Environmental Design & Research,
Landscape Architecture, Engineering & Environmental Services, D.P.C.
217 Montgomery Street, Suite 1000, Syracuse, New York 13202
P. 315.471.0688 • F. 315.471.1061 • www.edrdpc.com

memorandum

To: Derek Rieman,
Big Blue River Wind Farm, LLC

EDR Project No: 18168

From: Erica Tauzer, EDR

Date: June 13, 2019

Reference: Statewide Economic Benefits Summary for Big Blue River Wind Farm

On behalf of Big Blue River Wind Farm, LLC (Applicant), Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. has prepared this memo for the proposed Big Blue River Wind Farm (the "Project"), a utility scale wind power project located in the Townships of Fall Creek, Jefferson, Prairie, Henry, Harrison and Greensboro in Henry County, Indiana. Please refer to the Wind Energy Conversion System (WECS) Commission Approved Use (CAU) permit (WECS CAU Application) Site Plan for the proposed facility layout and Project site location.

This memo assesses the economic benefits of the Project. The construction and operation of the Project will have positive impacts throughout the local and statewide economy. Businesses involved in on-site Facility construction and operations, as well as those associated throughout the industrial supply chain, are expected to see a measurable increase in the demand for their services. In addition, the earnings by workers during construction and operation of the Project are expected to generate additional spending, creating a "ripple effect" throughout the statewide economy. Furthermore, the Facility is anticipated to have a positive impact on local jurisdictions through local property tax payments. The overall socioeconomic impact of Facility construction and operation is discussed here in detail.

Direct payments will occur in two forms: 1) direct payments to local landowners in the form of lease payments and 2) direct payments to local jurisdictions in the form of property taxes at the standard mill rate. Land lease payments are estimated to total $17.5 million over the 25-year lifespan of the Facility. Property tax payments are estimated to total approximately $21 million over the 25-year lifespan of the Facility, providing additional revenues for local government services, schools, road upgrades, and other municipal infrastructure improvements on an annual basis. A detailed list of the estimated property taxes to be distributed annually to local jurisdictions is listed below in Table 1.

Table 1. Estimated First Year Property Tax Distribution of Payments to Local Jurisdictions

Estimated Taxing Unit Property Tax Receipts[1]	Year 1	Year 2	Years 3-25
Henry County	$ 335,710.20	$ 503,565.31	$ 314,728.32
Shenandoah School Corporation	$ 337,227.01	$ 505,840.51	$ 316,150.32
Charles A. Beard Memorial School Corp.	$ 30,538.05	$ 45,807.07	$ 28,629.42
Blue River Valley School Corp.	$ 46,834.85	$ 70,252.27	$ 43,907.67
New Castle Community School Corp.	$ 42,070.92	$ 63,106.39	$ 39,441.49
New Castle-Henry County Public Library	$ 68,972.40	$ 103,458.60	$ 64,661.63
Middletown-Fall Creek Township Public Library	$ 2,199.74	$ 3,299.62	$ 2,062.26
Other Local Taxing Units	$ 23,935.67	$ 35,903.51	$ 22,439.69
GRAND TOTAL	**$ 887,488.85**	**$1,331,233.28**	**$ 832,020.80**

[1] These preliminary projects are based on assumptions regarding future events some of which may or may not occur as expected and the resulting differences could be material.

[2] Assumes local property tax rates remain unchanged from 2019 rates, which are the most recently available rates.

[3] For purposes of these estimates, we have assumed that all turbines will be fully installed in calendar year 2020 and reported on the return due in 2021.

[4] We have assumed that all site improvements are "utility distributable property," assessed as such with applicable treatment under 50 IAC 5.1-6-8, and subject to applicable MACRS depreciation under federal tax law.

[5] Estimated property tax payments in years 3-25 are assumed to be unchanging because the subject property cannot be depreciated below 30% of cost pursuant to 50 IAC 5.1-6-9.

In addition to direct payments in the form of property taxes, the Facility will also have local and statewide economic benefits in the form of jobs, earnings, and economic output. Henry County will derive additional revenue from food and beverage tax and innkeeper's tax generated by workers located in the area during construction and operations, The statewide economic benefits were determined using the economic input-output Jobs and Economic Development Impact (JEDI) model. This model was created by MRG & Associates under contract with the National Renewable Energy Laboratory and is an industry standard for investigation of the economic impacts of wind energy facilities. The JEDI model allows users to estimate the jobs and economic development impacts from wind power generation projects for both the construction and operation phases of a proposed project (USDOE NREL, 2017). These economic development impacts, categorized by the levels of impact and indicators described below, include onsite jobs and earnings, economic output from these onsite earnings, turbine/local revenue/supply chain jobs and earnings, economic output from these turbine/local revenue/supply chain earnings, induced jobs and earnings, and economic output from these induced jobs and earnings. The JEDI model calculates the aforementioned indicators for each level of impact using project-specific data provided by the Applicant, JEDI default cost values, and geographically-defined multipliers from 2016 (the most recent available). These multipliers are produced by IMPLAN Group, LLC using a software/database system called IMPLAN (IMpact analysis for PLANning), a widely-used and widely-accepted general input-output modeling software and data system that tracks each unique industry group in every level of the regional data (IMPLAN Group, 2015).

This report analyzes three levels of impact that the proposed Project may have on the economy:

1. **On-site labor impacts:** These are the direct impacts experienced by the companies/individuals residing in the State of Indiana engaged in the onsite construction and operation of the Project. These values represent expenditure of dollars on labor (wages, salaries and associated expenses) by Project onsite construction personnel as well as operation and maintenance (O&M) personnel. On-site labor impacts do not reflect material expenditures. Most other input-output models consider this level as "direct impacts," referring to changes in jobs, economic activity and earnings associated with the immediate impacts created by the investment, which would include the equipment installed onsite, the concrete used onsite, etc. However, the immediate economic impacts of the physical items used onsite, normally included in direct impacts, typically occur at some geographic distance from the project itself. Because of JEDI's focus on the local impacts of a Project, only the labor associated with the on-site location of the Project (Construction, Construction-Related Services and Onsite Labor during Operational Years) is counted at this level.
2. **Turbine, local revenue, and supply chain impacts:** These impacts measure the estimated increase in demand for goods and services in industry sectors that supply or otherwise support the companies engaged in construction and operation (also known as "backward-linked" industries). These measures account for the demand for goods and services such as turbine components, project analysis, legal services, financing, insurance, etc. Most other input-output models consider this level as "indirect impacts," referring to economic impacts associated with linked sectors in the economy that are upstream of the direct impacts, such as suppliers of hardware used to make the equipment installed onsite or the concrete used onsite. However, because of JEDI's focus on the local impacts of the Project, labor for components of this Project (e.g., turbine manufacturers) occurring at off-site locations are also counted in this level as a local revenue and supply chain impact.
3. **Induced impacts:** Induced impacts measure the estimated effect of increased household income resulting from the project. Induced impacts reflect the reinvestment of earned wages, as measured throughout the first two levels of economic impact. This reinvestment can occur anywhere throughout the local, regional, or state economy on household goods, entertainment, food, clothing, transportation, etc.

Each of these three levels of impact can be measured in terms of three indicators: jobs (as expressed through the increase in employment demand), the amount of money earned through those jobs, and the overall economic output associated with each level of economic impact. These indicators are described in further detail:

1. **Jobs:** Jobs refer to the increase in employment demand because of project development. These positions are measured across each level of impact, so that they capture the estimated number of jobs on site, in supporting industries, and in the businesses that benefit from household spending. For the purposes of this analysis, this term refers to the total number of year-long full-time equivalent (FTE) positions created by the Project. Persons employed for less than full time or less than a full year are included in this total, each representing a fraction of a FTE position (e.g., a half-time, year-round position is 0.5 FTE).
2. **Earnings:** This measures the wages and salary compensation paid to the employees described above.
3. **Output:** Output refers to the value of industry production in the state economy, across all appropriate sectors, associated with each level of impact. For the manufacturing sector, output is calculated by total sales plus or minus changes in inventory. For the retail sector, output is equal to gross profit margin. For the service sector, it is equal to sales volume. For example, output

would include the profits incurred by those businesses that sell electrical transmission line, concrete, or motor vehicle fuel to the Applicant.

Calculating the number of jobs and economic output requires project-specific data inputs (such as year of construction, size of project, turbine size and location). Using this project-specific data, the JEDI model then creates a list of default values, which include project cost values, default financial parameter values, default tax values, default lease payment values, and default local share of spending values. These default values are derived from 10 years of research by NREL, and stem from various sources, including interviews and surveys from leading project owners, developers, engineering and design firms, and construction firms active in the wind energy sector. The version of the model (W9.14.18) used for the job and economic impact analysis presented here used the most currently available (2016) multiplier data specific to Indiana to estimate potential impacts on a statewide basis. For purposes of the JEDI model, the Applicant has assumed the following inputs:

- Project Location (State): **Indiana**
- Year of Construction: **2020**
- Total Project Nameplate Capacity: **83.6 MW**
- Turbine Size: **2.2 MW**
- Number of Turbines: **38**
- JEDI Default Installation Cost: **$1,610/kW**
- JEDI Default Operations/Maintenance Cost: **$28/kW**
- Money Value (Dollar Year): **2019**

This economic analysis was based on a project-specific scenario that would generate a conservative estimate of the total positive jobs and economic impacts produced by this Project. Note that although the Applicant has assumed the Siemens Gamesa (SG) 2.7-129 MW turbine model for the WECS CAU Application, this memo analyzes the total number of positive jobs and economic impacts produced by the Project based on a smaller Vesta 2.2 MW turbine model. As such the maximum project nameplate capacity also has been reduced (from up to 132MW identified elsewhere in the Application to 83.6 MW presented in this analysis). This reduction in Project nameplate capacity avoids overestimating project economic benefits.

As a result of this analysis (see Table 2), it is anticipated that construction of the proposed Project will generate employment of an estimated 63 FTE onsite Construction and Construction-Related positions for Indiana residents, 59 of which will be for Construction and Interconnection labor and 4 of which will be Construction-Related Services (engineers and other professional services). A total of $3.7 million for annual earnings of the 63 onsite construction and project development jobs are estimated for Indiana residents. Estimated earnings represent total wages and salary compensation paid employees statewide (i.e., wages plus 37.6% average annual overhead costs including Supplemental Security Income, Medicare, workers' compensation, and disability). In addition to jobs and earnings, the construction of the Project is expected to have a positive impact on statewide economic output, a measurement of the value of goods and services produced and sold by backward-linked industries. As described in the definition above, output provides a general measurement of the amount of profit earned by manufacturers, retailers, and service providers connected to a given project. The value of economic output associated with Project construction is estimated to be $46.2 million. Between workers' additional household income and industries' increased production, the benefit associated with the Project are likely to be experienced throughout many different sectors and regions of the statewide economy.

Table 2. Summary Results of Statewide Jobs and Economic Impact Analysis

	Jobs	Earnings (Millions)	Output (Millions)
Construction			
Project Development and Onsite Labor Total	63	$3.7	$4.2
Construction & Interconnection Labor	59	$3.4	-
Construction-Related Services	4	$0.3	-
Turbine & Supply Chain Impacts	175	$9.4	$28.8
Induced Impacts	86	$4.4	$13.3
Total Impacts	**324**	**$17.6**	**$46.2**
Annual Operation			
Onsite Labor Impacts	5	$0.3	$0.3
Local Revenue & Supply Chain Impacts	6	$0.4	$1.2
Induced Impacts	3	$0.1	$0.4
Total Impacts	**14**	**$0.8**	**$2.0**

Source: Jobs and Economic Development Impact Model (USDOE NREL, 2018);
Note: Construction and operating jobs are full- time equivalent for a period of one year (1 FTE = 2,080 hours). Impact totals and subtotals are independently rounded, and therefore may not add up directly to the integers shown in this table.

Based upon JEDI model computations, the operation and maintenance of the proposed Project is estimated to generate 5 full-time onsite jobs for Indiana residents, with combined estimated annual earnings of approximately $300,000. These 5 positions are anticipated to be comprised of technicians, project management and administrative personnel. The Project is also estimated to generate a secondary employment demand on an annual basis during Operation and Maintenance, consisting of 9 jobs statewide with annual earnings of approximately $500,000. Total economic output is estimated at an annual output of $2.0 million statewide as a result of Project operation and maintenance. These estimates suggest that the construction and operation of the Project will have a positive impact throughout the statewide economy through the provision of employment, spending of wages, and increase in industrial output.

In conclusion, the Facility will have two primary forms of economic benefits: job and economic development impacts occurring at a statewide level and direct payments to both local landowners and local jurisdictions. During construction, the Facility is estimated to produce a total of 324 FTE positions across the state of Indiana, earning $17.6 million and creating an economic output of $46.2 million. Annually during operation, the Facility is estimated to produce a total of 14 FTE positions across the state of Indiana, earning a total of $800,000 and creating an output of $2.0 million. Direct payments to local landowners will occur in the form of lease payments, and direct payments to local municipalities will occur in the form of property taxes at the standard mill rate. Land lease payments are estimated to total $17.5 million for a 38-turbine layout over the 25-year lifespan of the Facility, while property tax payments are estimated to total approximately $21 million over the 25-year lifespan of the Facility. These local benefits will occur in addition to the statewide jobs and economic development, providing additional revenues for local government services, schools, road upgrades, and other municipal infrastructure improvements on an annual basis.

REFERENCES

IMPLAN Group LLC. 2017. General Information About Multipliers. Available at: https://implanhelp.zendesk.com/hc/en-us/articles/115009505707-General-Information-About-Multipliers Accessed February 2019.

U.S. Department of Energy (USDOE) National Renewable Energy Laboratory (NREL). 2018. Jobs and Economic Development Impact (JEDI) model release W9.14.18. Available at: https://www.nrel.gov/analysis/jedi/wind.html Accessed October 2018.

Copies To: Jane Rice (EDR), file