Interconnection Agreements are still pending for several Wind VII, Wind VIII
7 and Wind IX sites that were previously approved by the Board, the majority of
8 which have been operating under Provisional or Conditional Generator
9 Interconnection Agreements dating back to 2011, without any significant impacts
10 to operations or generation output.

11 MISO has an established interconnection process, which allows generators
12 to interconnect to the grid prior to final studies and interconnection agreements
13 being completed through their Provisional Generator Interconnection Agreement
14 process. While all generators are subject to potential curtailment in real-time,
15 generators operating under Provisional or Conditional Generator Interconnection
16 Agreements also are subject to QOL reviews until such time as all final studies
17 and any identified network system upgrades are completed to determine if
18 curtailments of service on a quarterly basis are necessary to maintain system
19 reliability.

20 Also, if the results of the studies that I discuss immediately below indicate
21 costs and upgrades are prohibitive to advance the Project and deliver the customer
22 benefits, MidAmerican will have the ability to reassess Wind X prior to incurring
23 the significant additional costs related to the turbine supply agreements. In
24 addition, as mentioned previously in my testimony, MidAmerican has included [REDACTED]
25 [REDACTED] mechanism in its arrangement with Developer to help

1 mitigate any potential cost impacts.

2 Optional System Impact Studies and Interconnection Facilities Studies for
3 the Site A and Site B sites are expected to be delivered by MISO prior to
4 [REDACTED] 2015, which are expected to outline the estimated cost and schedule to
5 complete any initial facility upgrades needed for the Project to connect and
6 operate under a Provisional Generator Interconnection Agreement. Once those
7 studies are complete, MidAmerican will request negotiations commence for the
8 Provisional Generator Interconnection Agreement, which are expected to
9 conclude by [REDACTED], allowing the Project to connect and operate until such
10 time as the final studies are complete and any additional network upgrades, if any,
11 are in service – at which point the Site A and Site B sites will transition to a
12 standard Generator Interconnection Agreement.

13 **Q. What is the basis for the cost estimate for substation and transmission costs**
14 **in the economic model?**

15 **A.** MidAmerican includes two cost components for the substation and transmission
16 items in the model. First, MidAmerican includes costs for the on-site substation.
17 This is often referred to as the collector system substation where the Project
18 collector lines aggregate and connect to the transmission system. These costs are
19 based on MidAmerican’s actual costs generally experienced for similarly sized
20 sites as those targeted for Wind X. Second, MidAmerican includes additional
21 substation and transmission costs for facilities located downstream of the collector
22 system substation. The costs for this component are based on the estimates from
23 Wind VIII, and [REDACTED]

24 [REDACTED]

25 [REDACTED]

1 [REDACTED]. Wind VIII's estimated costs for this category were roughly \$ [REDACTED]/kW;
2 Wind X is \$ [REDACTED]/kW.

3 **Q. Why is MidAmerican requesting ratemaking principles to address wind
4 installations up to 552 MW?**

5 A. MidAmerican believes there is real merit for customers and the Company in
6 having ratemaking principles established for up to 552 MW of new wind
7 generation, with encouraging economics, that will permit MidAmerican to take
8 advantage of sites we believe can be PTC-qualified and constructed before the
9 January 1, 2017 "continuous construction" automatic qualification deadline.
10 Having established ratemaking principles for this increment of new wind
11 generation will permit MidAmerican to add meaningful new, renewable energy
12 resources that we expect to be delivered at no net cost impact to customers, while
13 delivering the other benefits I discussed in my testimony.

Facility Description (41.3(1)“c”)

14 **Q. Please provide a general description of Wind X including a description of the
15 principal characteristics of the facilities.**

16 A. The source of electric generation for Wind X will be wind-driven turbines.
17 Depending on the outcome of MISO interconnection studies, Wind X has the
18 potential to reduce MidAmerican's projected capacity deficits by an amount that
19 is currently unknown but that MISO practices suggest will be upwards of 13.7%
20 of total nameplate capacity (or 75 MW), as covered in the testimony of
21 MidAmerican witness Hammer.

1 Each wind turbine unit will include a wind turbine (with tower, nacelle¹⁰,
2 and three blades) and a step-up transformer. The actual turbine size and the
3 number of installed units will depend on overall project economics and turbine
4 suitability, but ■■■ units manufactured by Vendor A, ranging between ■■■ MW
5 to ■■■ MW, are expected to be installed at the Site A site, and ■■■ units
6 manufactured by Vendor B ranging between ■■■ MW to ■■■ MW are expected to
7 be installed at the Site B site. Each wind turbine will be connected to an electrical
8 collection system. The electrical collection system gathers the electrical
9 generation on gathering lines each of which individually collects less than 25
10 MW. The gathering lines will be connected to a project substation where the
11 electricity is stepped up to a transmission voltage and enters the transmission grid.

12 The operation of the proposed facilities, equipment rating, and a general
13 forecast of the usage of Wind X is described further in my testimony below. It is
14 expected that approximate annual site capacity factors will be between 40% and
15 43% for the Project sites depending on the final turbine layout, which could
16 slightly positively or negatively impact the estimated capacity factor due to
17 potential interference between the turbines if less than the optimal spacing or
18 siting is achieved (e.g. lower elevation than expected at certain turbine locations).

19 Finally, I would add that MidAmerican is committed to using good
20 engineering practices in its construction, maintenance and operation of Wind X.
21 MidAmerican will follow the applicable provisions in the publications listed
22 below as standards of accepted good practice, along with other applicable codes
23 and standards, unless otherwise ordered by the Board: (a) Iowa Electrical Safety

¹⁰ A “nacelle” is the enclosure on top of the tower which houses the main shaft, gearbox, generator, and “up tower” control systems.

1 Code, as defined in 199 IAC 25; (b) National Electrical Code, as defined in 199
2 IAC 25; and (c) National Electric Safety Code (2007).

Raw Materials Used and Wastes Created (41.3(1)“d”)

3 **Q. What raw materials will be used by the proposed facility to produce**
4 **electricity?**

5 A. There will be no principal raw materials used to produce electricity at Wind X
6 sites. This is the same as for the prior Wind Power Projects.

7 **Q. Please describe the wastes created in the production process.**

8 A. There will be chemicals used for cleaning of equipment and buildings. Wind X
9 will be no different than prior Wind Power Projects, and similar to those projects
10 Wind X is likely to use a variety of materials including: lubricating and insulating
11 oils and greases in various closed systems such as power transformers and
12 rotating machinery; degreasing agents and solvents for cleaning and maintenance
13 of equipment; and office and janitorial supplies incidental to operations. All such
14 materials will be used in accordance with all applicable laws and regulations, and
15 spent lubricants, degreasers and solvents will be collected and recycled in
16 accordance with applicable regulations and laws.

17 **Q. What are the annual expected sulfur dioxide, carbon dioxide and nitrogen**
18 **oxide emissions from the facility, and your plan for acquiring allowances to**
19 **offset the emissions?**

20 A. Wind X is expected to have no air emission or wastewater effluent discharges.
21 The facilities will have no need for sulfur dioxide, carbon dioxide or nitrogen
22 oxide emission offsets since they will generate no sulfur dioxide, carbon dioxide
23 or nitrogen oxide emissions.

24 **Q. Please describe all transportation facilities that are available to serve the**

1 **proposed facility and any additional facilities that will be needed to deliver**
2 **materials and remove wastes.**

3 A. It is anticipated that existing transportation facilities will be adequate to serve the
4 construction and operation of Wind X just as existing transportation facilities
5 supported construction and operation activities for the prior Wind Power Projects.
6 The transportation facilities available to serve the proposed Wind X project are
7 likely to include existing harbors, railroads, interstate, state, and local highways,
8 and local street and road systems. Temporary and/or permanent private access
9 roads and, in certain cases, public road improvements will be constructed at or
10 near the Wind X sites where necessary to provide access from public roads to the
11 wind turbine locations. The existing interstate, state, and local highways and local
12 street and road systems will be used for operations, maintenance and waste
13 disposal transportation as well.

14 **Financial & Contractual Commitments (41.3(1)“e”)**

15 **Q. Please describe all financial and other contractual commitments undertaken**
16 **or planned to be undertaken with respect to the proposed facilities.**

17 A. Contracts required for developing and constructing the Wind X sites are or will be
18 (some are completed; some are not) similar in nature to those utilized for the prior
19 Wind Power Projects and will include two site acquisition agreements, two
20 turbine supply agreements, a BOP construction contract(s), and two generator
21 interconnection agreements.

22 Contracts required to operate the Wind X sites are similar in nature to
23 those utilized for the prior Wind Power Projects and will include service and
24 maintenance, spare parts, land lease, and road maintenance agreements.

1 Procurement of services and supplies needed for the operation and
2 maintenance of the Wind X sites were or will be completed in accordance with
3 MidAmerican's policies and procedures and in conjunction with MidAmerican's
4 other generating units in an attempt to obtain cost savings from larger quantity
5 purchases. MidAmerican will own and operate 100% of Wind X.

6 At the time of this filing, approximately [REDACTED] of the estimated project cost
7 has been contractually fixed or negotiated to the point where no significant
8 changes are expected (i.e., the turbine supply contracts and the Developers
9 contracts). Approximately [REDACTED] of Project costs have not been discussed with
10 suppliers (e.g. substation equipment costs, balance of plant costs, etc.) or
11 determined by MISO, but have been estimated based on past experience.

12 These remaining supplier costs, landowner easements and miscellaneous
13 costs are believed to be accurately estimated to within +/- 3% based on historical
14 references, and the network upgrade costs are believed to have an estimate
15 accuracy of +/- 75% based on a preliminary assessment of the potential network
16 upgrade cost ranges.

17 Representing these estimates in dollar figures, approximately \$ [REDACTED]
18 of estimated Project costs are fixed contractually or believed to be fixed
19 contractually without significant change; approximately \$ [REDACTED] of estimated
20 Project costs are believed to be accurate within +/- 3% (potential variance of
21 approximately \$ [REDACTED]); and approximately \$ [REDACTED] in estimated network
22 upgrade costs are believed to be accurate within +/- 75% (potential variance of
23 approximately \$ [REDACTED]). This results in a total potential variance from the
24 estimated Project costs, included in the economic model, of approximately
25 \$ [REDACTED]. Having built the largest portfolio of utility owned wind generation

1 in the country, MidAmerican draws upon its considerable experience in making
2 these estimates. I discuss how these values compare to the requested Project cost
3 cap in the following testimony.

4 **Q. Are the turbine prices and developer fees included for Wind X higher or**
5 **lower than Wind IX?**

6 A. Turbine prices for Wind X on a weighted cost basis are \$█/kW, which is
7 approximately \$█/kW █ than turbine prices included in Wind IX and
8 approximately \$█/kW █ than turbine prices included for Wind VIII.

9 Please note that turbine prices are not fungible and are dependent on many
10 factors including how risks are appropriated to the parties through the terms and
11 conditions in the agreement, the scope and scale of the pending project, the
12 location of the project, transportation costs, equipment type and any
13 enhancements required (cold weather, reactive power capability, etc.), the
14 credibility of the purchaser both financially and its ability to execute projects,
15 leverage of other pending business opportunities, manufacturers' supply and
16 customers' demand fundamentals, and whether other similarly evaluated suppliers
17 have capacity to fulfill the potential order under the requested terms. In addition,
18 only a fraction of the announced turbine supply transactions have publicly
19 revealed pricing data, making it even more difficult to come up with a statistically
20 valid number of data points to accurately compare MidAmerican's success
21 procuring turbines against the general market or if prices in the near or distant
22 future will be lower or higher than MidAmerican's turbine costs for Wind X.

23 In addition, I reviewed the report titled, "2013 Wind Technologies Market
24 Report" issued by the U.S. Department of Energy, Office of Energy Efficiency
25 and Renewable Energy, that was dated August 2014 – this is the latest available

1 version of this annual report – to try to determine the average installed cost/MW
2 of wind capacity in the Midwest over the last few years. The American Wind
3 Energy Association, National Renewable Energy Laboratory, U.S. Energy
4 Information Administration and the International Energy Agency also were
5 queried but do not maintain this information. The aforementioned report indicates
6 in Figure 42 on page 52 that the “Interior Region” had the lowest capacity-
7 weighted average cost per project of \$1,760/kW for installation years 2012-2013,
8 which included 53 projects totaling 4,480 MW. The report went on to indicate
9 that an early sampling from 2014 of 16 projects totaling more than 2 GW that
10 were under construction nationally and anticipated to be complete in 2014
11 suggested that capacity-weighted average installed costs per project were close to
12 \$1,750/kW. MidAmerican’s requested cost cap is \$1,638/kW.

13 Fees payable to the Developer are [REDACTED] than Wind IX by approximately
14 \$ [REDACTED]/kW and \$ [REDACTED]/kW [REDACTED] than the developer fees for Wind VIII. Differences in
15 pricing are a function of site capacity factors, any [REDACTED]
16 [REDACTED], and general timing and market
17 conditions.

18 **Q. Please explain the relationship between the cost estimate used in the**
19 **economic analysis and the requested cost cap.**

20 A. The estimated investment amount used in Mr. Specketer’s economic analysis is
21 \$ [REDACTED]/kW and is based on the assumed capital costs determined from executed
22 contracts or estimated prices for development sites, turbine agreements,
23 interconnection and potential network upgrades, balance of plant construction and
24 general other costs, such as environmental studies and general administration. The
25 cost cap calculation is a scenario run against the model assumptions at the capital

1 level where the net benefit of the Project to customers is zero and cost of the
2 Project to customers is net zero. This seems like an appropriate demarcation point
3 since the Project at such a point is being added at no net cost to customers, a fairly
4 attractive proposition.

5 The difference between the estimated investment amount used in the
6 economic analysis and the Project cost cap is \$█ per kW, or \$█ million, with
7 the Project cost cap being higher by that amount (\$1,638 per kW)¹¹.

8 Having margin between the estimated investment and the Project cost cap
9 allows MidAmerican room to pursue this Project and the associated customer
10 benefits even if a later, revised forecast of actual costs exceeds the estimated
11 investment amount, but remains within the cost cap, due to circumstances not
12 expected at the time of the original estimate, including the estimate accuracy for
13 the remaining unfixed costs as discussed earlier in my testimony.

14 There are matters that could impact the estimated investment amount, such
15 as balance of plant and interconnection costs, potential weather and supply chain
16 delays, other force majeure conditions, and additional study requirements and any
17 resulting mitigation. Consistent with several prior Iowa Utilities Board approvals
18 of ratemaking principles for MidAmerican wind projects, Wind X would have
19 \$█ per kW of margin above the estimated Project cost, which represents the
20 additional cost the Project could incur, after exhausting built in contingency of
21 \$█ per kW, or \$█ million, before customers would be impacted. It is not
22 known if and by how much any of the aforementioned potential issues could
23 cause costs to exceed the current estimate, but based on the estimate accuracy

¹¹ The estimated cost in the economic analysis also includes \$█ million of contingency, providing a total of \$█ million of headroom to the Project cost cap. This marginally exceeds the remaining estimate variance of \$█ million discussed earlier in my testimony.

1 discussed previously, it is probable the final costs will be very close to the Project
2 cost cap. MidAmerican's goal is to deliver Wind X at the lowest possible cost
3 however.

4 While it would be possible to justify additional wind generation even if
5 there was a small incremental cost to customers, MidAmerican is seeking Iowa
6 Utilities Board approval to add the 552 MW of additional wind generation based
7 upon a Project cost cap that makes it likely, on a present value basis, there will be
8 no net cost to customers associated with the incremental generation.

9 **General Contractor (41.3(1)“g”)**

10 **Q. Please describe the general contractor.**

11 A. MidAmerican will serve as its own general contractor for the Wind X project, but
12 the BOP scope of work will be performed under an engineer-procure-construct
13 (“EPC”) arrangement. MidAmerican will negotiate the EPC contract(s) for the
14 BOP work, the contract for the Vendor B turbines, and the contract for purchase
15 of the pad mounted transformers. Thus, MidAmerican will purchase the turbines,
16 and contract with one or more contractors to perform the BOP work. The BOP
17 contractor(s) will be responsible for performing the BOP work, which usually
18 includes procurement of materials for and construction of the access roads,
19 underground electrical collection and fiber optic systems, and turbine foundations;
20 installation of the pad mounted transformers; and erection of the towers and
21 turbines.

Plant Operator (41.3(1)“h”)

22 **Q. Who will operate Wind X?**

23 A. MidAmerican will be the long-term operator of Wind X. MidAmerican will
24 utilize the turbine vendor or third-party service provider(s) for all or a portion of

1 the service and maintenance requirements of Wind X.

Mitigation of Construction and Operating Risks (41.3(3))

2 **Q. Please describe the contractual standards with which the contractors must**
3 **comply to mitigate construction risks.**

4 A. As mentioned previously, the specific contracts for developing and constructing
5 Wind X have not all been finalized. However, MidAmerican will use the
6 experience it has accumulated through construction of the prior Wind Power
7 Projects to manage construction risk associated with Wind X by attempting to
8 transfer the risks of wind turbine siting, equipment supply and construction to the
9 developers and contractors performing the work. MidAmerican has or expects to
10 obtain performance guarantees, warranties, indemnities, insurance and other terms
11 and conditions that assign to the developers, turbine suppliers and the BOP
12 contractor(s) appropriate portions of the risks involved with development and
13 construction. Appropriate responsibility will be assigned to the turbine suppliers
14 and BOP contractor(s) to perform the work. The turbine suppliers will or are
15 expected to provide guaranteed delivery and commissioning dates and the BOP
16 contractor(s) are expected to provide guaranteed infrastructure completion dates
17 in order to receive, erect and commission turbines.

18 In addition, with respect to the construction of the wind turbines'
19 foundations and towers, MidAmerican intends to make the BOP contractors and
20 turbine suppliers responsible for defects in equipment and workmanship during
21 the warranty period.

22 Part of the work for Wind X is similar to work MidAmerican performs
23 and contracts for as part of its day-to-day utility business. Installing underground
24 and overhead electrical distribution systems is work that MidAmerican has

1 experience contracting for and doing itself. For these parts of Wind X,
2 MidAmerican would utilize types of contractual and risk mitigation practices
3 similar to what it utilizes in its normal day-to-day activities.

4 **Q. Please continue.**

5 A. MidAmerican expects the developers, turbine suppliers and BOP contractor(s) to
6 agree to completion guarantees such that if the contractor has not completed the
7 project as a whole (or the contractor's part of the work) by a guaranteed date(s),
8 the contractor would be responsible for liquidated damages or subject to breach of
9 agreement remedies afforded under the agreement and applicable law. The
10 warranties to be provided by the turbine suppliers include or are expected to
11 include a warranty that the equipment is new, free from defects in design,
12 materials and workmanship, and that the turbines will meet standard turbine
13 warranty terms. The turbine suppliers and contractors have or are expected to
14 require certain limitation of liability provisions and MidAmerican has or may
15 agree to certain of these limitations. The contracts require or are likely to require
16 that either MidAmerican or the vendor/contractor provide construction all-risk
17 insurance and other commercial general liability insurance. MidAmerican will
18 work with its insurance advisors to attempt to obtain the broadest coverages
19 available at reasonable costs. As in any contractual negotiation, MidAmerican
20 has, or will attempt to, properly balance the goal of transferring to the contractors,
21 vendors and/or insurance carriers as much of the risk of equipment supply and
22 construction as possible, consistent with the goal of obtaining the best overall
23 value.

24 MidAmerican will utilize its own employees and may utilize an owner's
25 engineer or other third-party resources to provide oversight of construction of

1 Wind X. MidAmerican has or will have contractual rights to inspect the work and
2 intends to exercise this right to monitor and evaluate each contractor's work.
3 MidAmerican will have employees and representatives at the site during the
4 construction phase to monitor each contractor's work. MidAmerican requires that
5 before any work is commenced on the Wind X sites, the contractor shall have first
6 provided MidAmerican with a safety program and with a quality assurance
7 program, both of which are required to be approved by MidAmerican.
8 MidAmerican will employ other contract management tools and practices so that
9 it is continually monitoring the contractor's performance (e.g., regular meetings
10 with contractors and written progress reports).

11 **Q. Please describe the actions that MidAmerican intends to take to mitigate**
12 **operational risks.**

13 A. MidAmerican will work to minimize operational risk in a number of ways. First,
14 during the procurement, design, development and construction phases of Wind X
15 sites, MidAmerican has or will evaluate the short-term and long-term operational
16 factors for the type and quality of equipment and services that are being proposed.
17 As part of the design of Wind X, MidAmerican expects that the sites and their
18 components would be designed to minimize operational risk while taking into
19 account the economics of such design. In addition, MidAmerican will attempt to
20 negotiate contracts with vendors, contractors, consultants and landowners and
21 obtain permits that minimize potential operational risks and costs. MidAmerican
22 will work to ensure that the actual construction and installation of the facilities
23 complies with the contractual requirements.

24 In the past, MidAmerican contracted with General Electric Company,
25 Mitsubishi Heavy Industries, LTD, Siemens Energy, Inc., and wind project

1 service and maintenance companies (such as EDF Renewables Service, Inc.), to
2 provide certain services and maintenance for the prior Wind Power Projects.
3 MidAmerican will utilize the turbine suppliers or third-parties for service and
4 maintenance for all of the service and maintenance requirements in connection
5 with Wind X.

Economic Impact (41.3(4)“a”)

6 **Q. Please provide information concerning the economic impact of the Wind X**
7 **sites within Iowa and communities where Wind X may be located.**

8 A. The construction, maintenance and operation of Wind X sites will contribute to
9 the economic development of the state of Iowa in a manner similar to the prior
10 Wind Power Projects, and do so in a way that is consistent with the land use and
11 environmental policies of Iowa. Wind X will also provide construction jobs
12 similar to those that were created during construction of the prior Wind Power
13 Projects. Wind X will generate meaningful local expenditures during construction
14 and these will benefit the economies of the communities located near each Project
15 site. The local and state expenditures associated with installation of 552 MW of
16 wind generation assets could approach \$200 million. The estimated total payroll is
17 expected to approach approximately \$14 million during construction.
18 Additionally, a project of this size is estimated to generate property tax revenues
19 for local tax districts in excess of \$160 million over 30 years. In addition,
20 MidAmerican will be making annual payments to the landowners on whose
21 property the added wind turbines are located. The turbines are expected to be
22 located primarily on agricultural land and, as such, the annual payments will
23 provide another source of income beyond the landowners' farming operations
24 income.

Efficiency and Control Technologies (41.3(4)“e”)

1 **Q. Please compare Wind X with other feasible sources of supply as it relates to**
2 **efficiency and control technologies.**

3 A. Wind X compares favorably with other feasible sources of supply relative to
4 efficiency and control technologies. Wind X will consist of wind-driven turbines
5 of proven technology. Wind turbine design and efficiency continue to improve
6 and wind turbines in this size range (i.e., 1.5 MW or larger) are commercially
7 viable and in use throughout the U.S. and abroad. Manufacturers continue to
8 improve turbine control and wind energy capture without significantly increasing
9 cost. Major areas of improvement include blade and rotor aerodynamic designs,
10 utilization of low-weight, high strength materials for blade construction, and
11 improved gearbox design and efficiency. Each turbine will have a control system
12 designed to operate it in the optimal way to produce the most energy from the
13 available wind resource and to avoid and/or minimize situations that could lead to
14 damage to the turbine or create other dangers.

15 Wind X and each turbine will include a modern, state-of-the-art
16 Supervisory Control and Data Acquisition (“SCADA”) system. This system will
17 monitor wind conditions, line parameters, and a multitude of individual turbine
18 status and performance indicators, including power output and fault status.
19 MidAmerican will be able to track production, availability, maintenance status,
20 power performance, outages and resets on appropriate turbine faults.
21 MidAmerican will also be able to remotely curtail energy production and perform
22 other turbine shutdown scenarios.

RATEMAKING PRINCIPLES

23 **Q. What ratemaking principles does MidAmerican seek to have the Board**

1 **approve in this docket?**

2 A. MidAmerican is asking that the Board exercise the authority granted it by the
3 Iowa Legislature in House File 577, and clarified in House File 659, to approve
4 the Wind X ratemaking principles. The contents of the ratemaking principles
5 being requested by MidAmerican are set forth in in the testimony offered by the
6 sponsoring witnesses. The following table indicates the name of the MidAmerican
7 witness who supports each ratemaking principle.

Section	Topic	Witness
5.1	Iowa Jurisdictional Allocation	Specketer
5.2	Cost cap	Wright
5.3	Size Cap	Wright
5.4	Depreciation	Wright
5.5	Return on Equity	VanderWeide
5.6	Cancellation Cost Recovery	Specketer
5.7	Renewable Energy and CO2 Credits, etc.	Specketer
5.8	Federal Production Tax Credit	Specketer
5.9	Customer Revenue Credit	Specketer

8 **Q. What ratemaking principles are you sponsoring?**

9 A. I sponsor three ratemaking principles; those pertaining to the cost cap, size cap
10 and depreciation.

Cost Cap Ratemaking Principle

11 **Q. What cost cap ratemaking principle is MidAmerican seeking for Wind X?**

12 A. I am sponsoring the cost cap ratemaking principle, which reads as follows:

13 The cost cap for the Wind X Iowa Project is \$1.638m per MW
14 (including AFUDC) on a Project-wide basis. In the event that
15 actual capital costs are lower than the projected capital costs, rate
16 base shall consist of actual costs. In the event actual capital costs
17 exceed the cost cap, MidAmerican Energy shall be required to
18 establish the prudence and reasonableness of such excess before it
19 can be included in rates.

20 Under the cost cap principle, MidAmerican’s proposed ratemaking principles

1 would apply to all new MidAmerican Wind X generating capacity up to 552 MW
2 (nameplate). The cumulative Project cost cap for Wind X is \$1.638 million per
3 MW (AFUDC included). This cost cap compares favorably to the \$1.825 million
4 per MW (AFUDC included) cost cap the Board approved in the Wind VIII
5 ratemaking principles proceeding, but is higher than the \$1.5 million per MW
6 (AFUDC included) cost cap for Wind IX, primarily related to the higher turbine
7 supply and estimated network upgrade costs for Wind X compared to Wind IX.

8 **Q. Why is the proposed cumulative cost cap reasonable?**

9 A. The Project cost cap is reasonable because it is set slightly above the estimated
10 Project costs included in the model, and at a price that provides net customer
11 benefits over the life of the facilities—i.e., that add no net costs to customers
12 based on our projections. MidAmerican witness Specketer addresses these
13 projections in more detail. MidAmerican has little margin for estimating error or
14 unforeseen costs as compared to the final approved cost cap for Wind VIII and
15 requested cost cap for Wind IX. Therefore, MidAmerican believes the cost cap is
16 appropriately set to allow MidAmerican the Project cost flexibility to address
17 potential issues while maintaining the Project schedule and resulting in no net cost
18 to customers over the life of the Project. The cost cap is \$187 per kW, or 10.2%,
19 lower than the cost cap approved for MidAmerican's Wind VIII project, which
20 included sites similar in size and location to the Wind X project.

21 **Q. Please continue.**

22 A. The Project cost cap for Wind X has been set at a level that will allow
23 MidAmerican to earn at a minimum the cost of capital over the life of the assets
24 while providing incremental renewable energy at no net cost to customers. The
25 details supporting the economics of Wind X are discussed further by

1 MidAmerican witness Specketer. Other factors such as transmission constraints,
2 detailed final site design, contract negotiations, operational reliability, and final
3 project economics will ultimately determine the total cost of new wind generation
4 built under these principles. It should be noted, however, that estimated costs to
5 complete Wind X, based on existing contracts and market conditions related to
6 contracts still being pursued, and remaining development and interconnection
7 costs, are anticipated to be under the Project cost cap, albeit marginally.

Size Cap Principle

8 **Q. What size cap ratemaking principle is MidAmerican seeking for Wind X?**

9 A. I am sponsoring MidAmerican's size cap ratemaking principle, which reads as
10 follows:

11 The ratemaking principles shall be applicable to all new
12 MidAmerican wind capacity up to 552 MW for both sites.

13 **Q. Why is the proposed size cap reasonable?**

14 A. The 552 MW was selected as the maximum potential size for Wind X based upon
15 a detailed review of available project sites in Iowa that are in the best position to
16 be qualified for the PTC and that can be reasonably constructed before
17 January 1, 2017.

Depreciation Principle

18 **Q. What information are you sponsoring in the Ratemaking Principles**
19 **Application regarding depreciation for Wind X?**

20 A. I am sponsoring MidAmerican's depreciation ratemaking principle, which reads
21 as follows:

22 The depreciation life of the Wind X Iowa Project for ratemaking
23 purposes shall be 30 years. MidAmerican shall be able to revise the
24 depreciable life in the event an independent depreciation expert
25 provides support for a different useful life.

1 The depreciation ratemaking principle I sponsor allows MidAmerican 30 years to
2 depreciate Wind X assets. MidAmerican will reconsider the depreciable life of
3 wind assets for future projects in the event evidence shows such reconsideration is
4 needed. Technology continues to change in the wind turbine industry, and it is
5 conceivable the normal design life of the turbines will change. Again, if that
6 occurs, MidAmerican will undertake an appropriate analysis. The 30-year
7 depreciation period is consistent with the period approved by the Board for the
8 Wind VIII and Wind IX projects. MidAmerican moved to 30 years based upon
9 historical performance of wind turbines in service longer than 30 years across the
10 nation and statements from major suppliers. Technology continues to improve in
11 the wind turbine industry, and it is reasonable to conclude that if older wind
12 turbines with less robust designs are still operating after 30 years, newer turbines
13 should be expected to last at least as long. In Wright Exhibit __ (ALW-1),
14 Schedules 1 and 2, I have provided the statements given to MidAmerican, by two
15 wind turbine manufacturers, in support of the 30-year period for depreciation.

SITING CERTIFICATE

16 **Q. Did MidAmerican obtain a siting certificate for Wind X?**

17 A. No. MidAmerican does not believe a siting certificate for Wind X is required, just
18 as no siting certificate was required for the prior Wind Power Projects. All the
19 relevant facts, and the law involved, with respect to Wind X, are indistinguishable
20 from those on which the declaratory order in Docket No. DRU-03-3 was based.
21 Like the previous wind projects, Wind X will be built in accordance with a design
22 that results in no single collector or gathering line connected to 25 MW or more
23 of nameplate generating capacity. Therefore, MidAmerican believes it is
24 reasonable to rely upon the declaratory ruling issued in the earlier docket,

1 pertaining to the initial 310.5 MW wind project (Docket No. DRU-03-3), with
2 respect to Wind X.

SUMMARY TESTIMONY

3 **Q. How would you summarize your testimony?**

4 A. I believe MidAmerican has positioned itself to deliver customer benefits by
5 installing new wind development assets that qualify for the PTC and that are
6 expected to be delivered within Project estimates and before January 1, 2017.
7 There are no unique risks associated with Wind X compared to the prior Wind
8 Power Projects. MidAmerican has extensive experience delivering and operating
9 economical wind projects that have yielded meaningful customer benefits – Wind
10 X will be no different.

11 **Q. Does this conclude your pre-filed direct testimony?**

12 A. Yes, it does.

STATE OF IOWA)
) ss:
COUNTY OF POLK)

I, Adam L. Wright, being first duly sworn, depose and state that the statements contained in the foregoing prepared direct testimony are true and correct to the best of my knowledge, information and belief, and that such prepared direct testimony constitutes my sworn statement in this proceeding.

 /s/ Adam L. Wright
Adam L. Wright

Subscribed and sworn to before me this 30th day of April, 2015.

 /s/ Sherri R. Long
Notary Public – Iowa