

Potential Impacts of Wind Farm Development Near Anza-Borrego Desert State Park

Reconnaissance Level Evaluation



Final Report

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Development Near Anza-Borrego Desert
State Park**

Reconnaissance Level Evaluation

Prepared for

The Anza-Borrego Foundation

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Executive Summary

In July 2012, the Anza-Borrego Foundation retained BBC Research & Consulting (BBC) to provide updated information regarding the economic contribution from visitation at Anza-Borrego Desert State Park (Anza-Borrego) and to conduct a reconnaissance level evaluation of the potential impacts on visitation and the regional economy if a commercial wind energy facility is developed in close proximity to the park's boundaries. BBC had previously conducted the *California Outdoor Recreation Economic Study* (2010 study) on behalf of California State Parks.

Current economic contribution from Anza-Borrego. Anza-Borrego is the largest state park in California (and second largest in the United States) and includes 12 designated wilderness areas. An annual average of 500,000 people have visited the park during the past five years, providing significant economic benefits for the surrounding communities. Current average trip expenditures per visitor at Anza-Borrego are estimated at \$83.77. Total annual visitor spending averages nearly \$42 million.¹ Based on the economic modeling from the 2010 study and updated visitation and visitor expenditure estimates for Anza-Borrego, the park supports more than 650 jobs across California. Figure ES-1 summarizes the current annual economic contribution from the park.

Figure ES-1. Current Annual Visitor Expenditures and Jobs Supported by Anza-Borrego

Metric	
Visitor Expenditures	\$41.9 million
Total Jobs	
Southern California Region*	559
Rest of California	<u>107</u>
California Total	666

Notes: * Imperial, Orange, Riverside, San Bernardino and San Diego counties.

Source: BBC Research & Consulting, 2012.

Prior studies and potential implications for Anza-Borrego. The most extensive research, discussion and debate regarding the effects of commercial wind energy facilities on nearby tourist attractions has occurred in connection with proposed offshore wind projects along the East Coast of the United States and in regards to proposed projects in the United Kingdom (particularly in Scotland). Prior studies in these areas (and other locations) have generally involved surveys of visitors or potential visitors. These studies have produced varied findings regarding potential impacts on tourism. Based on the best available studies, the proportion of tourists that would change their travel plans due to development of a nearby wind farm could

¹ See Page 2 of Reconnaissance Study for further detail.

range from as little as five percent or less to 25 percent or more. Figure ES-2 summarizes the estimated proportions of visitors that would avoid travel to destinations with nearby wind farms based on these studies.

Figure ES-2. Summary of Estimated Proportions of Visitors that Would Avoid Areas with Wind Farms from Key Studies

Study	Visitors that Would Avoid Wind Farm Areas
U.S. Offshore Studies	
Delaware (2010)	45% to 6% (1.5 km to 22 km offshore)
New Jersey (2008)	12% (3 miles offshore)
Scotland Studies	
NFO System 3 (2002)	10% to 25%
GC University (2008)	0% to 2.5% (Intercept Surveys) 18% (Internet Survey)
VisitScotland Survey (2012)	17% to 18%

If even 10 percent fewer visitors come to Anza-Borrego due to the proximity of the proposed wind energy facilities, the economic impacts would be substantial. Approximately 50,000 fewer people would visit the park each year. Visitor spending would be reduced by over \$4 million per year. Over the 30 year anticipated life of the proposed wind facilities, the cumulative impact on visitor spending could be approximately \$120 million. This reduction in spending would translate into about 67 fewer jobs each year across California, including about 56 fewer jobs each year in Southern California. These effects would be most strongly felt in the communities closest to the park.

Apart from the varied findings from previous studies, further uncertainty regarding the impacts of wind development adjacent to Anza-Borrego arises from the lack of research involving closely comparable settings and the need for more information about the number of Anza-Borrego visitors that would see the turbines during their visit to the park. More definitive estimates could be developed based on carefully crafted and administered intercept surveys with actual Anza-Borrego visitors, including visual simulations of the prospective wind farm from key locations. The surveys could be combined with analysis of visitor travel patterns at the park and analysis using geographic information systems to identify the viewshed for the prospective wind farm. Such research would not only provide more specific estimates of the potential impacts on visitation and the regional economy if the wind farm is developed, but could also help evaluate options to mitigate potential impacts on visitation and the regional economy.

Reconnaissance Study

In 2010, BBC Research & Consulting (BBC) conducted the *California Outdoor Recreation Economic Study* (“2010 study”) on behalf of California State Parks. The 2010 study quantified the contribution to the California economy from expenditures on outdoor recreation and the economic benefits that California residents obtain from participating in outdoor recreation. The 2010 study also included detailed analysis of the economic contribution and economic benefits for different types of parks and facilities throughout California, including analysis of the economic contribution from individual state parks throughout the California system.

The Anza-Borrego Foundation retained BBC to provide updated information regarding the economic contribution specific to Anza-Borrego Desert State Park (Anza-Borrego) and to conduct a reconnaissance level evaluation of the potential impacts on visitation and the regional economy if a commercial wind energy facility is developed in close proximity to the boundaries of the park. This report summarizes the results of BBC’s reconnaissance evaluation.

Economic Contribution of Anza-Borrego

Anza-Borrego is the largest state park in California (and second largest in the United States) and includes 12 designated wilderness areas. Approximately 500,000 people visit the park each year, providing significant economic benefits for the surrounding communities. The most common primary activities for Anza-Borrego visitors include hiking (29%), relaxing in the outdoors (23%) and camping (20%) (SPVS 2009). Figure 1 depicts the annual number of visitors to the park from the 2006-07 fiscal year through the 2010-2011 fiscal year.

Figure 1. Annual Visitation at Anza-Borrego

	Day Use	Camping	Total Visits
2010-11	311,856	90,695	402,551
2009-10	381,924	101,911	483,835
2008-09	422,986	120,027	543,013
2007-08	490,743	119,361	610,104
2006-07	351,243	109,979	461,222
Average	391,750	108,395	500,145

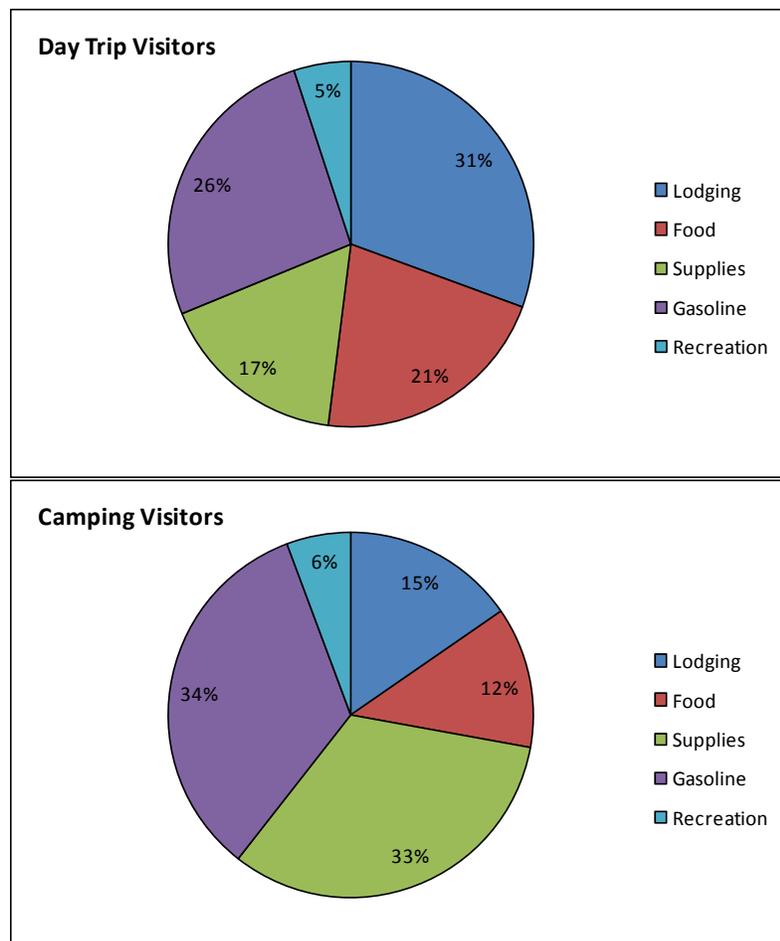
Source: Annual Statistical Reports, California State Parks, various years.

The economic contribution from Anza-Borrego (e.g. sales, jobs and earnings) directly and indirectly results from expenditures by individuals visiting the park (visitor expenditures) and by the State government to operate and maintain the park (operating

expenditures). Across the California state park system as a whole, visitor expenditures account for about 94 percent of the economic contribution from the state parks, while operating expenditures account for about six percent of the overall economic contribution (BBC 2010).

In the 2010 study, BBC derived estimates of total visitor expenditures at Anza-Borrego and other California state parks using data from the California State Park Visitor Survey (completed in 2009) and the annual Statistical Reports prepared by California State Parks. In 2008 dollars, the average visitor to Anza-Borrego spent \$80.18 during their trip to visit the park (BBC 2010).¹ Updated to 2011 dollars, the average expenditures per visitor would be approximately \$83.77 (BLS 2012). Based on an average of 500,000 visitors per year, this corresponds to almost \$42 million per year in visitor expenditures. As shown in Figure 2, expenditures of park visitors typically include spending on food, lodging, gasoline, supplies and recreation services.

Figure 2.
Breakdown of Trip Expenditures by State Park Visitors



Source: *California Outdoor Recreation Economic Study*, BBC Research & Consulting, 2010.

¹ The 2010 study developed estimates of the average expenditures per visit for each unit in the California State Park system. The figure cited here is the estimate specific to Anza-Borrego State Park. In general, visitor expenditures for remote State Parks such as Anza-Borrego are higher than for other park types (such as State Beaches).

In the 2010 study, BBC used the IMPLAN® input-output modeling system to estimate the economic contribution of California state parks. An input-output analysis estimates the overall economic impact (or contribution) on all industrial sectors that result from direct economic activity in one or more specific sectors. The overall economic contribution can be broken down into three categories as described below.

- **Direct:** the initial economic effects from visitor expenditures and California State Parks operating expenditures. The purchase of gasoline, groceries or restaurant meals as part of a trip to Anza-Borrego would be examples of direct effects.
- **Indirect:** the economic effects resulting from purchases of goods and services by directly affected industries from other firms. Wholesale purchases of food and other supplies by gasoline stations that directly service Anza-Borrego visitors would be examples of indirect effects.
- **Induced:** the economic effects stimulated by purchases by employees of directly and indirectly affected businesses. Purchases of groceries and home rental expenditures of the gasoline station employees would be examples of induced effects.

Figure 2 summarizes the annual economic contribution that Anza-Borrego currently provides to the Southern California region² and California as a whole. The estimated employment contribution reflects the combination of direct, indirect and induced effects.

Figure 2. Current Annual Visitor Expenditures and Jobs Supported by Anza-Borrego

Metric	
Visitor Expenditures	\$41.9 million
Total Jobs	
Southern California Region*	559
Rest of California	<u>107</u>
California Total	666

Notes: * Imperial, Orange, Riverside, San Bernardino and San Diego counties.
 The visitor expenditure estimate represents only the direct effect of visitation and does not include indirect and induced effects. The job estimates include indirect and induced effects.

Source: BBC Research & Consulting, 2012.

² As defined for the 2010 study, the Southern California region included Imperial, Orange, Riverside, San Bernardino and San Diego counties.

Based on the statewide results from the 2010 study, about two-thirds of the jobs supported by Anza-Borrego are in either the accommodation and food services sector or the retail trade sector (BBC 2010).

Previous Studies Regarding Tourism Effects from Commercial Wind Energy Developments

The question of how the development of commercial wind energy projects may affect tourist visits to nearby attractions, and local tourism-dependent economies, has attracted increasing attention over the past decade. There have been a number of studies and reports on this topic in the U.S. and in other countries. Some of this literature has included primary research (e.g. visitor surveys), while other reports have focused on summarizing and seeking to draw conclusions from the array of previous primary research studies.

A literature review performed for the Isle of Anglesey County Council (in the United Kingdom) provides some useful caveats regarding the literature on this topic:

“It is important to be clear about the status of the written material available. The coverage of the subject in peer reviewed academic journals or publications is quite limited ... Most of the directly relevant original research appears in reports published by research institutes or their client bodies, including tourist boards and other organizations ... This status does not mean that the evidence is necessarily less admissible and most reported research and analysis appears to be professionally and objectively conducted.

It is important, however, to be aware of the origin of some of the material. Some primary research and especially some of the written summaries of evidence has been commissioned or presented by parties who are not disinterested in the results. This includes windfarm developers and representative bodies in the field of renewable energy, or local and national groups opposed to specific or general windfarm development.” (The Tourism Company 2012).

While the literature is international in scope, and includes reports from a number of European countries, as well as Australia and South Africa, the most extensive research, discussion and debate has occurred in connection with proposed offshore wind projects along the East Coast of the United States and in regards to proposed projects in the United Kingdom (particularly in Scotland). Consequently, this literature review focuses on the most substantive studies performed in these two geographic areas.

U.S. offshore studies. Recent proposals to develop offshore wind energy facilities near beaches and communities along the East Coast have generated considerable controversy and fostered several research studies. Probably the best of these studies, and one of the very few reports regarding the impacts of wind energy facilities on

tourism that has been published in a peer reviewed journal, is *The Effect of Wind Power Installations on Coastal Tourism* (Lilley 2010).

The Lilley study was based on a 2007 survey of more than one thousand out of state tourists at Delaware beaches. Using visual simulations of offshore wind turbines at varying distances, the study found that there was a strongly negative response to offshore wind development in close proximity to the beach, but that negative response diminished substantially with increasing distance from the shore. As shown in Figure 3, almost 45 percent of respondents indicated they would visit a different beach in Delaware or not visit a Delaware beach at all if the wind turbines were situated 1.5 kilometers from the shore. If the turbines were situated 10 kilometers from the shore, the negative response dropped to 26 percent, while at 22 kilometers only 6 percent of visitors indicated they would change their travel behavior. However, 36 percent of respondents to the Delaware survey indicated they would very likely visit a new or different beach at least once to see an offshore wind farm located 10 kilometers from the shore (Lilley 2010).

Figure 3. Reported Visitation Response to Potential Offshore Wind Farms at Varying Distances (from Delaware Study)

Respondent Beach Choice	Turbines Distance from Coast			
	1.5 km	10 km	22 km	Out of sight
Same Beach	55.3%	73.9%	93.7%	99.4%
Different Beach in Delaware	35.0%	18.9%	4.3%	0.3%
No Delaware Beach	9.7%	7.2%	2.0%	0.3%

In 2008, Global Insight produced *An Assessment of the Potential Costs and Benefits of Offshore Wind Turbines* on behalf of the State of New Jersey. That report relied, in part, on research conducted in 2006 involving interviews with more than 4,000 New Jersey residents. Much like the Delaware study, the New Jersey research found that increasing distance from the shore was an important factor in reducing negative responses among tourists. Overall negative responses to potential wind turbine development were lower than reported in the Delaware study, with about 12 percent of respondents indicating they would avoid a beach if it had wind turbines three miles offshore. As in the Delaware study, Global Insight noted the possibility that the novelty of a new offshore wind farm would also attract some tourists that would not otherwise visit (Global Insight 2008).

Scotland studies. From a global perspective, the most intense debate concerning the relationship between wind energy development and tourism has taken place (and continues to occur) in Scotland. This debate has reached the highest levels of the Scottish government, including both supporting and opposition testimony before the Scottish Parliament and the Scottish Executive. Most recently, there has been extensive coverage in the UK of American tycoon Donald Trump’s dire warnings about the economic implications of wind development for Scottish tourism (and particularly near his proposed golf resort development in Scotland), and his threats to bring lawsuits to stop that development.

There are several factors underlying the extraordinary interest and scrutiny regarding this subject in Scotland. Tourism is a very important industry in Scotland, employing about 200,000 people, or 9 percent of the Scottish workforce. The Scottish government's stated goal, as of 2008, was to increase national tourism revenues by 50 percent by 2015. However, the Scottish government has also adopted a very aggressive renewable energy goal, seeking to produce 50 percent of the country's energy from renewable sources by 2020 (VisitScotland 2008).

The characteristics that make Scotland attractive to tourists are also an important consideration. Although the scenery and climate in Scotland are very different from Anza-Borrego, the tourist motivations are similar. Ninety-two percent of visitors to Scotland identify the scenery as the most important reason for visiting Scotland (VisitScotland 2008).

Among the Scottish literature on this topic, surveys of businesses in the tourism industry have perhaps most strongly indicated concerns about potential impacts. For example, in a 2005 study commissioned by the Western Isles Tourist Board, at least two-thirds of tourism businesses agreed with the statement that "Wind farms will destroy the natural and visual landscape and less tourists will visit" (TMS 2005).

At the other end of the spectrum, several studies – including a 2002 survey of visitors commissioned by the British Wind Energy Association near previously constructed wind farms in Argyll and Bute – have concluded there would be a minimal impact on tourism, with the small proportion of tourists indicating a negative response essentially offset by a similar proportion with a positive response to the wind farms (GC University 2008).

The three most important surveys and reports concerning the effects of wind farm development on Scottish tourism have all been conducted on behalf of VisitScotland, the national tourism agency in Scotland. VisitScotland is an arm of the Scottish government, which clearly supports both wind development and tourism, and has developed a highly nuanced and seemingly objective position regarding wind energy development.³ These studies include the 2002 report *Investigation into the Potential Impact of Wind Farms on Tourism in Scotland*, the 2008 report *The Economic Impacts of Wind Farms on Scottish Tourism*, and a recently released 2011-2012 survey entitled *Wind Farm Consumer Research*. The following narrative focuses on these three studies.

For much of the previous decade, the most important information regarding the potential impact of wind farms on tourism in Scotland was provided by the 2002 report produced by NFO System Three for VisitScotland. That report was based on information gathered from 180 visitors through a technique known in the UK as "Hall Tests", in which tourists were invited to a rented facility for a structured discussion and survey. The NFO System Three study found that 29 percent of visitors felt that wind farms detracted from their experience of the countryside. Fifteen percent indicated that they

³ See <http://www.visitscotland.org/pdf/Windfarms1.pdf>.

would stay clear of an area if the number of wind farms increased, while another 10 percent indicated they would be less likely to come back (NFO System Three 2002).

Not surprisingly, given the prominence of this issue and the NFO System Three study, there was considerably controversy surrounding the report. In the subsequent 2008 study for VisitScotland, the authors from Glasgow Caledonian University, the Moffat Centre and CogentSI noted a number of potential methodological concerns, including the screening of survey respondents (including the elimination of non-leisure travelers as well as those who were not primarily visiting Scotland for its scenery and natural environment—such as golf visitors) and “potentially leading questions” (GC University 2008). However, a more recent literature review performed for a local government in Scotland notes that the criticism in the 2008 report was “taken verbatim from earlier views expressed by the British Wind Energy Association, which may not have been impartial ... we believe that this [the NFO methodology] appears sufficiently sound for the results to be fully accepted as evidence when properly interpreted, and to be at least as reliable as the results from other more recent studies.” (The Tourism Company 2012).

The 2008 study for VisitScotland also surveyed visitors – through intercept surveys at Scottish tourist attractions near existing wind farms – and included an internet survey. The intercept survey of 380 visitors found that the presence of the existing wind farms would have almost no impact on their likelihood of returning to the area in the future. There was a slightly larger negative response to visual simulations of and questions regarding future expansion of the wind facilities, with about 2.5 percent of visitors indicating such expansion would make them less likely to return. In contrast to the intercept surveys, however, the internet survey found that approximately 18 percent of respondents would avoid wind farm areas if the number of wind farms were to increase (GC University 2008).

The most recent information developed for VisitScotland was produced by an online survey of three thousand residents of the UK (including one thousand Scottish residents). That survey found that 18 to 20 percent of respondents agreed with the statement that “wind farms spoil the look of the countryside.” 17 to 18 percent agreed that “I would tend to avoid an area of the countryside if I knew a wind farm was there” (VisitScotland 2012).

Summary findings from the literature review. There have been a number of studies, of varying quality, focused on the prospective responses of tourists to wind farm development. A few studies, primarily sponsored by the wind industry, have interpreted aggregate data regarding actual tourist visits to regions or nations with developed wind farms to indicate that wind farms do not impact tourism. These studies, however, do not systematically isolate the potential effects due to wind farms from other factors driving annual variations in tourism levels. On the whole, the research is not yet definitive.

It is possible, however, to draw some general conclusions from the existing research:

- While the development of wind farms is not likely to affect the travel plans of most tourists, there appears to be a significant minority of visitors that would avoid particular scenic destinations if wind farms are developed.** Based on the best available studies, that minority could range from as little as five percent or less of all visitors to 25 percent or more. Figure 4 summarizes the estimated proportions of visitors that would avoid travel to destinations with nearby wind farms based on the studies discussed earlier in this report.

Figure 4. Summary of Estimated Proportions of Visitors that Would Avoid Areas with Wind Farms from Key Studies

Study	Visitors that Would Avoid Wind Farm Areas
U.S. Offshore Studies	
Delaware (2010)	45% to 6% (1.5 km to 22 km offshore)
New Jersey (2008)	12% (3 miles offshore)
Scotland Studies	
NFO System 3 (2002)	10% to 25%
GC University (2008)	0% to 2.5% (Intercept Surveys) 18% (Internet Survey)
VisitScotland Survey (2012)	17% to 18%

- Another minority of tourists indicate they might be more attracted to an area if a wind farm was present.** As noted in the 2008 GC University study, this may be primarily a novelty effect that would diminish over time as wind farms become more prevalent.
- Visual impacts of wind farms are a significant concern in areas where tourism is largely driven by the scenic setting.** Surveys indicate that over 90 percent of visitors to Scotland are primarily motivated by the scenery. The undeveloped landscape at Anza-Borrego likely has a similar attraction for visitors to the park.
- Distance may be the key to reducing visitor impacts.** While the literature does not provide extensive guidance regarding potential mitigation strategies, the U.S. offshore studies indicate that adverse response to wind facilities diminishes substantially with increasing distance from the turbines.

- **Overall, the best strategy for accommodating both tourism and renewable energy interests may be in careful and strategic planning regarding appropriate locations for wind energy development.** As noted in VisitScotland’s position paper:

“We believe that the Scottish Government targets for both tourism and the renewable industry are not incompatible and that, sensitively developed and sited, wind farms should not have a significant negative impact on tourism growth.

We would also welcome a more strategic approach to wind farm development and siting, e.g. identifying and categorizing areas for development in a way that protects sensitive areas and considers tourism interests. We believe this would be a significant improvement on the current process of development, which is reactive and piecemeal.”
(VisitScotland 2008)

Implications for Anza Borrego and Potential Further Research

As suggested by the proceeding section of this report, the findings of previous research regarding the impacts of wind farm development on tourism are varied. The applicability of this research to the specific situation at Anza-Borrego is also uncertain. The best studies in the US have focused on potential offshore wind developments. Although research in Scotland has focused more on onshore wind energy developments, and the scenery in Scotland is a critical aspect of that country’s attraction for tourists, most of Scotland could not truly be considered “wilderness” in the same sense as Anza-Borrego.

Given these limitations (and somewhat discounting the applicability of the estimated 44% impact on Delaware beach visitation from a prospective wind farm located only 1.5 kilometers offshore), the research summarized in this report suggests a range of potential impacts on visitation due to the development of commercial wind farms near tourist areas. Some studies suggest the impacts could be minimal, while others suggest up to 25 percent of visitors might avoid the area or be less likely to return in the future.

If even 10 percent fewer visitors come to Anza-Borrego due to the proximity of the proposed wind energy facilities, the regional economic impacts would be substantial. Approximately 50,000 fewer people would visit the park each year. Visitor spending would be reduced by over \$4 million per year. Over the 30 year anticipated life of the proposed wind facilities, the cumulative impact on visitor spending could be approximately \$120 million. This reduction in spending would translate into about 67 fewer jobs each year across California, including about 56 fewer jobs each year in Southern California. These effects would be most strongly felt in the communities closest to the park.

While construction and ongoing operations of commercial wind energy facilities would likely support a number of new jobs in the region, these would generally be different

jobs, requiring different skills, than the jobs currently supported by visitation to Anza-Borrego. Although it is not uncommon to compare potential job gains and job losses associated with a proposed development such as a wind farm, such discussions of “net effects” tend to obscure the impacts to existing businesses and employees.

Potential further research. Several factors make it difficult to estimate the potential impacts from the development of a commercial wind energy facility in close proximity to Anza-Borrego. These include the variability in the findings from previous research, the lack of research involving closely comparable settings, and the need for more information about the number of Anza-Borrego visitors that would likely see the turbines during their visit to the park.

More definitive estimates could be developed based on carefully crafted and administered intercept surveys with actual Anza-Borrego visitors, including visual simulations of the prospective wind farm from key locations. The surveys could be combined with analysis of visitor travel patterns at the park and analysis using geographic information systems to identify the viewshed for the prospective wind farm. Such research would not only provide more specific estimates of the visitation and regional economic effects associated with the proposed wind farm development, but could also help evaluate options to mitigate potential impacts on visitation and the regional economy.

References

BBC Research & Consulting (BBC). 2010. *California Outdoor Recreation Economic Study*. Prepared for California State Parks. http://www.parks.ca.gov/?page_id=23880

Bureau of Labor Statistics (BLS). 2012. Online inflation calculator.

California State Parks System Statistical Report. Various years. California State Parks.

California State Parks Visitor Survey (SPVS). 2009. California State University Sacramento, San Diego State University and California State Parks. Unpublished data provided by California State Parks.

Glasgow Caledonian University, Moffat Centre, CogentSI (GC University). 2008. *The Economic Impacts of Wind Farms on Scottish Tourism*. Prepared for the Scottish Government.

Global Insight. 2008. *An Assessment of the Potential Costs and Benefits of Offshore Wind Turbines*. Prepared for the State of New Jersey.

Lilley, Meredith Blaydes; Firestone, Jeremy; and Willett Kempton (Lilley). 2010. *The Effect of Wind Power Installations on Coastal Tourism*. *Energies*, 2010, 3, 1-22.

The Market Specialists (TMS). 2005. *Western Isles Tourist Board, Wind Farm Research, Final Report*.

NFO System Three. 2002. *Investigation into the Potential Impact of Wind Farms on Tourism in Scotland*. Prepared for VisitScotland.

The Tourism Company. 2012. *The Impact of Wind Turbines on Tourism – a Literature Review*. Prepared for the Isle of Anglesey County Council.

VisitScotland. 2008. *Position Statement – Wind Farms*.

VisitScotland. 2012. *Wind Farm Consumer Research*. Conducted by OnePoll.