

As the result of recent literature, Crocker provides the following updated response to Data Request 2-27:

2-27) Referring to section 20.2.2 of the application, is Crocker aware of any studies that demonstrate there could be a potential negative impact to property values within or near a wind farm project area? If so please provide a list of those studies and an explanation as to why the study provided in Appendix H should be given more weight than any other property valuation studies Crocker is aware of.

Mark Thayer: Crocker's consultant conducted a literature review of studies that examine the relationship between wind facilities and nearby property values. This review concluded there are no large-scale statistical studies completed using data from areas in the United States and/or Canada which consistently show a significant negative impact from wind facilities on nearby property values after the wind facility is constructed and operable.

The studies included in the literature review utilized generally accepted statistical analysis, implying the data base was sizeable (thousands of observations, i.e., utility scale operations), must use market data used accepted methodologies (e.g., hedonic price method). Therefore, "studies" that use inappropriate statistical methods such as small sample sizes, non-transparent sample selection process, failure to control for obvious variables, failure to understand statistical significance, or were not subject to peer-review were not included. A study from Gardner¹ and Kielisch² were not included due to these inconsistencies.

To draw the most accurate comparison to South Dakota, studies analyzing areas outside of the United States and Canada were also not considered. While there have been European and United Kingdom studies that show possible negative property value impacts from wind facilities, the estimated impacts are small (3-7%).³ These impacts cannot be explained by data size, quality, or estimation methods and therefore have led to speculation that community involvement and compensation levels differ from standard practice in the United States and Canada bringing the relevance of these studies into question.

The literature review focused on estimated property value impacts after the wind facilities are fully constructed and operational. There is some evidence that the post-announcement/pre-

¹ Gardner, D.T. (2009) "Impact of Wind Turbines on Market Value of Texas Rural Land." Prepared for the South Texas Plains Agriculture Wind and Wildlife Conference, Lubbock TX.

² Kielisch, K.C. (2011) "Wind Turbines and Property Value." Presentation, Appraisal Group One.

³ Sunak, Y. and Madlener, R. (2012) The Impact of Wind Farms on Property Values: A Geographically Weighted Hedonic Pricing Model. Prepared for Institute for Future Energy Consumer Needs and Behavior (ACN), RWTH Aachen University. May, 2012 (revised March 2013). 27 pages. FCN Working Paper No. 3/2012; Jensen, C.U; Panduro, T.E; Lundhede, T.H. (2014) "The Vindication of Don Quixote: The Impact of Noise and Visual Pollution from Wind Turbines." *Land Economics* 90 (4), 668-682; Gibbons, S.F (2014) "Gone with the Wind: Valuing the Visual Impacts of Wind Turbines through House Prices, Spatial Econometrics Research Center Report, April.

construction phase of wind facility development could have a negative effect on nearby property values, however this has been labeled “anticipation stigma” and the effects are small and dissipate completely after the facility is operational.⁴

A recent 2017 study was included in the literature review that examines the impact of wind turbines on nearby property values on both sides of the United States/Canada border that finds inconsistent results.⁵ The study provided there are no significant property values in Canada for either turbine view or proximity to turbines; however, indications of negative property value effects primarily for turbine view were noted in the United States. The results for the proximity to turbine variables generally do not support the turbine view results as neither the full sample nor the restricted 10-mile sample show negative property value effects. The authors do not provide a definitive rationale for the overall results disparity (Canada v US, turbine view v. proximity) but do offer some speculation about when negative effects might be expected. These include: the quality of view prior to turbine construction, the relative quantity of vacation homes and/or waterfront properties, the level of involvement by the local residents, and the level of compensation to the local community. The results of this study indicate there will be no negative impacts on nearby property values from wind developments under the following conditions: the view prior to construction is not of water, there are relatively few vacation or waterfront homes, local residents are active participants in the turbine facility development, and if there is some positive compensation to the local community.

⁴ Hoen, B., R. Wiser, P. Cappers, M. Thayer, and G. Sethi (2011). “Wind Energy Facilities and Residential Properties: The Effect of Proximity and View on Sales Prices.” *Journal of Real Estate Research*. 33(3): 279-316; Hinman, J. L. (2010) “Wind Farm Proximity and Property Values: A Pooled Hedonic Regression Analysis of Property Values in Central Illinois.” Thesis Prepared for Master’s Degree in Applied Economics. Illinois State University, Normal. May, 2010. 143 pages; Heintzelman, M. D. and Tuttle, C. (2012) “Values in the Wind: A Hedonic Analysis of Wind Power Facilities.” *Land Economics*. August (88): 571-588.

⁵ Heintzelman, M.D., R.J. Vyn, and S. Guth (2017) “Understanding the Amenity Impacts of Wind Development on an International Border.” *Ecological Economics*. July (137): 195-206).