

# DECOMMISSIONING PLAN

For Diamond Trail Wind Project in Iowa County, Iowa

September 13, 2019

Submitted by:

MidAmerican Energy Company

## 1. DEFINITIONS

**Commercial Operation Date** shall mean the first day of the Project Term.

**County** shall mean Iowa County, Iowa.

**Decommissioning Plan** shall mean the plan to decommission the WECS as set out in this document as such plan may be revised from time to time as provided herein.

**Easement Agreement** shall mean an agreement between a Participating Landowner and the Facility Owner granting the Facility Owner an easement or other real estate rights for the right to use the Participating Landowner's property to construct, install, maintain, operate, repair, repower, and remove the WECS.

**Facility Owner (or Owner)** shall mean the entity or entities having controlling or majority equity interest in the Wind Energy Conversion System, including their respective successors and assigns. As of the date of this Decommissioning Plan, the Owner is MidAmerican Energy Company.

**Project** shall mean the Diamond Trail Wind Project as located in Iowa County, Iowa.

**Participating Landowner** shall mean any landowner under easement, lease or other agreement with the Facility Owner pertaining to the WECS.

**Project Term** shall mean the period commencing on the date Owner notifies Iowa County in writing that the entire Project has commenced commercial operation and expiring on the date 40 years after the date specified in such notice, unless sooner terminated or extended as provided herein.

**Property** shall mean the real property for which real property rights have been provided to Owner by a Participating Landowner under an Easement Agreement.

**Wind Energy Conversion System (WECS)** shall mean an electrical generating facility comprised of one or more wind turbines (made up of a foundation, tower, nacelle and rotor) and accessory facilities, including but not limited to: power lines, access roads, communication lines, transformers, substations, and meteorological towers that operate by converting the kinetic energy of wind into electrical energy. The energy may be used on-site or distributed into the electrical grid.

**Wind Turbines** shall have the meaning in Section 4.

## **2. PURPOSE**

The purpose of this Decommissioning Plan is to set out Owner's written agreement to dismantle and remove the Wind Turbines within 180 days after cessation of use, as further provided herein.

This Decommissioning Plan (a) outlines the anticipated means and cost of decommissioning the WECS upon a WECS becoming required to be dismantled and removed in accordance with Section 5 and (b) identifies the financial resources that will be available to pay for decommissioning and removal of the WECS and other accessory structures.

## **3. PROJECT DESCRIPTION**

Owner is planning to construct an approximately 250 MW wind Project which is located in Iowa County, Iowa. The Project involves constructing Wind Turbines, associated access roads, underground electrical collection system, underground communication system and other facilities.

## **4. PROJECT LIFE**

Owner intends to install Vestas and General Electric wind turbine generators, or similar wind turbines, ("**Wind Turbines**") for the Project which such Wind Turbines are expected to have a useful life of at least 40 years. The term of the operating period as provided in the Easement Agreements is up to 40 years. Beyond the end of its useful life, or at any other time, if a Wind Turbine needs to be replaced for any reason, a new Wind Turbine could potentially be installed as a part of the Project. It is expected that during the life of the Project that parts and components of the WECS will be repaired and/or replaced from time to time in order to continue to operate the WECS.

## **5. DECOMMISSIONING**

In the event the use of any Wind Turbine has been discontinued for a period of 180 consecutive days, it shall be deemed to be abandoned (except as otherwise provided herein). Determination of the date of abandonment shall be made by the Iowa County Engineer or his designee and the County will notify Owner of such determination and the date of such abandonment. Upon such notice of abandonment, the Owner shall have an additional 180 days within which to reactivate the use of the Wind Turbine or dismantle and remove the Wind Turbine. As an alternative, the Owner may prepare and submit a plan for the "banking" of the Wind Turbine for future reactivation and use. Said plan must be submitted to the Iowa County Engineer or his designee within 180 days of the discontinuation of use of the Wind Turbine, and shall be updated and submitted every 180 days thereafter for a maximum of two years, at which time the wind turbine must be reactivated or dismantled.

Decommissioning is a procedural process which involves the removal of the WECS and associated facilities and infrastructure as further described herein. The process of

decommissioning a WECS will involve evaluating and categorizing all components and materials based on their anticipated post-Project use. The categories will include recondition and reuse, salvage, recycle, and disposal. In order to reduce impacts from the transport of components to and from the county, materials will likely be stored onsite at one or more locations until the bulk of similar components or materials are ready for transport. The components and material will be transported to the appropriate facilities for reconditioning and reuse, salvage, recycling, or disposal.

This Decommissioning Plan requires that each wind turbine foundation and gravel ring will be excavated and removed to a depth of forty-eight (48) inches below ground level. If, however, the landowner has entered into an Easement Agreement which provides for more stringent requirements than this Decommissioning Plan, the wind turbine foundation and gravel ring will be excavated and removed in accordance with the applicable provisions of the Easement Agreement.

The following is a general description of the anticipated decommissioning process (and the decommissioning is also generally described in Appendix A1):

### **5.1 WIND TURBINES**

Wind Turbines are generally comprised of the tower, nacelle and rotor with blades which are modular items that can be disassembled. With some exceptions, Wind Turbine components are dismantled in the reverse order of their assembly using large crawler cranes. These turbine components are typically stored in temporary laydown areas before being hauled off-site to be resold or taken to a scrap metal facility or offsite disposal facility. It is common for blades to be cut-up into smaller pieces at the location of such Wind Turbine and then transported to an offsite disposal facility.

### **5.2 UNDERGROUND COLLECTION LINES**

Underground electrical and communication collection lines are typically installed at least forty-eight (48) inches below grade. As a result, the collection lines are typically rendered inert and left in the ground after decommissioning; however, at Owner's option, these lines may be removed and hauled off-site for scrap value.

### **5.3 FOUNDATIONS**

Turbine foundations and gravel rings will be excavated around the concrete pedestal to a depth of forty-eight (48) inches below grade. Turbine footings and foundations below forty-eight (48) inches of the ground level will remain after decommissioning.

### **5.4 ACCESS ROADS**

Once all of the Project components have been removed from the site, not including those parts of the WECS located more than forty-eight (48) inches below grade, the access

roads will be removed, unless requested otherwise by the Participating Landowner and agreed to by Owner. The road material will be removed, soil will be ripped and topsoil will be used to fill these areas.

#### **5.5 SITE RESTORATION**

Upon completion of the dismantling and removal of all WECS (not including that part of a WECS that is more than forty-eight (48) inches below ground level) the land will be returned to a condition reasonably comparable to the immediate surrounding property and in accordance with the Easement Agreement.

#### **5.6 WASTE DISPOSAL**

Solid and hazardous wastes, including but not limited to crates, packing materials, decommissioned WECS, as well as used oils and lubricants shall be removed from the site promptly and disposed of in accordance with all applicable local, state and federal regulations.

#### **5.7 ROADS**

Prior to any decommissioning work involving a substantial portion of the whole WECS Project, if requested by the County Owner will enter into a road use agreement with the County in a form similar to the agreement used for the original construction of the Project.

#### **5.8 COMPLIANCE WITH LAWS**

Solid waste and hazardous material will be disposed of offsite in accordance with applicable state and federal laws and regulations. Decommissioned gearboxes, transformers, and hydraulic systems will be drained of fluids, put into appropriate containers before dismantling, and then transported and disposed of off-site in accordance with state and federal laws and regulations.

#### **5.9 FORCE MAJEURE**

Notwithstanding any other provision in this Decommissioning Plan to the contrary, if performance of any act required to be performed by Owner under this Decommissioning Plan is in whole or in part prevented or delayed by reason of any fire, earthquake, flood, tornado, act of God or natural disaster, strike, lock-out, labor disputes or trouble, war, civil strife or other violence, inability to secure materials, any law, order, proclamation, regulation, ordinance, action, demand or requirement of any government agency, or any other cause, event or circumstance not the fault of Owner, including without limitation the invocation of a force majeure provision by any third party to excuse such third party's performance of any obligations related to the decommissioning of the WECS, then Owner, upon giving notice to County, shall be excused from such performance to the extent of and for the duration of such prevention, restriction or delay.

## 6. SUMMARY OF DECOMMISSIONING COST ESTIMATE

The estimated cost to decommission and remove the Project, including the estimated Project salvage value, is attached hereto as Appendix A1. The estimated cost is based on 2018-2019 prices. This Decommissioning Plan and all appendices will be reviewed and updated by the Owner every five (5) years from the Commercial Operation Date upon written request of the County in the manner provided in Section 8. If there are items upon which the Owner and County disagree with respect to assumed decommissioning costs, Owner and County shall meet to attempt to reach agreement on all such items. If agreement cannot be reached within a reasonable time, Owner shall engage and pay for an independent engineer acceptable to County to review the items and this Decommissioning Plan and determine whether the items in dispute should be re-evaluated. The determination of the independent engineer shall be final until the next time the Decommissioning Plan and appendices are updated as provided herein.

Based on Appendix A1, the following costs were estimated:

<b>Decommissioning Cost Estimate (costs less salvage/scrap values)</b>	<b>Project</b>	<b>Per Wind Turbine</b>
Estimated Cost for Wind Turbine Decommissioning	\$4,979,542	\$63,840

## 7. FINANCIAL RESOURCES TO PAY FOR DECOMMISSIONING AND REMOVAL OF WECS

The Owner will be responsible for all costs to decommission the WECS in accordance with this Decommissioning Plan and the Easement Agreements. The decommissioning activities will be funded by the proceeds from one or more of the following:

- i. Proceeds from the salvage and scrap value of certain components and raw materials included as part of the WECS as further described in Appendix A1.
- ii. Other Owner funding.

The County will have the right to request that Owner provide financial assurance in the form of (a) a cash escrow or deposit, bond, or letter of credit (as selected by Owner) in the amount of the total estimated costs of decommissioning the WECS located in the County (as such amount (cost less salvage/scrap values) is set out in the most recent Decommissioning Plan (including appendices) provided by Owner to County in accordance herewith) or (b) a guarantee or such other form of security that is acceptable to the County. The County may waive the financial assurance requirement if the Owner is a public utility regulated by the Iowa Utilities Board in the State of Iowa with the financial wherewithal to pay for the estimated decommissioning costs. However, in the event of a material change to the public utility status and financial status of Owner that would reasonably be expected to impair Owner's ability to fund the total estimated costs to decommission the WECS in Iowa County

(as such expected costs are set out in this Decommissioning Plan (or any future plan provided in accordance herewith), the County will have the right to require Owner to provide financial assurance as described above.

This Decommissioning Plan may be transferred to another party subject to the approval of the Iowa County Board of Supervisors, which approval shall not unreasonably be withheld. The County will have the right to request financial assurance from the new Owner and the new Owner will be subject to the requirements in this Decommissioning Plan.

## **8. NOTICES**

Any notice, demand, or other communication ("**Notice**") given under this Decommissioning Plan shall be in writing and given personally or by registered or certified mail (return receipt requested). A courtesy copy of the Notice may be sent by facsimile or email transmission.

Notices shall be given to the Parties at their addresses set forth below.

### **If to County:**

Iowa County Engineer's Office  
Attn: Nick Amelon, County Engineer  
950 Franklyn Ave  
Marengo, Iowa 52301  
Phone: (319) 642-3721  
Fax: (319) 642-7046  
E-mail: [namelon@co.iowa.ia.us](mailto:namelon@co.iowa.ia.us)

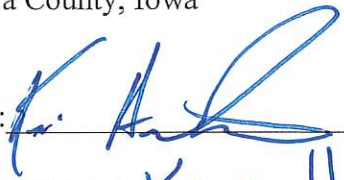
### **If to Owner:**

MidAmerican Energy Company  
Attn: Vice President, Generation  
PO Box 657  
Des Moines, IA 50306  
Phone: (515) 281-2425  
Fax: (515) 242-3084  
Email: [windadministration@midamerican.com](mailto:windadministration@midamerican.com)

By Notice to the other, either Owner or the County may at any time designate a different address or person to which such Notice or communication shall be given.

In Witness Whereof, [insert County Official] has executed this Decommissioning Plan for Iowa County, Iowa as the date set out above on the cover page.

Iowa County, Iowa

By:  \_\_\_\_\_

Name Printed: Kevin Heitshuse

Title: Vice - Chairman

In Witness Whereof, \_\_\_\_\_ has executed this Decommissioning Plan for MidAmerican Energy Company as the date set out above on the cover page.

MidAmerican Energy Company

By: \_\_\_\_\_

Name Printed: \_\_\_\_\_

Title: \_\_\_\_\_

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**DECOMMISSIONING PLAN  
DIAMOND TRAIL WIND ENERGY PROJECT  
IOWA COUNTY, IOWA**

June 24, 2019

### 3.0 DECOMMISSIONING COST ESTIMATE SUMMARY

Expenses and revenues associated with decommissioning the Project will be dependent on labor costs and market value of salvageable materials at the time of decommissioning. For the purposes of this report approximate late-2018 to early-2019 average market values were used to estimate both expenses and revenues. Fluctuation and inflation of the salvage values or labor costs were not factored into the estimates.

#### 3.1 DECOMMISSIONING EXPENSES

Project decommissioning will incur costs associated with the disassembly, removal, excavation and restoration of the proposed wind turbine sites and support infrastructure. Table 3 summarizes the estimates for activities associated with the major components of the Project.

**Table 3 Estimated Decommissioning Expenses**

Activity	Unit	Number	Estimated Unit	Total
Overhead and management (includes estimated permitting required)	Lump Sum		\$268,000	\$268,000
Mobilization and demobilization	Lump Sum		\$134,000	\$134,000
Turbine and step-up transformer disassembly and removal from site				
• Crane and disassembly of turbine			\$56,000	\$4,368,000
• Deconstruction into salvageable pieces			\$39,500	\$3,081,000
• Transport of materials to recycler				
– Steel transport			\$9,600	\$748,800
– Copper transport			\$3,800	\$296,400
• Demolition, transport and dumping for rotors (3) and nacelle cover	Each	78	\$2,500	\$195,000
• Transformer (load only, refurbisher will haul)			\$1,200	\$93,600
Crane pad installation, excavation, removal, and transportation	Lump Sum		\$174,800	\$174,800
Wind turbine foundation				
• Concrete demolition and disposal for 48-inch depth of pedestal	Each	78	\$15,000	\$1,170,000
• Backfill and site grading			\$584	\$45,552
Substation removal and site grading	Lump Sum		\$300,000	\$300,000
Access road excavation and removal (including geogrid)	Lump Sum		\$610,600	\$610,600
Access road backfill, stabilization and restoration	Lump Sum		\$1,170,300	\$1,170,300
<b>Total estimated decommissioning cost</b>				<b>\$12,656,052</b>

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### 3.2 DECOMMISSIONING REVENUES

Revenue from decommissioning the Project will be realized through the sale of wind farm components and construction materials. Turbine components may be sold within a secondary market or as salvage. For purposes of this report, estimated recovery values were based on the salvage value, as this is the more conservative estimate of revenue.

The market value of both steel and copper fluctuate daily and have varied widely over the past five years. Salvage value estimates were based on an approximate five-year-average price of steel and copper derived from sources including on-line recycling companies and United States Geological Survey (USGS) commodity summaries. The price used to value the steel used in this report is \$275 per metric ton; the value of copper, \$2.59 per pound (\$5,708 per metric ton). A more detailed discussion of the sources and methods used to estimate the salvage value of steel and copper are provided in Attachment A. The tower and nacelle are assumed to have 80 percent salvageable steel content. The hub is assumed to have 90 percent salvageable steel. Table 4 summarizes the potential salvage value for the wind turbine components and construction materials.

**Table 4 Estimated Decommissioning Revenues (based on 78 total turbines)**

Item	Unit	Number	Salvage Price per Unit	Salvage Price per Turbine	Total
<i>Wind Turbine Generators</i>					
GE 2.8-127 Turbine Tower (based on 25 turbines)	Tons of steel per turbine	124.8	\$275	\$34,320	\$858,000
V110 Turbine Tower (based on 19 turbines)	Tons of steel per turbine	164.4	\$275	\$45,210	\$858,990
V136 Turbine Tower (based on 34 turbines)	Tons of steel per turbine	228.0	\$275	\$62,700	\$2,131,800
Nacelle (steel) – weighted average of nacelles	Tons per nacelle	54.6	\$275	\$15,015	\$1,171,170
Rotor Hub – weighted average of rotor hubs	Tons per hub	25.7	\$275	\$7,067.5	\$551,265
Anchor Bolts (steel)	Tons per turbine	2	\$275	\$550	\$42,900
Transformer	Per turbine	1	\$1,500	\$1,500	\$117,000
Copper	Tons per turbine	4.0	\$5,708	\$22,832	\$1,780,896
<i>Project Substation</i>					
Substation Components (steel and transformers)	Total				\$50,000
<i>Aggregate course materials</i>					
Aggregate Base and Surface Course (sold for re-use as base course)	Total (based on 50% recovery rate)				\$114,489
<b>Total Potential Revenue</b>					<b>\$7,676,510</b>

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### 3.3 NET DECOMMISSIONING COST SUMMARY

The following is a summary of the net estimated cost to decommission the Project, using the information detailed in Sections 3.1 and 3.2. Estimates are based on 2018-2019 prices, with no market fluctuations or inflation considered.

**Table 5 Net Decommissioning Summary**

Item	Cost/Revenue
Decommissioning Expenses	\$12,656,052
Potential Revenue – salvage value of turbine components and recoverable materials	\$7,676,510
<b>Net Decommissioning Cost</b>	<b>\$4,979,542</b>
<b>Per Turbine Decommissioning Cost (based on 78 turbines)</b>	<b>\$63,840</b>

This engineer's estimate produces a conservative estimate of the cost of decommissioning the Project based on the following considerations:

- 1) Each individual component of the plan has been conservatively estimated. It is our professional opinion that the actual cost to decommission the Project would be lower than the estimate presented here.
- 2) No modern utility scale wind farm has been decommissioned, so actual referenced costs for decommissioning do not exist at this time. Hence the engineer's estimate is based on pricing from similar activities on other types of decommissioning projects. Once wind turbine decommissioning projects have occurred, we anticipate the process will become streamlined and the real cost will go down.
- 3) Given the growing demand and declining availability of raw materials, it is our opinion that the relative price paid for recycled materials will increase over time. Together with more refined recycling techniques, this will reduce the overall cost of decommissioning.
- 4) Decommissioning costs during the first 10 to 15 years following the Project's construction will likely be significantly lower than estimated as the turbines would be dismantled, sold, and reconstructed as used operational units. The engineer's estimates assume all materials are recycled, which will produce a much lower return.

Considering the factors above, it is the engineer's professional opinion that the conservative estimates in this report are higher than actual costs.

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## 4.0 REFERENCES

USGS Minerals Information, available from:

[https://minerals.usgs.gov/minerals/pubs/commodity/iron\\_&\\_steel\\_scrap/mcs-2019-fescr.pdf](https://minerals.usgs.gov/minerals/pubs/commodity/iron_&_steel_scrap/mcs-2019-fescr.pdf); accessed May 24, 2019]

Steelmaking Commodity Prices, 2009-2018, available from:

<http://www.steelonthenet.com/commodity-prices.html> [accessed May 24, 2019]

Copper Prices, available from:

<http://www.scrapmonster.com/scrap-prices/category/Copper-Scrap/128/1/1> [accessed May 24, 2019 (three-month lag)]