Economic Benefit and Property Value Study

Bellflower Solar Project, Henry and Rush Counties, Indiana

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Prepared for:

Lightsource Renewable Energy North America

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Abbreviations

AC	Alternating Current
BEA	Bureau of Economic Analysis'
DOC	U.S. Department of Commerce
GIS	Geographic Information System
Lightsource BP	Lightsource Renewable Energy North America
MW	Megawatt
Project	Bellflower Solar Project
RIMS II	Regional Input-Output Modeling System

1.0 INTRODUCTION

Lightsource Renewable Energy North America (Lightsource BP) is proposing to develop and construct the Bellflower Solar Project (the Project) across approximately 1,305 acres in Henry and Rush Counties, Indiana (Figure 1). The Project includes the development of an approximately 152.5-megawatt (MW) alternating current (AC) utility scale solar energy generation facility. In addition to photovoltaic modules, the Project will also include single access trackers, inverters, electrical collection system, access roads, a substation, and perimeter security fencing.

Stantec completed an evaluation of the economic benefit of the Project to the state and local communities. Stantec also completed a literature review of publicly available property values studies to identify any potential changes that may occur as a result of construction and operation of a solar energy facility. This report provides a summary of the methodology used to model the economic benefits, the predicted impacts, as well as a summary of the information found as part of the property values literature review and conclusions.

2.0 ECONOMIC EVALUATION

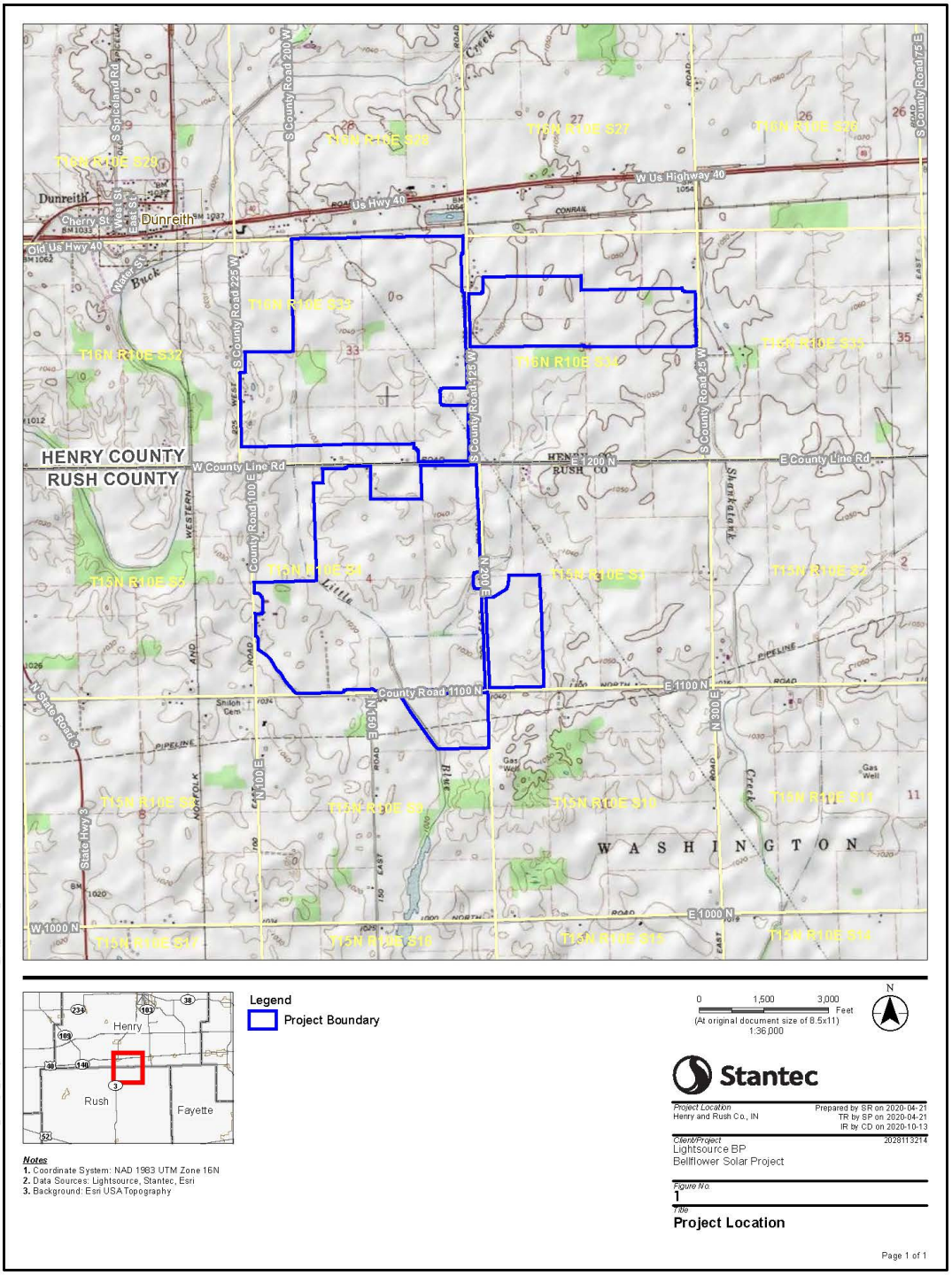
To evaluate the regional economic impact of constructing the Project, Stantec used the U.S. Department of Commerce (DOC) Bureau of Economic Analysis' (BEA) Regional Input-Output Modeling System (RIMS II; BEA 2018). In addition to the economic output resulting from construction and operation of the Project, Stantec also calculated the projected property tax revenues that could be paid to Henry and Rush Counties as a result of the Project. Combined, these are considered the economic benefits of the Project.

2.1 METHODOLOGY

RIMS II is based on an accounting framework called an Input-Output Model based on relationships between industries. Expenditures in an industry usually result in demands for goods and services in other industries. RIMS II is widely used in both the public and private sectors for assessing the economic impact of capital investment projects such as this Project.

To estimate the inter-industry relationships of a project, RIMS II estimates the flow of dollars during construction to other goods and services within the geographic area of a proposed project. For the Bellflower Solar Project, the affected area within which direct and indirect (induced) spending is assumed to occur is Henry and Rush Counties and the greater Indianapolis area. Custom RIMS II multipliers were obtained from BEA for the affected area and used in this analysis.

In this analysis, impacts are based on additional spending infused into an economy as a result of construction expenditures. The expenditures are new dollars spent in the economy as a result of construction only and exclude the cost of land and the purchase of solar modules, which may be purchased outside the affected area.



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Based on information provided by Lightsource BP, construction costs for the Bellflower Solar Project are anticipated to be $112 million. These construction costs were the basis of the analysis and were incorporated into the RIMS II model.

In addition to the economic output, payments to landowners to lease their land and payment of property taxes will be made to local jurisdictions over the life of the Project. Property tax revenue was estimated based on 2019 tax rates for each county and assuming the Project will be fully constructed and operational by 2022. We have also assumed a 50/50 split between Henry and Rush Counties in terms of revenues generated by the Project.

2.2 ECONOMIC BENEFITS

Development of the Project will provide beneficial economic impacts to Henry and Rush Counties and the greater Indianapolis region as a result of the construction activities. The purchase of materials and equipment, as well as employment of construction workers, will create demand for local business through the duration of construction, generating revenue within the regional economy.

During construction, the Project would employee approximately 250 people in engineering, development, and construction. Construction wages would total approximately $20,000,000. During the construction period, these jobs and earnings would have a multiplying effect resulting in support of additional employment in industries within the affected area and an additional $12 million in wages. Estimating the portion of projected employment that would come directly from the region is difficult. While many positions can be filled utilizing local labor, such as equipment operators, truck drivers, laborers, and electricians, there will also be some specialized skilled positions required for construction of the Project. It is anticipated that some of these specialized positions will need to be filled using non-regional workers, due to the specialized training required for each position.

Table 2 provides the direct, indirect, and total economic output that will result from construction expenditures from the RIMS II model in the affected area. The direct expenditures of $112 million would create indirect and induced expenditures, combining for a total economic output of $339 million. The direct expenditures can create indirect impacts, such as employment created in producing and transporting the solar modules and other Project equipment and construction materials, and induced impacts resulting from the increase in the employees' income and spending (i.e., local restaurants hiring additional staff to accommodate construction laborers spending their wages on meals).

TABLE 2. TOTAL ECONOMIC OUTPUT FROM PROJECT CONSTRUCTION IN HENRY AND RUSH COUNTIES AND THE GREATER INDIANAPOLIS AREA

Direct Expenditures	Indirect and Induced Expenditures	Total Economic Output
$112,000,000	$227,729,024	$339,214,712

Long-term maintenance and operation of the solar facility will continue to generate economic benefits through the employment of contracted maintenance services, purchase of replacement parts and

maintenance activities, and through the payment of property taxes to local jurisdictions. During operations it is estimated the Project will have an annual operating budget of approximately $2.4 million, which reflects lease payments as well as operation and maintenance costs for the facility. The facility will generate over $30 million in property taxes to be paid to Henry and Rush Counties over the anticipated 35-year lifespan of the Project.

During the operation of the facility, the Project would employ approximately one or two local full time employees, mostly for vegetation management.

3.0 PROPERTY VALUES LITERATURE REVIEW

When considering the economic benefits of the construction of large-scale infrastructure projects, questions arise regarding the project's impact on nearby residential property values. Ground-mounted solar energy facilities such as the Bellflower Solar Project can encompass land areas of up to more than a thousand acres. The maximum heights of solar panels and the associated racking panels rarely exceeds 12 feet, which is the maximum panel height for this Project. While solar panels are generally no taller than a single-story house, concerns about alterations to views, increased traffic, etc. lead to questions about changes to property values and reduced demand for residences near solar energy facilities. Stantec completed a literature review of publicly available studies that have been conducted nationwide, and within Indiana, to identify any trends in property values when comparing home prices before and after construction of solar energy facilities.

Based on available studies, solar energy facilities have no negative effect on nearby property values and in fact, in some locations, such as Illinois and Indiana, solar facilities can even result in slight property value increases (CohnReznick 2018, CohnReznick 2020). Solar energy facilities close to residential properties can provide benefits because they can increase job potential, supply industry growth, provide landowner profits, and result in improvements of roadways. Most of these benefits are a direct result of the increased tax revenue from the solar farm (Al-Homoodah et al. 2018).

CohnReznick, LLP (CohnReznick), a Valuation Advisory Services firm, completed a property value impact study near seven solar projects in Illinois and Indiana that were constructed between 2012 and 2015. CohnReznick used a paired sales analysis that compared properties that were adjacent to the solar facility (adjoining properties) to similar properties that were within the same county as the solar facility (control properties). The study only included adjoining properties that were sold after completion of the solar facility. As a means of comparison, the price per square foot for residential properties, or the price per acre for agricultural parcels, was compared between the adjoining and control properties, with sale prices adjusted for market conditions to a common date. Using the paired sales analysis, the study assumed that if solar farms resulted in an impact to the adjacent property value, that it would then be reflected in the range of the sale prices and the ability to market those properties. Nearly all the projects analyzed were in rural, predominately agricultural settings and project size ranged from 1 MW to 20 MW in size. Table 3 provides a summary of the paired sales analysis results of the CohnReznick property value impact study for each solar project included within the study. For projects with more than one adjoining property that was sold during the study period, a paired analysis was completed for each

individual property and a comparison to the corresponding control properties is reported in the table below.

TABLE 3. PAIRED SALES ANALYSIS RESULTS SUMMARY BY SOLAR PROJECT

Project		Paired Sale Analysis		Significant Impact on Property Values?
		Adjoining Properties	Control Properties	
Grand Ridge Solar, LaSalle County, Illinois, 20 MW		$79.30/sq. ft.	$74.35/sq. ft.	No
Portage Solar, Porter County, Indiana, 1.96 MW		$8,000/acre (farmland) $84.35/sq. ft.	$7,674/acre (farmland) $84.27/sq. ft.	No
IMPA Frankton Solar, Madison County, Indiana, 1 MW		$28.58/sq. ft. $52.40/sq. ft.	$28.42/sq. ft. $51.47/sq. ft.	No
Dominion Indy Solar III, Marion County, Indiana, 8.6 MW	2018 Evaluation	$59.81/sq. ft. $69.14/sq. ft.	$57.84/sq. ft. $68.67/sq. ft.	No
	2020 Update	$59.10/sq. ft. $72.15/sq. ft.	$57.84/sq. ft. $71.69/sq. ft.	No
Valparaiso Solar LLC, Porter County, Indiana, 1 MW		$82.42/sq. ft. $62.11/sq. ft.	$79.95/sq. ft. $64.07/sq. ft.	No
Middlebury Solar Farm, Elkhart County, Indiana, 1.5 MW		$132.79/sq. ft.	$104.26/sq. ft.	Yes, positive impact on price although could be a result of the smaller size of the adjoining property and the larger site area as compared to median metrics for the Control properties
Rockford Solar Farm, Winnebago County, Illinois, 3.06 MW		$3,943/acre (farmland)	$4,075/acre (farmland)	No

Source: CohnReznick, LLP 2018
CohnReznick, LLP 2020

CohnReznick, LLC assessed the Dominion Indy Solar III solar farm again in 2020 and found that additional property value analyses still did not find a significant impact on property value because of the solar farm (CohnReznick 2020).

CohnReznick concluded that they found no consistent negative impact to property values at adjacent properties to solar energy facilities that were found to be reflective of the distance to the solar facility (2018).

After completing the site comparisons, CohnReznick consulted brokers, developers, and appraisers to see if they saw any differences in property values when they are trying to sell or market properties that

adjoin solar farms. All that were interviewed indicated that they have not seen any impact on land or property values (2018).

CohnReznick, LLP also evaluated common factors that could affect property values and applied them to solar facilities – these factors include appearance of the project, noise, odor, and traffic as a result of the project, and hazardous materials used to build the project. After assessing each of these factors relative to solar energy facilities, it was decided that they were not impacting the value of the properties. Most of the solar facilities have a fence around the perimeter, which is planted with trees and shrubs that block views of the solar farm from the adjoining properties. Sound from solar farms only results from the inverters which produce a quiet hum that is not typically heard from outside of the perimeter fence. Solar farms, unlike other energy types, do not produce odors as there are no emissions. During the operational phase, solar farms do not require rigorous maintenance so there is not a significant increase in traffic entering and exiting the site. Lastly, solar panels are made from materials that are safe and only contain aluminum, glass, silicon, and Ethylene Vinyl Acetate (EVA) which are all recyclable materials (CohnReznick 2018).

While not an empirical study like the previously described paired analysis, a study conducted by Al-Homoodah et al. from the LBJ School of Public Affairs at the University of Texas at Austin utilized geographic information systems (GIS) data to evaluate 956 unique solar projects across the U.S. that were completed in 2016 or earlier. To assess the impact of these solar farms, a geospatial analysis was completed combining the area of the solar facility, creating buffer zones of increasing distances (100, 500, and 1,000 feet, 0.5 1, and 3 miles), and estimating the number of homes that were in each buffer zone. Surveys were also sent to approximately 400 property value assessors nationwide who have a solar facility of at least 1 MW in their county to gage the impact solar facilities have on home values within the different buffer zones. The survey questions asked whether the assessors believe there is an impact on home prices, the scale and direction of those impacts, and the source of those impacts (Al-Homoodah et al. 2018).

This study found that more homes are located near smaller solar facilities, while fewer homes are located near solar facilities greater than 100 MW. This is explained by the concept that more densely populated areas do not have the land area to support large solar facilities, while more rural, less densely populated areas have available land to support larger solar facilities. It is expected that the closer you are to the solar facility, the greater the impact on home value, and as the facility sizes increase the impact on adjacent properties would become larger. The study found that on average, 22 homes are within three miles of a 1 MW solar facility and at a 100 MW facility there is on average less than one home within 100 feet (Al-Homoodah et al. 2018).

Only 37 responses were received from the more than 400 surveys sent out and many geographic areas were omitted, most notably California, where the majority of the solar facilities were located. Sixty-six percent of responders said there was no impact on home prices, while 11 percent said proximity to a solar facility had a positive effect on home prices. Responses to estimated property value impacts at all distances from the various sized facilities had a median and mode of zero percent, meaning there was no estimated impact to property values for any solar facility at any distance. Some responses did indicate a negative impact to property values and when averaging over all responses, it was seen that properties that were within 1,000 feet of a 1.5 MW solar farm, properties that were within one half mile of a 20 MW

solar farm, and properties that are within one mile of a 102 MW solar farm are found to have negative impacts on property values. However, it was noted that a limited number of highly negative responses may have affected the median results. In analyzing the variation in responses, the survey also found that responders with experience assessing properties near a solar installation had a much less negative estimate of impact to property values (Al-Homoodah et al. 2018).

Overall, the assessor's responses indicate there could be negative impacts to property values at extremely close distances; however, the geospatial analysis found that given the density of homes surrounding solar facilities in the 100 foot buffer group where impacts are greatest, there is on average likely to be less than a single home within that distance, and within a half mile distance, there are only seven homes near a 1 MW facility and fewer as the size of the facility increases. This study indicates that the number of potentially negatively affected properties is extremely low. The results from the survey of residential home assessors shows that most respondents believe that the proximity to a solar installation has either no impact or a positive impact on home values. However, these responses can vary based on the size of facility, distance from the solar farm to the property, and the assessor's experience with previous solar farm adjoining properties.

4.0 REFERENCES

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