WENDY aims at unravelling the factors triggering social acceptance of wind farms through an in-depth analysis at three dimensions: social sciences and humanities, environmental sciences and technological engineering.

Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

WP2, T2.3

Task 2.3 partners

Leading partner: White Research
Participants: NINA, EGP, NOWC, MEC, CBS, Q-PLAN

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Technical Preferences

Project Acronym	WENDY
Project Title	Multicriteria analysis of the technical, environmental and social factors triggering the PIMBY principle for Wind technologies
Project Coordinator	CIRCE FOUNDACION CIRCE CENTRO DE INVESTIGACION DE RECURSOS Y CONSUMOS ENERGETICOS jperis@fcirce.es
Project Duration	Oct. 2022 – Sep. 2025 (36 months)

Deliverable No.	D2.3
Dissemination level*	PU
Work Package	WP 2 - Preparatory studies related to turbines' social acceptance and wind energy citizenship
Task	T2.3 - Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms
Lead beneficiary	2 (WR)
Contributing beneficiary/ies	3 (NINA), 4 (EGP), 5 (NOWC), 6 (MEC), 7 (CBS), 9 (Q-PLAN)
Due date of deliverable	31 July 2023
Actual submission date	28 July 2023

- PU – Public, fully open
- SEN – Sensitive, limited under the conditions of the Grant Agreement
- Classified R-UE/EU-R – EU RESTRICTED under the Commission Decision No2015/444
- Classified C-UE/EU-C – EU CONFIDENTIAL under the Commission Decision No2015/444
- Classified S-UE/EU-S – EU SECRET under the Commission Decision No2015/444

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This document has been prepared by WENDY project partners as an account of work conducted within the framework of the EC-GA contract no 101084137.

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WENDY project's abstract

WENDY aims at unravelling the factors triggering social acceptance of wind farms through an in-depth analysis at three dimensions: social sciences and humanities, environmental sciences and technological engineering. For that, the project will implement a series of local actions promoting the wider adoption of the project solutions, including guidelines, reports and handbooks which will be created to boost the understanding of wind farms decision making processes and enhance energy citizenship. This will be supported by the spatial multi-criteria WENDY toolbox. A tool able to identify the optimal turbines' siting with the minimum environmental impact and highest social acceptance likelihood. All developed models, methods, guidelines and tools will be implemented within 10 wind projects spread across 4 countries. These have been selected considering: geography (north vs. south Europe), maturity stage (viability phase / planning phase / short-term operation phase / long-term operation phase); type of wind energy (onshore / offshore – floating, fixed-); and co-existence with other activities (agriculture, fisheries, energy communities). In these locations, outreach activities tailored to their specificities will be performed, creating the WENDY Knowledge Hubs which will incorporate citizens, local authorities, business owners and value chain actors of wind energy. WENDY Hubs will serve as a baseline for the WENDY Knowledge Exchange Platform, a forum that will be developed to facilitate the exchange of knowledge between decision makers and key stakeholders within wind farms planning processes. For a successful implementation of the project activities, all the value chain and the best-in-class expertise is involved in the project consortium including 9 partners from 6 European countries: 1 Large Company (EGP), 2 SMEs (WR, Q-PLAN), 1 University (CBS), 2 RTO (CIRCE, NINA), 1 Energy Community (MEC), 2 Non-profit organisations and associations (NOWC, APPA).

List of the WENDY's consortium partners

No	Full name	Short name
1	FUNDACION CIRCE CENTRO DE INVESTIGACION DE RECURSOS Y CONSUMOS ENERGETICOS	CIRCE
2	WHITE RESEARCH SRL	WR
3	STIFTELSEN NORSK INSTITUTT FOR NATURFORSKNING NINA	NINA
4	ENEL GREEN POWER SPA	EGP
5	MARIN ENERGI TESTSENTER AS	NOWC
6	ENERGEIAKI KOINOTITA ANATOLIKIS KRITIS	MEC
7	COPENHAGEN BUSINESS SCHOOL	CBS
8	ASOCIACION DE EMPRESAS DE ENERGIAS RENOVABLES - APPA	APPA
9	Q-PLAN INTERNATIONAL ADVISORS PC	Q-PLAN

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Time-plan of Task 2.3 and its resulting deliverable 2.3

Action	Description	Planned time		Responsible
1	Literature review on behavioural research around wind farms	M1	M3	WR
1.a	Preparation of questionnaire form for social acceptance survey	M1	M3	WR
1.b	Preparation of guidelines for interviews	M1	M3	WR
1.c	Preparation of questionnaire form for EU-level survey	M1	M3	WR, CBS
1.d	Review of guidelines for interviews and survey questionnaires	M3	M3	all
2	Circulation of social acceptance survey	M3	M5	Pilot partners
3	Conduct semi-structured, consultation interviews	M3	M5	Pilot partners
4	Deploy EU-level survey on crowdsourcing platform	M3	M5	WR, CBS
5	Individual consolidated reports based on desk research, interviews and Survey	M6	M8	WR, all
6	Preparation of integrated deliverable 1st draft version of D2.3	M8	M9	WR, all
7	Quality review of D2.3	M9	M10	D2.3 Reviewers
8	Finalisation of D2.3	M10	M10	WR

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**The order of the names of partners, excluding the Task leader (WR), follows the order mentioned in the description of Task 2.3 in the DoA: NINA, EGP, NOWC, MEC, CBS, Q-PLAN.*

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List of abbreviations

Abbreviation	Full name
ANOVA	Analysis of Variance
CA	Consortium Agreement
CO_2	Carbon dioxide
DoA	Description of Action
EC	European Commission
EPC	Engineering, Procurement and Construction
EU	European Union
GA	Grant Agreement
GHG	Greenhouse emissions
GW	Giga Watt
km	kilometer
KPI	Key Performance Indicator
m	meter
MS	Member States
n.d.	no date

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NIMBY	Not In My Backyard
PIMBY	Please In My Backyard
RED	Renewable Energy Directive
RES	Renewable Energy Sources
WP	Work Package
WTG	Wind Turbine Generators

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Executive summary

The deliverable D2.3 was produced as part of Task 2.3, which falls under the first technical Work Package 2 (WP2) of the WENDY project. WP2 focuses on carrying out essential preparatory studies related to assessing turbines' social acceptance and energy citizenship. This assessment will contribute significant insights to upcoming Work Packages. WP2 establishes the groundwork for developing a comprehensive understanding of social acceptance and energy citizenship within the WENDY project's context.

Task 2.3 aims to identify and analyse existing perceptions and awareness of wind energy projects. The consolidated findings of this report will enable partners to fine-tune pilot actions and effectively address current concerns. For this reason, pilot and EU level surveys were conducted to assess wind farm social acceptance along with interviews with regional and national key actors in the wind farm value chain.

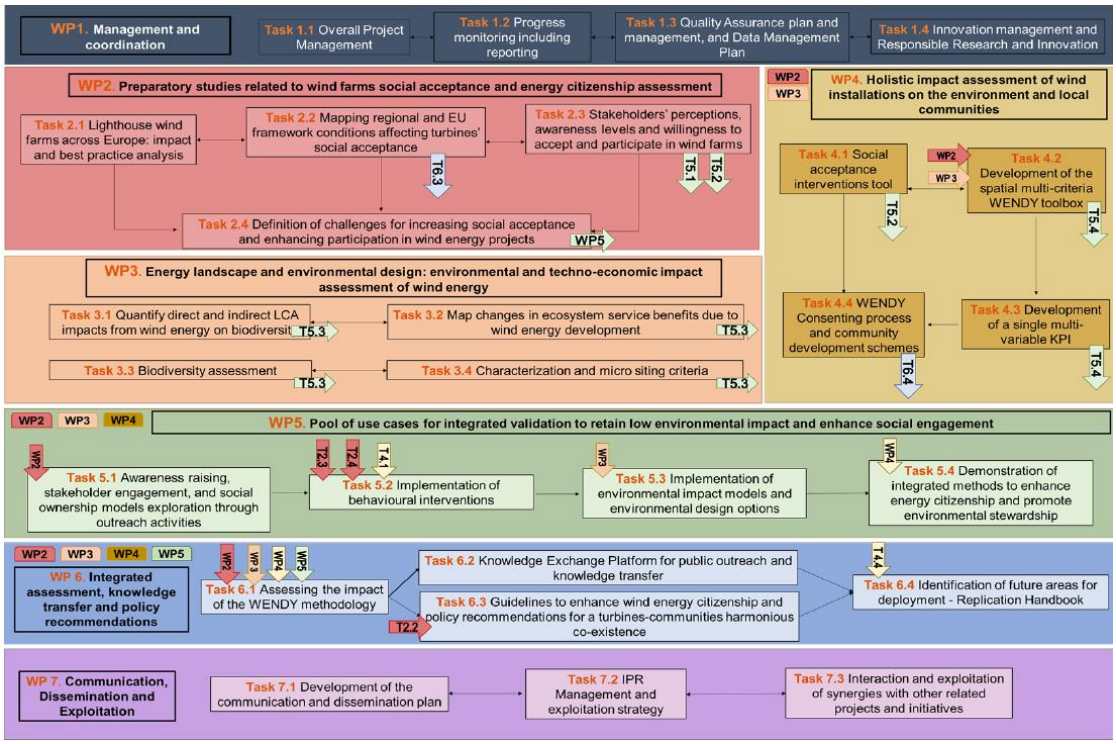

Figure 1: Work Package 2 and its linkage with the other Work Packages of the WENDY project

Task 2.3 began with desk research into the factors that may play a role in wind farm acceptance and participation. Factors identified in relation to social acceptance of wind farms and public participation include*: 1) Knowledge and awareness about wind energy farms and technologies, 2) Overall support towards wind farms, 3) General and individual attitudes towards wind farms, 4) Impact on local economic activities such as tourism, Aesthetic and distance of wind farms, 5) Health and well-being associated with noise from wind farms, 6) Awareness of ecology and environmental values, 7)*

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Economic impacts, 8) Trust and procedural justice, 9) Personal values, 10) Personality traits.

In line with the DoA and the scientific literature, barriers and drivers of public acceptance and participation in wind turbines development were also identified.

Table 1: Drivers and barriers of public acceptance and participation in wind turbines development based on the desk research conducted

Drivers	Barriers
Positive impact of wind farms on the local economy	Limited access to information
Transparent communication	Limited or ineffective engagement methods
Effective formal mechanisms of participation	Environmental-related factors
Effective informal mechanisms of participation	Technical characteristics
Environmental concerns and climate change awareness	Societal impacts of wind farms
Bio-diversity impacts	Individual-level sociodemographic characteristics
	Economic impacts of wind farms

Based on the findings of the desk research, a survey questionnaire was designed that included relevant questions from the literature to assess the social acceptance of wind farms. The survey was circulated by the pilot partners MEC, EGP, NOWC and NINA to the WENDY pilot cases in Greece, Spain and Italy, Norway accordingly at local level to capture perceptions, NIMBY phenomena and acceptance rates considering geographical and socio-cultural differences. A total of 448 responses were collected from the WENDY pilot cases. In addition, a survey was conducted at EU level using crowdsourcing techniques, collecting 3133 responses that complemented our study. The EU-level survey revealed whether factors assumed significant at the regional level are indeed important for the general public's preferences towards wind farms across Europe.

First, descriptive statistics were presented for the pilot and EU surveys. This analysis provided useful insights into the general trends and preferences of the public regarding wind energy in the pilot cases of the project and also at EU level. In addition, a total of 20 semi-structured interviews were conducted with regional and national

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key actors in the wind farm value chain to identify further barriers and drivers to wind farm acceptance and participation in wind turbines development. The interview questionnaire was developed in such a way to investigate further key dimensions, including *wind farm development and acceptance, wind farm project drivers and barriers, wind farm project public participation*.

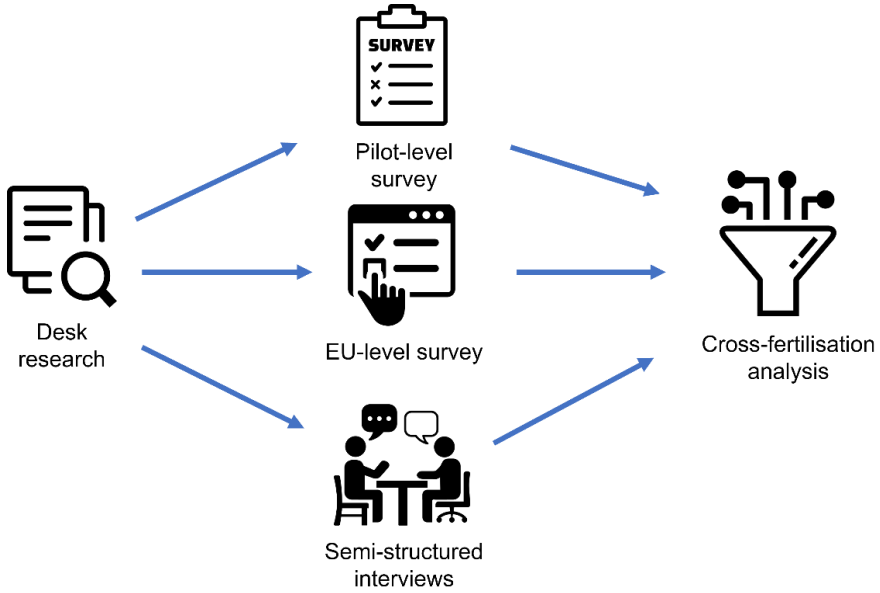

Figure 2: Methodology for Task 2.3, including desk research, pilot and EU level survey, semi-structured interviews and cross-fertilisation analysis

The next step of this study was a cross-fertilisation analysis between the pilot survey and the EU-level survey data and interview responses. A more detailed statistical analysis was carried out for the survey data by grouping the questions according to factors that might affect social acceptance and participation in wind farms, based on the literature, and whether these factors are drivers or barriers to wind energy. Specifically, for the pilot survey, a one-way ANOVA analysis was first conducted for each factor between the pilot cases to check if there was a significant statistical difference between them for that factor. In addition, a post-hoc test analysis was conducted to further test in which pilot cases the factor under study plays a role as a driver or barrier to wind farm acceptance. Based on this analysis, several useful insights could be gained for the pilot cases of the WENDY project. In particular, the results of the pilot analysis show that the Norwegian pilot case seems to have lower public support, more negative attitudes and lower general acceptance of wind farms compared to the other pilot cases, namely in Spain, Greece and Italy. Overall, this analysis underlines the subjective nature of reactions to renewable energy technology. For the EU-level survey, a linear regression analysis was conducted indicating which factors have a greater impact on social acceptance and participation in wind turbines development. Based on this EU survey analysis, a number of factors have been identified as drivers or barriers to the uptake of wind farms across Europe. In brief, the

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identified drivers that seem to influence the uptake of wind energy are: 1) egoistic value, 2) altruistic value, 3) income and 4) biospheric value. The identified barriers are: 1) perceived health impact, 2) perceived economic impact, 3) hedonic value and 4) perceived aesthetic impact.

The analysis of the interview responses revealed several common drivers and barriers in the pilot cases, which were categorised into three key areas:

i. Wind Farm Development,
ii. Establishment and Continuation Of Wind Farm Projects
iii. Public Participation in Wind Farm Projects

Deliverable 2.3 is a comprehensive analysis of the social acceptance and public participation in wind farms across Europe and its implications for key stakeholders. Important findings of this study include:

- ✓ **Pilot surveys:** The Norwegian pilot case of the WENDY project seemed to have the lowest support and acceptance of wind farms compared to the pilot cases of Spain, Italy, and Greece. The latter three countries showed higher levels of positive attitudes and support, with the Italian pilot case having the highest support. No significant differences were found in terms of economic impact and siting of wind farms.
- ✓ **EU survey:** Common drivers of social acceptance across Europe included personality values, emphasizing individual and community benefits in communication campaigns, and economic factors such as income and local economic benefits. Barriers to acceptance included perceived health impacts, aesthetic preferences, concerns about tourism, and environmental impacts.
- ✓ **Interviews:** Key drivers of wind farm development were climate change awareness, economic development, advances in turbine technology, and learning from past experiences. Social resistance, regulatory challenges, and lack of public participation were identified as barriers. Transparent communication and public knowledge were crucial for promoting public participation.
- ✓ **Pilot and EU survey comparison:**. In both surveys, offshore wind farms generally had higher acceptance than onshore wind farms.

The concluding outcomes of this deliverable have important implications for the various actors in the wind farm value chain. Tailored strategies that take into account regional differences and specific concerns are needed to promote social acceptance. Effective communication about the economic and environmental benefits, addressing health and aesthetic concerns, and engaging local communities are crucial. Transparent communication, accurate dissemination of information and fair distribution mechanisms for economic benefits can increase public support and

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facilitate the transition to wind energy. Overall, understanding regional differences and influential factors enables targeted and inclusive strategies to harness the potential of wind energy in the European renewable energy landscape.

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Table of contents

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List of Tables

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List of Figures

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1. Introduction

Deliverable 2.3 was developed as part of Task 2.3 under the first Technical Work Package 2 (WP2) of the WENDY Project. Based on the Description of Action (DoA), the main objective of Task 2.3 is to identify and analyse existing perceptions and awareness levels of wind energy projects. Task 2.3 aims to capture perceptions, NIMBY phenomena and acceptance rates, taking into account geographical and socio-cultural differences, by circulating a survey and collecting 100 responses per WENDY pilot case, namely Spain, Italy, Norway and Greece, to assess the social acceptance of wind farms at pilot level. In addition, the surveys provided insights on key dimensions to be further explored through semi-structured interviews at pilot level.

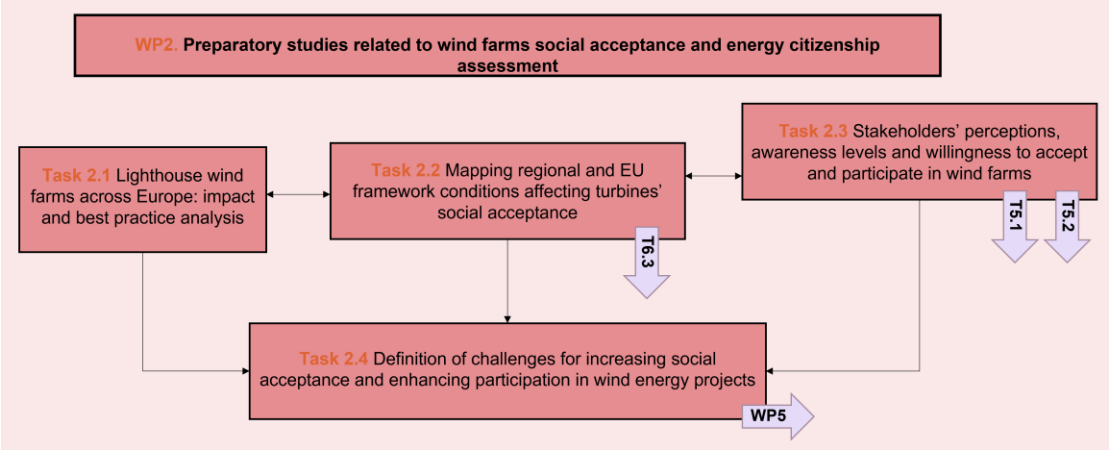

Figure 3: Task 2.3 within the framework of Work Package 2 and its linkage with other tasks and Work Packages

In total, 20 interviews (5 interviews per pilot case) were conducted with regional and national key actors in the wind farm value chain to share experiences and identify barriers and drivers for public acceptance and participation in wind turbine development. Finally, an EU-level survey was conducted on a crowdsourcing platform, collecting 3000 responses. The EU-level survey complemented our study and showed that factors assumed to be important at regional level may actually influence public preferences towards wind farms across Europe.

Based on the results of the pilot study and the EU-wide survey as well as the analysis of the interviews, a cross-fertilisation analysis was carried out. The analysis focused on the following aspects:

- Knowledge about wind farms
- Acceptance of wind farms
- NIMBY Effect
- Type of wind farms acceptance
- Impact on tourism
- Aesthetic and Visual impact

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- Environmental consideration
- Health and well-being associated with distance
- Economic impact
- Participation
- Trust and procedural justice

The analysis provided valuable insights into social acceptance and public participation in wind farms, both at pilot and EU level. Furthermore, the analysis shed light on the similarities and differences between the factors that could either facilitate or hinder the social acceptance of wind farms.

The rest of the document is divided into the following 5 main parts:

- **Part 2** is the desk research that provides the basis for the factors and barriers to social acceptance of wind farms identified in the literature.
- **Part 3** deals with the pilot and EU level surveys, including the methodology, the questionnaire and the analysis of the results.
- **Part 4** describes the interviews conducted, including the questionnaire used and the analysis of the interview data.
- **Part 5** is the cross-fertilisation analysis of the data from the pilot and EU-level surveys and interviews, revealing key drivers and barriers to social acceptance and public participation in wind farms.
- **Part 6** presents the main conclusions from this study and possible recommendations for different stakeholders to increase the acceptance of wind farms.

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2 Desk Research

Today, the effects of climate change are more than ever visible and therefore there is an urgent need for action to prevent the environmental, economic and societal consequences of this situation. A possible solution lies in renewable energy sources, which are a great alternative to fossil fuels and can contribute to the reduction of the greenhouse gas (GHG) emissions. To this end, the European Union (EU) has adopted a series of policies to encourage investment in the development of renewable energy facilities in Europe. Specifically, in 2018, the European Union proposed a new Renewable Energy Directive, Directive (EU) 2018/2001, (RED II) (Directive (EU) 2018/2001, 2018) to call on its Member States (MS) to take concerted action to make Europe a world leader in a wide range of renewable energy sources and ensure energy independence. The RED II changed the target of the previous Renewable Energy Directive, Directive 2009/28/EC, (RED I) (Directive 2009/28/EC, 2009) from 20% total energy production from renewable sources by 2020 to 27% by 2030 in the EU. Shortly afterwards, in 2021, the European Commission (EC) proposed an amendment to RED II with a more ambitious target of 40% of energy consumption coming from renewable sources by 2030 (Amending Directive (EU) 2018/2001, 2021). This paves the way for the EU to become climate neutral by 2050 (A Clean Planet for All A European Strategic Long-Term Vision for a Prosperous, Modern, Competitive and Climate Neutral Economy, 2018), i.e. to have an economy with zero net GHG emissions, which would make Europe the first continent to achieve this. Climate neutrality is at the heart of the European Green Deal and is in line with the EU's commitment to global climate action under the Paris Agreement (The Paris Agreement | UNFCCC, 2015).

One of the key pillars of the Green Deal is wind energy, as its technology is scalable, cost-effective and has the potential to create many jobs. In particular, the EC's long-term decarbonisation strategy foresees that wind energy will be the largest source of power generation by 2050 (In-Depth Analysis in Support on the COM(2018)| Knowledge for Policy, 2018). The market for wind energy, especially for onshore wind farms, is mature and competitive (Bórawski et al., 2020), and offers a technology with a high potential to reduce GHG emissions. The EU-27 has reached a total wind energy capacity of 189 GW (Wind Energy in Europe: 2021 Statistics and the Outlook for 2022-2026 | WindEurope, 2021) in 2021, of which 173 GW onshore and 16 GW offshore. This lays the foundation for the ambitious target of 1200 GW of wind energy in 2050, which will put the EU on the path to carbon neutrality. Currently, the EU needs to install 32 GW of new wind energy facilities per year to reach its target of 40% renewables by 2030, which equates to 453 GW of wind energy capacity in total.

However, the COVID-19 pandemic and the associated restricted movement of people and goods in 2020 led to a drop in wind installations in 2021. Wind installations also experienced delays in 2021 as a number of key volumes were postponed to 2022 due

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to supply chain issues and rising material costs. Apart from these urgent facts, the annual wind power capacity installed in the EU still seems to be stagnating and even decreasing recently (Wind Is Not Growing Fast Enough for EU Economy to Go Climate-Neutral, 2021), jeopardising the achievement of the climate targets set out in the European Green Deal. The root of this problem lies in the fact that the development of wind energy projects is facing increasing resistance at the local level in many EU countries. Resistance at the local level is most evident and worrying in regions across Europe that have great potential for renewable power production but are not exploiting it in the slightest. The acceptance of wind farms by local communities has become a crucial obstacle to the energy transition in Europe. As a result, attention to the social acceptance of renewable energy has steadily increased (Energy Transition Index Report 2021, 2021). For this reason, it is important to identify the key barriers and drivers for public acceptance and participation in wind farm development at local and EU level.

2.1 Factors affecting public acceptance and participation in wind farms

This section delves into key factors that wield significant influence over public acceptance and participation in relation to wind turbines development at pilot (Greece, Spain, Italy, Norway) and EU level. Several factors that influence the social acceptance of wind farms were identified through the desk research.

Knowledge and awareness about wind energy farms and technologies

Lack of knowledge and understanding regarding wind farms significantly contributes to lower levels of acceptance and support for wind energy projects. When individuals are unfamiliar with the benefits and operation of wind farms, their perceptions and attitudes towards these renewable energy initiatives tend to be more sceptical or dismissive. The higher the information level of the person about renewable energy, the more likely the person to accepts such projects (Ellis et al., 2007).
Furthermore, measure of knowledge and understanding can reflect genuine perceptions and alternative used as an attention or qualification check (Kaldellis, 2005; Kaldellis et al., 2013).

Overall support towards wind farms

The overall support towards energy technologies is close associate with social acceptance (Emmerich et al., 2020). A study by Baxter et al. (Baxter et al., 2013) suggest that support of the public towards wind farms is high in communities where

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wind turbines are located. Moreover, support may vary based on the stage that a wind farm project is. Specifically, it is observed that support towards a wind farm is lowest during the siting and construction phase and highest both before siting and after wind turbines have been in operation for years. In particular, it is observed that there may be widespread support by the public for a technology, but communities may oppose the planned construction of a wind farm near them, a phenomenon known as NIMBY "Not In My Back Yard" (Guo et al., 2015).

General and individual attitudes towards wind farms

The public's general attitudes towards wind energy play a crucial role in the acceptance of wind energy at the local level. According to the study by (Wolsink, 2007), there is a fundamental difference between the general attitude of the public towards wind energy and the individual attitude towards wind farm projects. Furthermore, a study (Bell et al., 2005) highlights the existence of an "individual gap", where a person has a positive overall attitude towards wind energy but actively opposes a specific wind farm project. This "individual gap" is different from the "social gap" that refers to the broader social phenomenon. However, other scholars suggest that general attitudes towards wind energy have an influence on the acceptance of specific wind farm projects. For example, people with a more positive attitude towards wind energy are more likely to accept a particular wind farm project (Johansson & Laike, 2007).

Impact on local economic activities such as tourism

Development of renewable energy projects such as wind farms present a significant impact on tourism, directly affecting the public acceptance and participation (Dalton et al., 2008). A possible negative influence on the tourism have been identified related to noise disturbance resulting from the wind turbines. This is negative for both the community's well-being and the rural tourist experience in where a relaxing, peaceful atmosphere marked by "sounds of wind and silence" (De Sousa & Kastenholz, 2015). On the other hand wind farms can also have positive impact to local tourism through the desired environmental friendly accommodation (Dalton et al., 2008).

Aesthetic and distance of wind farms

The visual aesthetic and the distance play a fundamental role for the acceptance of wind farms. This factor is frequently mentioned in several studies for a wind farm project at the European level. The study by (Wolsink, 2000), points out that concerns about the visual aesthetic impact of wind turbines is an important predictor of local opposition to such projects. The findings of (Baxter et al., 2013) on the visual aesthetics

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of wind turbines are also consistent with the literature, implying that concerns about visual impacts may indeed have a negative impact on public support for wind farms. In the same study, it was observed that support of the public towards wind farms is high in communities where wind turbines are located. Distance also has a significant influence on public acceptance. The study by (Betakova et al., 2015) reveal the negative visual impact of wind turbines for distances less than 5Km.

Health and well-being associated with noise from wind farms

Several scholars (Devine-Wright, 2005; Knopper & Ollson, 2011; Wolsink, 2006) suggest that there may be a link between the perceived health impacts by the public of wind turbines and the resulting opposition to wind farms. This link could be based on the fact that general noise is usually associated with annoyance, which in turn is associated with sleep disturbance and subsequently with a range of health problems. Therefore, the public might perceive wind turbines as a potential threat to their well-being, leading to their opposition against wind farm installations.

Awareness of ecology and environmental values

There is a strong correlation between awareness of environmental issues and climate change and the reported levels of social acceptance and participation. A study by (Poortinga et al., 2011) suggest that people who support renewable energy technologies do so because they are concerned about the environment, particularly climate change.

However, a study by (Neri et al., 2019) show that the relationship between environmental concerns and public acceptance of renewable energy technologies is more complicated. The study reveals that public acceptance and participation varies based on the environmental aspects people are concerned about and how they evaluate the impact of these technologies at different levels. For example, in conflicts over wind farms and other renewable energy projects, both sides may be guided by environmental concerns. Some people support these projects because they are concerned about the global impact of climate change, while others oppose them because of the potential negative impact on the local environment. This conflict is often referred to as a clash between two environmental perspectives known as 'green' versus 'green'.

Economic impacts

Economic motives play a fundamental role in social acceptance and participation on wind energy projects and in some cases is the most substantial factor (Zoellner et al.,

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2008) . The public perceives the economic impacts of wind farms as both positive, i.e. the number of jobs near wind farms and tax revenues for municipalities may increase (Copena et al., 2019) and negative, i.e. property values near wind farms may decrease (Sunak & Madlener, 2016). Furthermore, communities with weaker economies have a more positive attitude towards wind farm projects. A study by Brannstrom et al. (Brannstrom et al., 2022) suggest that the economic benefits of wind farms should be fairly distributed to increase public participation and acceptance at the local level.

Trust and procedural justice

Issues of trust and credibility are prominent in case studies of wind energy projects, as observed in various sources (Fast & Mabee, 2015; Fisher & Brown, 2009). These concerns are linked to the public's trust in the government's ability to regulate the siting process according to the public interest. Trust can be related to belief in national or European renewable energy policies and the underlying science of climate change (Jepson et al., 2012). It can also involve trust in the assessment of risks associated with wind energy projects, such as biodiversity, noise, and health, particularly when authorities prioritize expert opinions over local communities' knowledge (Aitken, 2009; Larsson & Emmelin, 2016). Establishing mutual trust between communities, developers, and state institutions is crucial for social engagement and public acceptance of wind energy projects. The perceived fairness of the process plays a significant role in conflicts over wind energy projects, and even less-accepted projects can benefit from a fair process effect (Gross, 2007). Some suggest that participation could be a solution for social acceptance , but others argue that it often has little impact on decision outcomes, focusing more on impact mitigation rather than fundamental decisions (Aitken et al., 2008) thereby undermining trust and procedural justice (European Commission. Joint Research Centre., 2016).

Personal values

The majority of people today are aware of global warming and the role humans play in it, but many still do not accept alternative energy sources, such as wind energy. Scholars in environmental research are trying to understand and anticipate discrepancies in environmental beliefs and behaviours, and to find ways to motivate people to accept more environmentally friendly energy sources. A key factor in a wide range of environmental beliefs and behaviours is personal values (Hornsey et al., 2016). Values are general goals that people strive for in life. They transcend specific situations, remain relatively stable over time and affect a wide range of a person's beliefs and behaviours. Four types of values have been found to be particularly relevant in predicting environmental beliefs and behaviours: 1) biospheric values, i.e.

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valuing the environment, 2) altruistic values, i.e. valuing the well-being of others, 3) selfish values, i.e. valuing personal resources, and 4) hedonistic values, i.e. valuing pleasure and comfort.

Personality traits

Personality traits are known to have a substantial influence on pro-environmental beliefs, attitudes, and decision-making, as well as investment in energy projects (Busic-Sontic et al., 2017). In the study of (Rothmann & Coetzer, 2003), they classified the most important personality traits into five categories known as the Big Five. These categories are as follows: 1) Openness to Experience, 2) Conscientiousness, 3) Extraversion, 4) Agreeableness and 5) Neuroticism. Openness to Experience captures individual differences in their approach towards new encounters. There is compelling evidence of a direct correlation between an individual's openness, characterized by qualities like imagination and insight, and their inclination towards environmentalism and ecological awareness (Brick & Lewis, 2016). Concurrently, researchers affirm that energy projects, by virtue of their positive environmental impact, can significantly enhance social acceptance of such endeavours at the regional level (Fytili & Zabaniotou, 2017).

2.2 Drivers and barriers of public acceptance and participation in wind turbine development

2.2.1 Drivers encouraging participation in wind farms

The motives for engagement and participation in wind energy projects can be complex and multidimensional. Some important driving factors that can promote social engagement in such projects are presented below.

The **positive impact of wind farms on the local economy** is a common driving factor for public's involvement in such projects. Positive impacts include increased activity of local businesses and the creation of new jobs and thus local employment. They also include the creation of added value at regional and local level in the form of tax revenues for municipalities (Leiren et al., 2020; Rygg, 2012; Slattery et al., 2012).

Transparent communication is one of the significant drivers for community acceptance that encourages the public to participate in wind farm projects. It refers to the activities and measures taken by wind project developers and other responsible-related actors to ensure that information about wind energy projects, such as implications, benefits and costs, is reliable, objective and easily accessible to the public (Maleki-Dizaji et al., 2020).

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Effective formal mechanisms of participation is the opportunity of local communities, citizens and relevant stakeholders to engage in the wind farm planning process, as required by law. Formal participation can take various forms, including local referendums, public consultations, public meetings, public surveys and public hearings. Effective formal participation can be an important driving factor for the public if this type of participation is constantly promoted throughout the proposal and development process of the project (planning and implementation) (Maleki-Dizaji et al., 2020; Rosario & Han, n.d.).

Effective informal mechanisms of participation is a very similar driver to effective formal participation, but the differences are that this type of participation involves voluntary arrangements that go beyond formal legal participation. Informal participation formats include citizens' meetings, ongoing dialogues and hearings with the opposed and concerned groups, discussions and information events for affected stakeholders, and workshops/conferences with stakeholders to shape priorities and project design. Informal participation, like formal participation, needs to be genuine to be an effective and important driver. Moreover, this participation needs to be constant throughout the planning and implementation process of the project (Maleki-Dizaji et al., 2020; Rosario & Han, n.d.).

Environmental concerns and climate change awareness can drive public participation in wind turbine development. People who prioritize environmental sustainability and understand the importance of renewable energy are more likely to engage in discussions and support for such projects (Poortinga et al., 2006).

Bio-diversity impacts are a driving force for public to take action to protect local nature, wildlife and biodiversity, both their physical and socio-cultural value, from the potential negative impacts of wind farm development. Consequently, activities to reduce these negative impacts are a reason for community involvement, including protection of the environment and the landscape (Gasparatos et al., 2017).

2.2.2 Barriers that hinder participation in wind farms

The public and interested stakeholders often face many challenges before engaging in wind energy projects. In the following section, we present a number of barriers that hinder public participation in this type of projects.

Limited access to Information about wind energy projects can hinder public participation. Without adequate information, individuals may struggle to engage meaningfully in the decision-making process (Susskind et al., 2022).

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Limited or ineffective engagement methods can hinder public participation. Traditional formats like public hearings may not effectively capture diverse perspectives, and alternative approaches, such as online platforms or community workshops, may be underutilized (Netshimbolimbo, 2017).

Some of the barriers that have a negative impact on the participation of the public and relevant stakeholders in wind energy projects are **environmental-related factors**, such as impacts on the physical environment and on biodiversity and wildlife (Gasparatos et al., 2017).

In addition, some **technical characteristics** of such projects are considered barriers, including the visibility and size of modern wind turbines and their distance from residential areas (Molnarova et al., 2012).

Concerns have been raised about the **societal impacts** of wind farms. Specifically, the fact that wind energy development could affect people's health, well-being and quality of life, for example through the noise emitted by wind turbines and the extent to which noise pollution is associated with health problems such as learning, sleep and cognitive disorders, as well as stress and anxiety. Therefore, these societal factors are often seen as barriers to public participation in such projects (Bartczak et al., 2021).

Individual characteristics can also be seen as a barrier to wind farms to a certain extent. (Pasqualetti, 2011), for example, notes that one reason for opposition to the construction of wind energy projects is concern that **people's cultural roots, lifestyle and place identity will be weakened**. People are also skeptical if they feel that wind energy development has reached a saturation point in their region. Interestingly, people are more concerned about wind energy development in their recreational areas, e.g. where they have a holiday home or go hiking, than where their main residence is.

Finally, some **economic impacts** of wind farms are also seen as a barrier, e.g. if recreational tourism is affected or the tourism industry has concerns about visual impacts and noise pollution (Devine-Wright & Howes, 2010; Leiren et al., 2020; Pasqualetti, 2011). Research has also shown that greater ownership by multinational companies negatively affects acceptance and thus public participation in wind farms (Sauter, 2008).

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3 Pilot and EU level Surveys

3.1 Methodology

A crowdsourcing method was used for the EU-level survey. In general, a crowdsourcing survey is used to collect information, insights or feedback from a large number of participants who contribute voluntarily or by getting rewards and incentives through online platforms. In our case, we used the Prolific platform (Prolific · Quickly Find Research Participants You Can Trust) for the EU-level survey. For our study, we used the SurveyMonkey platform (SurveyMonkey: The World's Most Popular Free Online Survey Tool) to create and design the questionnaire. The questions covered a wide range of factors that we wanted to explore in order to assess the social acceptance of wind farms. For more information on the questions used, see Section 3.1.3. A key feature of a crowdsourced survey is that anyone with access to the survey platform can participate, creating a large and diverse pool of participants. In this way, the survey taps into the collective knowledge, opinions or ideas of the crowd and aims to gather different perspectives and insights. However, we did not follow a crowdsourcing approach for the pilot-level survey. The pilot case partners, namely MEC for Greece, EGP for Spain and Italy, and NOWC and NINA for Norway, shared the link to the survey questionnaire via e-mail with various stakeholders in their network after first discussing with them the WENDY project and its objectives. If any of these stakeholders was interested in participating in the survey, they opened the link and submitted their answers. The link ensured the anonymity of the participants and was secured in such a way that participants could actually complete the survey only once.
Both the pilot survey and the EU survey started with a welcome note informing participants about the time needed to complete the questionnaire, data privacy and anonymisation of their data. A brief description of the WENDY project was also given. On the next page was the consent form, which the participant had to read and confirm by clicking *"I consent"* at the bottom of the page in order to continue with the rest of the questionnaire. The consent form included a description of the survey and its main components. In addition, the consent form informed participants that there were no risks and benefits associated with participating in the survey and also described their rights. Finally, there was a contact information section where participants could find the contact details of the project coordinator if they had any questions about the survey. If a participant did not agree with the consent form, they could click on *"I do not consent"* and were redirected to the last page of the survey. The consent form for the survey can be found in the Annex 8.1. The following subsections explain the selection of the pilot cases as well as the selection of the sample that participated in the survey and the questionnaire used.

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3.1.1 Pilot cases selection

The WENDY project works with a pool of pilot cases to validate its solutions. This pool of pilot cases has also been used to assess the perceptions and needs of the public through surveys at local level in order to increase social acceptance of wind energy. The pilot cases are in different project phases (e.g. planning, early operation, long term operation). In this way, the various challenges and needs of a wind farm project in its different phases of development and operation are reflected in these pilot cases. In Spain, four onshore wind farms are operational in the city of Zaragoza, owned by pilot partner EGP since 2019. In Italy, two onshore wind farms are already in operation in the Calabria region, also owned by EGP. Three wind farm areas in Norway were selected for their recognised offshore wind resources, two of which are in the planning phase and one of which will be installed this year. And finally, an energy community with wind resources managed by MEC in Greece. Thus, the WENDY project is working with 10 wind farm projects grouped in 4 pilot cases in 4 countries. For more information on the pilot cases, see Table 2.

Table 2: Overview of the WENDY pilot cases (source: WENDY GA)

Pilot Cases Region	**Calabria (Italy)**	**Saragossa (Spain)**	**Hywind Tampen (Norway)**	**Utsira Nord and Sorlige Nordsjo II (Norway)**	**Minoan EC (Greece)**
Type of project	Onshore / Continental	Onshore / Continental	Floating – Offshore	Floating / Bottom fixed – Offshore	Onshore / Non-continental
Project established	2010	2019	2022	-	-
Project phase	Long term operation	Short term operation	Early operation	Planning	Planning
Wind farms	2	4	1	2	-
Pilot representative	EGP	EGP	NOWC, NINA	NOWC, NINA	MEC

3.1.2 Sampling

Pilot survey

For the pilot-level survey, the pilot case partners (Greece: MEC, Spain and Italy: EGP, Norway: NOWC, NINA) distributed the survey questionnaire to their contacts from their network, i.e. to key stakeholders in the wind farm value chain. For the pilot level survey, the Key Performance Indicator (KPI) was a total of four hundred (400) responses and the pilot partners collected a total of four hundred and forty-eight (448)

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responses. However, some participants did not complete the survey, or answered the attention-check question incorrectly, giving us a final sample of three hundred and seventy-five (375) responses. To be more precise, 107 participants completed the questionnaire in Greece, 102 and 106 in Spain and Italy respectively. Finally, in Norway, there were 60 participants. Only in Norway was the number of responses lower, as the survey was distributed among stakeholders who were close to the pilot wind farm case, which is located on an isolated island with a small population.

EU survey

For the EU-level survey, three thousand one hundred and thirty-three (3133) participants were recruited from Prolific. Participants were EU citizens, were selected to have an approval rating higher than 95%. Some of the participants had not answered the attention check questions correctly and were removed from the sample. In addition, some participants had not answered all questions.

Table 3: Sample characteristics of the initial sample for the pilot and the EU survey (source: WENDY pilot and EU survey)

Characteristic	Pilot-level survey	EU-level survey
Initial sample size	448	3133
% Female	30.3	40.3
% Male	63.2	57.9
% Non-binary	1.9	1.4
% preferred not to answer	4.6	0.4
Representative age group	25 – 34	25 - 34

3.1.3 Questionnaire

The questionnaire used in the pilot-level survey consists of 24 questions in total, while the EU-level survey consists of 41 questions to assess whether the factors identified in the desk research could act as a barrier or a driver for public participation in wind farm

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development. The questions were identified in the relevant scientific literature and adapted to the needs of our study. The questionnaire used in the pilot-level survey and the EU-level survey can be found in Annex 8.1 and 8.2.

Pilot and EU level survey findings, based on an extended descriptive and statistical analysis, are presented in sections below.

3.2 Pilot Cases Survey Analysis

3.2.1 Pilot case Italy:

Demographics

Table 4: Italian sample distribution by individual characteristics (source: WENDY pilot survey)

Gender	**Responses**	**Percentage**
No answer	1	0.9%
Female	37	34.9%
Male	58	54.7%
Other	1	0.9%
Prefer not to say	9	8.5%
Total	106	100%
Age	Responses	Percentage
No answer	1	0.9%
18-24	2	1.9%
25-34	11	10.4%
35-44	26	24.5%
45-54	25	23.6%
55-64	24	22.6%
65+	12	11.3%
Total	106	100%
Education	Responses	Percentage
No answer	1	0.9%
Did Not Complete High School	0	0.0%
High School/GED	0	0.0%
Some College	5	4.7%
Bachelor's Degree	33	31.1%
Master's Degree	48	45.3%
Advanced Graduate work or Ph.D.	19	17.9%
Total	106	100%
Net Annual Household Income	Responses	Percentage
No answer	1	0.9%
€5.000 or less	2	1.9%
€5.001 - €15.000	8	7.5%
€15.001 - €25.000	17	16.0%
€25.001 - 35.000	21	19.8%
€35.001 - €45.000	18	17.0%
€45.001 - €55.000	10	9.4%

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€55.001 - €65.000	13	12.3%
€65.001 - €75.000	7	6.6%
€75.001 or more	9	8.5%
Total	106	100%
Living area	Responses	Percentage
No answer	1	0.9%
Urban setting	57	53.8%
Peri-urban setting	29	27.4%
Rural setting	15	14.2%
Natural setting	4	3.8%
Total	106	100%
Typology	Responses	Percentage
No answer	1	0.9%
Mainland	68	64.2%
Island	8	7.5%
Coastline	29	27.4%
Total	106	100%

Knowledge about wind farms

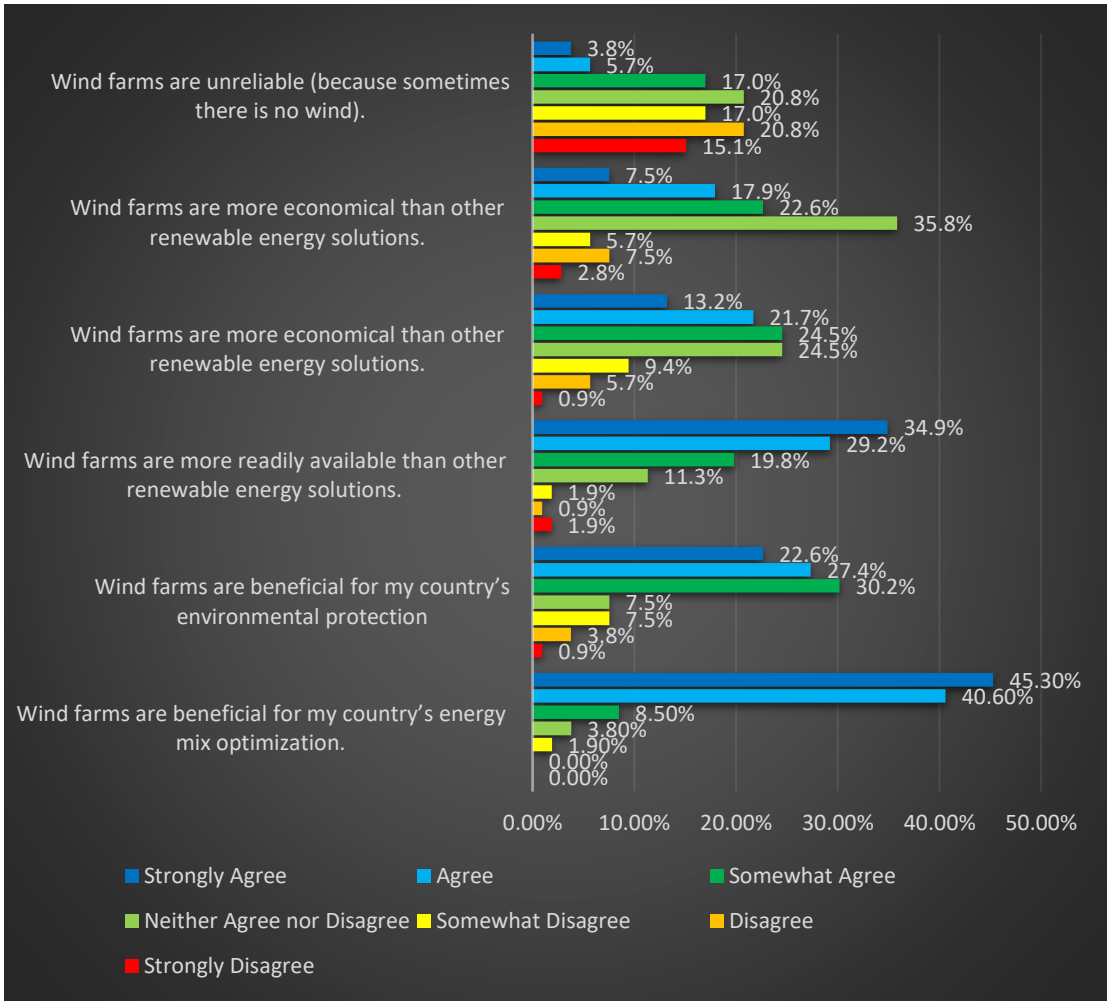

Figure 4: Knowledge about wind farms in the pilot case of Italy (source: WENDY pilot-level survey)

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The survey results paint a mixed picture of wind farms in Italy. A significant number of respondents see wind farms as beneficial for optimising the country's energy mix and protecting the environment. However, opinions differ widely on the availability and economic viability of wind farms compared to other renewable energy solutions. There are also concerns about the reliability of wind farms. These findings highlight the need for comprehensive assessment and communication to address concerns and improve public understanding of the role and benefits of wind farms in Italy's energy transition and environmental goals.

Acceptance of wind farms

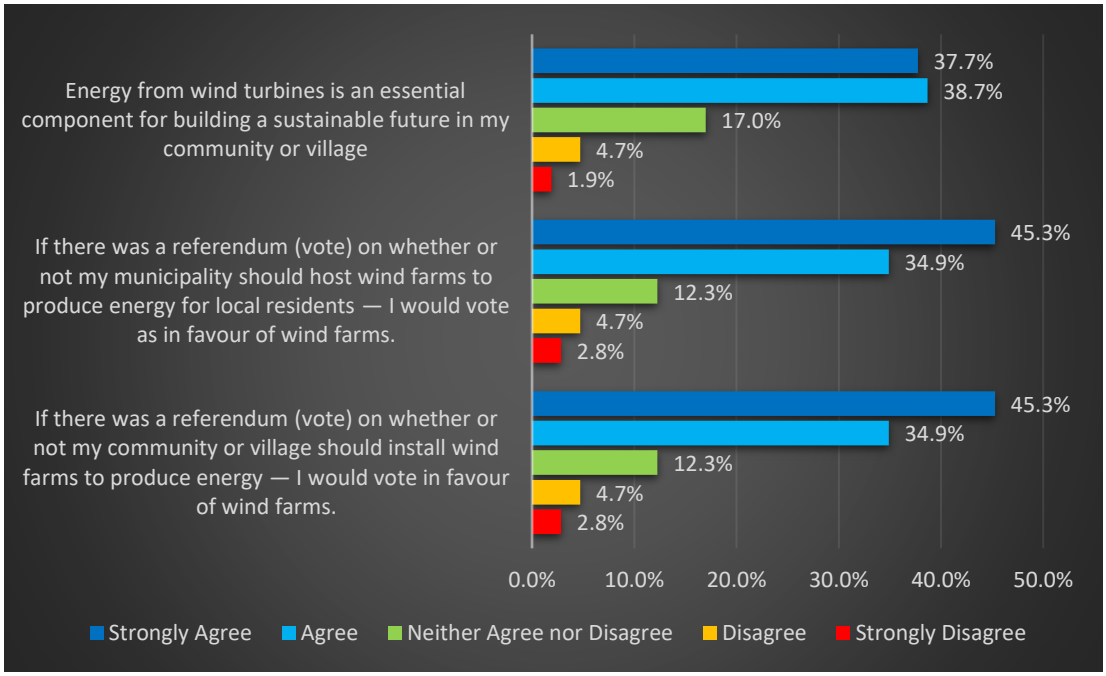

Figure 5: Acceptance of wind farms in the pilot case of Italy (source: WENDY pilot-level survey)

The results show strong support for wind farms in Italy. A clear majority of respondents said they would be willing to vote in favour of wind farms if given the opportunity, both at the community or village level and at the municipality level. Furthermore, a significant proportion of respondents recognised the importance of wind energy as a crucial element in building a sustainable future in their community or village. These results indicate a positive attitude towards wind farms and suggest a favourable environment for the development of wind energy projects in Italy.

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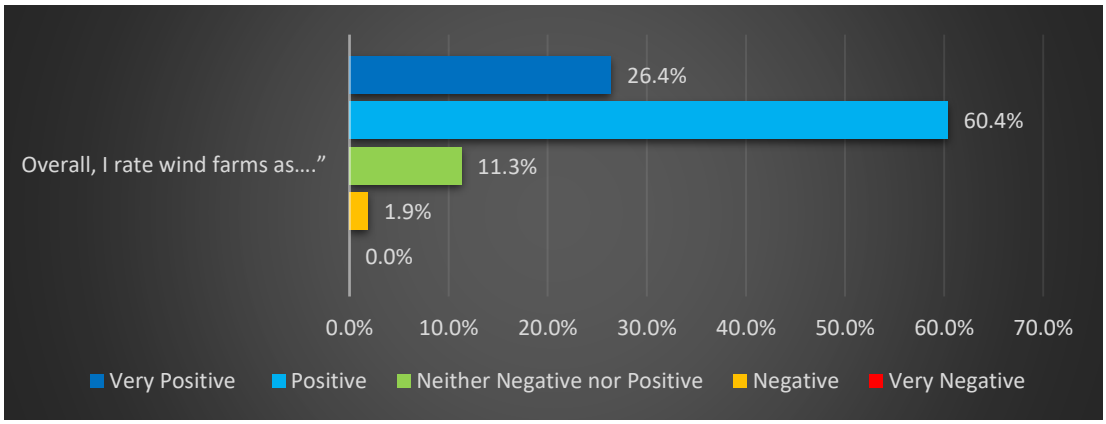

Figure 6: Overall acceptance of wind farms in the pilot case of Italy (source: WENDY pilot-level survey)

Overall, the survey findings demonstrate a strong positive perception of wind farms in Italy. The majority of respondents rated wind farms positively or very positively, indicating a favourable attitude towards this renewable energy source. These results suggest that wind farms are generally well-regarded in Italy, reflecting a supportive environment for their development and integration into the country's energy mix.

NIMBY Effect

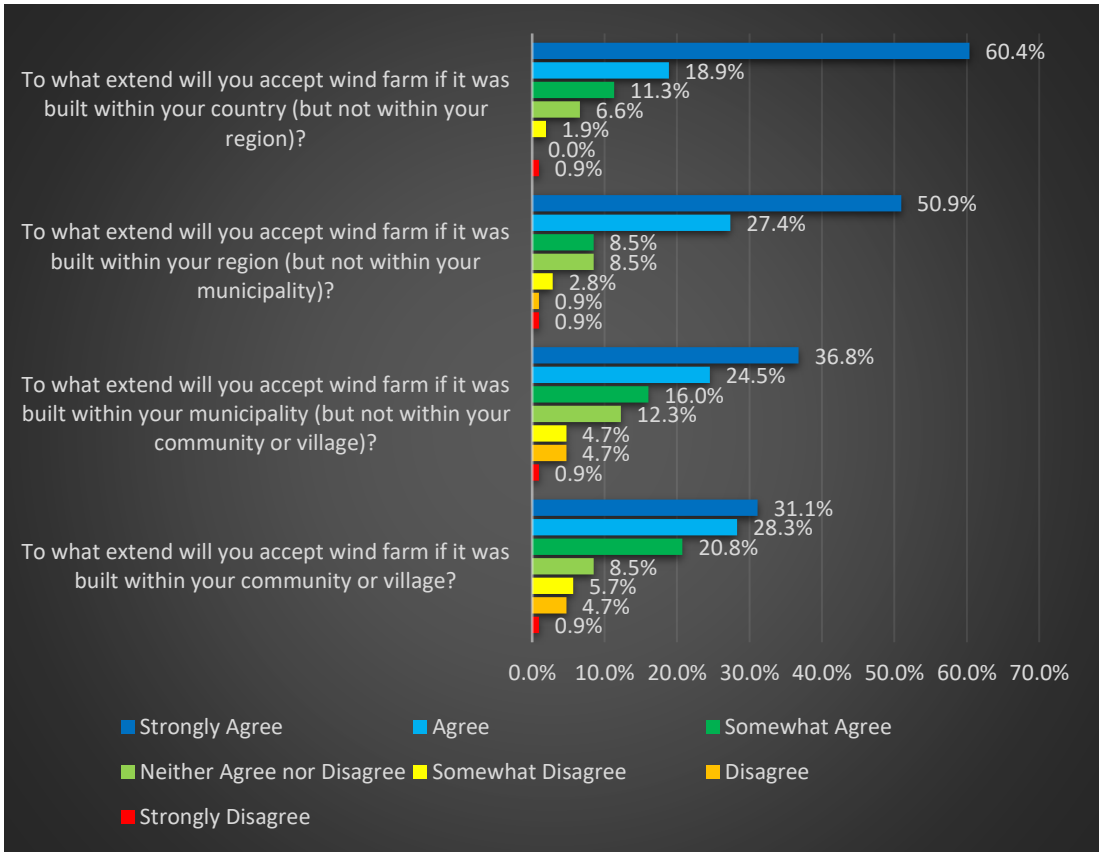

Figure 7: NIMBY effect in the pilot case of Italy (source: WENDY pilot-level survey)

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The results indicate a positive attitude towards wind farms among respondents in Italy, with a significant proportion of respondents willing to accept the development of wind farms at different geographical scales. These results indicate a favourable environment for wind energy development in Italy and highlight the potential for increased use of wind energy in the country.

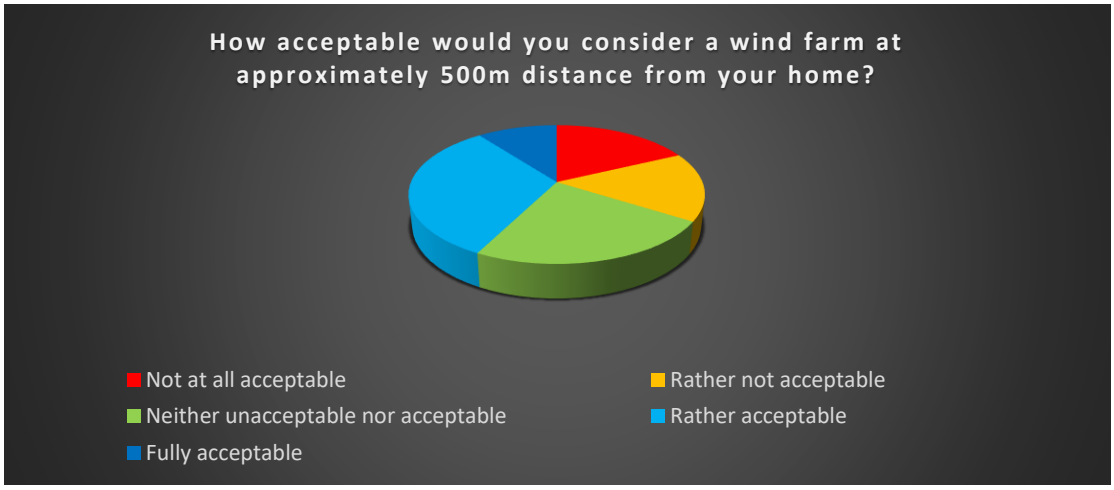

Figure 8: PIMBY effect in the pilot case of Italy (source: WENDY pilot-level survey)

While a considerable proportion of respondents found it acceptable, a considerable proportion expressed reservations or found it unacceptable. These results underline the importance of taking into account the preferences and concerns of people living in close proximity to wind farms when planning and implementing such projects. Public involvement, thorough impact assessments and community participation can help to address concerns and increase the acceptance of wind farms in residential areas.

Type of wind farms acceptance

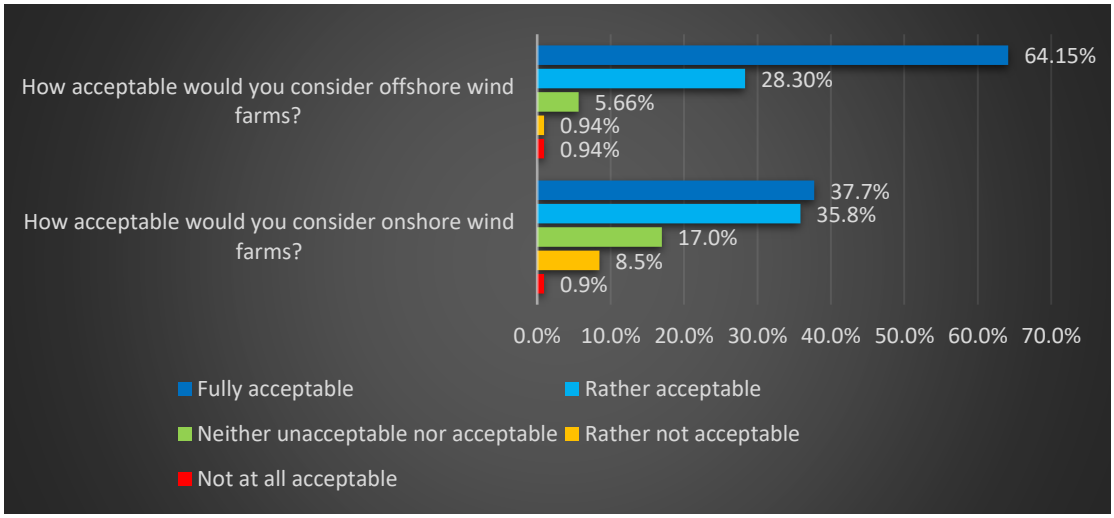

Figure 9: Acceptance of wind farms based on their type (onshore, offshore) in the pilot case of Italy (source: WENDY pilot-level survey)

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These results indicate a positive attitude towards wind energy development in Italy and show a high level of acceptance for both onshore and offshore wind farms. Such a positive perception can create a favourable environment for the growth and expansion of wind energy projects in the country.

Impact on tourism

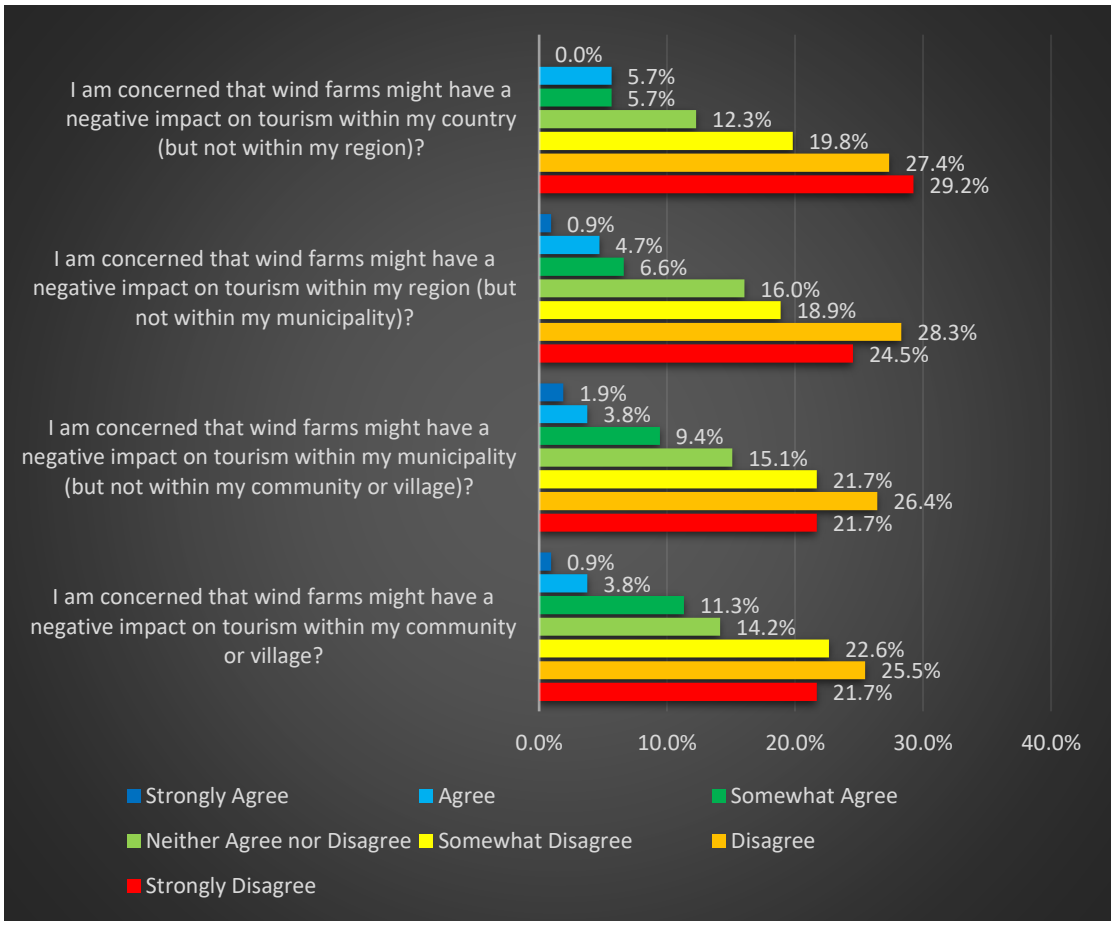

Figure 10: Impact on tourism and NIMBY effect in the pilot case of Italy (source: WENDY pilot-level survey)

In terms of tourism, a significant proportion of respondents do not see wind farms as a significant threat to their community, town, region or country. This indicates some confidence that wind farms can co-exist with and even contribute positively to the tourism industry. However, it is important to continue to monitor and address potential concerns to ensure a balanced approach that takes into account both renewable energy objectives and the preservation of the tourism sector in Italy.

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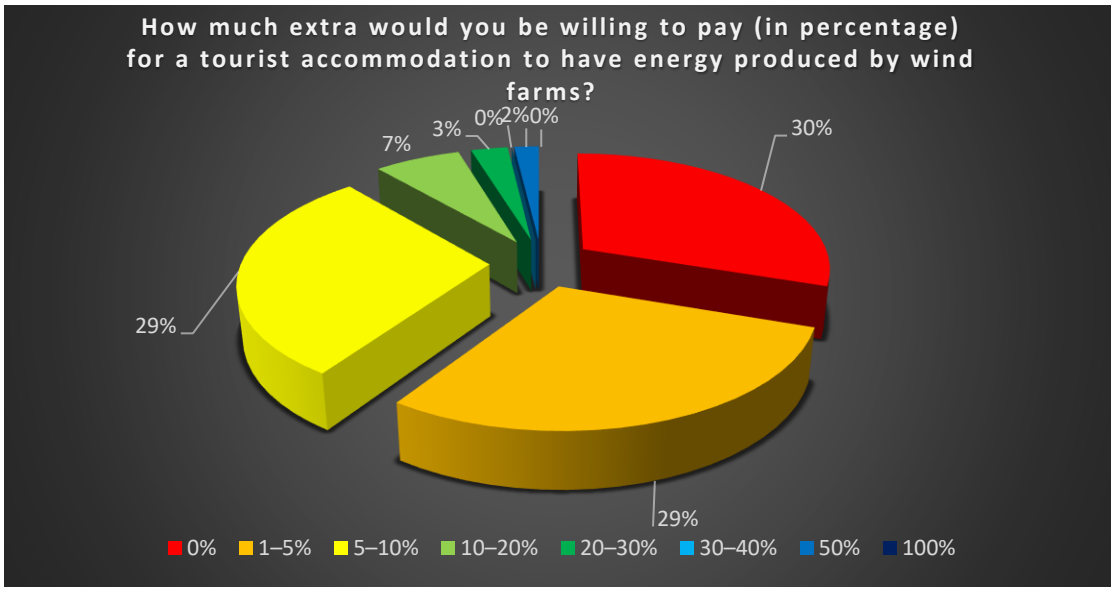

Figure 11: Willingness to pay for a touristic accommodation that have energy produced by wind farms in the pilot case of Italy (source: WENDY pilot-level survey)

The analysis shows that there is considerable interest and willingness among respondents to pay a modest premium for tourist accommodation that uses energy from wind farms. This shows that the tourism industry has the opportunity to use renewable energy sources such as wind farms to meet the preferences of environmentally conscious travellers. It also highlights the importance of raising awareness of the benefits of renewable energy and its positive impact on the environment and sustainability in order to encourage wider acceptance and support for such initiatives.

Aesthetic and Visual impact

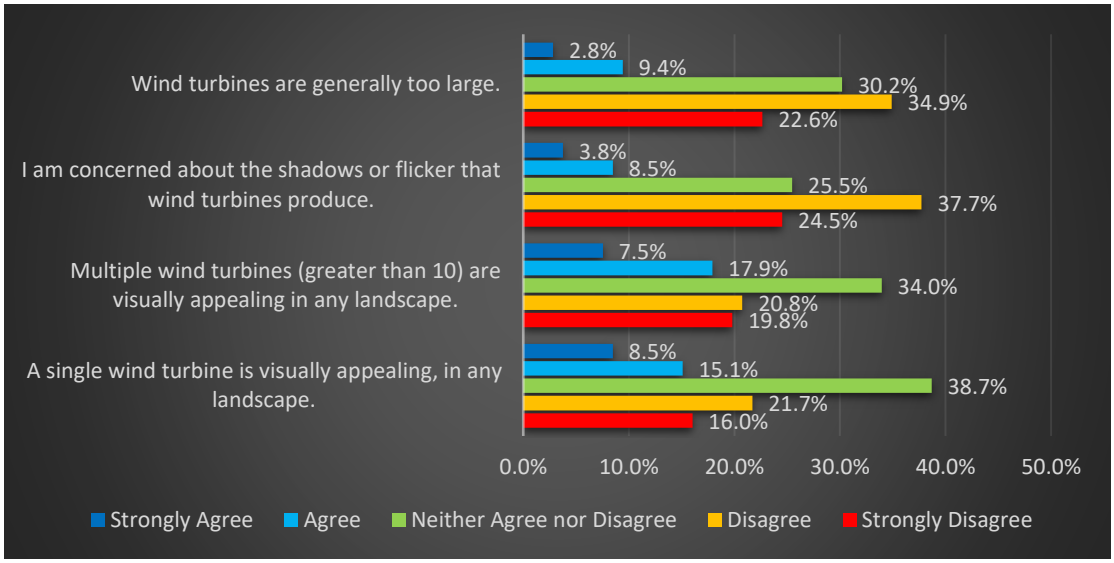

Figure 12: Visual impact and size of wind turbines in the pilot case of Italy (source: WENDY pilot-level survey)

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The results show that opinions vary on the visual attractiveness of wind turbines and concerns about their size and possible shadows or flicker. A significant proportion of respondents disagreed or strongly disagreed with statements about the visual attractiveness of a single wind turbine or multiple wind turbines. A considerable number of respondents also disagreed with the statement that wind turbines are generally too large.

It is noteworthy that a significant percentage of respondents (25.5%) neither agreed nor disagreed with the statement that they are concerned about shadows or flicker from wind turbines. This indicates that there is not much consensus on this issue.

The results of the survey highlight the different views on wind turbines in Italy. It is crucial that stakeholders, including authorities, developers and municipalities, have open and informed discussions to address concerns and ensure that wind energy projects are in line with the preferences and priorities of the local population. Such dialogue can foster greater acceptance and understanding of wind energy and its potential contribution to sustainable development in Italy.

Environmental consideration

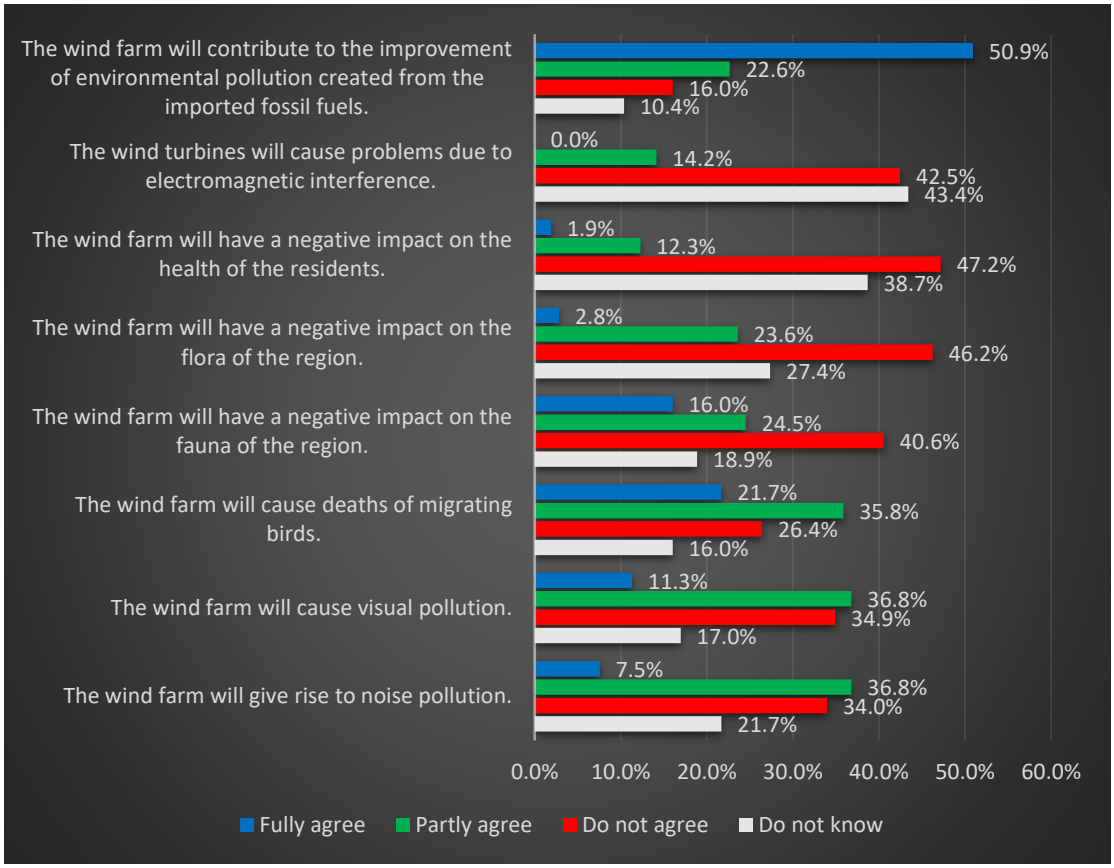

Figure 13: Environmental consideration of wind farms in the pilot case of Italy (source: WENDY pilot-level survey)

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The analysis shows that respondents had varying levels of certainty and agreement regarding the potential impact of wind farms in Italy. A considerable percentage of respondents expressed uncertainty or partial agreement on various aspects such as noise pollution, visual pollution, impact on fauna and flora, health impacts and electromagnetic disturbance.

It is noteworthy that a significant proportion of respondents fully agreed that wind farms would contribute to improving the environmental impact caused by imported fossil fuels. This indicates a recognition of the potential benefits of wind energy in addressing environmental challenges.

These findings highlight the importance of taking public perceptions and concerns into account when planning and implementing wind energy projects. Effective communication, community involvement and appropriate mitigation measures can help address potential problems and ensure the successful integration of wind farms, while taking into account environmental and socio-economic considerations.

Health and well-being associated to distance

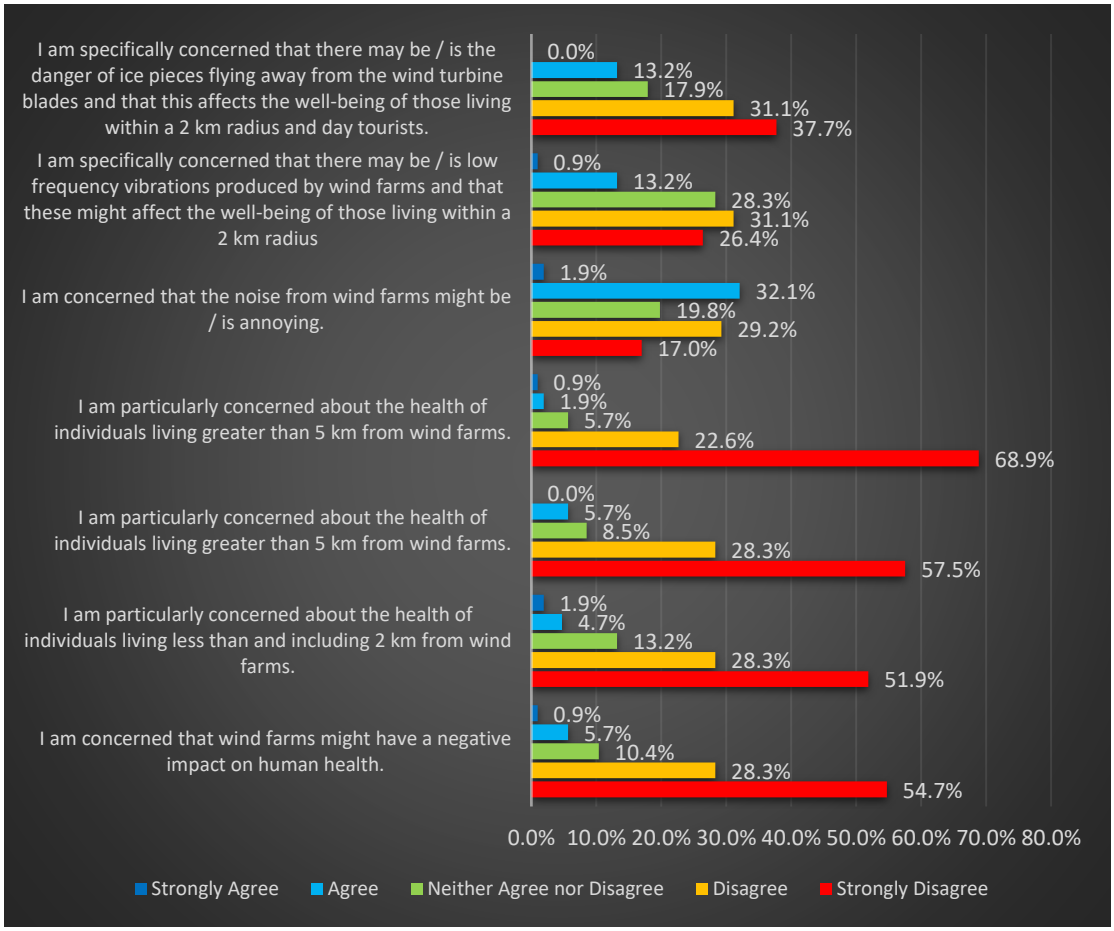

Figure 14: Health and well-being impact of wind turbines related to distance in the pilot case of Italy (source: WENDY pilot-level survey)

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Regarding the health impacts of wind farms, the results show that the majority of respondents disagreed or strongly disagreed with the concerns. There was relatively little agreement or strong agreement with these concerns. This suggests that respondents do not believe that wind farms have a significant negative impact on human health, including those who live in close proximity to wind farms. However, it is important to consider the ongoing research and address potential legitimate concerns through appropriate project planning and design and mitigation measures to ensure the wellbeing of communities living near wind farms.

Economic impact

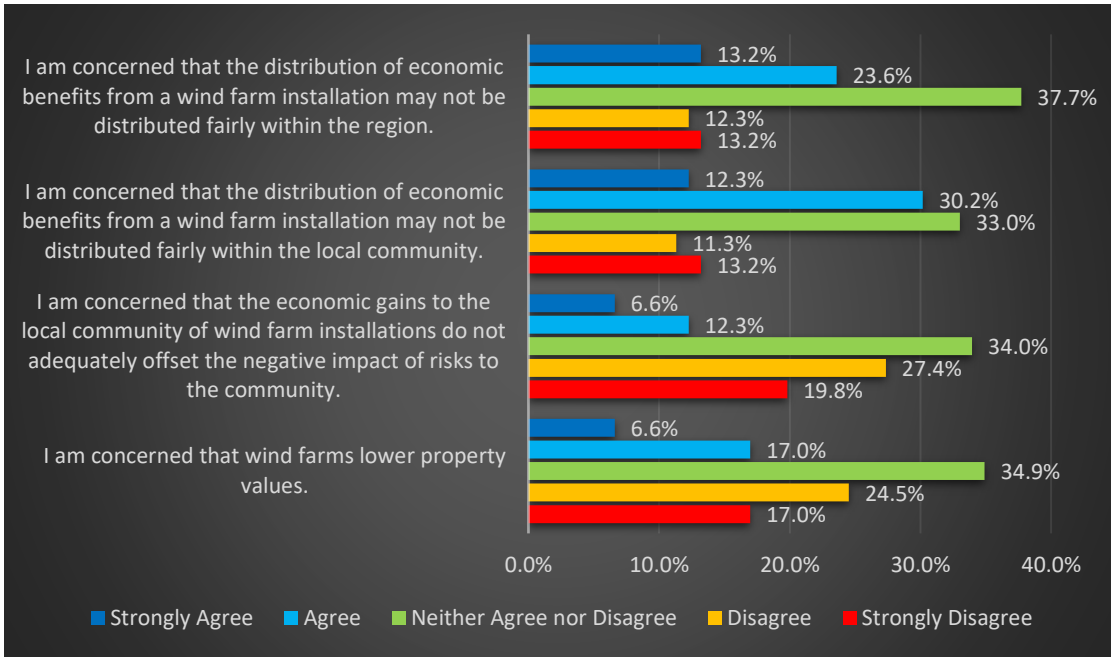

Figure 15: Economical impact and considerations of wind farms in the pilot case of Italy (source: WENDY pilot-level survey)

The survey results show that there is a range of opinions on the economic impact of wind farms. While a significant proportion of respondents disagreed or strongly disagreed with these concerns, a considerable percentage expressed agreement or strong agreement. This indicates that there is some level of concern about the economic aspects of wind farms, including property values and the distribution of economic benefits within the community and region. Addressing these concerns through transparent and equitable wind farm development practices and community involvement can help to promote acceptance and support for such projects.

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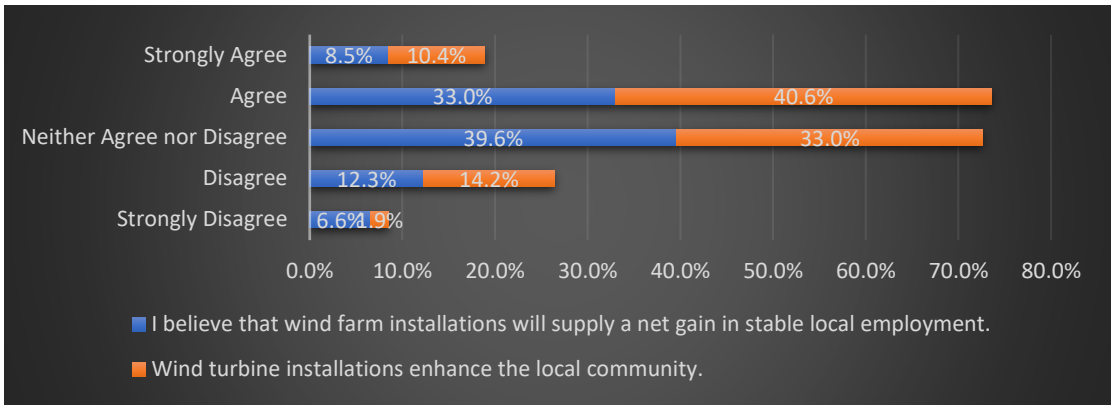

Figure 16: Added value of wind farms in local communities in the pilot case of Italy (source: WENDY pilot-level survey)

The results suggest that there are mixed perceptions regarding the benefits to employment and community enhancement from wind turbines. While a large proportion of respondents agree or strongly agree with these views, there are also respondents who disagree or strongly disagree. The relatively high percentage of respondents in the "neither agree nor disagree" category indicates that there is not much consensus on these issues.

It is important to remember that perceptions of employment gains and community enhancement may vary depending on individual experiences, local circumstances and the information available to respondents. Ensuring transparency, providing accurate information and engaging with local communities can help improve understanding of the potential benefits of wind farms. This can help to address concerns and strengthen support for renewable energy projects in the community.

Participation

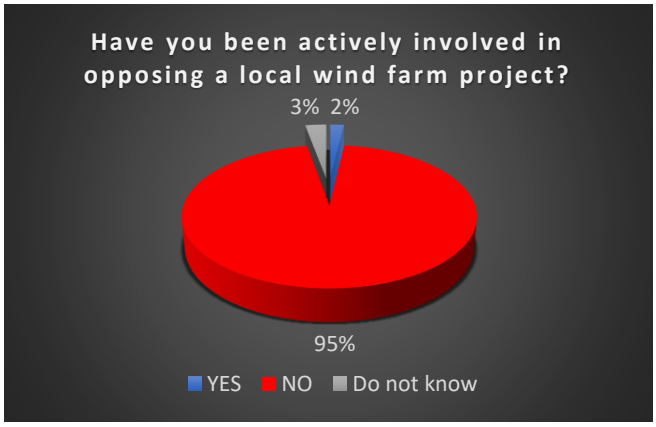

Figure 17: Public's active involvement in opposing a local wind farm project in the pilot case of Italy (source: WENDY pilot-level survey)

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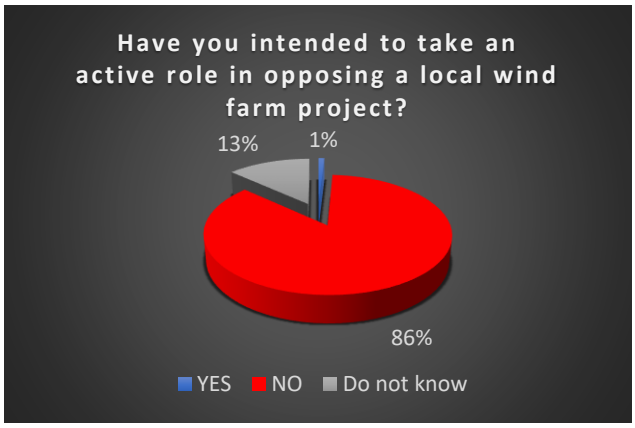

Figure 18: Public's intention to take an active role in opposing a local wind farm project in the pilot case of Italy (source: WENDY pilot-level survey)

These findings suggest that active opposition to local wind farm projects may be relatively limited in Italy. It is important to note that this survey represents a specific sample of respondents and may not reflect the views of the entire population. Public opinions and levels of active involvement may vary across different regions and communities. Nonetheless, these results suggest that there might be a general acceptance or lack of active opposition towards wind farm projects among the surveyed individuals in Italy.

Trust and procedural justice

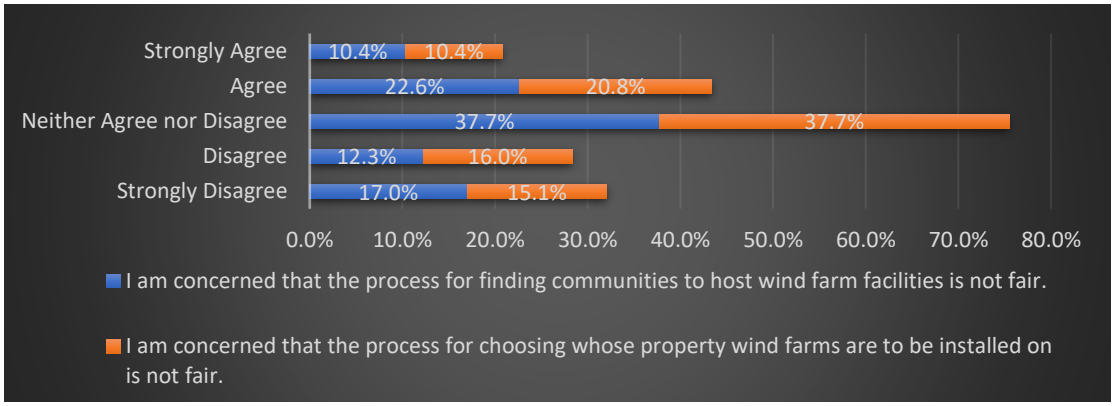

Figure 19: Trust in the processes for establishing wind farms in the pilot case of Italy (source: WENDY pilot-level survey)

The analysis shows that a significant proportion of respondents have concerns about the fairness of the process for selecting communities as sites for wind turbines and for selecting land for wind turbines. About one third of the respondents agreed or strongly agreed with these concerns. In contrast, a significant proportion of respondents were neutral or unsure about the fairness of these processes.

These results indicate that there is a notable portion of the surveyed population in Italy that has reservations or concerns about the fairness of the processes for selecting

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communities and land for wind farm installations. Addressing these concerns and ensuring transparency and fairness in the site selection process could be important in promoting public acceptance and support for wind energy projects.

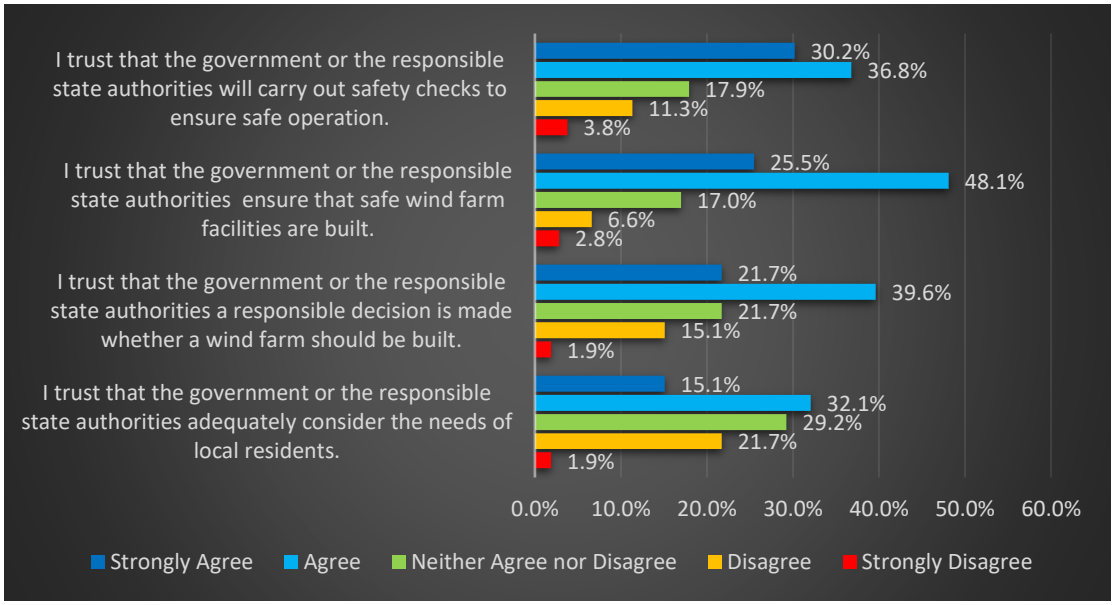

Figure 20: Trust to government or authorities in the pilot case of Italy (source: WENDY pilot-level survey)

The survey results indicate that there are varying levels of trust in the government or relevant state authorities in terms of taking into account the needs of local residents, responsible decision-making, ensuring the construction of safe wind farm facilities and implementing safety controls for the operation of the turbines. While a significant proportion of respondents expressed confidence in these areas, a considerable percentage had reservations or remained neutral.

It is important that the government and relevant authorities address the concerns and reservations expressed by respondents in order to build public confidence and ensure transparency and accountability in decision-making processes and safety measures related to wind farm installations.

3.2.2 Pilot case: Spain

Demographics

Table 5: Spanish sample distribution by individual characteristics (source: WENDY pilot survey)

Gender	Responses	Percentage
No answer	0	0.0%
Female	31	30.4%
Male	62	60.8%
Other	4	3.9%
Prefer not to say	5	4.9%

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Total	102	100%
Age	Responses	Percentage
No answer	0	0.0%
18-24	16	15.7%
25-34	32	31.4%
35-44	27	26.5%
45-54	18	17.6%
55-64	9	8.8%
65+	0	0.0%
Total	102	100%
Education	Responses	Percentage
No answer	0	0.0%
Did Not Complete High School	0	0.0%
High School/GED	16	15.7%
Some College	31	30.4%
Bachelor's Degree	27	26.5%
Master's Degree	25	24.5%
Advanced Graduate work or Ph.D.	3	2.9%
Total	102	100%
Net Annual Household Income	Responses	Percentage
No answer	0	0.0%
€5.000 or less	9	8.8%
€5.001 - €15.000	16	15.7%
€15.001 - €25.000	20	19.6%
€25.001 - 35.000	18	17.6%
€35.001 - €45.000	10	9.8%
€45.001 - €55.000	9	8.8%
€55.001 - €65.000	8	7.8%
€65.001 - €75.000	4	3.9%
€75.001 or more	8	7.8%
Total	102	100%
Living area	Responses	Percentage
No answer	0	0.0%
Urban setting	53	52.0%
Peri-urban setting	19	18.6%
Rural setting	29	28.4%
Natural setting	1	1.0%
Total	102	100%
Typology	Responses	Percentage
No answer	0	0.0%
Mainland	77	75.5%
Island	3	2.9%
Coastline	22	21.6%
Total	102	100%

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Knowledge about wind farms

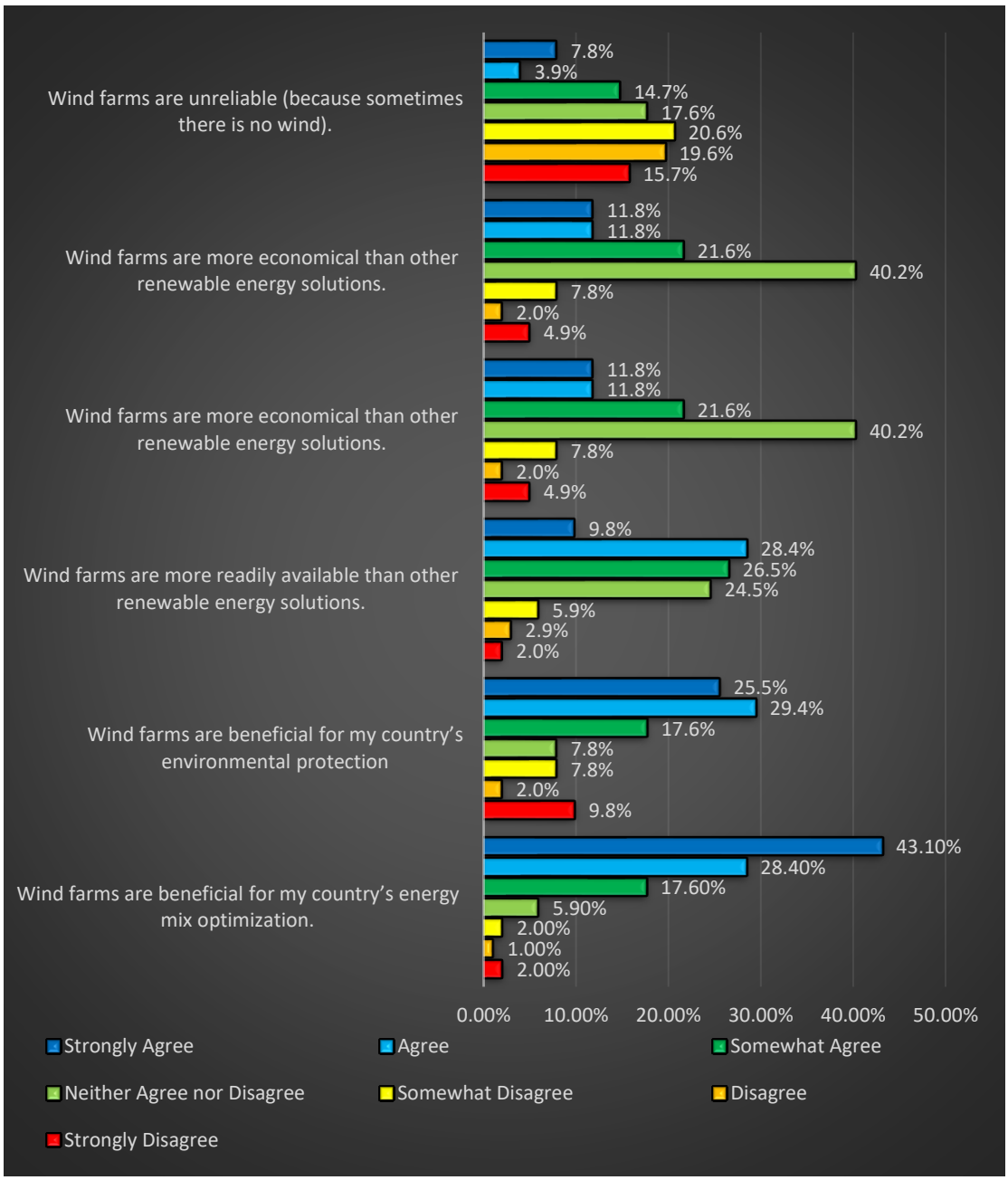

Figure 21: Knowledge about wind farms in the pilot case of Spain (source: WENDY pilot-level survey)

The analysis shows that a majority of respondents in Spain see wind farms as beneficial for optimising the country's energy mix and protecting the environment. However, opinions differ on the availability, economic viability and reliability of wind farms compared to other renewable energy solutions. These results illustrate the complexity and diversity of views on wind energy in Spain.

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Acceptance of wind farms

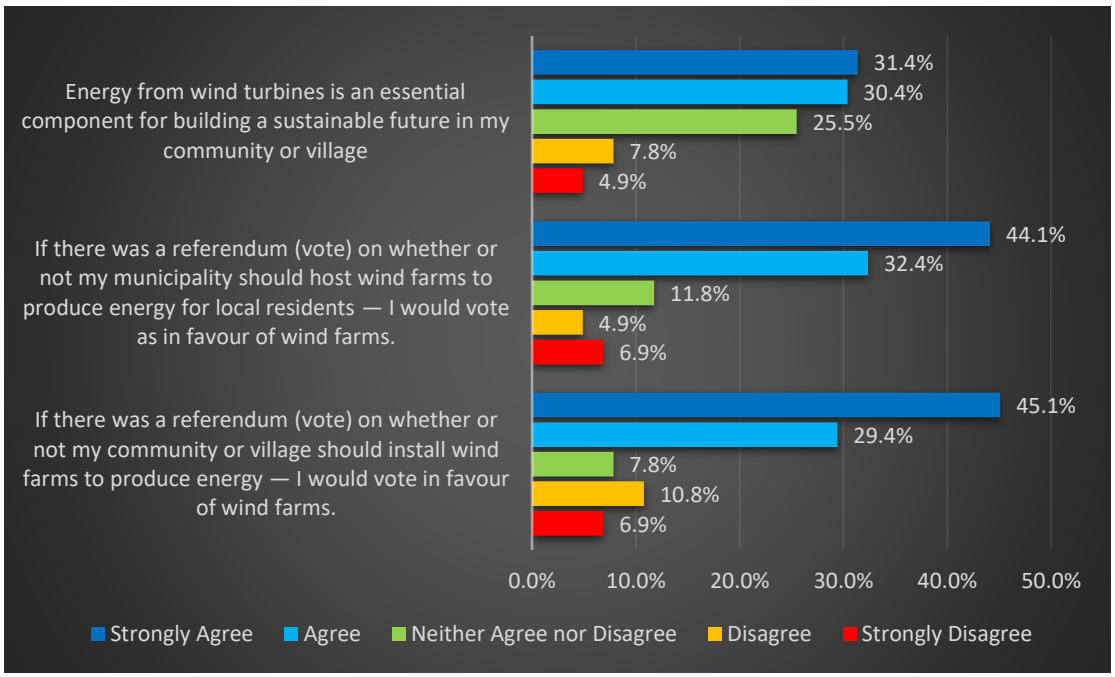

Figure 22: Acceptance of wind farms in the pilot case of Spain (source: WENDY pilot-level survey)

Regarding support for wind energy, the results show a high level of support in Spain. A large majority of respondents were in favour of wind farms, both at the community or village level and at the municipal level. Furthermore, most respondents recognised the importance of wind energy in building a sustainable future in their communities. These results show a very positive attitude towards wind farms as a means of local energy production and sustainability in Spain.

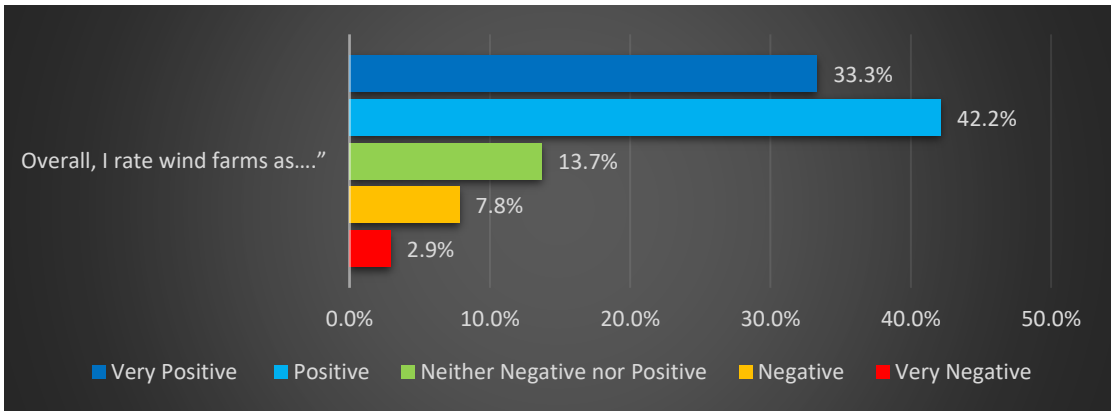

Figure 23: Overall acceptance of wind farms in the pilot case of Spain (source: WENDY pilot-level survey)

The results of the study show that the overall assessment of wind farms in Spain is predominantly positive. The majority of respondents viewed wind farms positively, either as "positive" or "very positive"," while a smaller percentage expressed negative

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views. These results indicate a generally positive perception of wind farms in Spain and reflect a positive attitude towards their role in the energy sector.

NIMBY Effect

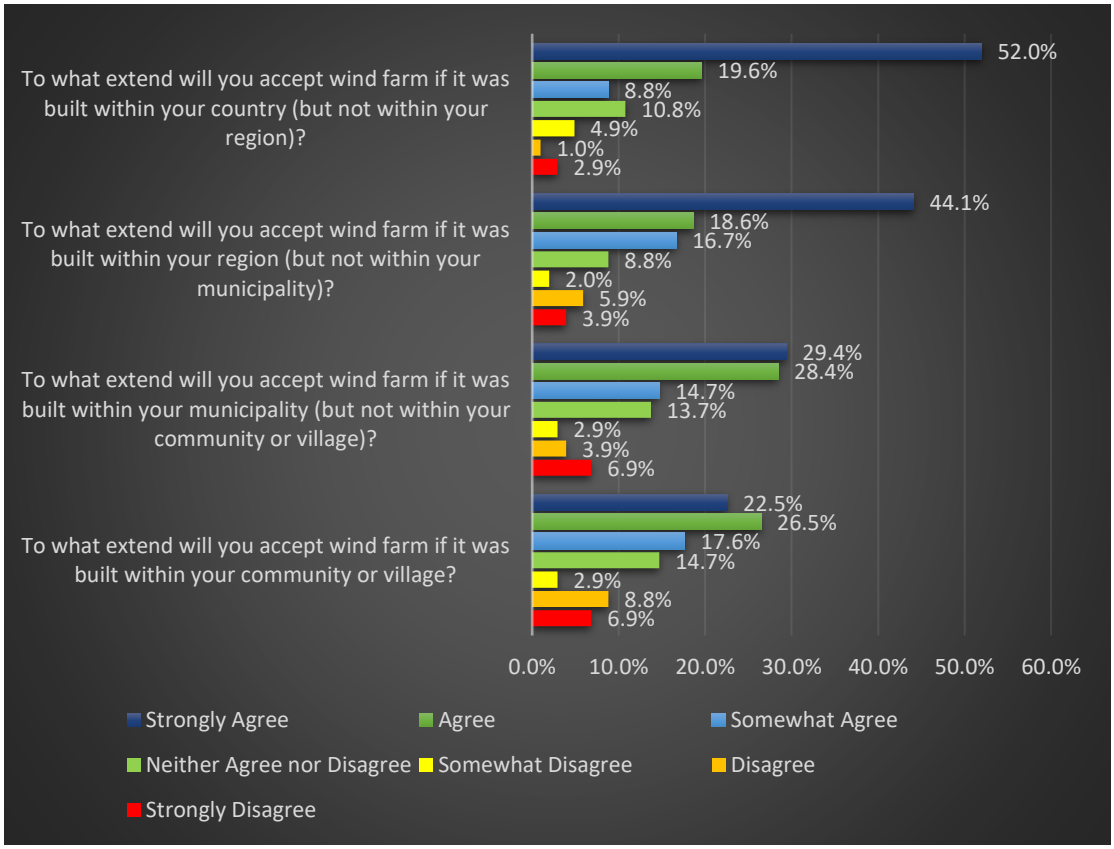

Figure 24: NIMBY effect in the pilot case of Spain (source: WENDY pilot-level survey)

The results show that acceptance of wind farms varies depending on their proximity to respondents' communities or villages, municipalities, regions and the country as a whole. Acceptance is generally higher when wind farms are further away from respondents' immediate surroundings, with the highest level of acceptance for wind farms built within the country but outside their region. These results show the importance of considering local perspectives and geographical context when implementing wind farm projects in Spain.

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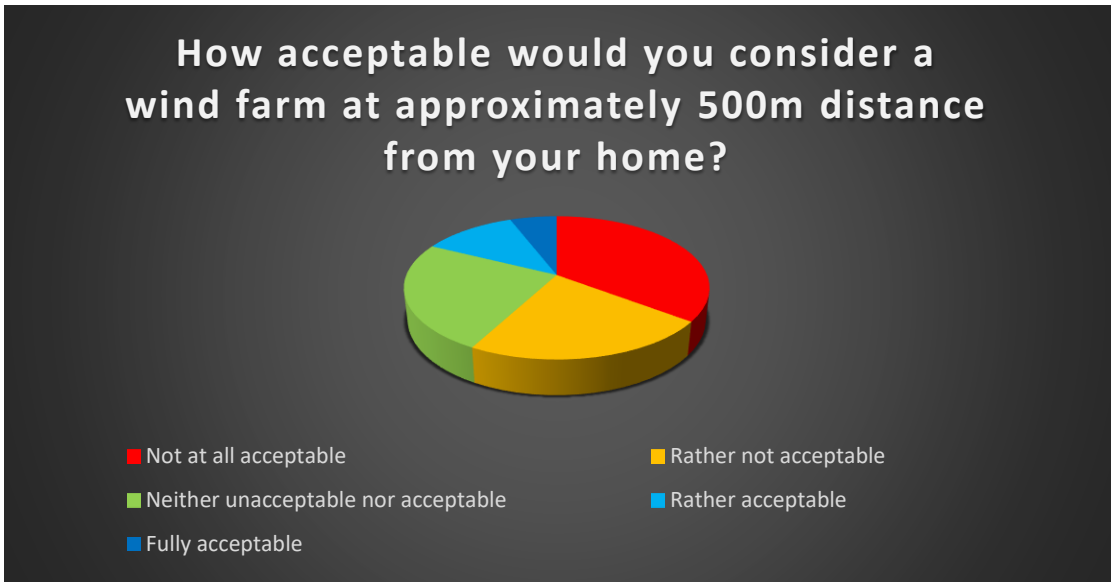

Figure 25: PIMBY effect in the pilot case of Spain (source: WENDY pilot-level survey)

Regarding the PIMBY effect, the results indicate that most respondents in Spain have reservations or concerns about the acceptability of a wind farm that is about 500 metres from their house. A significant percentage finds it unacceptable or rather unacceptable. However, there is still a proportion of respondents who agree to varying degrees, with a smaller but notable group finding the wind farm either rather acceptable or completely acceptable. These results underline the importance of taking into account the opinions of local residents and addressing concerns about the proximity of wind farms to residential areas in Spain.

Type of wind farms acceptance

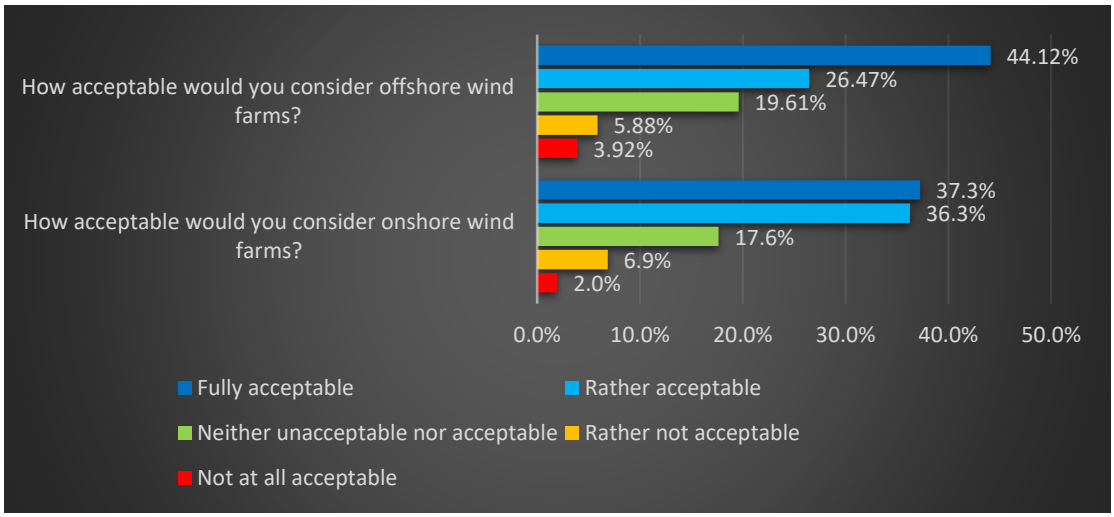

Figure 26: Acceptance of wind farms based on their type (onshore, offshore) in the pilot case of Spain (source: WENDY pilot-level survey)

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Regarding the type of wind farms, the majority of respondents in Spain find both onshore and offshore wind farms acceptable. A significant percentage rated them as "fully acceptable" or "rather acceptable," showing a positive attitude towards both types of wind farms. However, there is still a small percentage of respondents who express reservations or find them unacceptable. These results underline the generally positive perception of wind energy in Spain, regardless of whether it is generated onshore or offshore.

Impact on tourism

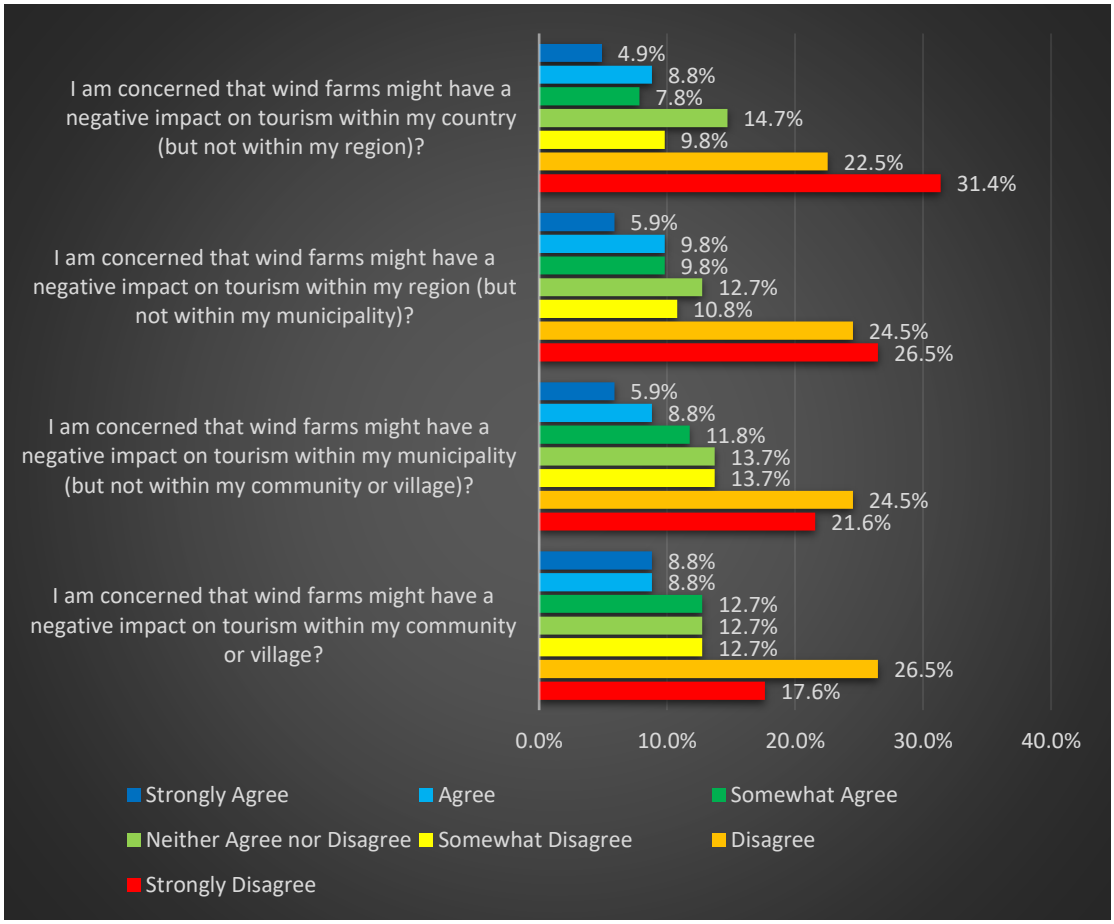

Figure 27: Impact on tourism and NIMBY effect in the pilot case of Spain (source: WENDY pilot-level survey)

Regarding the impact on tourism, the results show that a significant proportion of respondents in Spain do not share the concerns about negative impacts of wind farms on tourism. The majority of respondents at the different geographical levels, including the municipality or village, the city, the region and the country, either strongly rejected or disagreed with this view. These results indicate that there is a prevailing view among respondents that wind farms are not seen as a major barrier to tourism in different locations in Spain.

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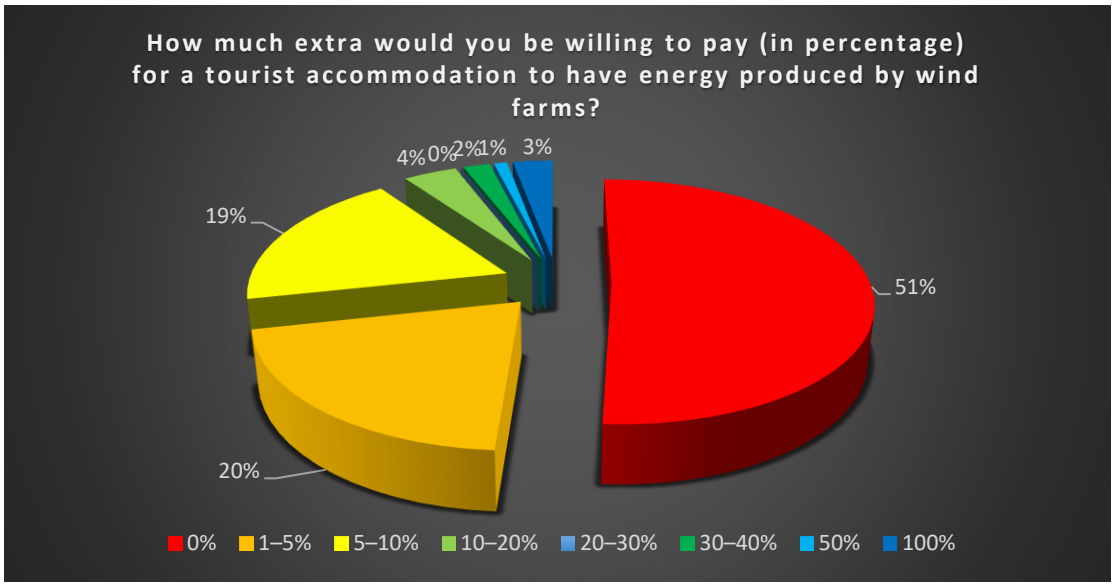

Figure 28: Willingness to pay for a tourist accommodation to have energy produced by wind farms in the pilot case of Spain (source: WENDY pilot-level survey)

Furthermore, the results of the survey show that the majority of respondents in Spain were not willing to pay an additional percentage for a holiday accommodation with wind energy. However, a significant proportion of respondents showed willingness to pay a modest additional amount between 1-5% and 5-10%. These results suggest that while there is some interest in supporting renewable energy sources such as wind farms, the majority of respondents prioritise cost considerations when choosing holiday accommodation.

Aesthetic and Visual impact

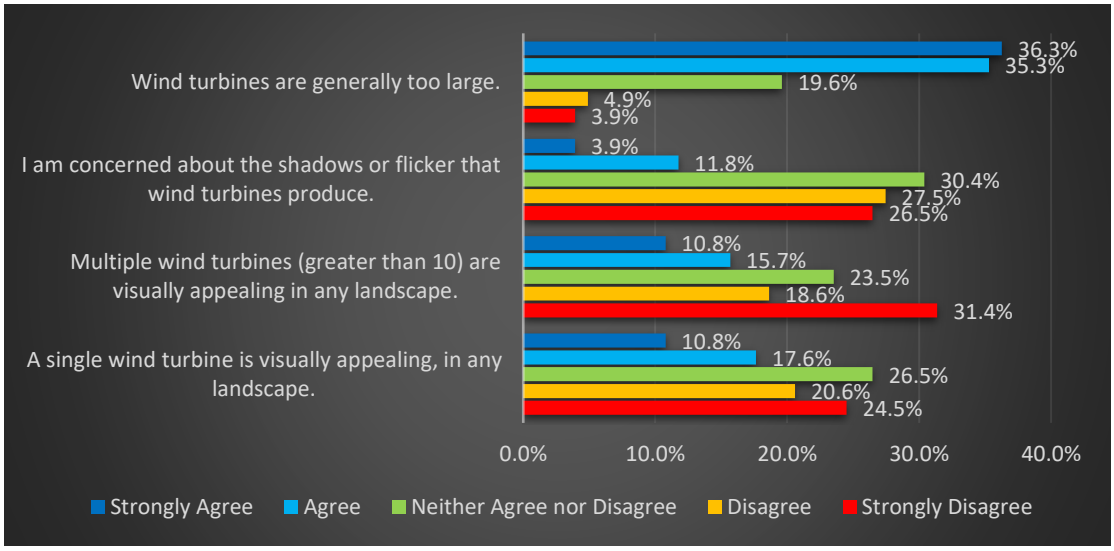

Figure 29: Visual impact and size of wind turbines in the pilot case of Spain (source: WENDY pilot-level survey)

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A range of opinions and concerns regarding the visual attractiveness and other aspects of wind turbines in Spain is observed. While a significant proportion of respondents found a single wind turbine visually appealing, the majority of respondents agreed with the visual attractiveness of multiple wind turbines. Concerns about shadowing or flicker and the overall size of wind turbines were present, with respondents agreeing to varying degrees. These results highlight the different views and considerations of wind turbines in relation to visual attractiveness and concerns in Spain.

Environmental consideration

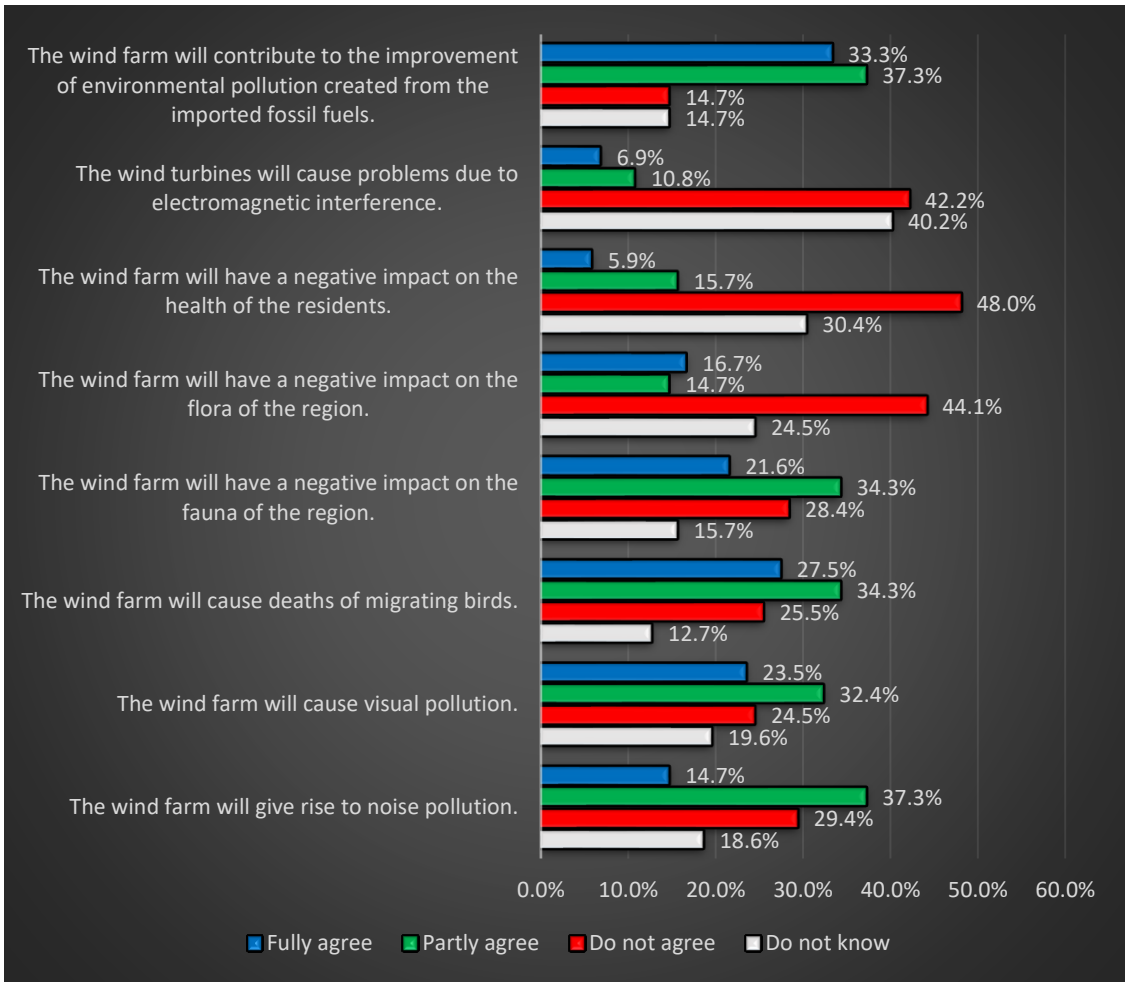

Figure 30: Environmental considerations of wind farms in the pilot case of Spain (source: WENDY pilot-level survey)

The survey results show that the impact of wind farms is perceived differently in Spain. While some respondents expressed uncertainty or disagreement about certain impacts, there were also respondents who partially or fully agreed with the negative impacts mentioned. These results highlight the need for further research and

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education to address concerns and provide a more comprehensive understanding of the potential impacts of wind farms on different aspects in Spain.

Health and wellbeing related to distance

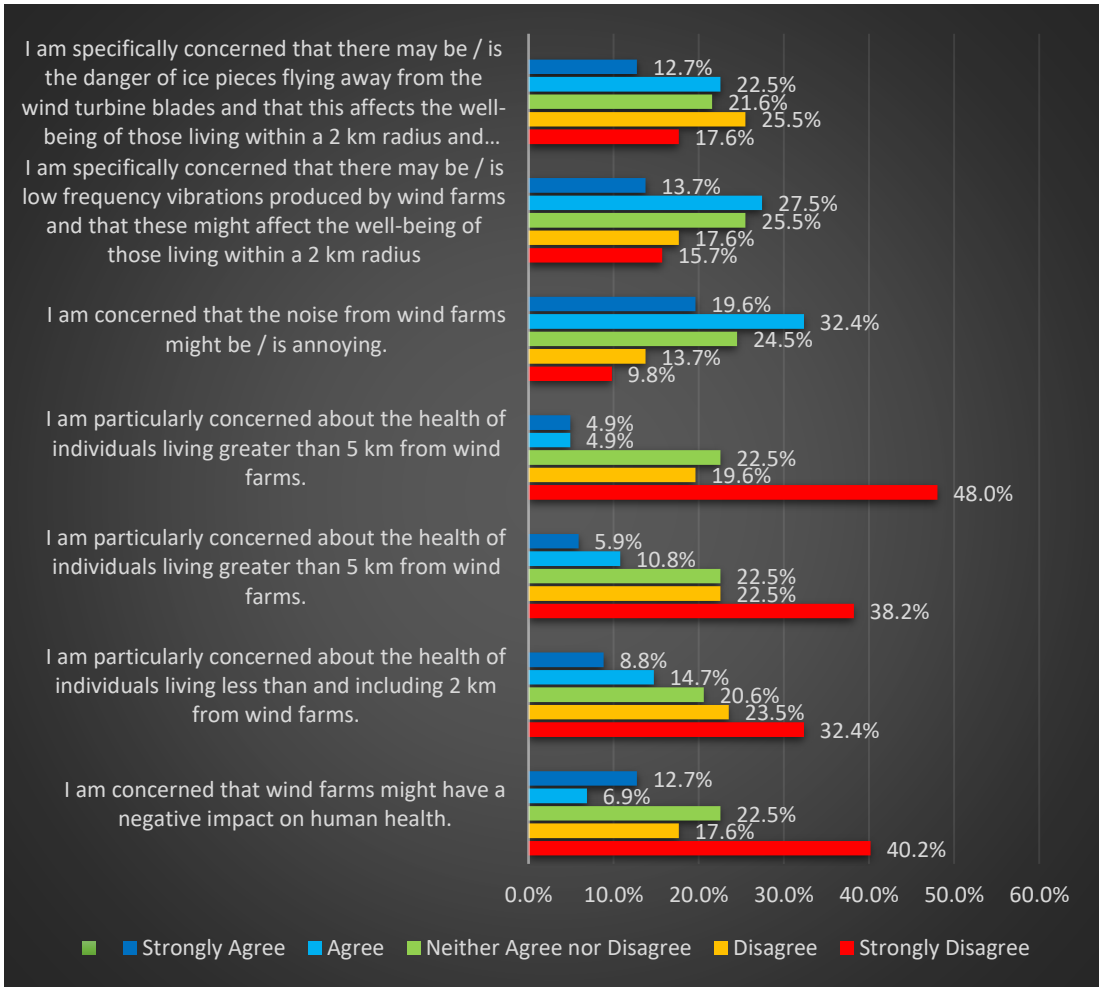

Figure 31: Health and well-being impact of wind turbines related to distance in the pilot case of Spain (source: WENDY pilot-level survey)

The Figure 31 shows data from a survey conducted in Spain that focuses on respondents' concerns about possible negative health effects of wind farms. Respondents were asked to indicate their level of agreement or disagreement with each statement, ranging from "strongly disagree" to "strongly agree". In summary, the survey results reveal a range of concerns about the health impacts of wind farms in Spain. While some respondents disagreed or rejected certain concerns, others expressed agreement or strong agreement. These results highlight the importance of addressing these concerns through further research, regulation and communication to ensure the health and well-being of people living in close proximity to wind farms.

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Economic impact

Overall, the survey results show that respondents are concerned to varying degrees about the potential negative impacts of wind farm installations, including the reduction of property values and the distribution of economic benefits. While a significant number of respondents disagreed or strongly disagreed with these concerns, there was also a notable proportion who agreed or strongly agreed with these concerns.

These results highlight the importance of addressing people's concerns and ensuring transparent and equitable processes for wind farm development. Engaging stakeholders, conducting thorough impact assessments and establishing fair benefit-sharing mechanisms can help address these concerns and foster greater acceptance and support for wind farm developments.

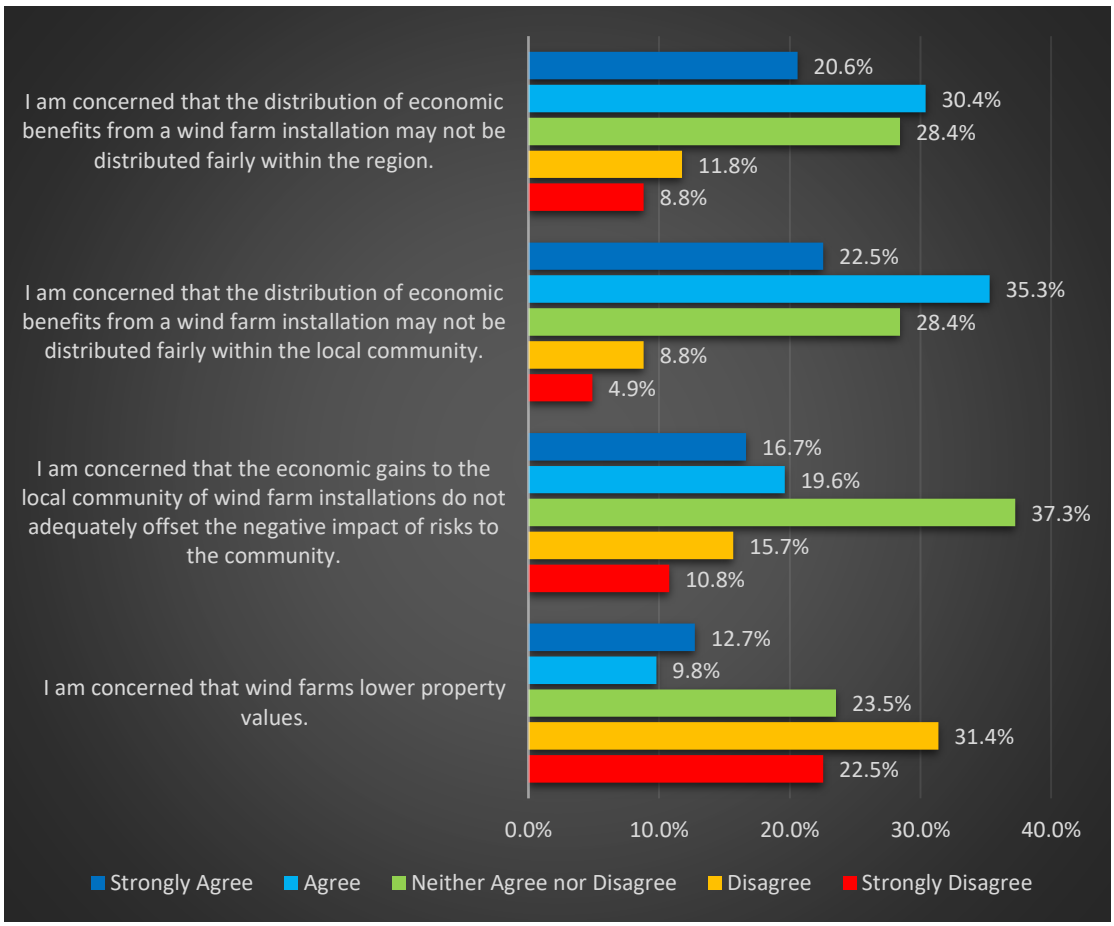

Figure 32: Economical impact and considerations of wind farms in the pilot case of Spain (source: WENDY pilot-level survey)

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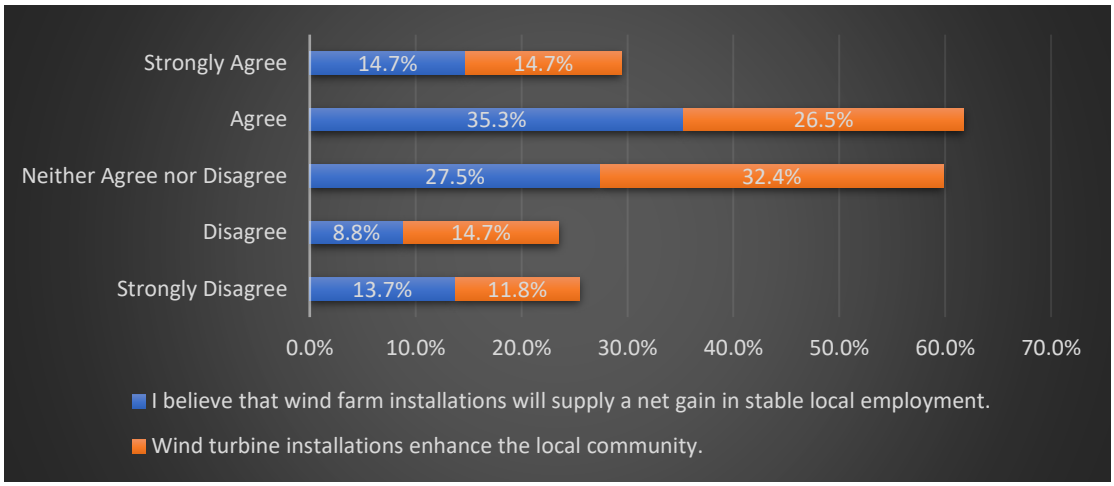

Figure 33: Added value of wind farms in local communities in the pilot case of Spain (source: WENDY pilot-level survey)

In terms of the added value of wind farms, the survey results indicate that a significant proportion of respondents have a positive view of wind farms and their potential to contribute to stable local employment. However, perceptions that wind farms improve the local community were more mixed, with a relatively large number of respondents expressing neither agreement nor disagreement.

These results demonstrate the importance of considering the potential benefits and concerns associated with wind farm installations when planning and implementing such projects. Engaging in dialogue with local communities, conducting impact assessments and addressing concerns can help ensure that wind farm developments are aligned with the needs and desires of local communities.

By incorporating community input and addressing potential concerns, wind farm developers can build positive relationships, promote local economic development and contribute to the overall well-being of the communities in which they operate.

Participation

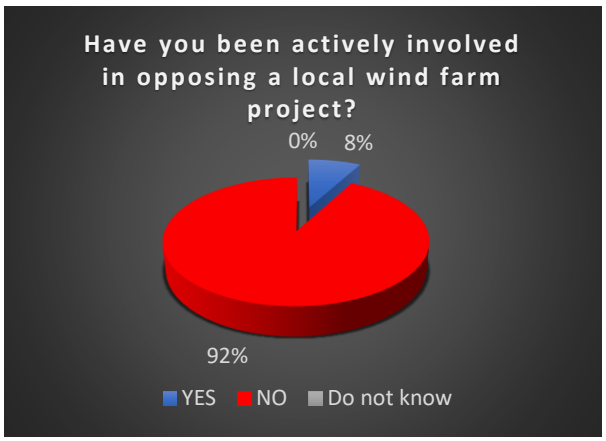

Figure 34: Public's active involvement in opposing a local wind farm project in the pilot case of Spain (source: WENDY pilot-level survey)

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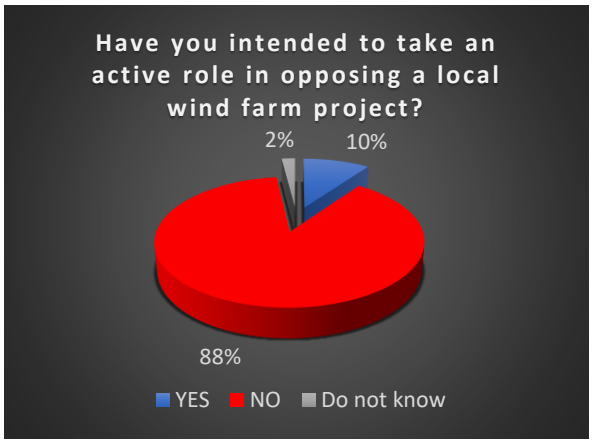

Figure 35: Public's intention to take an active role in opposing a local wind farm project in the pilot case of Spain (source: WENDY pilot-level survey)

In terms of participation, the majority of respondents in Spain did not actively oppose local wind farm projects and do not intend to take an active role in them. These results indicate that opposition to wind farm projects is relatively low among the surveyed population. It is important to take these results into account when assessing public opinion and stakeholder engagement in wind farm development.

Trust and procedural justice

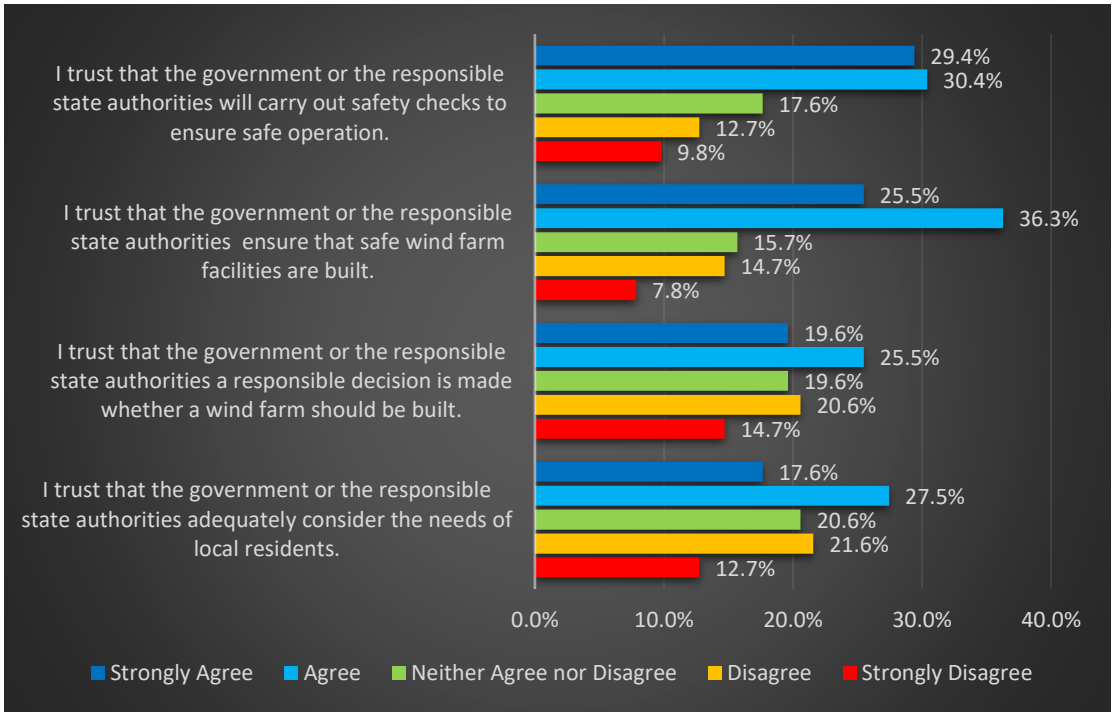

Figure 36: Trust to government or authorities in the pilot case of Spain (source: WENDY pilot-level survey)

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In terms of trust and procedural fairness, there are different perceptions of trust in the government or the relevant state authorities with regard to decision-making and the safety of wind farms. While a considerable proportion of respondents expressed trust in these instances, a considerable proportion either disagreed or were unsure. These results demonstrate the importance of building trust and addressing concerns through transparent and inclusive decision-making processes, effective communication and robust safety measures for wind farm projects.

3.2.3 Pilot case: Greece

Demographics

Table 6: Greek sample distribution by individual characteristics (source: WENDY pilot survey)

Gender	**Responses**	**Percentage**
No answer	0	0.0%
Female	21	19.6%
Male	83	77.6%
Other	1	0.9%
Prefer not to say	2	1.9%
Total	107	100%
Age	Responses	Percentage
No answer	0	0.0%
18-24	0	0.0%
25-34	7	6.5%
35-44	27	25.2%
45-54	27	25.2%
55-64	29	27.1%
65+	11	10.3%
Total	107	100%
Education	Responses	Percentage
No answer	0	0.0%
Did Not Complete High School	0	0.0%
High School/GED	8	7.5%
Some College	1	0.9%
Bachelor's Degree	37	34.6%
Master's Degree	35	32.7%
Advanced Graduate work or Ph.D.	26	24.3%
Total	107	100%
Net Annual Household Income	Responses	Percentage
No answer	0	0.0%
€5.000 or less	5	4.7%
€5.001 - €15.000	23	21.5%
€15.001 - €25.000	28	26.2%
€25.001 - 35.000	35	32.7%
€35.001 - €45.000	9	8.4%
€45.001 - €55.000	3	2.8%
€55.001 - €65.000	1	0.9%

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€65.001 - €75.000	2	1.9%
€75.001 or more	1	0.9%
Total	107	100%
Living area	Responses	Percentage
No answer	0	0.0%
Urban setting	57	53.3%
Peri-urban setting	27	25.2%
Rural setting	21	19.6%
Natural setting	2	1.9%
Total	107	100%
Typology	Responses	Percentage
No answer	0	0.0%
Mainland	24	22.4%
Island	80	74.8%
Coastline	3	2.8%
Total	107	100%

Knowledge about wind farms

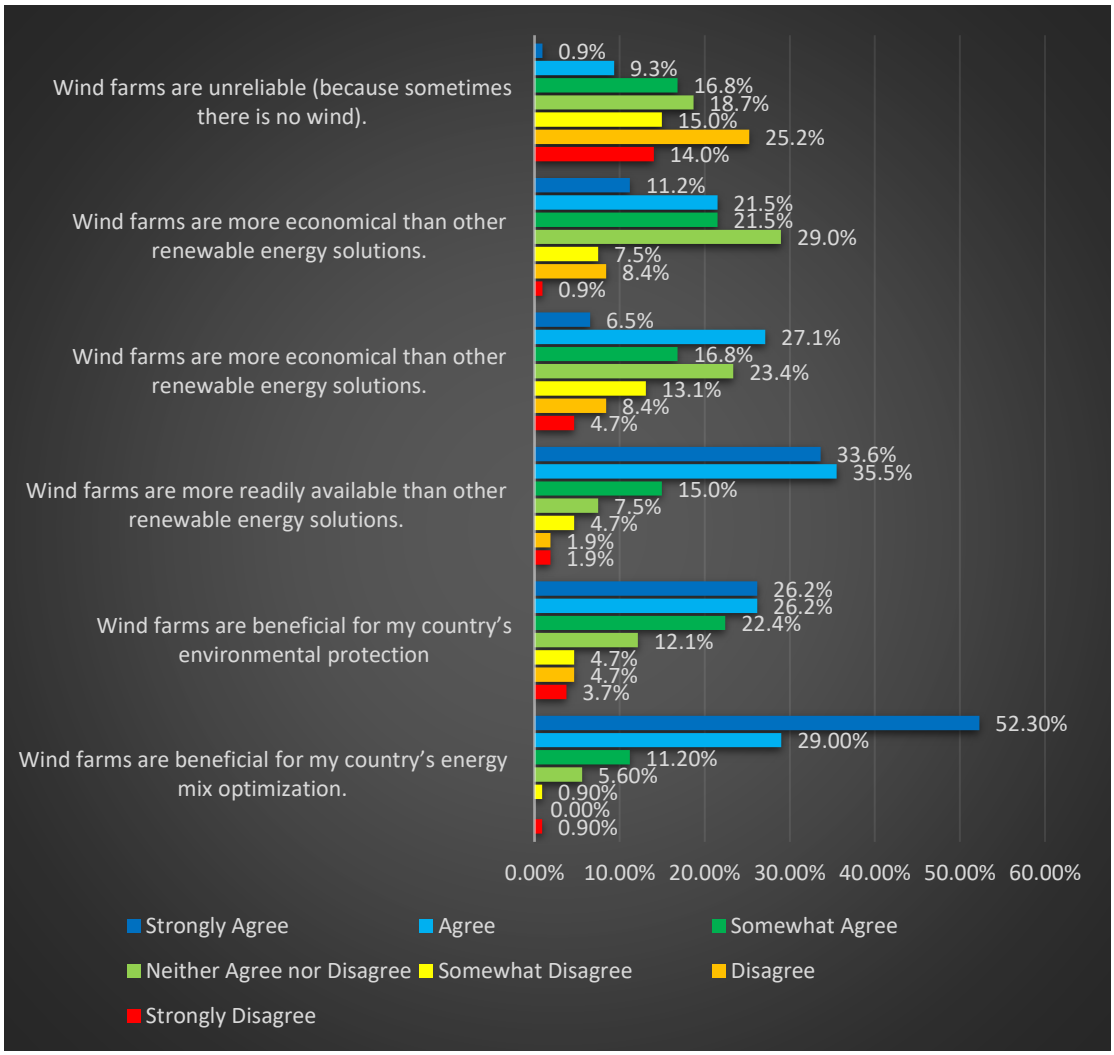

Figure 37: Knowledge about wind farms in the pilot case of Greece (source: WENDY pilot-level survey)

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The results show a generally positive perception of wind farms in Greece. The majority of respondents believe that wind farms are beneficial for optimising the energy mix and protecting the environment. However, opinions were more divided regarding the availability and economic viability of wind farms compared to other renewable energy solutions. In addition, there were mixed views on the reliability of wind farms, with some concerns expressed about their intermittency. These findings point to the need for further research and awareness campaigns to dispel misconceptions, promote the benefits of wind energy and explore ways to improve the reliability and economic viability of wind farms in Greece.

Acceptance of wind farms

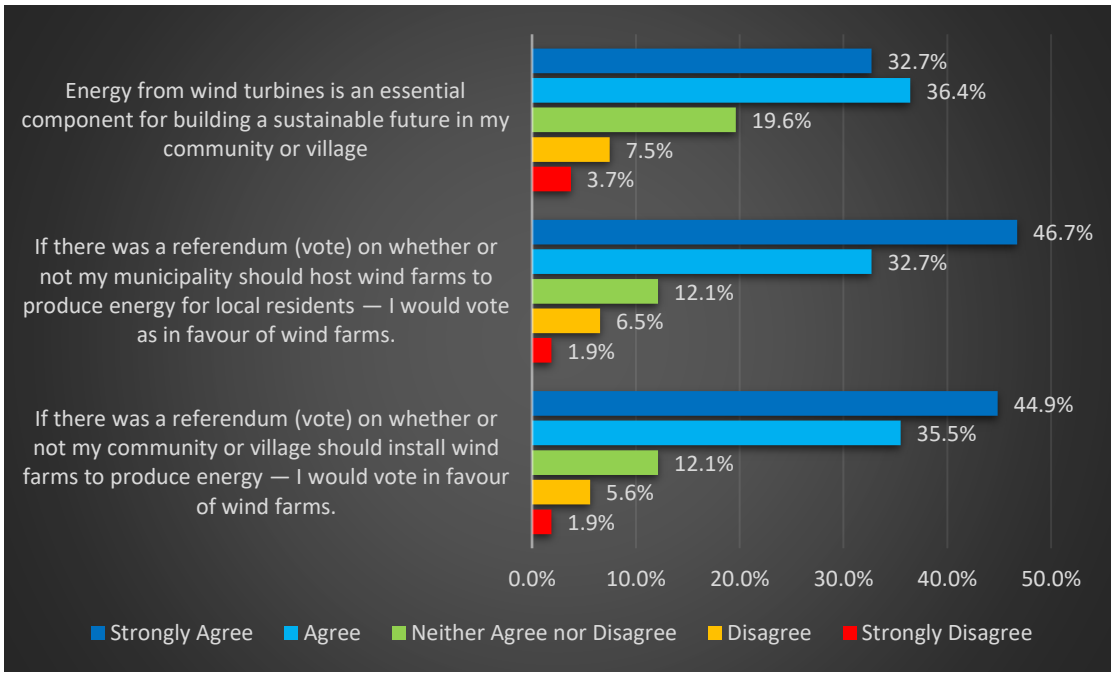

Figure 38: Acceptance of wind farms in the pilot case of Greece (source: WENDY pilot-level survey)

The survey results indicate a positive attitude towards wind farms in Greece. The majority of respondents are inclined to vote in favour of the construction of wind farms in their municipality or town, and they recognise the importance of wind turbines in achieving sustainability goals. These results indicate a favourable attitude towards wind energy in Greece.

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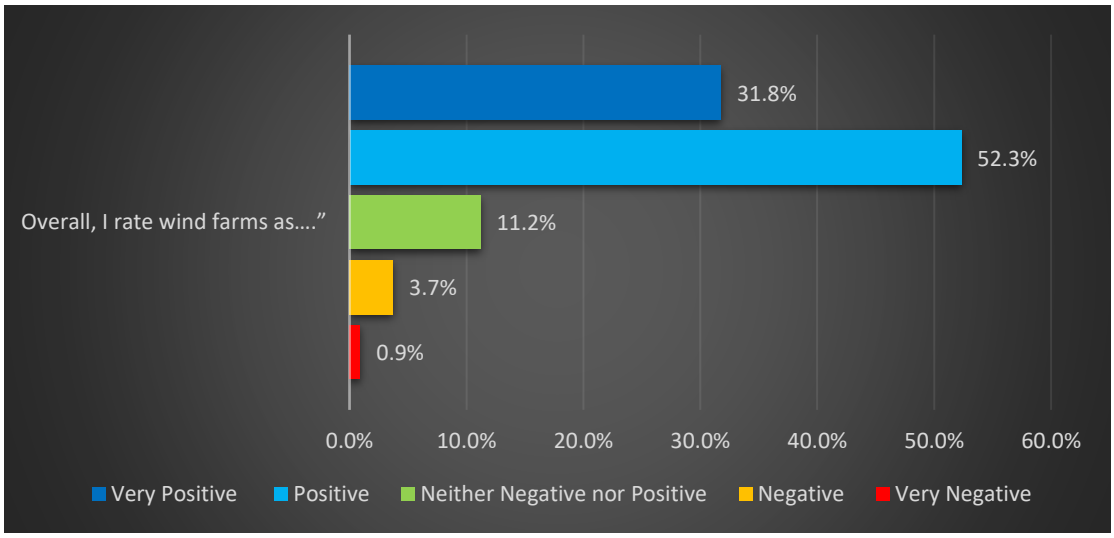

Figure 39: Overall acceptance of wind farms in the pilot case of Greece (source: WENDY pilot-level survey)

Furthermore, the overall perception of wind farms in Greece is positive, with the majority of respondents having a positive opinion. These results reflect a favourable environment for the development and use of wind energy in the country.

NIMBY Effect

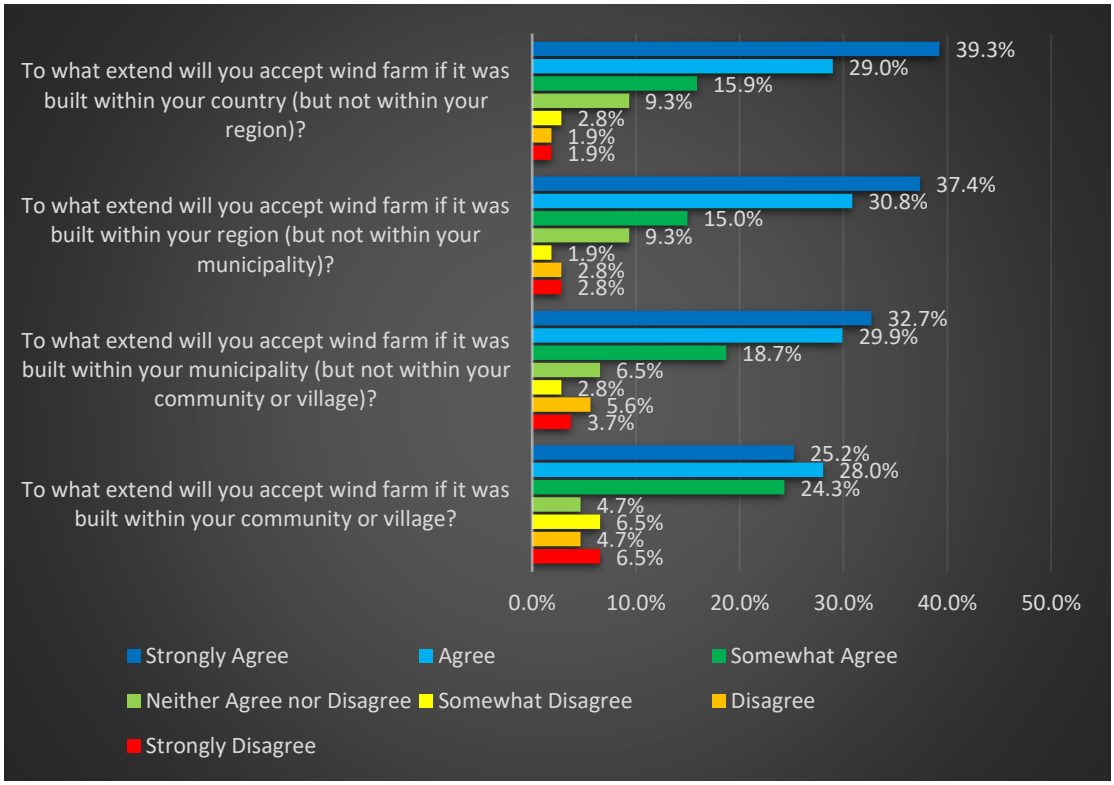

Figure 40: NIMBY effect in the pilot case of Greece (source: WENDY pilot-level survey)

The results of the survey show that respondents in Greece have a positive attitude towards wind farms, with a significant proportion willing to accept the development

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of wind farms at different geographical scales. These results indicate a favourable environment for wind energy development in Greece and highlight the potential for increased use of wind energy in the country.

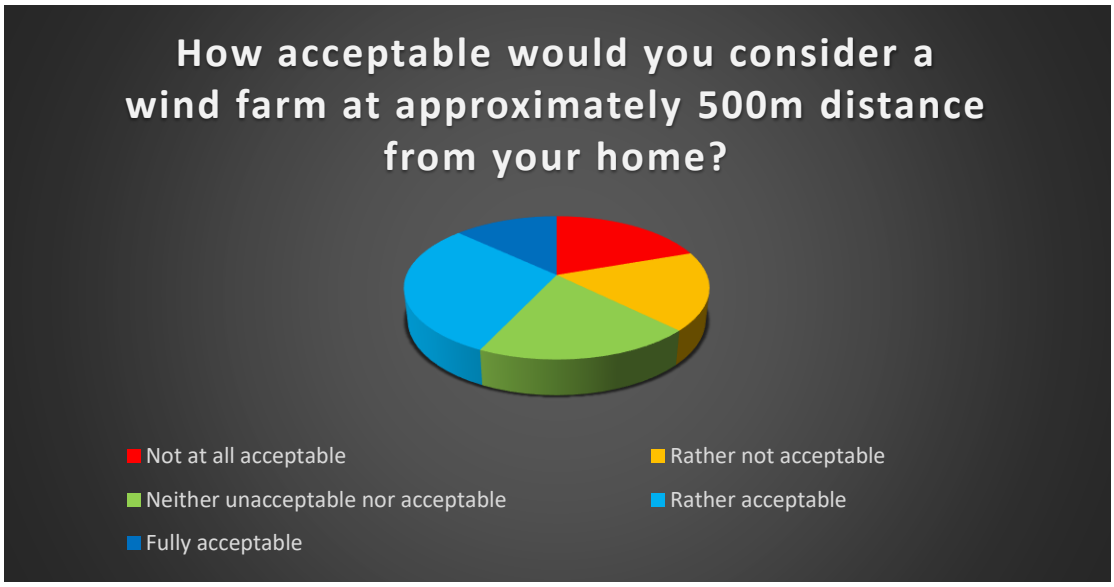

Figure 41: PIMBY effect in the pilot case of Greece (source: WENDY pilot-level survey)

In addition, a relatively positive attitude towards wind farms near homes in Greece, with a significant proportion of respondents expressing acceptance.

Type of wind farms acceptance

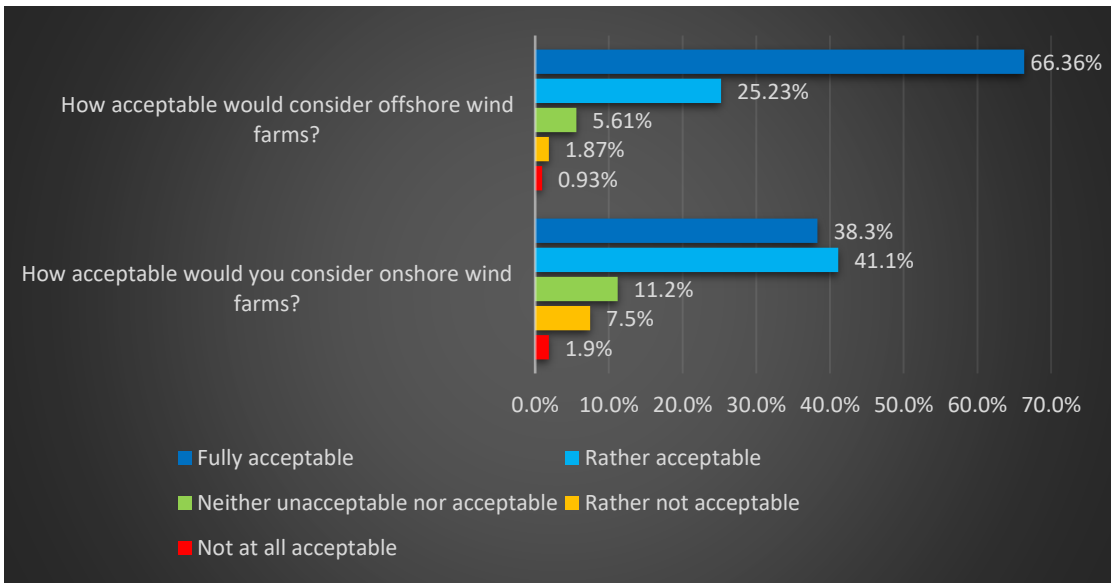

Figure 42: Acceptance of wind farms based on their type (onshore, offshore) in the pilot case of Greece (source: WENDY pilot-level survey)

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These results underline the positive attitude towards onshore and offshore wind farms in Greece.

Impact on tourism

Response patterns regarding concerns about the impact of wind farms on tourism within the community, region and country follow a similar trend. While the exact percentages vary, there is a mix of disagreement, agreement and neutral positions among the statements.

Overall, the survey results show that a significant proportion of respondents express some level of concern about the potential negative impacts of wind farms on tourism. However, it is worth noting that a significant percentage of respondents either disagree or are neutral, indicating that there is no significant concern or uncertainty about this issue.

These results demonstrate the importance of considering the potential impacts of wind farms on tourism and taking action to counteract any negative impacts. It is crucial that stakeholders, including local communities, municipalities and tourism authorities, develop comprehensive planning, communication and mitigation strategies to ensure the co-existence of wind farms and tourism in Greece. If these concerns are addressed, it is possible to strike a balance between renewable energy production and sustainable tourism development.

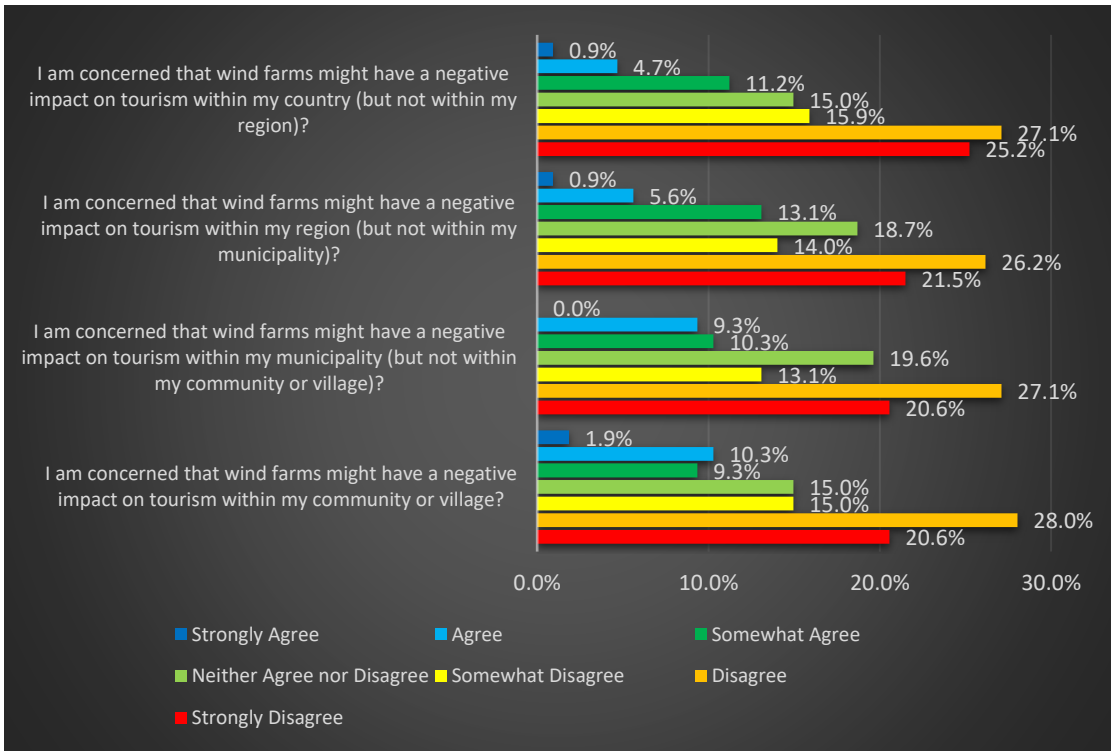

Figure 43: Impact on tourism and NIMBY effect in the pilot case of Greece (source: WENDY pilot-level survey)

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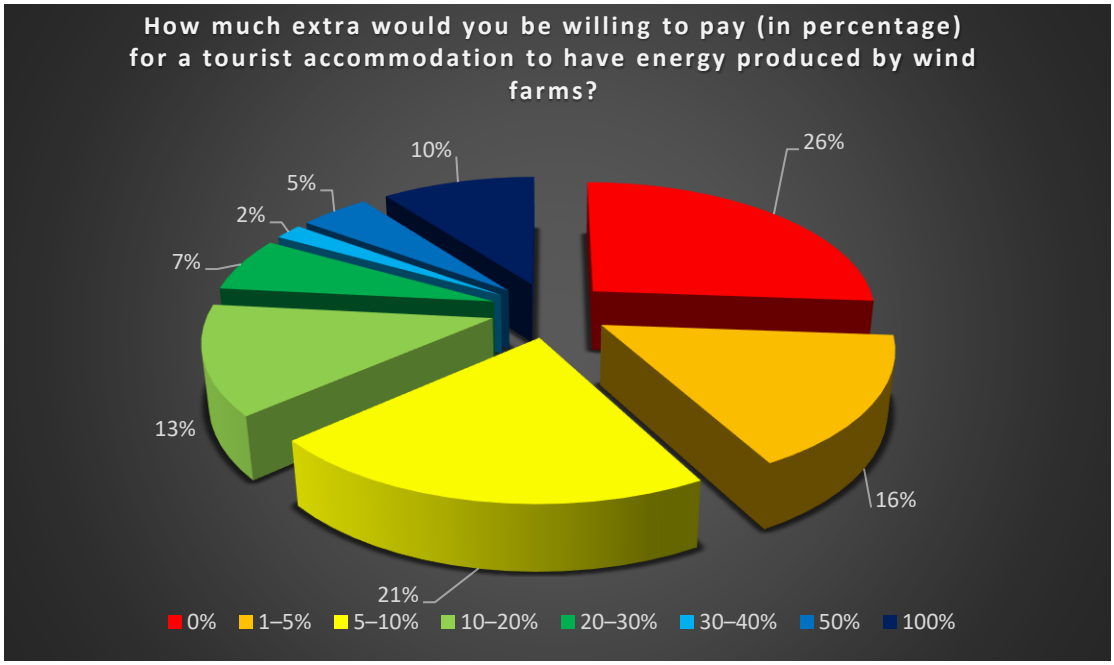

Figure 44: Willingness to pay for a tourist accommodation to have energy produced by wind farms in the pilot case of Greece (source: WENDY pilot-level survey)

Overall, the survey results reveal a range of attitudes and respondents' willingness to pay more for tourist accommodation that uses wind energy. While a significant proportion of respondents were willing to make a financial contribution to varying degrees, a sizeable percentage preferred not to pay any additional amount. These results show the importance of communicating the benefits and value of renewable energy sources such as wind farms to potential consumers and developing pricing strategies that take into account different preferences and financial possibilities.

Aesthetic and Visual impact

In general, the results show a range of attitudes and concerns towards wind turbines in Greece. While some respondents find single wind turbines visually appealing in any landscape, others have concerns about their size and the shadows or flicker they create. Views on multiple wind turbines are similar, with no consensus. These findings highlight the importance of considering visual and environmental impacts when planning wind turbines and addressing public concerns to ensure better acceptance and support from local communities.

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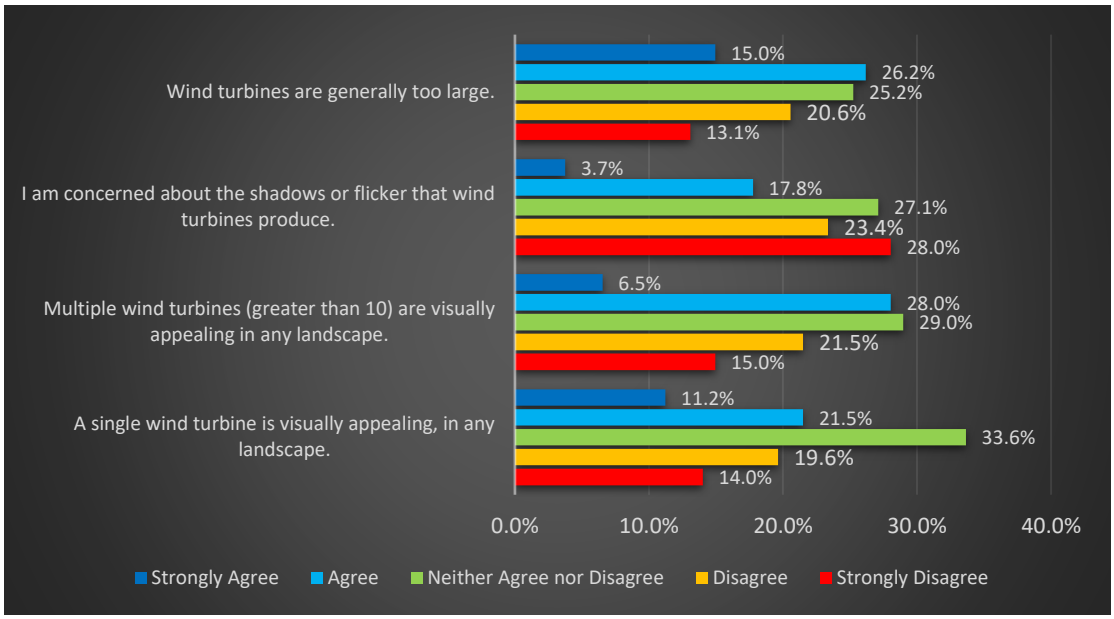

Figure 45: Visual impact and size of wind turbines in the pilot case of Greece (source: WENDY pilot-level survey)

Environmental consideration

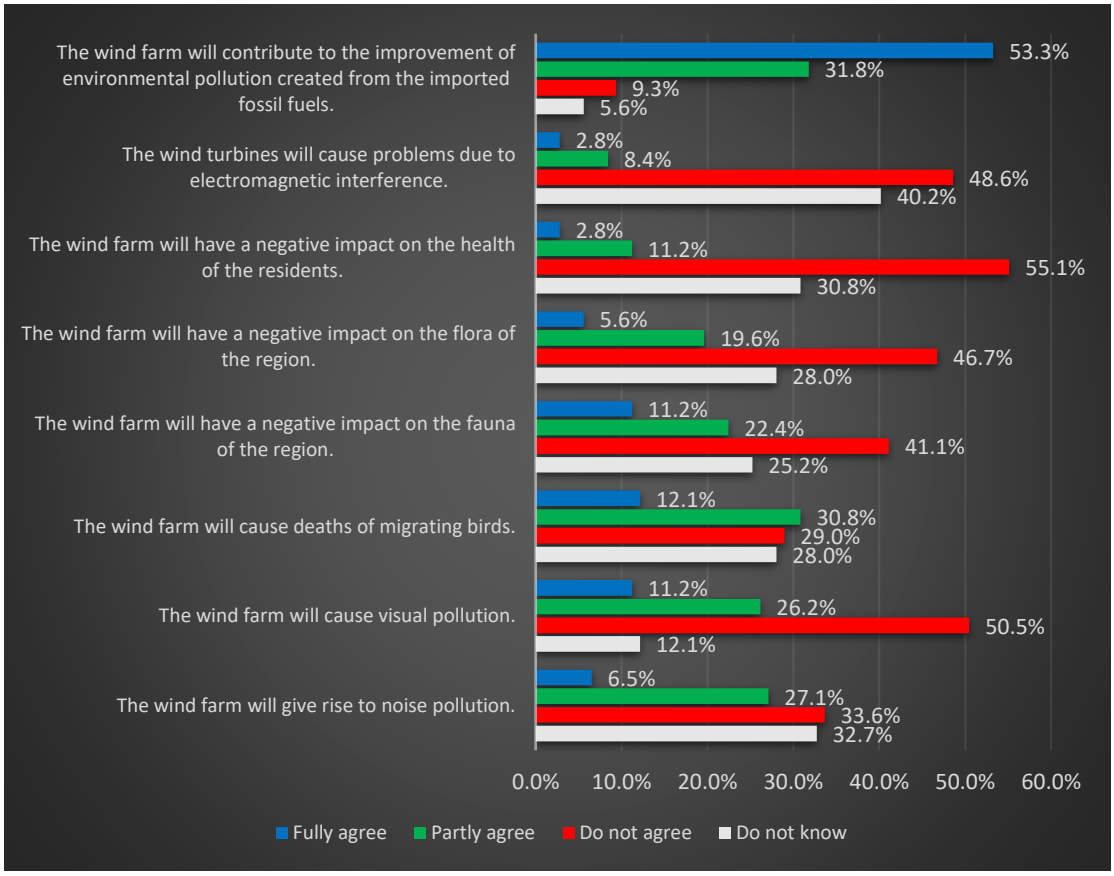

Figure 46: Environmental considerations of wind farms in the pilot case of Greece (source: WENDY pilot-level survey)

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There are a range of opinions and uncertainties regarding the perceived impact of wind farms in Greece. While some respondents expressed concern about noise pollution, visual pollution and possible negative impacts on wildlife, others disagreed or were unsure. The survey highlights the need for further research and public involvement to address these concerns and provide accurate information on the actual impacts of wind farms on the environment, wildlife and human health.

Health and wellbeing related to distance

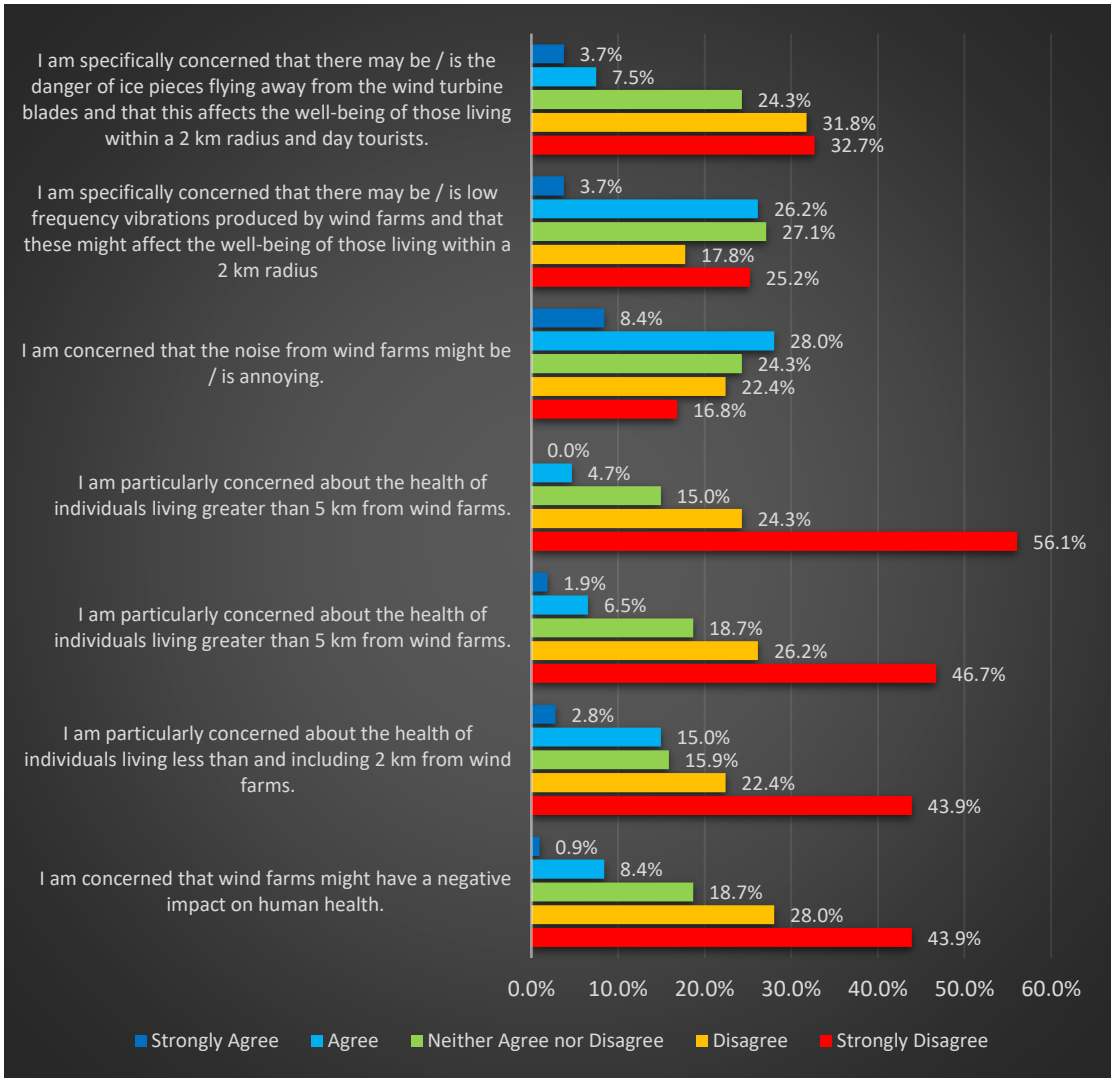

Figure 47: Health and well-being impact of wind turbines related to distance in the pilot case of Greece (source: WENDY pilot-level survey)

When asked about the impact of wind turbines on health and well-being in relation to distance, the results reflect a range of opinions and uncertainties about the potential health impacts of wind farms in Greece. While a significant proportion of respondents either disagreed or strongly disagreed with the statements, indicating a lower level of concern, there were also respondents who expressed varying levels of agreement and

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uncertainty. The findings highlight the need for further research and clarification to address public concerns and provide accurate information on the potential health impacts of wind farms on surrounding communities.

Economic impact

The results show a range of opinions and uncertainties regarding the economic impact of wind farms in Greece. While some respondents expressed concerns about property values, the adequacy of economic gains to outweigh risks, and the equitable distribution of benefits, there were also respondents who disagreed or strongly disagreed with these concerns. The results show that the economic impacts of wind farms need to be further investigated and assessed to address public concerns and ensure an equitable distribution of benefits across communities and regions.

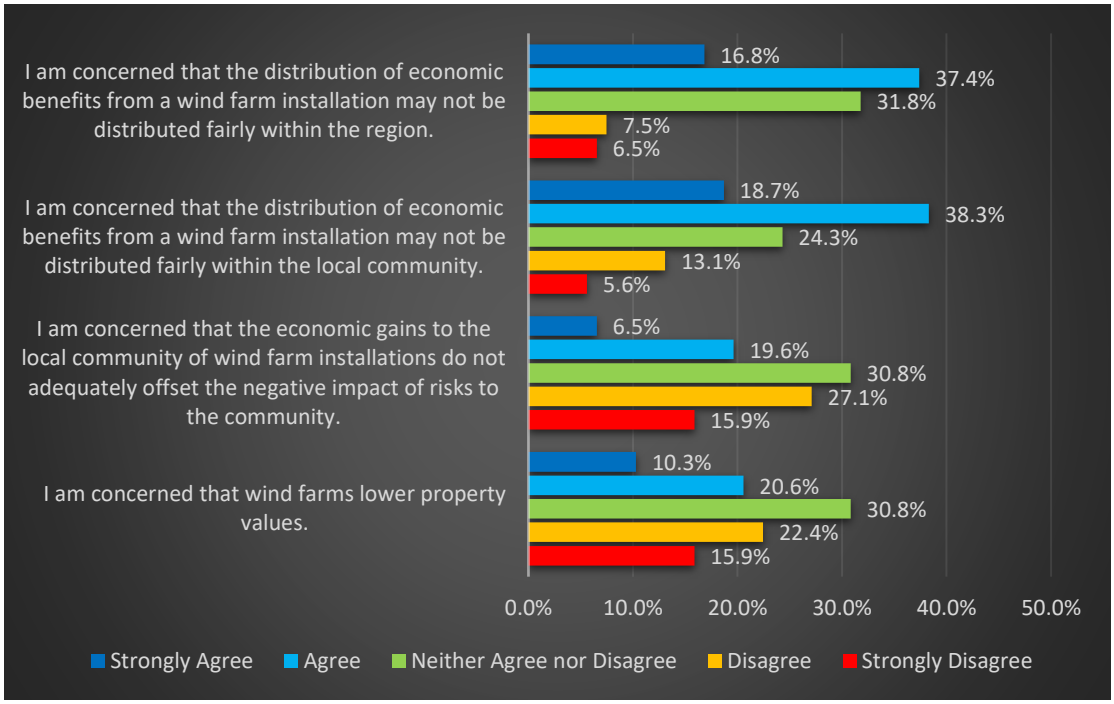

Figure 48: Economical impact and considerations of wind farms in the pilot case of Greece (source: WENDY pilot-level survey)

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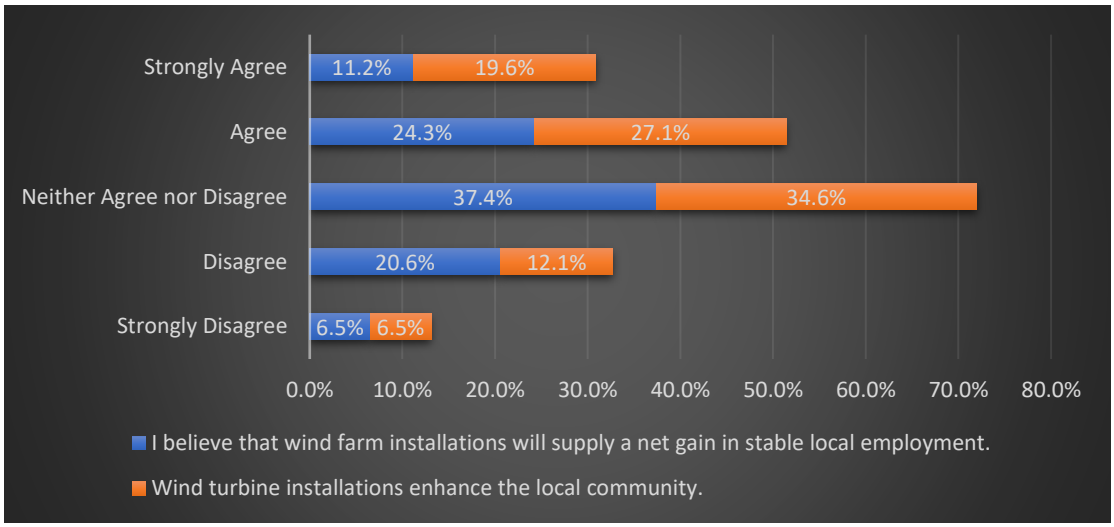

Figure 49: Added value of wind farms in local communities in the pilot case of Greece (source: WENDY pilot-level survey)

Generally, the survey results reveal a range of beliefs and opinions about the impact of wind turbines on local employment and the enhancement of the local community in Greece. While a large proportion of respondents expressed optimism and agreement with these statements, there were also respondents who disagreed or held neutral views. These results underline the need for further analysis and investigation of the actual impact of wind farm installations on local employment and community upgrading in order to improve public perception and ensure the sustainable development of wind energy projects in Greece.

Participation

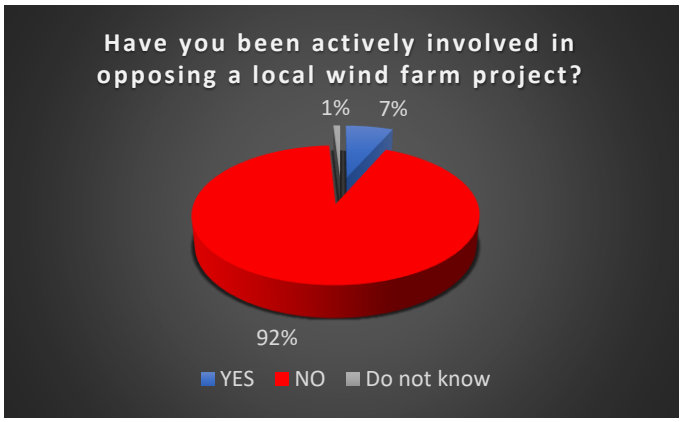

Figure 50: Public's active involvement in opposing a local wind farm project in the pilot case of Greece (source: WENDY pilot-level survey)

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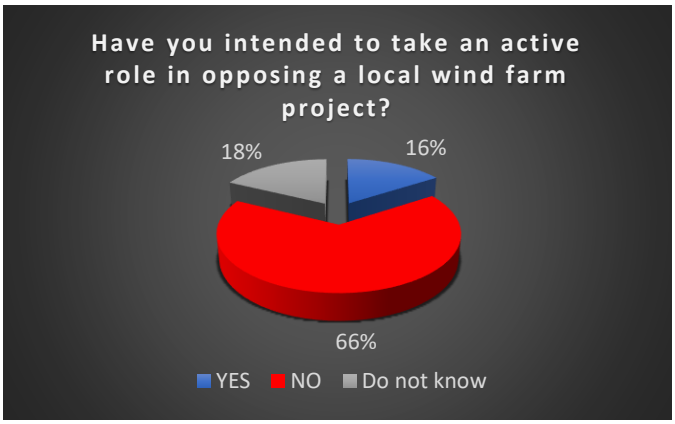

Figure 51: Public's intention to take an active role in opposing a local wind farm project in the pilot case of Greece (source: WENDY pilot-level survey)

The survey results indicate that while a minority of respondents have been actively involved in opposing local wind farm projects, a significant proportion do not currently participate in opposition activities. However, there is a notable intention among some respondents to take an active role in opposing such projects in the future. These findings highlight the diversity of perspectives and the potential for shifts in public opinion and engagement regarding local wind farm initiatives in Greece. It is essential to consider and address the concerns and intentions of the community when planning and implementing wind energy projects to ensure transparency, inclusiveness, and sustainable development in the renewable energy sector.

Trust and procedural justice

The study indicates that a considerable proportion of respondents have concerns about the fairness of both the process for selecting municipalities as sites for wind farms and the process for selecting land for wind farms in Greece. This also indicates a perceived lack of fairness and transparency in the decision-making processes related to wind energy projects. These findings highlight the importance of addressing community concerns, promoting stakeholder involvement and ensuring transparency and fairness in the planning and implementation of wind farm projects. Through public involvement and inclusive decision-making processes, it is possible to build trust, minimise conflict and promote sustainable renewable energy development.

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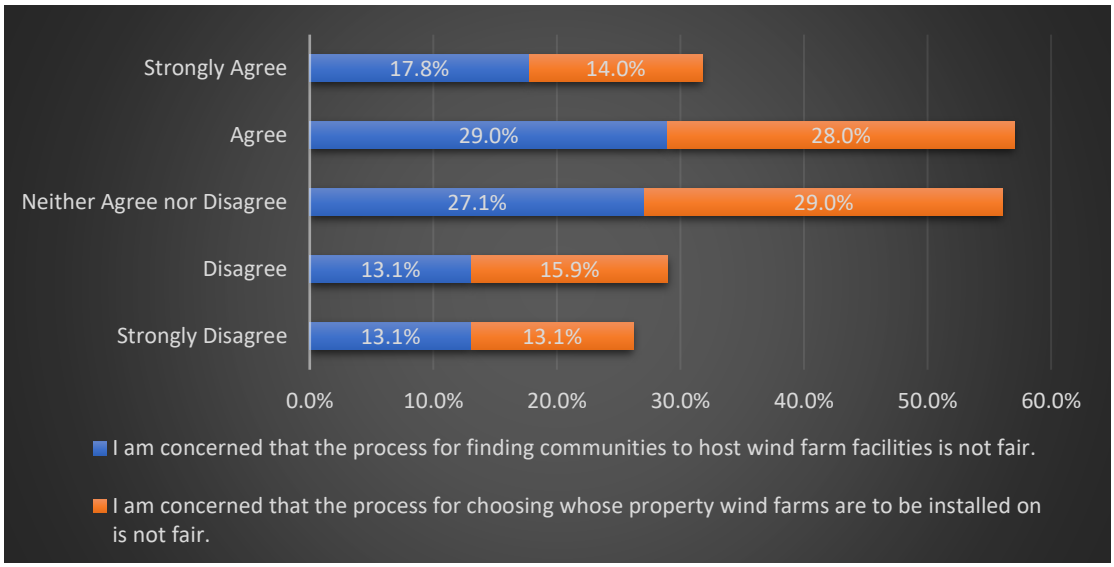

Figure 52: Trust in processes for establishing wind farms in the pilot case of Greece (source: WENDY pilot-level survey)

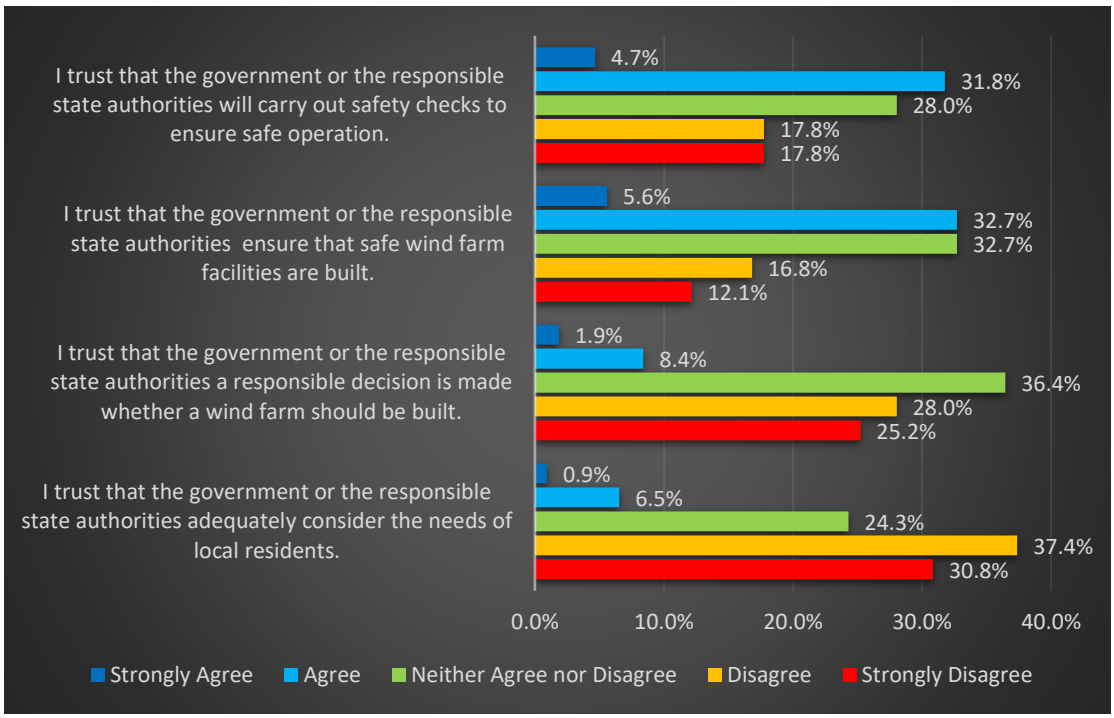

Figure 53: Trust to government or authorities in the pilot case of Greece (source: WENDY pilot-level survey)

The analysis of the data revealed a general lack of trust in the government or the relevant state authorities when it comes to various aspects of wind farm projects in Greece. Respondents expressed concerns about the government's consideration of the needs of local residents, responsible decision-making, ensuring the safety of wind farm installations and carrying out safety checks on wind farms in operation. These findings demonstrate the importance of building trust in wind farm projects through transparent and inclusive processes, effective communication and robust safety

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measures. By addressing these concerns and involving stakeholders in the decision-making process, government can build greater trust and support for wind energy initiatives.

3.2.4 Pilot case: Norway

Demographics

Table 7: Norwegian sample distribution by individual characteristics (source: WENDY pilot survey)

Gender	**Responses**	**Percentage**
No answer	4	6.7%
Female	23	38.3%
Male	31	51.7%
Other	1	1.7%
Prefer not to say	1	1.7%
Total	60	100%
Age	Responses	Percentage
No answer	4	6.7%
18-24	1	1.7%
25-34	5	8.3%
35-44	18	30.0%
45-54	13	21.7%
55-64	10	16.7%
65+	7	11.7%
Total	60	100%
Education	Responses	Percentage
No answer	4	6.7%
Did Not Complete High School	2	3.3%
High School/GED	11	18.3%
Some College	4	6.7%
Bachelor's Degree	12	20.0%
Master's Degree	23	38.3%
Advanced Graduate work or Ph.D.	4	6.7%
Total	60	100%
Net Annual Household Income	Responses	Percentage
No answer	4	6.7%
€5.000 or less	4	6.7%
€5.001 - €15.000	2	3.3%
€15.001 - €25.000	1	1.7%
€25.001 - 35.000	5	8.3%
€35.001 - €45.000	1	1.7%
€45.001 - €55.000	7	11.7%
€55.001 - €65.000	5	8.3%
€65.001 - €75.000	10	16.7%
€75.001 or more	21	35.0%
Total	60	100%
Living area	Responses	Percentage

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No answer	4	6.7%
Urban setting	23	38.3%
Peri-urban setting	18	30.0%
Rural setting	10	16.7%
Natural setting	5	8.3%
Total	60	100%
Typology	Responses	Percentage
No answer	4	6.7%
Mainland	41	68.3%
Island	3	5.0%
Coastline	12	20.0%
Total	60	100%

Knowledge about wind farms

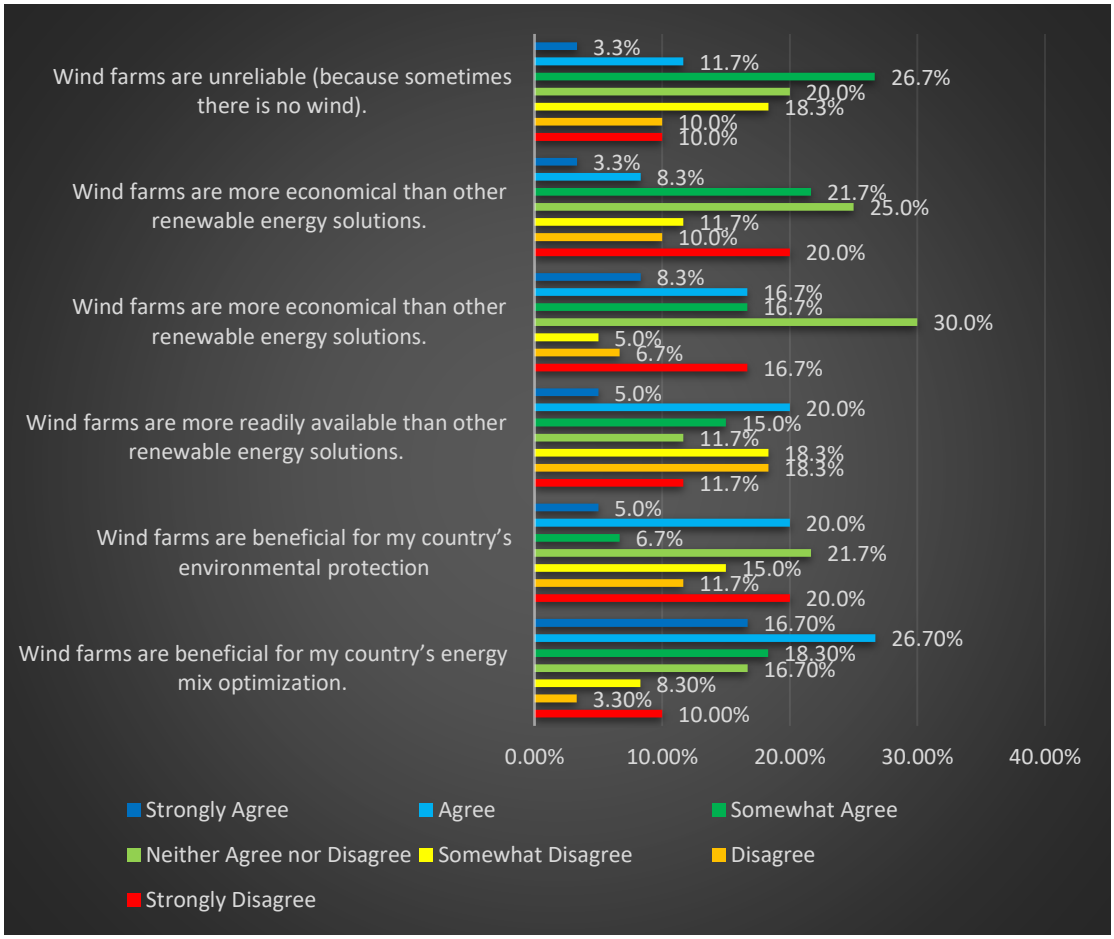

Figure 54: Knowledge about wind farms in the pilot case of Norway (source: WENDY pilot-level survey)

The results reflect a generally positive perception of wind farms in Norway, with the majority recognising their benefits for optimising the energy mix and protecting the environment. However, opinions on the availability, cost-effectiveness and reliability of wind farms compared to other renewable energy solutions varied widely. These

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results highlight the importance of continuing research and development in the renewable energy sector, while also addressing concerns about energy supply disruption and economic viability. Overall, the survey shows that wind farms are perceived as a valuable part of Norway's energy transition. However, further efforts are needed to address perceived limitations and increase public confidence in their long-term benefits.

Acceptance of wind farms

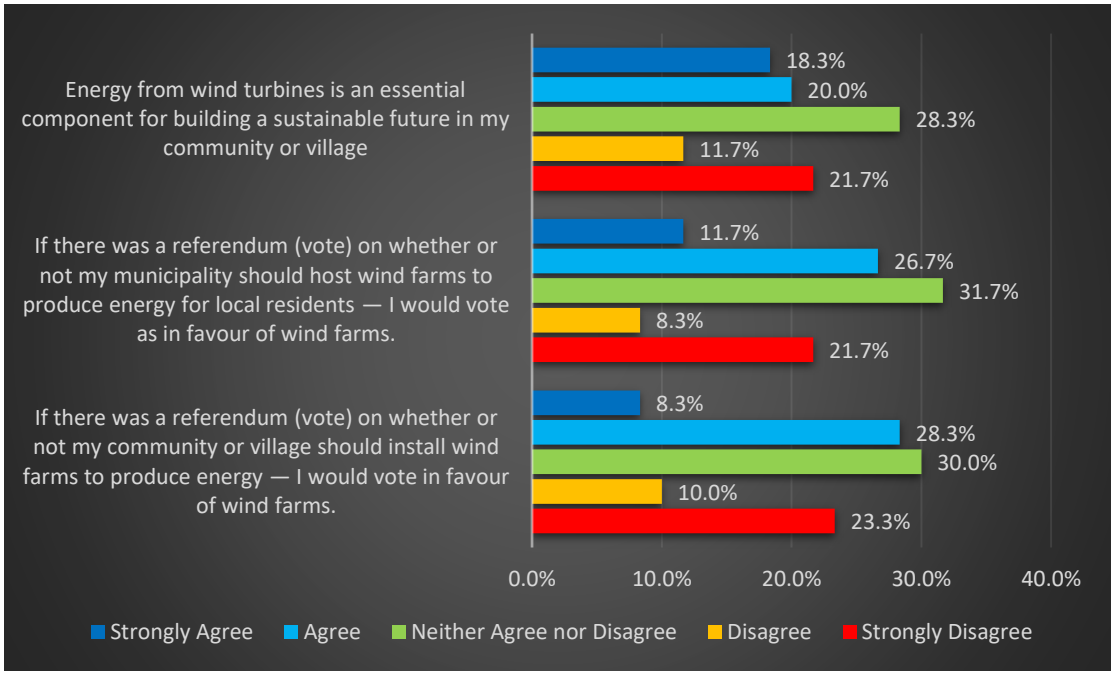

Figure 55: Acceptance of wind farms in the pilot case of Norway (source: WENDY pilot-level survey)

The survey results indicate a mixed perception of wind farms in Norway. While a proportion of respondents are in favour of the construction of wind farms and recognise their role in a sustainable future, a significant proportion are negative. These results illustrate that there are different perceptions and potential challenges in gaining broad support for wind energy projects in Norway.

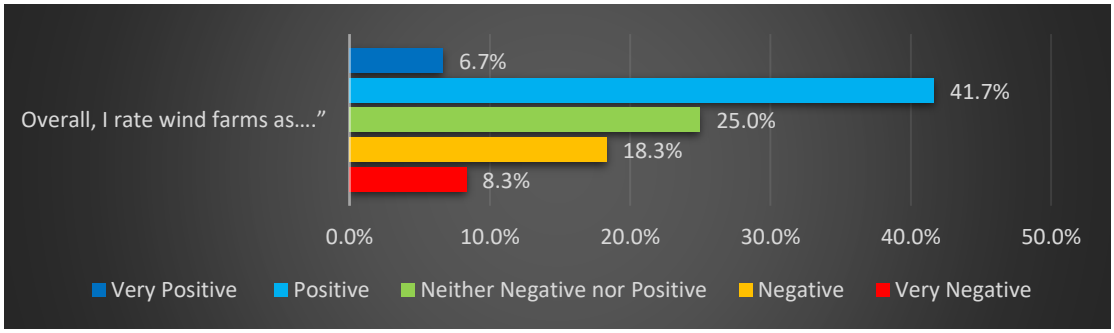

Figure 56: Overall acceptance of wind farms in the pilot case of Norway (source: WENDY pilot-level survey)

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Furthermore, a mixed perception can be found regarding the general acceptance of wind farms in Norway. While some respondents have a positive opinion, a significant part has a negative attitude. These results make it clear that there are different views and potential challenges in gaining broad support for wind energy projects in Norway.

NIMBY Effect

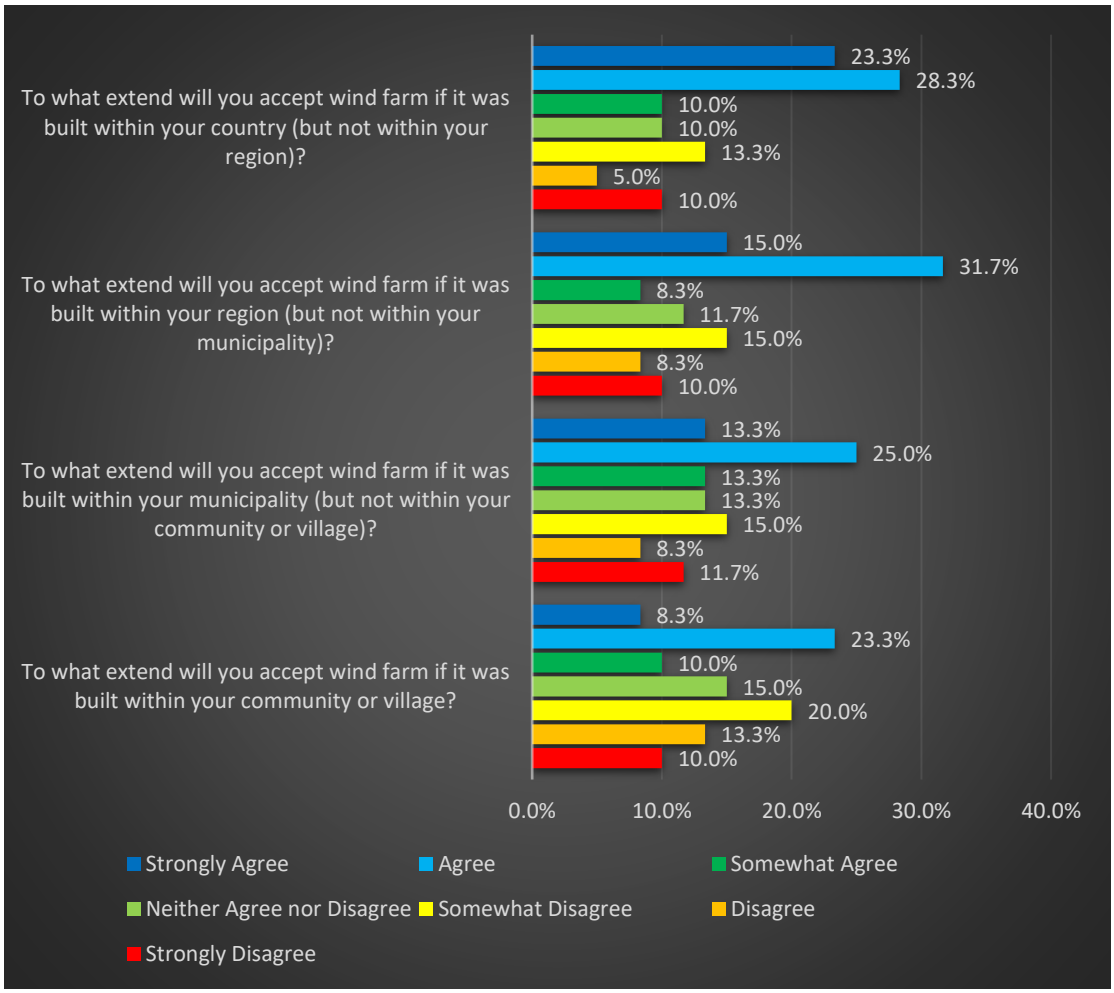

Figure 57: NIMBY effect in the pilot case of Norway (source: WENDY pilot-level survey)

The results of the survey show that the acceptance of wind farms varies depending on their proximity to different geographical areas. Regarding the acceptance of wind farms within one's own community or village, a significant percentage of respondents express agreement or strong agreement, while a smaller percentage express no agreement or strong disagreement. Similarly, when it comes to wind farms within one's own municipality but not within the municipality or village, a considerable proportion of respondents are in favour, while a smaller proportion are against. When it comes to wind farms in the region but not in the municipality, there is a larger

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number of participants who are in favour, with a significant percentage strongly agreeing. When it comes to wind farms in the countryside but not in the region, the majority of respondents express agreement or strong agreement. These results suggest that acceptance of wind farms tends to increase as the scale expands from the community to the region and countryside. It is important to note that these results reflect the opinions of the respondents and do not necessarily reflect the views of the entire population.

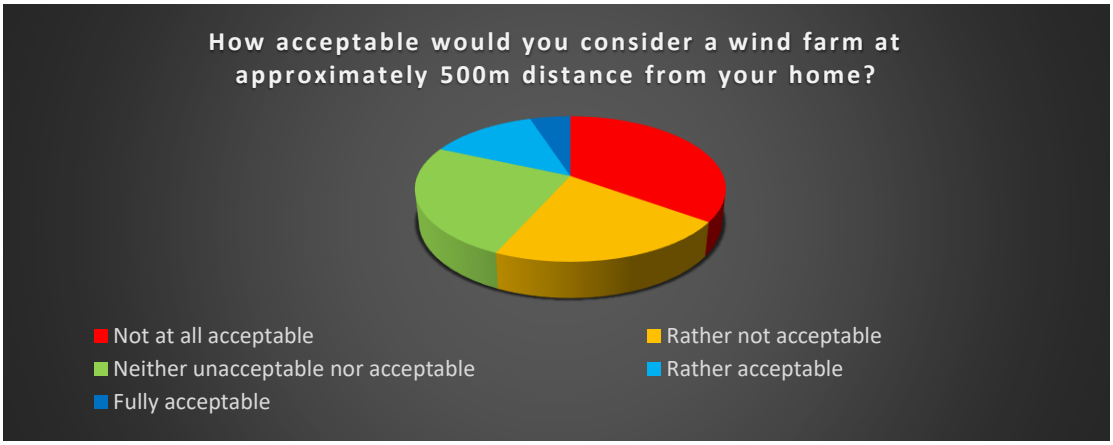

Figure 58: PIMBY effect in the pilot case of Norway (source: WENDY pilot-level survey)

The survey results indicate greater opposition to wind farms near residential areas in Norway, with the majority of respondents expressing concern or a negative perception of such proximity.

Type of wind farms acceptance

The results show that the acceptance of wind farms, both onshore and offshore, is rather mixed in Norway. While a significant proportion of respondents expressed reservations about onshore wind farms, the acceptance of offshore wind farms is comparatively higher. These results suggest that offshore wind farms may be better accepted by the Norwegian population. It is important that policy makers and project developers take these different attitudes and concerns into account when planning and implementing wind energy projects in Norway, adequately involve the public and address potential environmental and social impacts.

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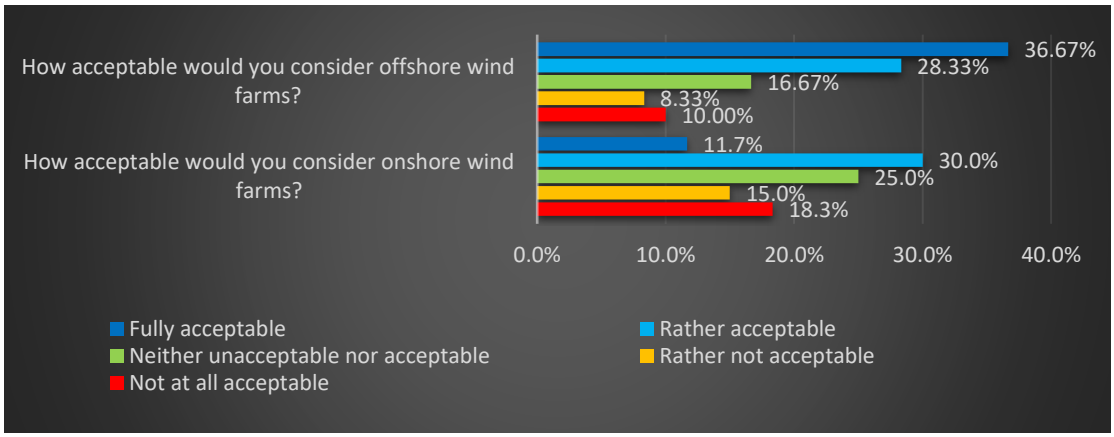

Figure 59: Acceptance of wind farms based on their type (onshore, offshore) in the pilot case of Norway (source: WENDY pilot-level survey)

Impact on tourism

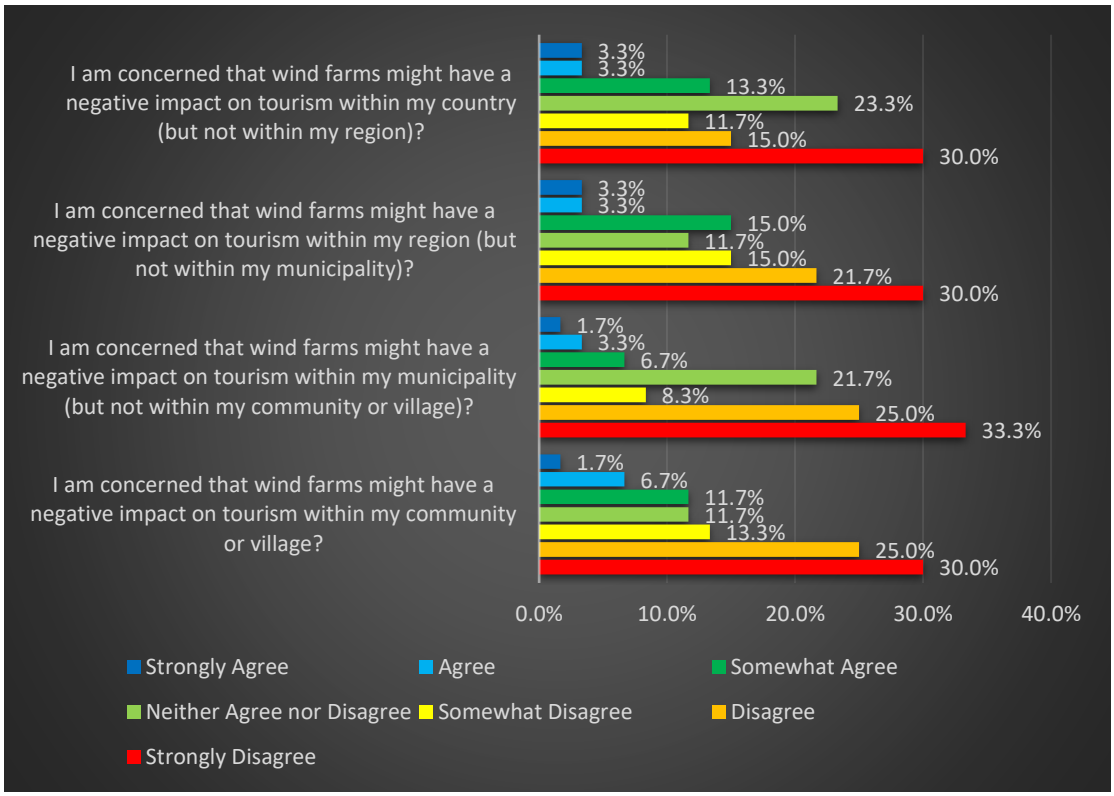

Figure 60: Impact on tourism and NIMBY effect in the pilot case of Norway (source: WENDY pilot-level survey)

In summary, the survey results indicate that concern about the negative impact of wind farms on tourism in Norway varies according to their proximity. Respondents were generally more concerned about the impacts within their municipality or village, with a larger percentage expressing disapproval or neutrality. When the scale was extended to the municipality, region and country, the level of concern decreased, with a higher percentage of respondents disagreeing or strongly agreeing.

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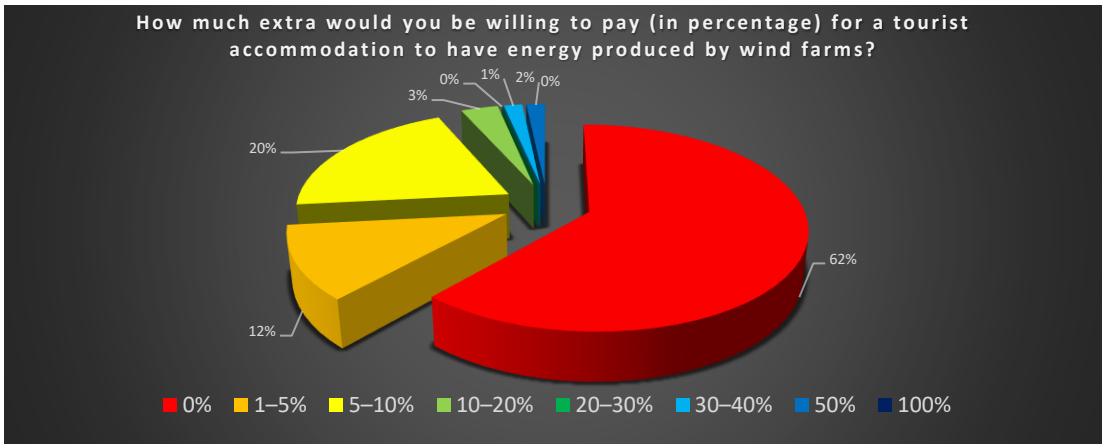

Figure 61: Willingness to pay for a tourist accommodation to have energy produced by wind farms in the pilot case of Norway (source: WENDY pilot-level survey)

The survey shows a mixed willingness among respondents in Norway to pay extra for tourist accommodation powered by energy from wind turbines. While the majority would not be willing to pay an extra amount, a significant proportion of respondents expressed some willingness to pay a premium, especially in the range of 1-10%. These results suggest that there is a market segment in Norway that values renewable energy and may be willing to support wind farm initiatives through their choice of accommodation, even if the majority prefer other factors in their decisions.

Aesthetic and Visual impact

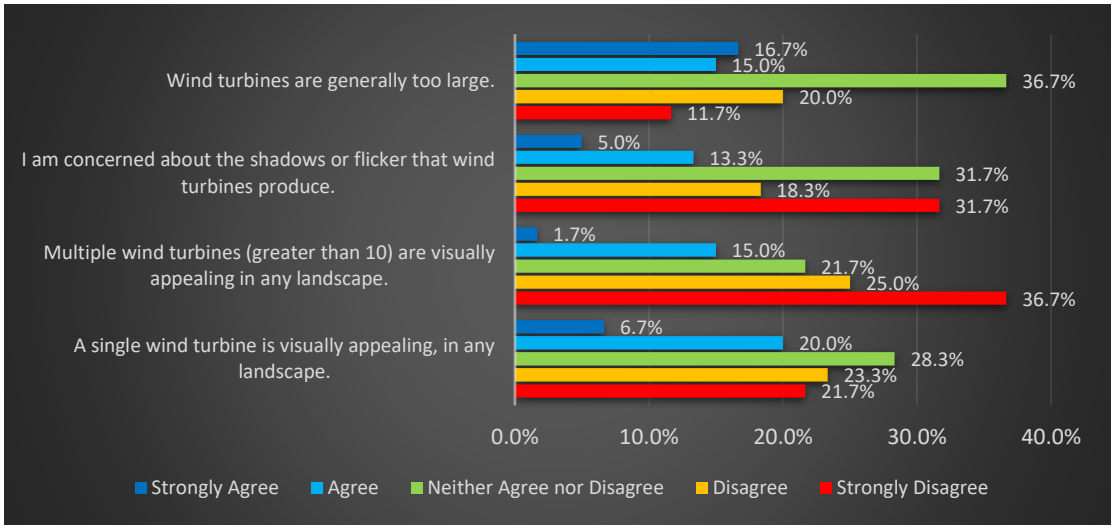

Figure 62: Visual impact and size of wind turbines in the pilot case of Norway (source: WENDY pilot-level survey)

Regarding the visual impact and size of wind turbines, the study shows a mixed picture among respondents in Norway. While multiple wind turbines are generally seen as visually appealing, a single wind turbine may not be perceived in the same way.

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Concerns about shadows or flicker caused by wind turbines are widespread, while opinions about the size of wind turbines are more varied. These results illustrate the different attitudes and considerations of the Norwegian population towards wind turbines.

Environmental consideration

The study shows that respondents in Norway express a wide range of concerns about the perceived environmental impact of wind farms. Noise and visual pollution, as well as possible environmental and health impacts, are areas of concern for a large proportion of the population. However, the positive environmental impacts of wind energy are also recognised. These results show how complex and multi-layered public opinion on wind farms is in Norway.

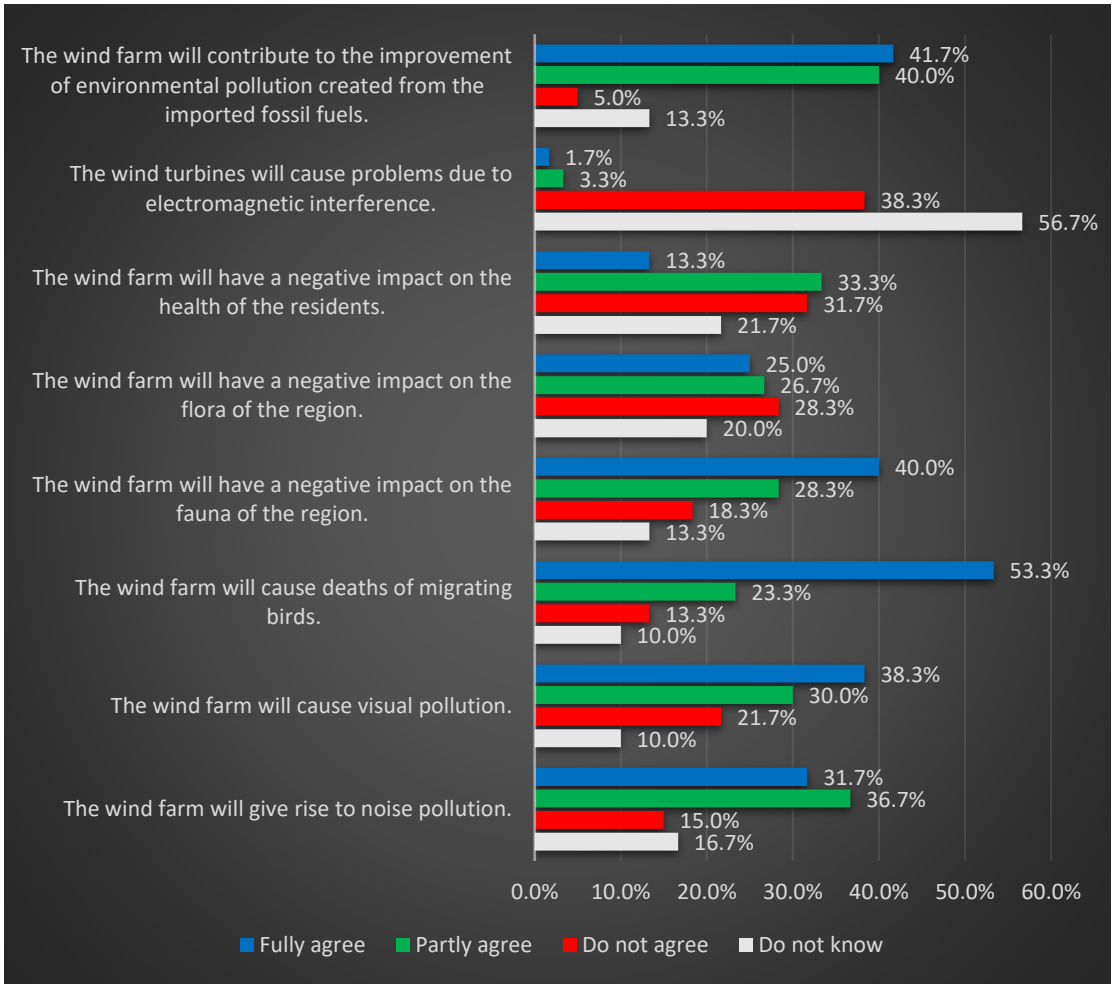

Figure 63: Environmental considerations of wind farms in the pilot case of Norway (source: WENDY pilot-level survey)

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Health and wellbeing related to distance

The survey results reflect a range of opinions and concerns about the potential impact of wind farms on human health and well-being in Norway. A large proportion of respondents expressed concern about aspects such as proximity to wind farms, noise pollution, low-frequency vibrations and danger from ice pieces, but there were also respondents who disagreed with these issues or took a neutral stance. These results illustrate the complex and different views on the relationship between wind farms and human health in the pilot case of Norway.

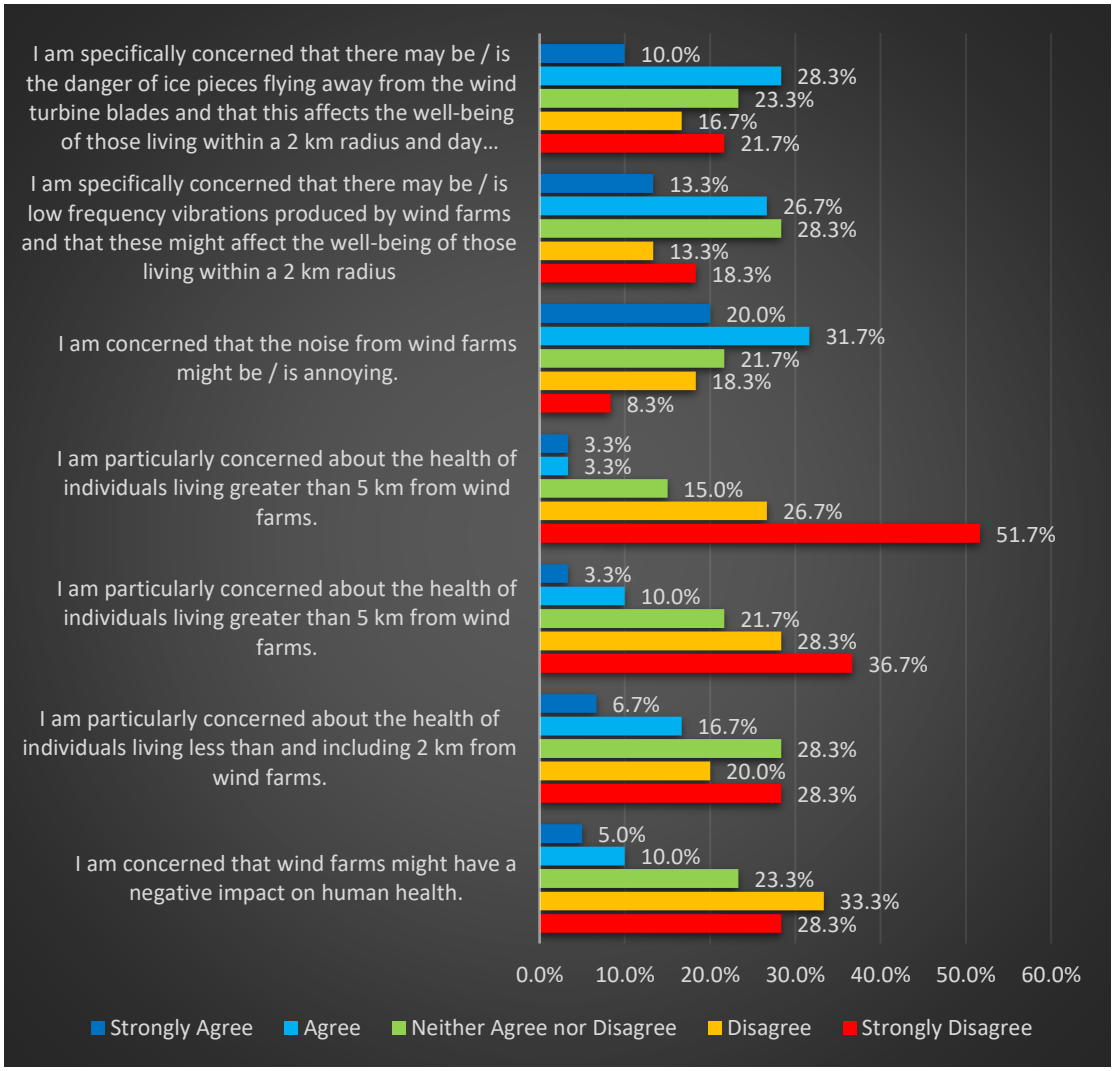

Figure 64: Health and well-being impact of wind turbines related to distance in the pilot case of Norway (source: WENDY pilot-level survey)

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Economic impact

The results show a mixture of opinions and concerns about the economic impact of wind farms in Norway. A large proportion of respondents expressed concern about property values and the distribution of economic benefits both locally and regionally, but there were also respondents who disagreed or took a neutral stance on these issues. These results highlight the different perspectives on the economic aspects of wind farms and underline the importance of taking into account local and regional dynamics to address concerns and ensure an equitable distribution of benefits.

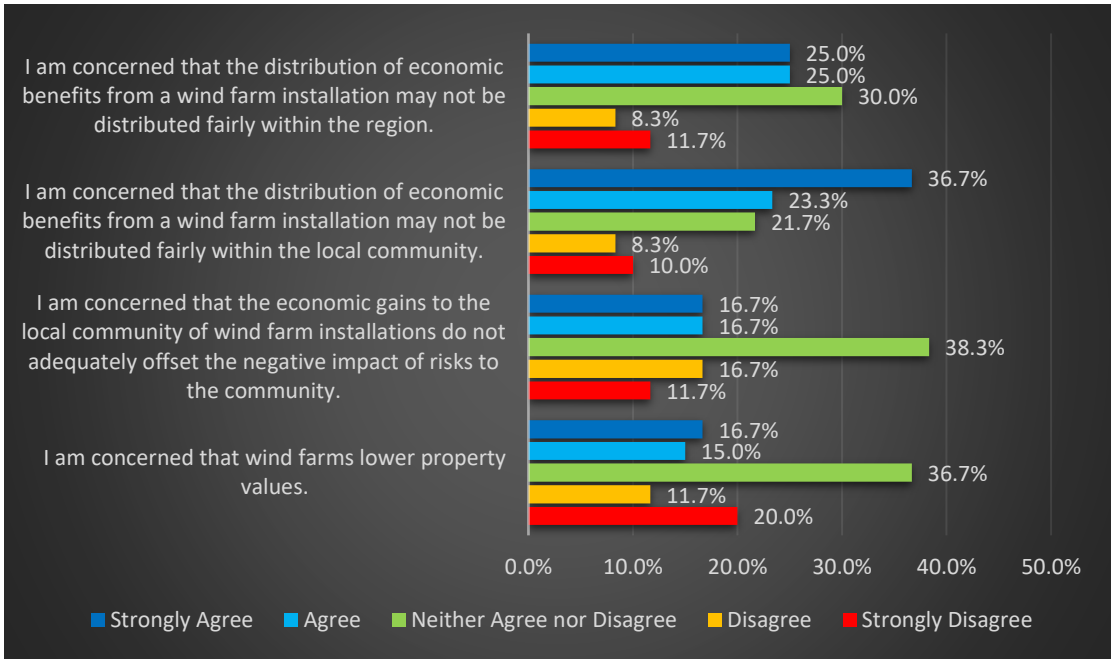

Figure 65: Economical impact and considerations of wind farms in the pilot case of Norway (source: WENDY pilot-level survey)

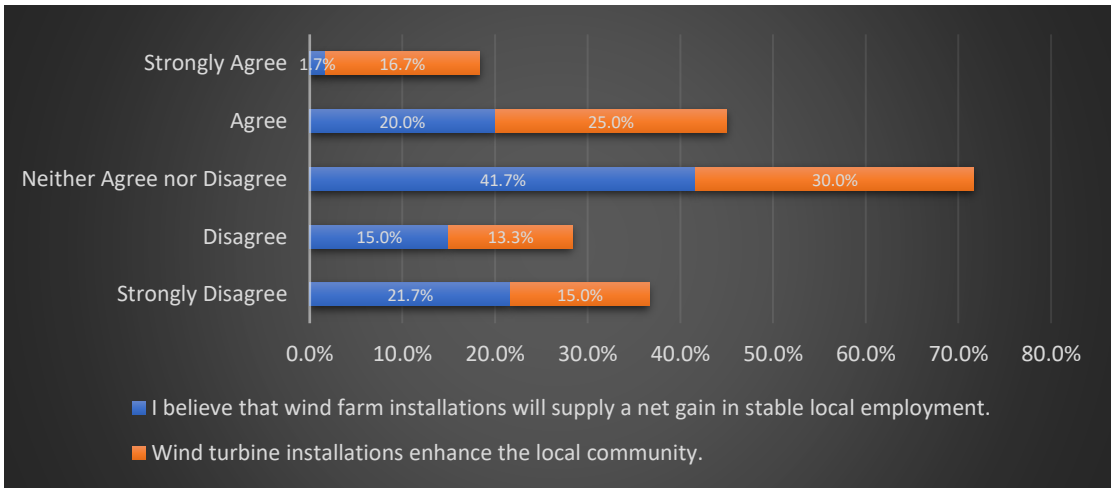

Figure 66: Added value of wind farms in local communities in the pilot case of Norway (source: WENDY pilot-level survey)

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With regard to the employment gains and community enhancement associated with the construction of wind farms in Norway, different beliefs and perceptions emerge. While some of the respondents expressed doubts or disapproval, others were positive about the potential for stable local employment and community enhancement. A significant number of respondents remained neutral or unsure, suggesting that they need more information or clarity on these issues. These findings highlight the importance of having informed discussions and addressing concerns to ensure a balanced understanding of the potential benefits and impacts of wind turbines on employment and local communities.

Participation

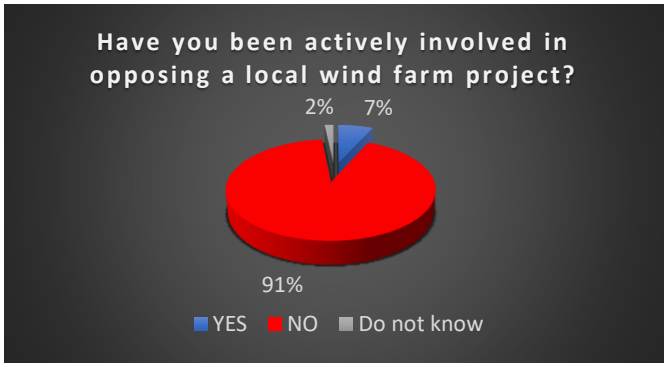

Figure 67: Public's active involvement in opposing a local wind farm project in the pilot case of Norway (source: WENDY pilot-level survey)

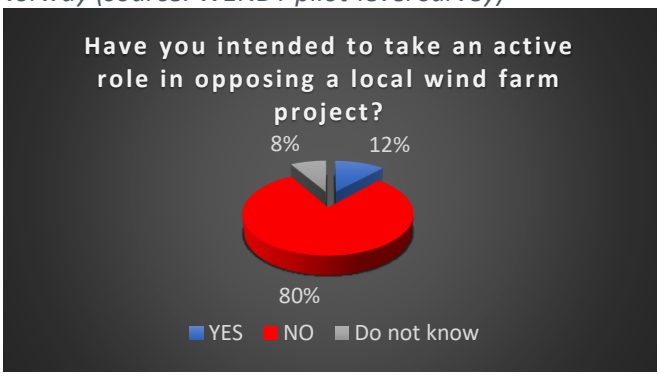

Figure 68: Public's intention to take an active role in opposing a local wind farm project in the pilot case of Norway (source: WENDY pilot-level survey)

The survey findings indicate that the majority of respondents in Norway have not been actively involved in opposition to local wind farm projects, nor do they intend to take an active role in such opposition. However, a considerable percentage of respondents have actively participated in opposing or intend to resist these projects. These results show that there is a minority who actively oppose local wind farm projects, while a larger proportion do not actively participate or intend to do so. Understanding the motivations and concerns of those who actively participate or intend to oppose wind

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farm projects can provide valuable insights for project developers and policy makers to address and mitigate potential conflicts and concerns in the future.

Trust and procedural justice

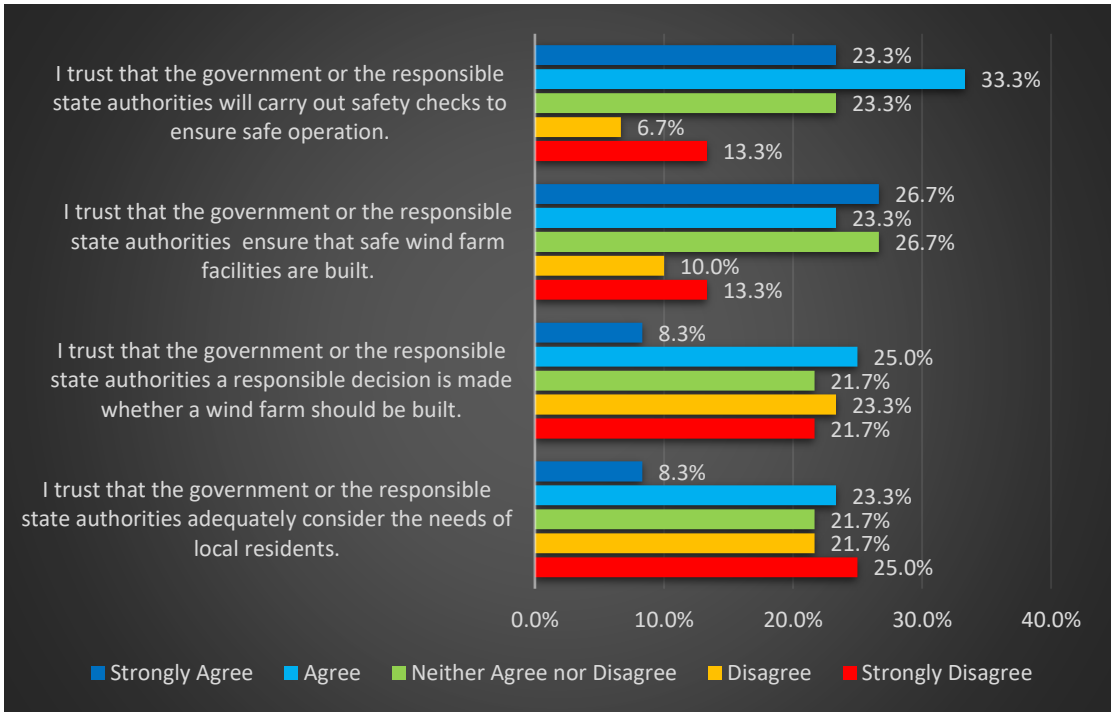

Figure 69: Trust to government or authorities in the pilot case of Norway (source: WENDY pilot-level survey)

The survey analysis shows that respondents in Norway have mixed confidence in the government or relevant state authorities' consideration of residents' needs, responsible decision-making, construction of safe wind farms and safety controls. While a significant proportion of respondents expressed concern or lack of confidence, a notable percentage still expressed confidence and trust in the actions of the government or authorities in these areas. These results highlight the importance of transparency, community involvement and addressing public concerns in wind farm projects to promote trust and ensure a balanced development of renewable energy while taking into account the needs and safety of local residents.

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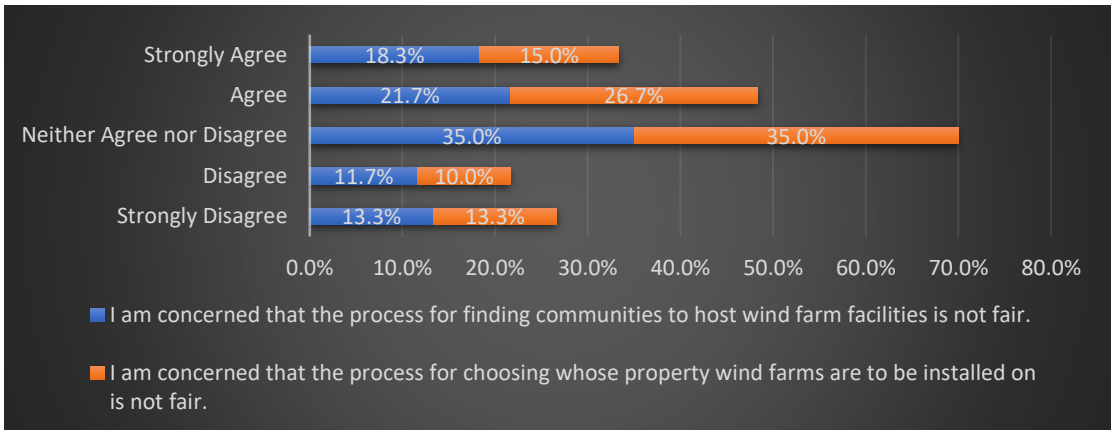

Figure 70: Trust in processes for establishing wind farms in the pilot case of Norway (source: WENDY pilot-level survey)

The analysis shows that a considerable number of respondents in Norway have concerns about the fairness of the process for selecting municipalities as sites for wind turbines and for selecting the land on which wind turbines are built. A significant proportion of respondents agreed or strongly agreed with these concerns, while a smaller percentage disagreed or strongly agreed. The significant number of respondents who neither agreed nor disagreed indicates a degree of uncertainty or lack of awareness about the fairness of the site selection process. These results show the importance of transparent and inclusive processes for community engagement, stakeholder participation and decision-making in wind farm projects. Addressing these concerns can help build trust and ensure a fairer and more sustainable approach to wind energy development in Norway.

3.3 EU Survey Analysis

Demographics

Table 8: EU sample distribution by individual characteristics (source: WENDY EU survey)

Gender	**Responses**	**Percentage**
No answer	107	3.65%
Female	1149	39.20%
Male	1622	55.34%
Other	40	1.36%
Prefer not to say	13	0.44%
Total	2931	100%
Age	Responses	Percentage
No answer	107	3.65%
18-24	1135	38.72%
25-34	1102	37.60%
35-44	386	13.17%
45-54	140	4.78%

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55-64	46	1.57%
65+	15	0.51%
Total	2931	100%
Education	Responses	Percentage
No answer	108	3.68%
Did Not Complete High School	27	0.92%
High School/GED	583	19.89%
Some College	536	18.29%
Bachelor's Degree	898	30.64%
Master's Degree	716	24.43%
Advanced Graduate work or Ph.D.	63	2.15%
Total	2931	100%
Net Annual Household Income	Responses	Percentage
No answer	108	3.68%
€5.000 or less	287	9.79%
€5.001 - €15.000	610	20.81%
€15.001 - €25.000	643	21.94%
€25.001 - 35.000	462	15.76%
€35.001 - €45.000	308	10.51%
€45.001 - €55.000	213	7.27%
€55.001 - €65.000	128	4.37%
€65.001 - €75.000	70	2.39%
€75.001 or more	102	3.48%
Total	2931	100%
Living area	Responses	Percentage
No answer	105	3.58%
Urban setting	1697	57.90%
Peri-urban setting	673	22.96%
Rural setting	408	13.92%
Natural setting	48	1.64%
Total	2931	100%
Typology	Responses	Percentage
No answer	105	3.58%
Mainland	2258	77.04%
Island	113	3.86%
Coastline	455	15.52%
Total	2931	100%

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Knowledge about wind farms

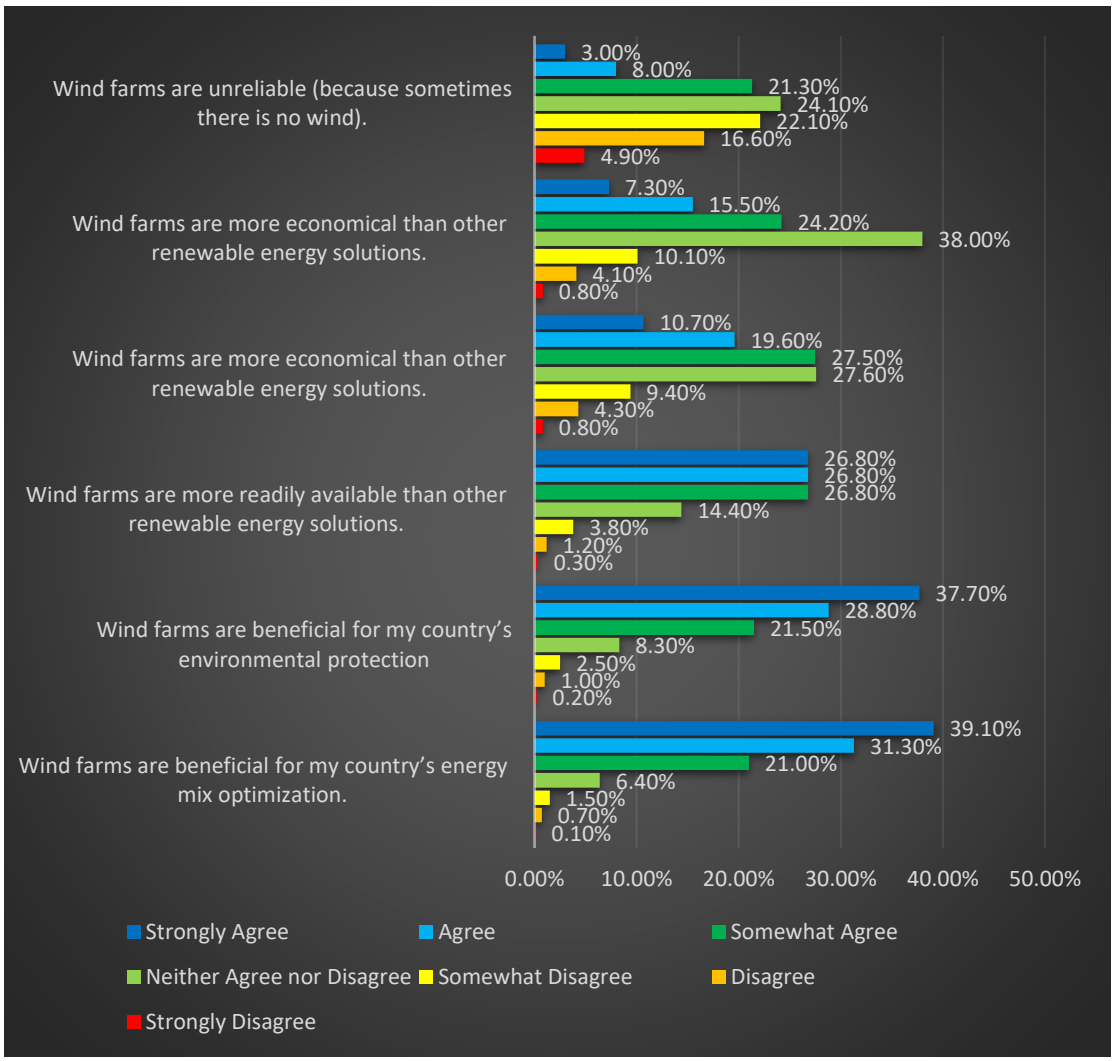

Figure 71: Knowledge about wind farms in the EU (source: WENDY EU-level survey)

In the EU, a generally positive perception of wind farms is presented. Respondents expressed confidence in the benefits of wind farms for optimising the energy mix and protecting the environment. There was some uncertainty or lack of consensus about the relative availability and economic benefits of wind farms compared to other renewable energy solutions. In addition, while some respondents agreed that wind farms could be unreliable due to erratic wind, a significant proportion of respondents did not clearly agree or disagreed. These results highlight the need for further education and awareness-raising to dispel misconceptions and provide accurate information on the benefits and limitations of wind farms as an integral part of the renewable energy landscape in the EU.

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Acceptance of wind farms

The survey results indicate a predominantly positive attitude towards wind farms in the EU. Respondents expressed a willingness to vote for wind farms in referendums and showed support for wind energy as a crucial element for a sustainable future. These results indicate that a significant proportion of the population recognises the potential benefits of wind farms in their communities and municipalities and underlines the importance of renewable energy sources in achieving sustainability goals.

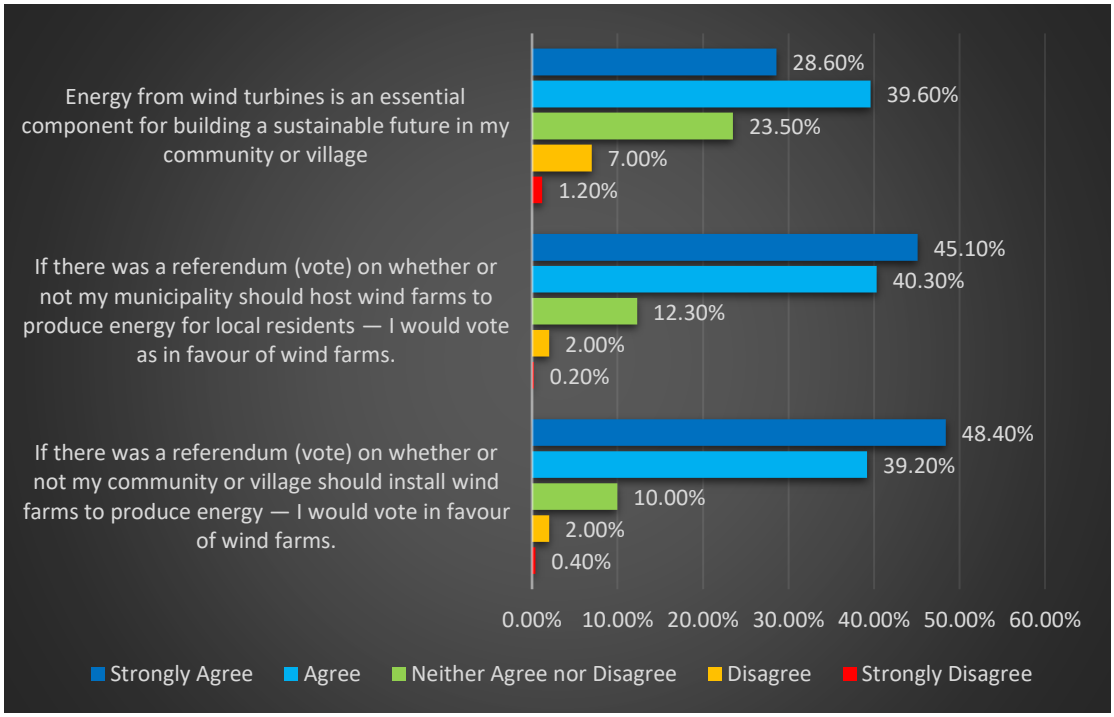

Figure 72: Acceptance of wind farms in the EU (source: WENDY EU-level survey)

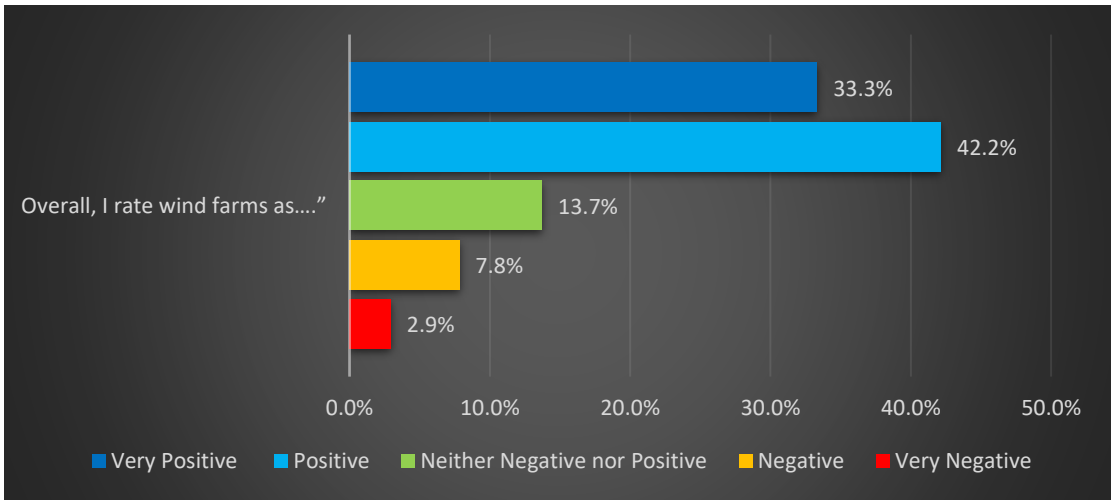

Figure 73: Overall acceptance of wind farms in the EU (source: WENDY EU-level survey)

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Regarding the general acceptance of wind farms, it appears that a considerable proportion of respondents have a positive attitude towards wind farms in the EU. The majority rated wind farms either positively or very positively, indicating strong advocacy and recognition of their value. However, a small percentage rated wind farms as negative or very negative, indicating that there is still concern and resistance among the surveyed population. The presence of respondents who rated wind farms neither negatively nor positively indicates a degree of neutrality or uncertainty among some individuals. These results show the importance of taking public opinion into account and addressing concerns when developing and implementing wind farm projects in the EU.

NIMBY Effect

The results show that the acceptance of wind farms within the EU is generally positive at all geographical levels, from the community or village level to the national level. The highest uptake was observed at the local level, with a slightly decreasing trend as the geographical scale became larger. These results indicate that the majority of respondents are open to the idea of wind farms and are willing to accept their presence in their immediate surroundings, in communities, regions and even at the national level. They reflect a positive attitude towards wind energy as a renewable and sustainable solution for the EU's energy mix.

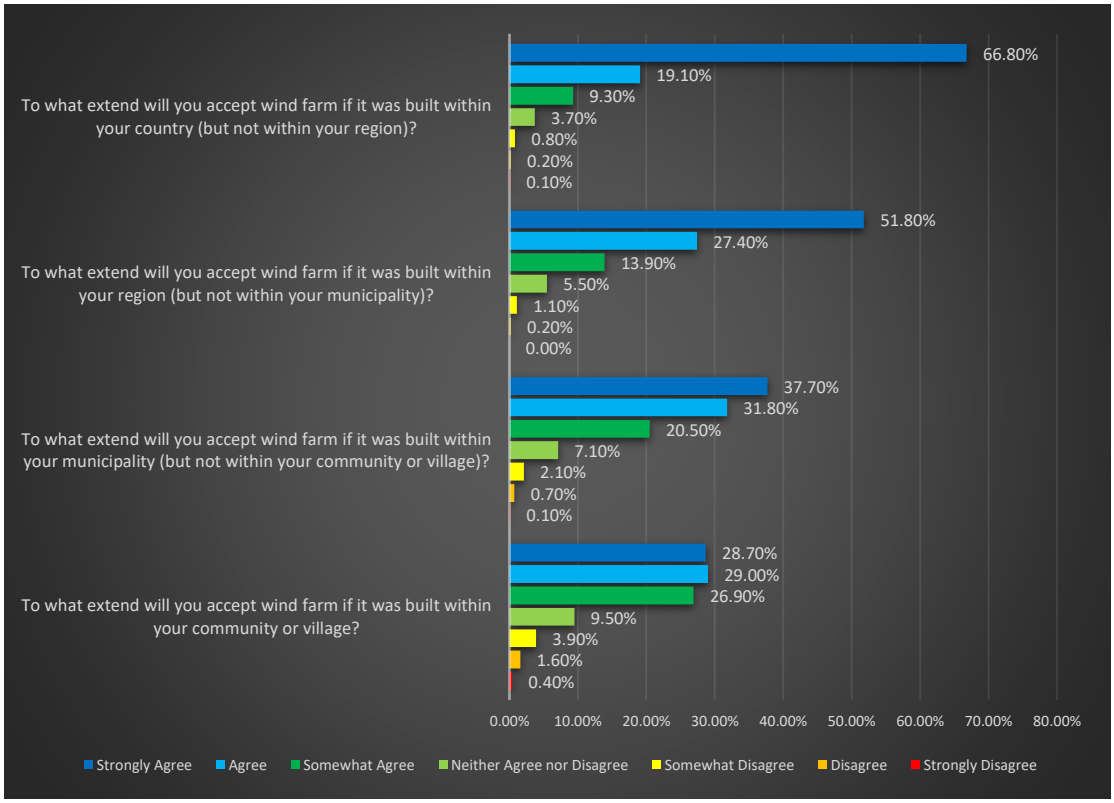

Figure 74: NIMBY effect in the EU (source: WENDY EU-level survey)

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Type of wind farms acceptance

In general, the survey results indicate a positive perception of both onshore and offshore wind farms in the EU. A significant percentage of respondents find both types of wind farms acceptable, with slightly higher acceptance of offshore wind farms. These results show a positive attitude towards wind energy generation, both onshore and offshore, as a means to achieve a sustainable and environmentally friendly energy mix in the EU. They indicate that the majority of respondents are open to the development and expansion of wind farms, both onshore and offshore, as part of the EU's renewable energy strategy.

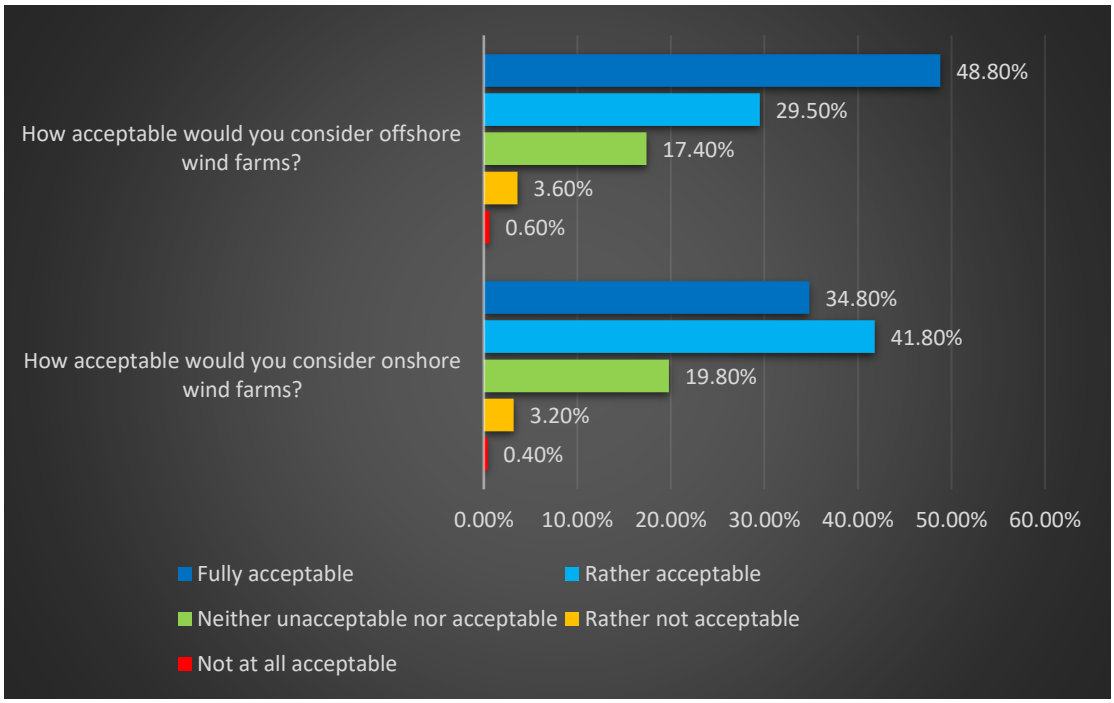

Figure 75: Acceptance of wind farms based on their type (onshore, offshore) in the EU (source: WENDY EU-level survey)

Impact on tourism

The survey shows that the majority of respondents do not believe that wind farms will have a negative impact on tourism, regardless of the geographical level considered. The concerns expressed by respondents are relatively low. Only a small percentage agree or somewhat agree that wind farms could negatively impact tourism. These results suggest that the perceived impact of wind farms on tourism is not a major concern among the EU population surveyed.

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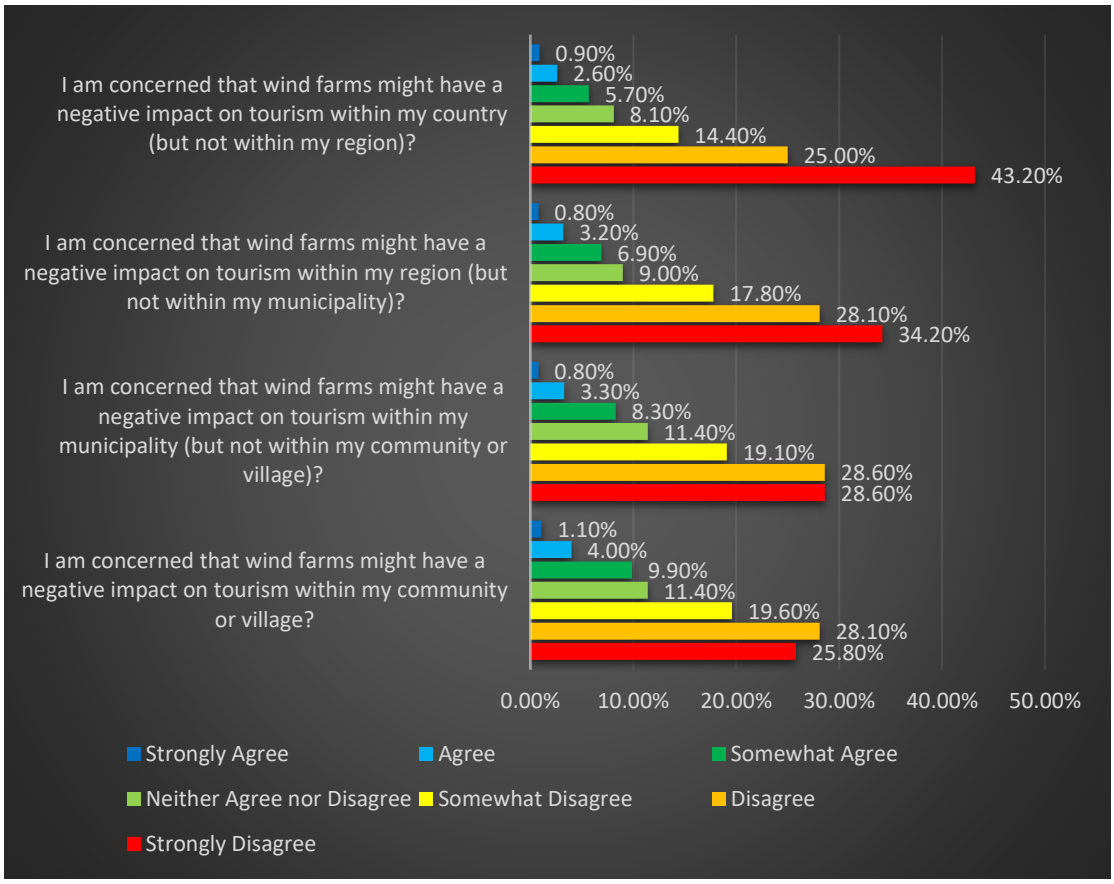

Figure 76: Impact on tourism and NIMBY effect in the EU (source: WENDY EU-level survey)

Aesthetic and Visual impact

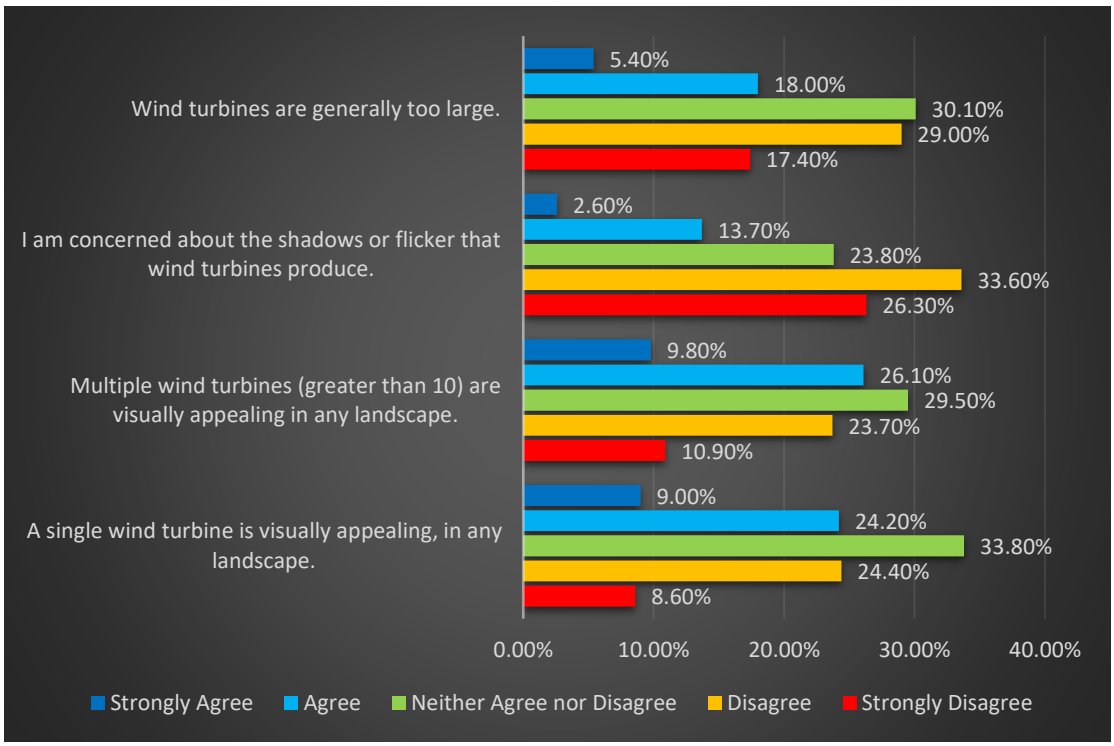

Figure 77: Visual impact and size of wind turbines in the EU (source: WENDY EU-level survey)

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The results show that respondents' perceptions of the visual attractiveness of wind turbines vary, with the majority taking a neutral stance. The majority of respondents took a neutral stance. However, there were significant concerns about the shadows or flicker caused by wind turbines. In addition, a large proportion of respondents felt that the wind turbines were too large. These results indicate that while there are some reservations and concerns, there is not a strong consensus among the EU population surveyed about the visual attractiveness of wind turbines and their size.

Environmental consideration

The survey results highlight a range of opinions and concerns about the potential negative impacts of wind farms. While respondents generally did not agree that wind farms cause significant noise or visual pollution, there were some concerns about impacts on birds, fauna, flora and health. There was also uncertainty or a lack of knowledge on certain aspects such as noise pollution and electromagnetic interference. On the positive side, wind farms help improve the environmental impact of imported fossil fuels. These results suggest that further research and information dissemination is needed to address concerns and promote a better understanding of the impact of wind farms.

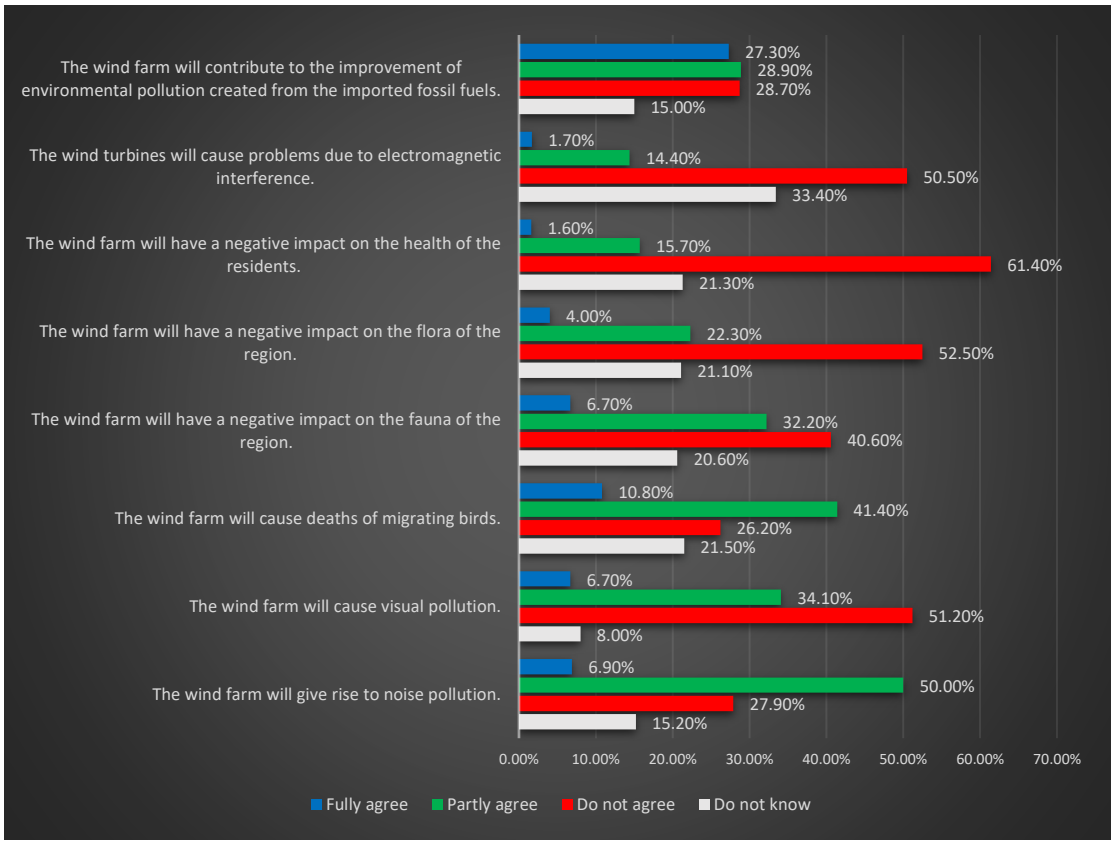

Figure 78: Environmental considerations of wind farms in the EU (source: WENDY EU-level survey)

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Health and well-being related to distance

The analysis shows that while some concerns were expressed about the potential negative impact of wind farms on human health, the majority of respondents did not perceive wind farms as a significant risk. There were greater concerns about noise pollution from wind farms, while concerns about low-frequency vibrations and the risk of pieces of ice flying off wind turbine blades were relatively low. These results suggest that there is not widespread concern about the health impacts of wind farms among the EU population surveyed, although there are some specific concerns about noise pollution.

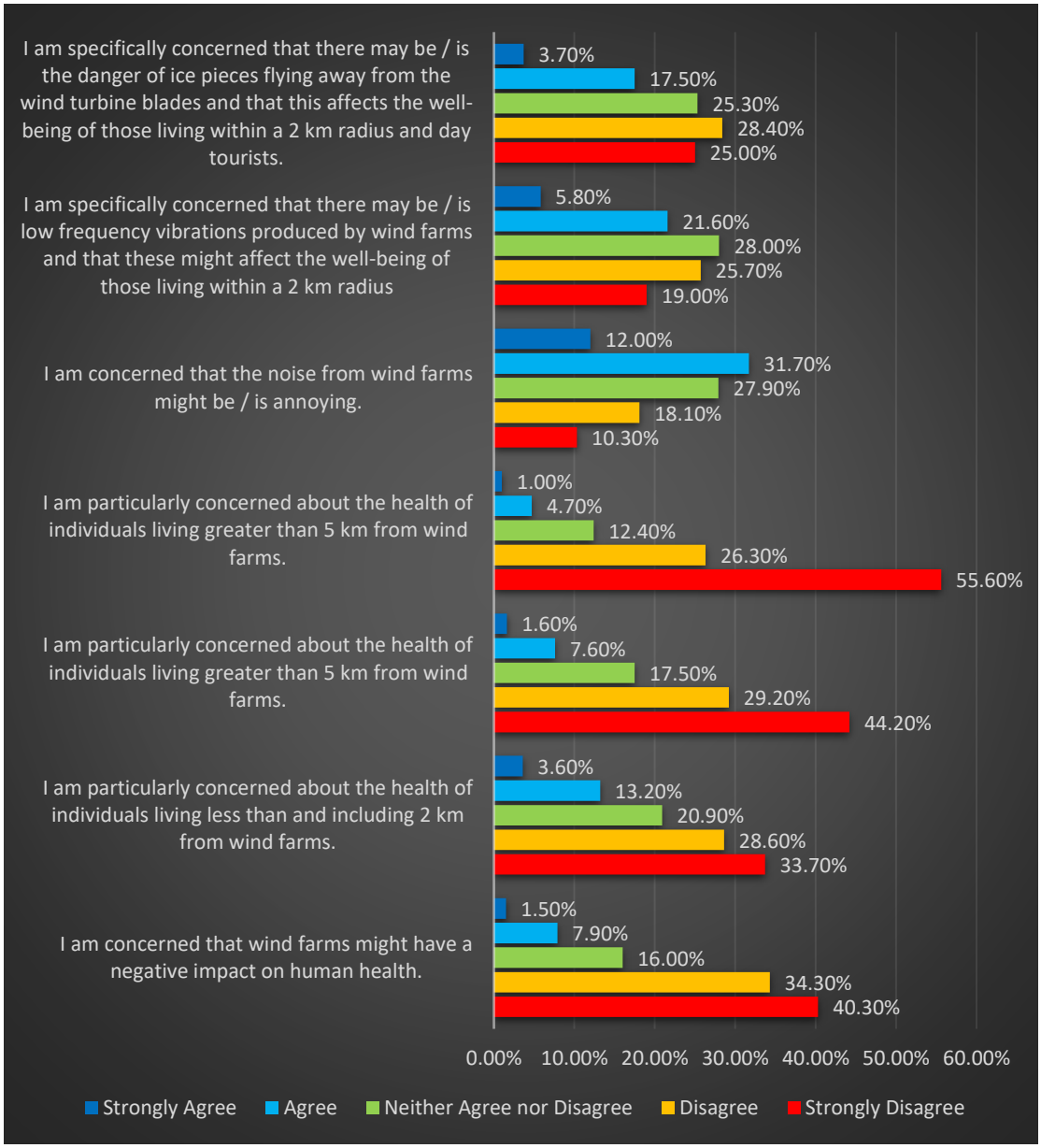

Figure 79: Health and well-being impact of wind turbines related to distance in the EU (source: WENDY EU-level survey)

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Economic impact

The results of the survey show that there are different views on the economic impact of wind farms. While a significant proportion of respondents did not believe that wind farms lower property values, there were concerns about whether the economic gains would outweigh the potential negative impacts. In addition, respondents expressed varying degrees of concern about the equitable distribution of economic benefits within the local community and region. These findings highlight the need to further explore and consider local economic dynamics and community engagement in wind farm projects to address concerns and ensure equitable distribution of benefits.

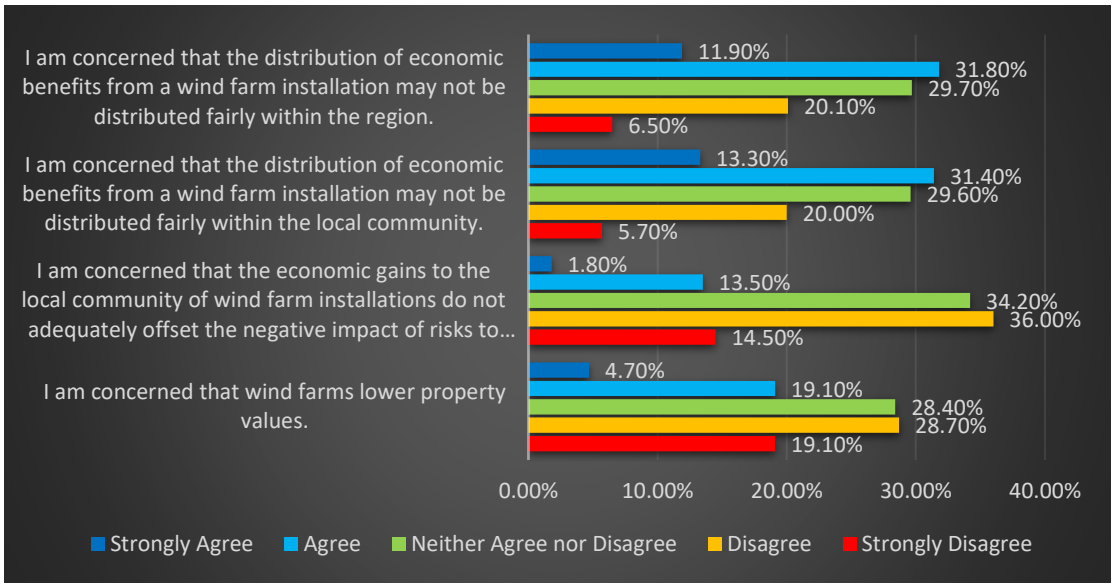

Figure 80: Economical impact and considerations of wind farms in the EU (source: WENDY EU-level survey)

Participation

The answers show that the majority of respondents did not actively oppose local wind farm projects. A small portion of respondents indicated that they actively oppose or intend to oppose such projects, but the number is relatively small. Additionally, a small percentage of respondents expressed uncertainty about their commitment or intentions. These results indicate that opposition to local wind farm projects is not widespread among survey participants. However, it is important to note that the data represent a specific sample and may not reflect the opinions and engagement of the general public.

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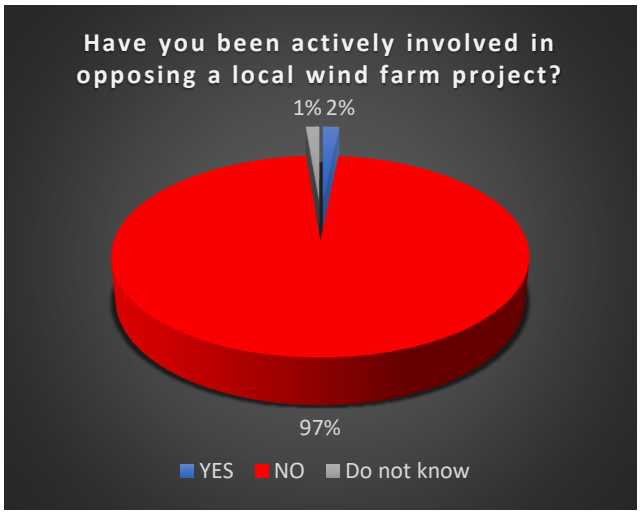

Figure 81: Public's active involvement in opposing a local wind farm project in the EU (source: WENDY EU-level survey)

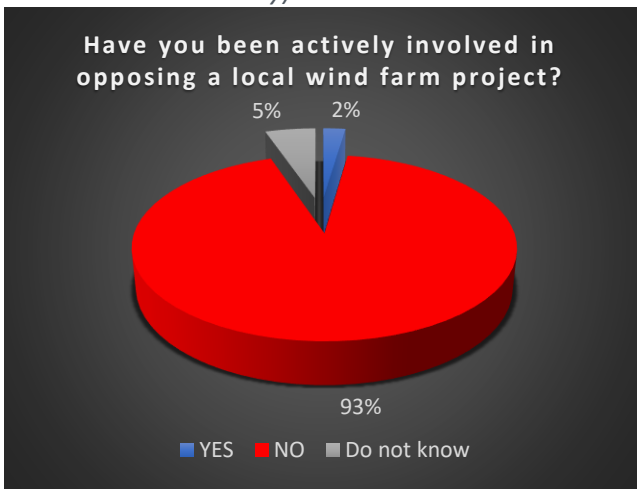

Figure 82: Public's active involvement in opposing a local wind farm project in the EU (source: WENDY EU-level survey)

Trust and procedural justice

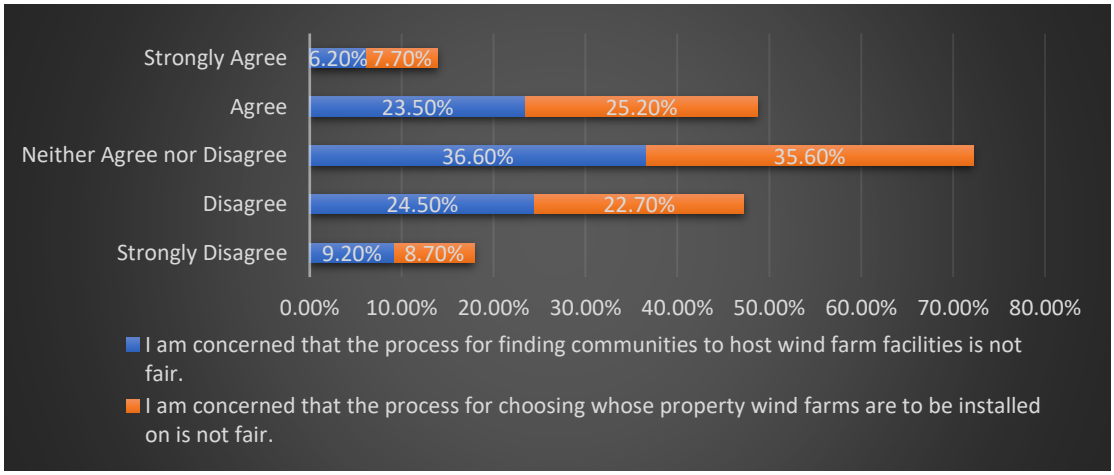

Figure 83: Trust in processes for establishing wind farms in the EU (source: WENDY EU-level survey)

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Opinions differ as to the fairness of the process of selecting communities as sites for wind farms and selecting land for the installation of wind farms. While a proportion of respondents express concerns and disagreement, a similar proportion totally agree with the fairness of these processes. Furthermore, a significant number of respondents neither agree nor disagree, indicating a degree of uncertainty or lack of consensus on the issue. It is important to note that the data reflects the opinions of the people surveyed and may not reflect the perspectives of the entire population.

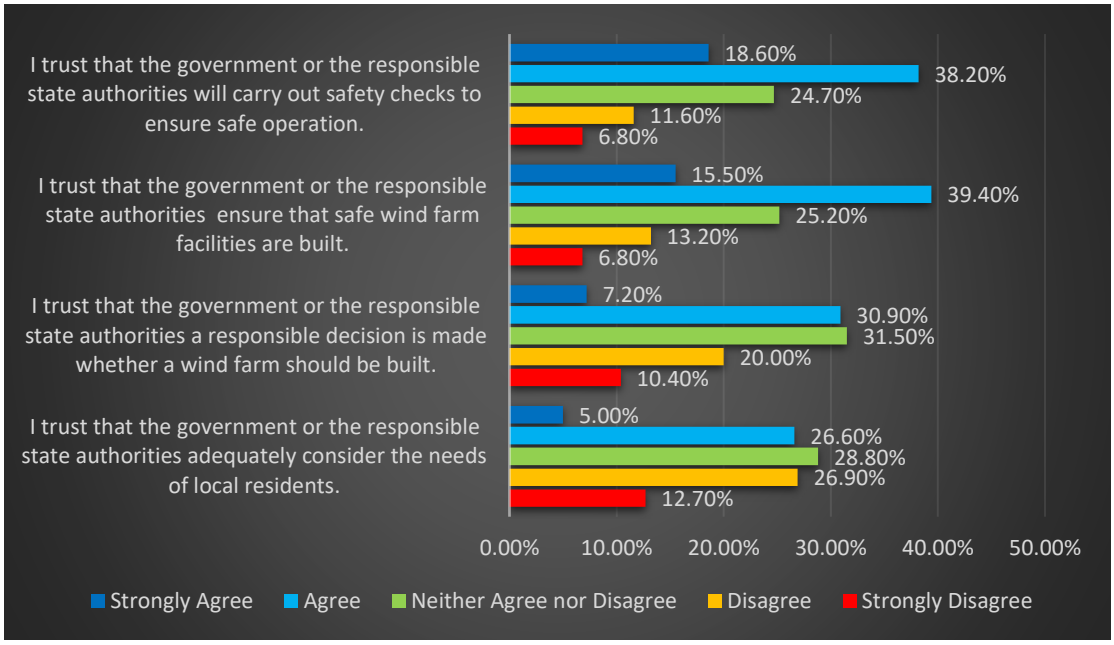

Figure 84: Trust to government or authorities in the EU (source: WENDY EU-level survey)

In addition, varying levels of trust were found in the government or relevant state authorities in terms of taking into account the needs of local residents, the decision-making process for the construction of wind farms, ensuring the safety of wind farm installations and conducting safety inspections for their operation. A significant percentage of respondents disagree or strongly disagree with the reliance on these authorities, while a significant proportion neither agree nor disagree. On the other hand, a significant number of respondents agree or strongly agree with trust in the government or relevant state authorities. These results highlight the diversity of opinion regarding trust in the role of government in addressing concerns and ensuring the safety of wind farm projects. It is important to be aware that these results represent the views of respondents and do not necessarily reflect the views of the population as a whole.

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4 Interviews

4.1 Methodology

In addition to the surveys conducted at pilot and EU level, interviews were also conducted with key stakeholders in the wind farm value chain to gain further insights into public perceptions and social acceptance of wind farms. The methodology followed was semi-structured interviews which are a data collection method used in qualitative research. Semi-structured interviews are a mixture of structured and unstructured interviews where some questions are pre-determined while other questions are not. In particular, the questions in semi-structured interviews are loosely structured and allow for new ideas to be raised during the interview based on what the interviewee says. For instance, interviewees are asked a series of open-ended questions and the interviewer can ask follow-up questions to further explore their answers and the topic of interest, in our case the social acceptance of wind farms.

For our study, WR prepared the interview material, including interview guidelines, consent form, questionnaire and reporting template. The guidelines regarding the semi-structured interviews were circulated by WR to the pilot partners, namely EGP, NOWC and MEC. The pilot partners were responsible for conducting the semi-structured interviews with the relevant stakeholders in the wind energy sector. The KPI was to conduct 5 interviews per pilot case (Spain, Italy, Greece and Norway), resulting in a total of 20 interviews. NOWC and MEC successfully conducted 5 interviews each for Norway and Greece, while EGP successfully conducted 5 interviews for Spain and 5 interviews for Italy.

The pilot partners first approached their network to find stakeholders who might be interested in participating in an interview. The pilot partners briefly discussed the WENDY project and its objectives with these stakeholders, either by phone, online (via email or video call) or in person. In case any of these stakeholders showed interest in participating in an interview, the pilot partners sent them the consent form by email, which the interviewees had to read, sign and return by email before the interview. Then, the pilot partner and the interviewee arranged a meeting based on their availability either online or face-to-face to conduct the interview. The interview had a duration of 50 minutes approximately. The interview questionnaire had 5 parts:

- Part 1: Background information
- Part 2: Wind farm development and acceptance
- Part 3: Wind farm project drivers and barriers
- Part 4: Wind farm project public participation
- Part 5: Final thoughts

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The exact interview questionnaire can be found in Annex 8.5. The pilot partners followed the interview questionnaire and kept written notes of the interviewees' answers. The written notes were transferred in aggregated form to the reporting template and sent to WR for analysis.

4.1.1 Interviewees' background information

The following tables provide consolidated background information on the interviewees for each pilot case. The pilot partners made a conscious effort to include representatives from the entire wind farm value chain in order to capture a comprehensive range of perspectives on public participation and social acceptance of wind farms.

Table 9: Background information of interviewees in Italy (source: WENDY interviews)

Pilot case: Italy	**Interview #1**	**Interview #2**	**Interview #3**	**Interview #4**	**Interview #5**
Stakeholder group	Ecologist advisor company	Representative of a renewable energy community	Representative of wind energy producers	Representative of a national environmental protection association	Wind farm installation companies, Wind farm developer
Gender	Male	Male	Male	Male	Female
Region	-	Italy (Puglia Region)	Italy (Campania Region)	Italy (Campania)	Italy
Education level	Doctorate or professional degree	Some college, but no degree	Master's degree or equivalent	Doctorate or Professional degree	Doctorate or Professional degree

Table 10: Background information of interviewees in Spain (source: WENDY interviews)

Pilot case: Spain	**Interview #1**	**Interview #2**	**Interview #3**	**Interview #4**	**Interview #5**
Stakeholder group	Wind farm developer	Wind farm developer	Wind farm developer	Wind farm environmental consultant	Representative of wind energy producers
Gender	Male	Male	Male	Male	Male
Region	- Spain	- Spain	- Spain	Aragon - Spain	Aragon - Spain

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Education level	Master's degree or equivalent	Master's degree or equivalent	Master's degree or equivalent	Bachelor's degree or equivalent	Master's degree or equivalent

Table 11: Background information of interviewees in Norway (source: WENDY interviews)

Pilot case: Norway	**Interview #1**	**Interview #2**	**Interview #3**	**Interview #4**	**Interview #5**
Stakeholder group	Wind farm developer	Farmers / fishermen	Local government / authorities	Trade union	Wind farm developer
Gender	Male	Male	Female	Male	Female
Region	Rogaland, Norway	Norway	Utsira, Rogaland	Oslo, Norway (national)	Haugesund, Rogaland
Education level	Master's degree or equivalent	Master's degree or equivalent	Master's degree or equivalent	Master's degree or equivalent	Master's degree or equivalent

Table 12: Background information of interviewees in Greece (source: WENDY interviews)

Pilot case: Greece	**Interview #1**	**Interview #2**	**Interview #3**	**Interview #4**	**Interview #5**
Stakeholder group	Wind farm developer	Farmers / fishermen	Local government / authorities	Trade union	Wind farm developer
Gender	Male	Male	Female	Male	Female
Region	Rogaland, Norway	Norway	Utsira, Rogaland	Oslo, Norway (national)	Haugesund, Rogaland
Education level	Master's degree or equivalent	Master's degree or equivalent	Master's degree or equivalent	Master's degree or equivalent	Master's degree or equivalent

4.2 Results

A comprehensive analysis of the interviewees' answers revealed several drivers and barriers for wind farm projects in the pilot cases. These drivers and barriers were categorised into three key areas: 1) wind farm development, 2) establishment and continuation of wind farm projects, and 3) public participation in wind farm projects.

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4.2.1 Pilot case: Italy

Drivers for Wind Farm Development

- **Climate change awareness and rising energy costs:** Growing concerns about climate change and the urgent need to move away from fossil fuels worldwide have led to an increasing focus on alternative and clean energy sources, including wind energy. In addition, the escalation of gas prices due to events such as the Ukraine conflict in 2022 has increased the focus on developing sustainable energy solutions such as wind farms to reduce dependence on expensive fossil fuels.

- **European commitments and energy transition:** Italy has made commitments at European level, including the implementation of the 'RED II' Directive, to achieve a 30% share of energy from renewable energy sources. These commitments along with the broader energy transition goals, are a driver for wind farm development in the country. Most of the public recognizes the importance of wind energy for the energy transition. Increasing awareness and understanding of the benefits of renewable energy sources can drive public support for wind farm development.

- **Economic development and job creation:** The presence of wind farms in the municipality of Roseto Valfortore and the wider Puglia region has attracted investment and new employment opportunities, especially for young people who have returned to their communities to work. The local population now see wind farm development as an opportunity for their region and recognise the positive impacts. This change in perception has contributed to the acceptance and support of wind farm projects fostering their advancement in the region. In addition, the development of wind farms in Campania and Apulia regions, particularly in marginal areas, has also brought economic benefits to the community. Landowners who rent their land to the companies owning the wind farms have experienced financial gains from these agreements. In addition, the development of such projects can foster the growth of local expertise, improve infrastructure, and have positive effects on tourism and cultural heritage.

- **Learning from past wind farm development experience:** In the regions of Campania and Puglia, wind farms were built on a significant scale until 2013, especially in areas considered suitable for such projects. This underlines the initial focus on exploiting the most favourable locations for wind farms. Local communities have witnessed the growth of wind farms and have become

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familiar with their benefits and potential. Over time, they have gained knowledge and understanding of wind energy, which has contributed to greater acceptance and support for wind farm development. Initial resistance was primarily due to lack of knowledge about the health impacts of wind farms. However, with increasing awareness and understanding that wind farms are not harmful to health, acceptance has increased in areas where wind farms exist.

- **Transparent communication and social acceptance:** Full transparency and open communication with the community are crucial for gaining social acceptance. The community seeks a balance between minimizing environmental impacts and maximizing social benefits. Transparent communication and engagement with the community can help address concerns and emphasize the positive impacts of wind farms. Providing clear information about the project, managing potential impacts, and highlighting the local benefits can foster support for wind farm initiatives. Involving the community from the beginning of the project through public meetings and conferences can build trust, address concerns, and create a sense of ownership among the residents.

- **Advancements in turbine technology:** The development of wind farms in Italy in recent years has seen the use of ever larger and more powerful turbines. These technological advances allow more energy to be generated with fewer turbines, making wind energy more efficient and cost-effective.

- **Geographical advantages:** Italy's unique geographical features, including the Alps, the Apennines and the extensive coastline, provide suitable conditions for wind energy production. The presence of wind resources in the central and southern regions has enabled the gradual development of wind farms that benefit local communities.

Barriers to Wind Farm Development

- **Unbalanced geographic distribution of wind farm installations:** There is an unbalanced distribution of wind farm installations, with most located in the southern regions of Italy, and there is also a lack of offshore wind installations although there are potential wind resources in the northern regions. Geographical contextualization plays a role, as these wind farm sites are often located in economically disadvantaged areas with limited support from the central government.

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- **Social opposition (NIMBY):** Social opposition, primarily driven by concerns over visual and noise impacts, can limit the social acceptance of wind farm projects. The proximity of wind farms to residential areas leads to increased skepticism, mistrust and resistance among the public.

- **Opposition from environmental associations and government agencies:** The development of new wind farms in a region may be hindered by opposition from high-profile environmental associations and government agencies. There are concerns about potential harm to bird populations from collisions with the rotating blades of wind turbines. Their concerns or regulatory hurdles could pose a challenge to the expansion of wind farm projects and potentially slow down the permitting and development processes.

- **Limited available areas:** The areas available for new wind farm projects are now less socially functional, often closer to urban areas where turbines are more visible. The scarcity of suitable areas for wind farm development and the presence of numerous potential developers with overlapping initiatives pose challenges. This can lead to concerns from the population about the impact on the landscape, creating a barrier to the development of new wind farms. Identifying appropriate locations and ensuring coordinated planning among stakeholders can optimize the use of available areas.

- **Challenges in participation and authorization:** The participation of wind farm projects in Auction and Registry procedures, as well as the authorization phase, faces significant difficulties. These challenges hinder the development of such projects and often require project proponents to seek government intervention to overcome obstacles and delays.

- **Bureaucratic delays:** Superintendencies in Italy frequently oppose many wind farm projects, leading to prolonged bureaucratic processes. The opposition and delays experienced during the authorization phase create significant barriers to wind farm development and result in lengthy project timelines.

- **Uncertain regulatory framework and short term planning:** Italy's regulatory framework for wind farms has been characterized by uncertainty, lacking consistency and long-term planning. A focus on short-term outcomes without considering the long-term benefits and planning can lead to skepticism and opposition. The absence of a clear and stable regulatory environment hampers the constant and planned development of wind farms. This uncertainty also

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impacts the country's ability to attract foreign capital investment. Demonstrating a long-term vision and outlining the sustained benefits can enhance community support.

- **Political opposition and misinformation:** The opposition to wind farm projects is often driven by political factors and misinformation. Sometimes, the culture of saying "no" is influenced by conflicting interests and misinformation campaigns, which can sway local populations against wind farm development.

- **Administrative complexities and conflicting opinions:** Involvement of multiple administrative authorities at different levels, such as national, regional, and municipal, can lead to differing opinions and conflicts, contributing to delays in the permitting process. Inadequate staffing, particularly in municipal offices dedicated to the permitting process, can result in delays. Increasing the number of personnel involved in the process, particularly at the local level, can help expedite the authorization procedures. Furthermore, the lack of digitization in permitting processes in Italy contributes to significant delays, highlighting the need for digitalization initiatives to streamline and simplify the process.

- **Limited economic benefits for citizens and engagement:** Greater acceptance of wind farm development could be achieved if a larger proportion of the population had direct access to the economic benefits. For example, if the entire population of an area received bill discounts resulting from a wind farm in their municipality, acceptance would increase significantly. Ensuring that the local community benefits directly from wind farms can help overcome resistance and increase support. To promote social acceptance, it is crucial for larger companies to involve the local population through mechanisms such as crowdfunding, bill discounts or the establishment of energy communities. Therefore, participation in the economic benefits of wind farms can significantly help to increase social acceptance. This is particularly important in marginal areas with limited industrial development, as wind farms can provide economic opportunities and contribute to the preservation of green spaces with minimal environmental impact.

- **Communication gaps on energy transition:** There is a lack of comprehensive communication efforts by the Ministry of the Environment concerning the wide range of benefits associated with transitioning to renewable energy sources. As a result, there is reduced awareness and understanding among the public

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regarding the numerous advantages of renewable energy sources, including wind energy.

- **No clear identification of suitable areas:** The absence of a clear identification of suitable areas for wind farm construction in each region adds complexity to the permitting process. Establishing designated areas that are conducive to wind energy development can expedite project approvals and provide developers with a clearer roadmap.

Drivers For Establishment and Continuation Of Wind Farm Projects

- **Renewable Energy Demand and Policy:** The increased emphasis on renewable energy sources is a direct response to the growing global concern for the environment and the need to reduce dependence on fossil fuels. The development of wind farms helps to reduce dependence on fossil fuel imports and increase energy security. In Italy, the Ministry of Environment has recognised the importance of an assertive renewable energy policy as a catalyst for wind farm development.

- **Offshore wind farms for greater public acceptance and lower visual impact:** There is a potential for greater public acceptance for offshore wind farm installations. Offshore wind farms are perceived to have a reduced level of annoyance and visual impact in comparison to onshore wind farms.

- **Vast potential for offshore wind farm locations in the Mediterranean:** The Mediterranean Sea presents a significant expanse of surface area, approximately six times larger than the Baltic Sea, showcasing tremendous potential for the development of offshore wind. The preference for offshore installations stems from their location at a considerable distance from the coast, resulting in reduced visibility and visual impact. The use of floating towers allows independent installation regardless of water depth (bathymetry).

- **Positive impact on marine biodiversity:** Offshore wind farms have the potential to significantly improve marine biodiversity. Measures can be taken to protect fish fauna by imposing fishing restrictions within the installation areas. This will also help to prevent the use of destructive fishing methods that could potentially cause damage to wind farm infrastructure.

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- **Environmental benefits and renewable energy goals:** The development of new wind farms is driven by the desire to achieve environmental benefits and meet renewable energy targets. Wind energy is a clean and sustainable energy source, and the establishment of wind farms contributes to reducing greenhouse gas emissions and transitioning to a more sustainable energy system. Wind farm developer companies have to carry out ad hoc studies, which may be required by the Ministry, to demonstrate that there will be no negative impact on the environment, especially on biodiversity and birdlife.

Barriers To Establishment and Continuation Of Wind Farm Projects

- **Slow permitting process:** The overall permitting process in Italy is perceived as slow, causing delays in project authorization. Streamlining and expediting the permitting procedures at all levels of administration can help accelerate the construction of wind farms and the energy transition in general.

- **Conflict of interest:** A potential conflict of interest arises when the companies responsible for developing wind farms select and pay professionals or agencies to carry out environmental impact studies.

- **Intervention by local authorities:** Local authorities have the power to impose changes or obstruct wind farm projects, leading to further delays and complications.

- **Lack of clear guidelines:** Complex administrative processes regarding environmental assessments and the impact on biodiversity can pose challenges to wind farm development. The Ministry of the Environment could provide clearer guidelines by mapping areas in the country that are outside of significant bird migration flows, streamlining the administrative process for wind farm installations in those areas.

- **Balance between the environmental impacts of wind farms and their benefits:** There is a need to implement appropriate mitigation measures to minimize potential impacts on seabirds. It is important to strike a balance between wind farm development initiatives and the protection of marine biodiversity and ecologically sensitive areas. Careful selection of sea areas that coincide with important bird migration routes is needed, paying particular attention to areas near the main Italian islands. The main focus should be on minimizing possible disturbance to bird populations and ensuring the preservation of vital migration routes. Balancing the environmental impact of

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wind farms with the benefits they bring is essential. Addressing concerns related to wildlife, landscape, and noise can help alleviate barriers to wind farm development.

- **Complex and slow bureaucratic-administrative system:** The main barrier to creating new wind farms in Italy, particularly in the Puglia region, is the complexity and slowness of the bureaucratic-administrative processes. The authorization process for new wind farms can take an average of five to six years, which hampers the timely implementation of projects. Streamlining and simplifying these processes would help expedite the authorization of new wind farm developments and remove administrative hurdles.

- **Lack of citizen benefits:** Without meaningful citizen participation and perceived benefits, wind farms may face opposition and resistance. The absence of opportunities for citizens to be involved as partners or receive incentives like bill discounts can result in a negative perception of wind farms as a blight on the land rather than a source of opportunity. Addressing concerns and focusing on the positive effects, such as job opportunities, skill development, and educational activities involving the community, can help improve acceptance. Engaging with the population through meetings and information sessions is crucial to address any misconceptions and increase awareness about the benefits of wind farms.

- **Lack of coordination between regional and national authorities**: The main barrier to the creation of new wind farms in Italy is the absence of effective coordination between regional and national authorities. In addition, the publication of conflicting laws and directives from these authorities creates regulatory challenges and uncertainty, impeding the development of new wind farms.

- **Regulatory challenges:** The current regulatory landscape in Italy lacks consistency and is plagued by uncertainties, hindering wind farm development. Delays, unfinished regulations, and administrative inefficiencies create uncertainty and make project implementation challenging. The development of wind energy in Italy faces obstacles related to regulation, including primary, secondary, and technical regulations. The uncertain and delayed political framework, coupled with inadequate training and administrative inefficiencies, hinders the preparation and implementation of investment plans for wind energy projects. Inadequate planning and inconsistent regulations contribute to uncertainties in site selection and project implementation. The absence of a

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stable planning framework affects the ability to identify suitable areas for wind farms, which can lead to constraints that may not be related to the actual characteristics of the territory.

- **Political resistance and "no" culture:** The political origin of the obstacles is evident, as some administrations exhibit a resistant attitude towards wind farm development. This "no" culture and opposition to wind farm projects further complicate the authorization process and lead to prolonged approval timelines.

Drivers for Public Participation in Wind Farm Projects

- **Environmental and economic compensation:** A proposal has been put forth to provide citizens with benefits, encompassing both environmental and economic aspects, for hosting wind farms in their vicinity. Suggestions include compensation in the form of reduced electricity bills or other types of financial rewards.

- **Communication and transparency:** There is a demand for continuous communication and active exchange of information between wind farm companies and citizens. The public would like to be regularly informed about the performance of a wind farm near them and keep up to date with relevant activities related to it. To engage citizens in wind project initiatives, an essential driver is the implementation of a comprehensive and transparent information campaign. This campaign should be carried out by both the public and private sectors, providing accurate and accessible information about renewable energy sources and their benefits. Open channels of communication with the population are crucial for building trust and increasing social acceptance of wind farm projects. Providing transparent information about the project, its benefits, and addressing any concerns or impacts can help foster a positive relationship with the community. Ensuring that citizens have timely and transparent information about the specific wind farm project they are being invited to participate in is crucial. This includes informing them about the nature of the investment, its associated risks, and the overall project details.

- **Promoting active citizen participation in wind farm projects:** There is an emphasis on encouraging citizens to play an active role in wind farm projects, with a specific focus on their local community. The aim is to foster a sense of ownership and responsibility among the citizens towards the development of the wind farm. The Ministry of the Environment plays a crucial role in defining comprehensive guidelines for wind farm developers, emphasizing the active

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involvement of local communities and the equitable sharing of economic benefits derived from these projects.

- **Leadership by major energy companies:** It is recognized that it is possible to facilitate citizen participation by actively involving large Italian energy companies, especially those known for their recognized environmental and social policies. Emphasis is placed on the importance of companies with state participation taking the lead in driving the energy transition towards renewable energy sources.

- **Involvement and support of local population:** It is important for wind farm investors to involve and support local populations to overcome technical and financial barriers. This can help facilitate citizens' participation in wind farm projects and promote their acceptance and engagement. There is a proposal to introduce mandatory regulations or obligations to ensure citizen participation and benefits in wind farm projects. It is recognized that such requirements may need to come from higher authorities or the state.

- **Opening to citizen participation:** The Italian regulatory framework has recently allowed for the active participation of citizens in the electricity market through Renewable Energy Communities (RECs). This opening creates a driver for wind farm development by enabling and encouraging citizens to actively engage in renewable energy projects.

- **Improved financial support:** The financial aspect of wind farm development can be enhanced by creating support schemes that facilitate raising local capital for investments in wind power plants. Such support can provide the necessary financial resources and incentivize local participation.

- **Knowledge and awareness:** Increasing knowledge and awareness among citizens about wind energy can lead to more informed and coherent decisions. This, in turn, fosters positive effects at the community level, as well as a better understanding of how wind farms are established in the local territory. Informed opposition is preferable to uninformed resistance, as it can be based on solid knowledge and lead to constructive dialogue.

- **Local authorities and citizen participation:** Municipalities in Italy may encourage citizen participation in wind farm projects through bill discounts and ownership quotas, which can enhance local support and engagement.

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Barriers to Public Participation in Wind Farm Projects

- **Lack of interest from wind farm developers to engage the public:** The prevailing impression is that wind farm developer companies are primarily concerned with the granting of building permits without actively involving citizens in the decision-making process. Furthermore, there seems to be limited interest or communication from these companies once the wind farm becomes operational.

- **No profit considerations for public participation:** Wind farm operators are driven by the potential for economic returns and benefits associated with these projects. The potential reluctance of companies to share profits or allocate resources towards citizen benefits have a negative impact on public participation in wind farm projects.

- **Financial barriers to citizen participation:** One of the primary barriers to citizen participation in wind farm project investments is the financial aspect. The costs associated with developing a wind farm are significant, making it challenging for individual citizens to participate financially in such projects. In particular, wind farm projects require significant capital investments, posing financial barriers for citizens and small businesses to participate actively. Supporting local populations through initiatives like crowdfunding or the creation of cooperatives, as seen in countries like Belgium, can provide opportunities for citizens to contribute financially and ensure a long-term supply of discounted green energy. The availability of local capital for wind energy investments can be limited, posing a barrier to development.

- **Technical complexity:** The design, construction, and maintenance of wind farms involve a highly complex process. This complexity can act as a barrier for citizen participation as it requires specialized knowledge and expertise that may not be readily accessible to individuals. Assessing wind farm projects requires a comprehensive evaluation of various factors, including technical aspects and regulatory processes. The complexity of this evaluation can be a barrier to citizen participation, as it may require specific expertise or resources to make informed decisions

- **Limited involvement and benefit sharing:** There is a perceived lack of active involvement and economic benefits sharing by wind farm developers with local communities. This perception creates potential barriers to citizen engagement and diminishes interest in participating in wind farm projects.

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- **Limited involvement of local citizens and small businesses:** One of the barriers to wind farm development is the limited participation of local citizens or small businesses. Despite the presence of large companies, there may be a lack of mechanisms or initiatives that facilitate the involvement of locals, such as crowdfunding. This can restrict the opportunities for citizens to actively participate in wind farm projects and reap financial benefits from their involvement.

- **Lack of environmental awareness:** Promoting environmental education initiatives is essential to raise awareness among local populations about the environmental and social impact of wind farm initiatives. By enhancing environmental literacy, communities can better understand the benefits and importance of wind energy, leading to increased acceptance and support.

- **Lack of accurate project-specific information:** One obstacle to citizen participation lies in the availability and accessibility of accurate information. Understanding the technical aspects of wind farm projects, along with associated risks and benefits, can be challenging without proper information dissemination. Inadequate communication and transparency regarding the project details, such as investment specifics and associated risks, can deter citizens from participating. Clear and accessible project information is necessary to enable citizens to make informed decisions about their involvement.

- **Risk perception:** The perception of risk associated with wind farm projects can vary among individual citizen investors. Some may be cautious or hesitant due to uncertainties or lack of familiarity with the industry, which could impede their participation.

- **Lack of effective information campaigns:** One of the barriers to citizen involvement is the absence of successful and sustained information campaigns on renewable energy sources, as outlined in legislative decrees. The failure to provide clear and ongoing information hinders citizens' understanding and engagement in wind farm projects. Insufficient knowledge and awareness about wind energy can act as a barrier to citizen participation. Without a solid understanding of the subject matter, some individuals may be hesitant or resistant to getting involved in wind farm initiatives.

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- **Regulatory gaps:** Italian legislation lacks provisions for private citizen participation in wind farm investments, such as participative investments or funding models, creating a barrier to widespread involvement. The absence of specific regulations on public participation in wind farm projects creates uncertainty and hinders effective community engagement. Clear guidelines and requirements are needed to ensure that public involvement is systematically incorporated into the project development process. The absence of regulations regarding citizen participation limits the potential for innovative funding mechanisms and inhibits the development of stronger partnerships between communities and wind farm developers. Modifications in the legal framework, such as additional requirements or procedures, can further complicate the authorization process and cause delays. Ensuring stability and avoiding unnecessary regulatory changes is important to maintain a smooth and predictable development environment.

4.2.2 Pilot case Spain

Drivers to Wind Farm Development:

- **Favourable economic environment:** A favourable economic environment, including investment opportunities and financial incentives, can drive the development of wind farms. Stable economic conditions and supportive policies encourage private investment and create a conducive environment for project development.

- **Favourable environmental conditions:** The presence of suitable wind resources in a region is a key driver for wind farm development. Areas with high wind speeds and consistent patterns provide favourable conditions for efficient energy generation. The potential for renewable energy production and reducing greenhouse gas emissions also contributes to the motivation for developing wind farms.

- **Path to sustainability:** Wind energy is seen as a crucial component in the transition towards a sustainable future. Positioning the sector as a vital contributor to addressing environmental challenges, reducing carbon emissions, and achieving energy independence can drive support and investment.

- **Technological development in wind turbine technology:** Advancements in wind turbine technology have significantly increased their efficiency and

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reduced their impact on bird life. Continued innovation in wind technology can help address concerns and mitigate the perceived impacts on avifauna, improving the acceptance of wind farms in rural areas.

- **Environmental awareness:** Increasing awareness and understanding of the importance of renewable energy and the need for sustainable practices can drive wind farm development. By emphasizing the environmental benefits of wind energy, such as reducing carbon emissions and mitigating climate change, public perception in rural areas can be positively influenced.

- **Increased contact with local stakeholders and authorities:** Establishing early and meaningful communication with local stakeholders and authorities from the inception of wind farm projects can help build trust, address concerns, and foster community engagement. This proactive approach promotes dialogue and collaboration throughout the development process.

- **Implementation of tangible measures and incentives:** Introducing tax aids, reduced electricity prices, and other tangible incentives at the municipal level can enhance the value proposition of wind energy for local communities. These measures demonstrate a direct and tangible benefit for the residents and promote a positive perception of wind farm development.

- **Coordination of national, regional, and local policies:** The coordination of policies at different administrative levels is essential to facilitate wind farm development. When national, regional, and local policies align, it creates a conducive environment for project implementation, ensuring consistency and clarity in regulatory frameworks and promoting a streamlined approach to decision-making.

- **Significant progress and potential:** There has been notable progress and a growing public interest in wind farm development. This is evident in public administration speeches and discussions, highlighting the recognition of the importance of renewable energy sources like wind energy in the energy transition.

- **Overall wind farm growth in Spain:** Various areas in Spain are experiencing significant growth in wind farm development, with a large number of wind farms already built and more projects under construction. This indicates a favourable environment for wind energy investments and suggests strong

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support for renewable energy development in the region. This indicates a positive market outlook and provides opportunities for further expansion.

- **Renewable energy policies and regulations:** Policies that support renewable energy development, including wind farms, are important drivers. These policies provide incentives, targets, and regulatory frameworks that encourage investment in the sector.

- **Support for the local area:** Initiatives that contribute to the socio-economic well-being of the surrounding communities, such as providing job opportunities or supporting local businesses, can play a crucial role in facilitating wind farm development. When wind farm projects are seen as beneficial to the local area, there is a greater likelihood of support and acceptance.

- **Economic benefits:** The potential economic benefits that individuals and communities can gain from wind farm projects, such as financial compensation or reduced energy costs, can be a driving factor in promoting development. Highlighting the economic advantages and ensuring that they directly benefit the stakeholders involved can increase support for wind farm initiatives.

Barriers to Wind Farm Development:

- **Mixed community attitude towards wind farms:** The community's attitude towards wind farm development varies across regions and municipalities. Some communities may be more open and supportive, while others may exhibit opposition or unrest. Understanding and engaging with the specific concerns and interests of local communities is crucial for gaining acceptance.

- **Inappropriate legal framework:** An inadequate or unfavourable legal framework can significantly impede wind farm development. Complex permitting processes, ambiguous regulations, and inconsistent policies create uncertainty for developers and hinder project progress. Revising and improving the legal framework to provide clearer guidelines and streamlined procedures can help overcome this barrier.

- **Economic viability:** The economic viability of wind farms is influenced by various factors, such as project costs, market conditions, and electricity prices. Economic challenges, such as high upfront costs, limited access to financing, or unfavourable market conditions, can pose barriers to the development of wind

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farms. Creating a supportive economic environment with favourable incentives and financing options can help address these challenges.

- **Avifauna impact of wind turbines:** Concerns about the potential negative effects of wind farms on bird life can be a significant barrier to their development, particularly in rural areas. Implementing more effective measures to assess and mitigate avifauna impacts, such as proper siting and advanced monitoring technologies, can help alleviate these concerns and improve public perception.

- **Community perception towards wind farms:** Public perception plays a crucial role in wind farm development, especially in rural areas. Addressing the concerns and misconceptions surrounding bird impacts and other potential issues through effective communication, public engagement, and community involvement can help improve the perception and acceptance of wind farms.

- **Social opposition (NIMBY):** Opposition from local communities, known as NIMBY (Not In My Backyard) syndrome, can impede wind farm development. Concerns about visual impacts, noise, impact on wildlife, and property values can lead to resistance and opposition. Overcoming these barriers requires proactive community engagement, effective communication, and addressing specific concerns with transparent information and mitigation measures.

- **Permitting bottlenecks:** Cumbersome and time-consuming permitting processes, including regulatory and administrative hurdles, can impede the development of wind farms. Delays in obtaining necessary permits and approvals can deter investments and hinder the achievement of renewable energy goals. Lengthy and complex permitting procedures, involving multiple authorities and stakeholders, can significantly slow down project development and increase costs.

- **Competitiveness against Photovoltaics:** The declining costs and increasing competitiveness of photovoltaic technology can create challenges for wind farm development. Overcoming cost barriers and enhancing the value proposition of wind energy compared to photovoltaics is important to ensure its continued growth.

- **Regional disparities:** Unequal distribution of wind farm projects, with a concentration in more industrialized areas and cities, can contribute to local opposition in less-developed regions. Balancing the geographic distribution of

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wind farms and ensuring fair access to the benefits of renewable energy can help address this perception of regional disparities.

- **Unreliable regulation and public planning:** The lack of reliable regulation and public planning hampers wind farm development. The absence of clear and consistent guidelines or regulations can create uncertainties for developers and investors, making it challenging to navigate the regulatory landscape and plan for long-term investments.

- **Environmental constraints interpretation by authorities:** The interpretation of environmental constraints by authorities can pose challenges for wind farm development. Varying interpretations and approaches to environmental impact assessments, including the assessment of ecological factors and biodiversity impacts, can lead to delays and uncertainties in obtaining necessary permits and approvals.

- **Lack of real, constant, and effective information on impact of wind farms:** Insufficient and inconsistent information about the minimal disruption caused by wind farms to rural areas and the potential for job creation can contribute to resistance. Establishing clear and consistent communication channels to provide accurate information about the benefits and opportunities associated with wind farm development can help address this barrier.

- **Inadequate and unreliable use of economic resources poured into municipalities:** The improper or unreliable utilization of economic resources allocated to municipalities can undermine public acceptance. Ensuring the effective and transparent use of funds directed towards local communities, such as investments in local infrastructure and development of such projects, can enhance acceptance and support for wind farm initiatives.

- **Regulatory instability:** Frequent changes in laws and regulations can create uncertainty and hinder wind farm development. Lack of regulatory stability makes it difficult for developers to plan and invest in wind farm projects.

- **Lack of coordination in policies:** In the absence of coordinated policies among national, regional, and local authorities, wind farm development may face challenges. Inconsistent or conflicting policies can create regulatory uncertainties, resulting in delays and inefficiencies in the development process.

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Drivers to Establishment and Continuation of Wind Farm Projects

- **Ambitious communication plan:** Developing a comprehensive and ambitious communication plan involving relevant stakeholders is crucial for increasing awareness and understanding of the importance of renewable energy plants. Promoting the message that such installations are vital for achieving a sustainable future can help shape public opinion and foster broader acceptance.

- **Boost on permitting and construction in specific regions:** Prioritizing wind farm permitting and construction in regions with lower development rates, such as Madrid, Cataluña, and Valencia, can contribute to broader acceptance. Ensuring a more equitable distribution of wind farm projects and their associated benefits can address the perception of regional disparities.

- **Social and economic local plan implementation:** Implementing social and economic plans that consider the specific needs and aspirations of local communities can generate acceptance and support. These plans can involve job creation, skill development, educational initiatives, and infrastructure improvements, providing tangible benefits for the local population.

- **Increasing interconnection options with France:** Enhancing interconnection capabilities between Spain and France will be crucial for promoting the development of wind farms. Improved interconnection allows for better utilization of renewable energy resources and facilitates the export and import of electricity between countries, contributing to a more robust and integrated energy system.

- **Support for hydrogen (H2) and derivatives:** Clear support from the Spanish and European governments for hydrogen and its derivatives can serve as a significant driver for wind farm development. Promoting the use of hydrogen as an energy carrier and facilitating its production, storage, and utilization can create additional avenues for the deployment of wind farm projects.

- **Regulation coordination across different levels:** Coordinating regulations and policies across regional, local, and national levels is essential to create a harmonized and supportive framework for wind farm development. Streamlining processes, ensuring consistency, and minimizing administrative hurdles can facilitate the efficient deployment of wind farm projects.

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- **Development of off-grid wind turbine generators (WTGs):** Emphasizing the development of off-grid WTGs can play a critical role in enabling the establishment of dedicated wind energy plants operating in self-consumption mode. By reducing dependence on the available grid capacity, off-grid WTGs provide opportunities for the development of wind farms in areas with limited grid infrastructure.

- **Policy/regulation:** While some public rules may act as barriers, there is an opportunity for wind farm development due to the increasing requirement for renewable generation in Spain and the European Union. This regulatory push creates a favourable environment for wind farm projects.

- **Finance/economic:** The renewable energy industry, including wind farms, offers attractive returns for investors. This financial aspect serves as a driver for further development and investment in the sector.

- **Technical feasibility:** Technical considerations are not significant barriers for wind farm development. The feasibility of wind farm projects relies on factors such as suitable wind resources, site assessments, and appropriate technology.

- **Knowledge about community benefits:** Increasing awareness and understanding of the benefits that wind farm projects bring to the community, such as job creation, local economic growth, and environmental sustainability, can significantly drive support for development. Effective communication and education initiatives are crucial to better inform and engage the community.

- **Predictability in the permitting process:** Establishing clear and predictable procedures for obtaining permits and approvals for wind farm projects can encourage participation and investment. Streamlining the permitting process, reducing bureaucracy, and providing transparent guidelines can create a more favourable environment for developers.

Barriers to Establishment and Continuation of Wind Farm Projects

- **Urban planning as a bottleneck:** Urban planning, which is often managed by municipalities, can become a major bottleneck for wind farm development. Competency transfer and varying urban planning criteria across different municipalities can lead to delays and complexities in obtaining necessary permits and approvals for wind farm projects.

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- **Lack of a comprehensive database:** The absence of a comprehensive and integrated database with information on existing and planned wind and solar projects can hamper effective planning and coordination. A centralized database can facilitate informed decision-making and support efficient development by providing a clear overview of the existing and potential renewable energy infrastructure.

- **Concentration of wind farm projects:** The concentration of wind farm projects in regions e.g. Aragón, can lead to concerns from some individuals who perceive the region to have an excessive number of such projects. This can result in a loss of social acceptance and increased pressure on local governments to impose stricter regulations or limitations on new developments.

- **Limited access to the grid:** Limited grid capacity or inadequate grid infrastructure can pose challenges to connecting new wind farms to the electricity grid. Insufficient grid availability and grid connection challenges need to be addressed to enable the expansion of wind energy capacity.

- **Risk of income cannibalization:** As the penetration of renewable energy, including wind, increases in the Spanish electricity landscape, there is a potential risk of income cannibalization. This refers to the possibility of reduced revenues for existing wind farms due to the increased competition from new renewable energy projects. Strategies to mitigate this risk, such as market design adjustments and incentivizing storage solutions, are necessary for sustaining the profitability of wind farm projects.

- **Construction bottleneck and component availability:** The anticipated construction bottleneck, including challenges related to Engineering, Procurement and Construction (EPC) activities and critical component availability, can present a barrier to the deployment of new wind farm projects. Addressing these challenges, such as improving supply chain management and streamlining construction processes, is essential to ensure the timely and efficient development of new wind farms.

- **Offsetting risk through storage deployment:** The deployment of storage technologies itself may pose challenges. Ensuring adequate infrastructure, regulatory frameworks, and incentives for energy storage will be crucial for maximizing the benefits and addressing any barriers associated with integrating storage systems with wind farm projects.

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- **Regulatory fragmentation:** Inadequate coordination and alignment between regional, local, and national regulations can create obstacles for wind farm development. Inconsistencies, conflicting rules, and administrative complexities can slow down project approval processes and hinder the efficient deployment of wind farm projects.

- **Community acceptance:** Community acceptance plays a crucial role in the success of wind farm projects. While some parts of the community may support the industry, others may oppose it due to concerns about visual impact, noise, or other perceived drawbacks. Overcoming social resistance and gaining widespread community acceptance can be a significant challenge.

- **Permitting challenges:** The collapse or inefficiency of authorities during the analysis and evaluation process for obtaining permits can pose a significant barrier to wind farm development. Delays and uncertainties in the permitting process can hinder project progress and increase costs, impacting the overall viability of the projects.

- **Avoidance of tourist locations:** Installing wind farms in areas that are popular tourist destinations may face opposition due to concerns about visual impact and potential effects on the local tourism industry. Identifying suitable locations away from highly frequented tourist areas can help mitigate this barrier and alleviate concerns related to tourism.

- **Limited involvement of local companies as partners:** The lack of involvement of local companies as partners in wind farm construction or financial matters can hinder acceptance and create a barrier. By establishing partnerships and offering a percentage of new ventures to local companies, there is an opportunity to generate a sense of ownership, economic benefits, and increased acceptance within the community.

- **Inadequate and unreliable use of economic resources poured into municipalities:** The improper or unreliable utilization of economic resources allocated to municipalities can undermine public acceptance. Ensuring the effective and transparent use of funds directed towards local communities, such as investments in local infrastructure and development projects, can enhance acceptance and support for wind farm initiatives.

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- **Administrative complexities:** The administrative processes involved in accessing the grid and obtaining permits for wind farm projects can be complex and time-consuming. Streamlining these processes, reducing bureaucratic hurdles, and improving coordination among public entities can help overcome barriers and expedite project development.

- **Investor and developer pushback:** The challenges posed by overcomplicated requirements, cost burdens, and timeline uncertainty can result in pushback from investors and developers. These obstacles can undermine the economic viability and attractiveness of wind farm projects, leading to a reluctance to invest or participate in development efforts.

- **Overcomplicated rules and regulations:** Complex and constantly changing rules and regulations related to wind farm development can create barriers for investors and developers. The increased complexity, coupled with cost burdens and uncertainty regarding timelines, can deter potential stakeholders from pursuing wind farm projects.

- **Insufficient human resources in the administration office:** Limited staffing and resources in the administration office responsible for analysing and processing permits can cause delays and bottlenecks. Increasing the allocation of human resources in these offices can help streamline the permitting process and expedite project approvals.

Drivers to public participation in wind farm projects

- **Local public administration involvement:** The involvement of local public administrations is instrumental in successfully developing new wind farm projects. Collaboration with local authorities helps ensure that projects align with regional development plans, consider local interests, and address any specific concerns or requirements of the local community.

- **Public participation through auctions:** Public participation plays a crucial role in wind farm development, particularly through auction mechanisms. Auctions provide income stability and help secure financing for wind farm projects by allowing participation from various stakeholders, including public entities and private investors.

- **Clear public guidelines for wind farm development:** Having clear guidelines that define suitable and unsuitable areas for wind farms is important. Public

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guidelines can provide certainty and guidance to developers, investors, and local communities regarding the location and criteria for wind farm projects. This clarity helps streamline the development process and avoid conflicts related to urban planning.

- **Reliability in the sector:** Building trust and confidence in the wind energy sector by ensuring reliable and consistent performance can be a driver for wind farm development. Demonstrating the reliability of wind power generation, both in terms of energy production and operational efficiency, can attract investment and support the growth of the industry.

- **Effective marketing and communication strategies:** Effective marketing and communication strategies that highlight the positive aspects of wind energy can generate public interest and support. Promoting the environmental benefits, job creation, and economic opportunities associated with wind farms can help shape public perception and encourage engagement.

- **Enhanced investment benefits:** Making a portion of the wind farm investment directly benefit the local areas can make wind farms more attractive to public opinion. This can be achieved through initiatives such as establishing new installations in the community, providing free electricity to neighbours, supporting local employers, and collaborating with schools.

Barriers to Public Participation in Wind Farm Projects

- **Negative portrayal in media:** The negative portrayal of renewable energy, including wind farms, in media can contribute to public scepticism and opposition. Countering misinformation and promoting accurate information about the benefits of wind energy is necessary to overcome these negative perceptions.

- **Lack of clarity on public participation:** The definition and scope of "public participation" in wind farm development may vary, leading to ambiguity and potential challenges in effectively involving the public. Clear guidelines and frameworks that define the roles and responsibilities of public entities and stakeholders in the decision-making process can help overcome this barrier.

- **Limited public engagement beyond permitting phase:** While public entities are involved in the access to the grid and permitting phase, their ongoing involvement and engagement in the operation and maintenance of wind farms

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may be limited. Enhancing public participation beyond the initial stages of development can foster a sense of ownership and ensure ongoing collaboration for the successful operation of wind farm projects.

- **Resistance to change:** The shift towards renewable energy sources, including wind energy, can challenge existing social ideas and mindsets. Overcoming resistance to change and addressing misconceptions or concerns about wind farms requires active engagement and education efforts.

- **Public administration participation:** The lack of interest or involvement from the public administration can be a barrier to wind farm development. As an economic activity, wind farm projects typically rely on private companies rather than direct participation or engagement from public entities.

4.2.3 Pilot case Greece

Drivers to Wind Farm Development

- **Advancements in wind turbine technology:** The continuous advancement of wind turbine technology plays a crucial role in the development of wind farms. Improved technology allows for the development of wind farms with reduced grid infrastructure, minimizing environmental impact. It also enables higher power output with fewer turbines, along with features such as electricity storage, remote control, and enhanced grid stability and security management.

- **Informing the public about the wind farm benefits:** Properly educating the public about the benefits of wind farms is critical to their development. It is important to highlight the environmental benefits of using renewable energy sources and how they contribute to a sustainable future. This awareness can help to gain public support and encourage the uptake of wind energy.

- **Global awareness of climate change:** Increasing global awareness of climate change and its harmful effects is a major driver for wind farm development. The realization that fossil fuels are not sustainable in the long term is creating demand for alternative energy sources such as wind energy, which can help reduce greenhouse gas emissions and mitigate climate change.

- **Financial incentives for citizens:** Financial incentives for citizens can be a powerful driver for wind farm development. By offering economic benefits such as subsidies or tax credits, citizens are motivated to invest in wind energy

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and support the growth of wind farms. These incentives can help overcome initial barriers and make wind energy more attractive to the public.

- **Environmental filters and improved protection:** The inclusion of environmental filters in wind farm design demonstrates a commitment to more effective environmental protection. While it is acknowledged that wind farms may bring a slight change to the ecosystem's balance, it is emphasized that this change is not catastrophic. The implementation of measures to mitigate environmental impact can help alleviate concerns and facilitate wind farm development.

- **Long-term environmental benefits:** The transition to wind energy is seen as a pathway to a better environment with reduced CO_2 emissions in the long term. This perspective recognizes that wind farms may have some environmental burden, but it highlights the broader positive impact on the ecosystem and climate. The prospect of improved environmental conditions can drive the acceptance and development of wind farms.

- **High wind potential:** The islands in the South Aegean Region have significant wind potential, which presents an opportunity for the development of small wind farms to harness this renewable energy source. Despite the abundant wind resources, there is a discrepancy between the wind potential and the actual production of wind farms in the region. This indicates the untapped opportunity for further wind farm development.

- **Local energy production:** Development of wind farms to meet local energy needs can be a driver. Emphasizing the importance of self-sufficiency and reducing dependence on external energy sources can encourage support for wind farm projects.

- **Infrastructure availability:** The presence of the necessary infrastructure in the transmission and distribution grid, including transmission lines and substations, is crucial for the development of wind farms. Adequate grid infrastructure enables the efficient integration and distribution of wind energy and supports the growth of the sector.

- **Compensatory measures for local communities:** Implementing compensatory measures to local communities is another driver for social acceptance. Wind farm owners can contribute to public works, provide monetary contributions to municipalities or citizens, or undertake projects of common interest.

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Ensuring that the local communities are informed about these benefits is crucial for fostering positive attitudes toward wind farms.

- **Engagement of local citizens:** The involvement and engagement of local citizens in the development of wind farms are important drivers for promoting acceptance and minimizing negative reactions. When citizens are actively engaged and have a say in the planning and implementation process, it can contribute to a smoother and more favourable development of wind farms.

- **Simplification of licensing process:** Legislative efforts to simplify the licensing process for wind farms have resulted in improvements in recent years. These efforts have aimed to reduce the maturation time of projects, making the development process more efficient and streamlined. There has been a notable reduction in the time required for a wind farm project to reach maturation. Previously, projects could take up to 10 years to mature, but now significant progress can be achieved within 3-4 years, assuming there are no major obstacles encountered.

- **National energy and climate plan objectives:** The development of wind farms aligns with the objectives of the national energy and climate plan. This alignment provides a strategic direction and framework that supports and encourages the growth of wind energy in the country.

- **Increasing positive public opinion:** There is a growing percentage of the public that holds a strong positive opinion towards the development of wind farms and renewable energy sources (RES). This shift in attitude is attributed to the practical benefits observed, such as reduced energy costs, resulting from the increased production of energy from RES, especially wind energy.

- **Availability of financing:** The availability of financing plays a significant role in promoting wind farm development. If wind farm operators possess the necessary technical expertise, they can secure financing from banks or investment houses. Adequate financial resources enable the implementation of wind farm projects, contributing to their growth and expansion.

Barriers to Wind Farm Development

- **Prejudices and misconceptions:** Prejudices and misconceptions surrounding wind farms, often based on misinformation rather than scientific data, hinder

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their development. Overcoming these biases requires effective communication strategies that present factual information, address concerns, and provide evidence of the positive impacts of wind energy.

- **Lack of public information:** Inadequate dissemination of information about the benefits of wind farms poses a barrier to their development. If the public is not sufficiently informed about the benefits of renewable energy, this can lead to scepticism and resistance. Clear and comprehensible communication is important to promote understanding.

- **Poor planning and community involvement:** Inappropriate planning of wind farm locations without adequately involving local communities can hinder their development. It is important to engage community members, address their concerns, and ensure transparency in the planning process. This participatory approach fosters collaboration and minimizes opposition, leading to more successful wind farm projects.

- **Insufficient compensatory measures:** Inadequate compensation offered by wind farm operators/owners can be a barrier to development. Providing appropriate compensatory measures, such as community benefits, job creation, or infrastructure improvements, can help build positive relationships with local communities and overcome resistance to wind farm projects.

- **Negative experience from past wind farm facilities:** The negative experiences associated with earlier wind farm facilities implemented without proper planning and dialogue with society have led to reactions and scepticism. These cases, where companies prioritized their own profits without adequately benefiting society, have contributed to barriers against wind farm development. Building trust and addressing past grievances is essential to overcome this barrier.

- **Magnification of environmental burden:** Some individuals react strongly against wind farms without providing serious counterarguments, magnifying the perceived environmental burden. These reactions hinder development and necessitate clear communication to dispel misinformation and address concerns. Overcoming biases and fostering informed discussions can help mitigate this barrier.

- **Need for profit diffusion:** The absence of proper profit diffusion to society from wind farm projects has been a point of contention. A lack of perceived benefit

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sharing with the community can lead to resistance and hinder development. Ensuring that wind farm projects include measures for equitable economic benefits and engaging in dialogue with the community can help overcome this barrier.

- **Opposition to industrial development:** Island communities often resist any form of industrial development, including large-scale wind farms, due to concerns about altering the character and image of the islands. The reaction is driven by the desire to preserve the unique nature and attractiveness of the islands, rather than ignorance. Recognizing the importance of maintaining the island's identity while promoting sustainable energy solutions can help bridge the gap.

- **Complex permit/licensing procedures:** Complex and lengthy permit/licensing procedures present a significant barrier to wind farm development. Simplifying these processes and reducing bureaucratic hurdles can encourage the involvement of private initiatives and local governments in the development of wind farms, fostering greater community engagement and support.

- **Grid upgrade requirements:** The development of wind farms in mainland Greece is limited by the need for concurrent upgrades in transportation grids. The capacity for higher installed wind energy is dependent on the availability and enhancement of grid infrastructure to accommodate increased generation and facilitate its transmission.

- **Need for balance and preservation of natural environment:** The negative reactions stem from a desire to strike a balance between renewable energy generation and the preservation of the natural environment. There is a concern about preventing the degradation of the natural aesthetics caused by large wind farm installations.

- **Lack of infrastructure:** The absence of infrastructure, such as interconnections and grids, has been a significant barrier to farm park development in the Greek pilot case. Without proper infrastructure, it becomes challenging to transmit and distribute the electricity generated by wind farms, limiting their potential.

- **Hostile public opinion:** A significant percentage of the public holds a hostile or negative opinion towards wind turbines and wind farms. Although the percentage may not have changed significantly compared to the past, the

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increased development of wind farms has amplified the reaction from this portion of the public, leading to challenges and opposition.

- **Absence of tools to address hostile voices:** The current lack of effective tools to address and isolate hostile voices that disrupt or impede the development of legally licensed wind farms poses a significant barrier. Overcoming this challenge requires mechanisms that can better manage and counteract the negative impact of opposition, allowing for smoother development processes.

- **Need of legal framework amendment:** The current legal framework in Greece poses the highest obstacle to wind farm development. The framework is perceived as insecure and lacks clarity, particularly concerning energy communities. Amending the legal framework to enable equal access to wind park projects for all, rather than favouring only big investors, would encourage development.

Drivers to Establishment and Continuation of Wind Farm Projects

- **Social acceptance of new wind farms through awareness:** Adequate awareness and information dissemination play a key role in gaining social acceptance for wind parks. An example in an area near the Greek pilot case, where the investor failed to approach and inform the local community before installing a wind farm, resulted in negative reactions. The approach and engagement of investors with the local community can significantly influence the acceptance and support for wind farm projects.

- **Availability of space:** In mainland Greece, including the Region of Peloponnese, there is ample space for the development of new wind farms. This provides opportunities for expanding wind power capacity and increasing renewable energy generation.

- **Interconnection with mainland grid:** The completion of underwater interconnections between Crete, the island where the Greek pilot case is, and the mainland grid opens up opportunities for increased wind farm installations. This integration reduces the restrictions previously imposed by the non-interconnected status of the island, enabling the licensing and installation of new wind farms.

- **Changing world opinion:** Global opinion on wind turbines is gradually changing. As the public becomes more aware of the economic benefits of wind

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farms and people become better educated about the actual environmental impacts, greater acceptance can be expected. This change in perception can contribute to the development of wind farms.

- **Positive legislative framework:** In the last decade, the Greek state has recognized the need to facilitate wind farm installations, resulting in more positive legislation. Despite some remaining ambiguities, progress has been made, allowing wind farms to be located in previously restricted areas. This improved legislative framework acts as a driver for wind farm development.

- **Subsidized financing:** Subsidized financing plays a significant role in driving wind farm development. Lack of subsidies or the existence of common subsidy criteria for all stakeholders, including large investors, ordinary citizens, and energy communities, can hinder progress. Introducing distinctions and tailored subsidy criteria can help incentivize investment and accelerate the growth of wind farms.

- **Central planning for wind farm capacity:** Delimiting the total capacity of wind farm installations on a regional or country level is essential. Having a top-level plan that predetermines the levels of installed power in each geographical region enables researchers, entrepreneurs, and the state to effectively plan and allocate wind farm sites. Central planning provides clarity and avoids ad hoc decision-making processes.

- **Domestic production and know-how transfer:** Promoting information dissemination and training for researchers, scientists, and technicians is necessary for wind farm development. Greece should not solely rely on importing know-how and products, it should strive for co-production of equipment and the transfer of maintenance knowledge. Linking wind farm installations to domestic added value is a national goal, ensuring the country's participation in equipment production and maintenance.

- **Improved technical expertise:** The capacity of the technical staff involved in wind farm development in Greece has significantly improved over the last 15-20 years. Firms engaged in the study, development, and installation of wind farms have strengthened their teams with highly skilled employees. This enhanced expertise leads to more effective and well-designed solutions in all aspects of wind farm operations.

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- **Economic benefits for landowners and local communities:** The potential economic benefits for landowners and local communities in the regions where wind farms are installed can serve as a driving force for further development. Offering financial incentives and ensuring that these benefits are communicated to the affected communities can foster support and cooperation.

- **Adequate financing:** Adequate funding is a crucial driver for the development of wind farms. Sufficient financial resources enable the implementation of such projects and the necessary infrastructure, helping to accelerate the growth of wind energy.

Barriers to Establishment and Continuation of Wind Farm Projects

- **Absent spatial planning for wind turbine siting:** The absence of a dedicated spatial plan specifically designed for wind turbine siting is a barrier. There is also a need for comprehensive planning and avoiding the abuse of environmental zones. Insufficient planning can lead to conflicts and challenges in the development process, hindering the growth and success of wind farm projects.

- **Negative perceptions and fears**: Many people in Greek island societies hold negative perceptions towards wind turbines, associating them with concerns such as bird mortality, noise pollution, and potential impact on the environment and tourism. Overcoming these fears and addressing misconceptions through accurate information and environmental assessments is crucial to changing the negative stance.

- **Lack of centralized information dissemination:** There is a need for improved information dissemination to the local community regarding wind farms. Currently, the information flow primarily comes from investors, which may not be sufficient to address concerns and foster greater understanding and acceptance. Providing centralized and comprehensive information, in line with legislation and zoning plans, can contribute to improving society's attitude towards wind farms.

- **Inadequate awareness of benefits:** In some cases, there is a lack of information and awareness among citizens regarding the contributions and benefits of wind farms to local communities. Insufficient communication from local

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municipalities or wind farm owners regarding the social and economic advantages can result in a lack of support and acceptance.

- **Strong reactions against large-scale wind farms:** The proposed licensing of large wind farms by big investors in Greece has sparked strong negative reactions. The perception is that these large-scale projects prioritize profit over environmental considerations and threaten the natural aesthetics of the region, leading to a resistance against their installation.

- **Unsatisfactory legal framework:** Although the legislation governing wind farm installation is generally supportive, certain points in its formulation may create misunderstandings and lead to different interpretations. These ambiguities can hinder development and require clearer laws to provide more certainty and guidance for all stakeholders involved.

- **Lack of subsidized financing and differentiation:** The absence of subsidized financing or the application of uniform subsidy criteria across all types of investors can be a barrier to wind farm development. Distinguishing between different stakeholders and tailoring subsidies accordingly can help attract diverse investment and promote project realization. For small units involving individuals or energy communities, a highly supportive legal framework for financing is crucial. Such initiatives should be encouraged as they provide personal benefits to participants and enhance social acceptance. In the case of large investments improving the energy infrastructure, financing should include provisions for giving back to society, such as local job creation, provision of free or affordable electricity to communities, or investments in enhancing local infrastructure.

- **Technical education and expertise:** The limited technical education and expertise related to wind energy on the islands hinder the progress of wind farm development. Building local capacity and providing training programs to enhance technical knowledge and skills can help overcome this barrier. Strengthening the technical capabilities of local communities can foster their active participation and engagement in wind farm projects.

- **Lack of electricity storage facilities:** The absence of adequate facilities for electricity storage is identified as a significant obstacle that negatively affects the development of wind farms. The stochastic nature of wind power production necessitates reliable storage solutions to effectively handle the fluctuating energy generation. Storage becomes crucial for managing the

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potential impact of large-scale wind power integration on the stability and dynamic security of electrical grids, particularly on small, autonomous insular grids.

- **Cost of electricity storage:** The expense associated with implementing electricity storage systems remains a significant barrier to wind farm development. While the technology is available and mature, its high cost can hinder widespread adoption and integration into wind energy projects.

- **Funding availability:** The availability of funding presents a significant obstacle, particularly for small investors and energy communities. While big investors and large companies usually have easier access to funding, smaller players may struggle to secure the necessary financial resources for wind park projects. Ensuring sufficient funding options for all types of investors can help overcome this barrier.

- **Inadequate targets for onshore wind:** The disappointing fact that the targets in the Greek national plan have increased for all renewable energy source (RES) categories except onshore wind indicates a lack of acceptance or support for further onshore wind farm installations. This limitation is unfortunate as the country possesses wind potential, but with existing problems, the production of affordable and environmentally friendly energy through onshore wind farms is hindered.

- **Balancing parameters:** A balance between the legal framework, public opinion, infrastructure, communication systems and technology, is essential for successful wind farm projects. Failure to strike a balance can hinder progress and create challenges in wind farm development.

- **Funding availability for small investors:** The lack of funding can be a significant factor hindering the engagement of small-scale investors in wind park projects. Access to sufficient financial resources is crucial for the development and implementation of these projects. Ensuring adequate funding opportunities can drive the involvement of small investors and promote broader participation in the wind energy sector.

- **Negative attitudes and environmental concerns:** The negative attitudes and irrational opposition towards wind farms, particularly in the tourism sector, are highlighted as barriers. Overcoming these negative perceptions and addressing

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environmental concerns effectively is crucial to foster a more supportive environment for wind farm development.

Drivers to Public Participation in Wind Farm Projects

- **Benefit sharing with local communities:** Offering a percentage of the annual revenue from some wind farms to local communities provided a direct benefit to residents. This participation and profit sharing promoted a positive attitude towards wind farms and facilitated their acceptance.

- **Strengthening energy communities and municipalities:** Initiatives such as energy communities or municipalities that prioritize social benefits should be supported institutionally and financially. By providing them with adequate resources, these entities can play a crucial role in driving wind farm development and promoting community engagement.

- **Friendly licensing framework:** The licensing framework should be designed to be more accommodating to initiatives focused on social benefit rather than solely financial gain. Creating a regulatory environment that facilitates the participation of smaller entities, such as citizens' cooperatives, can encourage their involvement in wind farm projects.

- **Favourable funding for social entities:** Providing favourable funding options for entities that prioritize societal benefits, such as citizens' cooperatives, can enhance their ability to contribute to wind farm development. Financial support can help these organizations overcome barriers and enable them to participate actively in renewable energy projects.

- **Increased societal understanding and awareness:** Educating and informing society about the benefits of wind energy is a crucial driver for wind farm development. When people have a better understanding of the advantages of renewable energy sources like wind energy, they are more likely to support and embrace wind farm projects.

- **Legislation for citizen participation:** The existence of legislation that facilitates citizen participation in wind farm development projects has been beneficial. It has provided opportunities for individuals and communities to engage in renewable energy projects, contributing to the overall development of wind farms. However, it is noted that there may have been instances of abuse or misuse of this legislation.

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Barriers to Public Participation in Wind Farm Projects

- **Unequal treatment:** Treating citizens the same way as large investors may discourage their involvement. It is important to recognize the unique needs and capacities of different stakeholders and provide appropriate support mechanisms tailored to their capabilities, rather than applying a one-size-fits-all approach.

- **Inadequate electricity production capacity of small producers:** Small producers like private individuals or energy communities may not have the capacity to meet the entire electricity demand of a country or support exports. This limitation can pose a barrier to their participation in wind farm projects, as their production capabilities may not align with broader energy requirements. Despite the capacity constraints, it is important to allocate a percentage of electricity production to small producers, strengthening their initiatives. This ensures that they still have an opportunity to contribute to the renewable energy sector and benefit from wind farm projects, even if their scale of production is comparatively smaller.

- **Lack of citizen information:** Insufficient citizen awareness and information about wind energy can hinder its development. By providing comprehensive and accessible information, citizens can better understand the benefits and potential of wind farms, thus encouraging support and participation.

- **Need for improved policies:** Public administration should develop policies that prioritise citizen participation and support the development of renewable energy sources. A policy framework that encourages and facilitates citizen engagement can contribute significantly to the growth of wind farms in the country.

- **Legal framework limitations:** The existing legal framework may not offer a direct and competitive access path for small investors and local community-based initiatives to participate in wind farm projects. This creates unequal opportunities compared to large-scale private investors who possess technical capacity, funding access, and administrative experience. Addressing these limitations and promoting a more inclusive legal framework can help remove barriers and foster greater participation from diverse stakeholders.

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- **Social acceptance challenges:** Wind turbines face challenges in terms of social acceptance, even for small-scale installations. The height and complexity associated with wind turbines can be a source of concern for local communities. As a result, wind farm projects, including those initiated by energy communities, may encounter opposition and obstacles from locals despite having obtained legal licenses.

- **Respect for the legislative framework:** It is essential that the public administration upholds the legislative framework consistently and respects the rules and timelines for wind farm applications. By doing so, it builds trust and confidence among citizens and cooperatives, encouraging their active participation in wind energy projects.

4.2.4 Pilot case: Norway

Drivers to Wind Farm Development

- **Good process in line with other energy infrastructure processes:** The wind farm project development process in Norway has been in accordance with established procedures used for hydropower projects, as well as concession processes in the oil and gas sector. This consistency promotes a sense of familiarity and enables smoother implementation.

- **Positive public perception of offshore wind:** The general public in Norway holds a positive view of offshore wind and considers it an important aspect of the "green shift" towards renewable energy. Offshore wind is seen as low-hanging fruit for achieving sustainability goals.

- **Potential for local benefits and income:** The acceptance of offshore wind projects by the wider community can be influenced by the expectation of local benefits. Implementing mitigating measures and compensatory measures to minimize negative effects and provide non-wind development-related benefits to the local community can contribute to greater acceptance. This can include financing community infrastructure, such as community halls, roads, harbours, or establishing investment funds.

- **Creating a good regulatory framework:** Establishing a comprehensive and effective policy and regulatory framework specific to offshore wind is crucial. This requires careful and groundbreaking work in Norway, ensuring that the processes and regulations support the development of offshore wind projects.

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- **Technological advancements of offshore wind:** Offshore wind energy is an innovative industry with new technologies that have undergone successful pilot phases. The presence of viable and proven technologies demonstrates the potential for scaling up offshore wind projects, attracting investment and interest.

- **Learning from onshore wind mistakes:** Lessons learned from the development of onshore wind in Norway provide valuable insights for offshore wind. Utilizing this knowledge can contribute to improving the development process and outcomes.

- **Creating local ripple effects:** Emphasizing the use of sustainable local materials and incorporating elements that benefit the community can generate positive local ripple effects. By maximizing the project's positive impact on the local economy, environment, and community, wind farm development can garner increased support and acceptance.

Barriers to Wind Farm Development

- **Incomplete decision-related elements and lack of support mechanisms:** Certain decision-related elements necessary for the wind farm development process are not yet in place. The absence of a finalized legal framework and the delay in implementing support mechanisms such as subsidies create additional obstacles. If these elements are not addressed soon, interest in the Norwegian market may decline, with developers focusing on opportunities in other countries where regulatory and support structures are more established.

- **Concerns of affected local communities:** The opinions of those most directly affected may differ from the general public. Local communities may adopt a "Not In My Backyard" (NIMBY) mentality and demand clear local benefits and payback for bearing the consequences of large-scale, visible offshore wind developments.

- **Insufficient focus on mitigating and compensatory measures:** Failure to prioritize mitigating negative effects and providing compensatory measures to impacted communities can hinder social acceptance. Engaging in resource allocation towards minimizing adverse impacts and compensating communities unrelated to the wind development process is seen as a means of "greasing the wheels" and gaining community support.

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- **Need for profitable energy:** The profitability of wind farm development has been a significant barrier. For offshore wind farms to be established, there must be a demand for the energy and a profitable business case.

- **Insufficient research on fish migration:** The lack of knowledge regarding the effects of wind farms on fish migrations, particularly for pelagic species, has been highlighted as a significant knowledge gap. This lack of understanding has hindered the development of offshore wind.

- **Lack of effective consultation:** In some cases, the consultation process with the fishing industry has been perceived as inadequate. The Hywind Tampen project, for example, was seen as a ready-made project with limited consideration for the fishing industry's concerns, leading to a loss of trust.

- **Carbon accounting and emissions:** The overall impact on climate emissions has been questioned, as wind farms may reduce emissions at specific locations but contribute to emissions during construction and decommissioning. This broader carbon accounting perspective has implications for evaluating the effectiveness of wind farm development.

- **Lack of focus on social sustainability:** The current process of wind farm development has primarily focused on authorities, consortiums, and suppliers, neglecting the importance of social sustainability. The municipality directly affected by the development has not been included in the decision-making process, leading to a lack of representation and consideration of the community's voice and needs.

- **Skipping the participation process:** Neglecting or bypassing the participation process can create barriers to wind farm development. Failing to engage stakeholders and seek their input may result in resistance, lack of support, and opposition to the project. Participation should be seen as a vital aspect of the development process, rather than an optional step.

- **Slow government proceedings:** Delays in wind farm development can occur due to slow processes at the government level. Environmental studies and impact assessments may take longer than planned, leading to potential delays in the development process.

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Drivers to Establishment and Continuation of Wind Farm Projects

- **Support mechanisms and predictability:** Having support mechanisms, such as financial incentives and long-term contracts, along with predictability in offshore wind policies and investments, are essential. Predictability instils confidence among investors and reduces the perceived risks associated with offshore wind projects.

- **Openness and transparency in the process:** Involving all stakeholders, especially those at the local and county levels, in open and transparent processes from the early stages of development is crucial. Allowing affected parties to have a say in the decision-making process, particularly regarding mitigating and compensatory measures, aligns with the normal Norwegian concession process and fosters acceptance.

- **Ongoing development and innovation potential:** Allowing for ongoing development and innovation in the wind energy sector is also important. Setting very high environmental standards during the prequalification stage may hinder progress, as it becomes difficult for developers to accurately calculate the long-term climate footprint of turbines that may be in operation for several decades. Promoting a flexible approach to evolving environmental standards can facilitate project viability.

- **Realistic plans based on climate considerations:** Competing based on realistic plans that demonstrate how developers will consider climate factors, rather than focusing on concrete and uncertain numbers, is important. The emphasis should be on evaluating the strategic approach to climate impact mitigation rather than expecting precise figures.

- **Price predictability and contract flexibility:** Ensuring price predictability for future power generation is a potential driver for new wind farms. Utilizing contracts for difference can be part of the solution, but they need to be adjustable in a realistic market. There is a need to address uncertainties surrounding price projections and establish a mechanism that accounts for future market fluctuations.

- **Coexistence with other ocean uses:** Establishing offshore wind farms alongside existing activities such as fisheries and shipping requires careful management. Ensuring coexistence and evaluating industries in a comparable manner is essential. Balancing the needs of different industries and securing a process-

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level agreement for all stakeholders is crucial for successful wind farm development.

- **Green energy and renewable energy transition:** Offshore wind farms play a significant role in contributing to the "green shift" and addressing energy challenges in the next decade. They offer a mature and reliable renewable energy source compared to less established alternatives like nuclear power in Norway.

- **Coordinating processes and institutions:** Wind farm development involves coordinating numerous processes and institutions at the local, regional, and national levels. Effective coordination and collaboration across these entities are necessary to navigate the complexities of permitting, regulations, and stakeholder engagement.

- **Importance of including affected municipalities:** In order to ensure a comprehensive and inclusive process, municipalities directly affected by offshore wind development should be included and given the opportunity to express their opinions. Excluding the municipality or disregarding its objections may result in delays or negative attitudes towards both offshore and onshore wind projects.

- **Open and honest processes**: It is important to have transparency and openness in the development of wind farms. Providing accurate and comprehensive data about the project, including the area that will be affected, is essential to build trust and credibility.

- **Establishing a foundation for future development:** The early stages of wind farm development, particularly the first two concession rounds set the course for future projects. It is crucial to approach the process with openness, neutrality, and a realistic assessment of the potential impacts, avoiding excessive optimism or sugarcoating of information. Negative consequences can arise when stakeholders, including politicians and industry representatives, adopt a biased or one-sided approach.

- **Long-term planning and technology development:** Offshore wind farms require careful planning to account for future technological advancements. Current projects must anticipate turbine advancements, logistics, substation solutions, and other technological developments. This forward-looking

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approach involves some risk but acknowledges the generational development of turbines and the feasibility of realizing ambitious goals.

Barriers to Establishment and Continuation of Wind Farm Projects

- **Addressing energy problems and grid development**: Offshore wind has the potential to solve various energy challenges. However, grid development poses a significant hurdle, as there is a desire among the public in Norway for radial cables, which limits integration with the European energy balance and the developers' aspirations. Creating a hub in the North Sea that enables seamless energy exchange and balance with Europe or the Nordic/North Sea nations requires a different energy infrastructure.

- **Project-level challenges:** Wind farm developers face multiple challenges at the project level, such as assessing profitability, addressing environmental concerns, managing grid issues, and dealing with sea floor considerations.

- **Conflicts of interest:** Conflicts of interest with other users of the sea in the offshore wind areas concerned can affect the process and create challenges. Resolving conflicts and finding a balance between the interests of different stakeholders is crucial for the progress of wind farm projects.

- **Lack of predictability in wind policies:** Uncertainty and unpredictability in offshore wind policies and investment conditions can deter potential investors. A stable and predictable environment is crucial for attracting the necessary investments in offshore wind farm projects.

- **Market uncertainty**: The wind farm development process in Norway has experienced significant delays, creating uncertainty in the market. The lack of clear guidelines for governmental support, regulation of concession content, detailed planning, and impact assessments has hindered progress. This uncertainty poses challenges for operators who want to move forward quickly but are met with an unprepared governmental system.

- **Unexpected competition in the prequalification stage:** The prequalification stage, which developers did not anticipate as a competition in itself, presented unexpected challenges. This unexpected element adds complexity to the market and may lead some participants to consider legal challenges.

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- **Uncertainty in project processes:** The focus on delivering ambitious and uncertain numbers during the concession process can create uncertainty and unrealistic expectations. Developers may feel compelled to provide unrealistic figures to win the bid, potentially leading to difficulties in meeting those targets later on. Shifting the emphasis towards realistic plans and evaluating how developers will consider climate impact can address this challenge.

- **Price prediction challenges:** Predicting future power prices presents a challenge for wind farm developers. The need for a predictive price for power in the future to submit competitive bids adds uncertainty. Ensuring flexibility in contracts for difference to adapt to realistic market conditions can help mitigate this challenge.

- **Coexistence with existing industries:** Achieving a balance between offshore wind development and existing industries, such as fisheries, poses challenges. It is necessary to evaluate the impacts and benefits of different industries equally and secure a coexistence agreement that addresses concerns and ensures fair treatment.

- **Area suitability and process-level agreements:** In Norway, the chosen areas for wind farm development are selected based on economic, environmental, and coexistence considerations. Ensuring effective coexistence and addressing challenges within these designated areas is crucial. In other markets, where developers can propose their own areas, similar considerations need to be taken into account.

- **Complex project technical challenges:** Building offshore wind farms involves overcoming various technical challenges, including ensuring the availability of the desired turbine models, addressing logistics for transporting turbines, and constructing necessary substation infrastructure. Planning for future technology developments adds an additional layer of complexity and risk to project execution.

- **Supply chain limitations:** The offshore wind industry requires a well-established and comprehensive supply chain to support the development and operation of wind farms. However, the current plans for offshore wind deployment in different countries surpass the capacity of the existing supply chain. Scaling up the supply chain, meeting national requirements, ensuring local content, and addressing harbour capacity and pricing are critical challenges to be overcome.

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- **Lack of specific impact assessments:** As of now, no applications for impact assessments related to offshore wind have been submitted. Understanding how offshore wind farms may affect fish stocks from both an industrial and commercial perspective is essential. Scepticism may arise regarding the applicability of reports, data, and studies conducted abroad to the specific Norwegian context. The fishing industry may not possess comprehensive knowledge of the legal aspects or technicalities involved in offshore wind development, adding to the complexity of the process.

- **Increased fuel consumption for fishermen:** Fishermen have experienced increased fuel consumption due to avoiding wind farms, which has implications for their operations and carbon emissions.

- **Limited offshore wind experience in Norway:** The relative lack of experience in offshore wind in Norway may present challenges in navigating the unique aspects of offshore wind farm projects. Overcoming this barrier requires leveraging international partnerships, sharing knowledge, and learning from established offshore wind markets to accelerate development.

Drivers to Public Participation in Wind Farm Projects

- **Involvement of local developers and companies:** Engaging local developers and companies in wind farm projects can contribute to social acceptance and community involvement. Local entities often have a vested interest in the well-being of the local environment and are dependent on social acceptance as their employees and communities are directly impacted. Their participation can foster a sense of pride, local connection, and increase acceptance compared to projects led solely by foreign companies without local ties.

- **Transparent and inclusive concession rules:** In Norway, there is a tradition of involving stakeholders in the draft process for concession rules. While it may not be possible to satisfy everyone's opinions completely, the government takes the lead in ensuring neutral and objective communication and discourse. This practice promotes a fair and robust decision-making process.

- **Agreeing on facts:** Before entering discussions, all parties involved should agree on the fundamental facts related to the wind farm project. This includes aspects such as the area to be utilized, environmental effects, and economic

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impacts. Debating and distorting facts for personal gain only hinder progress and cooperation.

- **Inclusive stakeholder involvement:** Incorporating the perspectives and interests of different stakeholders is crucial. Exploring possibilities for coexistence, such as integrating aquaculture with offshore wind farms, and considering potential economies of scale can help address concerns and provide benefits to multiple parties. Learning from examples like the UK, where fishermen's practices were adjusted and vessels repurposed for research, demonstrates the value of proactive engagement and collaboration.

- **Availability of funding:** Adequate funding plays a crucial role in promoting the engagement of citizens in wind farm development. Sufficient financial resources enable the implementation and operation of wind farm projects, making them more accessible to a wider range of participants, including local communities and individual citizens.

- **Appropriate formulation of the legal framework:** A well-designed and supportive legal framework is essential for encouraging citizen involvement in wind farm projects. When the legal framework provides clear guidelines, transparent procedures, and equal opportunities for citizens to participate, it creates a favourable environment that promotes their engagement and investment in the development of wind farms.

- **Capacity building of local communities:** Building the capacity of local communities is a valuable asset that can support their active involvement in wind farm projects. By providing education, training, and knowledge-sharing opportunities, communities can enhance their understanding of wind energy, project development, and operation. This capacity building empowers citizens to contribute effectively and make informed decisions regarding wind farm initiatives.

- **Understanding of wind farm benefits:** Ensuring a comprehensive understanding of the benefits and impact of offshore wind energy is essential for social acceptance. Questions regarding power generation, national benefits, and whether the power is sold domestically or abroad are part of the larger energy debate and play a role in gaining acceptance for offshore wind.

- **Knowledge dissemination and stakeholder participation:** Offshore wind developers need to contribute to knowledge dissemination and engage in

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meaningful participation processes with stakeholders, including local communities and other industries. Providing assurance of benefits, including local content, is important for fostering acceptance.

- **Effective participation process:** Engaging stakeholders and allowing their active participation in the development process is crucial. By setting up an inclusive participation process, developers can ensure that stakeholders feel heard, involved, and have the opportunity to provide valuable feedback. Starting the dialogue early on and maintaining continuous engagement is essential for a successful participation process.

- **Continuous dialogue and information sharing:** Holding regular meetings and maintaining ongoing dialogue with stakeholders is necessary. Merely conducting one meeting is often deemed insufficient. Developers should establish effective channels of communication to keep stakeholders informed and engaged throughout the project's lifecycle.

- **Utilizing the "participation ladder":** Developers can employ the "participation ladder" approach, which involves a step-by-step process. The first step is to inform stakeholders about the project plans and intentions for the sea area. The subsequent step is to initiate a dialogue, allowing for two-way communication and exchange of ideas. The final step involves direct participation, wherein stakeholders actively contribute to the decision-making process.

- **Public participation activities:** Conducting public meetings and organizing various activities for involvement are crucial for fostering public participation. These initiatives provide opportunities for the local community and stakeholders to contribute their ideas, opinions, and concerns to the development process, ensuring their voices are heard and considered.

- **Emphasizing collaboration among various stakeholders:** Emphasizing the importance of working together on non-competitively sensitive aspects can foster collaboration among authorities, developers, and other stakeholders. Creating platforms like collaboration forums can facilitate more effective communication and cooperation in the development process.

Barriers to Public Participation in Wind Farm Projects

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- **Avoiding polarized rhetoric:** Parties involved in wind farm development should refrain from engaging in lengthy newspaper debates that belittle those with different perspectives or opinions. Labelling sceptics or opponents undermines constructive dialogue. Instead, the industry should acknowledge knowledge gaps, commit to monitoring programs, and take appropriate action if adverse effects are identified.

- **Pressure on the fisheries industry:** The fishing industry is currently under significant pressure, and there are numerous stakeholders contacting them regarding offshore wind farm projects. Dealing with these additional demands, while managing their primary fishing activities, poses a challenge for fisheries organizations. The industry's limited resources and expertise may hinder their ability to engage fully in discussions and assessments related to offshore wind farm development.

- **Lack of open and neutral discussion:** A barrier to wind farm development can arise when discussions are not conducted in an open and neutral manner. Polarized debates, misinformation, or twisting of facts can hinder progress and create conflict among stakeholders.

- **Environmental concerns among the public:** Environmental factors such as biodiversity, natural diversity, birdlife, and fish are potential sources of negative social acceptance. The impact of offshore wind farm projects on these aspects, including the size of the sites and project structures, as well as issues like microplastics and waste, raise concerns among people.

- **Lack of collaboration:** Insufficient collaboration among relevant stakeholders can hinder the progress of wind farm development. Without effective communication and cooperation, challenges may arise in addressing shared concerns, finding common ground, and streamlining processes.

- **Lack of local developers' involvement:** The absence of a local connection or involvement of local developers and companies in wind energy projects can undermine social acceptance. Lack of trust and identification with the project may arise if the local community perceives foreign entities as disconnected from local interests and concerns.

- **Insufficient or limited dialogue:** Holding only a single meeting or failing to maintain continuous dialogue with stakeholders can hinder the participation process. Stakeholders should be provided with ample opportunities to express

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their opinions, raise concerns, and provide input throughout the project's lifecycle. Establishing effective communication channels and actively seeking feedback are essential for successful public engagement.

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5 Cross-fertilisation analysis

This section includes the synthesis of the pilots' survey, the identification of barriers and drivers through the EU survey, the fusion of the interviews from the pilot cases and the final comparison between the EU and pilot survey.

5.1 Pilots' survey synthesis

To analyse the data collected in the pilot surveys, we used one-way ANOVA, also called analysis of variance. This is a statistical technique that compares the means of two or more groups to see if there are significant differences between them. It helps answer the question of whether the variation observed in the data is due to true group differences or to chance. In our study, we have four (4) groups, namely the pilot case countries, Spain, Italy, Norway and Greece, and we want to know if there is a significant difference between the groups for each factor we examine, that may affect the social acceptance of wind farms. With One-way ANOVA we can test this by looking at the variation within each group and comparing it to the variation between groups. If the variation between the groups is greater than the variation within the groups, this indicates that there is a significant difference between at least some of the groups.
After conducting an initial analysis of the pilot survey data using the one-way ANOVA and finding that there was a significant overall difference between the groups on some factors, we conducted post-hoc tests to further explore and compare the individual factors across the pilot case countries. As mentioned earlier, we have four groups for our study, namely the pilot case countries, Spain, Italy, Greece and Norway. In order to understand in which groups the individual factors differ, we conducted post-hoc tests. This test helps us to compare each group, i.e. the pilot case country, to see if certain pairs of pilot case countries differ significantly for a certain factor.
For example, the post-hoc test could show whether a factor, e.g. the support towards wind farms, is significantly different between group A and group B, or whether it is significantly different between group B and group C, and so on. It provides more detailed information by identifying specific group differences that were not obvious in the initial analysis. In summary, a post hoc test is a statistical analysis performed after an initial analysis, such as one-way ANOVA, to compare and identify specific differences between groups. For the reader interested in the one-way ANOVA and the post-hoc test analysis, the results can be found in Annex 8.3.

The main outcomes obtained through the statistical analysis using one-way ANOVA on the pilot-level survey data for each factor are presented below. It is important to consider that the primary findings of this analysis are specific to the pilot-level

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situation and may not necessarily extend to broader conclusions applicable to each individual pilot case country. For this reason, we conducted an EU wide level survey in order to assess the perceptions.

Support towards wind farms: Our results show a statistically significant negative difference in public support for wind farms in Norway compared to the other pilot countries. The result from the one-way ANOVA is in agreement with our results from the post hoc analysis, which states that the pilot case of Norway is statistically different from the other pilot cases of Spain, Italy and Greece in terms of support towards wind farms.

Attitudes towards wind farms: It seems that there is a significant difference in the public's attitude towards wind farms in the Norway pilot compared to the other pilot cases. This difference suggests that public opinion in the pilot case of Norway is more negative towards wind farms than in the pilots of Spain, Italy and Greece.

General acceptance: The general acceptance of wind farms in the Norway pilot also differs statistically significantly negatively from that in the other pilot countries. This means that the general acceptance of wind farms by the public in the pilot of Norway is negative compared to the pilot cases of Spain, Italy and Greece.

Perceived impact on tourism: It seems that the public in the Spain pilot case perceives the impact of wind farms more positively than in the other pilot countries (Italy, Norway, Greece). However, the post hoc analysis shows that there is no significant statistical difference between the pilot cases in terms of tourism impacts of wind farms.

Willingness to pay: The public in the pilot case of Greece seems to be more willing to pay more for a tourist accommodation that generated energy with the help of wind farms compared to the other pilot cases. This is also confirmed by our post hoc analysis, which also indicates that the public is more willing to pay for such tourist accommodation in the Greek pilot case.

Aesthetic impacts and distance: Aesthetic impact and distance appear to be negatively significantly different in Norway compared to the pilots of Greece, Italy and Spain. However, the post-hoc test shows no significant statistical difference between the pilot cases in terms of aesthetic impact and distance of wind turbines.

Health impacts: In Italy, there is a negative significant difference in the public's perception of the health impacts of wind turbines compared to the other pilot cases. The post hoc analysis shows that this negative difference exists between pilots of Italy

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and Spain and also between pilots of Italy and Norway. However, there does not seem to be a statistical difference between pilot cases of Italy and Greece regarding the health impacts of wind turbines.

Environmental impacts: In the pilot case of Norway, there is a positive statistical difference in the environmental impact of wind turbines compared to the pilot cases of Greece, Italy and Spain. This statistical difference is observed between the pilot case of Norway and Italy and between the pilot case of Norway and Greece, while this is not the case between pilots of Norway and Spain. This means that the public in the pilot of Norway perceives the environmental impact of wind turbines more positively than the public in the pilot cases of Italy and Greece. This result may be at odds with the results of general acceptance or attitudes towards wind farms in the pilot case of Norway, but it can be explained by the fact that reaction to wind farms and renewable energy technology in general is very subjective. In particular, some people may view renewable energy positively in terms of its environmental impact, but still react negatively to it.

Economic impacts: As for the economic impact of wind farms on the pilot cases, there does not seem to be a significant statistical difference. This is also confirmed by our post hoc analysis that there is no significant statistical difference between the pilot cases.

Siting process: There is a positive statistical difference in the siting of wind turbines in the Italy pilot case compared to the other pilot cases. However, the post hoc analysis shows no significant statistical difference for the siting process.

Trust in government: In terms of trust in government, the pilot case of Greece seems to show a negative statistically significant difference compared to the pilot cases of Spain, Italy and Norway. This is also evident in the post hoc analysis, particularly between the Greece and Spain pilot cases and the Italy and Greece pilot cases. This means that the public in the pilot case Greece is more negative towards trust in government than in the pilot cases Spain and Italy.

Below is a comparison of the results of the analysis of public support, attitudes and perceptions towards wind farms in the four pilot cases: Norway, Spain, Italy and Greece. The results show that the Norwegian pilot case has significantly lower public support, more negative attitudes and lower general acceptance of wind farms compared to the other pilot cases. The Spanish pilot case is characterised by a more positive perception of the impact of wind farms on tourism, while the Greek pilot shows a higher willingness to pay for tourist accommodation with energy generated by wind farms. The Norwegian pilot also differs significantly from the other pilots in

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terms of aesthetic impact and distance of wind turbines. In the Italian pilot case, the health impacts of wind turbines are perceived more negatively, while the Norwegian pilot perceives the environmental impacts more positively compared to the pilot cases of Italy and Greece. Overall, this analysis highlights the subjective nature of responses to renewable energy technology, with trust in government significantly lower in the Greek pilot case than in the Spanish, Italian and Norwegian pilot cases. However, there are no significant statistical differences between the pilots in terms of economic impact and siting of wind turbines.

5.2 EU survey synthesis

In this section we present the main results of the statistical analysis of the EU-level survey data collected, as well as the factors which may act as drivers or barriers to the social acceptance of wind farms. A visual classification of the drivers and barriers found through this analysis can be seen in Figure 85. As can be seen in Figure 85, some of the factors examined in the survey were excluded because they were not statistically significant (for $p < 0.01$) for the social acceptance of wind farms. For readers interested in a more comprehensive understanding, the detailed statistical analysis can be found in Annex 8.4.

5.2.1 Drivers for the social acceptance of wind farms

Egoistic value: Based on Figure 85, it seems that egoistic value can play an important role as a driver for the social acceptance of wind farms. According to the existing literature (Bouman et al., 2018), individuals who have strong egoistic values generally exhibit less environmentally friendly behaviour and hold weaker pro-environmental beliefs. However, this paradigm shifts when environmentally friendly behaviour aligns with egoistic benefits. For instance, if renewable energy sources are linked to cost savings, egoistic values may positively correlate with the acceptance of such energy sources. From this, a first conclusion can be drawn: In order to increase the social acceptance of wind farms in a particular area, relevant stakeholders should effectively communicate the benefits that residents can gain from the installation of a wind farm nearby, such as lower energy costs.

Altruistic value: Altruistic value also appears to be a driver for social acceptance of wind farms. Altruistic values reflect concern for the well-being and fair treatment of others. Altruistic values are positively related to the adoption of renewable energy sources, such as wind energy, as also observed in (Venugopal & Shukla, 2019).

Income: Our analysis further reveals that individual income may influence the acceptance of wind farms. This finding aligns with prior research (Sardianou &

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Genoudi, 2013) indicating a positive correlation between income levels and the adoption of renewable energy projects in residential areas. It has also been observed (Ross et al., 2022) that renewable energy deployment is often lower in communities with higher levels of poverty, unemployment and pollution.

Biospheric value: In our analysis, the biospheric value has been identified as an important factor in driving the social acceptance of wind farms. People who care about nature and the environment are those who advocate strong biospheric values. This observation may hold true as individuals who prioritise biospheric values are more likely to engage in pro-environmental behaviour, such as actively participating in wind farm development. Furthermore, these people have strong beliefs about the environment and can recognise wind energy as a sustainable and environmentally friendly energy source.

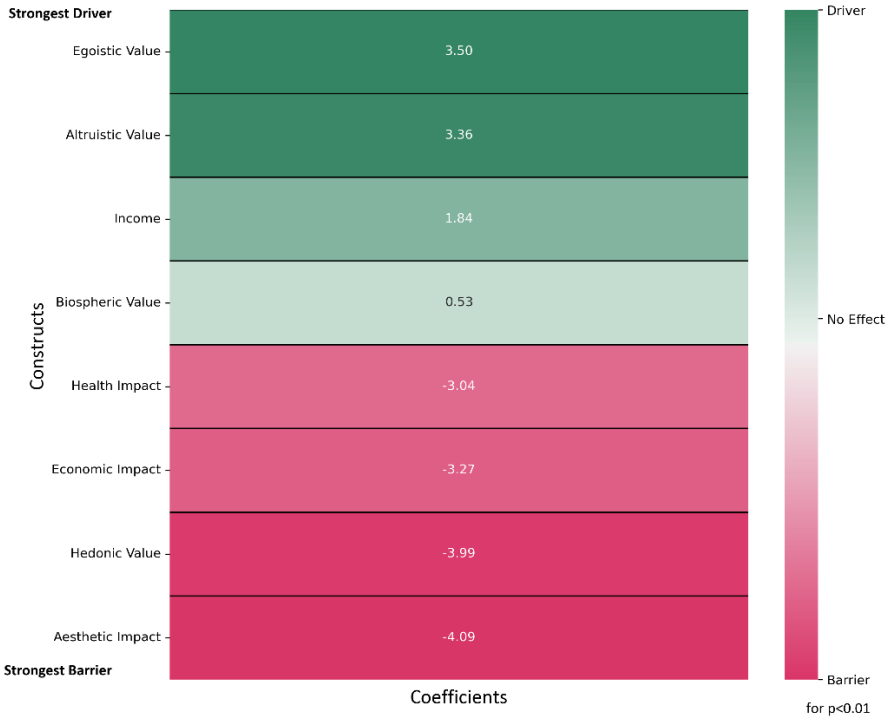

Figure 85: Visual classification of the drivers and barriers of the social acceptance of wind farms derived from our analysis (for p < 0.01) (source: WENDY EU-level survey)

5.2.2 Barriers for the social acceptance of wind farms

Perceived health impacts: The public's perceptions of the health impacts of wind farms could be a barrier to their acceptance. This suggests that the public is concerned that wind farms may have negative impacts on health.

Perceived economic impacts: Based on our findings, the public's perceptions of the economic impacts of wind farms act as a barrier towards their social acceptance.

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Hedonic value: Our analysis indicate that the acceptance of wind farms by the public may be influenced by hedonic values. Existing literature (Bouman et al., 2018) suggests that hedonic values can hinder the acceptance of renewable energy sources, depending on their interaction with other values and contextual factors. For example, if the public perceives renewable energy as aesthetically unpleasant compared to conventional energy sources, their hedonic values may negatively affect the uptake of renewable energy sources such as wind farms. Furthermore, if people prioritise immediate comfort or convenience over long-term sustainability, their hedonic values may also be a barrier to the acceptance of renewable energy.

Perceived aesthetic impacts: The aesthetic impact of wind turbines and the way they are perceived by the public seems to be a barrier to the acceptance of wind farms.

5.3 Interviews synthesis

The following section summarises the findings of the interviews in the four pilot areas. Common drivers and barriers related to 1) wind farm development, 2) establishment and continuation and 3) public participation were identified and presented in the following tables. In particular, wind farm development focuses on the initial stages of site selection and preparation, while the establishment and continuation of wind farms involve the construction, operation, and maintenance of the wind turbines and associated infrastructure.

Table 13: Common drivers to wind farm development across the WENDY pilot cases (source: WENDY interviews)

Drivers to Wind Farm Development	Italy	Spain	Greece	Norway
Climate change awareness and energy transition	X	X	X	
Economic development (e.g. job creation)	X	X		
Advances in turbine technology	X	X	X	X
Learning from past experiences with wind farm development	X	X		X
Geographical advantages for wind energy	X		X	
Incentives for citizens	X	X	X	X

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Table 14: Common barriers to wind farm development across the WENDY pilot cases (source: WENDY interviews)

Barriers to Wind Farm Development	Italy	Spain	Greece	Norway
Social opposition (Not In My BackYard Syndrome - NIMBY)	X	X		
Unstable regulatory conditions	X	X		
Slow and complex regulatory procedures	X	X	X	X
Negative public perception of the environmental impact of wind farms		X	X	
Unbalanced regional distribution of wind farms	X	X		
Lack of community involvement			X	X
Lack of public information	X	X	X	

Table 15: Common drivers to establishment and continuation of wind farm projects across the WENDY pilot cases (source: WENDY interviews)

Drivers to Establishment and Continuation of Wind Farm Projects	Italy	Spain	Greece	Norway
Offshore wind farm potential	X	X		X
Demand for renewable energy	X		X	X
Awareness raising for wind farm projects		X	X	
Effective coordination of multiple entities		X		X
Well-executed wind farm planning			X	X
Economic benefits for local communities		X	X	X

Table 16: Common barriers to establishment and continuation of wind farm projects across the WENDY pilot cases (source: WENDY interviews)

Barriers to Establishment and Continuation of Wind Farm Projects	Italy	Spain	Greece	Norway
Lack of social acceptance for wind farms		X	X	
Lack of electricity storage facilities		X	X	
Conflict of interest between different parties	X			X
Permitting challenges / slow bureaucratic administrative system	X	X	X	

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Limited access to the grid for wind turbines		X		X
Problems in planning a wind farm project			X	X

Table 17: Common drivers to public participation in wind farm projects across the WENDY pilot cases (source: WENDY interviews)

Drivers to Public Participation in Wind Farm Projects	Italy	Spain	Greece	Norway
Transparent communication between the public and stakeholders	X			X
Public knowledge and awareness about wind farms	X		X	X
Financial support (e.g. funding for local communities)	X		X	X
Involvement of local authorities	X	X		
Legal framework for public participation		X	X	X

Table 18: Barriers to public participation in wind farm projects across the WENDY pilot cases (source: WENDY interviews)

Barriers to Public Participation in Wind Farm Projects	Italy	Spain	Greece	Norway
Environmental concerns of the public about wind farms	X		X	X
Misinformation about wind farms (e.g. in the media)	X	X	X	
Lack of social acceptance (e.g. scepticism, negative attitudes)	X	X	X	X
Limited participation of small local businesses	X		X	
Presence of some regulatory gaps	X		X	

5.4 EU and pilot cases survey comparison

In the following section the comparison between the pilot cases and EU survey results is presented. The identified factors are examined and compared to identify whether factors assumed significant at a regional level are indeed important in driving public preferences across Europe.

Knowledge about wind farms

Overall, in the pilot cases of Spain and Greece there is a more positive attitude towards wind turbines. Compared to the EU average, more respondents here fully agree with the benefits of wind turbines for optimising the energy mix and protecting the

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environment. The Italian pilot also shows a positive attitude, especially with regard to environmental protection. In the Norwegian pilot, however, the responses are more mixed as the percentage of agreement is lower in certain areas. In the pilot cases of Spain, Greece and Italy, the percentage of respondents expressing concern about the reliability of wind farms is higher than the EU average. In the pilot case of Norway, on the other hand, concern about reliability is lower and more in line with the EU average. These results suggest that while there is general agreement on the benefits of wind farms, there are also some regional differences in perceptions, with the pilot cases of Spain and Greece being more enthusiastic, Italy in between and Norway having some reservations due to previous wrong experiences with onshore wind farms without taking in account public opinion.

Acceptance of wind farms

From the comparison we have identified that the pilot cases of Spain, Greece and Italy consistently show greater support for wind energy and its role in building a sustainable future compared to the pilot case of Norway. These three pilot cases show similar attitudes, with a significant proportion of respondents strongly agreeing with statements about the installation of wind farms and their importance to a sustainable future. In the pilot case of Norway, on the other hand, the level of agreement with all statements is lower and the proportion of those who strongly agree is significantly lower. Comparing the results with the EU average, The Spain's pilot responses are generally in line with the EU average, while the pilots of Greece and Italy tend to show higher agreement with the statements than the EU average. In the pilt case of Norway, agreement is consistently lower compared to the EU average. These results suggest that while there is overall support for wind energy in the countries surveyed and in the EU, there are some regional differences in the level of enthusiasm and belief in the importance of wind energy for sustainability, with enthusiasm being lowest in the pilot of Norway and higher than the EU average in the pilots of Greece and Italy.

NIMBY Effect

The data show that the acceptance of wind farms varies widely across the countries studied and across the EU. The pilot cases of Spain, Greece and Italy generally show similar levels of acceptance at local level, with the pilot case of Italy showing the highest acceptance (low NIMBY effect) and the Norwegian the lowest (high NIMBY effect). These differences in acceptance can be influenced by various factors, such as geographical characteristics, cultural perceptions and energy policy.

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Furthermore, even though the acceptance of wind farms 500 m from the place of residence varies in the countries studied, the EU average shows a more positive attitude compared to some individual countries. Factors such as geographical location, cultural perception, local policies and proximity to existing wind farms may play a role in influencing public acceptance in individual countries.
In summary, while regional factors influence the acceptance of wind farms in individual countries, EU-wide preferences suggest that other important factors play a role in public acceptance of wind farms. These factors could include a broader EU energy policy, international commitments, technological advances and public awareness campaigns. Policy makers should carefully analyse both regional and EU-wide preferences in order to develop effective and inclusive strategies to promote renewable energy sources such as wind farms across the EU.

Type of wind farms acceptance

The data show that the acceptance of onshore and offshore wind farms varies across the countries studied and across the EU. The Spanish pilot case generally has higher acceptance rates for onshore and offshore wind farms than the pilot cases of Greece, Italy and Norway. The Norwegian pilot case stands out with the highest percentage of respondents who consider onshore and offshore wind farms "not at all acceptable" and "fully acceptable".

The pilot case of Greece shows a higher acceptance for offshore wind farms compared to the pilot cases of Italy and Norway but lags behind in the acceptance of onshore wind farms. The Italian pilot case shows a relatively higher acceptance for both onshore and offshore wind farms.

Overall, the EU average shows a higher level of acceptance for offshore wind farms compared to onshore wind farms. This suggests that offshore wind projects may meet with greater acceptance in the EU countries studied. However, it is important to consider regional differences and the local context when planning and implementing wind energy projects to ensure successful public acceptance and support. Factors affecting acceptance include geographical characteristics, local policies, public awareness, and the perceived environmental and community benefits and impacts of wind farms. Policy makers and stakeholders should take these differences into account to develop targeted strategies to promote renewable energy projects and address concerns in order to promote a sustainable transition to cleaner energy sources across the EU.

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Impact on tourism

The data shows that there is a significant level of disagreement among respondents in all countries and in the EU regarding concerns about the negative impact of wind farms on tourism. Overall, the EU average consistently shows a higher level of strong disagreement compared to individual countries at all geographical levels, indicating a stronger belief that wind farms do not have a negative impact on tourism at larger regional and national levels.

Of the individual countries, the Norwegian pilot consistently has the highest percentage of respondents disagreeing with the idea of negative impacts on tourism, while Spain has the second highest percentage of strong disagreement in most categories.

The results indicate that the impact of wind farms on tourism is generally perceived positively in the countries surveyed. Public awareness and support for renewable energy projects, such as wind farms, may be increasing, leading to decreasing concerns about their impact on tourism in different geographical areas.

However, it is important to note that these results reflect the perceptions of respondents and that the actual impact on tourism may depend on various factors, including the specific location and characteristics of wind farm projects.

Aesthetic and Visual impact

The data show that there are significant differences in perceptions and concerns about wind turbines between the countries surveyed. The pilot case of Spain shows higher levels of strong disapproval in most categories, indicating higher levels of disapproval of negative perceptions and concerns about wind turbines. The Greek pilot case, on the other hand, shows consistently lower levels of agreement, indicating a more positive perception of wind turbines.

In the pilots of Italy and Norway, agreement on certain aspects is higher than the EU average, especially regarding concerns about shadows or flicker from wind turbines and the size of wind turbines.

Overall, the EU average is consistently in between responses across pilot countries, suggesting that public opinions and concerns about wind turbines vary across Europe. These differences may be influenced by factors such as local experience with wind

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farms, cultural attitudes towards renewable energy and the place of wind energy in each country's energy mix.

Environmental consideration

The data show that there are significant differences in perceptions and concerns about the potential impacts of wind farms between the countries studied compared to the EU average. The Greek pilot consistently shows higher levels of uncertainty and scepticism, particularly in relation to noise and visual pollution, and impacts on birds and flora. The Norwegian pilot case also shows higher levels of uncertainty in several areas, including concerns about impacts on fauna and flora, health impacts and electromagnetic disturbance. In contrast, the pilot case of Spain shows a more balanced view with a lower percentage of uncertainty and higher agreement on the potential positive impacts on pollution. These differences in public perceptions highlight the need for tailored approaches to address concerns and promote the acceptance of wind energy development in each country. Policy makers and stakeholders should effectively engage the public, provide transparent information and actively involve local communities to ensure a successful and sustainable implementation of wind energy across Europe.

Health and well-being associated with distance

The data show that perceptions and concerns about the potential health impacts of wind farms differ in the countries studied compared to the EU average. The Greek pilot consistently shows more concern about the negative impacts on human health and the health of people living near wind farms. The pilot case of Norway is also more concerned about health problems, such as noise pollution and low-frequency vibrations. In the pilots of Spain and Italy, concern in these areas is lower compared to the EU average. These differences highlight the importance of addressing public health concerns and providing accurate information to mitigate potential negative perceptions of wind energy projects. Working with local communities, ensuring appropriate siting and noise regulations, and conducting comprehensive health studies can help build confidence and promote the sustainable development of wind energy in each country.

Economic impact

The data show that there are some differences in views on the impact of wind turbines on stable local employment and local community enhancement between the countries

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studied. Spain stands out with a relatively high percentage of respondents believing that wind farms will lead to a net gain in stable local jobs, while the pilots of Greece and Norway show a slightly lower percentage of agreement in this regard.
Regarding the belief that wind turbine installations improve the local community, The pilot case of Greece shows a significantly higher level of agreement, indicating a more positive perception compared to the EU average. The pilot case of Italy also shows a more positive attitude in this regard.
In terms of concerns about wind farms and their potential impact on property values and economic benefits in the community, the data shows some differences between the countries surveyed. The pilot cases of Spain and Greece stand out with a higher percentage of respondents disagreeing with the fear that wind farms could lower property values. In the pilot cases of Italy and Norway, on the other hand, more respondents agreed with the concern that the economic benefits do not adequately outweigh the risks to the community.
Regarding concerns about the fair distribution of economic benefits, the percentage of strong agreement is higher in the pilot cases of Greece, Italy and Norway than the EU average. In the Spanish pilot case, the percentage of strong agreement on this concern is close to the EU average.
Overall, the data suggest that respondents in the pilot cases of Spain, Greece, Italy and Norway are generally positive about the potential benefits of wind turbines. The differences observed between countries could be influenced by various factors, such as the development and perception of renewable energy projects in each country, local economic conditions and community engagement efforts.
In addition, the data suggests that respondents in the pilot cases of Greece, Italy and Norway are generally more positive about the potential economic benefits of wind farms and less concerned about their impact on property values. On the other hand, respondents in the pilot case of Spain are more concerned about the potential negative impacts on property values, but still show agreement regarding a fair distribution of economic benefits within the community.

Participation

In summary, the Greek pilot case stands out with a higher percentage of respondents who have actively opposed local wind farm projects and intend to continue to do so. This indicates a higher level of activism and engagement on this issue in the pilot case of Greece compared to the EU average. Opposition and intention to oppose wind farm projects is also higher in the pilot case of Norway. In contrast, opposition is lowest in the pilot case of Italy, while percentages in the Spanish pilot are relatively close to the EU average.

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Trust and procedural justice

In the pilot case of Greece, the proportion of respondents expressing concern about fairness in finding communities for wind farms and in selecting land for wind farms is higher than the EU average. Concerns about site selection are also slightly higher in Italy, while in the pilot cases of Spain and Norway agreement is relatively low compared to the EU average. The different responses may reflect different public perceptions of the transparency and fairness of decision-making processes related to wind farm projects in different countries.

The data show that trust in the role of government in decisions about wind farms and safety aspects varies across the countries studied. In the pilot case of Greece, trust is generally lower than the EU average, while the Norwegian pilot case shows higher levels of trust in most categories. The pilot cases of Spain and Italy are generally in line with the EU average, with the Italian pilot showing higher levels of trust in ensuring safe wind farm installations and carrying out safety checks.

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6 Conclusions

The comprehensive analysis of the social acceptance of wind farms in Europe provides valuable insights and implications for policy makers and stakeholders. The study comprised four main sections, including the synthesis of the pilot surveys, an EU-wide survey analysis, interviews and a comparison between the EU and the pilot surveys. Each section provided important information on factors influencing public attitudes towards wind energy, regional differences in uptake, and challenges and opportunities for promoting sustainable wind energy development.

The synthesis of the pilot survey showed that the pilot case of Norway seems to have the lowest support, attitude and general acceptance of wind farms compared to the other pilot cases (Spain, Italy and Greece). Conversely, the pilot cases of Spain, Italy and Greece showed higher levels of positive attitudes and support towards wind farms, with the Italian showing the highest support on most factors. There were no significant differences between the pilot cases in terms of economic impact and siting of wind farms.

The synthesis of the EU survey revealed several common drivers and barriers to social acceptance of wind farms across Europe. Selfish and altruistic values emerged as important drivers, underlining the importance of emphasising individual and community benefits in communication. Economic factors, such as income and local economic benefits, also played a crucial role in public support. On the other hand, perceived health impacts, aesthetic preferences and concerns about tourism and environmental impacts acted as barriers to acceptance.

The results of the interview synthesis provided a deeper understanding of the drivers and barriers to wind farm development and continuation and public participation. Climate change awareness, economic development, advances in turbine technology and learning from past experiences were identified as key drivers. Social resistance (NIMBY), regulatory challenges and lack of public participation were identified as barriers to the progress of wind energy projects. Transparent communication and public knowledge were identified as key factors in promoting public participation.

The comparison between the EU and the pilot surveys highlighted the regional differences in acceptance within each country. The pilot cases of Spain, Greece and Italy consistently showed higher support and acceptance of wind farms compared to the Norwegian pilot , with the pilot cases of Spain and Greece showing the highest support. It was found that on average in the EU, acceptance was higher for offshore wind farms than for onshore wind farms.

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The results of the study can be of great importance for policy makers and stakeholders in the renewable energy sector. Tailored strategies that address regional differences and specific concerns are essential to promote social acceptance of wind farms across Europe. Effective communication about the economic benefits and environmental advantages of wind farms is crucial to gain public support. In addition, addressing concerns about health impacts, aesthetic considerations and impacts on tourism can help overcome barriers to social acceptance.

To promote sustainable wind energy development, policy makers must prioritise public involvement and engage local communities throughout the planning and development process. Transparent communication and the dissemination of accurate information about the benefits and impacts of wind energy are crucial to gaining public trust. In addition, promoting economic benefits for local communities and establishing fair distribution mechanisms can increase public support and facilitate the transition to cleaner energy sources.

In summary, social acceptance of wind farms plays a crucial role in the successful implementation of renewable energy projects in Europe. By understanding regional differences and the specific factors that influence public attitudes, policy makers and stakeholders can develop targeted and inclusive strategies that realise the full potential of wind energy as a sustainable and important component of the renewable energy landscape in Europe.

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8 Annex

8.1 Pilot-level survey questionnaire

WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

Welcome note

Dear participant, welcome to our survey!
The survey lasts about 10-15 minutes. There are no right or wrong answers, this is about your views. All data is anonymised and your privacy is guaranteed.
Thank you for helping us gather relevant information!

What is WENDY all about?
WENDY is an EU funded (Horizon Europe) project aiming to unravelling the factors triggering social acceptance of wind farms through an in-depth analysis at three dimensions: social sciences and humanities, environmental sciences and technological engineering.

Your participation is contributing to our understanding of the awareness levels and perceptions regarding wind farms in your region. Additionally, you help us to identify NIMBY (Not In My Back Yard) phenomena and acceptance rates, considering geographical and socio-cultural differences the needs, perceptions and challenges of various wind energy projects.

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WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

CONSENT FORM

STUDY TITLE: Wind Farm Attitude Project

DESCRIPTION: This is a study which contains several parts. In the first part, you will be asked to answer some questions about your experience with wind farm projects. In the second part of the study, you will be asked to answer questions on your personal views on wind farm relevant project. In the third part you will be asked questions for your personal information such as age, area of residence, educational status and Net Annual Household Income for socio-demographic purposes. In the last part you will be asked questions regarding environmental impact.

RISKS AND BENEFITS: There is no risk associated with this study.

SUBJECT'S RIGHTS: If you have read this form and have decided to participate in this project, please understand your participation is voluntary and you have the right to discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. You have the right to refuse to answer particular questions. Your individual privacy will be maintained in all published and written data resulting from the study.

CONTACT INFORMATION: If you have any questions concerning this privacy policy or our data collection practices you may contact us at jperis@fcirce.es. We reserve the right to change this privacy policy at any time and inform all participants about the updates.

In addition to your opinion, we are collecting some personal information such as age, area of residence, educational status and Net Annual Household Income for socio-demographic purposes. The collected data will be saved and used until the end of the research period of the WENDY project (31/09/2025). The data will be only used for the purpose of the WENDY project, funded under the European Union Horizon Europe programme.

The lawfulness of the processing of personal data is determined pursuant to Article 6 of the EU's General Data Protection Regulation (GDPR). With respect to personal data, the processing of personal data is based on consent. White Research will be responsible for accessing and processing the data.

* 1. If you have read the information above and would like to participate in the study, please click "I consent."
Alternatively, if you do not want to complete the study, please click "I do not consent" and you will be redirected to the end of the study.

◯ I consent.

◯ I do not consent.

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WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

Personal views on wind farm relevant project.

* 2. Please indicate your agreement with the following statements: [1=Strongly Disagree; 2=Disagree; 3= Somewhat Disagree; 4=Neither Agree nor Disagree; 5= Somewhat Agree; 6=Agree; 7=Strongly Agree]

	1	2	3	4	5	6	7
Wind farms are beneficial for my country's energy mix optimization.	○	○	○	○	○	○	○
Wind farms are beneficial for my country's environmental protection	○	○	○	○	○	○	○
Wind farms are beneficial for my country's economic growth.	○	○	○	○	○	○	○
Wind farms are more readily available than other renewable energy solutions.	○	○	○	○	○	○	○
Wind farms are more economical than other renewable energy solutions.	○	○	○	○	○	○	○
Wind farms are unreliable (because sometimes there is no wind).	○	○	○	○	○	○	○

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* 3. Please indicate your agreement with the following statements: [1=Strongly Disagree; 2=Disagree; 43=Neither Agree nor Disagree; 4=Agree; 5=Strongly Agree]

	1	2	3	4	5
If there was a referendum (vote) on whether or not my community or village should install wind farms to produce energy — I would vote in favour of wind farms.	○	○	○	○	○
If there was a referendum (vote) on whether or not my municipality should host wind farms to produce energy for local residents — I would vote as in favour of wind farms.	○	○	○	○	○
Energy from wind turbines is an essential component for building a sustainable future in my community or village.	○	○	○	○	○

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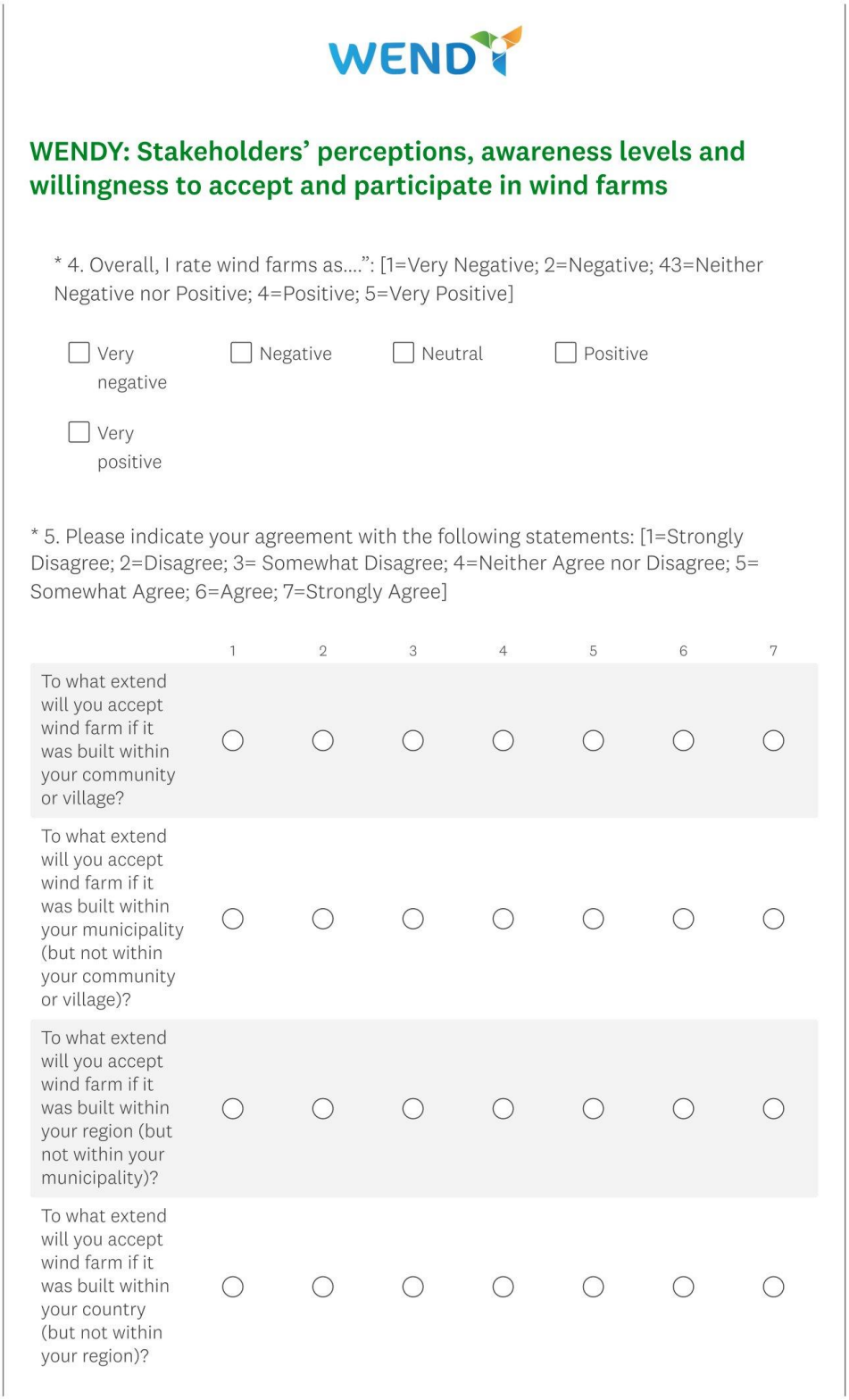

WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

* 4. Overall, I rate wind farms as....": [1=Very Negative; 2=Negative; 43=Neither Negative nor Positive; 4=Positive; 5=Very Positive]

☐ Very negative ☐ Negative ☐ Neutral ☐ Positive

☐ Very positive

* 5. Please indicate your agreement with the following statements: [1=Strongly Disagree; 2=Disagree; 3= Somewhat Disagree; 4=Neither Agree nor Disagree; 5= Somewhat Agree; 6=Agree; 7=Strongly Agree]

	1	2	3	4	5	6	7
To what extend will you accept wind farm if it was built within your community or village?	○	○	○	○	○	○	○
To what extend will you accept wind farm if it was built within your municipality (but not within your community or village)?	○	○	○	○	○	○	○
To what extend will you accept wind farm if it was built within your region (but not within your municipality)?	○	○	○	○	○	○	○
To what extend will you accept wind farm if it was built within your country (but not within your region)?	○	○	○	○	○	○	○

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* 6. Please indicate your acceptance with the following statements: [1=Not at all acceptable; 2=Rather not acceptable; 3=Neither unacceptable nor acceptable; 4=Rather acceptable; 5=Fully acceptable]

	1	2	3	4	5
How acceptable would you consider onshore wind farms?	○	○	○	○	○
How acceptable would consider offshore wind farms?	○	○	○	○	○

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WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

* 7. Please indicate your agreement with the following statements: [1=Strongly Disagree; 2=Disagree; 3= Somewhat Disagree; 4=Neither Agree nor Disagree; 5= Somewhat Agree; 6=Agree; 7=Strongly Agree]

	1	2	3	4	5	6	7
I am concerned that wind farms might have a negative impact on tourism within my community or village?	○	○	○	○	○	○	○
I am concerned that wind farms might have a negative impact on tourism within my municipality (but not within my community or village)?	○	○	○	○	○	○	○
I am concerned that wind farms might have a negative impact on tourism within my region (but not within my municipality)?	○	○	○	○	○	○	○
I am concerned that wind farms might have a negative impact on tourism within my country (but not within my region)?	○	○	○	○	○	○	○

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* 8. How much extra would you be willing to pay (in percentage) for a tourist accommodation to have energy produced by wind farms?

◯ 0% ◯ 1-5% ◯ 5-10% ◯ 10-20% ◯ 20-30% ◯ 30-40% ◯ 50%

◯ 100%

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WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

* 9. Please indicate your agreement with the following statements: [1=Strongly Disagree; 2=Disagree; 43=Neither Agree nor Disagree; 4=Agree; 5=Strongly Agree]

	1	2	3	4	5
A single wind turbine is visually appealing, in any landscape.	○	○	○	○	○
Multiple wind turbines (greater than 10) are visually appealing in any landscape.	○	○	○	○	○
I am concerned about the shadows or flicker that wind turbines produce.	○	○	○	○	○
Wind turbines are generally too large.	○	○	○	○	○

* 10. How acceptable would you consider a wind farm at approximately 500m distance from your home? [1=Not at all acceptable; 2=Rather not acceptable; 3=Neither unacceptable nor acceptable; 4=Rather acceptable; 5=Fully acceptable]

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

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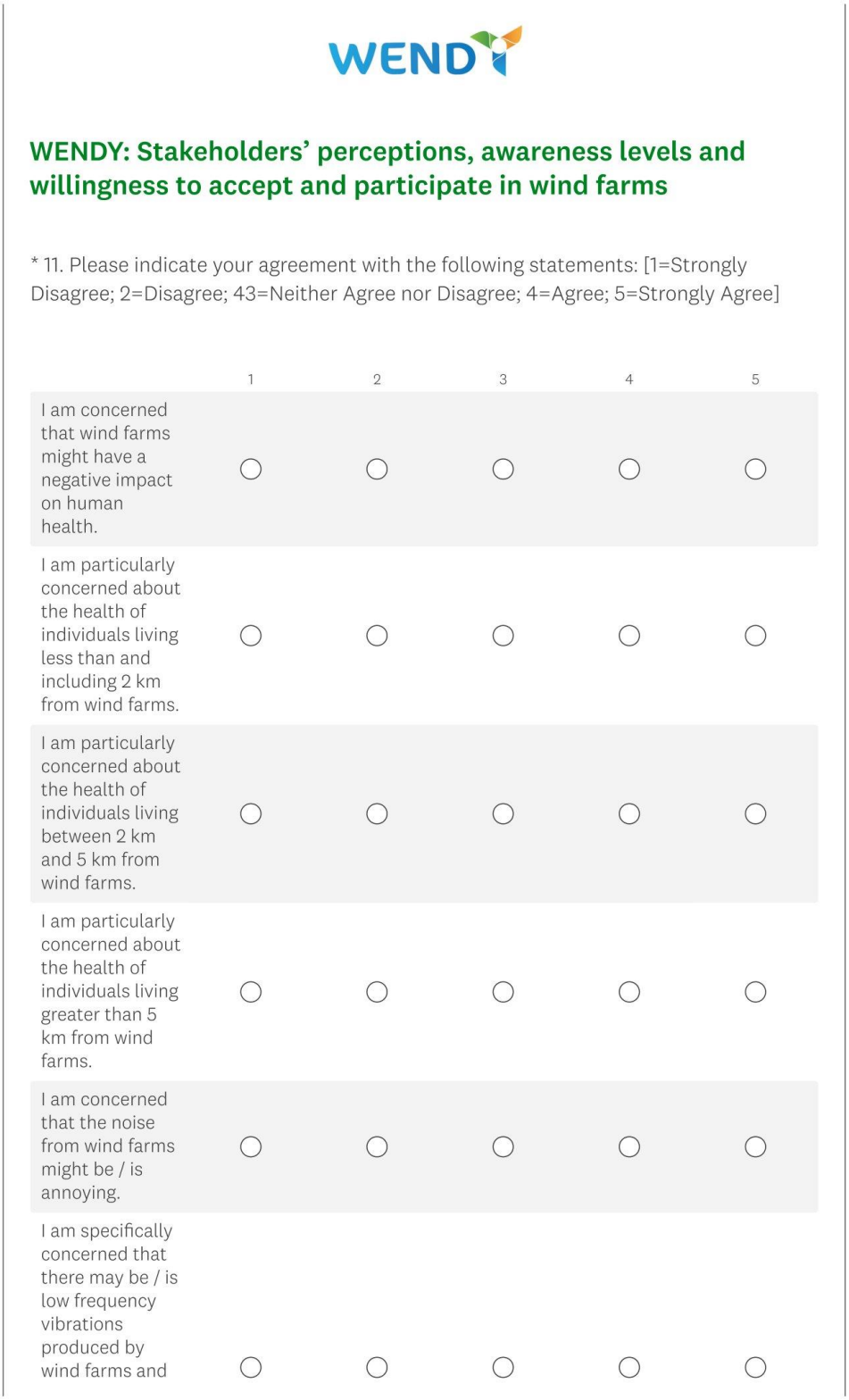

WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

* 11. Please indicate your agreement with the following statements: [1=Strongly Disagree; 2=Disagree; 43=Neither Agree nor Disagree; 4=Agree; 5=Strongly Agree]

	1	2	3	4	5
I am concerned that wind farms might have a negative impact on human health.	○	○	○	○	○
I am particularly concerned about the health of individuals living less than and including 2 km from wind farms.	○	○	○	○	○
I am particularly concerned about the health of individuals living between 2 km and 5 km from wind farms.	○	○	○	○	○
I am particularly concerned about the health of individuals living greater than 5 km from wind farms.	○	○	○	○	○
I am concerned that the noise from wind farms might be / is annoying.	○	○	○	○	○
I am specifically concerned that there may be / is low frequency vibrations produced by wind farms and	○	○	○	○	○

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* 12. Please indicate your agreement with the following statements: [1=Do not know; 2=Do not agree; 43=Partly agree; 4= Fully agree]

	1	2	3	4
The wind farm will give rise to noise pollution.	○	○	○	○
The wind farm will cause visual pollution.	○	○	○	○
The wind farm will cause deaths of migrating birds.	○	○	○	○
The wind farm will have a negative impact on the fauna of the region.	○	○	○	○
The wind farm will have a negative impact on the flora of the region.	○	○	○	○
The wind farm will have a negative impact on the health of the residents.	○	○	○	○
The wind turbines will cause problems due to electromagnetic interference.	○	○	○	○
The wind farm will contribute to the improvement of environmental pollution created from the imported fossil fuels.	○	○	○	○

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WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

* 13. Please indicate your agreement with the following statements: [1=Strongly Disagree; 2=Disagree; 43=Neither Agree nor Disagree; 4=Agree; 5=Strongly Agree]

	1	2	3	4	5
I am concerned that wind farms lower property values.	○	○	○	○	○
I believe that wind farm installations will supply a net gain in stable local employment.	○	○	○	○	○
I am concerned that the economic gains to the local community of wind farm installations do not adequately offset the negative impact of risks to the community.	○	○	○	○	○
I am concerned that the distribution of economic benefits from a wind farm installation may not be distributed fairly within the local community.	○	○	○	○	○
I am concerned that the distribution of economic benefits from a wind farm installation may	○	○	○	○	○

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not be distributed fairly within the region.					
I am concerned that the process for finding communities to host wind farm facilities is not fair.	○	○	○	○	○
I am concerned that the process for choosing whose property wind farms are to be installed on is not fair.	○	○	○	○	○
Wind turbine installations enhance the local community.	○	○	○	○	○
Wind turbine installations create community conflicts.	○	○	○	○	○

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WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

* 14. Have you...:

	YES	NO	Do not know
... been actively involved in opposing a local wind farm project?	○	○	○
... intended to take an active role in opposing a local wind farm project.?	○	○	○

* 15. I trust that the government or the responsible state authorities ...:[1=Strongly Disagree; 2=Disagree; 43=Neither Agree nor Disagree; 4=Agree; 5=Strongly Agree]

	1	2	3	4	5
... adequately consider the needs of local residents.	○	○	○	○	○
... a responsible decision is made whether a wind farm should be built.	○	○	○	○	○
... ensure that safe wind farm facilities are built.	○	○	○	○	○
... will carry out safety checks to ensure safe operation.	○	○	○	○	○

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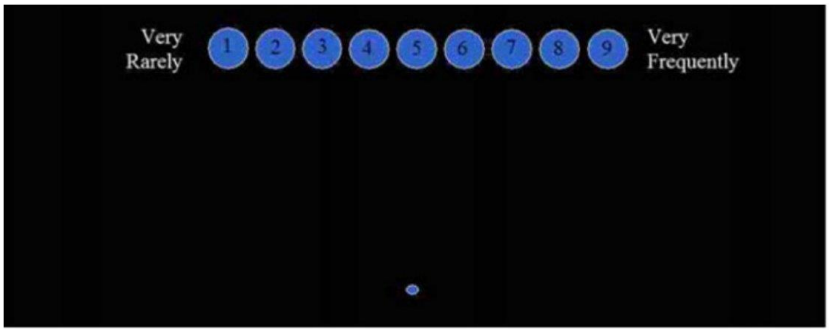
WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

* 16. Please click on the little blue circle at the bottom of the screen. Do not click on the scale items that are labeled from 1 to 9.



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WENDY: Stakeholders' perceptions, awareness levels and willingness to accept and participate in wind farms

Background Information

* 17. Please select the area that you are living in.

- ◯ Urban setting
- ◯ Peri-urban setting
- ◯ Rural setting
- ◯ Natural setting

* 18. Broadly speaking I live in...

- ◯ Mainland
- ◯ Island
- ◯ Coastline

19. Please select the country you currently live

Other (please specify)

* 20. Please name the city/town/village that you are currently living in

* 21. Please indicate your age:

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* 22. Gender: How do you identify?

- ◯ Female
- ◯ Male
- ◯ Other
- ◯ Prefer not to say

* 23. What is the highest level of education you have completed?

- ◯ Did Not Complete High School
- ◯ High School/GED
- ◯ College
- ◯ Bachelor's Degree
- ◯ Master's Degree
- ◯ Advanced Graduate work or Ph.D.

* 24. What is your Net Annual Household Income (in Euros)?

- ◯ €5.000 or less
- ◯ €5.001 - €15.000
- ◯ €15.001 - €25.000
- ◯ €25.001 - 35.000
- ◯ €35.001 - €45.000
- ◯ €45.001 - €55.000
- ◯ €55.001 - €65.000
- ◯ €65.001 - €75.000
- ◯ €75.001 or more

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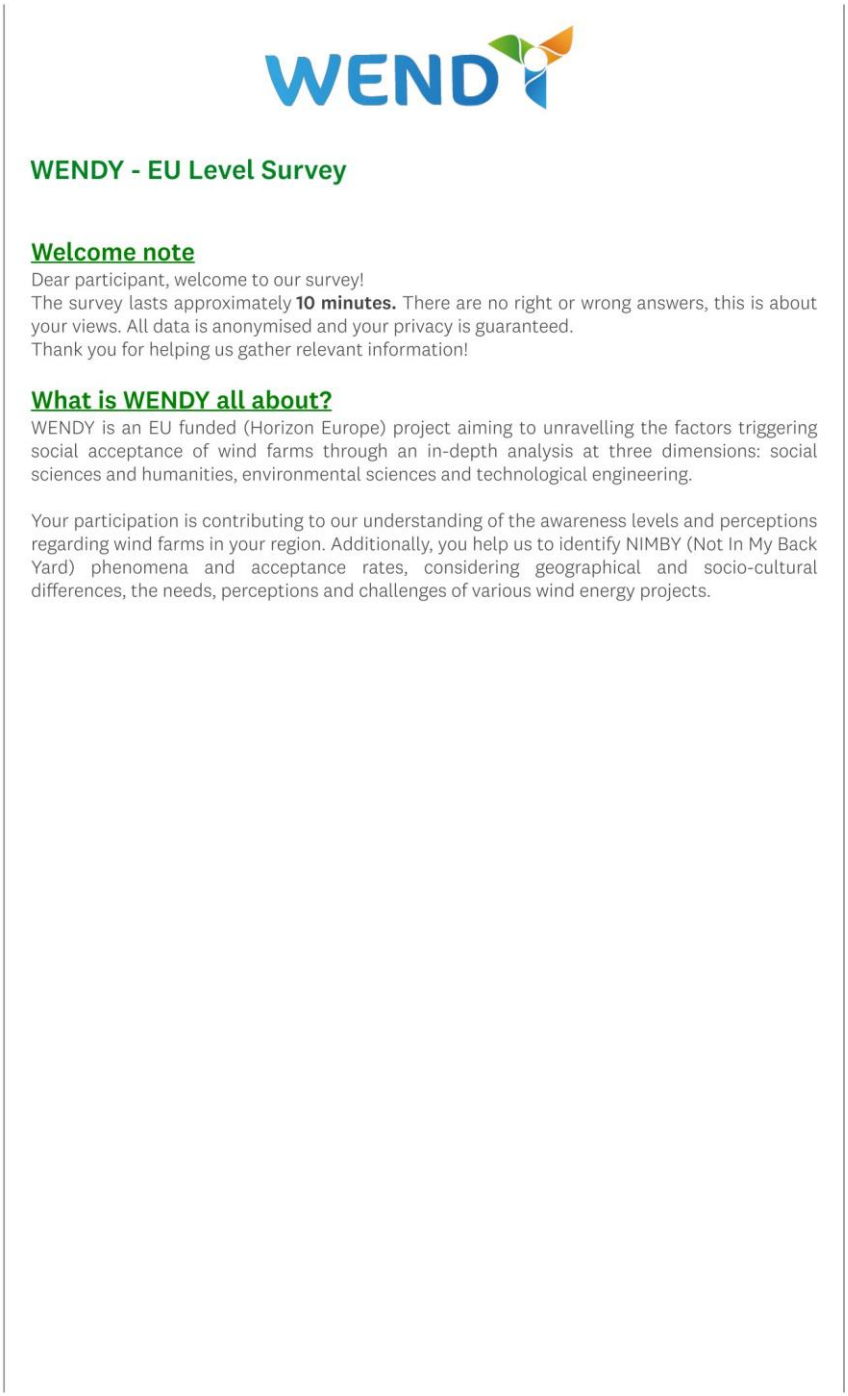
8.2 EU-level survey questionnaire



WENDY - EU Level Survey

Welcome note

Dear participant, welcome to our survey!
The survey lasts approximately **10 minutes.** There are no right or wrong answers, this is about your views. All data is anonymised and your privacy is guaranteed.
Thank you for helping us gather relevant information!

What is WENDY all about?

WENDY is an EU funded (Horizon Europe) project aiming to unravelling the factors triggering social acceptance of wind farms through an in-depth analysis at three dimensions: social sciences and humanities, environmental sciences and technological engineering.

Your participation is contributing to our understanding of the awareness levels and perceptions regarding wind farms in your region. Additionally, you help us to identify NIMBY (Not In My Back Yard) phenomena and acceptance rates, considering geographical and socio-cultural differences, the needs, perceptions and challenges of various wind energy projects.

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WENDY - EU Level Survey

STUDY TITLE: Wind Farm Attitude Project

DESCRIPTION: This is a study which contains several parts. In the first part, you will be asked to answer some questions about your experience with wind farm projects. In the second part of the study, you will be asked to answer questions on your personal views on wind farm relevant project. In the third part you will be asked questions for your personal information such as age, area of residence, educational status and Net Annual Household Income for socio-demographic purposes. In the last part you will be asked questions regarding environmental impact.

RISKS AND BENEFITS: There is no risk associated with this study.

SUBJECT'S RIGHTS: If you have read this form and have decided to participate in this project, please understand your participation is voluntary and you have the right to discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. You have the right to refuse to answer particular questions. Your individual privacy will be maintained in all published and written data resulting from the study.

CONTACT INFORMATION: If you have any questions concerning this privacy policy or our data collection practices you may contact us at jperis@fcirce.es. We reserve the right to change this privacy policy at any time and inform all participants about the updates.

In addition to your opinion, we are collecting some personal information such as age, area of residence, educational status and Net Annual Household Income for socio-demographic purposes. The collected data will be saved and used until the end of the research period of the WENDY project (31/09/2025). The data will be only used for the purpose of the WENDY project, funded under the European Union Horizon Europe programme.

The lawfulness of the processing of personal data is determined pursuant to Article 6 of the EU's General Data Protection Regulation (GDPR). With respect to personal data, the processing of personal data is based on consent. White Research will be responsible for accessing and processing the data.

1.
If you have read the information above and would like to participate in the study, please click "I consent."

Alternatively, if you do not want to complete the study, please click "I do not consent" and you will be redirected to the end of the study.

◯ I consent.

◯ I do not consent.

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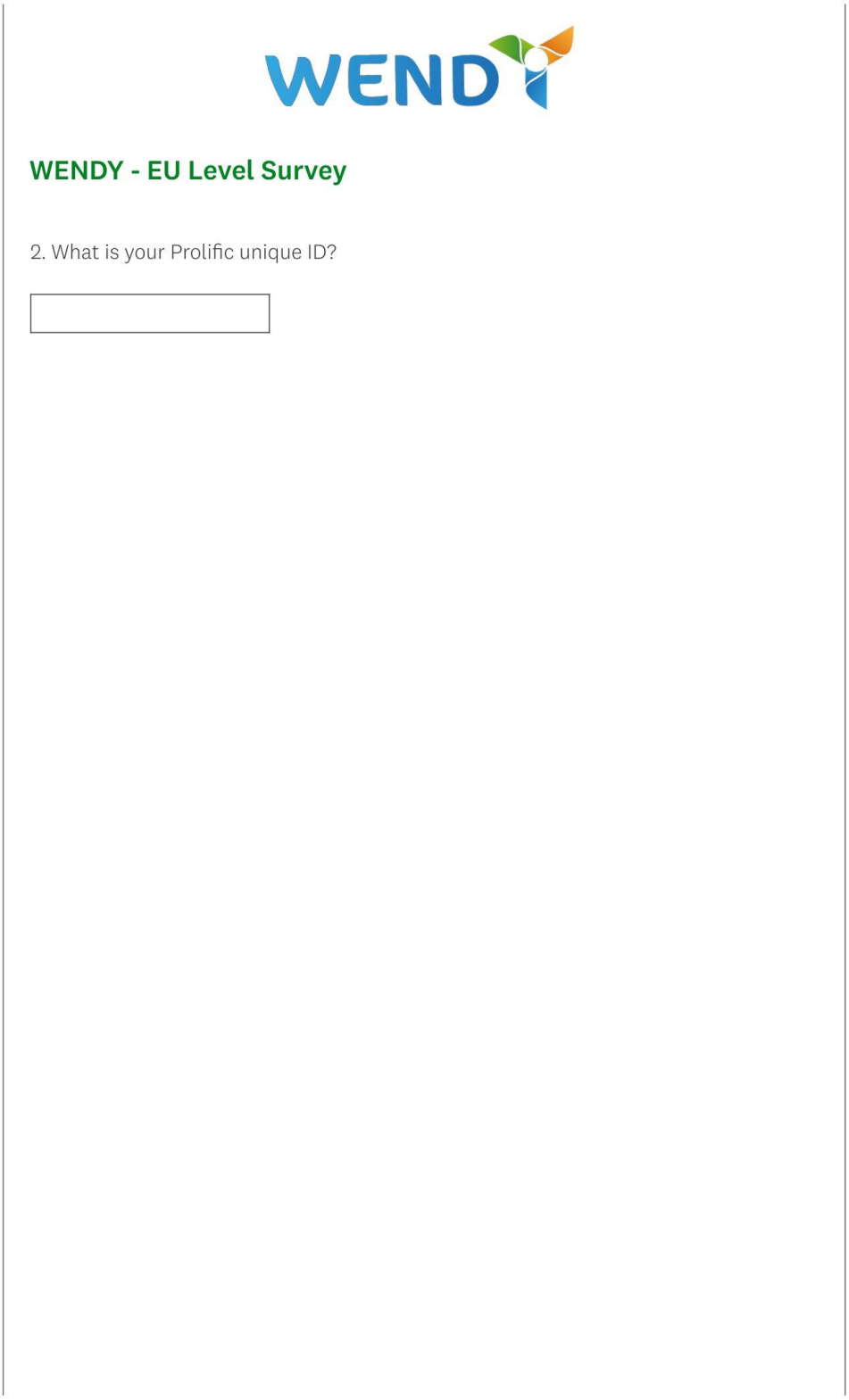

WENDY - EU Level Survey

2. What is your Prolific unique ID?

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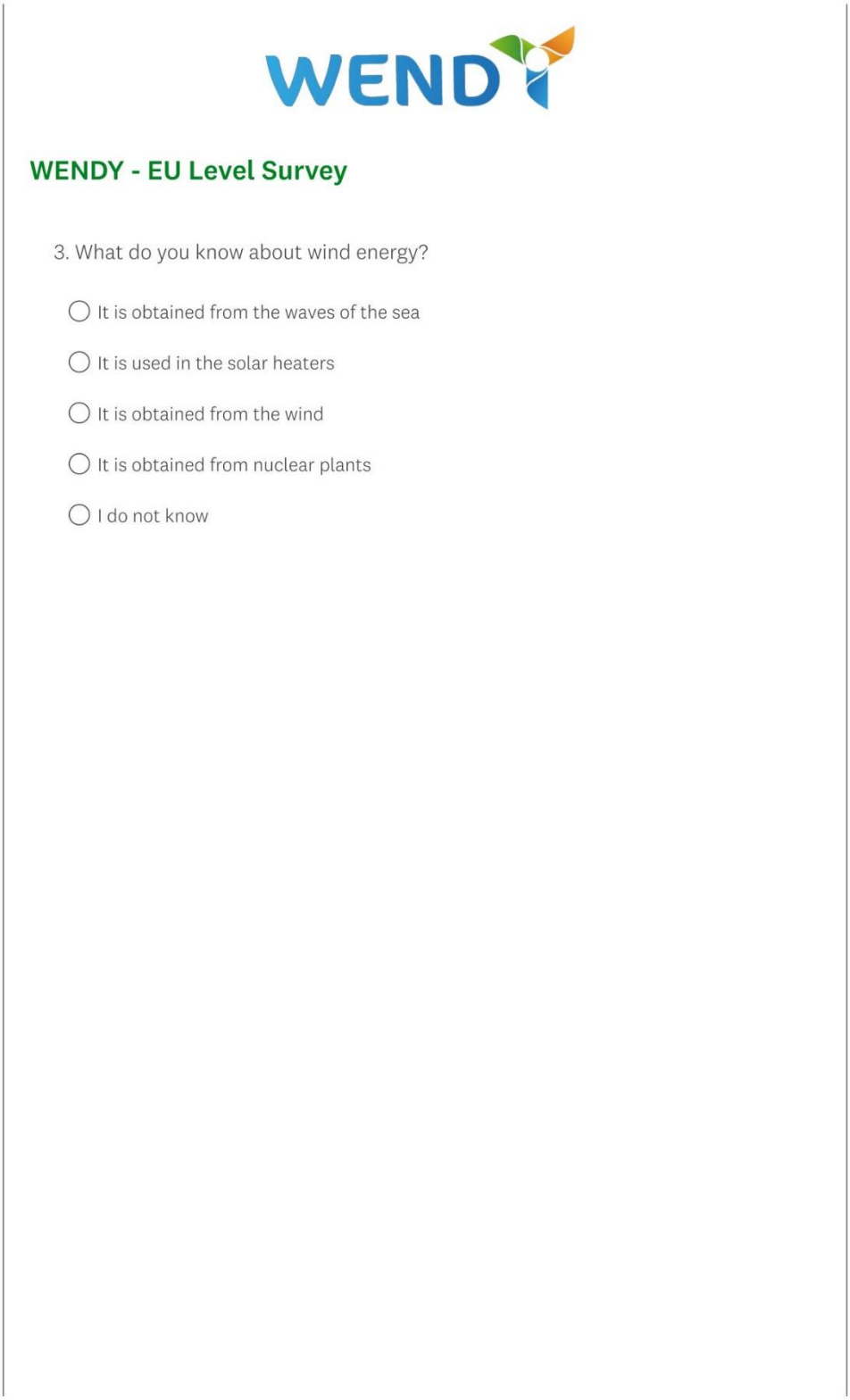

WENDY - EU Level Survey

3. What do you know about wind energy?

- ◯ It is obtained from the waves of the sea
- ◯ It is used in the solar heaters
- ◯ It is obtained from the wind
- ◯ It is obtained from nuclear plants
- ◯ I do not know

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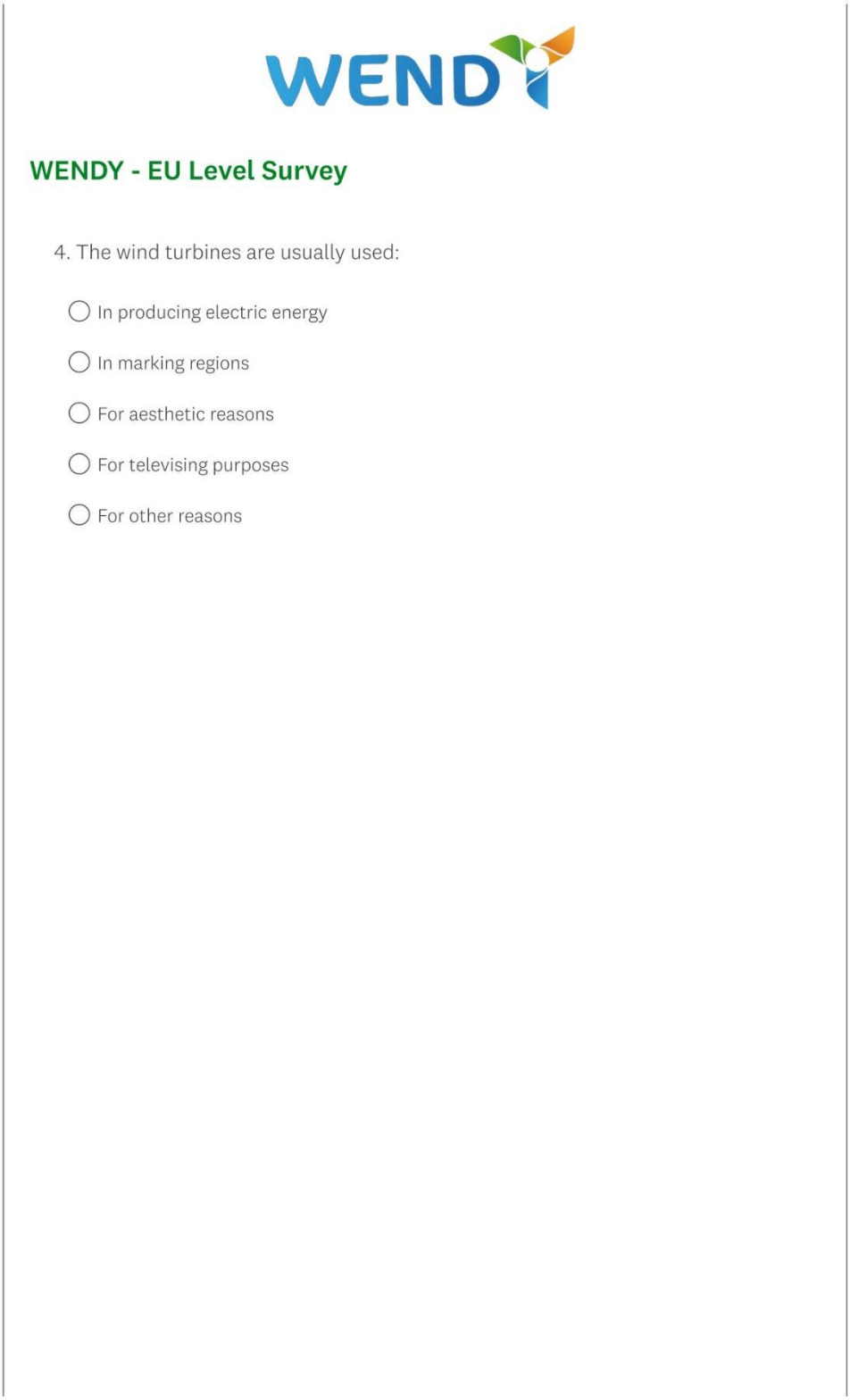

WENDY - EU Level Survey

4. The wind turbines are usually used:

- ◯ In producing electric energy
- ◯ In marking regions
- ◯ For aesthetic reasons
- ◯ For televising purposes
- ◯ For other reasons

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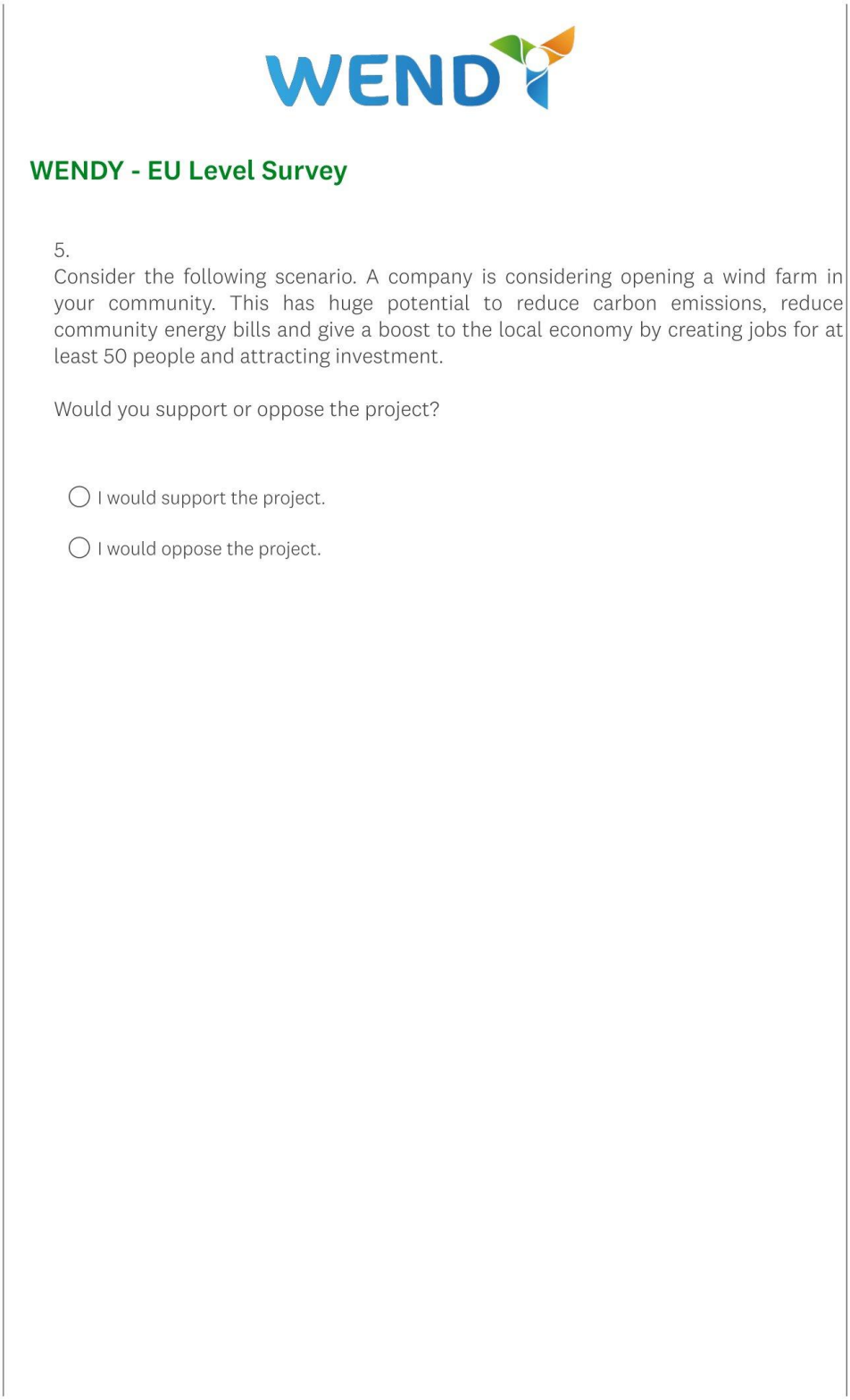

WENDY - EU Level Survey

5.
Consider the following scenario. A company is considering opening a wind farm in your community. This has huge potential to reduce carbon emissions, reduce community energy bills and give a boost to the local economy by creating jobs for at least 50 people and attracting investment.

Would you support or oppose the project?

◯ I would support the project.

◯ I would oppose the project.

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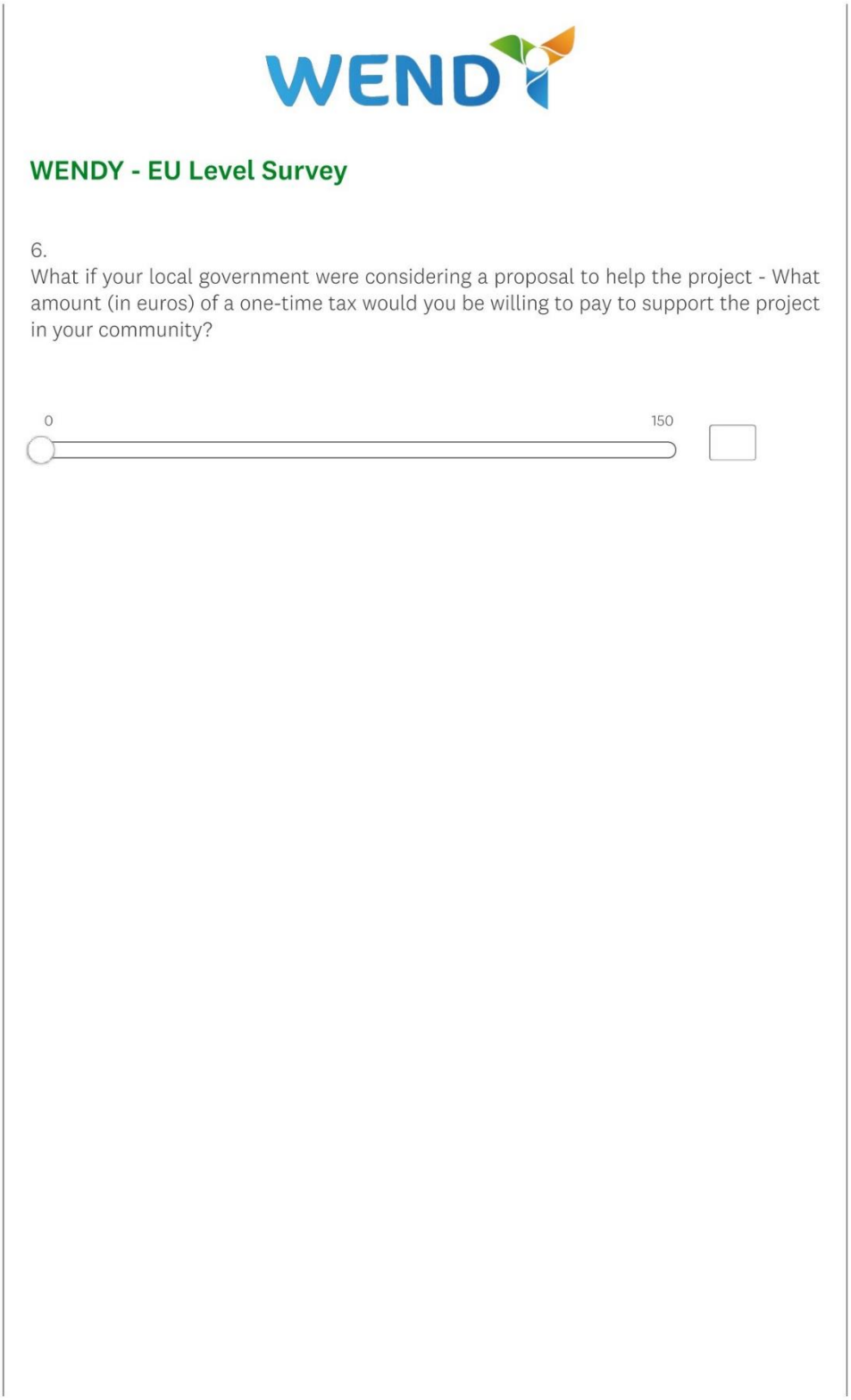

WENDY - EU Level Survey

6.
What if your local government were considering a proposal to help the project - What amount (in euros) of a one-time tax would you be willing to pay to support the project in your community?

0 150

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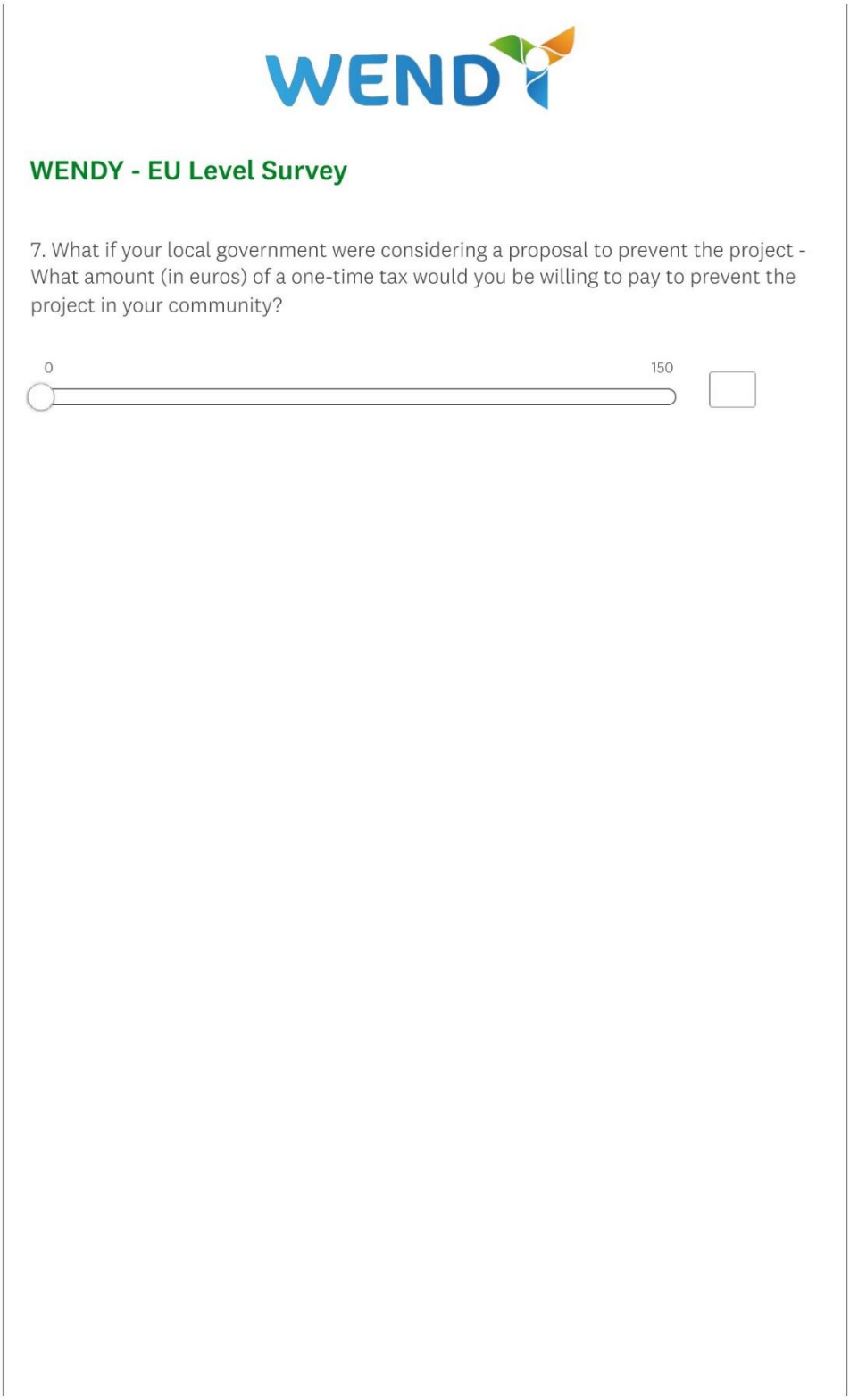

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WENDY - EU Level Survey

8. Please indicate your agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5	6	7 = Strongly Agree
Wind farms are beneficial for my country's energy mix optimization.	○	○	○	○	○	○	○
Wind farms are beneficial for my country's environmental protection	○	○	○	○	○	○	○
Wind farms are beneficial for my country's economic growth.	○	○	○	○	○	○	○
Wind farms are more readily available than other renewable energy solutions.	○	○	○	○	○	○	○
Wind farms are more economical than other renewable energy solutions.	○	○	○	○	○	○	○
Wind farms are unreliable (because sometimes there is no wind).	○	○	○	○	○	○	○

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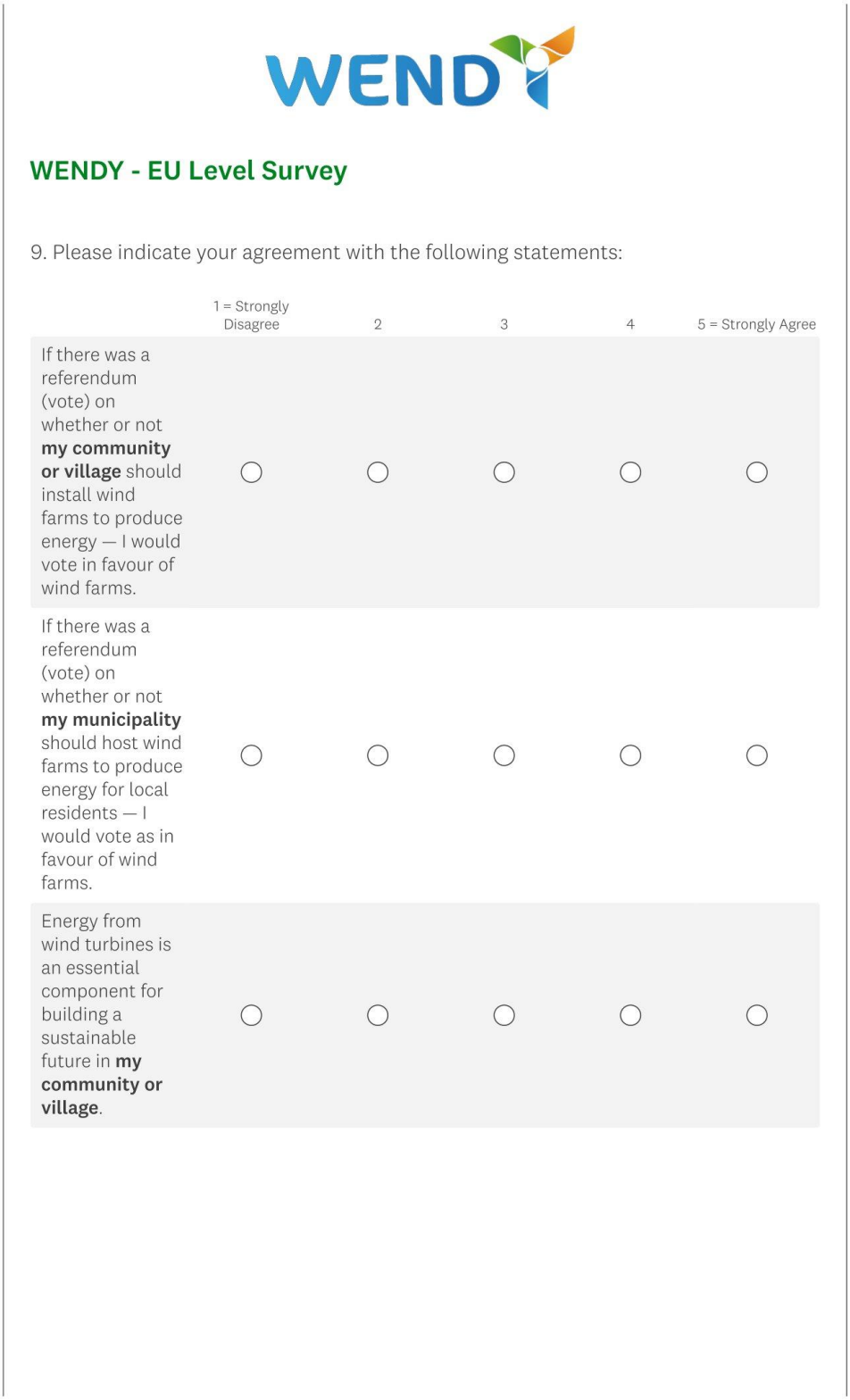

WENDY - EU Level Survey

9. Please indicate your agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
If there was a referendum (vote) on whether or not **my community or village** should install wind farms to produce energy — I would vote in favour of wind farms.	○	○	○	○	○
If there was a referendum (vote) on whether or not **my municipality** should host wind farms to produce energy for local residents — I would vote as in favour of wind farms.	○	○	○	○	○
Energy from wind turbines is an essential component for building a sustainable future in **my community or village**.	○	○	○	○	○

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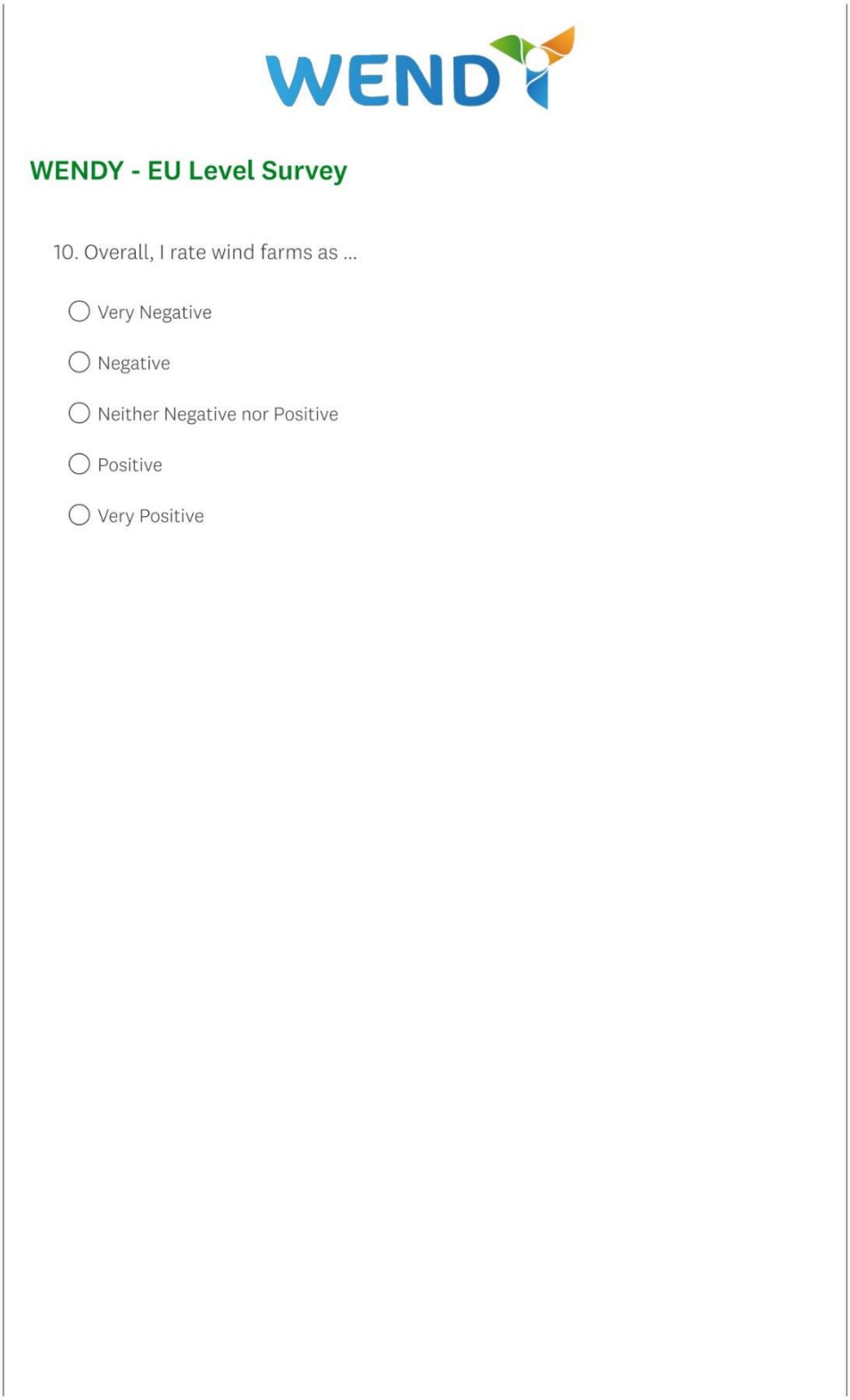

WENDY - EU Level Survey

10. Overall, I rate wind farms as ...

- ◯ Very Negative
- ◯ Negative
- ◯ Neither Negative nor Positive
- ◯ Positive
- ◯ Very Positive

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WENDY - EU Level Survey

11. Please indicate your agreement with the following statements:

	1 = Strongly Reject	2	3	4	5	6	7 = Strongly Accept
To what extend will you accept wind farm if it was built **within your community or village?**	○	○	○	○	○	○	○
To what extend will you accept wind farm if it was built **within your municipality** (but not within your community or village)?	○	○	○	○	○	○	○
To what extend will you accept wind farm if it was built **within your region** (but not within your municipality)?	○	○	○	○	○	○	○
To what extend will you accept wind farm if it was built **within your country** (but not within your region)?	○	○	○	○	○	○	○

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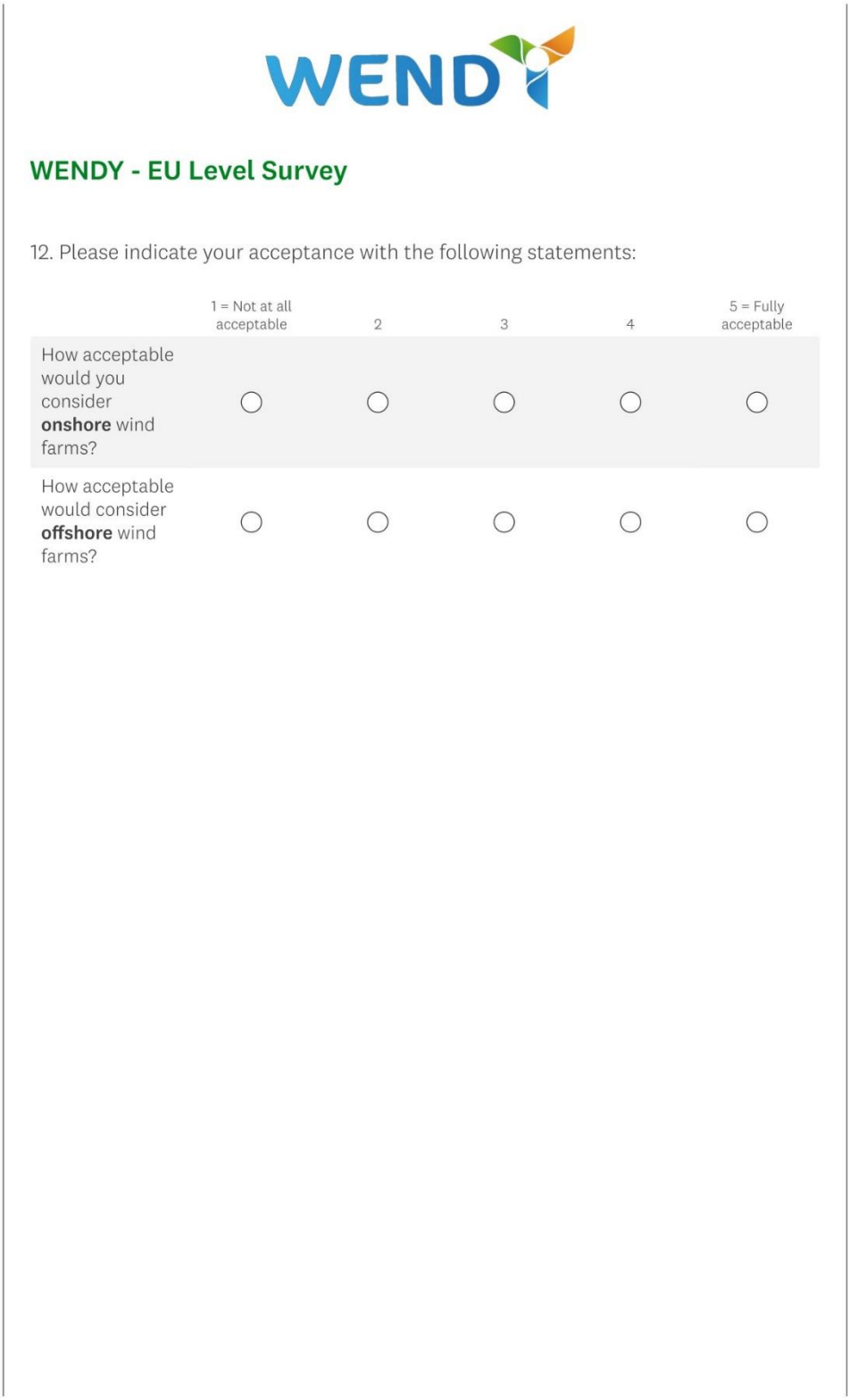

WENDY - EU Level Survey

12. Please indicate your acceptance with the following statements:

	1 = Not at all acceptable	2	3	4	5 = Fully acceptable
How acceptable would you consider **onshore** wind farms?	○	○	○	○	○
How acceptable would consider **offshore** wind farms?	○	○	○	○	○

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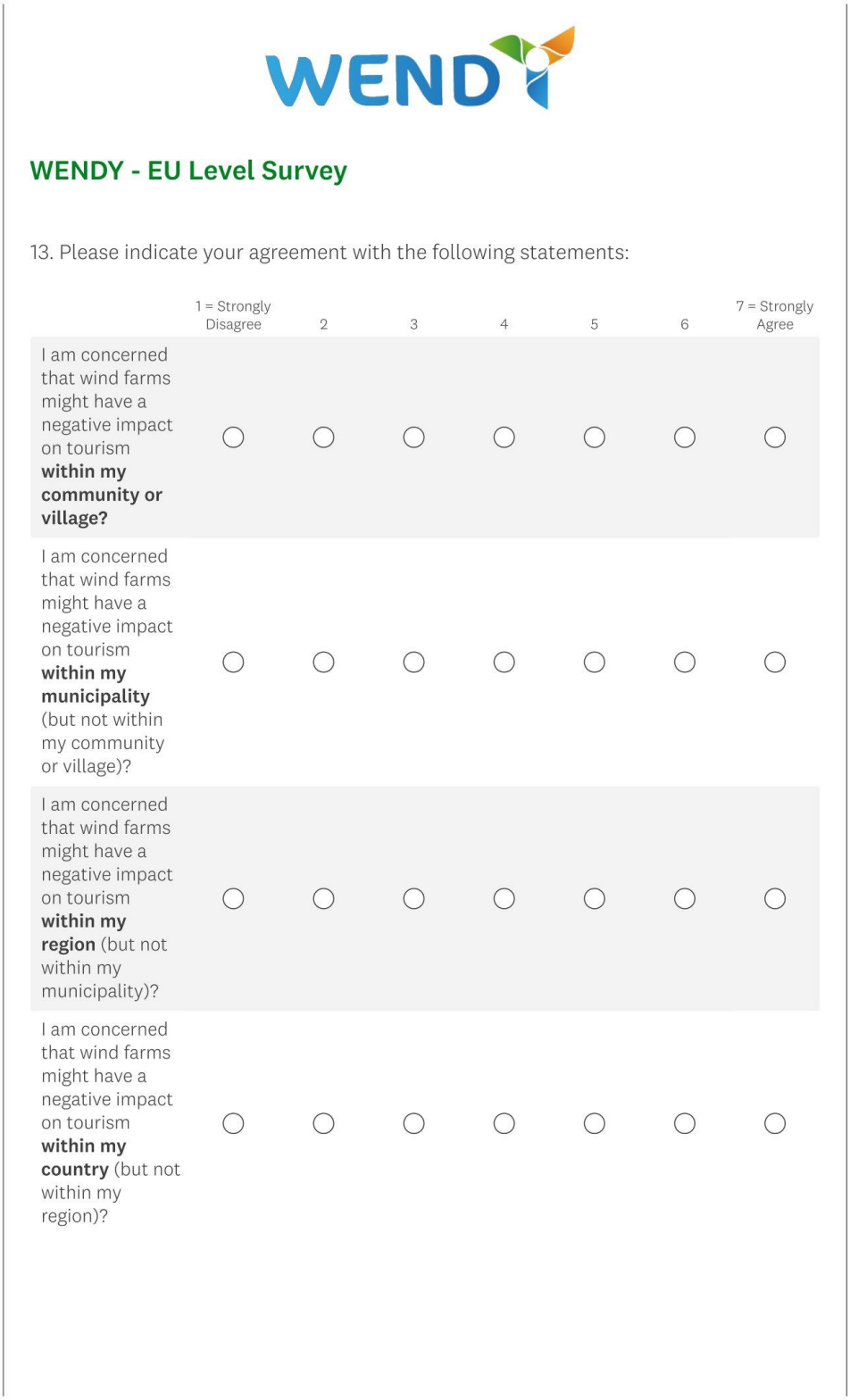

WENDY - EU Level Survey

13. Please indicate your agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5	6	7 = Strongly Agree
I am concerned that wind farms might have a negative impact on tourism **within my community or village?**	○	○	○	○	○	○	○
I am concerned that wind farms might have a negative impact on tourism **within my municipality** (but not within my community or village)?	○	○	○	○	○	○	○
I am concerned that wind farms might have a negative impact on tourism **within my region** (but not within my municipality)?	○	○	○	○	○	○	○
I am concerned that wind farms might have a negative impact on tourism **within my country** (but not within my region)?	○	○	○	○	○	○	○

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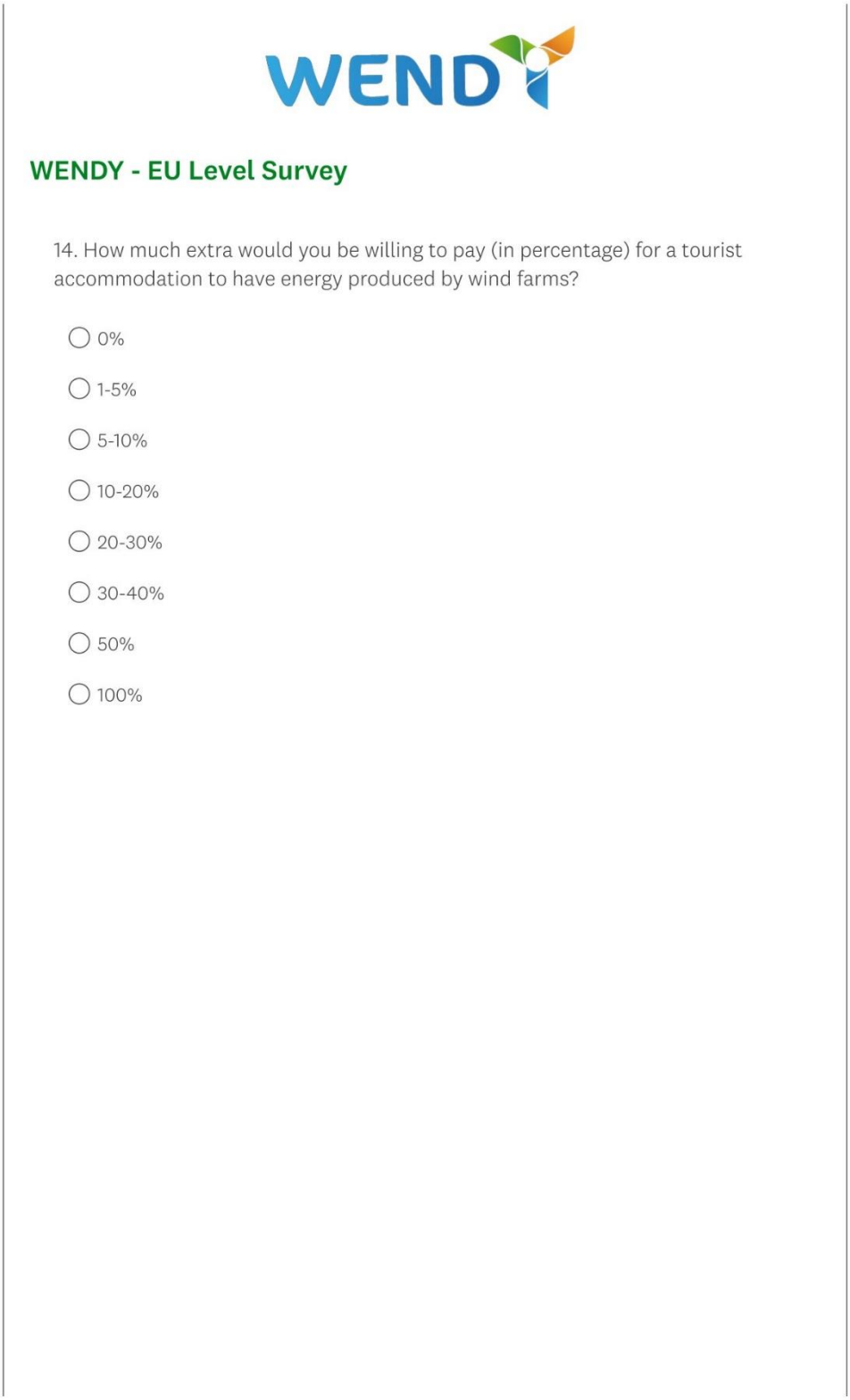

WENDY - EU Level Survey

14. How much extra would you be willing to pay (in percentage) for a tourist accommodation to have energy produced by wind farms?

- ◯ 0%
- ◯ 1-5%
- ◯ 5-10%
- ◯ 10-20%
- ◯ 20-30%
- ◯ 30-40%
- ◯ 50%
- ◯ 100%

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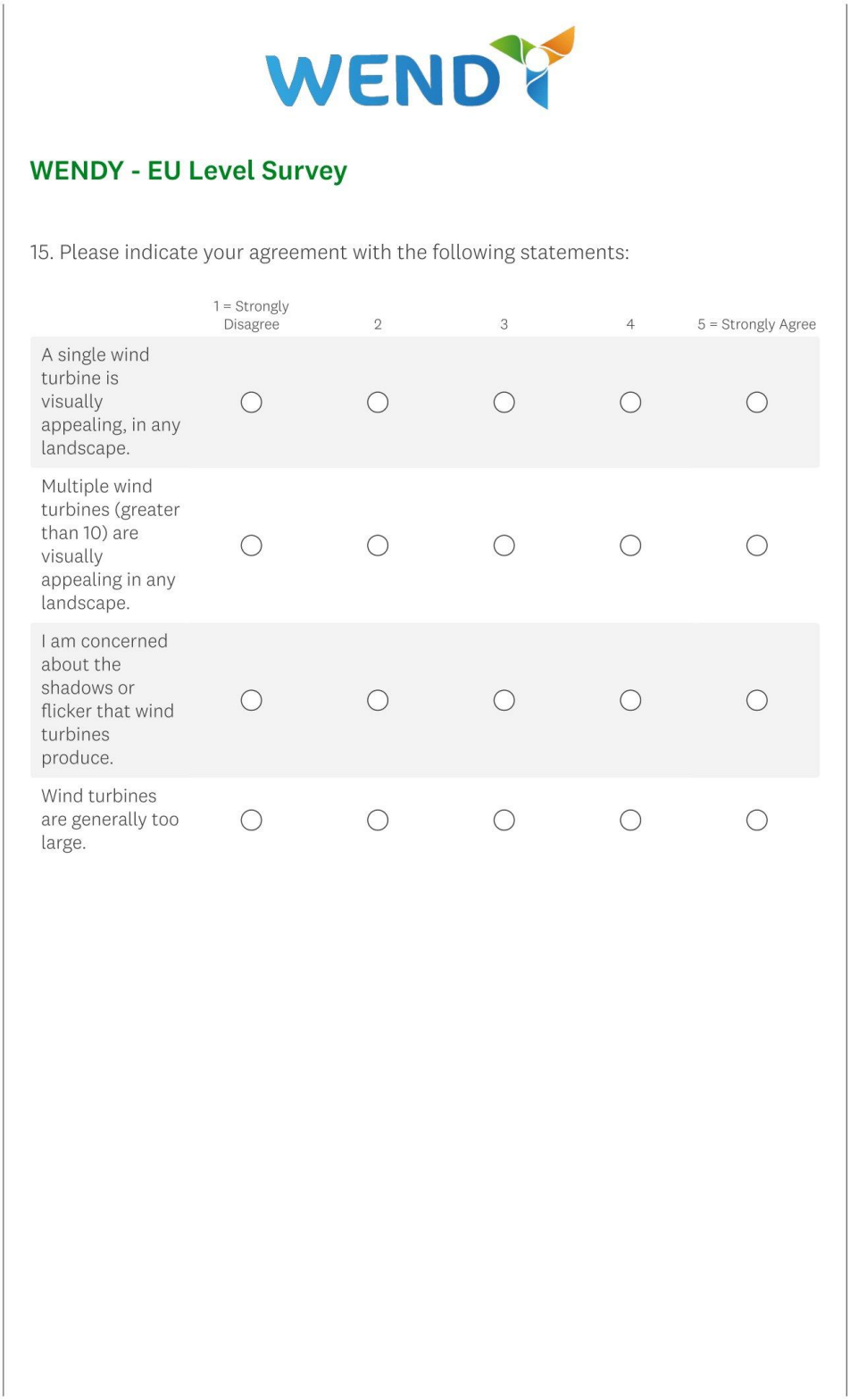

WENDY - EU Level Survey

15. Please indicate your agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
A single wind turbine is visually appealing, in any landscape.	○	○	○	○	○
Multiple wind turbines (greater than 10) are visually appealing in any landscape.	○	○	○	○	○
I am concerned about the shadows or flicker that wind turbines produce.	○	○	○	○	○
Wind turbines are generally too large.	○	○	○	○	○

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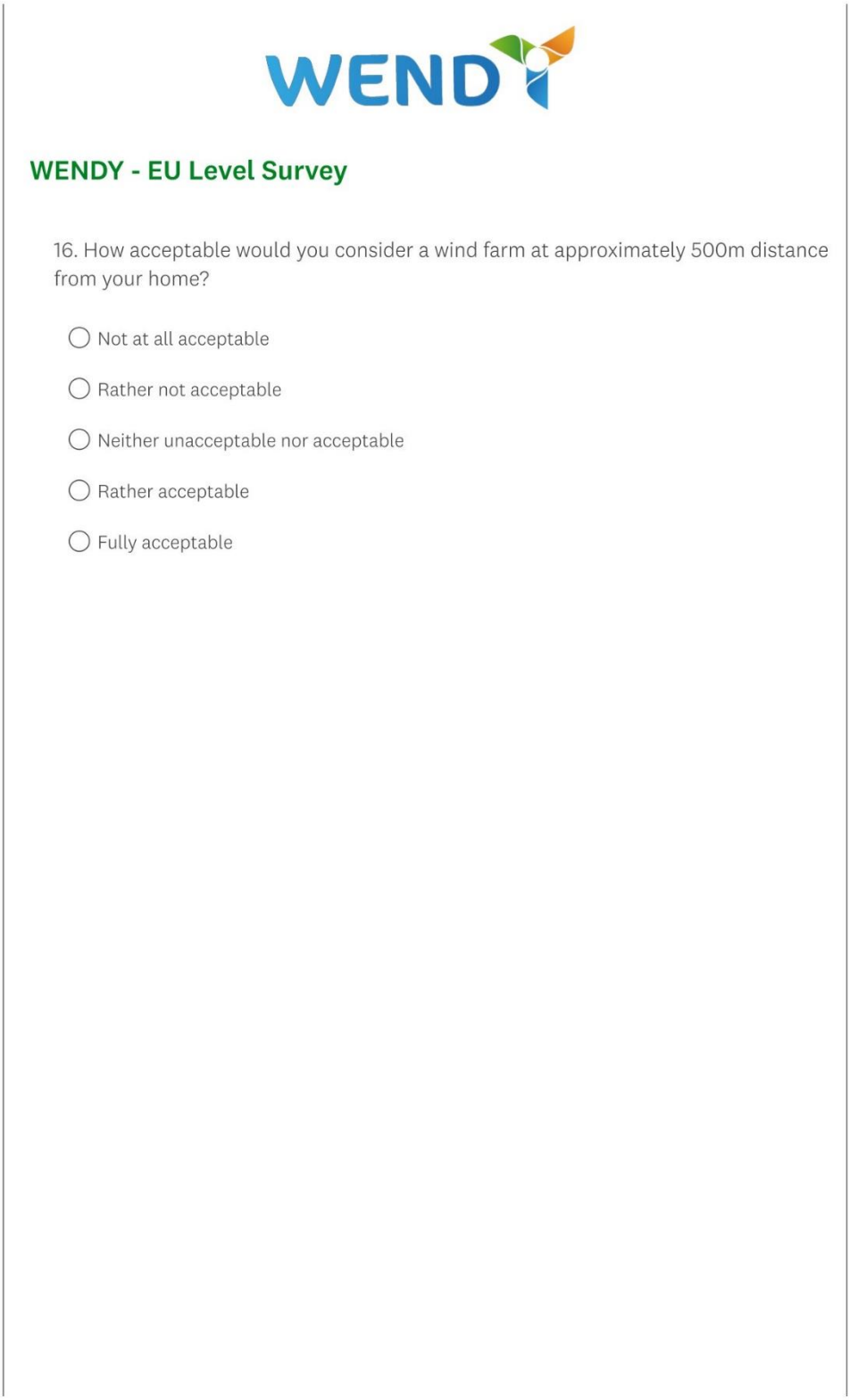

WENDY - EU Level Survey

16. How acceptable would you consider a wind farm at approximately 500m distance from your home?

- ◯ Not at all acceptable
- ◯ Rather not acceptable
- ◯ Neither unacceptable nor acceptable
- ◯ Rather acceptable
- ◯ Fully acceptable

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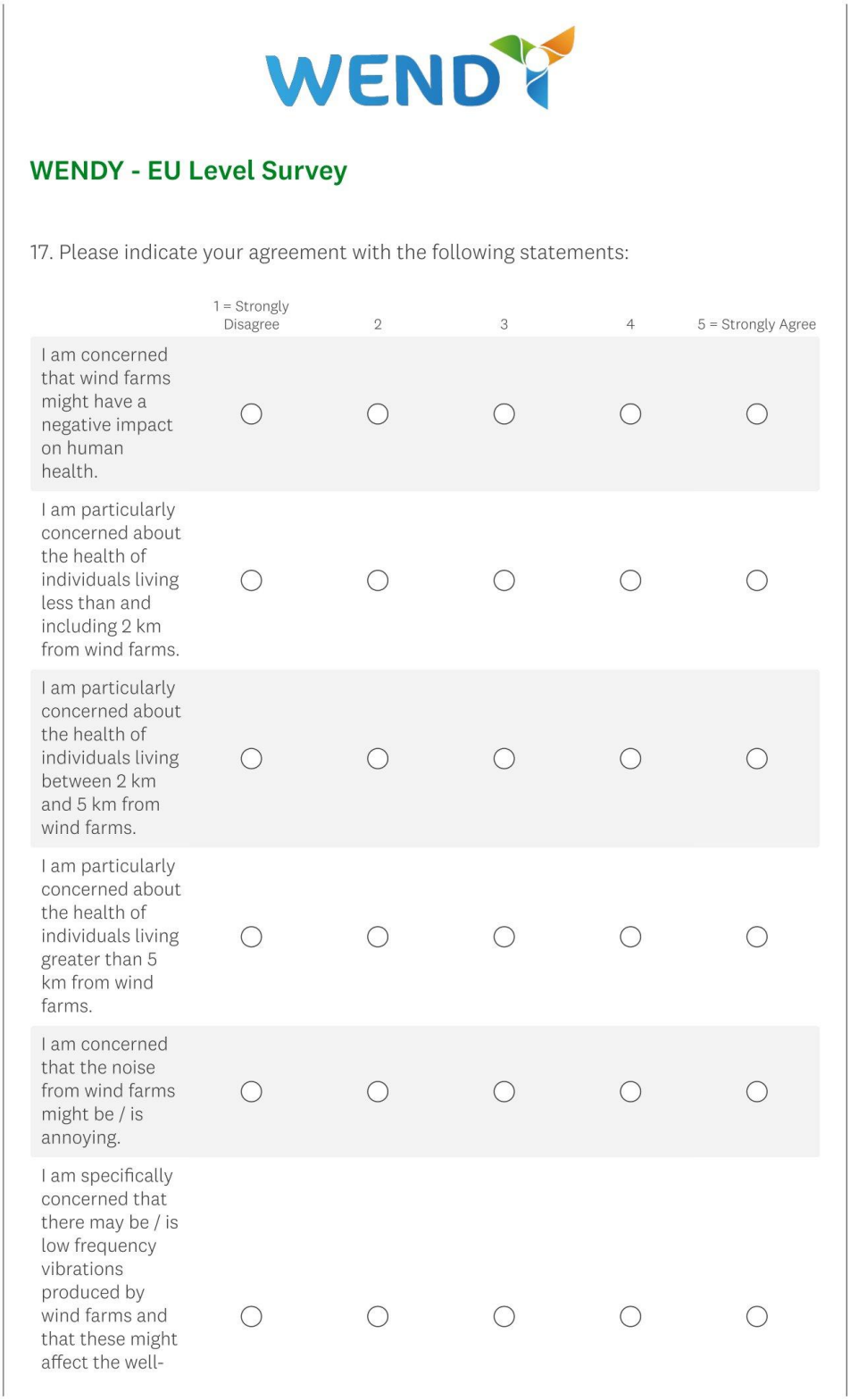

WENDY - EU Level Survey

17. Please indicate your agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
I am concerned that wind farms might have a negative impact on human health.	○	○	○	○	○
I am particularly concerned about the health of individuals living less than and including 2 km from wind farms.	○	○	○	○	○
I am particularly concerned about the health of individuals living between 2 km and 5 km from wind farms.	○	○	○	○	○
I am particularly concerned about the health of individuals living greater than 5 km from wind farms.	○	○	○	○	○
I am concerned that the noise from wind farms might be / is annoying.	○	○	○	○	○
I am specifically concerned that there may be / is low frequency vibrations produced by wind farms and that these might affect the well-	○	○	○	○	○

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being of those living within a 2 km radius.					
I am specifically concerned that there may be / is the danger of ice pieces flying away from the wind turbine blades and that this affects the well-being of those living within a 2 km radius and day tourists.	○	○	○	○	○

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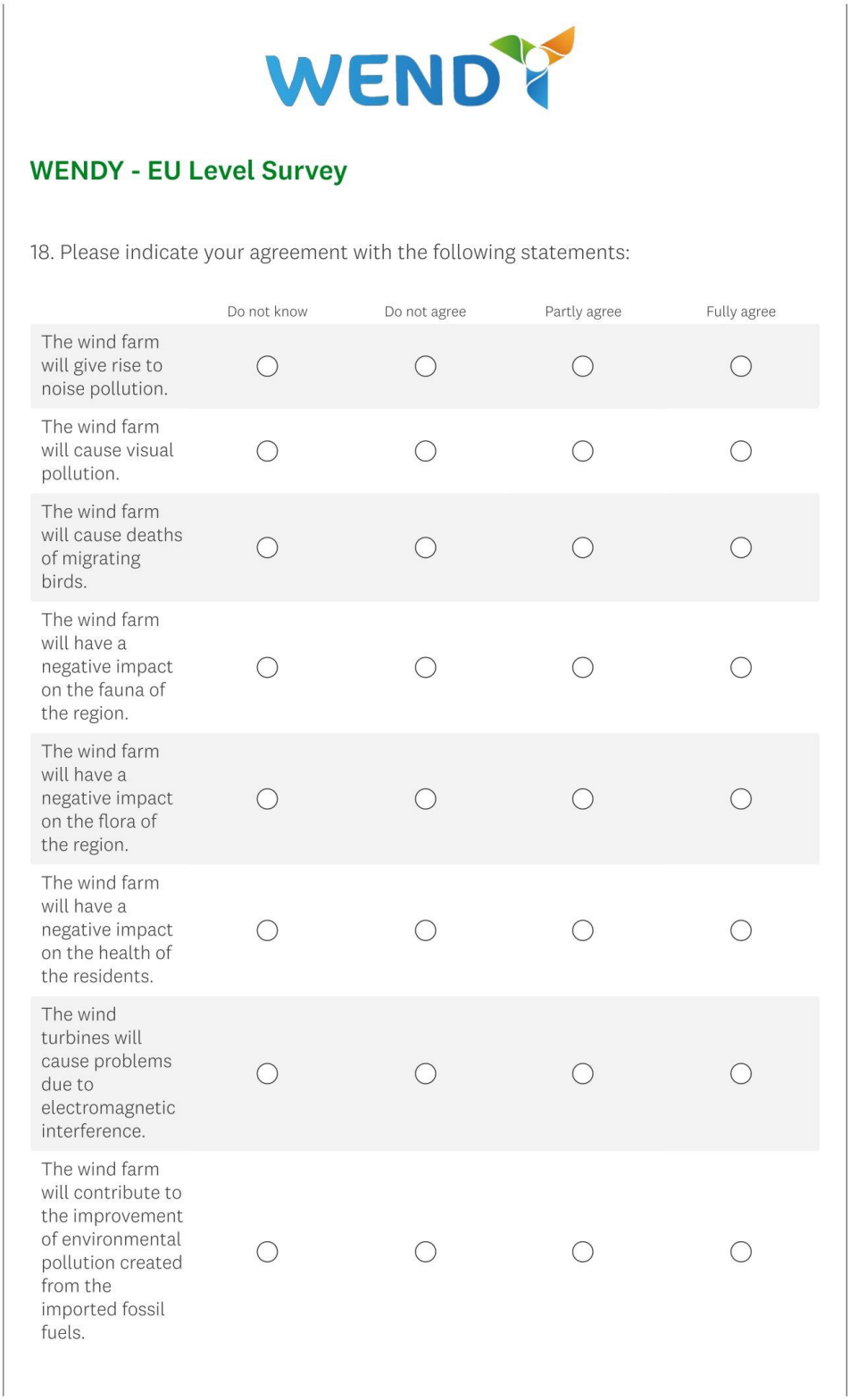

WENDY - EU Level Survey

18. Please indicate your agreement with the following statements:

	Do not know	Do not agree	Partly agree	Fully agree
The wind farm will give rise to noise pollution.	○	○	○	○
The wind farm will cause visual pollution.	○	○	○	○
The wind farm will cause deaths of migrating birds.	○	○	○	○
The wind farm will have a negative impact on the fauna of the region.	○	○	○	○
The wind farm will have a negative impact on the flora of the region.	○	○	○	○
The wind farm will have a negative impact on the health of the residents.	○	○	○	○
The wind turbines will cause problems due to electromagnetic interference.	○	○	○	○
The wind farm will contribute to the improvement of environmental pollution created from the imported fossil fuels.	○	○	○	○

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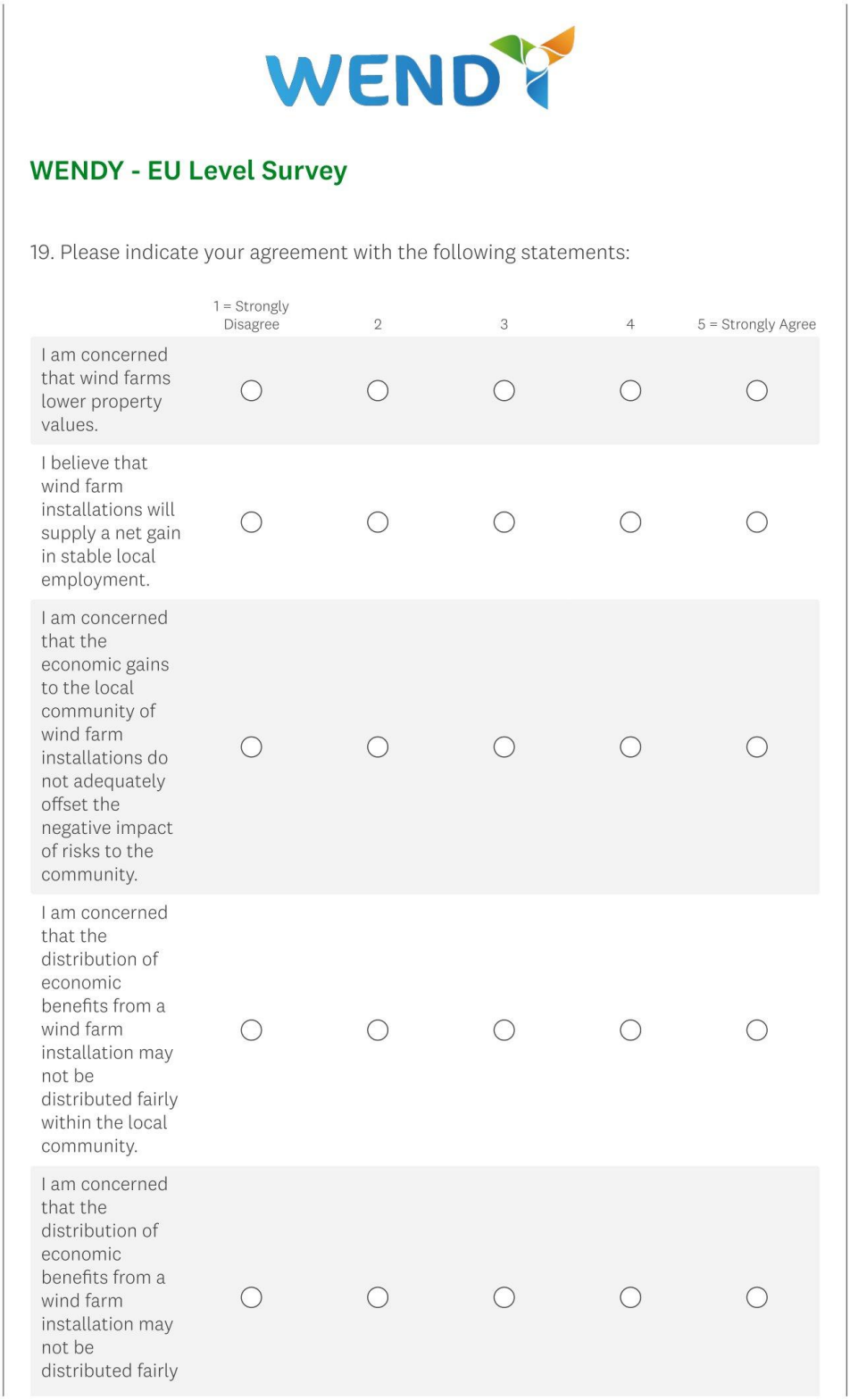

WENDY - EU Level Survey

19. Please indicate your agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
I am concerned that wind farms lower property values.	○	○	○	○	○
I believe that wind farm installations will supply a net gain in stable local employment.	○	○	○	○	○
I am concerned that the economic gains to the local community of wind farm installations do not adequately offset the negative impact of risks to the community.	○	○	○	○	○
I am concerned that the distribution of economic benefits from a wind farm installation may not be distributed fairly within the local community.	○	○	○	○	○
I am concerned that the distribution of economic benefits from a wind farm installation may not be distributed fairly	○	○	○	○	○

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within the region.					
I am concerned that the process for finding communities to host wind farm facilities is not fair.	○	○	○	○	○
I am concerned that the process for choosing whose property wind farms are to be installed on is not fair.	○	○	○	○	○
Wind turbine installations enhance the local community.	○	○	○	○	○
Wind turbine installations create community conflicts.	○	○	○	○	○

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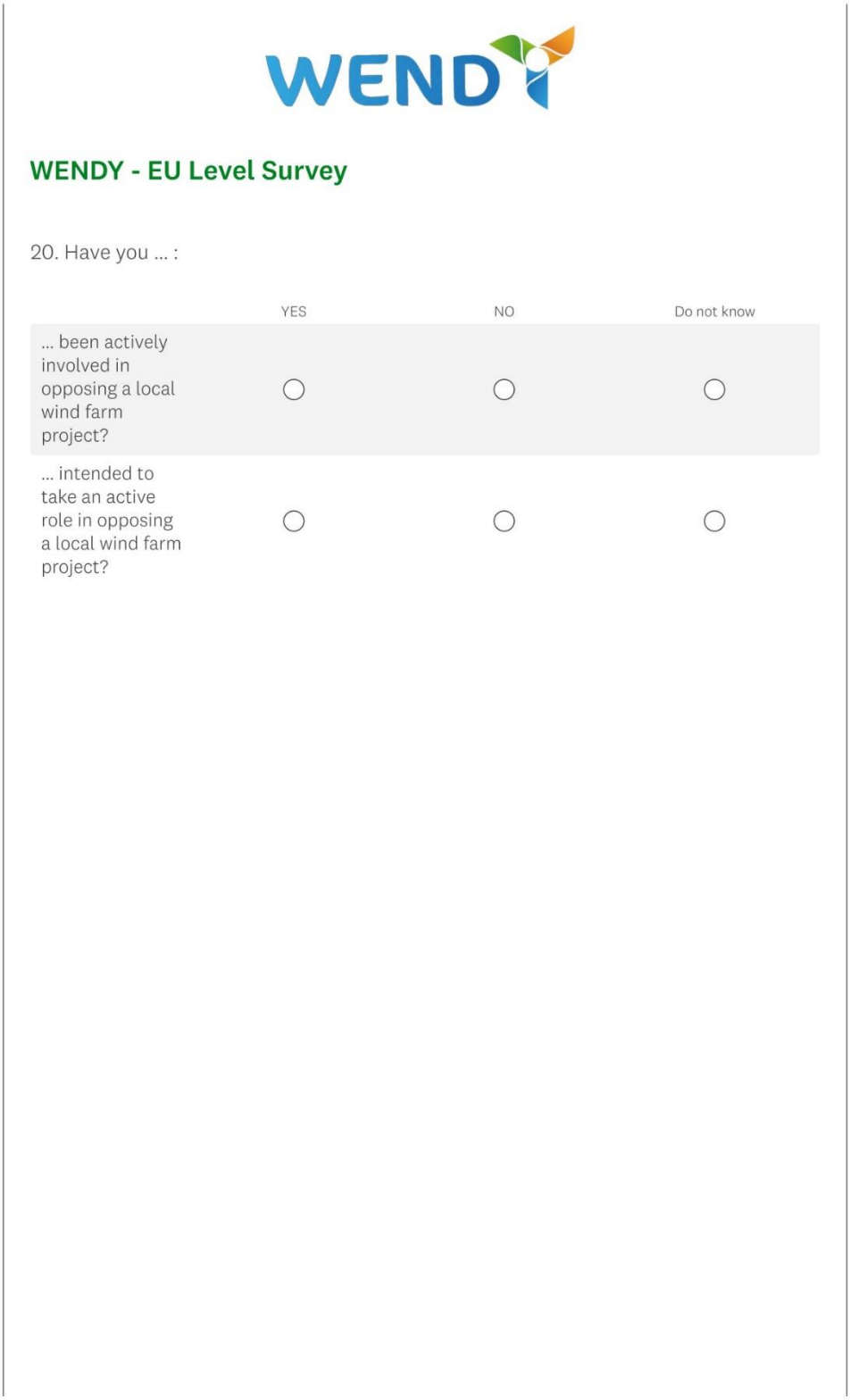

WENDY - EU Level Survey

20. Have you ... :

	YES	NO	Do not know
... been actively involved in opposing a local wind farm project?	○	○	○
... intended to take an active role in opposing a local wind farm project?	○	○	○

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21. I trust that the government or the responsible state authorities ... :

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
... adequately consider the needs of local residents.	○	○	○	○	○
... a responsible decision is made whether a wind farm should be built.	○	○	○	○	○
... ensure that safe wind farm facilities are built.	○	○	○	○	○
... will carry out safety checks to ensure safe operation.	○	○	○	○	○

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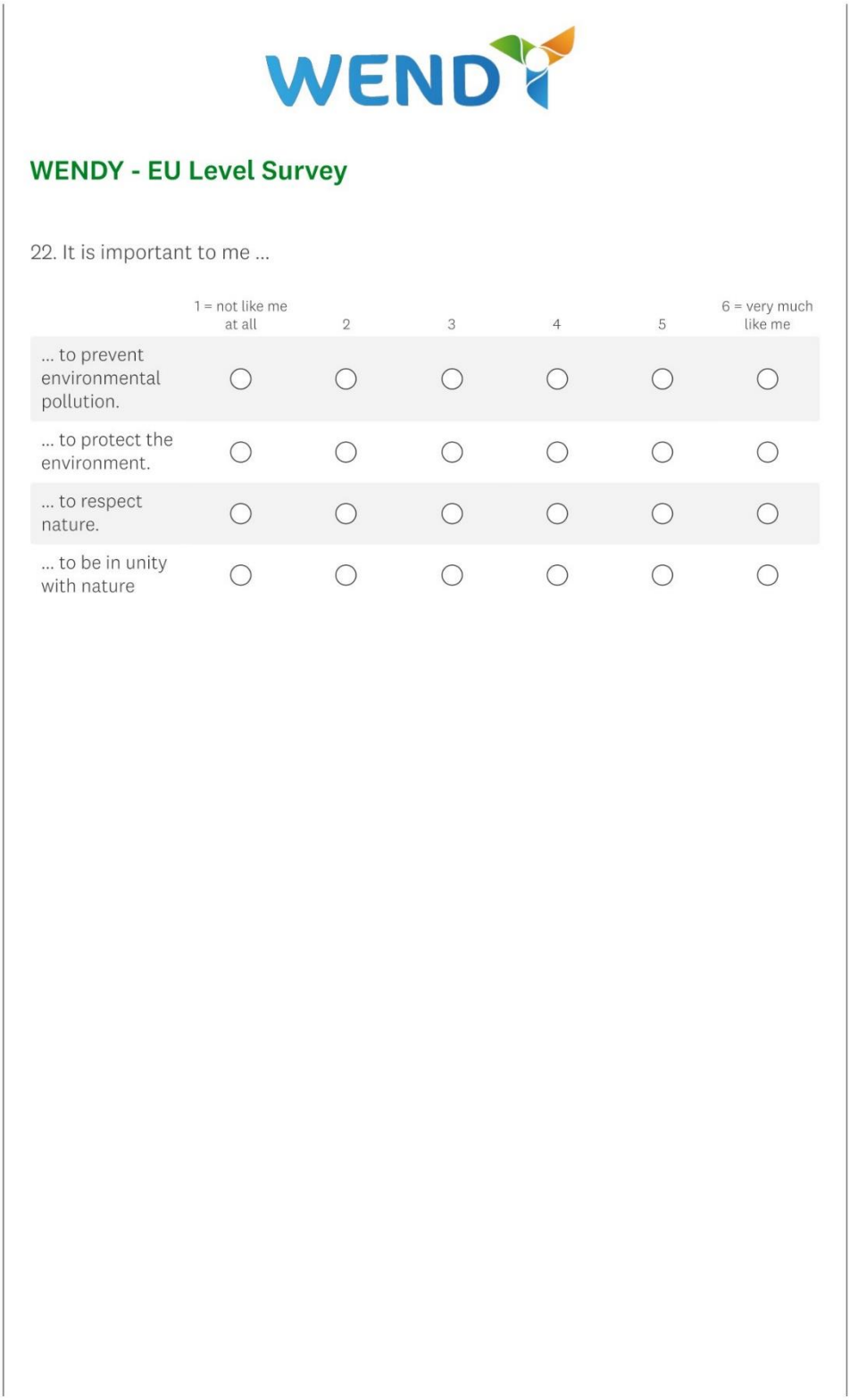

WENDY - EU Level Survey

22. It is important to me ...

	1 = not like me at all	2	3	4	5	6 = very much like me
... to prevent environmental pollution.	○	○	○	○	○	○
... to protect the environment.	○	○	○	○	○	○
... to respect nature.	○	○	○	○	○	○
... to be in unity with nature	○	○	○	○	○	○

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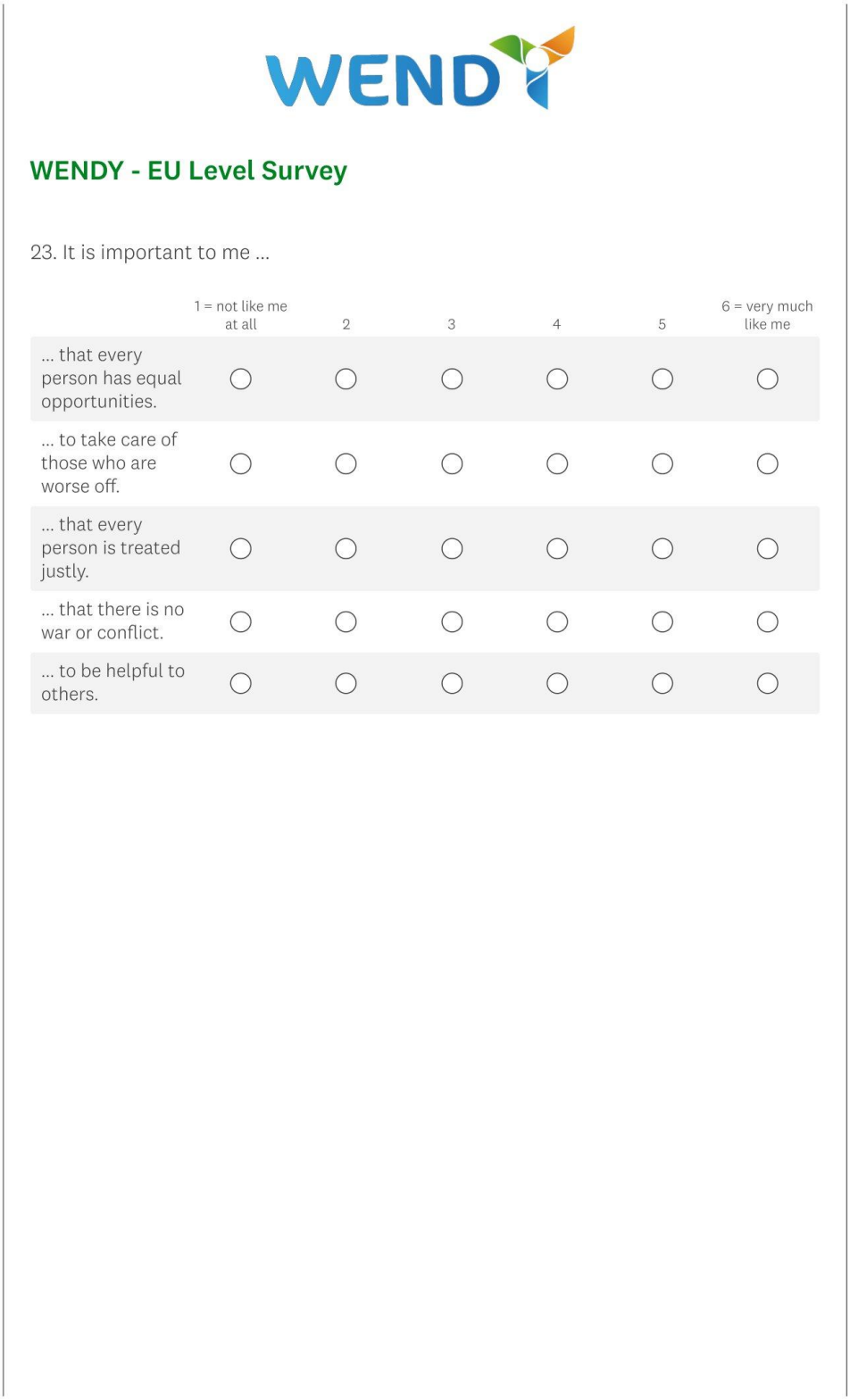

WENDY - EU Level Survey

23. It is important to me ...

	1 = not like me at all	2	3	4	5	6 = very much like me
... that every person has equal opportunities.	○	○	○	○	○	○
... to take care of those who are worse off.	○	○	○	○	○	○
... that every person is treated justly.	○	○	○	○	○	○
... that there is no war or conflict.	○	○	○	○	○	○
... to be helpful to others.	○	○	○	○	○	○

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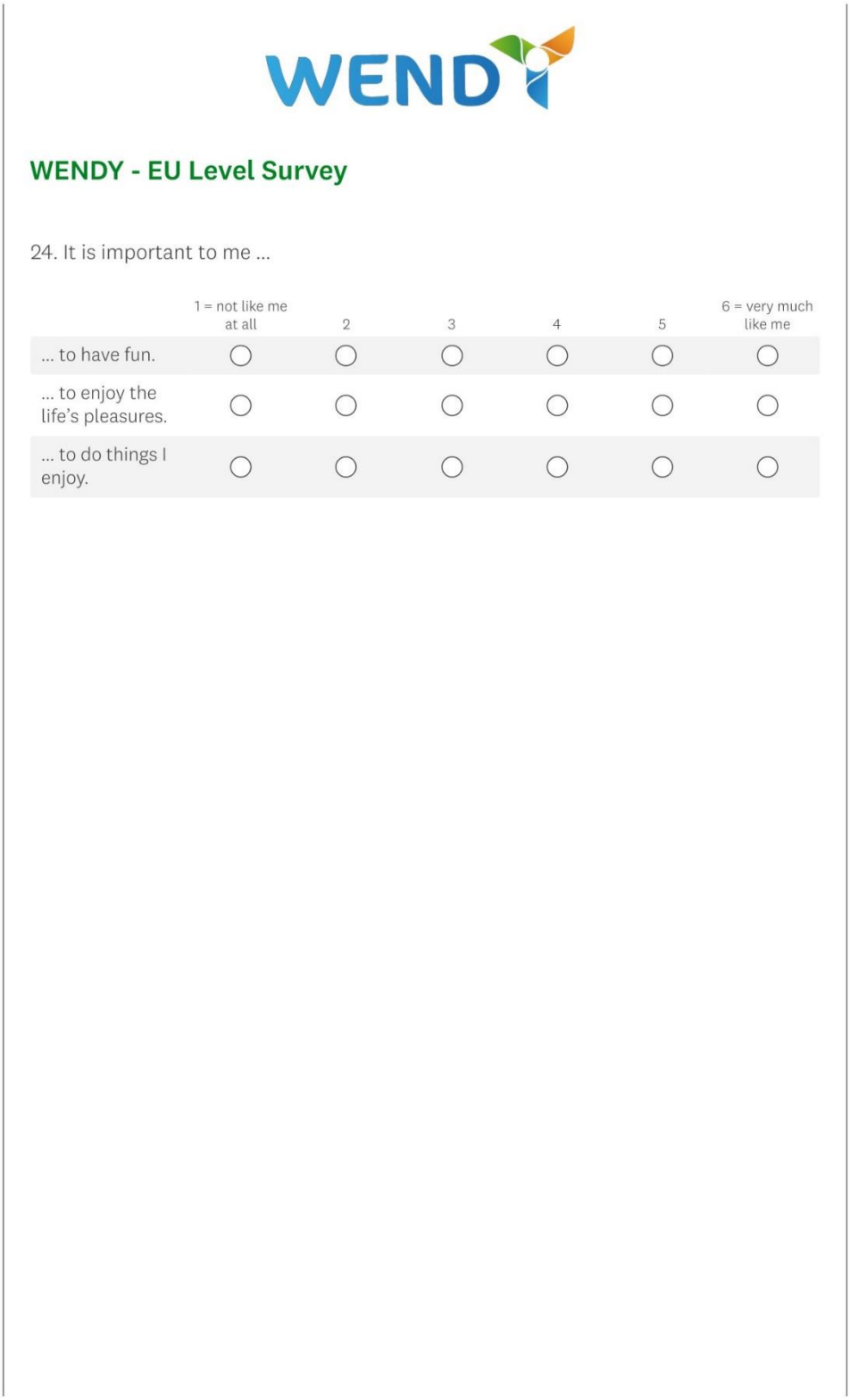

WENDY - EU Level Survey

24. It is important to me ...

	1 = not like me at all	2	3	4	5	6 = very much like me
... to have fun.	○	○	○	○	○	○
... to enjoy the life's pleasures.	○	○	○	○	○	○
... to do things I enjoy.	○	○	○	○	○	○

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25. It is important to me ...

	1 = not like me at all	2	3	4	5	6 = very much like me
... to have control over others' actions.	○	○	○	○	○	○
... to have authority over others.	○	○	○	○	○	○
... to be influential.	○	○	○	○	○	○
... to have money and possessions.	○	○	○	○	○	○
... to work hard and be ambitious.	○	○	○	○	○	○

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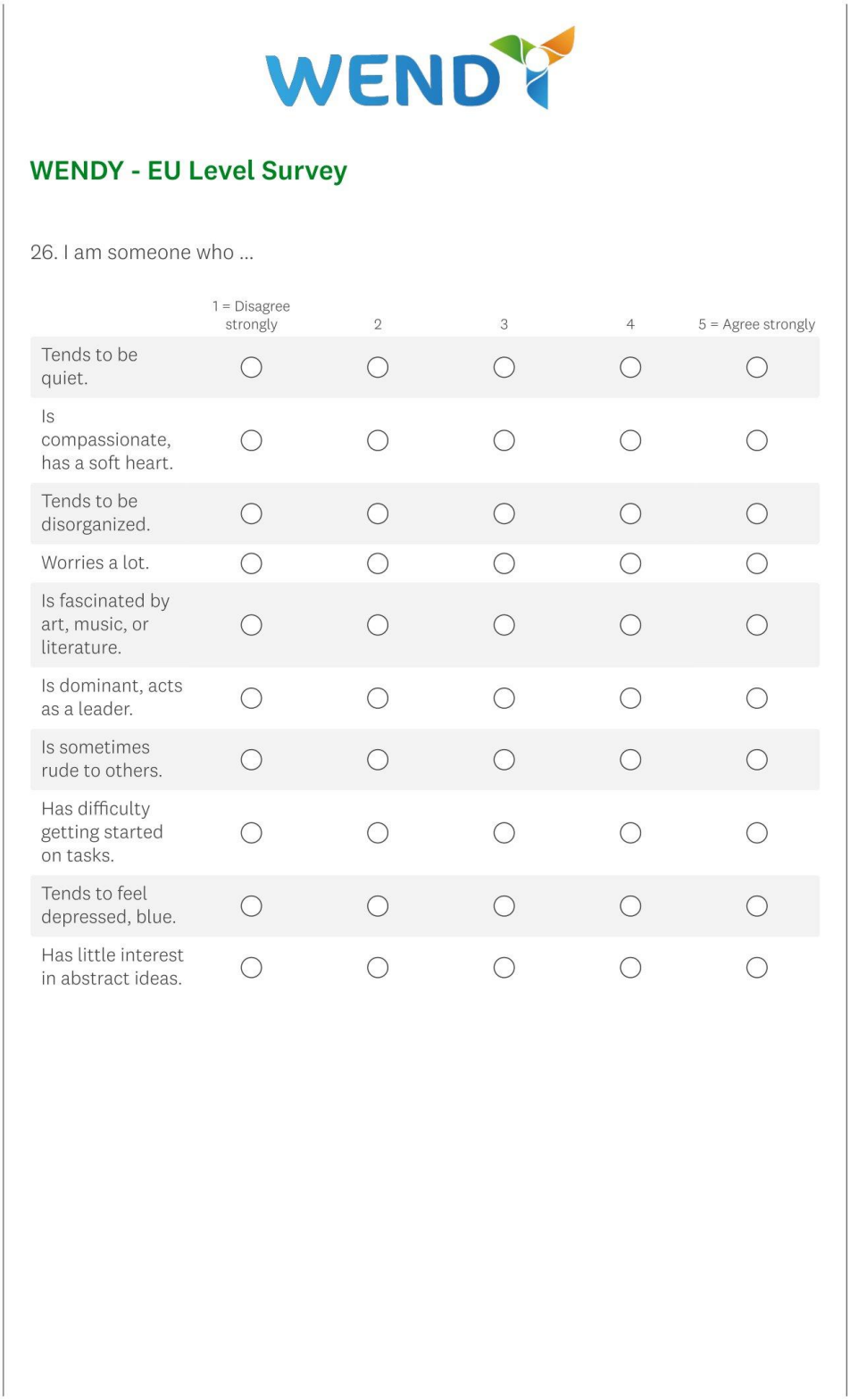

WENDY - EU Level Survey

26. I am someone who ...

	1 = Disagree strongly	2	3	4	5 = Agree strongly
Tends to be quiet.	○	○	○	○	○
Is compassionate, has a soft heart.	○	○	○	○	○
Tends to be disorganized.	○	○	○	○	○
Worries a lot.	○	○	○	○	○
Is fascinated by art, music, or literature.	○	○	○	○	○
Is dominant, acts as a leader.	○	○	○	○	○
Is sometimes rude to others.	○	○	○	○	○
Has difficulty getting started on tasks.	○	○	○	○	○
Tends to feel depressed, blue.	○	○	○	○	○
Has little interest in abstract ideas.	○	○	○	○	○

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WENDY - EU Level Survey

27. I am someone who ...

	1= Disagree strongly	2	3	4	5 = Agree strongly
Is full of energy.	○	○	○	○	○
Assumes the best about people.	○	○	○	○	○
Is reliable, can always be counted on.	○	○	○	○	○
Is emotionally stable, not easily upset.	○	○	○	○	○
Is original, comes up with new ideas.	○	○	○	○	○
Is outgoing, sociable.	○	○	○	○	○
Can be cold and uncaring.	○	○	○	○	○
Keeps things neat and tidy.	○	○	○	○	○
Is relaxed, handles stress well.	○	○	○	○	○
Has few artistic interests.	○	○	○	○	○

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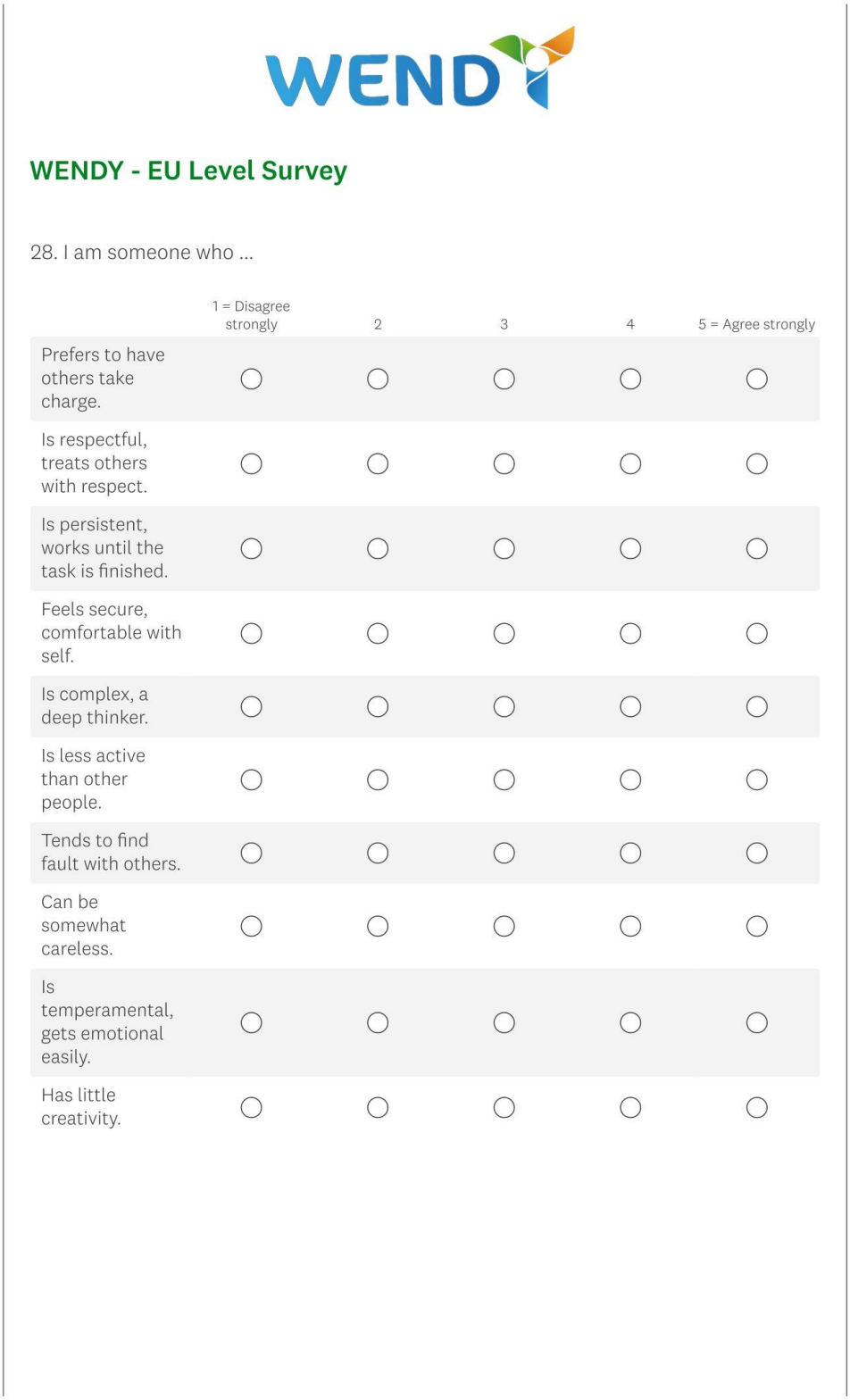

WENDY - EU Level Survey

28. I am someone who ...

	1 = Disagree strongly	2	3	4	5 = Agree strongly
Prefers to have others take charge.	○	○	○	○	○
Is respectful, treats others with respect.	○	○	○	○	○
Is persistent, works until the task is finished.	○	○	○	○	○
Feels secure, comfortable with self.	○	○	○	○	○
Is complex, a deep thinker.	○	○	○	○	○
Is less active than other people.	○	○	○	○	○
Tends to find fault with others.	○	○	○	○	○
Can be somewhat careless.	○	○	○	○	○
Is temperamental, gets emotional easily.	○	○	○	○	○
Has little creativity.	○	○	○	○	○

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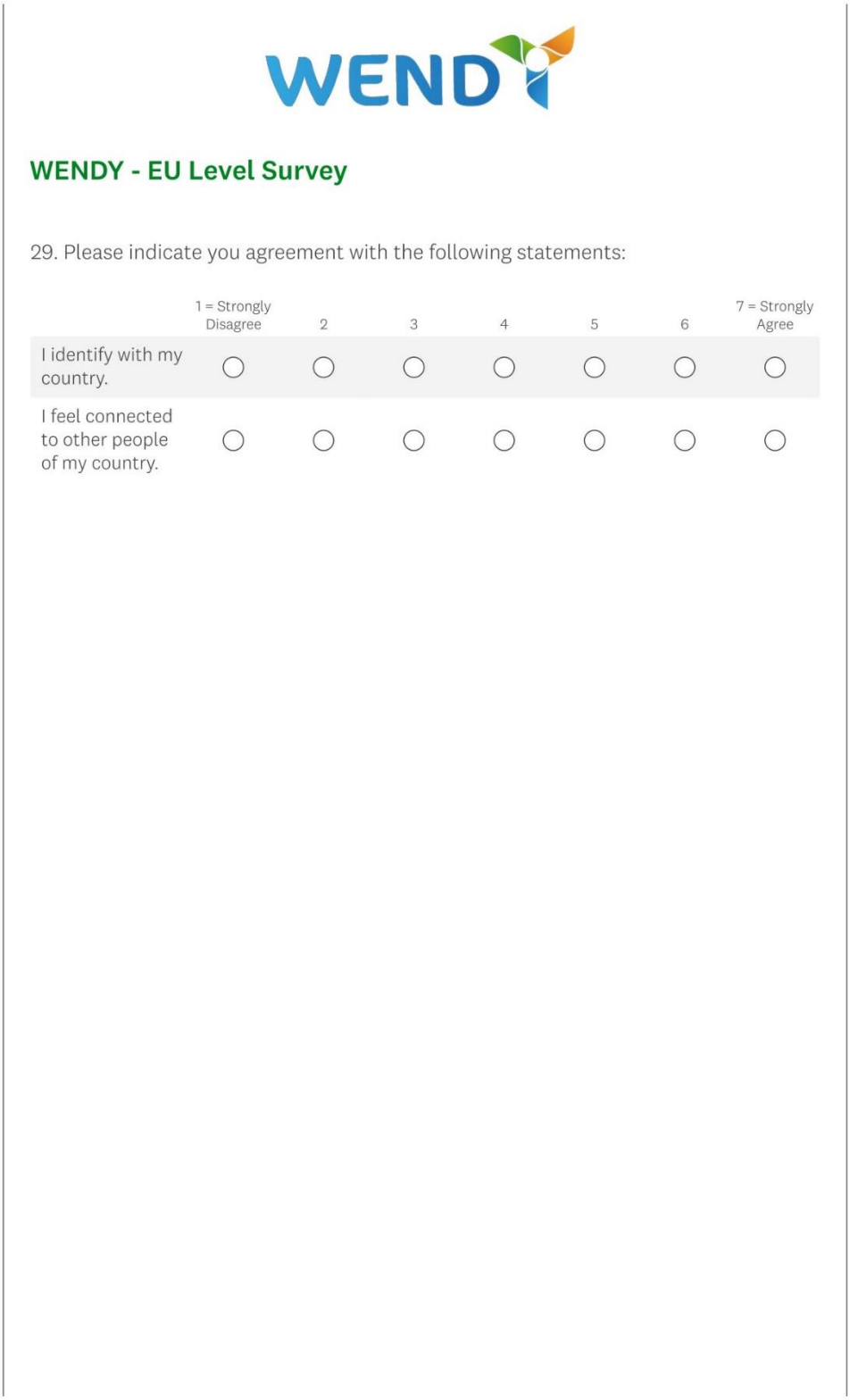

WENDY - EU Level Survey

29. Please indicate you agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5	6	7 = Strongly Agree
I identify with my country.	○	○	○	○	○	○	○
I feel connected to other people of my country.	○	○	○	○	○	○	○

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WENDY - EU Level Survey

30. Please indicate you agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5	6	7 = Strongly Agree
I am not happy until the people of my country get the appreciation that they deserve.	○	○	○	○	○	○	○
I get very angry when my country or people of my country are criticized.	○	○	○	○	○	○	○
If my country was able to have more of a say in the world, the world would be a better place.	○	○	○	○	○	○	○
The interests of my country are not understood by many people.	○	○	○	○	○	○	○
In general people of my country are not respected enough.	○	○	○	○	○	○	○

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31. Please rate your political ideology:

1 = Extremely liberal	2	3	4	5	6	7 = Extremely conservative
○	○	○	○	○	○	○

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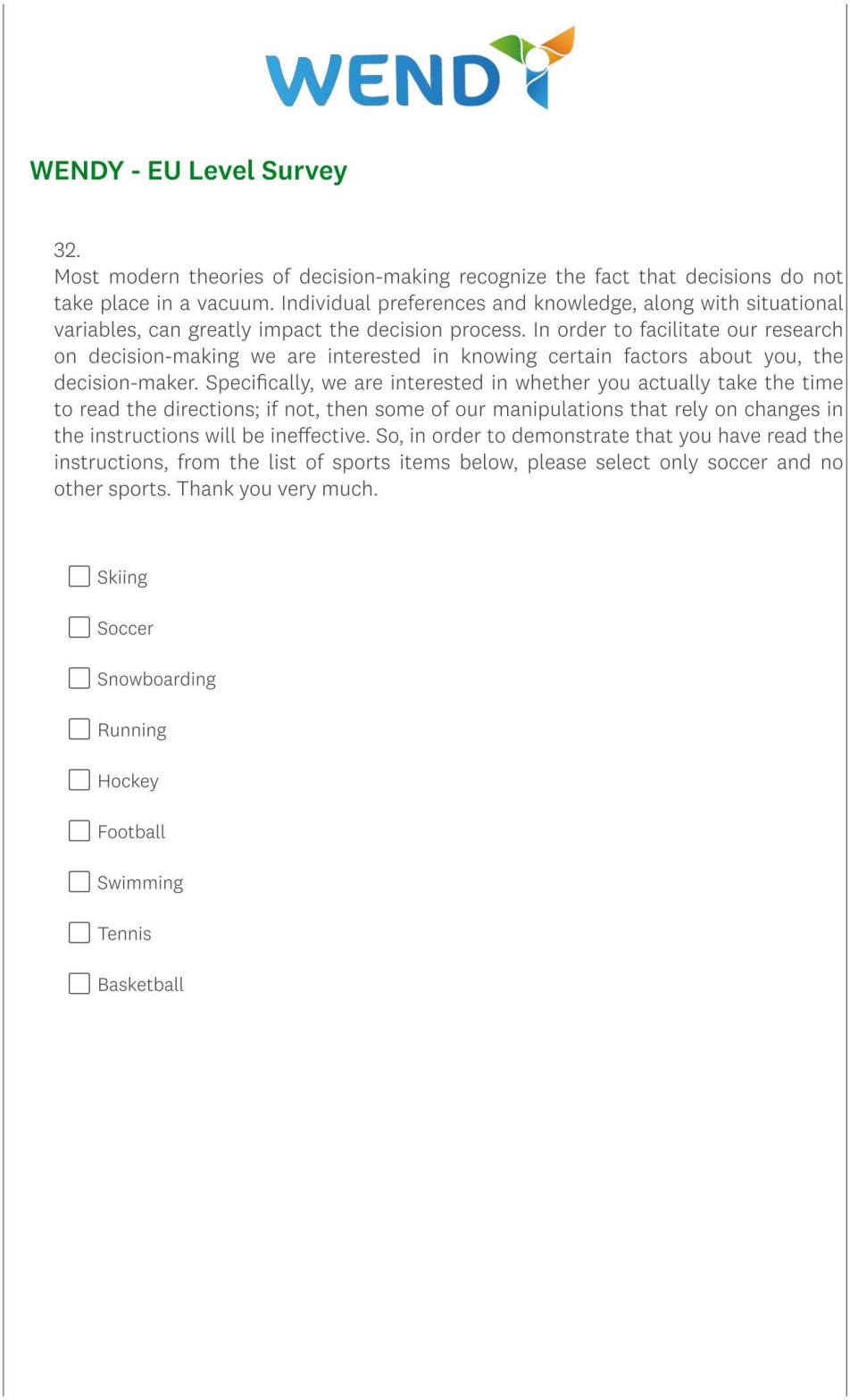

WENDY - EU Level Survey

32.
Most modern theories of decision-making recognize the fact that decisions do not take place in a vacuum. Individual preferences and knowledge, along with situational variables, can greatly impact the decision process. In order to facilitate our research on decision-making we are interested in knowing certain factors about you, the decision-maker. Specifically, we are interested in whether you actually take the time to read the directions; if not, then some of our manipulations that rely on changes in the instructions will be ineffective. So, in order to demonstrate that you have read the instructions, from the list of sports items below, please select only soccer and no other sports. Thank you very much.

- ☐ Skiing
- ☐ Soccer
- ☐ Snowboarding
- ☐ Running
- ☐ Hockey
- ☐ Football
- ☐ Swimming
- ☐ Tennis
- ☐ Basketball

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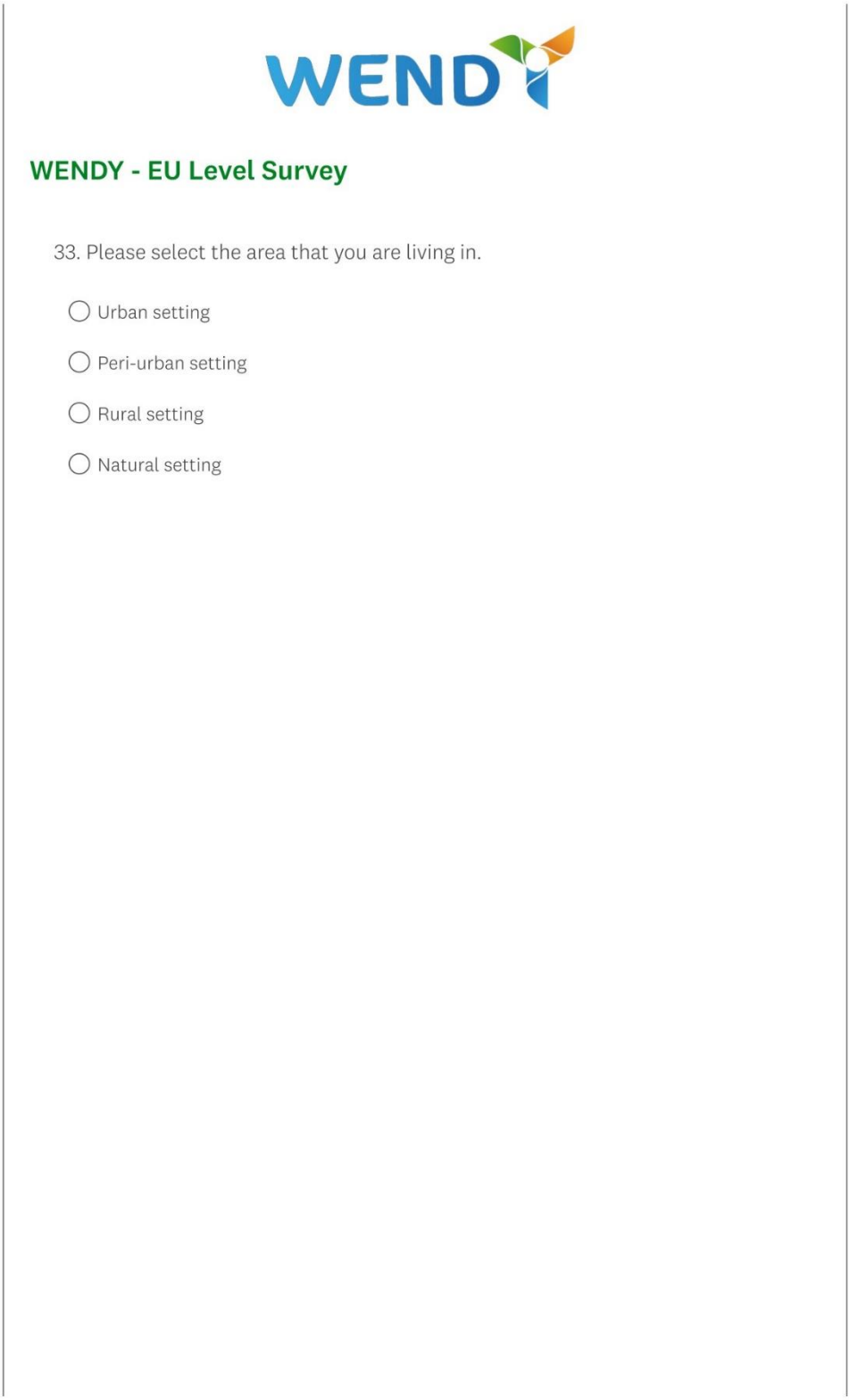

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33. Please select the area that you are living in.

- ○ Urban setting
- ○ Peri-urban setting
- ○ Rural setting
- ○ Natural setting

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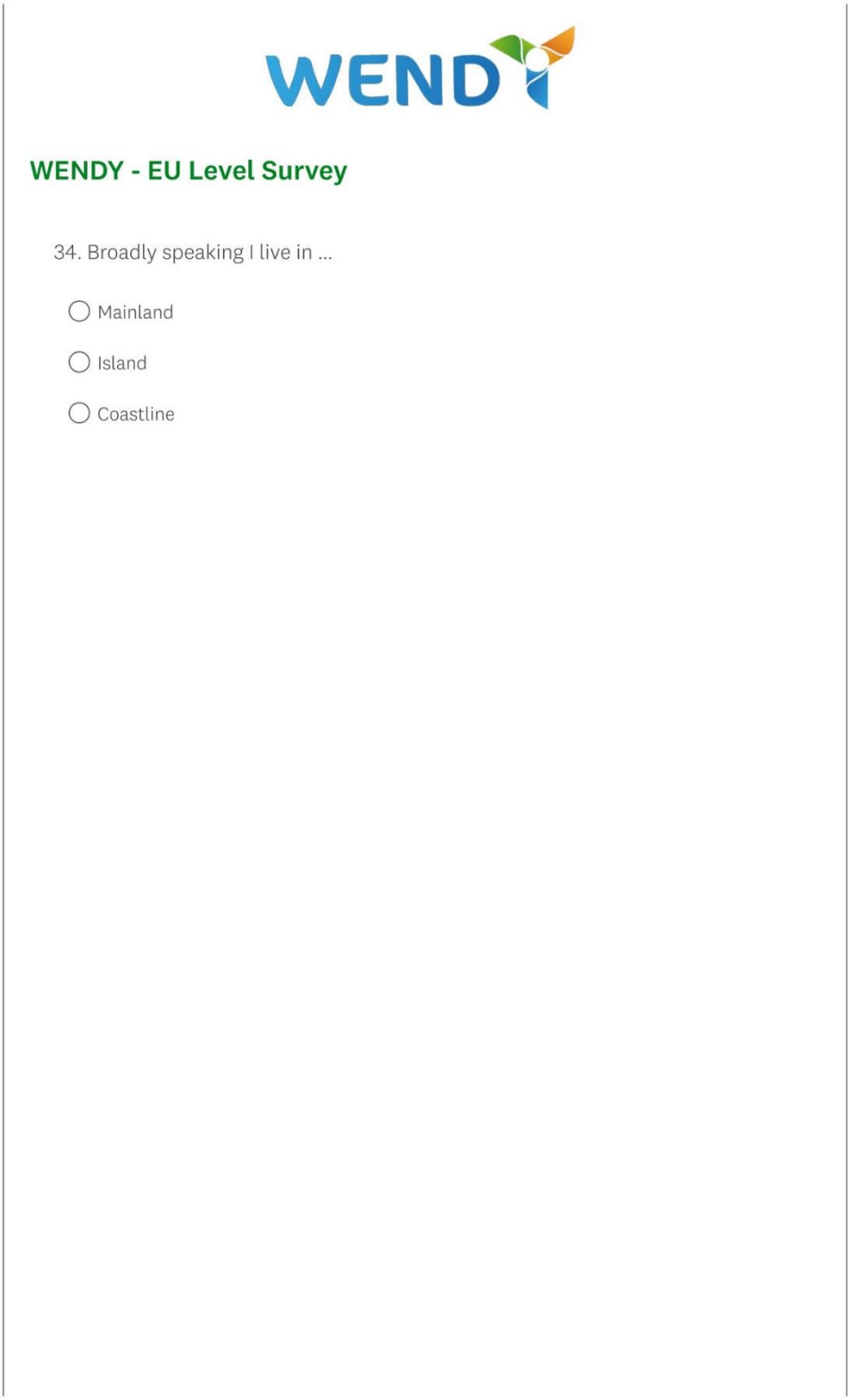

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34. Broadly speaking I live in ...

- ◯ Mainland
- ◯ Island
- ◯ Coastline

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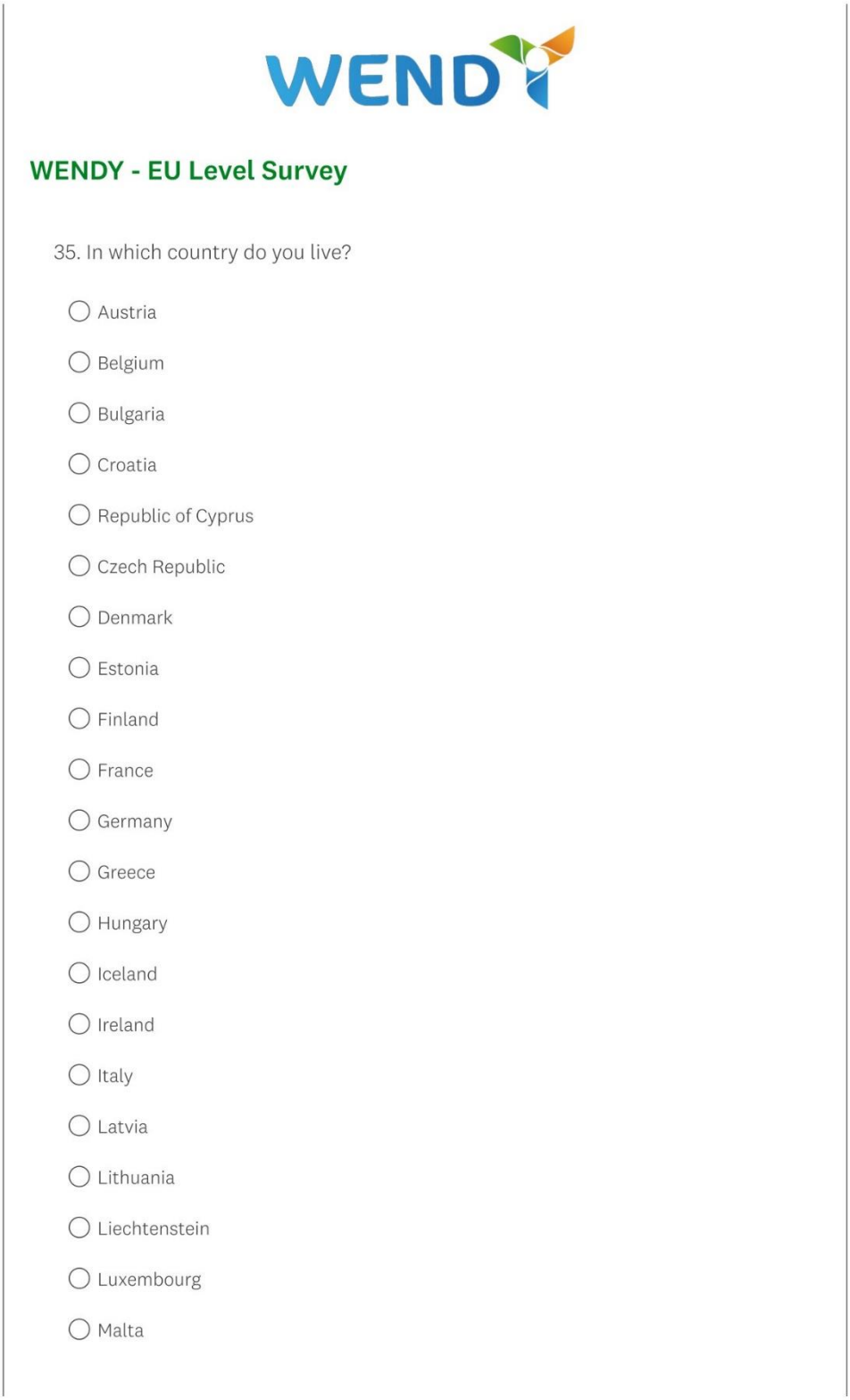

WENDY - EU Level Survey

35. In which country do you live?

- ◯ Austria
- ◯ Belgium
- ◯ Bulgaria
- ◯ Croatia
- ◯ Republic of Cyprus
- ◯ Czech Republic
- ◯ Denmark
- ◯ Estonia
- ◯ Finland
- ◯ France
- ◯ Germany
- ◯ Greece
- ◯ Hungary
- ◯ Iceland
- ◯ Ireland
- ◯ Italy
- ◯ Latvia
- ◯ Lithuania
- ◯ Liechtenstein
- ◯ Luxembourg
- ◯ Malta

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- ◯ Netherlands
- ◯ Norway
- ◯ Poland
- ◯ Portugal
- ◯ Romania
- ◯ Slovakia
- ◯ Slovenia
- ◯ Spain
- ◯ Sweden
- ◯ Switzerland
- ◯ Other (please specify)

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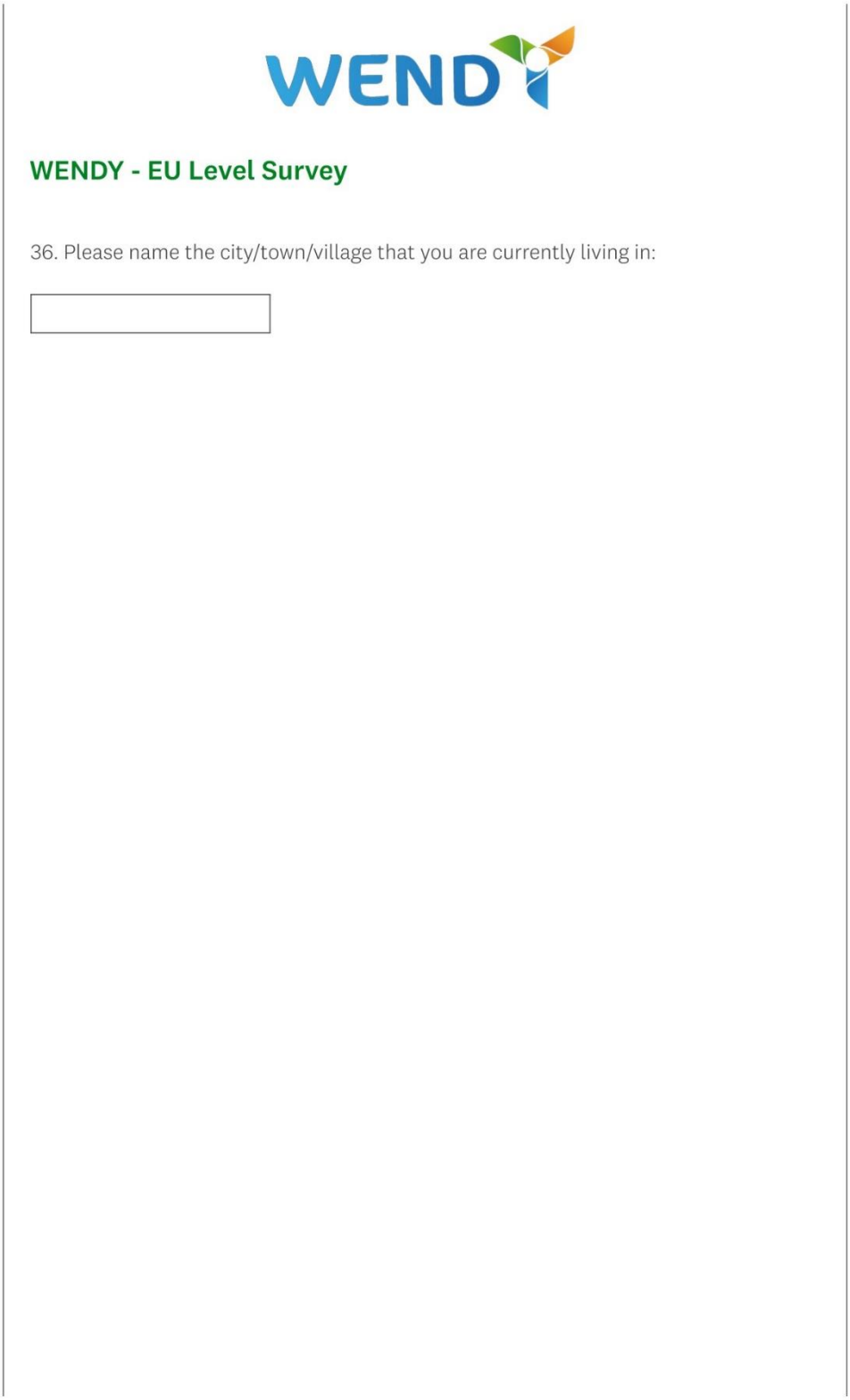

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36. Please name the city/town/village that you are currently living in:

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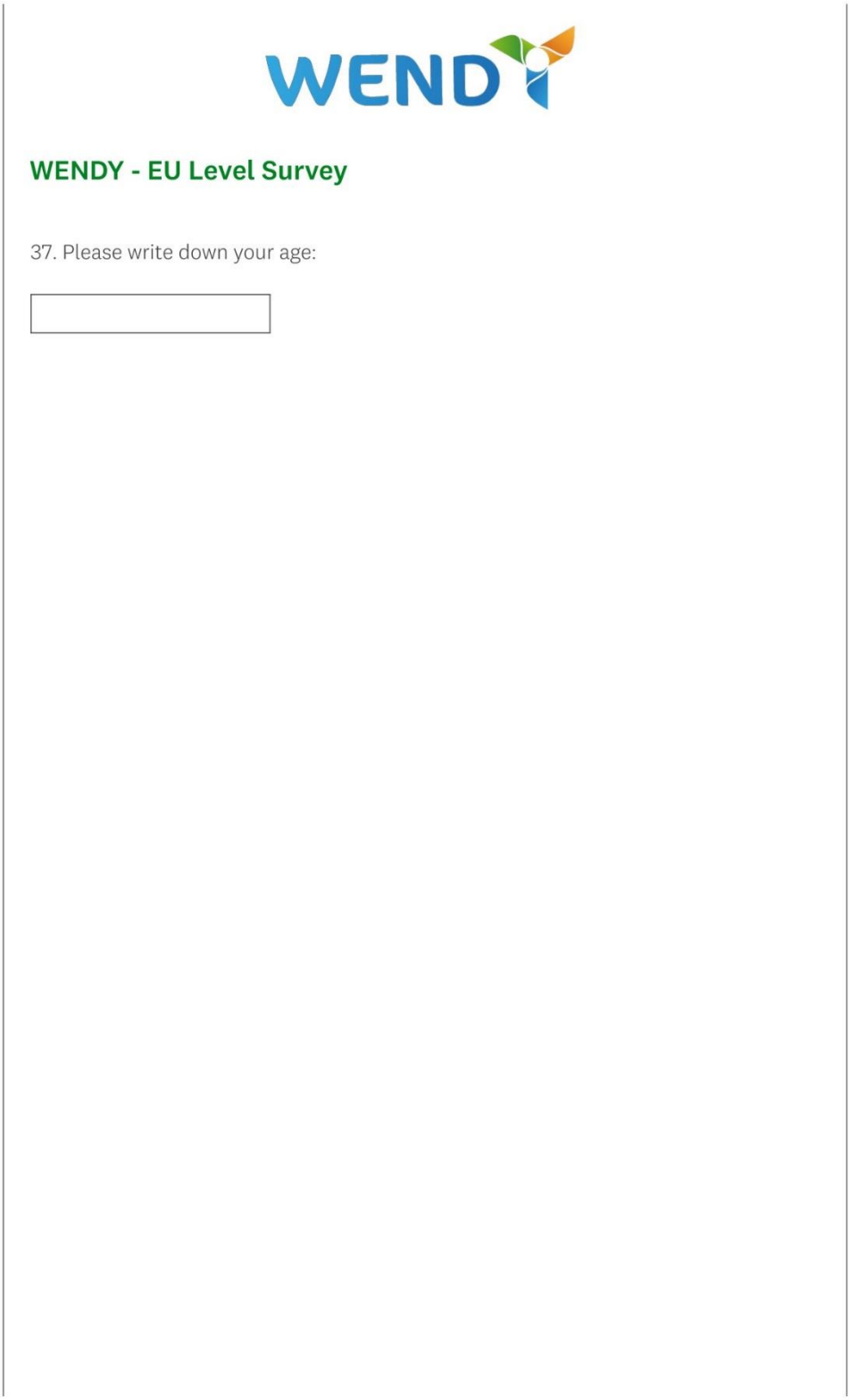

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37. Please write down your age:

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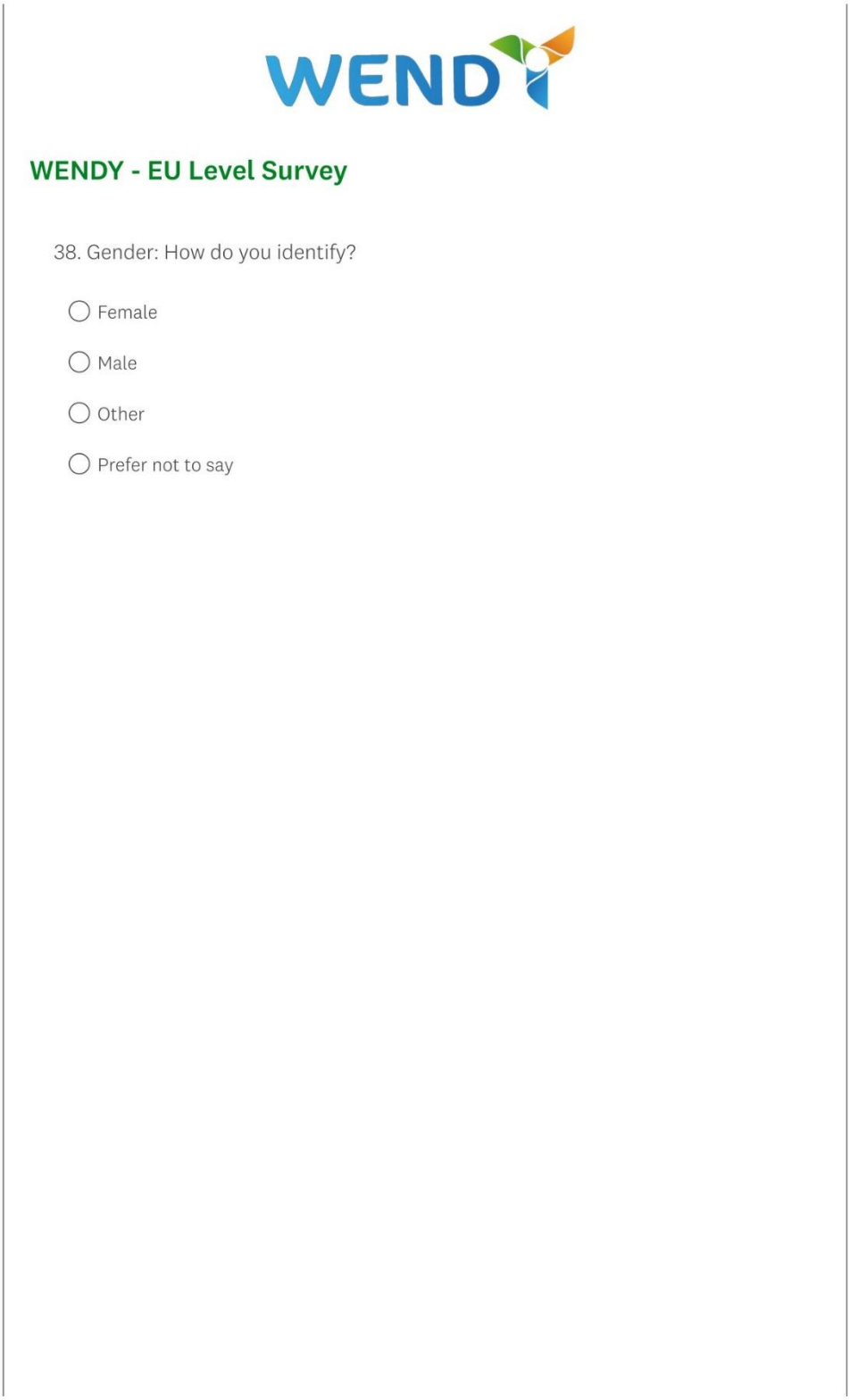

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38. Gender: How do you identify?

- ◯ Female
- ◯ Male
- ◯ Other
- ◯ Prefer not to say

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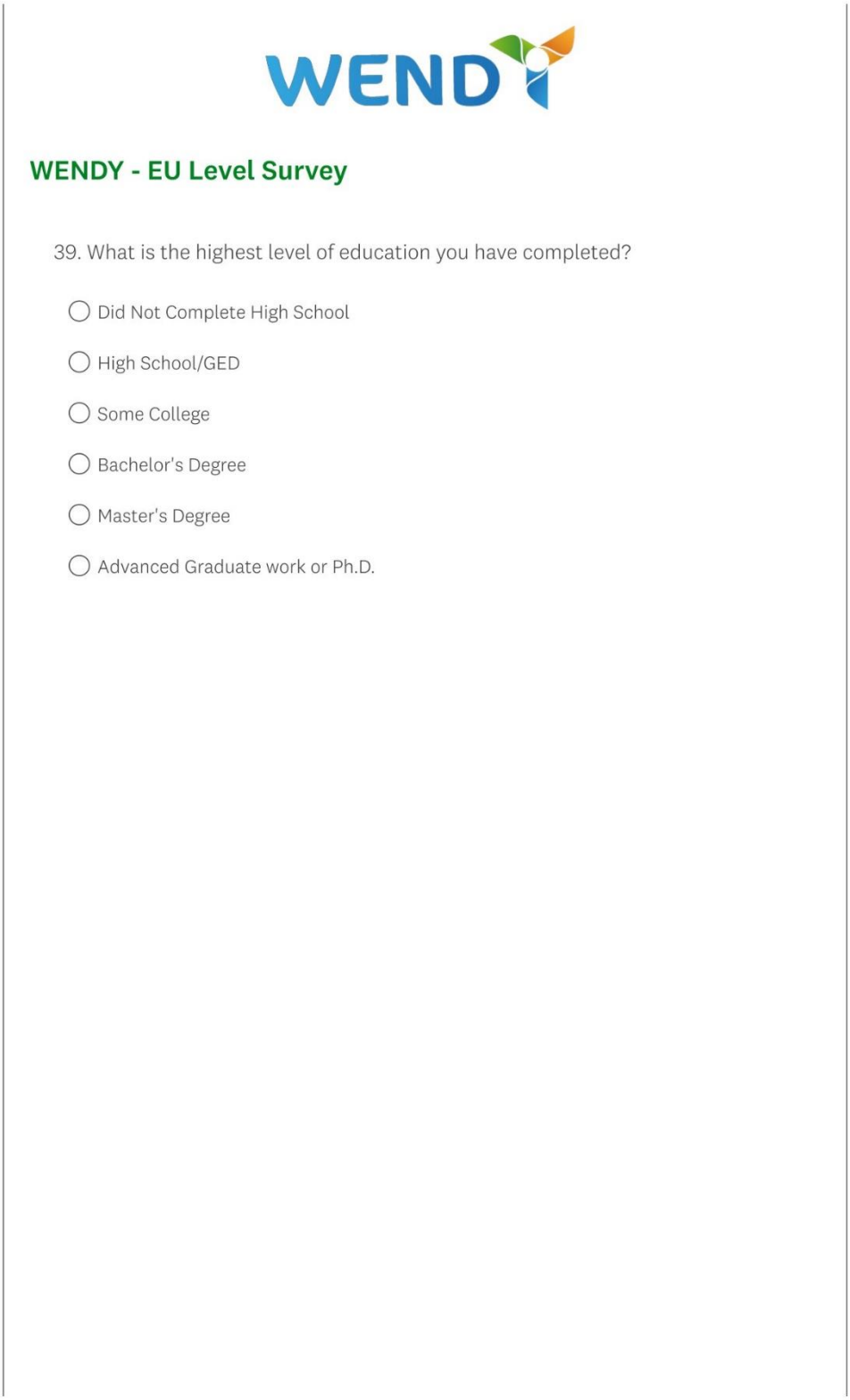

WENDY - EU Level Survey

39. What is the highest level of education you have completed?

- ◯ Did Not Complete High School
- ◯ High School/GED
- ◯ Some College
- ◯ Bachelor's Degree
- ◯ Master's Degree
- ◯ Advanced Graduate work or Ph.D.

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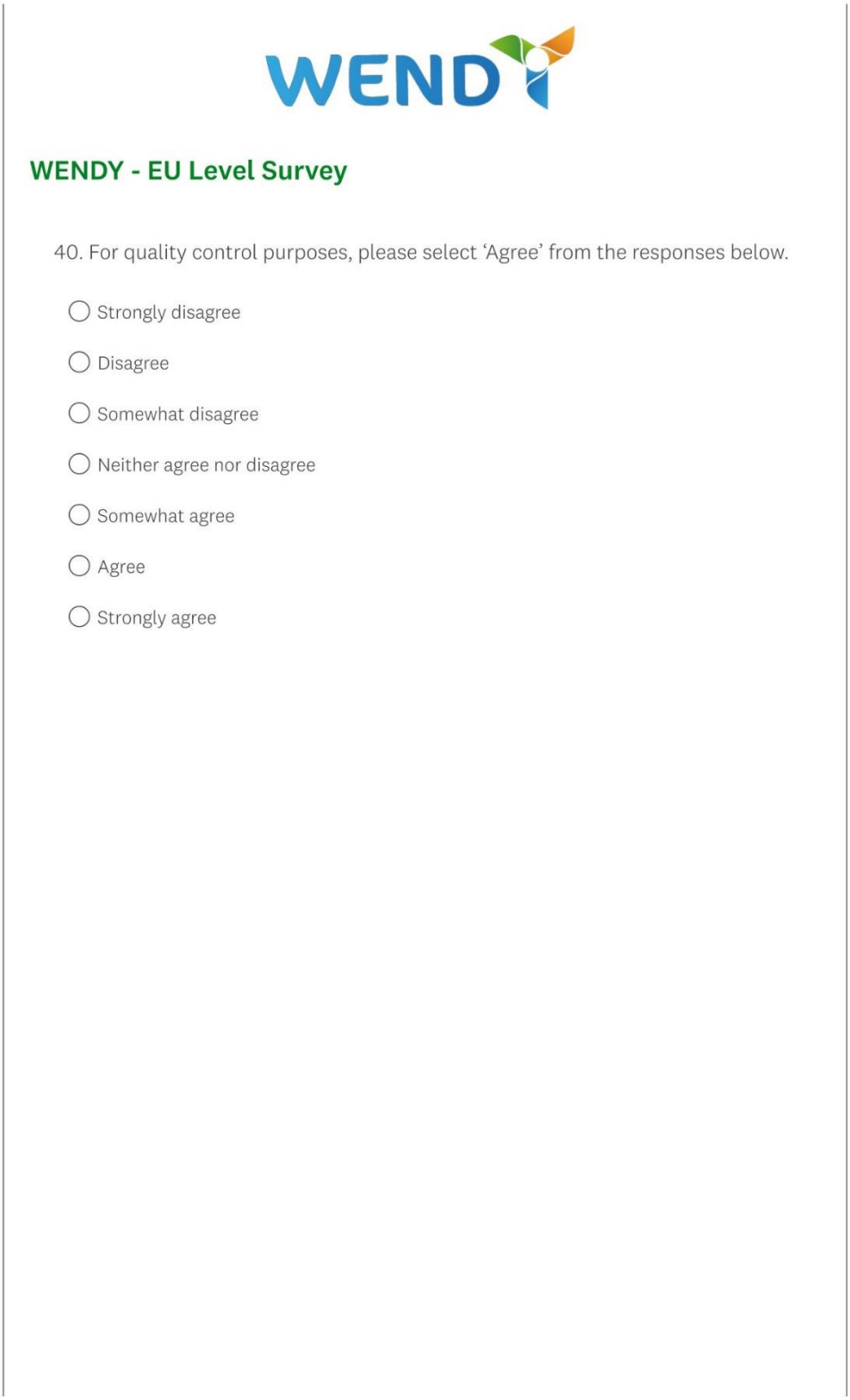

WENDY - EU Level Survey

40. For quality control purposes, please select 'Agree' from the responses below.

- ◯ Strongly disagree
- ◯ Disagree
- ◯ Somewhat disagree
- ◯ Neither agree nor disagree
- ◯ Somewhat agree
- ◯ Agree
- ◯ Strongly agree

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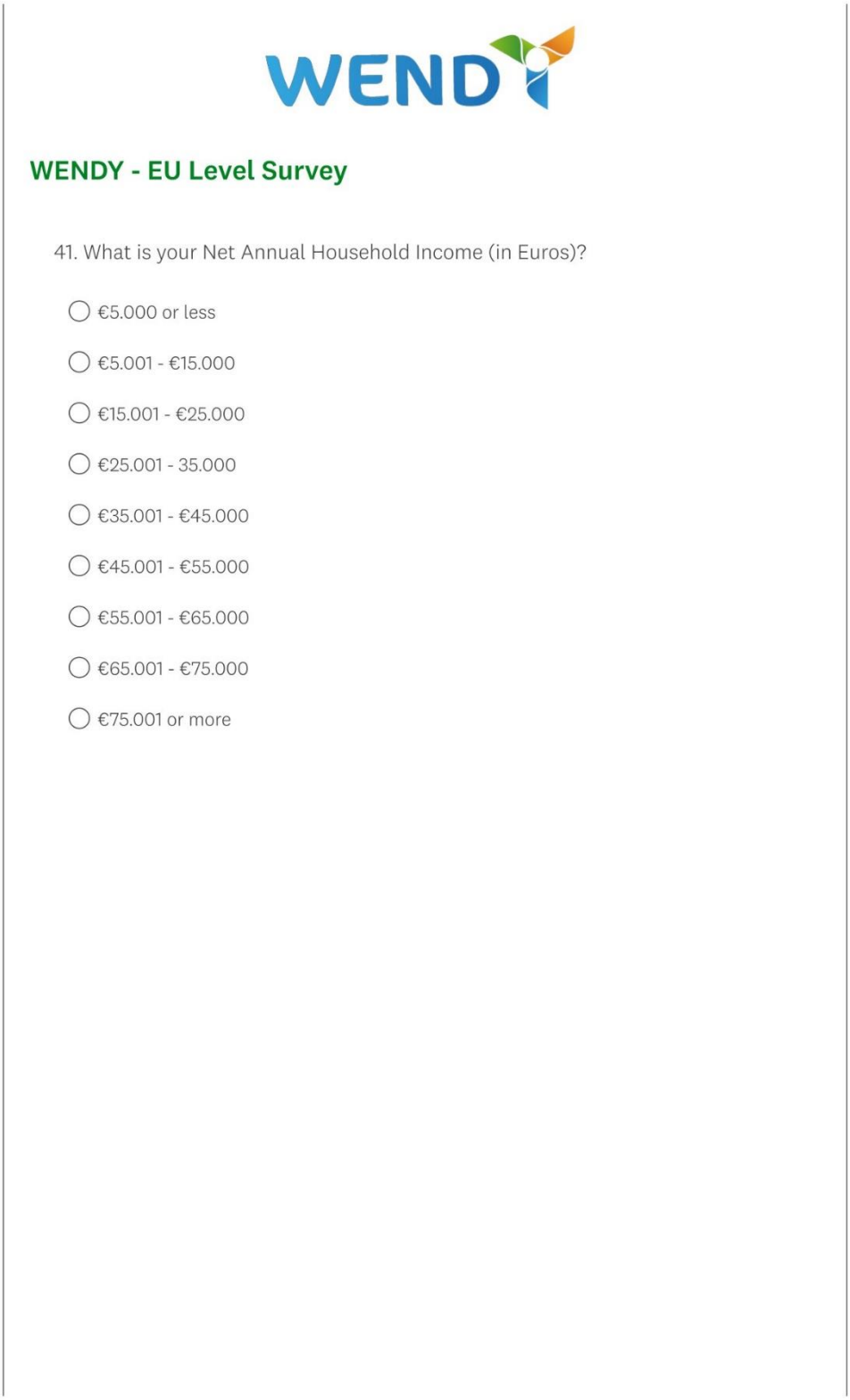

WENDY - EU Level Survey

41. What is your Net Annual Household Income (in Euros)?

- ◯ €5.000 or less
- ◯ €5.001 - €15.000
- ◯ €15.001 - €25.000
- ◯ €25.001 - 35.000
- ◯ €35.001 - €45.000
- ◯ €45.001 - €55.000
- ◯ €55.001 - €65.000
- ◯ €65.001 - €75.000
- ◯ €75.001 or more

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8.3 Statistical analysis of pilot-level survey data

8.3.1 One-Way ANOVA

One-Way ANOVA

		F	df1	df2	p
ATTITUDE	Welch's	10.58	3	176	< .001
	Fisher's	18.60	3	371	< .001
SUPPORT	Welch's	14.64	3	179	< .001
	Fisher's	19.25	3	371	< .001
GENERAL ACCEPTANCE	Welch's	11.84	3	176	< .001
	Fisher's	14.82	3	371	< .001
TOURISTIC IMPACT	Welch's	1.30	3	184	0.275
	Fisher's	1.37	3	371	0.253
WTP	Welch's	11.36	3	188	< .001
	Fisher's	15.18	3	371	< .001
AESTHETIC IMPACT	Welch's	5.23	3	187	0.002
	Fisher's	4.82	3	371	0.003
HEALTH IMPACT	Welch's	11.83	3	182	< .001
	Fisher's	11.54	3	371	< .001
ENVIRONMENTAL IMPACT	Welch's	7.69	3	181	< .001
	Fisher's	8.77	3	371	< .001
ECONOMIC IMPACT	Welch's	2.62	3	178	0.053
	Fisher's	2.60	3	371	0.052
SITING PROCESS	Welch's	6.45	3	178	< .001
	Fisher's	4.59	3	371	0.004
TRUST IN GOV	Welch's	25.34	3	181	< .001
	Fisher's	20.63	3	371	< .001

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Group Descriptives (es: Spain, it: Italy, no: Norway, el: Greece)

	COUNTRY	N	Mean	SD	SE
ATTITUDE	es	102	4.95	0.935	0.0925
	it	106	5.01	0.822	0.0798
	no	60	3.96	1.342	0.1733
	el	107	4.95	0.860	0.0832
SUPPORT	es	102	3.91	1.104	0.1093
	it	106	4.12	0.884	0.0859
	no	60	2.96	1.231	0.1589
	el	107	4.06	0.934	0.0903
GENERAL ACCEPTANCE	es	102	4.82	1.279	0.1266
	it	106	5.16	0.868	0.0843
	no	60	3.96	1.433	0.1850
	el	107	4.99	1.106	0.1070
TOURISTIC IMPACT	es	102	3.14	1.771	0.1754
	it	106	2.73	1.362	0.1323
	no	60	2.80	1.543	0.1992
	el	107	2.94	1.536	0.1484
WTP	es	102	2.06	1.578	0.1563
	it	106	2.30	1.228	0.1193
	no	60	1.80	1.273	0.1643
	el	107	3.34	2.240	0.2166
AESTHETIC IMPACT	es	102	2.78	0.723	0.0716
	it	106	2.63	0.621	0.0603
	no	60	2.53	0.604	0.0779
	el	107	2.88	0.626	0.0606
HEALTH IMPACT	es	102	2.62	1.051	0.1041
	it	106	1.95	0.781	0.0758
	no	60	2.58	0.981	0.1266
	el	107	2.19	0.890	0.0861
ENVIRONMENTAL IMPACT	es	102	2.43	0.613	0.0607
	it	106	2.30	0.553	0.0537
	no	60	2.69	0.665	0.0858

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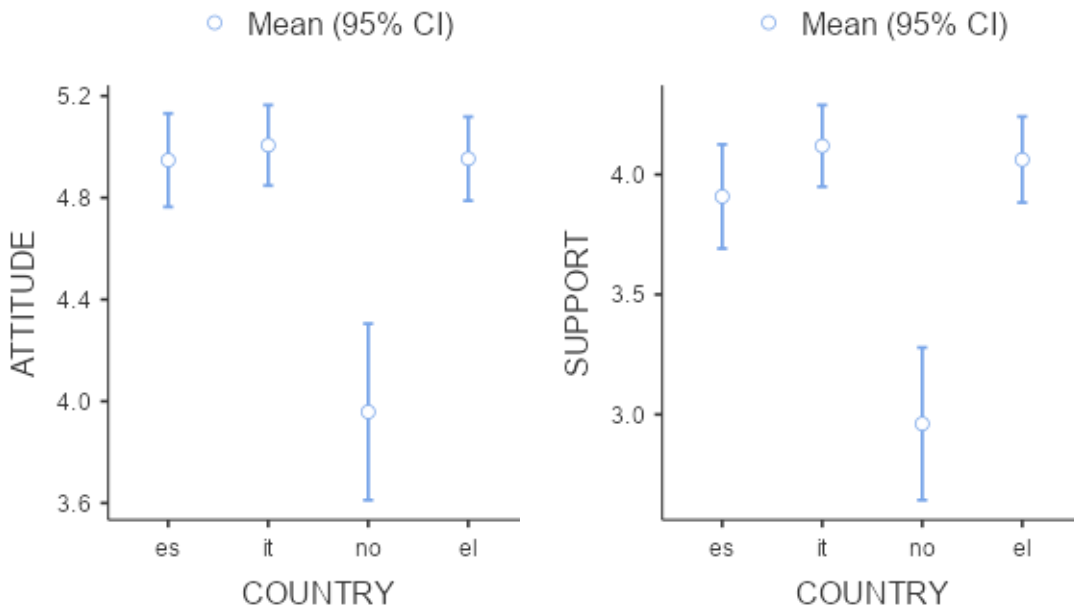
Group Descriptives (es: Spain, it: Italy, no: Norway, el: Greece)

	COUNTRY	N	Mean	SD	SE
ECONOMIC IMPACT	el	107	2.23	0.529	0.0512
	es	102	3.24	0.623	0.0617
	it	106	3.01	0.703	0.0683
	no	60	3.10	0.851	0.1099
SITING PROCESS	el	107	3.22	0.583	0.0564
	es	102	1.92	0.270	0.0268
	it	106	2.07	0.219	0.0213
	no	60	1.96	0.336	0.0433
TRUST IN GOV	el	107	1.98	0.336	0.0325
	es	102	3.36	1.192	0.1180
	it	106	3.67	0.934	0.0907
	no	60	3.08	1.145	0.1478
	el	107	2.58	0.915	0.0885

Box Plots (es: Spain, it: Italy, no: Norway, el: Greece)



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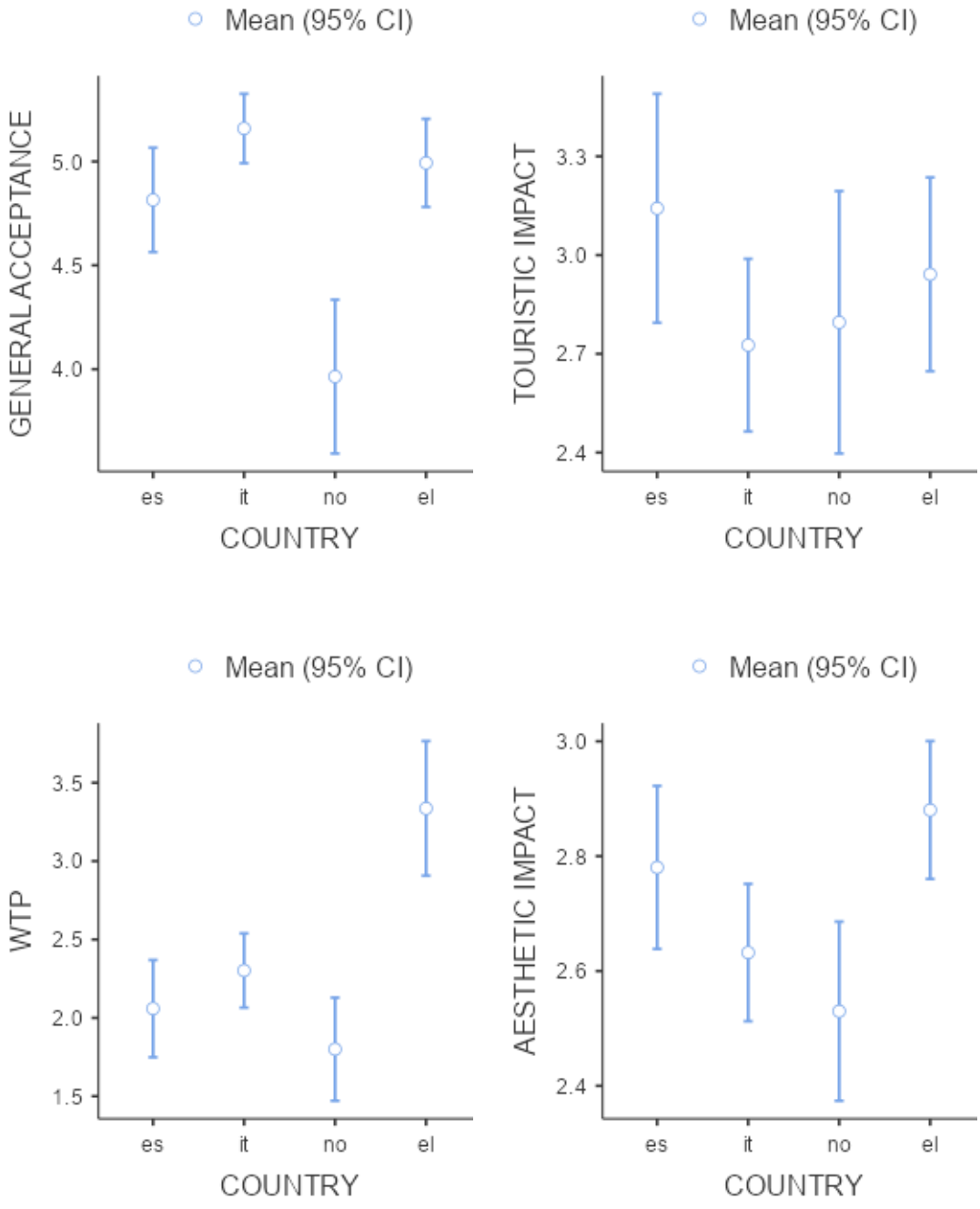

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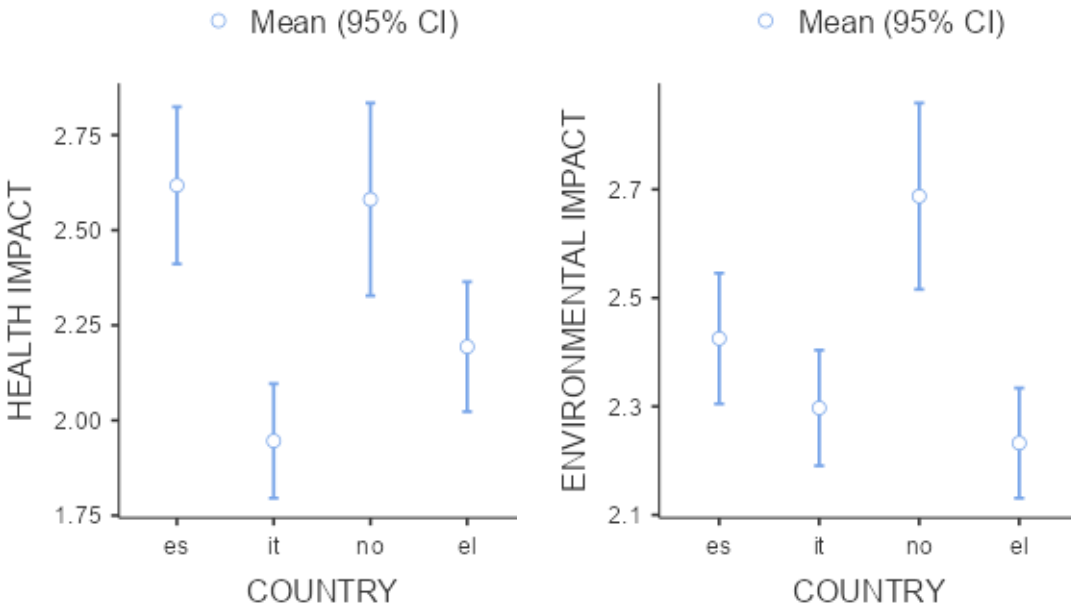

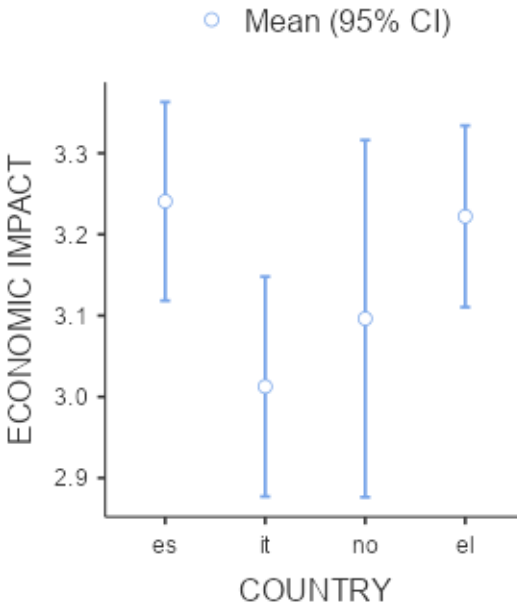

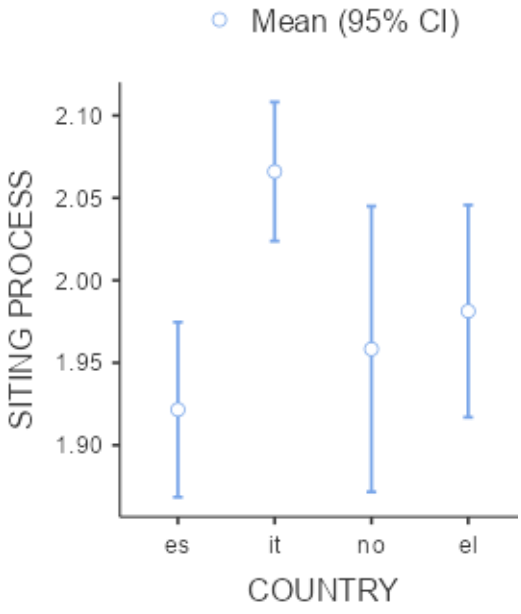

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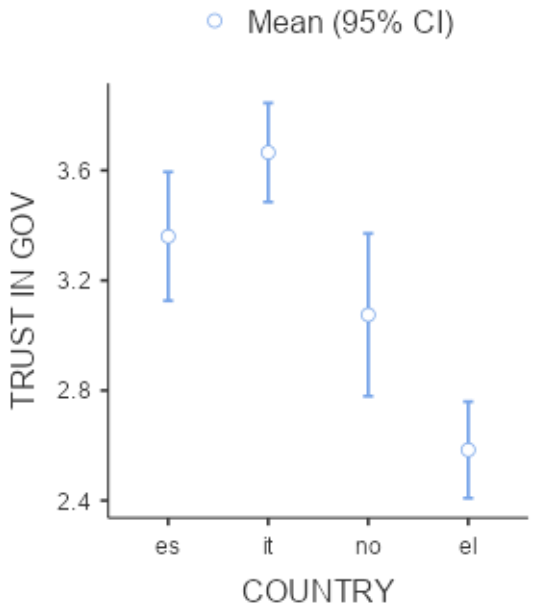

8.3.2 Post Hoc Tests

Tukey Post-Hoc Test – ATTITUDE (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
es	Mean difference	—	-0.0586	0.989 ***	-0.00556
	t-value	—	-0.439	6.32	-0.0417
	df	—	371	371	371
	p-value	—	0.972	< .001	1.000
it	Mean difference		—	1.048 ***	0.05302
	t-value		—	6.74	0.4018
	df		—	371	371
	p-value		—	< .001	0.978
no	Mean difference			—	-0.99494 ***
	t-value			—	-6.4072
	df			—	371
	p-value			—	< .001
el	Mean difference				—
	t-value				—
	df				—
	p-value				—

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Tukey Post-Hoc Test – ATTITUDE (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el

Note. * p < .05, ** p < .01, *** p < .001

Tukey Post-Hoc Test – SUPPORT (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
es	Mean difference	—	-0.211	0.947 ***	-0.1538
	t-value	—	-1.49	5.70	-1.088
	df	—	371	371	371
	p-value	—	0.445	< .001	0.697
it	Mean difference		—	1.158 ***	0.0572
	t-value		—	7.02	0.409
	df		—	371	371
	p-value		—	< .001	0.977
no	Mean difference			—	-1.1012 ***
	t-value			—	-6.685
	df			—	371
	p-value			—	< .001
el	Mean difference				—
	t-value				—
	df				—
	p-value				—

Note. * p < .05, ** p < .01, *** p < .001

Tukey Post-Hoc Test – GENERAL ACCEPTANCE (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
es	Mean difference	—	-0.344	0.851 ***	-0.178
	t-value	—	-2.15	4.53	-1.11
	df	—	371	371	371
	p-value	—	0.141	< .001	0.681
it	Mean difference		—	1.195 ***	0.166

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Tukey Post-Hoc Test – GENERAL ACCEPTANCE (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el	
	t-value		—	6.40	1.05	
	df		—	371	371	
	p-value		—	< .001	0.722	
no	Mean difference			—	-1.029	***
	t-value			—	-5.52	
	df			—	371	
	p-value			—	< .001	
el	Mean difference				—	
	t-value				—	
	df				—	
	p-value				—	

Note. * p < .05, ** p < .01, *** p < .001

Tukey Post-Hoc Test – TOURISTIC IMPACT (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
es	Mean difference	—	0.416	0.3463	0.201
	t-value	—	1.92	1.365	0.930
	df	—	371	371	371
	p-value	—	0.220	0.522	0.789
it	Mean difference		—	-0.0694	-0.215
	t-value		—	-0.276	-1.007
	df		—	371	371
	p-value		—	0.993	0.745
no	Mean difference			—	-0.146
	t-value			—	-0.580
	df			—	371
	p-value			—	0.938
el	Mean difference				—
	t-value				—

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Tukey Post-Hoc Test – TOURISTIC IMPACT (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
	df				—
	p-value				—

Note. * p < .05, ** p < .01, *** p < .001

Tukey Post-Hoc Test – WTP (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el	
es	Mean difference	—	-0.243	0.259	-1.28	***
	t-value	—	-1.05	0.951	-5.52	
	df	—	371	371	371	
	p-value	—	0.721	0.777	< .001	
it	Mean difference		—	0.502	-1.03	***
	t-value		—	1.858	-4.51	
	df		—	371	371	
	p-value		—	0.248	< .001	
no	Mean difference			—	-1.54	***
	t-value			—	-5.70	
	df			—	371	
	p-value			—	< .001	
el	Mean difference				—	
	t-value				—	
	df				—	
	p-value				—	

Note. * p < .05, ** p < .01, *** p < .001

Tukey Post-Hoc Test – AESTHETIC IMPACT (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
es	Mean difference	—	0.148	0.250	-0.1000
	t-value	—	1.65	2.371	-1.11
	df	—	371	371	371

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Tukey Post-Hoc Test – AESTHETIC IMPACT (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el	
	p-value	—	0.353	0.085	0.682	
it	Mean difference		—	0.102	-0.2483	*
	t-value		—	0.973	-2.79	
	df		—	371	371	
	p-value		—	0.765	0.028	
no	Mean difference			—	-0.3504	**
	t-value			—	-3.35	
	df			—	371	
	p-value			—	0.005	
el	Mean difference				—	
	t-value				—	
	df				—	
	p-value				—	

Note. * p < .05, ** p < .01, *** p < .001

Tukey Post-Hoc Test – HEALTH IMPACT (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it		no		el	
es	Mean difference	—	0.672	***	0.0367		0.424	**
	t-value	—	5.24		0.244		3.32	
	df	—	371		371		371	
	p-value	—	< .001		0.995		0.005	
it	Mean difference		—		-0.6349	***	-0.247	
	t-value		—		-4.256		-1.96	
	df		—		371		371	
	p-value		—		< .001		0.207	
no	Mean difference				—		0.387	*
	t-value				—		2.60	
	df				—		371	
	p-value				—		0.047	
el	Mean difference						—	

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Tukey Post-Hoc Test – HEALTH IMPACT (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
	t-value				—
	df				—
	p-value				—

Note. * p < .05, ** p < .01, *** p < .001

Tukey Post-Hoc Test – ENVIRONMENTAL IMPACT (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
es	Mean difference	—	0.128	-0.262 *	0.1928
	t-value	—	1.59	-2.77	2.391
	df	—	371	371	371
	p-value	—	0.388	0.030	0.080
it	Mean difference		—	-0.390 ***	0.0647
	t-value		—	-4.15	0.810
	df		—	371	371
	p-value		—	< .001	0.850
no	Mean difference			—	0.4550 ***
	t-value			—	4.843
	df			—	371
	p-value			—	< .001
el	Mean difference				—
	t-value				—
	df				—
	p-value				—

Note. * p < .05, ** p < .01, *** p < .001

Tukey Post-Hoc Test – ECONOMIC IMPACT (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
es	Mean difference	—	0.228	0.1444	0.0185
	t-value	—	2.43	1.312	0.198

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Tukey Post-Hoc Test – ECONOMIC IMPACT (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
	df	—	371	371	371
	p-value	—	0.073	0.556	0.997
it	Mean difference		—	-0.0837	-0.2096
	t-value		—	-0.766	-2.261
	df		—	371	371
	p-value		—	0.870	0.109
no	Mean difference			—	-0.1259
	t-value			—	-1.154
	df			—	371
	p-value			—	0.656
el	Mean difference				—
	t-value				—
	df				—
	p-value				—

Note. * p < .05, ** p < .01, *** p < .001

Tukey Post-Hoc Test – SITING PROCESS (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it		no	el
es	Mean difference	—	-0.144	**	-0.0368	-0.0597
	t-value	—	-3.60		-0.781	-1.493
	df	—	371		371	371
	p-value	—	0.002		0.863	0.443
it	Mean difference		—		0.1077	0.0847
	t-value		—		2.306	2.138
	df		—		371	371
	p-value		—		0.099	0.143
no	Mean difference				—	-0.0230
	t-value				—	-0.493
	df				—	371
	p-value				—	0.961

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Tukey Post-Hoc Test – SITING PROCESS (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el
el	Mean difference				—
	t-value				—
	df				—
	p-value				—

Note. * p < .05, ** p < .01, *** p < .001

Tukey Post-Hoc Test – TRUST IN GOV (es: Spain, it: Italy, no: Norway, el: Greece)

		es	it	no	el	
es	Mean difference	—	-0.305	0.285	0.776	***
	t-value	—	-2.11	1.69	5.39	
	df	—	371	371	371	
	p-value	—	0.151	0.332	< .001	
it	Mean difference		—	0.590 **	1.081	***
	t-value		—	3.51	7.59	
	df		—	371	371	
	p-value		—	0.003	< .001	
no	Mean difference			—	0.491	*
	t-value			—	2.93	
	df			—	371	
	p-value			—	0.019	
el	Mean difference				—	
	t-value				—	
	df				—	
	p-value				—	

Note. * p < .05, ** p < .01, *** p < .001

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8.4 Statistical analysis of EU-level survey data

8.4.1 Linear Regression

Linear Regression

Model Coefficients- Support

Predictor	Estimate	SE	t	p
Intercept	39.4500	11.3771	3.467	<.001
Extraversion	0.4747	1.1711	0.405	0.685
Agreeableness	-1.3058	1.3218	-0.988	0.323
Consciousness	-2.5967	1.1875	-2.187	0.029
Neuroticism	-1.5254	1.0172	-1.500	0.134
Openness B5	-2.2960	1.1196	-2.051	0.040
Economic Impact	-3.2701	1.0037	-3.258	0.001
Environmental Impact	0.6584	1.6990	0.388	0.698
Touristic Impact	0.6786	0.6427	1.056	0.291
Aesthetic Impact	-4.0885	1.0900	-3.751	<.001
Health Impact	-3.0419	1.0556	-2.882	0.004
Biospheric Value	5.3376	1.0110	5.279	<.001
Altruistic Value	3.3645	1.2337	2.727	0.006
Hedonic Value	-3.9885	0.9942	-4.012	<.001
Egoistic Value	3.5039	0.8618	4.066	<.001
Age	-0.0388	0.0854	-0.454	0.650
Gender	3.4580	1.5406	2.245	0.025
Education	1.5292	0.6518	2.346	0.019
Income	1.8400	0.3628	5.072	<.001

Model Fit Measures

Model	R	R^2
1	0.273	0.0743

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8.5 Interview Transcripts

8.5.1 Italy pilot case

8.5.1.1 Interview 1

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. I believe that overall the development of onshore wind farms in Italy is at a good point and I imagine that it will accelerate over the next few years. I note that the distribution of installations in the country seems unbalanced with a majority of installations built in the south (despite the fact that there is probably more wind in the northern regions) and offshore installations are completely lacking.
Among the factors that have slowed and still slow down wind power development, I believe that the aesthetic impact on the landscape and the risk of collision for birds have carried the most weight. The former is also linked to the 'not in my backyard' syndrome whereby distrust of wind farms increases with proximity to one's home. The risk of collision for birds remains an objective risk as well as an intuitive one: since both birds and blades need wind to move, a conflict situation can be expected if the blades are concentrated in areas traversed by migratory birds.

Q2. How would you characterize the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. I believe that the acceptance of wind farms has profoundly changed since we started to worry about climate change and the need to reduce the use of fossil fuels on a global scale. The focus on alternative and clean energy sources increased further during 2022, when the outbreak of the Ukrainian conflict led to increases in gas prices. I believe that the development of wind farms, in addition to contributing to a nation's overall energy balance, should also bring benefits at the local level, especially to the communities that host the plants in their territory. In addition to appropriate compensation measures, the population would feel more involved and helpful towards

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the plants if they felt directly responsible for them in some way, e.g. through a share in the ownership or economic benefits of energy production. Probably a public share in the installations would further increase their acceptance.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. Among the biggest obstacles to the development of wind farms is certainly bureaucracy and the lack of a pro-active renewable energy policy by the Ministry of the Environment. The current process of creating wind farms, as well as photovoltaic ones, leaves it up to the company to choose the site (among possible ones) where to install the structures and then, during and after construction, the obligation to demonstrate with ad hoc studies (possibly prescribed during the authorisation process by the Ministry) the lack of effects on the environment and in particular for the biodiversity component, the harmlessness of the blades towards birdlife, for example. This process is based on an obvious conflict of interest determined by the fact that the choice of professionals or agencies that will have to conduct the possible study are chosen and paid for by the same companies that will build the plant. Moreover, local authorities (municipalities, regions) may intervene at various stages to impose changes on the project or to obstruct it. This can lead to delays in the passage of paperwork between the ministry, local authorities and construction companies, with the result that permits are issued years. Last April, for example, there was much interest in the news that the administrative process for authorisations for Italy's first offshore wind farm in Taranto had been concluded after 14 years!
As far as the environmental compatibility of the plants in relation to biodiversity is concerned, the administrative process could be considerably lighter if the Ministry of the Environment were to indicate on a map the areas of our country outside of important bird migration flows. In these areas, the installation of plants could follow simplified procedures. For example, in these areas companies could proceed with construction without undertaking the environmental assessment processes.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**

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- **Anything else?**

A4. I believe that if new plant constructions were oriented towards off-shore plants, public acceptance would be almost total. Personally, although I understand their usefulness, I always look at on-shore installations with some annoyance. At sea, on the other hand, far from the coast and therefore beyond sight, this feeling of annoyance is lessened, and I believe many feel the same way.
At sea, in our Mediterranean, the area available for the construction of offshore plants at a sufficient distance from the coast not to be noticed is far greater than that on land.
Plants can now use floating towers and are therefore independent of bathymetry. I would point out that the Mediterranean Sea has six times the surface area of the Baltic Sea; therefore, the potential for developing offshore wind power in our sea is enormous.
Obviously, sea areas along the main migratory corridors for birds, which are in fact those aligned north-south with the main Italian islands, should not be used. There would still remain large areas in the centre of the Mediterranean to the east and especially to the west of the islands and archipelagos.
I also believe that the off-shore installations can help marine biodiversity. If the same criteria were adopted in our country as in other European countries, fishing would be forbidden in the areas of the installations and, in any case, destructive systems such as floating nets or longlines could not be used in the marine areas affected by the installations because they would get entangled with the structures of the installation. Fish fauna could therefore benefit from the presence of the wind structures (fishing activities less so). For seabirds, the risk of impact is relatively small and recent studies indicate that with appropriate mitigation measures there could even be a positive impact.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

Primarily, I do not believe there is an interest on the part of the companies that build and operate plants in involving citizens.
Those who build plants have an immediate interest in 'extorting' consent for the construction of the works, but then the role of citizens is essentially passive, and once the plant is built there is no communication and indeed no interest on the part of citizens.
essentially passive and once the plant is built communication ends and indeed there is no interest on the part of the companies to reopen it.

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Participation should also be active in the sense that citizens should benefit in some way from the plant 'in their backyard',
both with environmental and economic compensation (e.g. on the electricity bill) as well as being kept informed of the performance of the plant and other activities around it.
But companies probably don't want to cut into their profits.... It would therefore take an obligation for citizens to be involved and for them to benefit from hosting wind farms on their territory to come from above (the state).

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

The Ministry of the Environment, in addition to defining directions to manufacturers for an obligation to involve and share the economic benefits of wind power plants with local communities, should increase communication efforts on the benefits of the energy transition.
Citizen participation would probably be facilitated if large Italian energy companies (with state participation) with recognised environmental and social policies were to lead the energy transition to renewables.

Q7. "Would you like to share any final thoughts? Anything you consider important to highlight?"

A7. I warn that the above considerations reflect my familiarity with ecology and an interest in environmental issues, but little information on technical and economic political issues.

8.5.1.2 Interview 2

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

• Which factors do you believe that might hold back Wind Farm development in your region/country?

• What are, in your opinion important factors for Wind farm development, in your region/ country?

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A1. The first wind farms built in the territory of the municipality of Roseto Valfortore (Puglia region) date back to the 1990s, and nowadays both in the municipality of Roseto and in the rest of the Puglia region, the development of wind farms is very advanced and well accepted by the population, who perceive wind farms as an opportunity and development of the area. The wind farms in Roseto have brought new jobs that have allowed young people who had left the region to return to their territories to work.
I believe that it is the high-level environmental associations and government bodies that are holding back the development of new plants in the region.

Q2. How would you characterize the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

For the first wind farms, small groups of people protested, delaying the construction of the plants. The situation has changed somewhat in the meantime and now the population sees the development of wind farms as an opportunity for prosperity as it provides new jobs in marginal areas of the region. In the municipality of Roseto, thanks to the wind farms, many young people have returned to work in their own country after leaving it for other European regions and countries due to a lack of work.
The development of wind farms could be more accepted if a larger segment of citizens had access to economic benefits. I imagine that if the entire population of an area benefited from bill discounts for a wind farm in their municipality, acceptability would increase dramatically.
The royalties that municipalities get for granting land to operators should be used, for example, to discount the energy bills of the municipality's citizens.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. In Italy and in the Puglia region, the main barrier to the creation of new wind farms is the complexity and slowness of the bureaucratic-administrative system. It takes an

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average of five to six years to authorise new plants. Authorisation processes in Italy are too slow and complex, they should be lightened.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. For the promotion of wind power plants, in my opinion, the bureaucracy should be made leaner and lighter in order to speed up and simplify the whole authorisation process.
In addition, another factor is clearly the social/economic one, in the sense that if citizens were given the opportunity to participate as partners in the development of the wind farm and/or have discounts on their bills, this would greatly increase social acceptability and acceptance of the construction of new plants, which would be seen not only as a nuisance and blight on the land, but as an opportunity for prosperity.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. The barriers to citizen participation in project investments are first and foremost financial. The design, construction and maintenance of a wind farm requires large companies with large budgets that have the expertise to follow a very complex process.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. It is precisely these large companies that invest in an area that should facilitate the involvement of local citizens or small businesses with initiatives such as crowfunding and thus give citizens the opportunity to actually participate and then benefit from some financial return.

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Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. If Italy wants to increase the development of wind farms, it must simplify the excessively slow authorisation and bureaucratic processes. Instead, in order to increase social acceptability, citizens must be given the opportunity to participate with shares in new wind farm projects and thus have economic benefits.

8.5.1.3 Interview 3

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. In recent years, wind farms with larger and more powerful turbines have been developed in Italy than in the past, allowing more energy to be obtained with fewer machines installed.
In Campania and Puglia region until 2013, there was a strong development of wind power plants that were built in the most eligible areas of the two regions. Currently, the areas where new wind projects can be developed are areas that are less functional from a social point of view as they are closer to the city and where the turbines are more visible, and this gives the population the idea of blighting the landscape.
It is crucial for the development of wind farms that even larger companies involve the population more through crowdfunding and bill discounts or by encouraging the creation of energy communities. Participation in the economic benefits of a wind farm is certainly a key factor that would promote the social acceptability of wind farms.

Q2. How would you characterize the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

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A2. The community's attitude has evolved over time. Initially, there was some resistance to the construction of the first wind farms, mainly due to a lack of knowledge about the health effects of these new installations. Currently, in areas where there are wind farms, acceptability has increased both because there is an increased awareness that wind farms are not harmful to health and because part of the community has benefited economically from the development of the farms in their municipality. In Campania and Apulia region, wind farms have been developed in marginal areas and this has led to economic benefits especially for land owners who rent their land to the companies that own the plants.
The development of wind farms could be more accepted if the population was more involved in participating in the economic benefits, especially in marginal areas, which are not very industrially developed and therefore green areas with little pollution.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. In Italy, the main problem hindering the creation of new wind farms is regulation. There is no coordination between regional and national authorities that publish laws and directives that sometimes conflict with each other.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. Certainly the economic/financial factor to promote new projects from the plant operators' point of view. Social acceptability is also a determining factor and this could be increased by promoting a more active participation of citizens and extending the possibility of obtaining economic benefits from the construction of new plants to a larger segment of the population.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**

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- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. The barriers that complicate citizens' participation in project investments are mainly technical and financial.
Technical because the development, design, construction, operation and maintenance of wind power plants requires specific, multidisciplinary knowledge and skills.
The complexity of all these aspects makes it difficult for citizens to participate directly in wind power projects. This is why it is important for investors themselves to involve and support local populations.
Then the barriers are also financial, since, being capital intensive, financially important investments, it is difficult for citizens and small businesses to have the capital to make investments in the sector. Therefore, it would be important to support local populations by giving them the opportunity to participate, for example through crowdfunding initiatives, in investments.
As is already the case in countries such as Belgium, one could encourage the creation of cooperatives with members who participate in the construction of a wind farm by investing shares and thus guaranteeing the supply of green energy at a fixed discounted price for a long time.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. The Italian regulatory framework, for example, has only today opened up to the active participation of citizens in the electricity market through Renewable Energy Communities (RECs).
The financial aspect should be improved through the creation of support schemes to raise local capital to support investments in wind power plants.
Promoting environmental education initiatives to make local populations more aware of the environmental and social impact of these initiatives.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Social acceptability comes through extending economic benefits to citizens and the creation of energy communities could facilitate this process.

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By involving citizens economically, they would realise the potential of their territory, especially in the most marginal areas, because wind and sun are also resources and have great value.

8.5.1.4 Interview 4

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. In Italy currently there is a bipolar situation. On the one hand, there are the commitments that the country has made at the European level by implementing the 'RED II' Directive, i.e. the attainment of a 30% share of energy from renewable sources on gross final consumption, in addition to the political commitments inherent to energy transition. On the other hand, there are the results of the Auction and Registry procedures that show various criticalities in the participation of wind energy projects in these procedures, as well as, with regard to the very 'development' of projects, they experience enormous difficulties in the authorisation phase. So, in essence, we are left with two opposing forces, between European commitments on the one hand, and what is happening in national operational reality on the other.

One of the most significant brakes on wind energy development would seem to be the constant opposition of the Superintendencies to the many projects presented, which often obliges the proponents of initiatives to turn to the government to unblock projects, which already in themselves, when they follow the envisaged procedure, and manage to reach a conclusion, take so-called 'biblical' times.

Italy, unfortunately, suffers, and has suffered in past years, from an uncertain regulatory framework, which has not allowed a constant, consistent and planned development of wind farms. While, on the contrary, a certain, long-term and visionary regulation would allow investment planning and would make the country capable of attracting capital from abroad as well, certainly to a much greater extent than it already is, despite the many regulatory changes, even retroactive ones, that the renewable world, especially wind energy, is and has experienced.

Q2. How would you characterize the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**

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- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. Italy is a very particular country in terms of conformation and geographical position. The Alps in the North, the Apennines that cross the country at length, and the sea that laps much of the territory, characterise in themselves the presence or absence of the source necessary for our plants, wind. On the contrary, the strong industrialisation of the North, and the historically agricultural vocation of the South mirror the development of wind farms, where in the Centre-South and the South, the presence of the Apennine mountains, and of the sea, and therefore of Wind have allowed the development of these plants gradually. In such contexts, local communities have seen the plants grow, both in number and size, learning to grow with them, realising their benefits and potential even in times when energy culture was not within everyone's reach.

In the vast majority of cases, the factors that can hinder consensus towards wind energy plants are due to purely "political" issues, where sometimes the NO culture is the bearer of different interests, and thanks to misinformation it reaches its goal, managing to drag the local populations partly or wholly into opposing wind energy development in that specific area.

One of the key keys in the development of wind projects is often the geographical contextualisation of the site. Many wind sites are located in the south of the country, thus typically 'poorer' than the north, and in areas often in the Apennines, where work can be scarce and where the central state's attention to smaller communities is less. The development of new Wind farms is of great interest in training local personnel who can then work on the site, thus creating a virtuous mechanism between the population and the plant. The development of a 'wind' initiative also generates beneficial effects at the level of infrastructure, which is either built from scratch or maintained or improved.

Benefits also occur at the level of logistics, protection of cultural heritage, and tourism, all elements on which the activity of the wind farm has a direct or indirect effect in favour of the site.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

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A3. There are several obstacles to the development of wind energy in Italy, all of which relate in general terms to regulation (primary, secondary and technical) but which have a political origin. In fact, the uncertain political framework, characterised by regulations that are often delayed or unfinished, with some administrations operating in a blind or obtuse manner as they are not adequately trained, or, it can also be said, bent to the policy of 'no', greatly limit the preparation of investment plans for wind energy projects, as they make project implementation uncertain, and with authorisation times extremely diluted in time.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. In a "certain" political framework with a long-term vision and planning, consistent and linear regulatory policies can be inserted, and consequently investment plans can be planned that are aligned and attractive over time, eliminating or minimizing the regulatory uncertainty that currently weighs on every wind project.
A stable regulatory framework, with targets set, would allow projects to be planned in both technical and financial terms. For example, embarking on a project with the certainty that it can be implemented in a given site, municipality, as an area defined as "suitable" would be extremely useful to the proponent of the initiative, who would then aim to implement the best project from a technical-landscape point of view, since the assessment would focus on that, and not on other extremely uncertain parameters such as the presence of constraints that are not always absolutely traceable to the actual characteristics of the territory.
At a social level and also at the level of the communities involved, it has been seen, over the course of these years of wind energy development, that correct information allows a better dialogue with them, who are better able to understand all aspects of a wind energy project, starting with those inherent to the landscape, passing through the economic ones and then, those of a more purely local impact, which usually affect the individual citizen.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**

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- **Anything else?**

A5. In Italy, there are no formal obstacles to citizen participation in wind power projects. Typically, the initiative is private. Therefore, if the private initiative is in the form of a company, there is nothing to prevent the same company from being made up of multiple investors who are natural persons, citizens or not, and who have the appropriate characteristics for the type of investment.
Every business initiative is characterised by a risk, and so, here too, it is necessary to analyse the propensity for risk of the individual citizen investor, who must be properly informed, and the information is a priority.
An obstacle, therefore, could be found in the correct information, since in a wind power project, not only the economic and financial aspect must be assessed, but also the technical aspects from connection to authorisation, and ending with construction and operation.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. As discussed above, in order to get citizens involved in wind project initiatives, an extremely clear and objective information campaign is deemed absolutely necessary. This must be proposed by both the public and private sectors. Already in one of the first legislative decrees (2003) aimed at promoting the growth of renewable energy sources in our country, an information campaign on these sources was envisaged, which was never effectively followed up.
Knowledge and awareness enable coherent choices would also have a positive effect on the Community and Social level, as well as, towards the understanding of how these types of plants are established in the territory. In fact, even an informed and prepared opposition is, in absolute terms, better than an obtuse and blind one that has no answer other than 'no', as it is not supported by a solid basis of knowledge.
Correct information must necessarily also concern the project itself in which the citizen is to be involved; therefore, the citizen should be informed in a timely and transparent manner about what that investment consists of and the risk factor to which he would be exposed.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

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A7. Highlights:

- *a certain, long-term and visionary regulation would allow greater and faster wind farm development in Italy*
- *an extremely clear and objective information campaign is necessary in order to get citizens involved in wind project initiatives and so to increase the social acceptability*

8.5.1.5 Interview 5

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. In Spain and in Italy many new initiatives are waiting for authorizations, the overall permitting process is too slow. If the States really want to accelerate the energy transition, it is necessary to speed up the authorization processes. The involvement of many administrative authorities at different levels (national, regional, municipality) leads to different and potential conflicting opinions with a delay in the overall permitting process.
The offices that deal with the authorization should be reinforced with more people. A national strategy is needed in order to dedicate more resources to authorization at every level: national, regional and municipal.
Often in a municipal office only 1 person is dedicated to permitting process of new projects. With 3 or 4 people the process would be speed up.
In Italy the lack of the digitization in permitting process leads to severe delays.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. The community is aware of the wind energy is necessary for energy transition, but they want a sort of balance between the environmental impacts and the social

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benefits. A full transparent communication with the community is the best way to increase the social acceptance. The community should be informed about all aspects of the new farms especially how the potential environmental and social impacts will be managed, and it should be useful to show them the benefits for their territory (for example employment opportunities, renovation of local infrastructures). It is important to be transparent with the population and to involve them from the very beginning of the project (with public meeting, conference).
Key words to increase social acceptance: transparency, good communication, long-term planning, benefits sharing.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. The main barrier is the long-term permitting process. In Italy there is not certain timeline in the permitting process. You can have the authorization after 2, 3, 5 or more years from the request. The authorization of the point of connection is another critical point. The feedback from the TSO/DSO can take a lot of time; this aspect can make the permitting process slow. • Environmental and planning constrains (Natura 2000 sites, birds migration path, minimum distance for residential areas, tip/hub height restrictions, aerial/navigation exclusion zones, archaeological findings, etc.) reduce the eligible areas where to build new wind farms. Suitable areas occupation is not yet fully ruled in Italy, so competition between developers is very high with the risk that one or more developers competing for the same areas will abandon the initiative.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. In emerging countries (in LATAM for example), people are very happy if a wind farm is built on their territory because they know that this will bring new jobs and more prosperity.
In Europe the situation is different and here for a new wind farm project the focus should be addresses on the positive effects that wind farms can generate (e.g.,

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employment, improvement of job skills, educational activities that involves different actors and with meetings with the population to inform them).

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. In Italy the public hearing in wind farms project is foreseen only during the permitting process. It is not regulated the participation of privates to the investment (e.g., participative investments / fundings). There is a gap in Italian legislation on this aspect. Municipalities often ask the developer to let citizens participate with bill discounts and by participating with quotas, but in Italy this is not regulated at the moment.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. This aspect of public participation needs to be regulated in Italy. Transparency and communication throughout the project process, a kind of open channel with the population.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Simplification of the authorisation process and time certainty. Changes in the legislative framework may further delay the release of the permits. For example, in December at national level, another step was added to the authorization process, requiring the Ministry of Culture to provide a preliminary opinion about the archaeological risk of the proposed project area before proceeding with the VIA procedure. It makes life more complicated for those who want to develop new facilities, increasing the timing for obtaining all the needed opinions from authorities. A common direction and regulation between the various national, regional and municipal levels is desirable. Currently these various levels are not aligned. Give more

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evidence of the benefits of a wind farm for the territory. It is desirable for each Italian region to identify areas suitable for construction in order to speed up the permitting process.

8.5.2 Spain pilot case

8.5.2.1 Interview 1

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. Very developed. The main factor that has slowed it down wind farm development is an inappropriate legal framework. The economic situation and environment are important factors that can affect wind farm development.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. The development of wind technology is complicated in rural areas, especially due to the aspect of the bird life. The perception that people have in these areas would be improved if more effective measures were implemented to alleviate the effects of these avifauna impacts.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. Policy/regulation and social acceptance.

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Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. Regulation.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. Social.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. Regulation.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Apart from the social part, which I think is the most influential, one of the limitations is the network, the infrastructures have to be very powerful to support the high percentage of generation with renewable energies.

8.5.2.2 Interview 2

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

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- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. The progress so far is substantial, but not enough to reach PNIEC, 2030 and 2050 goals.
Factors that hold back / important:
- Access to the grid
- Permitting bottleneck
- Competitivity against PV
- Social unrest (NIMBY effect)
- Lack of a comprehensive database (with an integrated map) with:
a) Operational WP and PV plants
b) WP/PV Plants under permitting

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. Community's attitude is mixed and varies a lot on regions and specific municipalities.
- In general, unrest and opposition is growing since 3 years ago. In Spain, RE -PV and Wind- have been even presented as "the bad guys" in a couple of recent and successful films (Alcarrás & As Bestas), which is pretty symptomatic about the current challenges.
- The local opposition often mentions the following:
- A) Landscape impact
- B) Environmental impact
- C) No implication of the local community and/or opinions
- D) No real value for the locals
- E) A sensation of poor rural areas / less developed
Autonomous communities (like Galicia, Andalucía, Cantabria) being filled with hardware to benefit big industrial areas and cities (Madrid, Barcelona, Valencia, which on top of that have a more restrictive approach towards RE plants and have a very low quantity of projects built or permitted).
More widely acceptance may be achieved through:
- Increased contact with local stakeholders and authorities from the beginning
- Social and Economical local plan implementation

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- Boost on permitting and construction in Madrid, Cataluña, Valencia
- Implementation of tax aids and other tangible measures (e.g. reduced prices of electricity) at the municipalities
- An ambitious communications plan from relevant stakeholders to spread the word that ground mounted RE plants are critical to achieve a viable future.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. We don't identify any main barrier to set up (understood as to connect an already built WP) or keep operating a WP in Spain.
For those between RTB and COD, a construction bottleneck (EPC and critical components availability) is foreseen and may be relevant to deploy new WP in the upcoming 2-3 years.
There is a risk of cannibalization of income that comes with the increase of RE penetration within the Spanish electrical landscape. A proper market design to push storage will help to off-set this risk and deploy more WP in the future.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. Increasing interconnection options with France will be critical.
Another important push should come from a clear support to H2 (and derivatives) from the Spanish and European government.
Regulation coordination between regional, local and national rules should be implemented Development of off-grid WTG's should be critical to allow for dedicated plants (in self-consumption mode) to be developed irrespective of the available capacity.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**

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- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. It depends on the definition of "public participation". Public entities already play a crucial role during the access to the grid and the permitting phase until COD and beyond.
Local public administration involvement is also instrumental to successfully develop new projects.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. Public participation is important through auctions, which is a critical mechanism to provide income stability and help financing WP projects.
- National, regional and local policies should be coordinated to help development at all administrative levels.
- Clear public guidelines on where wind farms can and cannot be developed would be very helpful, specially when it comes to urban planning criteria. Urban planning is a competency transferred to municipalities and is often a main bottleneck.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Nothing important to highlight.

8.5.2.3 Interview 3

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

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A1. We have seen both a significant progress / potential and a public interest in it in public administration speech but not followed by political decisions and associated regulation.
Factors that hold back / important:

- *Unreliable regulation and public planning*
- *Access to the grid*
- *Permitting bottleneck*
- *Environmental constraints interpretation by authorities*

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. Contestation is increasing due to a lack of information on the criticality of renewables and the good socio-economical impact in local.
- Compensation is not enough to convince parts of social stakeholders and the level o direct employment created by the projects is not balancing the cons perceived.
More widely acceptance may be achieved through:
- Real, constant and effective information on:

- *o low impact in rural normal works and tasks*
- *o Attraction to rural areas of employment (although not that much) and activity to avoid rural emptiness*
- *o Effective and reliable use of the economic resources poured on municipalities.*

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. Regulation and environmental constraints are the more typical reasons of windfarm projects to stuck.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**

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- **social (e.g. community acceptance)**
- **Anything else?**

A4. Access to the grid will unblock a lot of projects that are currently under development but on hold waiting for connection solution.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. Rules and regulation are more and more complicated, so the attractive opportunities are less and less. The overcomplication of requirements, cost burdens and timeline uncertainty are pushing back investors and developers.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. Reliability in the sector, predictability in the permitting process discussions and less types or paths to develop projects (National, 17 x Regional paths…) will help the participation.
- Socially wind should be seen as a lucky resource for the villages and areas in which is present. It is an appreciated asset that they need to value and properly manage as community benefit.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Wind is one of the more exciting fields and industries to work on nowadays. We need as sector to be able to be identified as future only path to sustainability and a beneficial workforce in social change. Environmentally respectful and scalable. It is a matter of marketing one side, and public and politic real engagement in the other.
We are in the correct side of the history but struggling with the change of paradigm which is shocking some of the previous social ideas and mindsets.

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8.5.2.4 Interview 4

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. Wind farm development in Aragón is being very high nowadays. Probably one of the highest in Spain, which also has a high growth. There are many wind farms already built, and some more under project or construction. Precisely this growth is one of the mayor barriers for new developments, since the region begin to concentrate what some people think, are too many projects. This results in a loss of social acceptance, which puts a high pressure on local governments, which become more restrictive towards these facilities. Also environmental issues become more important and may hold back, in some cases, the wind farm development.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. Usually, the acceptance of wind farms was relatively high, since they produce renewable energy. As years pass by, and the industry has grown up, the rejection of this facilities has also grown up. They begin to be seen as a threat, specially for wildlife (birds and bats) and the way of life of small communities.
To become more accepted, I think the need to work harder on the social aspect. First, through the social impact assessment (the same way it is made in the environmental way) and finally involving more local people (creating jobs, returning money locally, environmental programs that may benefit the area…) and -very important communicating to these local stakeholders every detail of the project and their benefits for the area/region.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**

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- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3.

- *policy/regulation: Laws change very often. Lack of regulatory stability*
- *social: as the wind farms grow up everywhere, people begin to react against them (maybe too many wind farms too close one to each other)*
- *Environmental: saturation of wind farms on specific areas/regions may cause relevant impact on birds*

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4.

- *policy/regulation: Public rules are more a barrier than a promotion. On the other hand, Spain (and the UE) is supposed to increase their renewable generation and this requirement is a big opportunity for the wind farm development.*
- *finance/economic: renewable industry has good returns for investors*
- *technical issues: it is not a barrier, nor a help*
- *social (e.g. community acceptance): a part of the community would support this industry, but another part would not.*

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5.

- *policy/regulation*
- *finance/economic*

Public Administration is not interested in this participation. As a economical activity, it is relied to private companies.

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Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6.

- *policy/regulation: using public power to promote wind farm projects*
- *social: if wind farms projects had a public interest (e.g. by public Statements participating directly in the project) the community acceptance would increase highly*

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Important to focus on social and environmental aspects for these projects.

8.5.2.5 Interview 5

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1.

- *Environment factors could be the first reason for blocking WF development. Birds are under surveillance of neighbors. Apart of that, installations in areas of tourist and nature interest are not so popular.*
- *Initiatives that contribute to help the support of the area in terms of work can be an important factor for WF development.*
- *Economic benefits that people can put in their pockets could contribute to the development.*

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

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- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. This question is highly related to previous one and the same answers are valid.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3.

- *Knowledge about benefits for the community. It should be explained much better to the community*
- *Collapse of authorities during their analysis and evaluation for the permit*
- *Avoid touristic location for installation (Matarrana Wind Farm)*

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4.

- *Promote the benefits not only for the authorities but also for all community*
- *Place more human resources in the administration office to speed up all the analysis for the permit*
- *Collaborate with local associations/companies from financial point of view*

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

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A5.

- *Schools/Institutes are not so involved, and they can contribute for future people hired by developers*
- *Involve local companies as partners in the constructions or financial issues giving a percentage of the new societies is not frequent and it could be a barrier in the acceptance.*

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6.

- *Promote training and school participation.*
- *Projects that can integrate public participation are in a very small location*

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Final Thought: Wind farms could be more attractive for public opinion if part of the investment finishes in the areas in term of new installations, free electricity for neighbors, employers, collaboration with schools. Those benefits are not visible for the society right now.

8.5.3 Greece pilot case

8.5.3.1 Interview 1

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. Wind farms have been developed to a satisfactory extent. They cover a percentage of the country's required energy, but this percentage should be higher, at least 90%. The factors inhibiting the development of wind farms in the Greece include a) not

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properly informing the public about the benefits, combined with b) prejudices that still exist (and which are in no way based on scientific research and data), c) the wrong planning for the wind farms' location without informing the local community and d) the wind farm operators/owners usually do not provide the appropriate compensatory measures.
On the other hand, the following factors that will strengthen the development of wind farms. Firstly, informing the public about the benefits arising from the use of an environmentally friendly renewable energy source, both in the short term and in the long term for each citizen but also for the society as a whole. Secondly, raising the world's awareness of the threat of climate change and the effects of the use of fossil fuels combined with the fact that they are not an inexhaustible energy source. Finally, I believe that the citizen himself should have some financial incentive from the installation of wind farms.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. The attitude of society in Crete towards the development of wind farms is -in general- positive. The reactions are fewer but they are more intense and as a result they create a false impression. The people who agree are more but they will not state it with intensity, they will put it more mildly (stating either acceptance or tolerance).
The negative experience from the first facilities that were implemented without proper planning and without dialogue with society, with a central aim the profiting the companies (which naturally expected to exist) created the reactions. There should have been a profit diffusion to society, which did not occur.
However, the world's opinion about wind turbines is slowly changing, with public information about the economic benefit but also while people get better informed about the actual environmental burden (of wind farms), there will definitely be greater acceptance. The environmental burden exists but is magnified by those who react without a serious counterargument.
But now the design includes environmental filters for more effective environmental protection. It must be understood that the installation of such units may bring a slight change in the balance of the ecosystem but this is not catastrophic. We are moving to a situation where we will have a better environment with less CO2 emissions in the long term. Especially after the electrical interconnection of Crete with the mainland, which makes it easier to install and interconnect wind farms and thus the benefits to the citizens will also be seen, the acceptance rate will increase and not decrease.

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The comparison of the benefit gained against any cost incurred is overwhelmingly in favour of the benefit.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. If the legal framework is not supportive then it is an inhibiting factor for the creation and operation of the projects. If it is not possible to install wind farms, the energy issue cannot be solved.
The legislation that governs the installation of wind farms is indeed supportive, but at certain points the way it is formulated may create misunderstandings, which may in turn result in the different interpretations of the law. So the laws in some cases should be clearer.
Regarding the subsidized financing, it is an inhibiting factor when there is none; or when the subsidy criteria are common to all (large investors, ordinary citizens or energy communities). So there should be a distinction here.
The lack of technical training is also a 100% inhibiting factor for the creation and operation of wind farm projects. In Greece we have not yet reached the desired level of technical training. The technical training does not only concern the installation but also the maintenance, operation and long-term use of the equipment. It is important that -in the future- the expertise expands to the production of equipment and machinery in our country as well, so that the added value can be maximized through these projects. This should at least cover the maintenance of the projects, in the first phase, and immediately afterwards the production of the equipment. It is not acceptable to for the entirety of the equipment of a wind farm imported.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. In Greece in the last decade, the state understands that it must facilitate the installation of wind farms, which has resulted in more positive legislation nowadays. In the past this was not the case and that is why there were no wind farm installations. Today there is a legislative framework and despite all the ambiguities that may be still

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present in some of the laws, we have reached the point where wind farms can be located in areas that were not allowed, which is a sign of progress.
Also, the region or the country for each region, should delimit the total capacity that can be installed so that there is scope for the researchers, the interested entrepreneurs and also for the state itself to plan the siting the wind farm correctly and not leave it on a case-by-case basis. In other words, there should be a top level (central) plan that predetermines the levels of installed power in each geographical region of the country.
As far as the financial framework is concerned, there should be a distinction between large installation units and small ones. For small units, for example, involving an individual or entities such as energy communities - which address the world - the legal framework that determines the financing should be very supportive. Such initiatives must be supported because they enable the ordinary citizen who will participate in such a project to have a personal benefit and at the same time enhance the social acceptance. Regarding the large investments that improve the energy infrastructure of the country, the financing should include a clause for "giving back to society", for example either generate and maintain local jobs, or with the provision of free or cheap electricity to local communities or with investments in infrastructure projects that will they will enhance and highlight the area, or even all of the above.
Finally, as far as the technical part is concerned, there should be information and training of researchers, scientists, technicians, etc. As a country, we should not only import know-how and products from abroad, but this should be combined with co-production of part of the equipment and the transfer of know-how for maintenance. The installation of wind farms should be linked to domestic added value. The national goal should therefore be the participation of the country in the production of equipment as well as in its maintenance.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. All of the above can act as inhibiting factors to public participation in wind farm projects. It should be emphasized that both the institutional framework and the financial incentives should be directed towards enabling citizens (either individually or collectively) and institutions (Municipalities) to participate. The aforementioned categories (citizens and institutions) should not be treated with the same criteria as a large investor.

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Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. Initiatives such as energy communities or a Municipality mainly aim at social benefit, so they should be strengthened institutionally and financially. The licensing framework should therefore be more "friendly" to these initiatives rather than a large investment that is mainly aimed at financial benefit. Funding for the society focused entities should also be more favorable; for example a small citizens' cooperative should have the opportunity to be supported financially. The electricity production for country's (Greece) domestic needs and for possible exports, cannot be covered by small producers (private individuals, energy community). But a percentage should be given to them, strengthening such initiatives.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. I consider the installation of wind farms to be the only way forward for the next several years. We should all focus on proper siting and financing so that, in the next 30 years, the fewest possible mistakes are made with respect to the development of new wind farms. To free ourselves from fossil fuels and to utilize our wind potential as much as possible and in the best way, in order to have a better perspective/future for the country. We can achieve the optimally possible planning, to get a good and acceptable result. There is no other way to generate energy, at least for now, other than wind and solar. We can combine a better environment with the combination of the upcoming facilities. The problem seems difficult but if there is a goal, the combination is achievable. There is a relationship that one thing affects another but the transition to the new situation can be made and at the same time the environment is protected.
It is important to know where we want to take our country, to change our culture so that we leave a cleaner environment for our children and grandchildren.

8.5.3.2 Interview 2

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

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- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. The development of wind farms in the South Aegean Region is limited. Given the high wind potential that the islands have, there could have been more small wind farms, so there is a mismatch between the wind potential and actual production. In mainland Greece, wind farms are quite developed. Among the factors delaying the development of wind farms I will mention the legislative framework and permit licensing.
For a small business, for a Municipality or for a cooperative of people it is almost impossible to develop a wind farm in the way the system works in Greece. The second inhibiting factor is the social acceptance which in my opinion is limited. If more people had the information, education and knowledge to realize the usefulness of renewable energy sources and especially wind energy, perhaps the administrators would be more willing to simplify the licensing process. The way permit licensing process favors large companies.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. The attitude of the island society is not positive; it is neutral with a tendency towards negative and sometimes it can be observed that people most often align themselves with voices that are opposing projects (reacting to projects). This negative stance is unjustified if there is moderate development of wind farms with the aim to cover the local energy needs. If people were adequately educated and informed about what wind energy can offer to a place, then over time the stance (towards wind farms) would become more positive.
In the islands, there is a section of people who think that wind turbines are big, they kill birds, they make noise, and they can affect the fauna and flora and/or the tourist interests, so a combination of fears make people negative towards wind farms. People (in islands) don't want industry of any kind, be it cement factories or 'industrial wind farms', because big investment proposals tend to alter the character of an island and people don't like it. The reaction to this issue is justified and has nothing to do with ignorance as the end result affects the image of an island. On the other hand, there are factors that could influence society's stance towards wind farms on the islands and

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these are: first and foremost, providing continuously information with the aim to help people understand and accept the installation of wind farms for the local energy production needs (which in most cases is only a few wind turbines).
A second factor is simplifying the permit/ licensing procedures. A third factor specific to island societies is a bringing together the private initiative and local government (for the development of wind parks). This would bring better results, especially if individuals participated in a cooperative scheme such as energy communities.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. The legislative framework and policies, as we mentioned above, are obstacles for the further development of wind farms in Greece. Making them more suitable would aid development. Also, significant obstacles are the (lack of) social acceptance and technical education and expertise on the islands.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. The obstacles mentioned above are also reinforcing factors from the moment they cease to be obstacles. If the legislative framework is improved and the policies are more appropriate, they would help further the development of wind energy farms. Also, if society is informed and understands the benefits of wind energy, it will be an aiding factor. In my view, however, currently only the availability of financing is a aiding factor in Greece. If the operator has the technical expertise, they can find financing either from a bank or from an investment house.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**

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- **Anything else?**

A5. In Greece, there are difficulties in the legislative framework but also in its application. An example from my personal experience in Sifnos is the submission of an application for a production license in 2016 by a citizens' cooperative. In this particular case, the legislative framework should have been respected based on the date of the application submission, but, eventually, the public administration did not respect the legislative framework. In this case the state is sabotaging the process. Citizens therefore lose faith and eventually loose the will to participate. Finally, ignorance and lack of technical expertise and education are always obstacles for any sector and it applies here as well.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. As mentioned above, when the factors inhibiting citizens' participation cease to be obstacles, they strengthen the participation of citizens or local government organizations in wind farm development projects.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Finally, I would like to point out that if the public administration had set honestly the goal of involving citizens in the development of renewable energy sources and especially wind farms, they would have formed a completely different policy. The legislative framework should be observed (and perhaps improved where necessary) and citizens should be better informed (which is not the case). These two together would be a cornerstone for the development of wind farms in our country.

8.5.3.3 Interview 3

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**

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- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. In Crete the wind parks installations are the maximum possible, because until recently the island was non-interconnected with the mainland grid and this was a restricting parameter for the licensing and the installation of new wind parks in the island. The Operator did whatever was possible so as the maximum wind power can be absorbed from the grid and the wind power curtailments can be reduced as much as possible. With the integration of the first underwater interconnection of Crete with the mainland grid, which was completed in June 2021, and the 2nd and larger one, which is expected to be fully installed within the next 2 years, more wind parks licenses are expected to be issued.
In the mainland Greece, during the last years we had a considerable increase of the installed wind power. Probably we could have even higher wind power installed, but this would require a concurrent upgrade of the transportation grids.
Regarding the parameters that can affect positively or negatively the wind parks' development in Crete and in Greece, we may underline the existence of the required infrastructure in the transportation and distribution grid (lines and substations) and, of course, the public opinion for the wind parks. I think that if the local communities participate in the development, the management and the ownership of wind parks, the local opinion will be highly positive and this will be a significant contribution to the development of new wind parks.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. In Crete we didn't have significant negative reactions against the installation of wind parks, unlike other regions of the country. I believe that this is because the wind turbines installed more than 20 years ago were of small size (at the range of 600 kW to 900 kW) and they were installed in remote areas. Additionally, some of these wind parks, 20 years ago, offered a percentage of their annual income to the local communities. So, the local inhabitants had a direct benefit from them. During the last 10 years we have of course seen strong reactions against these large size wind parks which have been proposed for licensing by big investors. People in Greece and in Crete feel that very large companies have come to harvest the wind potential and to spoil the natural environment by installing wind parks of very large size, which I think is not acceptable from anyone. We need a balance. We do not

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only want not to burden the natural environment with the emission from thermal power plants, but, additionally, we do not either want to deteriorate the natural aesthetics with these large wind parks installations.
To conclude with, I believe that the strong reactions against the wind parks are due to these large size applications from a small number of big investors. This is the main parameter for the development of a strong negative movement against the installation of wind parks in the last years.
On the other hand, the active involvement of local citizens in the development, the management and the ownership of wind parks, through energy cooperatives and communities can considerably contribute towards the cultivation of a positive attitude of local communities in favor of wind parks.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. If all the aforementioned parameters are configured towards the correct direction, they will certainly held and not delay the further development of wind parks. A significant obstacle I would like to add, which I think affects negatively the development of wind parks, is the lack of the required facilities for electricity storage. The electricity production from wind parks is stochastic. We cannot rely on the wind parks technology without storage. Only with storage we can handle the potential impact of large wind power penetration on the stability and the dynamic security of electrical grids, especially, small, autonomous insular ones.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. If all these parameters are correctly and adequately formulated, they will certainly support the further development of wind parks. As mentioned in the previous question, another parameter that can assist the wind parks' development is the storage of the electricity produced by them. Electricity storage, in combination with remote control and automatic operation can help to overcome any malfunctions may occur from high wind power penetration. An adequately communication infrastructure is required, so

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as we can inspect the wind parks' operation, send execute orders on time etc. We also need electricity storage with systems which can undertake the grid's frequency regulation and the voltage drops. This technology exists, is mature, yet still quite expensive. It consists of SCADA systems and facilities equipped with power electronics, which have the capacity to handle on time any voltage drops. Finally, the emerging wind turbines and wind parks technology can also provide methods and techniques to improve their smooth penetration and integration in the electrical grids.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. Similarly with my previous answer, all these parameters, if they are not appropriately formulated, can potentially constitute important obstacles against the engagement of citizens or local authorities in the development, the operation and the ownership of wind parks.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. Apart from the parameters mentioned above, which of course can act supportively if they are appropriately formulated, I would also like to add the technology evolution. I think that the technology is very important, because it can enable the development of wind parks with less grids, hence lower impact on the environment. It can also offer more power with fewer turbines, electricity storage, remote control and adequate handling of grid's stability and dynamic security contingencies. However, for further technology evolution, more money must be invested and more projects must be implemented, which will enable further and enhanced experience. To conclude with, the balance of all the above parameters is extremely important for wind parks projects.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

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A7. I would like to add that there should a clear direction towards the development of dispersed wind parks or rather low power, instead of few and large power projects. In this way we do not burden the transportation and distribution electrical grids and, of course, the environment. In combination with decentralized photovoltaics, the distributed power production is promoted and the local communities become less dependent on the electrical grids.

8.5.3.4 Interview 4

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. The installations of wind parks in Crete are limited. Much more wind parks than the already existing ones can be installed. In the mainland Greece, during the last 10 years, there is a huge development, resulting to considerably high installed wind power. Specifically, in the Region of Peloponnese, but also in the whole mainland Greece, there is still plenty of space for new wind parks' projects. The basic factor for the delay of more installations of wind parks in Crete is that until recently the island was not interconnected with the mainland Greece. With the island's interconnection new margins are created for further wind parks' installations. In general, the availability or not of infrastructure (interconnection, grids) is a significant factor for the development of wind parks. Additionally, the social acceptance, which can be ensured through the public awareness, and the spatial planning are two more factors which affect the wind parks' development. At the moment in Greece, the incorrect spatial planning has resulted to significant public reactions against wind parks' projects.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. In Crete most of the citizens have a positive opinion for wind parks, on the condition that the prerequisites and the restrictions set by the legislation are taken into account, regarding their siting and operation. The wind turbines should be appropriately sited,

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far enough from nearby settlements and, in general, all the defined procedures and terms should be followed, since all of them have been introduced for the benefit of the local communities and the natural enviornment. The adequate awareness is the key-element for the social acceptance of wind parks. In Crete we have an example to avoid, which affected negatively the wind parks' social acceptance. In one of the first wind parks in the island, in the Prefecture of Chania, the investor, without any former attempt to approach and inform the local community, proceeded to the installation of the wind park, the opening of new access roads, causing serious reactions from the local citizens. The way that the investor approaches the local community can play an important role for the configuration of the local opinion. Another factor that affects the social acceptance is the compensating benefits for the local communities. Public works or works of common interest can be constructed by the wind parks' owners, or direct monetary contributions can be supplied either to the local municipalities or to the citizens. In some cases there are no projects implemented or, even if there are some projects constructed, the local municipalities do not inform their citizens, which are not aware on the social contribution of the wind parks. The same happens with the public rates that the wind parks' owners pay to the local municipalities: the citizens are not informed on this contribution. Finally, the engagement of the local citizens on the development of wind parks is very important. I believe that in this case there will not be any reactions.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. The legal framework is the highest obstacle in the wind parks' development process in Greece. As it is configured at the current moment, it is not truly helpful. We can see that the potential investors feel rather insecure regarding the way that the new permits for wind parks installations are issued. I think that the legal framework in Greece, and particularly for energy communities, is not clear and the State is not such close. Also, there is not a spatial plan, especially and particularly designed for wind parks' siting. There is also incomplete awareness of the citizens on how necessary wind energy is for the reduction of the electricity production cost. The legal framework should be amended, so as to enable equal access to wind parks' projects for all, not only for the big investors. The availability of funding is also an important parameter, which may constitute a significant obstacle for the implementation of new wind parks' projects, particularly for small investors and energy communities. The big investors and the large companies usually do not have problems to obtain funding for their projects.

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Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. The capacity of the technical staff involved in the development of wind parks (construction and installation, operation and maintenance) has been considerably improved during the last 15-20 years in Greece, a fact that acts significantly positively. The firms activated in the study, the development and the installation of wind parks have enhanced their staff with highly expertised employees, so this part of the chain completely improves and develops, offering more effective and well-designed solutions. On the other hand, the local communities remain, mostly, not adequately informed on the wind parks. Additionally, the economic benefits for the land owners and the local communities in the regions of the wind parks' installations can be another important factor which can help towards the wind parks' further development.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. The lack of funding can be an important factor particularly for the engagement of small size investors in wind parks' projects. Also the legal framework, as long as it does not offers a direct and competitive access for the licensing and the development of wind parks for small size investors and local community-based initiatives, can certainly be another crucial factor with negative impact. If the legal framework does not support the citizens' initiatives, for example in the form of energy communities, it creates unequal opportunities for these local communities' initiatives, compared to the large size private investors, which possess technical capacity, access to funding sources, procedural and administrative experience and capacity etc.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**

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- **social (e.g. community acceptance)**
- **Anything else?**

A6. The availability of funding, together with the adequate and appropriate formulation of the legal framework are the most important parameters which can promote the engagement of citizens in the development of wind parks. The capacity building of local communities is an asset that can be gained and support the active involvement of citizens in wind parks' projects. Similarly, the social acceptance can also be gained with appropriate campaigns, info-days etc.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. No, I don't have anything else to add.

8.5.3.5 Interview 5

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. The development of wind farms with respect to the objectives of the national energy and climate plan has improved in recent years. After legislative efforts to simplify licensing began, there have been several steps towards improvement. A project's maturation time has decreased; it used to be 10 years in the past, but now one can say that a project will mature in 3-4 years if significant obstacles are not encountered. But in order to achieve the goals of the new National Plan for Energy and Climate - that is currently being drafted - an even greater improvement is needed. So yes, there is an improvement but not one sufficient enough so that it will allow us to install the required power. Regarding the factors delaying the development of wind farms, I think that public services and the set of required committee opinions(permits) are the most critical factors. For example, the offices that deal with the environmental licensing of the projects, are not properly staffed or do not have a very clear guide of deadlines for the opinions/recommendations they have to prepare. Therefore, there is a need to strengthen the public services with more manpower that has proper training, so that they can efficiently complete the volume of work they are assigned.

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Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. Public opinion has a significant percentage that is hostile to wind turbines. In relation to the past, I believe that this percentage has not changed; the reaction from the public today seems greater because the development of wind farms is now much greater and there are many more in operation or in the maturation stages. On the contrary, there is an ever-increasing public opinion percentage that is strongly positive towards the development of wind farms and RES in general. This is happening as they now see in practice how much energy production from RES and especially wind energy can reduce our energy costs. The parameter that will improve society's attitude towards wind farms is information. More information to the local community centrally, not only from the investors, and encouraging public opinion to accept RES, always in accordance with what the legislation and the zoning plan stipulates. Currently the tools do not exist to isolate the hostile voices that disrupt or slow down the development of fully and legally licensed wind farms.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. All the above parameters, apart from financing and technical capacity, are obstacles for the development of wind farms. All of the above improvement to have a larger and more successful development of wind farms. It is disappointing to see that the targets in the national plan have been increased for all RES categories except onshore wind. Onshore wind remains at the same levels and this is an indication that the state accepts, that any more onshore wind farms should not be installed. This is sad because our country has wind potential but with the problems that exist we cannot produce cheap and environmentally friendly energy.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**

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- **social (e.g. community acceptance)**
- **Anything else?**

A4. This parameter which furthers the development of wind farms is financing. Funding currently exists and is plentiful.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. I will speak about the social acceptance parameter, for which there are two speeds. In photovoltaic technology, the acceptance is huge because people consider them small, easy and friendly investments. Photovoltaics do not have the height and difficulty that one encounters in wind turbines, so the entry of small investors from local communities is huge. In wind turbines, on the contrary, social acceptance is still an obstacle even for the small power installations. I will mention for example the small projects of energy communities; I've heard that they are facing obstacles from locals even though they are legally licensed.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. The legislation for citizen participation in wind farm development projects exists and has been extensively used. Perhaps to some extent it has been abused. There is also funding availability. Everyone with capital is looking to find RES projects to invest in. The technical expertise/skills exist even more so in our country after 25 years of developing RES projects.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Something that I think is missing from Greek society is the wide participation of secondary school students. I think kids don't learn enough about RES, beyond how a

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wind turbine works. Students must understand exactly how a RES project reduces the price of energy, why the battery is needed next to the photovoltaic or the wind turbine. They should understand what interconnection means and why we couldn't put wind turbines on the islands for so many years.
Therefore, greater effort in secondary education is now needed and in view of the plans our country has for the utilisation of offshore wind potential, something which, in my opinion, is necessary. I hope that the state takes all the necessary measures and that all the knowledge that has been accumulated over the years, will be used so that we do not have, on the one hand, stagnant projects, trapped investors, irrational vetoing and people with negative attitude towards this sector of development; and on the other hand, to not encounter abuse of environmental zones. I think we should all be aware of what is happening in other countries abroad, such as in Spain where there are hotels that advertise that they are next to wind farms and are proud of their location. The reaction here of Greek tourism, which does not want to see wind turbines anywhere, I consider to be outdated and irrational. My personal opinion is that we should all have RES projects next to us and in our homes and in our summer cottages. Therefore, in view of the development of offshore wind farms, I would like to emphasize that attention is needed.

8.5.4 Norway pilot case

8.5.4.1 Interview 1

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. When it comes to the question of the process we have had in Norway, then I think that in essence it has been a good process in line with those we are used to from other energy infrastructure processes, both hydropower, land wind and grid. Additionally, it is of course also in line with concession processes from the oil and gas sector.
What has been problematic is that it has taken a long time – which creates uncertainty in the market. From the original date that the concessions were opened over 2 years have passed without clear guidelines for governmental support (crucially subsidies/ contract form), regulation of concession content, detailed planning, impact assessments, etc. It was opened without any of these (and more) of these things being in place. The revised legal framework was also not in place, just a draft which was

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opened for comment. This has been a burden for operators who were willing to go ahead quickly but were met with a governmental system which was not ready for offshore wind yet. This is a back to front way to go about industrial development!
Risk factors for future development: That a concession system is not in place which developers can accept (but this is maybe unlikely in the long term). It is starting to be more predictable but is still taking a long time. The prequalification stage had unexpected elements to it, most actors didn't expect this stage to be a competition in itself. This is challenging for the players in the market, and the interviewee believes some may challenges this legally. The overall framework is within what could be expected but there are some decision-related elements which are not in place.
The support mechanisms (subsidies) must be in place soon otherwise interest in the Norwegian market may be reduced, with consortia becoming more interested in developments outside of Norway. Most of the consortia planning to bid for Norwegian concessions are already active internationally, with many having installed capacity from before (real experience). There are therefore many companies who may concentrate on markets outside of Norway, if this uncertainty continues.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. Overall, there is a lot of goodwill, and the general public is positive to offshore wind in Norway. There has been a period of land-based development which people have not been so happy with. This is associated with poor development processes, large scale environmental impacts, and perceived "corruption", with assets and profits leaving Norway. But for offshore wind most people still believe this will be an important part of the so called "green shift". Kind of a low hanging fruit.
But there may be differences between what the general public thinks and the opinions of those most greatly affected (e.g. Utsira area). Here a more normal NIMBY mentality can prevail with the locals asking what is in it for them, for the area the give/ consequences they may bear. Those who are directly affected are usually skeptical to giving something to the wider community without having some local payback. Otherwise, the interviewee means there is broad acceptance for offshore wind in Norway.
Factors which may influence social acceptance in a negative direction: That one is imposed a large-scale development/ plant which is very visible, or which takes a lot of space, may have environmental consequences, without any local payback for the community. Many wish that offshore wind shall be developed along similar lines as for

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hydropower in Norway with the hosting communities receiving a large part of the income. Local authorities in Norway have a lot of income based on hydropower and it follows the county boundaries. If one cannot show local advantages from wind development, then acceptance of the developments may be difficult. You can't just tell then that it is happening regardless.
Use resources on? Mitigating measures or making any negative effects as small as possible. Compensating measures in the form of financing something in the local community, such as a community hall, roads, harbors, investment fund etc. Compensation in a form which is not related to the wind development at all, can be seen as "greasing the wheels". If one gives something away, one can expect something in return.
Another aspect is openness. That there are open, transparent processes. That all who will be affected, especially at the local and county level, are involved in the process as early as possible and have the opportunity to influence which measures are started, as far as that is possible. Be listened to when it comes to mitigating and compensatory measures – quite "normal" Norwegian concession process. In summary; openness, early involvement, payback to the local community, compensation (non, wind farm related).

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. Lots of the same things we have discussed over. "we are working the whole time with the challenges we have at the project level, starting with finding out if projects are at all profitable, are there environmental challenges, grid issues, sea floor issues, etc. There are many aspects which are challenging regarding establishing and building a wind farm". One problem is if very high environmental standards are set at an early stage, as is the case for the prequalification, where there are requirements to calculate the climate footprint. This is tricky and not appropriate, as the turbines might be in place for 40 years, and there will be lots of development and innovation underway which may lead to a reduction in the footprint. It is challenging for projects to estimate this at an early stage.
If we are to compete already on this, then the developer needs to deliver and be the "best in the class" already now based on numbers which are highly uncertain then there really is no point. The developers need to ask the supply chain which will be unable to produce realistic numbers, especially seeing as they will not be involved for another 5-10 years. This will lead to very uncertain and very optimistic numbers, and

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nobody wants to end up last because they weren't ambitious enough. The interviewee compares this to a beauty contest, where developers may deliver unrealistic numbers which they cannot delivery to win the concession and instead pay fines etc. which are small spread over the production lifetime of the wind farm. This will create uncertain processes. Instead, we should compete based on realistic plans, that developers show how they will consider climate, rather than delivering on concreate numbers.
Pris is also a challenge. It is difficult to predict what price you will achieve. If we have to deliver a bid, then we need a predictive price for power in the future. Contracts for difference can be part of the solution but must be carried out in such a way that they may be adjusted in a realistic market in the future. There is uncertainty here.
Coexistence – make offshore wind work alongside fisheries, shipping, and other use of the oceans in these areas. At the same time, it is a challenge that establishing industries are compared equally to existing ones. It can't be that the most recent industries are at the mercy of the older ones. The fisheries industry must be maintained but should be evaluated in a comparable way to offshore wind. A future agreement needs securing at the process level for all to adhere to. The most important aspect is to solve the co-existence question. In Norway we have chosen areas which are suitable both economically, environmentally and in terms of co-existence, so this must be solved within the areas one has been given. In other markets it is possible for the developers to suggest areas themselves. In Denmark they have taken it a step further by having governmental surveys and impact assessments, which creates predictability for the concession process.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. Green energy. Renewable energy. Contribute to the "green shift". In a European context if one is to have other energy sources in addition to water and wind, then it takes a very long time to get started. Offshore wind may address energy challenges the next 10 years compared to for example nuclear power which is immature (in Norway). Offshore wind can solve many energy problems.
Grid development is often a challenge. In Norway it is a wish by the public that only Radiale cables are installed – but this goes against helping with the European energy balance and what the developers wish for. All want a hub in the North Sea which supports "plug and play" solutions, and that we have an exchange of energy, and balance with Europe, or at least the Nordic/North Sea nations. If Norway is to benefit

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from this, then we need a different type of net. We need a different type of energy exchange between North/South/East and West, a central net which perhaps needs to be developed in a different way. Offshore wind won't be a quick fix if these things are not in place. What is happening currently is that one must plan an offshore wind farm, which is not able to be built right now. The turbine wished for, the logistics for moving them, substation solutions not built etc.
Planning for the future and taking into account technology development which much happen to realize these ambitions. It is a risk, but that is how it must be done. You can watch the generational development of the turbines and see that it is possible. Project technical challenges in summary.
Supply chain: A vast apparatus which needs to be in place. The plans which individual countries have for offshore wind equates to a supply chain out of all proportion. If you estimate based on everything available today of suppliers and logistics, then there is nothing which suggests it is possible. The supply chain is a critical element and also how to adjust to national requirements and to secure enough local content. Harbors are also an issue here, and the pricing of them. The supply chain needs developing at the same tempo that the wind farms are being planned and developed, this is perhaps the biggest challenge we face. There are also many processes and institutions, local, regional and national to consider, all needs coordinating – an enormous system which needs to be in place.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. Get involved in the draft process for concession rules. It is not possible to get a perfect system where all opinions are taken into account, but we have a good tradition in Norway for good practice in such processes. The government takes the lead here, and so one can be safe in the knowledge that communication and discourse is handled in a neutral and objective manner. This might not necessarily be the case in other markets where the developers may run these processes themselves, such as Sweden.
Coexistence and fisheries. These are large-scale and complicated things which need to be discussed with the fisheries industry, and there are many fisheries organizations which are not all able to meet all the enquiries they may get from all the actors. They have another type of knowledge and experience, and we can't expect them to give complete feedback regarding offshore wind. This is a complicated process, technically, economically, and environmentally. This remains a large challenge.

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We are effectively in a process before the process. There hasn't been any application sent in for impact assessment yet. In what way will offshore wind affect fish stocks in both an industrial and commercial perspective. When the developers come with reports, data and studies from abroad there will always be a certain amount of skepticism that the results will not be applicable the Norwegian situation.
You can't expect the fishing industry to have an overview of these things either. If you are an educated fisherman and have invested in a vessel, then it is not natural that you should understand or have an overview of the legal aspects of the offshore wind industry's input. There is a lot of pressure on the fisheries industry at the moment, there are a lot of people in contact with them.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. Need to have open processes and be honest and open about the facts. Tell it like it is, there is a large area which will be taken. Show the data which is available.
The different parties should avoid long newspaper rhetoric where one takes the high ground over those who are stupid enough not to understand the best idea in the world! Then there is grounds to be skeptical. We haven't done this previously in Norway and we do not know the long term effects. Therefore we should be careful about forming an opinion about all who are skeptical, or have a different agenda or who don't want wind energy, that they are "all idiots", for that reason. As a collective industry we need to be open about the knowledge gaps and state how they will be addressed through monitoring programs. If the effects are shown to be too great then
action is needed, at the very least in the following concession rounds.
What we do now in the first two concession rounds will pave the way for what comes afterwards in the following decades. We should have openness and neutrality in relation to what we are doing, don't sugarcoat it too much. There are examples of those who enter these debates with negative consequences for the industry. This can just as easily be politicians as it can be from industry, a kind of stakeholder trap!
We need to agree what are the facts before one enters the discussion. Area, effects, economic effects etc. debates about what are the facts are not helpful, and some actors will try and twist these to their advantage.
So, in different ways include the different stakeholders and try to give them a piece of the pie. Is it possible to have aquaculture together with an offshore wind farm? Are there economies of scale advantages? UK: instead of paying compensation to the fishermen, they have adjusted their practices. One example is where they have re-

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purposed fishing vessels to conduct research on the effects of the industry in real time, whilst development is ongoing and once they are in production. Adequate involvement of interested parties is crucial.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Look to Denmark when it comes to environmental challenges. The way it has been carried out until now in Norway is dependent on which data comes from where, and is almost carried out in secret. Little openness surrounding this. Little involvement with the players about what they actually need. It looks like the government has collected data for themselves but not based on what the developers need. So there is the hope that this will be enough for the EIA. This creates uncertainty. There is a difference between decision level information and what a research institute "needs".

8.5.4.2 Interview 2

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. There are currently no offshore wind farms in Norwegian waters, therefore many people say that the process has been slow. It is not because of fisheries, but that there must be a need for the energy, and it must be profitable. It has not been profitable. Siragrunnen, which originally received a license from NVE (The Norwegian Water Resources and Energy Directorate) was a process that destroyed fisheries. These were the grounds out in the sea - called fishing banks. The reason they got a license was that the two municipalities would get 900 million NOK in property tax (state aid / oil tax). When the state aid model came to the Ministry of Petroleum and Energy, the Ministry rejected the proposal.
Another example is Havsul 1 (fishery accepted this one). The premise for the fishery industry was that this should not interfere with the most important spawning areas we have in the North Atlantic Sea (Mørebankene) and Norwegian spring-spawning herring in this areas. This should have been clarified in the project, but nothing was done. The concession was nevertheless extended and when it was extended for the second time, a complaint was lodged. The reason for the concession was also state aid (oil tax) - an agreement was made with Sandøy municipality for 1 million NOK per inhabitant if the

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project was implemented. When this came up late in the process, it had negative impact on the confidence and trust in the project. State aid, in this setting, lead to the fishery industry not being heard. The concession could not be extended further. This was an unfortunate start for offshore wind. Actually, the fishery industry said yes to Havsul because it was not interfering with fisheries. However, the knowledge on how it affects fish is important. In particular, knowledge of fish migrations – as pelagic fish species that are not so dependent on the artificial reef effect. The knowledge on this is not good enough. There is a lot of research needed to have enough knowledge. It was said that ocean research could guarantee that this would go well. Interviewee argues this is not true. It wasn't until September 2022 research on the Norwegian continental shelf started.

Hywind Tampen. The Norwegian fishing industry agreed to this and expected to achieve a good coexistence there. There is not much fishing in this area. However, it was a ready-made project, and the consultation was not perceived as real by the fishing industry. You couldn't even move a cable. And two of the eleven turbines destroyed a fishing field.

Not a good thing for the development of offshore wind in Norway – it affected the trust. Part of the problem was that Equinor gave incorrect information. Interviewee says it was not correct that fisheries were mapped in the correct way, or that considerations for stock exchange sensitivity meant that one could not have a dialogue on the placing/adjustment of cables. Therefore, the Hywind Tampen is not seen as a great example of offshore wind in the eyes of the fishing industry. Later, the interviewee read in the newspapers that the financing of Hywind Tampen was 6 billion NOK, and that 91% was state aid. This made it more difficult for the fishing industry to understand why "they" weren't heard in this matter.

Those who look at the total climate/carbon accounting will see that it will not reduce climate emissions in the big picture. You can see it with 200.000 tonnes of CO2 equivalents at Gullfaks and Tampen in isolation.

But it is part of a large market - this is sold, and the emissions end up in a different climate budget. It costs emissions to build a facility and to take it down.

The fishermen use more fuel (by avoiding wind farms) and emit more on the same fishing quotas as before.

The interviewee thinks Equinor probably has the need to show Hywind Tampen as a success. This is provoking for the fishermen, but they do not speak up about it in the media.

The interviewee has outlined the first three offshore wind projects in Norway from a fisheries-perspective. The fishing industry believes the reason for the slow process so far has been connected to the investors and developers like Equinor.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

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- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. The fishing industry has agreed to Utsira Nord and Sørlige Nordsjø 2. There is not much fishing here. This is an area that is quite large and what we are particularly concerned about is that the two areas that have been settled are developed in a proper and efficient manner. And that is where a difficult issue may lie ahead. What has now been decided is that a total of 4.5 GW will be developed on 3,600 km2 with an area efficiency of 1.3 MW per km2. Then we need approximately an area 4-5 times as large to build out 30 GW according to the industry and research institutions. We will get an indication of that in April when NVE presents the new areas. There will not be room for 20,000 km2 in the North Sea.

Then you have to go out into deeper water. We have had over 70 meetings with the 14 consortia that plan to develop offshore wind, and none of them have asked for areas north of the Sognefjord. It obviously has to do with power demand and electricity price. Those asking for land north of the Sognefjord are county councils, business clusters and municipal politicians, but no developers. It also has to do with network development and other things. It can get tight in the North Sea. The areas that are not controversial (can also include what is called Trollvind - have good discussions with Equinor) must be used well.

Area efficiency is important. Must use deeper areas - for example Norskerenna. There is almost no fishing there - and relatively conflict free. That is where the wind power companies want to go. What concerns the fishing industry is how much space it takes up, where facilities are established, and here the effects on fish stocks (migrations and spawning). It must not go beyond, especially the pelagic, stocks.

Ecofisk wind, which the fishing industry agreed to this summer, was put aside because it was too expensive - even with 87% oil tax support and support from the NOX fund. There are a number of such things that the fishing industry does not fully understand. The fishing industry has agreed to a lot, but I don't think it is fisheries that will limit this here so much. I think it will go to finance, and balance power, financing. And the Center Party will probably have to agree that the power should only go ashore in Norway - but not the fishing industry's business.

It is something that the marine industry has not responded to – which has implications for social acceptance. It is: how will offshore wind concretely contribute to lower power prices in Norway in the long term. In the first phase, the Center Party will only build out cables into Norway, while the industry will have hybrid cables/hybrid networks to the UK+EU. Then you must find mechanisms to solve it there - and we haven't seen any answer to that. Balance power. 140 GW will be developed in the North Sea (includes countries other than just Norway). In the North Sea, the wind blows pretty much the

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same everywhere, but where does the balancing force come from? Do we have to build out more hydropower, will there be more efficiency driving, what about the waterways? Does balancing power come from fossil energy? There has been no response to this. Figures have also emerged that it will cost almost the entire state budget to develop 30 GW in Norwegian waters. How will this be financed – electricity price, state aid? It also seems to be quite a bit more expensive.

The offshore wind industry must probably contribute to answering this to gain social acceptance. The electricity bill is important to people. How will this happen? Who will pay if it is not the state or the electricity bill that will pay?

The process takes time, but it is also important to do things properly. The fishing industry agrees with the offshore industry on using the areas effectively. Why is a limit of 1.5 GW set for Utsira Nord when it is possible to develop 3 GW? The areas should be mapped better in advance – both parties agree on this. Not just geophysical surveys. There is better dialogue between the offshore wind industry and the fishing industry now.

The Ministry of Petroleum and Energy has had low capacity, but things have improved there now. There is also talk of doing things very quickly. REPowerEU was consulted in August with a fast-track process. The fishing industry is initially skeptical towards this. If NVE (Norwegian Water Resources and Energy Directorate) must do the same job in a very short time, it will not be good. It is not a must for the fishing industry for the process to a long time if there are conflict-free areas, but the fishing industry has not been considered. The projects have slowed down or been abolished due to financing (state aid), and not because of fisheries.

Another issue might be Trænabanken. It is an area relevant for offshore wind and fisheries have agreed. The way this is sold is not very good. It has been indicated a need for power in Helgeland, and it is certainly real.

However, the estimated number is not. This is an area where 80,000 people live, and it is said the need will be between 9.5 and 13.5 TwH extra over the course of 7 years. This is as much as the entire country needs. NVE is stated as the source, but NVE has not heard of this. This is how it is sold to the ministry, and when it is done in an area that conflicts with fisheries, it is not very good.

There is talk about offshore wind electrifying aquaculture. The economy in this concept is not perceived as good enough as it is now. A fish tank for fish farming uses almost no electricity – perhaps around 300,000 - 400,000 kwh per year. It doesn't need heating or anything. It is the feed that requires energy.

"We are an industry ourselves, and cannot say no to other industries at sea, but an important criterion is not to destroy the fish stocks at sea or be an obstacle for fisheries to continue their work".

During the press conference at the opera house in January 2022 where the investment plan for offshore wind was presented, neither fisheries nor coexistence were mentioned. Norwegian industry, represented by Stein Lier-Hansen, said that marine

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research could guarantee that this would go well. It wasn't true. The fishing industry had a national council on the same day, and this led to such a heated atmosphere that the national council for fisheries said no to further development of offshore wind in Norway until the processes would improve. "After this we have said yes again, but what is said must be true."
Interviewee refers to the debate on onshore wind. Haramsøya (has gotten international attention) as an example, where those who live there think the social economy does not make sense and have many questions. For offshore wind power, fisheries are more involved in the process than before, and have gotten some promises. What is documented as important fishing areas must be protected. Interviewee is concerned if offshore wind will get larger areas, it might lead to more conflict. Fisheries are concerned with the results, and the impact on fish stocks. If promises are kept, it will be fine (not "taking" important areas for fishing).
The developers have only expressed interest for building offshore wind in the North Sea. This will require efficient use of the area. There has been made some calculations saying that it is possible to get the same amount of energy from offshore wind in an area of 70x70 km, corresponding to all of Norway's hydropower. This turned out to be a sketch from the University of Bergen. There is another professor looking into this is professor and meteorologist Nørs. He has been looking into macro figures for large areas, and found that the maximum you possible can get out of an large area in the North Sea is 1.5 MW per km2. There are no hotspots in the sea like on land. If you develop a small area in the North Sea, you can get 5-7 MW. If you want to build big, you won't get much more than 1.5. Sørlige Nordsjø 2 and Utsira Nord are at 1.3. In the North Sea you cannot fish with lines and nets as in the Baltic Sea. If it turns out that you open for 20,000-25,000 km2 in the North Sea, then you are back to square one. We are talking about different things. If you use smaller areas, you may be able to get a higher effect. The ministry is at 3.5 MW per km2, but this is slightly less than half of what was said in the last consultation. Will it be as effective as it has been said?

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. The fishermen are the ones used to being at sea, and they skeptical to the massive forces at sea, the rough conditions, corrosion etc., which are far greater than those on land, which makes them question the lifetime of the turbines offshore, maintenance needs, and ultimately costs. They don't have stainless gear systems for example. When the turbines lifespan comes to an end then there needs to be a system for

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decommissioning. Fishermen have poor experiences from smaller aquaculture developments where there was a race to build, but no financial capacity to pay for the clean up afterwards, so many of them remain "in the way" as an obstacle for fishing activity. Need to be a guarantee or framework for decommissioning.
There are currently only 7 turbines installed and the biggest challenge will continue to be challenges associated with the economic framework. 2.3 billion kr in governmental support was given to Hywind tampen, and only then was it developed. 566m came from the NOXfund and it wouldn't have been realized without this support. Either way it's a good project for Equinor. The Ekofisk project has been out on hold for the same reasons, even with 78% oil tax financing. The developers that the fishing industry has spoken to state that they need the hybrid grid to be in lace in order for the economics to be viable.
Right now, both >NVE and Statnett are working on these issues, which will be a much more critical bottleneck than area conflicts between fisheries and offshore wind. Need stable, economic framework for investors to be willing to risk capital – they need to see it will be profitable. How is this possible if all the cables are to come into Norway? The fishing industry doesn't understand this, and actors we are in dialogue with mean that a new policy of energy protectionism is required. When it comes to the North Sea grid then it is important that it is created in a way that will allow fishing – should be buried in important fishing areas.
Politicians wish for the development of offshore wind. What they are promising are areas for development, not financing of export cables.
The "ground rent" debate can also potentially be a question for offshore wind? Combination with hydropower will be important in balancing of the power production, this is why some of the big hydropower producers are in the developer consortia. There is uncertainty regarding the profitability of what is being developed now, prices will come down, less important for bottom fixed as its currently cheaper to install. If we collectively build a lot of offshore wind in the North Sea then a power surplus will be created which will influence the price. The highest production will take place when prices are low (or zero), but when it's not windy prices will be high, and hydropower will be especially valuable. This has little to do with the fishing industry but the interviewee feels this will be the most important bottleneck moving forward. Again what the politicians promise is area, but the investments need to be profitable, how to establish a framework for this.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

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A4. See Q3.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. Very positive developments the last years. Good contact with the industry directly. Compares fishing industry with Indians on the American prairies "political lobbying for an existing industry is not as exciting as new developments". The fishing industry is trying to map and protect the most important fishing areas, but not carry out active lobbying, we do not have anyone working on this full time, whilst the wind industry has many. We are in the oil and energy departments coexistence forum – here are structured and good discussions. We believe that the issue of efficient use of the areas will be on the political agenda.
There are also other parallel initiatives considering co-existence. What is most important for the fishing industry is that the government has said that important fishing and spawning areas shall not be developed but protected – and we are happy to hear this. It is also politically decided that we shall have positive coexistence. It is often the shallow areas which are attractive to both industries, especially when it comes to bottom fixed wind. The Norwegian Channel (deeper water) would be relatively unproblematic, but maybe transferring the power to land will be difficult. The fishing industry is interested in seeing how these areas will be defined.
The artificial reef effect we know quite a bit about. We don't know so much about how sound may affect fish migration for cod, for example. The (fishing) industry sits together with several wind industry actors in a reference group for a project which is looking at this. Its about defining the roles. Hywind Tampen can be a relevant study site. If it turns out that it goes ok, then this will of course be positive for all actors.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. See Q5.

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Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. The reason why it has taken time is lack of communication. Competition between the companies, and then there is a lack of good impact assessments. The areas have not been mapped in terms of biology. Utsira Nord is mapped for geophysics and anchoring, and they will not be ready until after applications for allocating areas are made. It is too late.
The reason why the dialogue is better is that the ministry requires coexistence. Applicants must have a plan for coexistence.

8.5.4.3 Interview 3

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. The last year has been fast track. The process has been good. Utsira is the only directly affected municipality - and it has given up a large sea area. The municipality is not included on the agenda. Focus on authorities, focus on consortium, focus on suppliers. This is where social sustainability comes in, and that piece is missing in the process.
The municipality is highly dependent on people with knowledge on offshore wind do be able to take part in the process when the government is not including it automatically. Those directly affected should be included and their voice should be heard. If the municipality says no to offshore development in its area, the process may be delayed or determined. It may also create the same attitudes towards offshore wind as to onshore wind.
The government has agreed and put it in writing that the municipalities (or others) facilitating resources and areas used for xxx must also be compensated for the inconveniences and the area that is being given up. In the current process (concession process) the municipality has not been taken care of so far. However, the process in itself has been good.
The METCenter has been important as a driver and instigator for wind farm development, and as a source for information. A great deal of the process concerns environmental factors – like birds, fish, and biodiversity. Economic factors are also

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taken into consideration – the projects must be cost efficient. The local inhabitants, not so much. The interviewee sees social sustainability as just as important – regarding SDGs 1, 4, and 8 as highly important in this (no poverty; competences; decent work). It is a community in a municipality. The human beings are at the centre of these communities, not just birds and fish. The people are important resources and should be considered just as much as nature and animals.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. There has been a constant change and development in the Utsira municipality (where the first floating windfarm will be built). Already from the 19th century when people made the change from farming to herring fishing. Today, we once again see a transition - to wind energy this time. If the municipality and community at Utsira doesn't take this opportunity to change, the risk is that the municipality and community will stop developing and eventually die. They must do this. The population at Utsira is generally positive regarding the offshore wind development, but they want something in return for the areas they are "giving up". They wish to be seen, respected, and included. If they are, they are also willing to cooperate and "give up" the sea areas for the large offshore wind farm. The interviewee emphasizes the importance of information – information on the process, the stages and steps, and where government or developers are in the process. It is a small municipality, which needs help and tools. There will be put a lot of money into the consortiums developing the wind farm projects, but there should also be set aside money for the municipalities to prepare.
It would be good for the municipalities to be able to hire consultants to map out what is needed in advance of the development of wind farms. There can often be a mismatch between bureaucratic and innovative processes, as they operate with a different pace. There is a need for the bureaucracy in the municipality to get a better understanding of the process, what is needed at the different stages, and when it is necessary to act quickly. The municipalities must be innovative in a process like this, and here they might need help to do so. To be able to establish industry in the municipality, the spatial plans and plans for the municipality must be in place. It is therefore important that the municipality is aware of the process, stages, and what is needed. The affected municipalities should be involved in risk analysis and feasibility
studies.
It is all about mental attitudes, and there is an ongoing discussion on whether people know what "we" have agreed to. When the process started in 2013, the turbines were

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said to be somewhere between 50-100 meters tall. Today, they talk about more 300 meters. This is a drastic change, and the inhabitants at Utsira may need help to visualize – as the dimensions are too large to imagine. And more importantly, what is the result compared to what you get in return. If someone will capitalize and export large amounts of energy and services (based on experience from building this), while the community at Utsira will be left with a car park, people won't be happy or accepting of offshore wind. Interviewee compares it to someone taking 70% of your house, while you get nothing in return. The attitudes towards the wind farm development are positive, but they need help understanding what will happen.

There are several structures to ensure a return for the municipality and its inhabitants. E.g. an ownership structure that ensures permanent income for the municipality – maybe permanent rental agreement.

Currently, the municipalities "hosting" offshore wind will not receive resource rent tax or similar for areas beyond 1 nautical mile offshore. Today it is only land-based energy production that must pay this kind of taxes. Interviewee wish for a tax model of the sea. Another model might be creating funds. The question is who will be responsible for doing this.

In the UK they give 1500 pounds per 1 MW they install. This can be used for business and community development in the municipality. Interviewee wonders who will pay for all infrastructure and other investments needed to develop offshore wind farms. Will the government put money on the table, or will the consortiums be charged for this? The ports must be developed to be able to commercialize them.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. Technical barriers: what technology is available. Has it been tested? Risk scenario?

The operational barriers: how to operate it? Where should the control room be located - thinking about security for Utsira. 1010 km2 of offshore wind, and the control room in Oslo? It doesn't feel safe and good enough for the people living at Utsira. Utsira should get something (money) to develop effective operating models, and maintenance models, etc. Local expertise must be used to develop the operating models.

The organisational aspect: how do you build up the organisation to operate a wind farm? Local knowledge - must use the local people with knowledge. Do not hire SINTEF and others for knowledge and expertise for weather and wind, but rather the local

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ones. The locals have an extreme local knowledge and expertise about depth (anchor) – they know the seabed after years of fishing. The use of local expertise can create trust. The interviewee wishes for the developers to come to the local population and survey existing skills and look at the possibility of logging it in a pool of competences. The consortiums competing for the Utsira Nord concession can then log in and use the local knowledge.

There is national expertise on birds at Utsira – a very enthusiastic man at Utsira logs all birds and writes books on them. Interviewee therefore believes that there is no need for bringing in bird expertise from other parts of the country when there are locals who can do the same job. Hiring locals is a real option.

Policy and regulation: There should be a policy that states that control and preparedness should be located close to the offshore wind sites. There should also be a research centre connected to the offshore wind site. Geographical proximity to the field should be used to develop good processes and operating models. It is important to clarify the barriers before getting started.

How to get hold of critical spare parts - it should be at Utsira. Why not consider 3D printing at Utsira. It is more efficient than having to wait 3 weeks to get a component from Germany. Must rethink, which can be a barrier.

The Petroleum Safety Authority will put in place guidelines on preparedness, maintenance frequencies, proximity to sites, requirements regarding response time for medical preparedness, discharges to sea, and the issues with critical spare parts. Must have a stock in case things go wrong. It is not as easy as onshore.

Considering a drone base is also important – being able to send things out with a drone from somewhere close to the field. Create innovative ways of inspection and maintenance monitoring.

Ocean surveillance: there must be security in place, and a certain control of the area. The interviewee refers to the Nord Stream sabotage.

There is also a Coexistence Forum for Oceans managed by the Ministry of oil and energy. It is very important that the municipalities are invited in and included. If not, the society affected is put on the side lines, while fishermen etc. are included. It will prevent progress rather than

promote it in the coming projects.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. See Q3.

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Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. One large barrier is if the local community and municipality is not seen and listened to. If all parties (developers, suppliers, clusters, ministry, fishers etc.) but not the people affected (the municipality), it will be a problem. Sustainability matters does not only concern those of environmental sustainability (birds, fish etc.), but also people. There will be major conflicts if fisheries and birdlife are not considered, as there are large organisations protecting these interests (environmental associations, fishermen's associations etc.). However, there are no interest organisations to ensure the local community's interests. If the local community don't shout loud enough, no one will hear them as there are no interest organisation representing them or big money to make an impact.

There is need for a policy in place stating that affected parties must have a voice. If there are several regions or municipalities affected, they should have a common voice. There are also opportunities for municipalities close to the site but not directly affected to deliver products and services to the municipality directly affected. These municipalities (not directly affected) do not need compensation for the wind farm but can get benefits from the windfarm being installed – eg. Jobs and green energy. However, the government must make sure the directly affected municipalities get a voice.

For the local community to be represented at meetings and happenings where discussions on offshore wind take place, the municipality's representatives must travel for such meetings. The municipalities do not necessarily have the economy to ensure representation at all the various arenas. Therefore, the government should provide support for directly affected municipalities to be able to participate.

The interviewee would like to see a centre for business development/one-stop-shop to be developed in the municipality. This can cooperate with the consortiums on what is needed in the municipality for the wind farm to be developed, operated, and maintained. If there is need of an operation base or emergency centre, the centre can look into cost estimates, realistic planning, where it should be located, how it is in line with municipal plans, commercial areas, etc. The centre should also ensure that local business or people can be included on the supply side. A one-stop-shop can map an analyse ripple effects locally and ensure the environmental side of it. We don't need three different institutions working on mapping birds – it should be organised from the

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one-stop-shop. This can contribute to bringing costs down and make the process more efficient.
The interviewee calls for more information to the local community. It is not good if the local community receives information on the offshore wind projects based on the knowledge level of the employees in the municipality. It is now up to the individual employees in the municipality to ensure they get the information they want/need to understand what will happen with regards to the wind farm and how they can take part. Skills development and knowledge in the municipalities will help developers and authorities get the projects running smoothly.
The local community is willing to "sacrifice" to secure energy for the nation. However, the community want something more in return than "just" energy. They also want jobs in exchange for the areas occupied by wind turbines.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. See Q5.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. The world's first wind turbine linked to hydrogen: Hydro had a very good process of setting up an onshore wind turbine in the municipality. They involved the local community and created trust. There is a high social acceptance in the municipality because they built trust. Human being in the centre. Example: EU project, ROBINSON (smart integration of local energy sources and innovative storage for flexiBle, secure, and cost-efficIent eNergy Supply ON industrialized islands), where they have developed the project from a human perspective. The areas devoted to wind energy should be used well!

8.5.4.4 Interview 4

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**

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- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. The process has been pretty good. It is always like that with new concepts: some wants it to happen faster, and some want it to happen slowly or not happening at all. In general, the process has been good so far, but overall things should have perhaps been moving along a little faster compared to onshore wind energy. It's easy to have a good process when you haven't seen "it" yet. There hasn't been much resistance towards offshore wind at this point. However, resistance often appears when areas are mapped. So far there hasn't been much criticism, but some say that it (the process) has been moving too slow.
What drives it forward is the need for power. There is a sense of urgency. The energy debate is complex. And it has also changed – now people want or need more energy. At first, people wanted hydropower, but then there was opposition to it. Now, most people are positive to hydropower because there are other energy sources that are seen as worse. When onshore wind energy started to be developed and deployed it became controversial. Offshore wind is next, so it will perhaps be more controversial when it becomes a reality – but for now the opposition is low. Nuclear power is next in line. People always want something else, something that takes up less space and has less consequences for environment and people. The interviewee believes that over the last couple of years the situation has changed, which has led to people understanding that we need more energy. This is a push for offshore wind. Some people think that if we "cut the cables" (export energy cables), it will be solving the energy crisis in our country, but it is not so easy to solve this problem. Protection/conservation of birds, fish, and fisheries, as well as nature, is slowing the process. Not that environmental protection is not necessary. The interviewee believes
that it is possible to make it work with offshore wind (regarding coexistence with other industries and environmental considerations).
In particular, floating offshore wind – which is what Norway is focusing on. Compared to bottom fixed, the impact on the seabed is lower with floating technologies. Some people are anxious about the anchor attachment points for wind turbines. However, it becomes less of an issue when you have other industries in the same area doing something "worse" – like seabed mining. Compared to seabed mining, offshore wind has a small impact on the seabed, and therefore nature activists might focus more attention onto seabed mining than offshore wind or fish farming.
Norway has a large supply industry liked to oil and gas, where there will be less activity in the future. This is a driver for the industry to take market shares in offshore wind – the potential in the export market and the industrial opportunity. This might be more of an argument to investing in offshore wind to create a Norwegian export industry and create/secure jobs for the future, and less for producing energy.

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However, the energy production has become more important the last couple of years. Value creation and supplier industry is important for the future, and it has been a driver for the green transition. The industry is not holding back, and we see more impatience among the industry players. Those resisting offshore wind, or wind energy in general, are a diversified group. Environmental organisations and others might have different perspectives – some are arguing that we need renewable energy, and this will have consequences, while others argue it is more important to conserve and protect environment/biodiversity etc.
Instead of producing more renewable energy, we should focus on energy efficiency. The interviewee is not sure if these groups get that much traction or are heard in the debate. The focus seems to be, at the moment, that it is urgent to get started with offshore wind. Also, pushing towards electrification of the continental shelf to reach Norwegian climate targets (by 2030). Although this is highly disputed.
There are somewhat realistic arguments on whether this is something offshore wind can be used for, or if mainland energy should be used for electrification of offshore oil rigs. However, this is probably also a driver for the industry and government to develop offshore wind.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**
- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. Overall, very positive. However, if turbines are built where people can see them, they automatically become more sceptical towards windfarms. This is the same as with onshore wind. Interviewee thinks that the process for onshore wind has affected the perception a bit, but still people are more positive towards offshore wind compared to onshore wind. People might remain positive towards wind energy to the extent they see a value being created for their region. This might not be as valid for offshore wind as onshore wind. There are areas with onshore windfarms but still high electricity prices, which makes people wonder why the turbines are there when they don't even contribute to lowering the energy price for the local community. This will probably also be the case with offshore wind parks, however, to a lesser extent. For now, most people are positive. It is easier to be positive when you haven't seen the results yet. However, offshore wind will be less invasive compared to onshore wind. There is a slight variation in the dynamics in the various regions – this is related to the regional difference between total production and total consumption of power over a year.
Electrification of Melkøya (large-scale liquefied natural gas (LNG) plant on Melkøya island outside of Hammerfest) is a current discussion. Whether Equinor is going to use

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energy from the mainland to do this or build offshore wind. It is seen as positive that offshore wind can replace onshore wind.
Good positioning: many are pointing at offshore wind as the way forward. The further process is highly important – coexistence is important. The development of offshore wind must be done right, and properly. Good working conditions are important, and the electricity must benefit the country. Value creation is a key word. It will be visible that offshore wind is intervening in nature and seizing areas. For this to have further acceptance in society, it must create positive ripple effects on land. Job creation and operating in orderly conditions is of cause important. The way forward is important to keep the good atmosphere for offshore wind. There are currently no large and significant groups of people that are very negative towards offshore wind.
Onshore wind has had a bad reputation as workers are flown in from other countries to do the work. This relates to the job creation aspect, but also to minimum wage. The trade unions and workers have not been happy about this. Combined with expensive electricity, this has become a cocktail that people aren't willing to drink. It is seen as completely meaningless as there is no value creation for the local community or even country, and people therefore get a negative perception to wind energy. The advantage in offshore wind is that there are relatively large, professional, and established companies interested in a market share of offshore wind. Although the consortiums planning to apply for the concessions at Utsira Nord and Sørlige Nordsjø 2 are mixed, most of the companies are professional and already have these considerations in place today. They are already in the energy market (mostly oil and gas) – Equinor, Statkraft, Aker Solutions etc. There is an organised working life and orderly working conditions, which the interviewee thinks will be transferred in a good way to the offshore wind industry. The acceptance will decrease the further away the jobs are created – local/regional job creation is the best, and national job creation second best. Interviewee also thinks there perhaps is more expertise in the supply industry for services in the oil and gas industry that can be translated into offshore wind related operations. Creating new jobs is important in itself but there is also an aspect of high salaries in oil and gas. It might not be as attractive to start working in offshore wind if the salaries cannot match the same level as in oil and gas. It is "promised" that offshore wind will be the next national industrial adventure, and it is important to deliver (most of) what is promised. Origin of the labour is important.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

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A3. An important driver is the workplace perspective which the trade union movement is concerned with - jobs must be created. It is a bit like in oil and gas, where there have been fluctuations in activity. The concern is ensuring relatively steady activity that creates safe and permanent jobs. It shouldn't be accepted having employees working e.g. 3 months per year and furloughed the rest, which leads to people being dependent on working somewhere else for the rest of the year. On the
technical side: it's one thing to install x number of wind turbines, but how many jobs are in operation. This is connected directly to the turbine. It is something else is to develop the industry and supply chain for export markets – technological solutions. It is an important driver for development. This is perhaps also where jobs can be created, and with predictability. The supplier industry is set up so that you have projects, and then activity is kept up during the project period, while there may be less activity in other periods.
I think offshore wind is oversold in terms of jobs, compared to oil and gas which is a super industry. You will not get these values within offshore wind. It is not just one industry that will come in and take over after oil and gas. However, offshore wind is pointed out as one of these industries and is an important part of it. Around 200.000 work in oil and gas and have relatively good salaries. Each employee has a value creation of around 15 million, while in normal mainland industry the value creation is 3-5 million per employee. One might take for granted that things are as they are, and that another industry will step in and take that role. It will probably be easier to see how it will be when things become more materialized. I think people are positive now because they think offshore wind will become the same kind of industry as oil and gas. The commercial and industrial communities want it to go faster to create more jobs and secure a future for the companies, while the climate and environmental side want more renewable energy where offshore wind is a good alternative. It's an unusual alliance and not seen in other areas.
Regarding the technical: a concern for when everything is to be electrified. If you are going to build wind turbines and cables everywhere - there is a need for enough raw materials, manufacturers, suppliers, etc. to reach the goals that all the countries have set for this.
Infrastructure can be a problem. The supplier industry is not that big. You think it is a given that you can buy generators and the cables you need, but that is not necessarily the case. When scaling up, there is a limit to how many people can deliver on these input factors. There are risks that can limit development. This can lead to inflation and price increases for a lot of the components needed to develop wind turbines.
Is it worth the money? If the government has to step in and subsidize more in order for expansion to take place, it will depend on the situation. It is easier to accept development of wind power when electricity is expensive compared to how electricity prices have been in Norway in the past. I don't think that most people have such a long-term perspective, and do probably not think about the power balance far into the

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future or climate targets for 2030 and 2050. Most people are concerned with paycheck to paycheck, how the economy looks now, and whether you have the electricity you need at the moment. Of course, things can change, but...

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. See Q3.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. Energy policy in general is a bit of a nerdy thing and somewhat inaccessible to most people. This is a limitation in the debate and the involvement, and the commitment of people beyond the fact that offshore wind is good, and it is good that it is coming. The interviewee is trying to use TW/h as a term to make it easier for people to understand - rather than GW and MW, or the effect of the production. These concepts are not so accessible to people.
It does not take long before the technical insight limits the debate or understanding. Those who are not engineers may struggle with the use of terms in the debate, and the interviewee thinks it should be made easier to understand for most people. The interviewee believes the debate among politicians and energy companies is driven by people who have significantly more insight and knowledge than most people. They end up talking over everyone's heads. People are not as involved because they may not feel they have sufficient insight and understanding, and therefore cannot have an opinion about it. It is difficult for people without insight have an opinion like "there should be 50 wind turbines rather than 65 in the field to be developed". People probably expect that what is decided is ok and reasonable, and that those who decide this have good prerequisites for making the decision. After all, it is typical for the Norwegian people to have confidence in decision-makers, and we expect them to find

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good solutions. Nevertheless, we reserve the right to have opinions and report if things go wrong. We have seen this with onshore wind - that you have received a negative response when you see negative side effects.
The debate takes place on websites within the industry, and at conferences with a somewhat narrow range of participants. There is a lot of debate on energy policy in general, but it is communicated in a technical and complicated way. Not in a good way. It might make people a little confused and angry. The energy debate on, and the government's ambitions to develop, offshore wind has a form that is accessible to people. People getting involved probably have very strong opinions about it. The politicians are on board and have good support for offshore wind - so the people's voice is heard indirectly.
Society is not particularly enlightened or interested in climate goals, energy, energy balance and new forms of energy as one might have hoped.
The risk is that people think that energy is energy, and this can create expectations that energy will become cheaper. Many people think it is now a state of emergency, but the reality is that the electricity price will not go down to the level it was at before. We must probably expect to pay more for electricity. It can be hard to accept for some people. Some think that being connected to gas prices in Europe is the reason why electricity has become so expensive. Many decline fixed price for electricity because they think prices will return to the previous level.
Energy from hydropower is not very expensive, while kw/h produced by offshore wind costs considerably more. How will this be connected when both energy sources are in the mix? Will it cause energy prices to go down altogether, or will electricity have to be priced higher? It has to do with energy efficiency, and how to manage consumption throughout the day. Offshore wind is not a form of energy like hydropower that you can produce at very low prices. In that sense, it can be a challenge to connect hydropower with the kw/h price of floating offshore wind (0,12NOK vs 1 NOK). How does it affect people?
Everything positive is thrown out the window if people feel they are paying too much for electricity. There is a certain pride for the hydropower in Norway, and the inhabitants have already paid for it (through generations). Many people probably won't care what is produced and where, as long as electricity prices are low. Low prices will probably give more acceptance, and the opposite when prices are high. The authorities' reimbursement scheme will not necessarily help with acceptance, because people will think that a mistake has been made, which means that the prices are higher than they really should be. If the prices are not around 30-40 øre (0,3-0,4 NOK), people will probably think that there is something wrong somewhere.
Offshore wind is now seen as part of the solution for the future energy system, but if offshore wind becomes a light version of "gas price in Europe", where the price level spills over into the price level for hydropower, it will become part of the problem.

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There are many who do not want to export the energy from offshore wind to the rest of Europe, but rather keep the energy for us. Radial system.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. See Q5.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Offshore wind solutions are less complicated than oil and gas. Must have a certain volume if you are to create a certain number of jobs in offshore wind.
There are parts from China, etc., which just need to be put together (especially for bottom fixed). Floating offshore wind will probably be a little more complicated and require different solutions. However, still a smaller investment factor than in o&g. Jobs are not jobs – where can the companies make money and how many "jobs" will be needed to put together and maintain the offshore installations? The competence in Norway fits well with floating wind.

8.5.4.5 Interview 5

Q1. How would you evaluate the progress in the Wind Farm development in your region/ country?

- **Which factors do you believe that might hold back Wind Farm development in your region/country?**
- **What are, in your opinion important factors for Wind farm development, in your region/ country?**

A1. Factors holding back wind farm development:
The proceedings at government level have been a bit slow, which can cause delays. Regarding case management and process, there has been set up a plan and a schedule. However, environmental studies and impact assessments are elements that may take longer than planned and thus delay the development process. There may also be elements creating resistance towards offshore wind, so we need to be careful.

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There is a connection between resistance and environment. Conflicts of interest in the relevant offshore wind areas will be a factor affecting the proceedings. That means conflicts of interest with other users of the sea.
Resistance in the local population and public opinion. It may happen for various reasons, but lessons have been learned from onshore wind power and the case processing process and the participation process here. The time aspect is an important factor, along with participation.
This has created unrest which, together, has led to resistance to wind energy (onshore).
Important factors:
It is important to reduce the costs in the projects, so that they are feasible. Technology development, especially for floating offshore wind, is important. Building energy projects as large as offshore wind also requires social acceptance of the projects. Understanding of development and the need for these projects are also key elements. This is particularly important in the local communities that are close to offshore wind projects with regards to avoiding attitudes such as "NIMBY".
Effective governmental processes towards the start of project development must take place in parallel to gain momentum and reach the goals that have been set. Both from the industry side and the government side. Cooperation in certain non-competitive areas is essential. Developers should cooperate in these areas, especially for studies and data collection, together with the authorities. This is an important factor.
Avoiding conflict of interest is all about ensuring good coexistence throughout. This requires good dialogue and understanding for other users of the sea throughout the process. This in turn will have an impact on stakeholders feeling included and having a certain degree of participation in the project process. Here, it is the authorities who set the framework for involvement through application procedures, consultation statements, consultation rounds, public meetings, and forums. This is also an important factor for success.
What are the important factors for offshore wind development, and how do we succeed with this new industry in Norway? An important point is diversity, both on the developer side and on the supplier side, in the first projects to lay the foundations for a new industry. Diversity in the players building this expertise. The concept of diversity in the stakeholder group is also relevant. Involving different stakeholders in the process will be important for more people to have a positive attitude towards the development.

Q2. How would you characterise the community's attitude towards wind farms development, in your region/ country?

- **Are there any factors hindering the social acceptance of Wind Farms development, in your region/country?**

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- **How could Wind Farm development become more widely accepted in your region/ country?**

A2. We have all the prerequisites to make offshore wind better than onshore wind, as we can learn from the mistakes made in the development of wind energy on land. It is very relevant to draw parallels to what has happened with onshore wind in Norway, even if there are many elements that are different, there is a connection for most people. This is reflected in the type of arguments used regarding offshore wind, as this is often carried over from discussions on onshore wind energy. This is largely related to knowledge and information.
But there is general positivity regarding the development of offshore wind in the region. You can see the possibilities that offshore wind will be able to represent. Most people understand that something big is going to happen, without most people having detailed information about what it will look like and what will actually happen. But in this phase, many people are very positive because they feel that offshore wind will generate something in return, benefiting the region and cause positive ripple effects. An important point, especially when it comes to the population closest to the upcoming offshore wind site (Utsira), they are excited and positive, but "they want something back". Therefore, it is important for wind energy developers to make sure the local community gets something in return for "giving up" for the space used for wind turbines.
Things that can have a negative effect on social acceptance:
Questions related to the environment in the areas where offshore wind is developed. It is about biodiversity, natural diversity, birdlife, fish, and generally the size of the sites and projects. The structure of the tubes.
Microplastics and waste issues are often issues that people are concerned about.
What is perceived as extra important concerns bird life, nesting birds, how to adapt the wind farms in relation to bird life, and any remedial measures. Utsira is a bird mecca in Norway. We have already started to map birds in the sea area around Utsira and have mapped 50.000 birds using AI technology. It is important to start already now to help develop the AI technology so it learns to recognize more species before the process actually starts. The comprehensive understanding of why we should have wind power. How much power will it actually generate, and will it benefit the country and my local environment - or is the power sold out of the country? This is part of the larger energy debate which is very essential to gain acceptance for offshore wind. Offshore wind is part of the solution as part of the energy mix.
I think it is important that people in the region have an understanding of what the power will be used for, and whether you will get something in return. Knowledge is power, and the offshore wind players must contribute to increased understanding in the population.

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Participation and cooperation from stakeholders are also important to ensure good processes. Stakeholders (both other industries and the local population) must feel that they are listened to. The authorities are responsible for the formal process and have various forums for participation. But the developers should also ensure processes with stakeholders and give confirmation that the development will provide something in return, also in the local community. Local content in the projects is therefore important.

Q3. What are the barriers to setting up or keeping Wind farms projects going?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A3. Creating a good framework for offshore wind (policy & regulation) is ground-breaking work in Norway. It is said that you should "hurry slowly" to ensure good processes. In addition, it is important to have support mechanisms in place, and predictability regarding offshore wind and investments in offshore wind. Without predictability, the willingness to invest will be lower. Offshore wind energy is an innovative new industry with a lot of new technology that has been in a pilot phase. If there was no technology that seemed to work when it was tested, there would be no interest in scaling up either. But when we see interest in scaling up, it indirectly means that this is something worth investing in.
Support from society and the local community is also important to drive the process forward in an offshore wind project. We have seen cases in Sweden where municipalities have put their foot down and slowed down the process due to low support or direct opposition from the local population.

Q4. What other factors promote Wind farm projects, if any?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A4. This question is closely related to question 3. It is important to have good support mechanisms, orderly and open processes, and knowledge and understanding in public opinion.

Q5. What are the barriers for public participation in Wind farms projects?

- **policy/regulation**

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- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A5. A barrier to participation is skipping the participation process. It is also important how you, as a developer, set up the process for participation even before you are allocated an area/concession. Feedback from stakeholders is that it is not enough to hold one meeting – the dialogue must continuous. The earlier you start the dialogue, the better the participation process will be, and the stakeholders will feel heard and involved. Can use the "participation ladder", where the first step is to inform the stakeholders about the project plans. What one thinks of doing in the sea area. The next step is dialogue with stakeholders, and the last step is direct participation.

Q6. What factors could promote public participation in Wind farm projects?

- **policy/regulation**
- **finance/economic**
- **technical issues**
- **social (e.g. community acceptance)**
- **Anything else?**

A6. The question is closely related to question 5. It is largely about which activities are initiated. Public meetings and other activities for involvement are important for public participation.
One example is that we have engaged local architecture students who will look at how to build a transformer in a better way, where the building is something that the local community can be proud of and that can be used by others - for example bird watchers etc.. The use of sustainable local materials is also important. It can contribute to more local ripple effects.

Q7. Would you like to share any final thoughts? Anything you consider important to highlight?

A7. Will emphasize on the importance and usefulness of working together on things that are not competitively sensitive. All parties can be involved here – authorities, developers and other stakeholders. You have a shared responsibility to make it happen, and both the collaboration forum and the Norwegian Offshore Wind cluster can be useful arenas for more collaboration and dialogue.
It is important to learn from what is good and what has worked. In Norway, we do not have much experience with offshore wind, but many Norwegian players have

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international partners with long experience – with whom we can exchange good practice. The WENDY project should also ensure that.

Information to the local communities and other stakeholders about where you are in the process is important to secure social acceptance. Wind energy has a lot of technological development. From the time you start studying the areas until the wind turbines are actually set up, a lot of development in the turbines and floaters have occurred. There may be larger and more efficient turbines that are set up than what was initially planned when the process began. Therefore, it is very important to keep people updated about what is happening. Local developers, or local companies, are probably important in wind power projects – because they have a pride and care about the local environment. They are also dependent on social acceptance as the employees are part of the local communities or have friends and family living close to where the tubes are put up. This has been a challenge in Norway for onshore wind, as the projects have been run by foreign companies and developers without any kind of local connection or local content. It creates less social acceptance than if, for example, it is the city's cornerstone company involved in the process of building out wind energy.

8.6 Exploitation potential of D2.3 results and findings

This special section discusses the exploitation strategy of the results and findings of D2.3, as well as their value to the partners who own them. The following table addresses four (4) dimensions: Exploitation potential, IP protection, Potential exploitation pathways, and Partners' plans. Additionally, it allows for the inclusion of any unforeseen dimensions.

Analysis		
1	Exploitation Potential	**Main users** that stand to benefit from the results or findings are the: wind energy farm developers and operators; regulatory authorities and/or government agencies responsible for energy and environmental policies and procedures; NGOs related to issues such as environment, local development, cultural heritage; local authorities/governments and local communities; consultants, citizens residing close to wind farm installations. The **added value** of the results or findings for WENDY, its partners or external stakeholders is based on the following aspects: a comprehensive understanding of stakeholders' perceptions, awareness levels, and willingness to accept and participate in wind farms. It will provide valuable insights into the behavioural aspects and misconceptions surrounding wind turbines, resistance to change, and wind energy innovations. **Unique features** of the deliverable's results that may be attractive: focusing on onshore/offshore wind farms cases from various EU countries and insights from the broader EU will equip stakeholders with crucial insights and knowledge to make informed decisions and implement effective strategies for enhancing social acceptance and participation in wind farms across different regions, ultimately contributing to the sustainable development of wind energy.
2	IP protection	IP protection could be based on the following measures: applying data protection measures that ensure confidentiality and security of any personal data collected; use of Creative Commons to disseminate and use the results and findings.

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3	**Potential exploitation pathways**	Exploitation actions could include, among others, the following: knowledge transfer activities through KEP or other means (such as workshops, webinars, publications, to disseminate the findings); development of a new service related to the enhancement of social acceptance of wind energy farms; consultation of involved stakeholders, leveraging the creation of new energy communities, and the willingness of the corporates to comply with the ESG criteria, or address sustainability priorities (social, economic, and environmental aspects); further development of research through other funding opportunities.
4	**Partners' plans**	Partners can inform their business plans and policy strategies considering the results and findings as a key information resource on the topic. Partners' plans could include knowledge transfer activities; development of a new service; seeking new opportunities for relevant research.
5	**Other**	The exploration of potential collaborations and synergies with key actors and stakeholders could enhance the exploitation potential of the results.

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