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# Impact Study of Wind Power on Tourism on Gotland



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## FOREWORD

Dear reader,

Thank you for your interest in this summary report of a MSc. thesis with the title *Impact Study of Wind Power on Tourism on Gotland* (2013). I hope you find it a valuable document, however, I would like to encourage you to read the complete thesis, which is available online in a PDF format.

The thesis links where you can find other information as well is: [www.hgo.se/tourism](http://www.hgo.se/tourism) and [www.cvi.se](http://www.cvi.se)

To briefly introduce my professional curriculum vitae, I am a graduate of Master of Wind Power Project Management from Uppsala University Campus Gotland, with a Bachelor in Foreign Languages for Business. I have 18 months experience in technical client support at an international company focusing on IT, outsourcing and consulting. Having completed the academic path and being enriched by wind power knowledge, I am currently returning to the professional life through the wind power door.

In the course of my studies, my relation to Gotland with its dear inhabitants and beautiful sceneries became a special one. Therefore, I was happy to respond to the need related to the wind power industry on Gotland with the Master thesis and address the gap in the current wind power knowledge regarding the impact of wind power on tourism. Thus, on behalf of Uppsala University, I have strived to produce a concise summary for the wind power industry and stakeholders in Sweden, however, I will welcome your insights should you wish to share them with me.

Please do get in touch with your comments on the report or alternatively to highlight any additional information needs you may have, particularly if you would wish to obtain an access to the survey data files.

I hope you, as a reader, find this document rewarding.

Best regards,

*Vendula Braunová*

# Impact Study of Wind Power on Tourism on Gotland

**This study investigates the impact of wind power on tourism on Gotland. The main objective is to identify how tourists on Gotland during their holidaying perceive the visual features associated with wind turbines in the landscape. Additionally, it is sought to establish whether tourists plan to return to Gotland despite the presence of wind turbines, with a special focus on first-time visiting tourists. Using a structured questionnaire technique on a sample size of 735 respondents, this study finds that 8% of tourists perceive wind turbines negatively. Next, the study identifies that the decision to return to Gotland of absolute majority of tourists, including first-time visiting tourists, is not impacted by the presence of wind turbines. Lastly, it has been concluded that a potential on the island exists to develop a form of ‘wind power tourism’.**

## 1 INTRODUCTION

The current study has been carried out on Gotland, a popular Swedish island, which a number of tourists find an attractive holiday destination. With the arriving tourists the island starts flourishing, which boosts the local economy.

Not only does the tourism industry contribute to the local economy, but so does also wind power, which is abundant over the island as Gotland is blessed with favourable wind conditions to harvest wind energy. The energy generated by approximately 150 wind turbines covers almost 40% of Gotland’s electrical energy demand. The goal for onshore and offshore wind power expansion within Gotland Municipality is set to reach an annual production of approximately 2.5 TWh of electricity, i.e. 1,000 MW installed capacity onshore, which implies that more space will be needed for approximately 250 new wind turbines at certain locations on Gotland (Bygg Gotland, 2013). Gotland has already witnessed a significant wind power development, both onshore and offshore, while the proposed new projects will lead to an increase in the numbers of wind turbines. The situation is a subject of debate on the island, including concerns about the potential impact on tourism, particularly as a result of the effect of the wind turbines on the landscape attractiveness.

Therefore, the main objective of the present thesis is to identify how tourists who have encountered wind turbines on Gotland during their holidaying perceive the visual features associated with wind turbines in the landscape, and whether the tourists plan to return to Gotland despite having noticed wind turbines. An additional goal is to establish whether wind farms can become a tourist attraction so that tourists decide to visit wind parks for the sake of wind power experience and excursion, for instance through visitor centres. Investigating the impact of wind turbines on tourism seems relevant, particularly in a market context where wind turbines on Gotland are planned to grow.

In order to address the research objectives, a structured questionnaire has been developed and employed. The questionnaire was distributed to tourists leaving Gotland during the course of July 2013. Only tourists leaving

# Impact Study of Wind Power on Tourism on Gotland

on a ferry have been interviewed. As time and resources have been limited, only the current impact of wind power on tourism has been researched, i.e. before the further planned wind power expansion on Gotland. Therefore, it is outside the scope of the current paper to address the impact of wind power on tourism after the planned wind power expansion.

## 2 METHOD

As the primary objective of the current survey is to learn about tourists' standpoints about wind turbines on Gotland, a paper structured questionnaire has been selected as a suitable tool to accomplish the goals of the research project. The questionnaire also allows standardizing our questioning to such an extent that a more numerate, statistically-based analysis is possible. The questionnaire design commenced early April 2013 and was finalized at the end of June 2013. The questionnaire was designed by the author, supervisors, advisors, related academics and verified by statisticians and psychologists. Subsequently, the questionnaire was piloted for one week, during which time, resources, and response rate were tested. The pilot study preceded the field survey and took place after midsummer, from 24 June 2013 till 26 June 2013.

From a layout point of view, the questionnaire comprised of three sections. The first section began with addressing details about the tourists' visits. The second section focused on questions about tourists' attitudes towards wind turbines, aiming at discovering how tourists perceive wind turbines in the landscape, the impact of wind turbine presence on tourists' decision to return to the island and the level of tourists' interest in visiting a wind farm as a tourist attraction. The third section addressed personal data, i.e. gender, age, nationality, and potential comments. The aim of the data collection was also to include approximately equal gender representation, a complete age spectrum, and respondents both from Sweden and abroad.

The sample size is an important feature of any empirical study, in which the goal is to make inferences about a population from a sample. To determine the sample size, this study has assumed a standard normal distribution, margin of error and a confidence interval of 95% and a formula for estimating sample size that is based on sample error  $E$  around estimates of proportions. This is standard statistical practice for survey data, which brings us to a minimum sample of 400 respondents to complete the questionnaire (Shao, 1999; Jankowicz, 2005; Malhotra et al., 2012).

In the course of July 2013, field research was carried out by the author of this paper. The questionnaires were handed out within the premises of the ferry company Destination Gotland in Visby, where the leaving visitors with or without cars queue to board the ferry. The month of July was selected for data collection due to the highest frequency of tourists' visits. The number of tourists coming to Gotland in July was estimated to reach approximately 350,000 tourists.

# Impact Study of Wind Power on Tourism on Gotland

After the aforementioned pilot study, the following procedural amendments were introduced. Fundamentally, insufficient sampling was identified and improved. The deficiency was detected during the pilot data analysis when a number of questionnaires were completed identically by 'cluster' groups, for instance, families, couples or a group of teenagers who visited Gotland for confirmation purposes. A similar phenomenon appeared with respondents queuing in the car terminal. In other words, when all passengers in one car filled in the questionnaire individually, significant overlapping and/or identical responses were detected. Therefore, to maintain unbiased, representative and impartial approach, such cluster effects were avoided in the course of the real study.

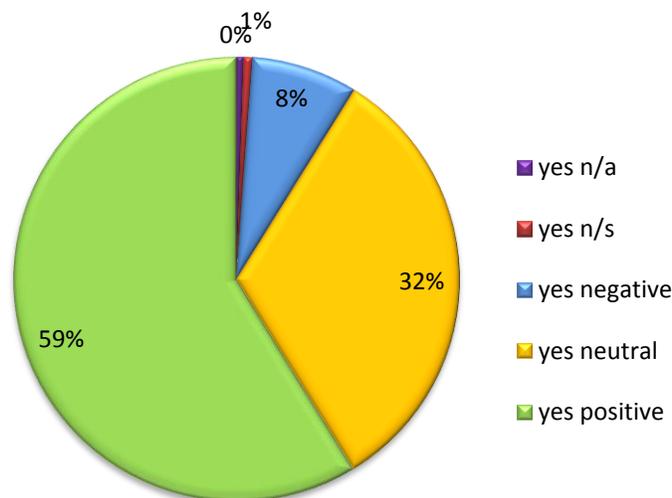
On average, every fifth person declined to fill in the questionnaire. Each questionnaire completion lasted approximately 5 minutes. In total 743 responses have been acquired, of which 8 questionnaires were not fully completed, and therefore not used for final analysis. 611 tourists out of 735 respondents saw wind turbines on the island, therefore the results focus on this particular group of respondents only.

## 3 RESULTS

A summary listing the current research's findings follows:

- A minimum number (8%) of tourists perceived wind turbines negatively.
- Whether tourists have seen wind turbines or not, it did not affect the general impression of wind turbines, that means the group of respondents with positive impression prevails.

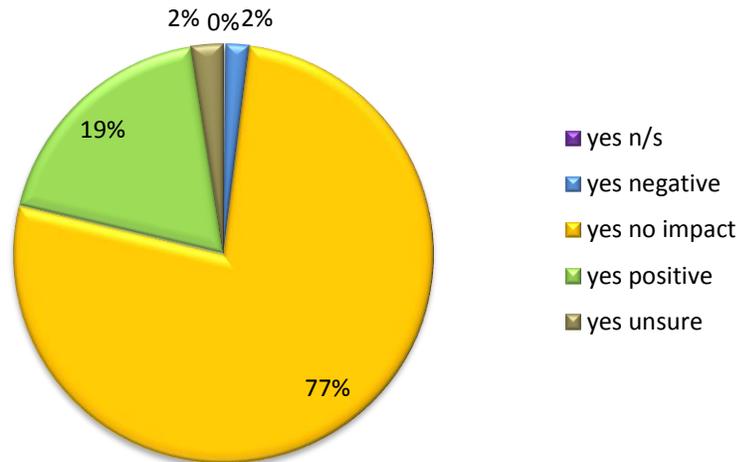
### Impression of wind turbines



# Impact Study of Wind Power on Tourism on Gotland

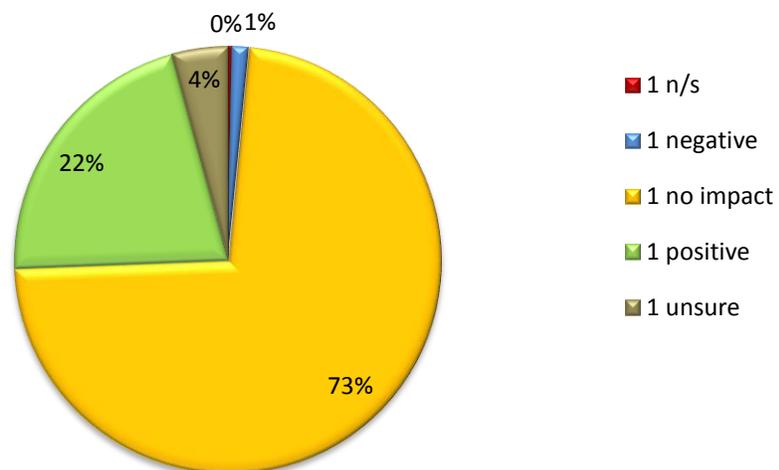
- Whether tourists' motivation to visit Gotland was purely 'nature' or combination of purposes, the percentages were rather consistent. Nature lovers showed 10% negative impression of wind turbines, 'seaside & weather' 7% negative and 'multiple' 7% negative.
- From the 'accommodation' point of view, it can be concluded that respondents' impressions did not significantly vary when assessing the accommodation being 'camping' and 'summer house'. Respondents who camped expressed 6% negative impression of wind turbines, respondents who stayed in summer houses were 9% negative. Considering the given margins of error and natural statistical variations, any comments on the differences can be merely intuitive.
- Two main differences between respondents with positive and negative impressions of wind turbines were that tourists with negative impression of seeing wind turbines came to the island with negative attitude and left with negative attitude to wind turbines. Secondly, absolute majority of the negative respondents did not express interest in visiting a wind farm as a tourist attraction.
- Both women and men expressed mainly positive impressions of wind turbines followed by neutral and lastly negative impressions. Women shared positive impressions in 53%, neutral in 34% and negative in 5% of cases while men claimed positive impressions in 56%, neutral in 29% and negative in 8% of cases. Conclusions about differences in wind turbine perceptions by gender can, therefore, be drawn only intuitively.
- All age groups had mainly positive impressions of wind turbines followed by neutral and lastly negative impressions. The tendency of predominantly positive impressions of wind turbines remained in all age groups and it cannot be concluded that one or another age group perceived wind turbines with a significant difference.
- A significant difference in wind turbine perception by nationals was not detected in the current study.
- The decision to return to Gotland of absolute majority (98%) of tourists is not impacted by the presence of wind turbines on Gotland.

## Impact on decision to return



- The decision of absolute majority of first-time visiting tourists (99%) to return is also not impacted by the existence of wind turbines on Gotland.

## First-time comers: impact on decision to return

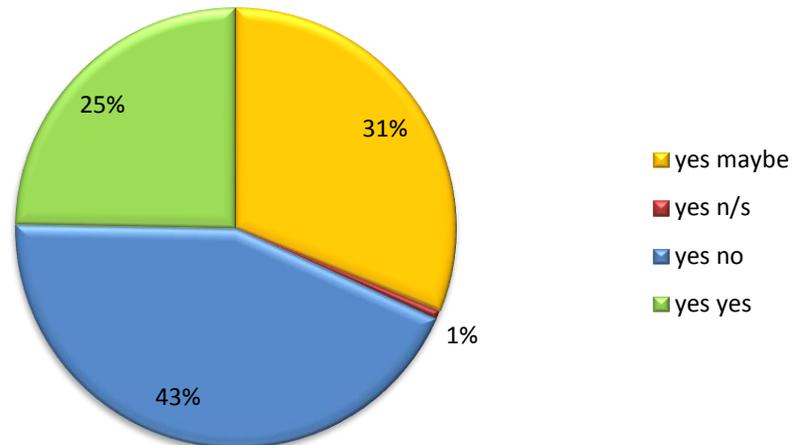


- Although four first-time comers (1%) claimed negative impact on their decision to return, this fact might not mean that tourists would not return at all as eight (out of 12 tourists who claimed negative impact on their decision to return) have returned. The evidence follows: two respondents have come back to Gotland three times despite having claimed a negative impact on the decision to return to the island, one respondent has returned four times, two respondents five times and three respondents more than five times.

# Impact Study of Wind Power on Tourism on Gotland

- Approximately half of respondents (56%) expressed interest in visiting a wind farm as a tourist attraction, therefore, wind turbines could be used to encourage development of a new form of tourism on Gotland, i.e. 'wind power tourism', with the support of proper marketing promotion.

## Interest in visiting a wind farm: 'yes' have seen



- Universally speaking, we conclude that wind power does not significantly affect tourism on Gotland.

Current findings seem overall consistent with the literature reviewed in terms of impact of wind power on tourism. Consistently with studies conducted in Scotland, Wales, Australia, Denmark, Quebec, Sweden (2009), the Czech Republic and France, also on Gotland wind turbines are not perceived as having a detrimental effect on the tourism industry. Only in Dalarnas Län (Sweden, 2010), the research concludes that wind power development in the investigated area can result in conflict with the tourism industry. In contrast to Dalarnas Län, in Quebec and the Czech Republic, the surveys conclude that new wind installations will have only a minor or negligible negative impact on tourism. Regrettably, the current thesis cannot provide any conclusion in this respect as it is beyond the scope to research the impact after the planned wind power expansion. The Gotlandic survey also corresponds to Australia and Sweden (2009) in terms of the potential of wind turbines to become a tourist attraction.

Next, we shall incorporate qualitative findings about the research problem developed during the current survey. Some of those insights discovered in the course of the survey have not been considered in the reviewed literature. A summary of the main points follows:

- Firstly, the interviewer had to be constantly aware of the advantages and disadvantages of a questionnaire as a research tool. It is uncertain whether we can assume, and if so to what extent, that the answers to the questionnaire measure specifically wind power versus tourism on Gotland, and not people's general attitude towards wind power.

# Impact Study of Wind Power on Tourism on Gotland

- Secondly, it has been identified that to distinguish tourists from regular travelling residents of Gotland can be a complex process.
- Particularly respondents staying in summer houses represent a problematic group as many of them belong to the group known as 'summer Gotlanders' who at times consider themselves tourists while some others do not. Uncertainty remains whether the approached travellers who did not wish to complete the questionnaire had other attitudes to wind turbines than people who have completed the questionnaire.
- The relatively high ratio of 'not stated' (5%) in the category gender was not anticipated. This phenomenon appeared due to tourist's decisions to fill in the questionnaire not individually, but together as a couple or a group.

## 4 LIMITATIONS AND FURTHER RESEARCH

This section discusses limitations that became apparent during the progress of the research, particularly certain questionnaire results that may indicate a limitation.

This research represents a case-study dealing specifically with the segment of tourists who were leaving Gotland by ferry and it remains to be established to which extent the general public opinion has been represented. Yet the survey findings have a predicative value and we can deduce certain generally true verdicts from them as listed in the previous section.

Moreover, comparing the current wind turbine perception results from a tourist point of view (59% positive, 32% neutral, 8% negative), there is a certain level of correspondence with the SOM Institute survey results. The SOM Institute asked Swedish citizens what energy sources Sweden should invest in, which resulted in 73% of the respondents stating that Sweden should 'invest more' into wind power (Hedberg, 2005). The result is considered rather supportive in comparison with for example coal where 2% of Swedish citizens responded 'invest more'. The proportion of people positive towards investing more in wind power by gender and age follows: male (72%), female (73%); age 15-30 (70%), 31-60 years (79%) and 61-85 years (63%). Relating these figures to the results of the current survey, we can see only a slight difference between the genders and therefore it is not possible to draw any distinct conclusion. Regarding the age differences between the current results and the SOM Institute, the age group '31-60' seems to be the most supportive one as per the SOM Institute whereas the current survey suggests that both groups of tourists '31-55' and 'over 55' share positive impressions of wind turbines. As mentioned, comparing these two studies only indicates a similar tendency of positive/supportive attitude, and further research is encouraged in terms of comparative studies on wind power acceptance in Sweden.

# Impact Study of Wind Power on Tourism on Gotland

Regarding the current questionnaire results, age and gender of respondents indicate a limitation. Distribution of participants in age groups 'under 18' and '19 – 30' was considerably lower than in age groups '31 – 50' and 'over 50'. However, the prevailing age of tourists was known and therefore, the age limitation was anticipated and afterwards proven during the course of the survey. Another potential limitation of the study is the slightly unequal gender distribution.

Additionally, absent economic analysis and financial figures represent the last limitation. To address all potential concerns of local entrepreneurs and others, it would be beneficial to know more details regarding tourists' expenditures on Gotland. For instance, the value that either returning or first-time coming tourists bring to the island, and how the purpose of visit, length of stay and accommodation affect the tourists' expenditure. As a matter of fact, as far as the current study investigates the impact of wind power on tourism on Gotland, the absent economic analysis is considered a limitation that became apparent during the course of the survey and could be researched further.

Concerning the further research suggestions, these refer to both the topic and the methodology. Only the current impact of wind power on tourism has been researched, i.e. before the planned wind power expansion on Gotland. This fact provides an opportunity for further research in terms of identifying how tourists perceive wind turbines on Gotland after the planned wind power expansion in order to understand the impact fully and completely. One could also continue investigating the challenging relation between the maximum planned wind power expansion on Gotland, the level of impact, financial implications and/or the tourists' experience.

Regarding the point that the current survey represents a case-study dealing specifically with the segment of tourists who were leaving Gotland by ferry, the point also provides an opportunity for further research. For instance, research could be conducted with Swedish nationals who have never been to Gotland and investigate their motivation to (not) visit the island.

As a matter of fact, it would be beneficial to expand the current study by economic analysis focusing on the value that wind turbines bring to Gotland. That means job creation value, investment, economic benefits, electricity independence, the costs, loss of usable lands among others. With such economic extension, certain hypotheses could be tested as well for the current survey operated without any stated hypotheses. Additionally, more detailed financial figures concerning the value that tourism industry brings to Gotland should be introduced. Afterwards, a cost-benefit analysis could be conducted to identify both values of the wind and tourism industries.

Lastly, the study would benefit from certain methodological amendments including a more in-depth analysis of the interrelations in the survey. Although Excel proved itself to assist with the data analysis sufficiently, a real statistical software package, for instance SPSS (Statistical Package for the Social Sciences), would enable the

# Impact Study of Wind Power on Tourism on Gotland

researcher to identify potential correlations or analogies. Moreover, involving a larger research group would be beneficial as well.

This more detailed analysis should afterwards serve to establish whether 'wind power tourism' development on Gotland is needed and would bring the desired effect of increased wind power acceptance.

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