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STUDY

Germany’s policy practices for improving community acceptance of wind farms

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Abstract

Germany's 20 years of energy transition experience holds valuable lessons learned, recipes for success but also mistakes to avoid for other countries. The objective of this study was to explore the best solutions for improving community acceptance of onshore and offshore wind farms in South Korea by benchmarking Germany's policy practices and experiences with community acceptance of wind projects. The study is based on desk research, literature review and expert interviews with project developers, municipality representatives and stakeholders from civil society. Community acceptance can be generated through financial participation and public participation in the planning process. The interview questionnaire thus focused on different elements of financial and public participation. In total, nine case studies were developed, each offering specific lessons learned. Based on the best practices and lessons learned, twelve policy recommendations for improving community acceptance of onshore and offshore wind farms in South Korea were developed.

Firstly, as part of a comprehensive public participation process, citizens should be involved as early, inclusively and transparently as possible. Secondly, municipalities should actively communicate the benefits of wind energy for their community and local value creation. For increased acceptance, the tax revenue from the wind park should not become part of the general municipal budget, but should be earmarked for investments that are well visible for the citizens. Third, active financial participation by citizens is beneficial for community acceptance. Active financial participation can take many forms; the most prevalent is the energy cooperative already widely used in Germany and Korea. Fourth, wind farms can create winners and losers in a local community. Projects should include elements to create distributional justice, such as a redistribution of lease payments. Fifth, the origin of the project developer can be key. In every examined case, where the project developer was a local actor, the interviewees and the literature research confirmed a positive effect on community acceptance. Sixth, local politicians who are committed to the project and act as advocates can increase community acceptance. Seventh, the political and regulatory framework needs to be attractive for wind energy development and should support participation of citizens in wind projects. Eighth, projects need to be planned thoroughly. Good project and spatial planning will reduce the risk of legal conflicts and increase acceptance. Ninth, project developers should honour citizen's concerns about environmental impacts and should communicate openly and transparently. Tenth, offshore wind farms should, if possible, be built in a distance to shore, as this reduces acceptance problems. Eleventh, misinformation can pose a significant threat to wind park acceptance. This should be counteracted by information campaigns and a clear commitment. Lastly, the importance of the specific wind energy project for achieving energy transition and climate change mitigation should be emphasized. Communities often have a broader acceptance of the energy transition itself, which might be forgotten in the local project context.

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List of Abbreviations

AA	Auswärtiges Amt (engl.: Federal Foreign Office)
AfD	Alternative für Deutschland (right-wing party in Germany)
BEE	Bundesverband Erneuerbare Energien (engl.: German Renewable Energy Federation)
BfN	Bundesamt für Naturschutz (engl.: German Federal Agency for Nature Conservation)
BMBF	Bundesministerium für Bildung und Forschung (engl.: Federal Ministry of Education and Research)
BMU	Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (engl.: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety)
BMVI	Bundesministerium für Verkehr und digitale Infrastruktur (engl.: Federal Ministry of Transport and Digital Infrastructure)
BMWi	Bundesministerium für Wirtschaft und Energie (engl.: Federal Ministry for Economic Affairs and Energy)
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (engl.: Federal Ministry of Economic Cooperation and Development)
BSH	Bundesamt für Seeschifffahrt und Hydrographie (engl.: Federal Maritime and Hydrographic Agency)
BUND	Bund für Umwelt und Naturschutz Deutschland (Friends of the Earth Germany)
CDU	Christian Democratic Union (conservative German party of chancellor Merkel)
DGRV	Deutscher Genossenschafts- und Raiffeisenverband
EEG	Erneuerbare Energien Gesetz (engl.: Renewable Energy Act)
EEZ	Exclusive Economic Zone
EU	European Union
GHG	greenhouse gas
GW	gigawatt
LCOE	levelised cost of electricity
MW	megawatt
NECP	National Energy and Climate Plans
NIMBY	Not-in-my-backyard
PPA	power purchase agreement
RE	renewable energy

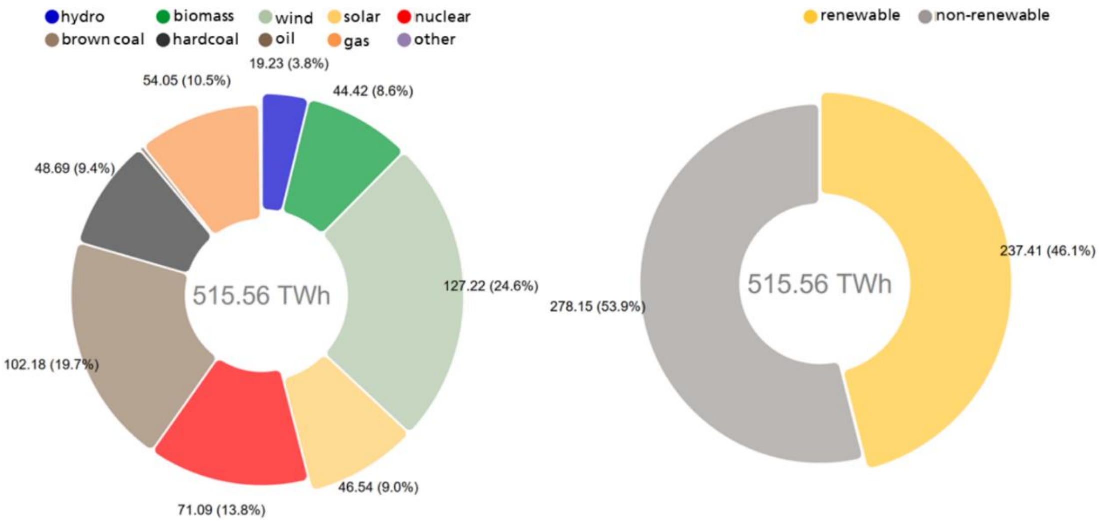
RECs	Renewable Energy Communities
RED II	Renewable Energy Directive II
SPD	Social Democratic Party of Germany (social, center-left German party, in coalition with Merkel's CDU in the Federal Government)
TSO	transmission system operator
TWh	terawatt hours
UK	United Kingdom

1 Introduction

1.1 Background and targets

Germany's energy transition has started in the 1980s and has come a long way since. In 2019, for the first time, the net electricity generation from renewable energy sources surpassed the share of fossil fuels[1]. Wind energy is a fundamental element in the German energy transition (*Energiewende*). In 2019, wind energy supplied about 127 TWh, as seen on Figure 1, of which 102.6 TWh were contributed by onshore and 24.4 TWh by offshore wind parks (Fraunhofer ISE 2020b). Total electricity generation in Germany amounted in 2019 to 515.56 TWh, similar to the 553 TWh in Korea (Enerdata 2020). Thereby, wind energy was the main source of electricity in Germany in 2019.

Figure 1: Net electricity generation mix in Germany in 2019



Source: Fraunhofer ISE 2020b

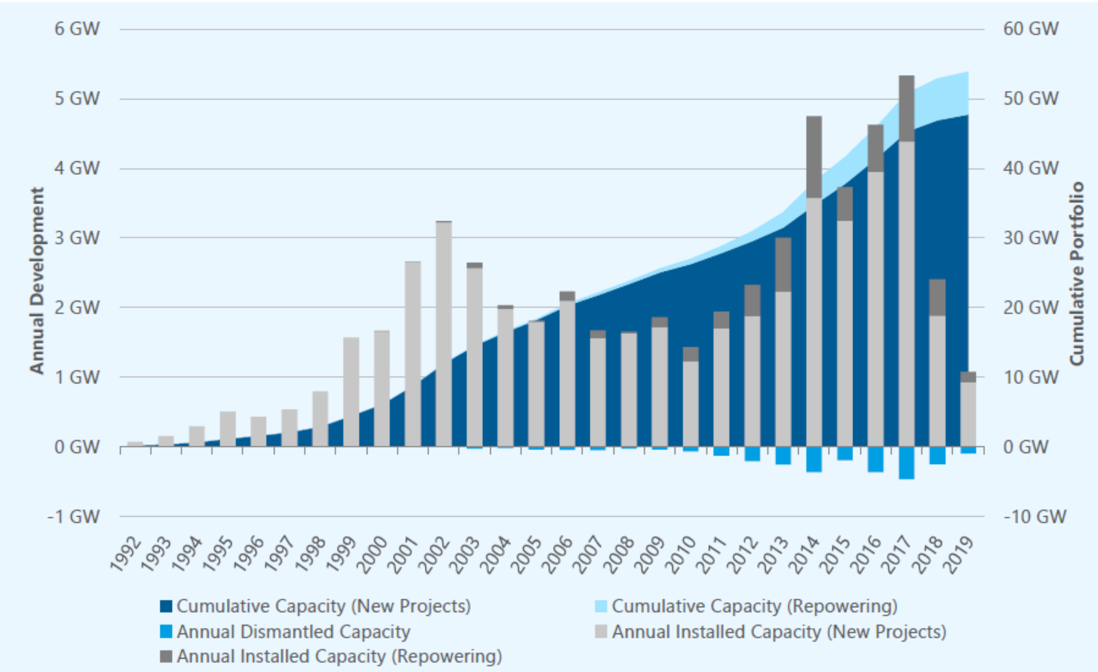
The levelised cost of electricity (LCOE) for renewable energy sources has decreased significantly over the past years. Solar energy has benefitted most from cost reductions, followed by onshore wind energy. Costs for onshore wind energy projects fell because of lower turbine and balance of projects expenses, improved performance, and full load hours thanks to higher hub heights. With decreasing costs, renewable energy sources have become increasingly competitive vis-à-vis fossil fuels. In 2018, the global weighted-average LCOE of onshore wind, hydropower, bioenergy, and geothermal projects was at the lower end of the fossil fuel cost range, making renewable energy in many places around the world the most economic choice for new generation capacity (IRENA 2019).

[1] In German statistical analysis, the following sources of electricity count towards "fossil fuels": oil, gas, hard coal and brown coal. Nuclear energy does not count towards fossil fuels, but also not towards renewable energy. Thus in Figure 1, on the right-hand side, nuclear energy can be found under "non-renewable".

1.1.1 Onshore wind energy

Onshore wind energy is often described as the 'working horse' of the German energy transition. In 2019, Germany had, globally, the third highest installed onshore wind energy capacity behind China and the US with around 53 GW (IRENA 2020). Currently however, onshore wind energy expansion in Germany is at a historical low point – the expansion in 2019 was 50% lower than in 2018 and 80% lower than in 2017, as seen in Figure 2 (Deutsche WindGuard 2020). This makes the 1,078 MW installed in 2019 the lowest capacity addition since the introduction of the Renewable Energy Act (EEG) in 2000 (Bundesverband WindEnergie and VDMA 2020).

Figure 2: Annual development of onshore wind energy capacity in Germany 1992 - 2019



Source: Deutsche WindGuard 2020

The **reasons for the low point** are plentiful but regulatory issues restricting the number of permits given are widely seen as the most important reason (Amelang and Wehrmann 2020). Also contributing is the opposition from local communities and initiatives against wind energy (Narita and Cames 2019). The visible effect of wind turbines can lead to passionate protests by some residents, as people are emotionally bound to the landscape and some of them are unwilling to accept wind turbines in their immediate area without receiving financial compensation (the so-called 'NIMBY-effect', meaning 'Not-In-My-Backyard'). Their protests and lawsuits have hindered further expansion in some areas (Fachagentur Windenergie an Land 2019a). While some residents simply dislike the visual effect of wind turbines, others fear economic implications due to lower tourist numbers or reduced land for agriculture. Others also have concerns about potential health impacts, which are however largely driven by misinformation, as scientific studies, for instance looking into noise emitted by turbines, find no health impacts (see e.g. Twardella 2015).

This role of misinformation is crucial as it is to a degree generalizable to other acceptance issues with scholars suggesting that “most of the animosity regarding wind turbines stem from misinformation” (Zitzer 2009). One way to remedy such problems is through dialogue, even though this is sometimes difficult as anti-wind citizens’ initiatives in Germany are well connected and organize themselves in large associations, which provide assistance with argumentation strategies and contacts. Such groups also tend to misuse public consultations, sometimes leaving only one-on-one discussions as an option in the local context. Misinformation is therefore a general issue regarding wind energy in Germany, undermining acceptance in several projects. Especially dangerous is in this regard the growing role of the right-wing populist party AfD, which is politicizing these issues and pushes an increasing interconnection between their party and different organizations criticising the energy transition and questioning climate science. A central role plays the so-called *“Europäisches Institut für Klima und Energie”* (European Institute for Climate and Energy, EIKE), which is not a scientific institute, but rather an association actively contradicting scientific evidence regarding climate change (Umweltbundesamt 2013). This organization is closely connected to the AfD (Fiedler 2019) and provides some of the misinformation serving as the basis for campaigns and actions of *Vernunftkraft*, the association of anti-wind-energy citizen’s initiatives in Germany. This association has several hundred local member organizations and supports local anti-wind-energy initiatives with material and argumentative support (Taßler et al. 2019). EIKE is furthermore connected with other organizations, such as the US-American Heartland Institute, which has in the past received financial support from the oil industry and foundations close to Donald Trump (Bovermann 2019). Therefore, a part of the issue of local acceptance is tied to larger national or global associations that attempt to halt progress on the energy transition, partly due to particular economic and political interests both in Germany and abroad.

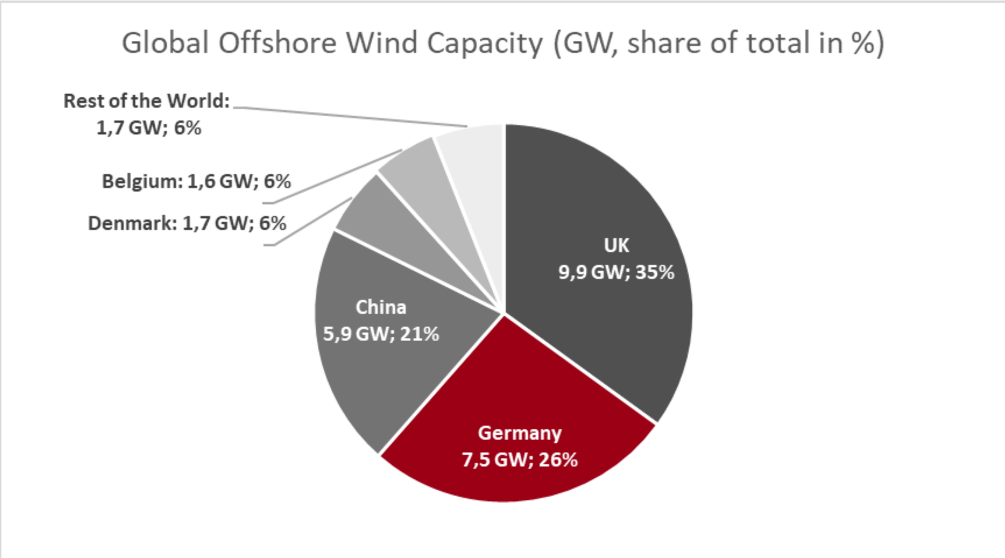
Often, nature conservation groups are also leading the way with protests and lawsuits at local level. They are concerned that wind projects impact ecosystems by clearing out forests or killing bats or birds that fly at rotor-height (NABU 2019). However, such organizations generally find themselves in a dilemma, as they mostly also fear the consequences of climate change. Therefore, concerns of environmental groups tend to be related to specific design issues and can mostly be solved through discussion or minor project changes. At the federal level, wind energy has been in a political gridlock over a controversial nationwide minimum distance rule of 1,000 metres from the nearest residential area for new turbines, further limiting the development of new projects (see chapter 2.1 for more information) (Dziadosz 2020).

1.1.2 Offshore wind energy

The first German test offshore wind plant was commissioned in 2009. Ten years later, in the end of 2019, **7.5 GW of offshore wind energy were installed** in the North and Baltic Sea, feeding into the national grid (Stiftung Offshore-Windenergie 2020). Further 112 MW of turbines had been fully erected by the end of 2019, but were not yet in operation. In comparison, across the EU (incl. UK), almost 22 GW were installed (IRENA 2020).

An underlying problem for offshore wind energy development in Germany is the relatively small exclusive economic zone (EEZ) at sea. Compared to the German land mass, population, and power consumption, the German EEZ is substantially smaller compared to other leading offshore wind countries (Piria et al. 2020). Over 90% of German potential offshore wind capacity is located in the North Sea, only a minor share is located in the Baltic Sea, where wind speeds are lower (Piria et al. 2020). Despite the challenges, 26% of global offshore wind capacity are installed in German waters, making the country one of the global leaders in offshore wind energy, second only to the UK (see Figure 3) (IRENA 2020).

Figure 3: Global grid-connected offshore wind energy capacity at the end of 2019



Source: IRENA 2020 (own illustration)

Since the relatively small EEZ also has to accommodate other users, such as shipping, sand and gravel mining, fishing, military, and host cables for power and telecommunication, the construction of new offshore wind parks holds potential for conflict. Among these, the fisheries industry in particular is often opposed to new offshore wind energy projects, as the industry fears direct implications for their economic situation. This is largely related to the comparatively strict regulatory environment in Germany banning fishing in the wind parks as risks of damages are deemed too high (EUWID 2017). Furthermore, environmental groups sometimes oppose offshore wind parks due to concerns that construction noise or the parks themselves might negatively affect marine mammals and birds, especially if projects are developed in ecologically valuable areas (NABU 2020a). Due to their distance to shore, visual impacts are, in contrast to onshore wind parks, usually no concern or potential source of conflict.

1.2 Regulation and support

The German Federal Government supported the plan of the European Commission to increase the EU's climate targets from the current goal of at least 40% greenhouse gas (GHG) emissions reduction by 2030 in comparison with 1990, to a reduction of 50-55%. However, the European Commission has recently proposed an even higher goal of at least 55%. Even though it seems likely that the German Federal Government, which has already set itself the GHG emissions reduction target of 55% by 2030 (in comparison with 1990), will endorse this change, there is no official position yet.

The German Federal Government's target is to increase the **share of renewable energy in gross electricity consumption to 65% by 2030 and 80% by 2050** (2019: 46%, first half of 2020: 55.8%) (Fraunhofer ISE 2020b, 2020a). This renewable energy goal is embedded in the larger set of climate and energy targets, partly set by the EU. The 2018 Renewable Energy Directive (RED II) has raised the overall EU-wide target for energy consumption from renewable sources to 32% by 2030 (2018: 18.9%) (European Commission 2019; Eurostat 2020).

1.2.1 Onshore wind energy

1.2.1.1 Targets

As part of the 2019 Climate Protection Programme, the German Federal Government set a **target for onshore wind of 67 to 71 GW by 2030** (Bundesregierung 2019). With an installed capacity of 54 GW in 2019, this would result in a 1.3 – 1.7 GW increase annually. As mentioned in chapter 1.1, only 1,078 MW were installed in 2019, thus staying well below even the lower expansion trajectory and indicating that more installed capacity will be needed in the future to achieve the goals. The Federal Government projects an annual electricity consumption of 583 TWh in 2030, down from 599 TWh today due to energy efficiency improvements. Given the target to achieve 65% renewables by 2030, technology-specific expansion targets can be derived. However, this calculation has received criticism from academia, think tanks and industry for being too low. The German Renewable Energy Federation (BEE) modelled in 2019 that gross power consumption will rise to 740 TWh in 2030 driven by higher electricity consumption in the transport, heating and industry sectors (BEE 2019). Applying the 65% RE target, 481 TWh of renewable electricity would be needed. For the case of onshore wind energy, an annual expansion of 4.7 GW would be needed. Other studies have come to a similarly high number (Local Energy Consulting 2020). While the BEE calculation is on the higher end of modelling results, the underlying rationale is the same across the board. The **mismatch with the government's target** is evident. To achieve the 65% RE target, the onshore expansion target should be much higher than 67-71 GW by 2030.

At the same time, the Federal Government needs to create conditions where such an accelerated expansion is possible. This includes, amongst others, sufficient staff in the local authorities to approve plans and hand out permits, sufficient grid extension to connect new plants, and credible support schemes and regulatory frameworks to attract investors. In addition, acceptance by local communities is needed to avoid lawsuits.

Many **Federal States in Germany have set specific targets for wind energy**. These targets are defined differently, ranging from a certain percentage of area to be covered with wind turbines, over a percentage in the electricity mix to a certain installed capacity target or a production target (Fachagentur Windenergie an Land 2019b). Lower Saxony, the second largest Federal State by land size set the target to have at least 1.4% of land area covered with wind farms until 2050. Brandenburg, the fifth-largest state set a target of 2% until 2030. Bavaria (the largest Federal State), Baden-Wuerttemberg (3rd largest) and North Rhine-Westphalia (4th largest) have no such area targets. Bavaria wants to have a share of 5-6% of wind energy in its gross electricity production by 2025. Saxony wants to have 2,200 GWh of electricity from wind annually by 2022.

1.2.1.2 Support scheme

Since 2000, the Renewable Energy Act (EEG) supports the deployment of renewable energy at federal level. The EEG has been reformed multiple times over the years to mirror changing market conditions and price developments. The latest reform in 2017 introduced a competitive element to the support scheme. The basic requirement for remuneration under the EEG is participation in the tender. Each project receives the level of support that the bidder offered and for which he was awarded a contract ('pay as bid'). The only exception to this rule is the case of energy cooperatives (in German: *Bürgerenergiegenossenschaften*), for which the highest value still awarded on the bidding date is used as the uniform price (see below) (Fachagentur Windenergie an Land 2020b).

The last **auction** was held on July 1st 2020. There were 26 successful bids amounting to 191 MW of new projects (Bundesnetzagentur 2020a). The lowest successful bid was 5.5 €ct/kWh, while the highest successful bid had the maximum permissible value of 6.2 €ct/kWh (Bundesnetzagentur 2020a). The total available tender volume of about 275 MW was not reached (Bundesnetzagentur 2020a), as the ongoing discussions over a statutory minimum distance rule between the States and the Federal Government discouraged participation. Most tender rounds in 2019 were characterized by a lack of competition, the overall awarded volume stayed thus significantly below the volume envisioned in the expansion path for onshore wind. In 2019, a total volume of 3.7 GW was tendered, however only wind energy projects with a capacity of 1.8 GW were awarded (Bundesverband WindEnergie and VDMA 2020). The low level of competition is also reflected in the high award values.

Germany's grid expansion has furthermore been unable to keep pace with the rapid expansion of renewable energy in the northern part of the country. As a result, there are structural grid congestion issues on the transmission lines transporting the renewable electricity from the production sites in the North to the large consumption centres in the South and West. Consequently, the Federal Network Agency (*Bundesnetzagentur*) decided in 2017 to limit the wind energy deployment in certain areas to not further worsen the grid congestion issues (Bundesnetzagentur 2020b). Since then, one element of each tender is the maximum capacity to be added in a so-called 'network expansion area' (*Netzausbaugebiet*).

The EEG support is paid out over 20 years. In 2020, some of the very first projects to be installed thus drop out of the support scheme, totalling around 4 GW by the end of the year. Each coming year, around 2.5 GW of installed wind capacity will drop out of the support scheme (wind-turbine.com 2019). Power purchase agreements (PPAs) with utilities or private companies seeking to increase their 'green footprint' have however become an option for these plants (Teuffer 2019).

The above-mentioned 2017 change of the EEG law to a competitive tendering system had implications on **energy cooperatives**. In order to alleviate an increased price risk, cooperatives were able to enter the tendering process for a project without having all necessary permits. However, this option was initially suspended for a limited period from the bidding date of 1 February 2018 and finally abolished with an amendment of the EEG in May 2020 (Endell and Quentin 2020). Furthermore, the bidding behaviour was restricted by the prerequisite that cooperatives may not have been awarded a contract for another wind energy project within 12 months before the current bid was submitted. In addition, energy cooperatives must involve the local municipality in the project and have to offer it a 10% financial participation in the energy cooperative (Endell et al. 2018). Irrespective of this, the EEG 2017 guarantees that successful bids by energy cooperatives receive the highest value still awarded in the respective bidding round - the so-called uniform price.

The RED II Directive on EU level included a provision that consumers, as prosumers, have the right to consume, store or sell electricity from renewable energy plants generated on their premises. This includes specifically Renewable Energy Communities (RECs). Member States have to promote and facilitate the development of RECs including preferential conditions or incentives (Lowitzsch et al. 2020). According to this, Germany could exempt citizen wind projects up to a size of 18 MW from tenders and grant them a fixed remuneration ('de minimis rule') (Hanke 2020). However, this option is not yet used in Germany.

1.2.2 Offshore wind energy

1.2.2.1 Targets

For the first time in 2010, the energy strategy of the German Federal Government defined offshore wind as one of its main priorities (Bundesregierung 2010). It set a target of 25 GW by 2030, followed by an intermediate target of 10 GW by 2020 (Piria et al. 2020). The main drivers of this goal were climate action, technology development and reduced dependency on energy imports. The prioritization of offshore wind energy was then reinforced by the 2011 decision to phase-out nuclear energy (Piria et al. 2020). However, cost reductions for offshore wind energy (unlike onshore wind energy) did not materialize as quickly as the German government had hoped. Consequently, the expansion target was reduced to 6.5 GW by 2020, which has now been over-achieved, and 15 GW by 2030. Later, in 2019, the Federal Government approved a Climate Protection Programme, which included an increase of the **2030 offshore wind target from 15 GW to 20 GW**.

In May 2020, the Federal Government, its federal agencies, the five coastal States (Bremen, Hamburg, Lower Saxony, Mecklenburg-Western Pomerania and Schleswig-Holstein) and the three Transmission System Operators (TSOs) with offshore connections confirmed the ratcheting up of the expansion target to accelerate offshore wind energy deployment (Federal Ministry for Economic Affairs and Energy 2020a). The ministry in charge, the Federal Ministry for Economic Affairs and Energy, tabled a legislative change to implement the agreement. For the first time, the draft law included a **2040 target of 40 GW** (Federal Ministry for Economic Affairs and Energy 2020a).

In June 2020, the Federal Government published its **national hydrogen strategy,** which includes a significant role of offshore wind power. According to the strategy, 90 to 110 TWh of hydrogen will be needed by 2030. To complement imports, up to 5 GW of new generation capacity for green hydrogen, including offshore and onshore energy generation, will be needed within Germany (The Federal Government of Germany 2020). The additional offshore wind energy capacity is not yet reflected in the offshore wind energy support auctions, which is why offshore wind energy associations argue that tendering volumes need to be adjusted to attract the additional investment in projects (BWO 2020b).

1.2.2.2 Support schemes

Over the years, the support scheme for offshore wind energy was altered several times. At the federal level, the feed-in-tariff system was replaced by a feed-in premium in 2014. Since 2017, this feed-in premium is no longer determined by law, but by technology-specific tenders for medium and large-sized renewable plants. The 2017 support scheme reform also introduced a **transition period** for offshore wind projects that already held a permit or were in advanced phases of approval in August 2016, with planned commissioning in 2021-2025. For projects to be built after 2026 a **'central model'** was implemented. In the future, the Federal Maritime Hydrographic Agency (*Bundesamt für Seeschifffahrt und Hydrographie* – BSH) will pre-develop sites that are auctioned to project developers (Bundesnetzagentur 2020d).

The transition period consisted of two pay-as-bid tender rounds held in April 2017 and April 2018, for 1,550 MW each (3.1 GW total). The project developers bid for the feed-in premium and a guaranteed grid connection. The two bidding rounds produced spectacular results – in both rounds **zero support bids** were submitted, meaning that these project developers bid to secure the option to build an offshore wind farm, rather than to secure a support payment (Müsgens and Riepin 2018).

The next tendering rounds for offshore wind capacity in Germany are scheduled for 2021, for projects that will begin operation between 2025 and 2030. As stated above, under the 'central model' sites will be pre-developed by the BSH. To reflect the substantially higher investment by the public hand, the guarantee that project developers must deposit will increase to 200 €/kW (previously 100 €/kW), discouraging developers from strategic bidding (Piria et al. 2020). The volume of future tenders is determined by the difference between the 2030 target and the capacity in operation in 2020 (Piria et al. 2020).

The zero support bids of 2017 and 2018 had not been foreseen by the legislator and made **regulatory change** necessary. According to the currently still valid legal framework, the lowest bid of the auction of April 2018 determines the highest allowed bid in future auctions. Consequently, only zero bids could have been submitted in the future. At the time of writing, a proposed law by the German Federal Ministry for Economic Affairs and Energy cancels this clause and introduces decreasing maximum bid values, from 7.3 €ct/kWh for the auctions of 2021 to 6.2 €ct/kWh for the auctions in 2023. In case of more than one zero support bid, the law proposal foresees a second auction round, during which bidders may offer positive sums (like a concession fee) to obtain the right to build the auctioned offshore wind plant.

At the time of writing, the German offshore wind and electricity sector associations are heavily protesting against this clause and questioning its legality (BWO 2020a). They argue that with the previous reform of 2017 the government had de facto confiscated the rights of project developers on specific projects, to auction them at a later point. In exchange, the developers had obtained a right to be awarded the projects by submitting bids at the lowest possible price.

At the state-level, the coastal states (Lower Saxony, the Free Hanseatic City of Bremen, The Free Hanseatic City of Hamburg, Schleswig-Holstein and Mecklenburg-Western Pomerania) and municipalities have provided support to incentivize the creation and expansion of local parts of the offshore wind value chain (Piria et al. 2020). The support may include investments in public infrastructure, facilitation for spatial planning, training facilities, promoting public acceptance, and direct financial incentives (e.g. see case on Cuxhaven in 3.2.8).

1.3 Governance structure

1.3.1 Federal level

The Federal Republic of Germany consists of 16 Federal States (*Länder*). While the Federal States hold competencies over issues such as education, energy policy is largely decided at federal level. The **Federal Ministry for Economic Affairs and Energy** (*Bundesministerium für Wirtschaft und Energie - BMWi*) is the lead ministry in the field of energy policy. The pooling of responsibilities enables a coherent energy policy and a close consideration of the energy market in its entirety. The BMWi drives the energy transition efforts and has committed to making it a driver for energy efficiency, modernisation, innovation and digitalization in the electricity and heating sectors (Federal Ministry for Economic Affairs and Energy 2020b). Besides the BMWi, other ministries with interests or marginal competencies in the energy field include the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (*Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit - BMU*), the Federal Ministry of Economic Cooperation and Development (*Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung - BMZ*), the Federal Ministry of Education and Research (*Bundesministerium für Bildung und Forschung - BMBF*) and the Federal Foreign Office (*Auswärtiges Amt - AA*).

The Federal Network Agency (*Bundesnetzagentur - BNetzA*), an agency of the BMWi, is the competent regulatory authority to ensure the most secure, low-priced, consumer-friendly, efficient, and environmentally sustainable supply of electricity and gas possible (Bundesnetzagentur 2020c). Most significant in this context is its role as the authority holding the renewable energy tenders and regulating the grid network in Germany.

With the development of offshore wind energy, the utilization of Germany’s marine space increased beyond its traditional uses, such as shipping or fishing (Piria et al. 2020). The Federal Maritime and Hydrographic Agency (*Bundesamt für Seeschifffahrt und Hydrographie - BSH*) is responsible for the maritime spatial planning in the EEZ, where most offshore wind plants are situated (BSH 2020), and defines priority areas for the competing uses. The agency reports to the Federal Ministry of Transport and Digital Infrastructure (*Bundesministerium für Verkehr und digitale Infrastruktur - BMVI*), while states are responsible for the coastal waters.

The German Federal Agency for Nature Conservation (*Bundesamt für Naturschutz – BfN*), an agency of the BMU, is the government’s scientific authority with responsibility for national and international nature conservation (BfN 2020). The BfN provides the BMU with professional and scientific assistance in all nature conservation and landscape management issues and compiles environmental impact assessments.

1.3.2 State level

The Federal Government and the 16 Federal States continuously coordinate on the implementation of the energy transition. Twice a year, the Federal Chancellor and the Federal Minister for Economic Affairs and Energy meet with the heads of government of the States to discuss the status of the energy transition. Furthermore, the relevant federal and state ministers also meet annually to set their priorities and agree upon the next steps to be taken as part of the energy transition. Next to the institutional coordination, there is continuous co-operation and exchange on a technical level (Federal Ministry for Economic Affairs and Energy 2020b).

Between the Federal States, there are differences in terms of regional distribution of onshore wind energy. Differences are driven by wind speeds, land availability, and local political conditions. As of 2019, coastal states account for about 41% of cumulative capacity, while the states in central Germany account for about 44% and the ones in the south for about 15% of the cumulative capacity (Deutsche WindGuard 2020).

With relevance for the development of offshore wind energy are these five coastal States: The Free Hanseatic City of Bremen, the Free Hanseatic City of Hamburg, Lower Saxony, Mecklenburg-Western Pomerania and Schleswig-Holstein. Each State works to ensure that its spatial planning procedures are in line with the national targets.

1.3.3 Germany in the EU

Germany is one of 27 member states of the EU. Its energy transition policy is embedded in the European policy framework (Federal Ministry for Economic Affairs and Energy 2020b). Together, the EU member states have set ambitious energy and climate targets to guarantee security of supply, competitiveness and climate protection throughout Europe. As part of the commitment to the Paris Agreement, the EU has created a new monitoring tool in form of the National Energy and Climate Plans (NECP). In an iterative process, member states develop NECPs on a ten year rolling basis (Climate Action Network Europe 2018) and the European Commission can issue recommendations if the national targets are off track.

As part of the European Green Deal (EGD), the European Commission is planning to revise the Renewable Energy Directive, which has entered the first stage of public consultation. This implies that the details of the revision are yet to be discussed, but the Inception Impact Assessment already indicates the direction the Commission wants the directive to take. In this document, the Commission underlines the importance of wind energy by stating that “Initiatives under the recovery plan […] will aim to support investments and reforms […], such as rolling out sustainable renewable energy projects, especially wind, solar and kick-starting a hydrogen economy” (European Commission 2020a). The document additionally states that the overall objective of the revision will be to make sure that renewable energy is expanded sufficiently to fulfil the Union’s climate targets, which the Commission recently proposed to increase to an emissions reduction of at least 55% (Ursula von der Leyen 2020), and will therefore possibly review the current 32% renewable energy target upwards.

Furthermore, the Commission is currently working on a proposal for the Strategy on Offshore Renewables, which is also part of the EGD. The strategy will not only include offshore wind, but also tidal and wave energy, and is currently in the formal consultation process. Feedback to the roadmap, the first step of the consultation process, was possible until August of 2020 and the second step, public consultations regarding the strategy, runs until the end of September. It is currently estimated that the finalized strategy will be presented by the end of 2020. The direction of the strategy is however already apparent in the published roadmap. It states that, “the current offshore wind and renewable development pace is far too slow and constrained to meet the needed massive scale up to ensure climate neutrality by 2050” and that “the strategy will look into how available EU financial tools can be used more strategically to support the [above] objectives,” while also emphasising the role of acceptance by mentioning that the offshore potential needs to be “exploited in a fair and responsible way with the many other sea natural capital and users (ecosystems, defence, shipping, fishery, sailing and tourism)” (European Commission 2020b). Even though the decisions on these pieces of legislation have not been made yet, it can therefore be assumed that the EU will further support the development of wind energy projects, both on- and offshore, making it likely that pace and scope of wind energy development in Europe will pick up speed in the future.

2 Policies for community acceptance

Acceptance can be divided into three distinct concepts: socio-economic acceptance, market acceptance and community acceptance (Narita and Cames 2019; WinWind 2018). Socio-political acceptance describes the general acceptance of technologies and policies (WinWind 2018). Market acceptance describes the “process by which market actors adopt and support (or otherwise) the energy innovation. Market acceptance is proposed in a wider sense, including not only consumers but also investors and, very significantly, intra-firm acceptance” (WinWind 2018). Community acceptance describes the acceptance of specific projects by the local communities (including affected population, key local stakeholders and local authorities).

In the context of this study, the focus lies on community acceptance. While overall socio-political acceptance and market acceptance for wind energy projects in Germany are high (Fachagentur Windenergie an Land 2019c), securing high community acceptance is crucial for the successful development of new projects. According to the Fachagentur Windenergie an Land (2017), community acceptance can be generated through financial participation (see 2.2) and public participation in the planning process (see 2.3).

2.1 Policy measures on the national level

Community acceptance can be facilitated by policy measures. In October 2019, the BMWi published an **18-point work plan** with measures to increase acceptance of wind energy (Federal Ministry for Economic Affairs and Energy 2019). The work plan requires a joint effort on the part of the federal, state, local and regional governments and was developed in collaboration with citizens’ initiatives, industry associations and other relevant stakeholders (BWE 2019a). The work plan included measures to increase acceptance, measures to increase legal certainty in planning procedures, measures to accelerate permitting, and measures to improve synchronization of grid expansion and wind deployment. All measures were to be implemented in 2019 or 2020.

Three measures were specifically targeted at increasing community acceptance. First, the federal government wanted to implement a minimum distance rule (see below). Secondly, the federal government decided to quickly accept a **directive on wind turbine illumination** that would allow operators to turn off hazard warning lights for air traffic during the night if no aircraft are around (Wehrmann 2020). Third, the federal government planned to increase the participation of local authorities in the operation of wind turbines including **benefit sharing** (see 2.2.3). Amendments may include increased direct payments from wind farm operators to the municipality and favourable electricity tariffs for the local community. At the time of writing, the first two measures have been implemented, while the third measure, which could be seen as the most important of the three, is part of a proposed revision of the EEG, which has yet to be passed by the German parliament, which is expected for 2021.

In January 2019, the two governing parties at federal level initiated a working group on the acceptance of the energy transition. One of the key topics discussed is the previously mentioned **minimum distance rule** for new onshore wind turbines. The party of Chancellor Merkel, the Christian Democratic Union/Christian Social Union proposed a general distance of 1,000 metres from the nearest residential area. Another proposal was the ‘10H rule’, meaning that turbines would need to be ten times their height away from the nearest residential area (for most modern turbines this would mean about 2,000 metres distance). This rule, applied since 2014 in the Federal State of Bavaria, has essentially led to a complete standstill of wind development there (Weinhold 2019). Furthermore, even though it was argued that the distance rule would increase acceptance, a meta-study found no significant positive correlation between distance and acceptance for onshore wind energy (Fachagentur Windenergie an Land 2015).

According to studies up to 1.7% of the area of Germany are classified as largely conflict-free available land in nationwide observations (BMVI 2015). For the necessary expansion of wind energy in accordance with the energy and climate policy goals described earlier, a nationwide land use of 2.0% to 2.3% would however be needed (Fachagentur Windenergie an Land 2019b). Increasing the distance to 1,000 metres would reduce available sites by 20-50% and applying the 10H rule by 85-97% (Umweltbundesamt 2019). Thus, a distance rule is unlikely to increase acceptance but likely to hinder the achievement of renewable energy targets.

Critics have argued that mainly conservative politicians, looking to limit the energy transition efforts in Germany and position themselves for upcoming local elections, support the proposed distance rule (Weinhold 2019). Over a year later than initially intended, in May 2020, the working group reached an agreement. Instead of a national rule, each Federal State can opt-in to using the 1,000 meter distance rule (Zeit Online 2020). The Federal State of Bavaria keeps its stricter 10H rule.

While discussions at the federal level on acceptance are necessary, the policy measures concluded so far have yet to prove their effectiveness. In the meantime, low participation rates in tenders reflected the high level of uncertainty among investors.

2.2 Financial participation

Successful public participation combined with financial participation can help to extend the influence of local actors on project design and implementation and thereby strengthen the social anchoring of a wind energy project on site. Financial participation of citizens and municipalities can help improve the perceived distributive justice. While the visual burden of a wind turbine is on everyone, often only individual landowners and operators benefit financially, the burden-benefit ratio is thus perceived as unfair in some places. There are various options for strengthening the financial participation of those affected. These options can be divided into forms of 'active' or direct and 'passive' or indirect financial participation and are aimed at citizens and/or municipalities (Fachagentur Windenergie an Land 2020a).

2.2.1 Active financial participation

Active financial participation is possible through direct participation in the equity of a project company, meaning that citizens become co-entrepreneurs (Narita and Cames 2019). For more than two decades, various legal forms of ownership have allowed citizens to own wind turbines in Germany. The most common forms are **energy cooperatives** (*Energiegenossenschaften*) and the hybrid 'GmbH & Co. KG' (**limited liability company & limited partnership**) (Wettengel 2018). At the end of 2018, there were 869 energy cooperatives organized under the German Cooperative and Raiffeisen Confederation (*Deutscher Genossenschafts- und Raiffeisenverband - DGRV*). Cooperatives have an average of around 300 members and consist of 95% private individuals, 2% companies/banks, 2% farmers and 1% local authorities (DGRV 2019).

As mentioned in chapter 1.2.2, energy cooperatives received special treatment in the EEG 2017. To support this form of active financial participation of citizens, frameworks such as a fixed remuneration for citizen wind projects is necessary.

Active participation can also take the form of indirect participation through saving binds, bearer bonds, silent partnerships or subordinate loans. In these cases, citizens have no say over the project, as the project developer takes all decisions.

2.2.2 Passive financial participation

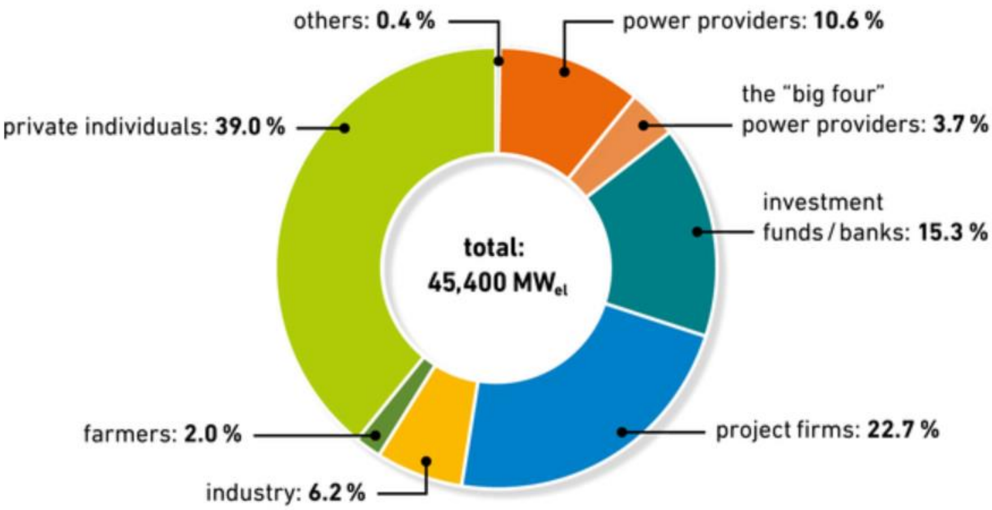
There are three methods to allow for passive financial participation. Passive financial participation can benefit citizens through the lease of land, reduced electricity prices, or the direct marketing of electricity (Fachagentur Windenergie an Land 2020a).

First, **land lease models** can allow participation beyond the direct owner of the project site. Under land lease models, a certain proportion of the lease can be paid directly to the owner, while the rest is distributed evenly across citizens within a certain radius. Second, when the wind turbine operator and the local electricity supplier cooperate, citizens can benefit from **reduced electricity prices**. Third, citizens can also benefit indirectly from wind energy projects through increased municipal **tax revenues** allowing investments in local infrastructure or community spaces. Indirectly, these investments in local infrastructure also benefit the local workforce hired. Usually, the municipality in which the wind park is located receives 70% of the trade tax revenue (BWE 2018). The remaining 30% goes to the municipality where the wind farm operator has its legal residence. However, these shares can be distributed differently for specific projects.

2.2.3 Legislation on financial participation

In 2017, 39% of onshore wind parks in Germany were in the hands of private citizens organized in citizen energy communities (trend:research 2017). Many factors contribute to public acceptance, but benefit sharing with local communities is certainly very significant.

Figure 4: Ownership structure of onshore wind power installations in 2016



Source: trend:research 2017 (illustration from Renewable Energy Agency 2020)

As mentioned above, the Federal Ministry for Economic Affairs and Energy plans a major amendment to the EEG in the second half of 2020. A study commissioned by the ministry presented its conclusions in May 2020. The scientists recommend that wind turbine operators are to pay an amount of 0.1 €ct/kWh to local authorities (IÖW et al. 2020). In addition to municipal participation, the experts also recommend a reduced citizen electricity tariff for private households in the vicinity of the wind turbine, which must be 20% cheaper than the local basic supply tariff. A four-person household could thus save an average of 100 to 200 euros per year. If no discounted electricity tariff is offered, the payment to the municipality is to be increased to 0.2 €ct/kWh. The latter suggestion is now part of the government proposal for the new EEG, which still has to be approved by parliament (Federal Government of Germany 2020). This is expected to happen before the end of 2020.

So far, two Federal States have adopted **legislation on passive financial participation**. In 2018, the Citizen and Community Participation Act was adopted by the parliament of Mecklenburg Western Pomerania (Ministerium für Energie, Infrastruktur und Digitalisierung 2020). The basic idea of the law is the obligation of project developers to establish a limited liability company for new wind farms and to offer shares of at least 20% to the immediate neighbours for participation. A share may cost a maximum of 500 euros. As a second option, project developers can instead also offer the host and neighbouring municipalities within a radius of five kilometres an annual compensatory levy. The municipalities decide whether to accept such an annual payment for the operating time of the wind turbines or to choose the original legal procedure of acquiring a stake in the project company. Since 2019, the act on the payment of a special levy to municipalities in the vicinity of wind turbines requires project developers in the State of Brandenburg to pay for each wind turbine put into operation after 2019 10,000 euros annually to municipalities within a radius of three kilometres (BWE Landesverband Berlin/Brandenburg 2019).

In order to strengthen the active financial participation of citizens through energy cooperatives, the state of Schleswig-Holstein has provided the special fund ‘Bürgerenergie.SH’ (Investitionsbank Schleswig-Holstein 2020). The special fund is intended to facilitate in the first steps in the planning and start-up phase for energy cooperatives’ projects and to reduce financial risks. The fund aids with pre-planning costs for feasibility studies or environmental impact assessments. The fund also supports expenditure on public relations, including the costs for public and stakeholder participation.

2.3 Public participation

The concept public participation can be divided into formal and informal participation. Formal public participation comprises the legally required participation in planning and approval procedures (see 2.3.1). Informal participation goes beyond the participation required by law and includes all measures that project and planning authorities implement on their own initiative in order to prepare and support projects well (see 2.3.2).

2.3.1 Formal public participation

In Germany, law requires public participation in the land use plan procedures (e.g. designation of areas for wind energy use in municipalities) and approval procedures (BMU 2006). Public participation is an important component of planning law procedures. Its purpose is to give the interested public the opportunity to participate in approval procedures for environmentally relevant projects by inspecting planning documents and submitting comments. In most such processes, affected and interested citizens as well as environmental NGOs participate.

The contact restrictions currently in force to contain the COVID-19 pandemic have brought many construction planning and approval procedures to a standstill (EnergieAgentur.NRW 2020a). The problem is that the legally required public participation cannot take place as usual because of infection control regulations. Consequently, in April 2020, the Federal Government adopted a regulation, which temporarily (until 31 March 2021) provides relief for procedural steps that previously required physical presence (EnergieAgentur.NRW 2020b). The use of online tools fulfils the public participation requirements and allows projects to stay on schedule.

2.3.2 Informal public participation

Informal participation and early community involvement goes beyond the mere participation required by law. For example, wind energy projects can already be addressed when municipal climate protection concepts are drawn up and common guidelines for good project implementation can be defined. Project developers can introduce themselves and enter into dialogue with the public while the land is still being secured. All sides benefit from such an approach. The interests of local people can be taken into account and projects can be embedded in their respective local contexts. This way, suitable projects are created that are accepted and supported locally and can therefore be implemented efficiently (Fachagentur Windenergie an Land 2020a).

Measures for increasing communication and informal public participation have not only been initiated on the municipal level but also have been supported by **initiatives launched by several Federal States**. Since 2011, Energy Dialogue.NRW, a service offered by the State of North Rhine-Westphalia (NRW), has helped municipalities, companies and citizens' groups in all aspects of the planning and implementation of local renewable energy projects with expert advice and detailed information (EnergieAgentur.NRW 2019). The service offers on-site formats tailored to local requirements and digital services such as online portals and interactive tools. Behind all this was the aim to support players in their energy and climate protection activities, solve conflicts, show scope for action, strengthen competences and promote public participation. After the project funding ended in 2018, the new 'Participation and Planning' department of EnergyAgency.NRW is now developing the successful EnergyDialog.NRW formats further on behalf of the state government. The local players continue to receive support in all factual questions related to planning and approval procedures, as well as public and citizen participation, through initial consultations. A further aspect is the provision of conflict avoidance and advice on conflict management. Companies, potential investors and local authorities are shown first steps on how to return to constructive dialogue in the event of a conflict and receive initial assistance, for example in initiating mediation proceedings.

Similar to the energy agency in NRW, the Thuringia Energy and GreenTech Agency (*Thüringer Energie und GreenTech-Agentur*) of the Federal State of Thuringia offers information, consulting and support measures to increase acceptance of wind energy projects through its Wind Energy Service Office (Thüringer Energie und GreenTech-Agentur 2020b). Thuringia targets 100% renewable energy by 2040 and has recognized the importance of wind energy for this goal. The Wind Energy Service Office supports citizens, municipalities and project planners with a variety of services and is committed to transparency and regional value creation. The Service Agency Wind Energy has developed guidelines for companies in the wind energy sector. Project developers can commit to implementing the principles of cooperation and transparency for all parties involved under the "Fair Wind Energy Thuringia" seal of approval (Thüringer Energie und GreenTech-Agentur 2020a). In order to obtain the seal, a developer or planner can apply by committing to a set of rules at any given point in time. The seal is then awarded, after a general check of the applicant, and the company as well as the projects it is implementing are then checked on a regular basis (THEGA 2020). With the seal, the Federal State of Thuringia hopes to increase acceptance and trust among the local communities. Over 50 project developers and planners have already qualified for the seal.

In the Federal State of Hesse, the citizens' forum *Energieland Hessen* is implemented by the *Hessen Agentur* on behalf of the state (Hessisches Ministerium für Wirtschaft, Energie, Verkehr und Wohnen 2020). The fundamental goal is to improve the acceptance of the local energy transition, as Hesse targets 100% renewable energy by 2050. As a neutral platform between the different interest groups, the forum's task is to provide a factual basis for the discussion about the energy transition and to professionally support mayors and municipalities on site. The forum works with three central instruments: dialogue, energy coaching and mediation/conflict management.

The Federal State of Baden-Wuerttemberg has an Energy Dialogue Forum focused on resolving conflicts relating to renewable energies (Forum Energiedialog 2020). It aims to strengthen the capacity of municipalities to act and supports local decision-makers. In addition, the population is informed so that planning and approval procedures are better understood.

In the State of Schleswig-Holstein the 'guideline for the evaluation of fair wind farm planners in Schleswig-Holstein' is a voluntary commitment for planners and planning companies (Faire Windparkplaner Schleswig-Holstein 2020). With regard to a fair planning process, it is intended to create transparency for all persons involved. The continuous compliance with the voluntary commitment in the planning of wind farms in Schleswig-Holstein is checked and documented by a seal. Essential criteria are information and transparency in the planning process, fair dealing with contracts, financial participation opportunities and regional support and added value. The guideline is a common initiative by the Federal State of Schleswig-Holstein and the wind energy industry in the state.

Several **manuals** have been developed by interest groups to facilitate informal public participation (Fachagentur Windenergie an Land 2017): Dialogue procedures should be able to integrate as many relevant interest groups and persons as possible and be open to all who wish to participate. Those involved should participate continuously in the procedure. For participation to be timely and effective, the public must be informed about processes and contents. Therefore, information must be provided at an early stage in the run-up to planning and approval procedures. In this way, the existing scope and limits of the participation procedure can be clarified, interests can be disclosed and excessive expectations can be prevented. Relevant information must be comprehensibly disclosed, disseminated, explained and continuously documented. The technical language used by engineers, lawyers and planners must be translated and communicated in a way that is generally understandable. There must be room for manoeuvre - only in this way those involved can make a difference at all. Legal regulations, restrictions of a financial or planning nature that influence and limit the scope for participation must be disclosed from the outset. Without room for manoeuvre, participation is void. The dialogue should include independent experts or third party mediators in the discussion and information process to raise trust.

Table 1: Overview: Support scheme examples for public participation in different German States

State	Measures
North Rhine-Westphalia (NRW)	*Energy Dialogue.NRW* – supports planning and implementation of local renewable energy projects with expert advice and detailed information. Currently developed further to also include advice on public participation as well as on conflict avoidance and management.
Thuringia	*Thuringia Energy and GreenTech Agency* – offers information, consulting and support measures to increase acceptance of wind energy. *"Fair Wind Energy Thuringia" seal of approval* – shows commitment to cooperation and transparency.
Hesse	*Citizens' forum Energieland Hessen* – targeted at conflict avoidance, provides a factual basis for discussions and supports mayors and municipalities.
Baden-Wuerttemberg	*Energy Dialogue Forum* – targeted at resolving conflicts by informing citizens, and supporting local decision makers.
Schleswig-Holstein	*Guideline for the evaluation of fair wind farm planners and seal* – voluntary guideline targeted at transparency in the planning process, fair dealing with contracts, financial participation, regional support and added value.

3 Case studies

3.1 Data collection

The goal of this study was to find best practices from German wind energy projects that can serve as a benchmark for wind energy developments in South Korea. Such details were collected for eleven case studies for wind parks both onshore and offshore in Germany. For the data collection two complementary methods were used – desk research and interviews.

3.1.1 Desk research

In a first step, desk research, or secondary research, was used to review existing literature on local acceptance of wind parks in Germany to gain a better general understanding. The desk research gave a clearer picture on the types of acceptance, the sub-categories of community acceptance and the measures to increase financial and public participation. The desk research also allowed for deeper insights into policy measures taken both at federal and state (or local) level to increase acceptance. However, the desk research could not produce sufficiently detailed insights into local acceptance measures taken for all specific cases.

3.1.2 Interviews

Hence, in a second step, interviews were used as a means to getting detailed insights into measures taken in specific projects. The conducted interviews were semi-structured. This type of methodology follows a script of questions, but allows the interviewer to go into detail on certain aspects. At the same time, the questionnaire makes sure that all important information is gathered and that overall conclusions can be drawn across cases.

Over the course of six weeks, seven **expert interviews** were conducted, which were expanded by another six interviews regarding offshore wind farms conducted during a second phase lasting three weeks. As previously mentioned, the interviews were supposed to enclose details about local circumstances and project specific steps or innovations for achieving community acceptance. Thus, mostly local stakeholders (instead of national industry associations or large utilities) were contacted, while, due to the special importance of offshore wind farms, four of the interviews were conducted with experts from larger companies or associations to get a better overall picture of relevant issues. The section dealing with these general insights is however clearly marked and therefore distinguishable from the case studies. Interviewees included project developers, municipality representatives, local politicians and stakeholders from civil society. A list of interviewees can be found in Annex 1.

The **questionnaire** was designed so that each interview would take around 45 minutes. The questionnaire was sectioned into six areas. Section 1 focused on the situation at site, asking about the local economic situation (whether the project was to be built in an industry area, agricultural land or a touristic area), the key concerns of local population (incl. health concerns) and about the reaction of local environmental groups. Many questions here pick up on the concerns mentioned in 1.1. Section 2 asked about the types of stakeholders involved in the public participation, how the public participation process was designed, and how the local population reacted to the offer to engage in the public participation process, building on the insights from 2.3. Section 3 focused on the financial participation and asked how the project was financed, how the municipality and locals were included and how the active or passive participation was designed, thus reflecting the insights from 2.2. Section 4 focused on local added-value and asked how revenues from the project were used, a topic raised in 2.2.2. Section 5 focused specifically on offshore wind energy, see 1.1 for details. Section 6 closed the interview with questions on the key lessons-learned from the project. The full questionnaire can be found in Annex 2.

In the following description and analysis of the case studies, information that is not cited otherwise stems from the interviews related to the section in question, with a list of interviewees displayed in Annex 1.

3.2 Description of cases

The following map of Germany shows the location of the chosen cases.

Figure 5: Map of Germany with the location of all cases marked

Source: own illustration

3.2.1 Wind parks in Arzfeld

In 2018 and 2019, the two wind parks in Arzfeld entered into operation. The nine wind turbines with a capacity of 32.4 MW produce enough electricity to supply around 23,000 households, much more than what the municipality needs for its 9,500 citizens. Contrary to the usual process, in the case of Arzfeld a project developer did not approach the municipality first, asking about the option to build, but the other way around. For political reasons, mirrored by the full approval of every step by the city council, the association community Arzfeld, a union of 43 small municipalities, itself has taken the initial steps and leased the potential areas from the approximately 150 private property owners and was in frequent exchange with the 43 local municipalities affected. However, of those, only five were directly affected.

Thanks to the unusual process, a lot of the public participation effort happened before the onboarding of the project developer. The municipality talked to all of the 150 landowners and exchanged with the respective local mayors and local councils of the other affected municipalities. According to the mayor, during the **public participation** process, concerns circled around impacts on the quality of life of the residents (visibility of wind turbines, distance, noise, shadowing). With the help of events and a citizen's dialogue with experts, the approval authority, and the project developer, the majority of the citizens approved of the wind park in the end. The determined presence of local mayor, Andreas Kruppert (no party affiliation), and the strong effort to enable participation of all citizens was crucial for community acceptance. This commitment to the wind park helped create a positive atmosphere around the project and made the realization of the project much easier, according to the project developer.

From day one, there was a website to inform citizens about the wind park. Throughout the approval process, around 60 events were held and the local newspaper published relevant information, allowing even people without internet access to stay updated on the project. A large inauguration ceremony with the participation of local associations helped convince citizens of the benefits of the wind park, while also offering the opportunity for local value creation.

Due to the unusual process, remuneration for the landowners was also managed differently. Usually, the wind farm operator would negotiate single contracts and pay the several landowners directly. In Arzfeld, the landowners all had a legal tie to the municipality. In turn, the municipality then leased the land as one item to the operator. From the 43 included municipalities, only five were directly affected by the new wind turbines. Usually, only those five municipalities would get paid by the operator. By joining a **solidarity pact**, it was possible to also include the other 38 municipalities in that financial compensation process. According to the pact, one third of the total municipal lease income is made available to a solidarity fund, which in turn benefits all local municipalities equally. Specific fixed compensation costs were negotiated for those land owners directly restricted by the wind turbines and guaranteed that those landowners would be additionally compensated. The rest of the share was distributed equally, related to the amount of square meters that each landowner leased. The mayor stated that it is a special quality of this pact that all landowners and municipalities have the same contract conditions and therefore are treated the same. This solidarity pact - that was negotiated with all participants and decided unanimously - increased acceptance, as all citizens benefitted.

Besides the passive financial participation, citizens could also purchase a "Windsparbrief" (a wind savings certificate). Citizens can thereby invest their money in the form of a savings certificate at a bank. The amount invested earns interest at a fixed rate over the term of the savings certificate and is repaid at the end of the term. The municipality, in cooperation with the wind park operator, chose this form of participation, as it is less risky for investors.

3.2.2 Wind park Druiberg

Picture 1 – Wind park Druiberg

With its installed capacity of 82 MW, the Druiberg wind park in the town of Dardesheim generates 40 times more electricity than the 800 inhabitants and companies need annually (Energiepark Druiberg 2019). The wind farm is erected on a former Russian radar station on a hillside above the town.

It took ten years to plan and build the wind farm. The long timeframe was a consequence of challenges in the approval procedure because of changing responsibilities, but above all due to the attempt to involve the residents of Dardesheim and the neighbouring villages. The first wind turbine in Dardesheim started operation in 1994, right when wind energy emerged in Germany. According to the project developer, citizens did not know much about the new technology that was to be built around them. The project developer thus organized trips to the production site of Enercon, the producer of the wind turbines that were to be built in Dardesheim, where Citizens were able to inform themselves, thereby increasing community acceptance. The project developer communicated transparently on all issues, including on nature conservation matters. The wind park lies in a red kite range, a protected species in Germany. The wind park developer financed studies on the impact of the wind park on the wildlife and was thereby able to reduce opposition on the project. Since 2003, the *'Dardesheimer Windblatt*', a **quarterly newsletter**, informs all citizens on projects, developments and initiatives surrounding the wind park (Neue Energie 2016). According to the project developer, such a method of public participation has the advantage that citizens can inform themselves in the comfort of their own home and do not necessarily need to attend citizen's assemblies, which are also held.

The mayor of Dardesheim, Ralf Voigt (no party affiliation), is also the project manager at the wind farm operator for the Druiberg wind park. Thus, throughout the public participation process, he was available to citizens as a contact person who had technical knowledge about the project and was also able to speak to the procedural side of the project development. The wind park operator has its seat in Dardesheim, thus all trade tax stayed in the municipality in the first years of operation. However, after a regional reorganization in 2010, the town belongs to the neighbouring municipality, thus the money flows there. Through an association, the people of Dardesheim however ensured that they benefit directly from the wind farm's yields (Neue Energie 2016). A fixed percentage of the respective revenues goes to the association each year, amounting to 60,000-80,000 euros. In Dardesheim, 30% of this amount goes to the local associations, such as the multiple award-winning music orchestra, while 70% is invested in infrastructure, for example in road construction or the conversion of street lighting to LED.

Picture 2 - Dardesheim

Furthermore, citizens can acquire shares of the wind park. All turbines were pre-financed by the wind park operator, but local citizens can buy **shares as limited partners** at any time, benefitting of an 8-10% dividend. The wind park has had a good demand for shares as many citizens want to invest their money regionally.

Because Dardesheim was one of the first towns in Germany developing wind energy, Enercon, the wind turbine producer, brought many guests to the town to visit the wind park including international visitors from over 50 countries. The wind park Druiberg has therefore turned into a focal point for renewable energies. While previously the town had only been characterized by agriculture, the **tourism** by renewable energy professionals has increased with the years.

3.2.3 Three-zone leasing model in Ahaus

The municipalities of Heek (8,300 citizens) and Legden (6,800 citizens) as well as the city of Ahaus (almost 50,000 citizens) founded the energy cooperative *Energiegenossenschaft Ahaus-Heek-Legden* (AHLEG) in 2016 as the legal basis for the development of citizens wind farms and for the bundling of all local wind priority zones in a common company. Citizens from the three municipalities, in particular, farmers and employees of local companies were to be involved in the wind farm. The marketing and member recruitment of the cooperative was therefore broadly organised. Information was provided via a project website and cooperation with radio and the local press was intensified (BWE 2018). In this way, the citizens were informed about the status of the project development. The organisers made use of existing networks in the region, for example trade associations, and the board of directors of the energy cooperative from early on sought the broadest possible consensus in individual discussions in order to anticipate possible conflicts later in the active planning phase. In addition to the shares in the cooperative, which owns two of six turbines in the wind park, citizens were also able to actively participate in the wind farm corporation. The group of project developers consisting of the land owners and interested locals had agreed with the municipalities that half of the limited partnership capital will go to local citizens with an initial subscription right for residents.

However, according to the project developer, the key to success for the broad participation and acceptance of the project was a **three-zone lease model**. The model provides the possibility to participate for all land owners and direct wind farm residents. This means that 25% of the lease income is paid to landowners of specific sites on which the wind turbines are erected (zone 1). However, the majority of the lease income, i.e. 75%, is distributed over the entire area of the designated wind farm (zone 2) and to residents in the direct vicinity of the wind turbine site (maximum distance of three times the height) (zone 3). Residents in zone 2 or 3 receive a so-called "neighbourhood money" of around 3,000 to 4,000 euros per year depending on the distance between their place of residence, the location of the wind turbines and their individual impairments due to noise and shadows predicted by experts. The total lease income consists of 1% of sales revenues in the first ten years of operation of the wind turbines and 1.25% in the second ten years of the project term (BWE 2018).

In parallel to the legally required public participation, the consultant for the wind park, *Bäuerlicher Bürgerwind* (BBWind, translates to rural citizen's wind), together with the group of developers had individual **one-on-one conversations** with all immediately affected residents. Previously, BBWind had held open gatherings for citizens to inform themselves about the plans. These gatherings increasingly became platforms for opponents with sometimes radicalized views, making sensible discussions about concerns and compromise impossible. As a result, the above-mentioned one-on-one conversations with neighbours were initiated and are very successful. All other citizens receive information through press and municipality.

The wind farm Ahaus-Heek-Legden is just one example of 16 citizens wind projects in the immediate area that were successfully developed with the same or a very similar financial participation concept and the support of BBWind. All these projects received exceptionally high local acceptance, there were no complaints from nature conservation associations and only one project was subject to an unsuccessful legal challenge. In contrast to classic wind energy projects of large project developers, a large part of the value added by the mentioned projects remains in the municipality and region. The 16 wind farms with a capacity of 163.3 MW generate a total added value of about 660 million euros over 20 years, of which about 170 million euros will be distributed to citizens and 25 million euro will flow to the local communities via trade tax. Each local community receives 25,000 to 30,000 euro in trade tax revenue per wind turbine per year.

3.2.4 Wind park Büttstedt

Picture 3 – Wind park and Struth (village next to Büttstedt)

Büttstedt, a municipality with around 850 inhabitants, found an important source of income in wind turbines. When the first regional development plan of the Federal State of Thuringia, to which Büttstedt belongs, came into force, areas around the municipality were defined as priority areas for wind energy. The municipality then adopted a development plan for wind energy. The wind expansion happened in several phases, today, 35 wind turbines are operating in the wind farm, while 22 of them are located in Büttstedt (Thüringer Energie und GreenTech-Agentur 2016).

The mayor of the Büttstedt, Franz-Josef Degenhardt (CDU), actively involved citizens in the discussions. Throughout the planning phase, there were about 70 meetings (Thüringer Energie und GreenTech-Agentur 2016). As part of the public participation dialogue, the citizens and municipality found solutions and **compromise** to concerns. One example of such a compromise was the increase of the minimum distance to houses from 600 to 1,000 meters.

The municipality concluded a contract with the operator of the wind park, which guarantees an income share of 2-3% of net sales: since 2003, the municipality has received 140,000 to 185,000 euros each year. When in 2013 five new turbines with a capacity of 2.3 MW each came into operation, another 45,000 to 60,000 euros were added each year. Büttstedt had made sure that 90% of the trade tax would stay in Büttstedt thereby achieving that another 250,000 to 300,000 euros end up in the municipal budget (Thüringer Energie und GreenTech-Agentur 2016).

The tax revenue is **invested into social and community projects**. When the municipality's multi-purpose hall was so dilapidated that it had to be rebuilt at a cost price of two million euros, it was only possible because of the income from wind energy. Another example is the old primary school in Büttstedt, which was renovated with the community's own funds. Sufficiently large funds would not have been available prior to the wind park. Additionally, eight new apartments were built. The costs for the renovation and the apartment construction amounted to 350,000 euros - without wind energy, the money would not have been available. Now the municipality benefits from the rental income, amounting to 24,000 euros a year.

3.2.5 Energy community Lichtenau

Picture 4 – Wind park in Lichtenau

After the 7000 citizens of Lichtenau elected mayor Hartmann (SPD) in 2014, he made the expansion of wind energy a priority. Today, 173 wind turbines are located in and around the municipality of Lichtenau. The wind turbines produce around 730 GWh a year, more than nine times the demand of the town (WDR Fernsehen 2020). The municipality, located in the Federal State of North Rhine-Westfalia, lives off agriculture; there is no industry. Initially, the mayor's plans faced opposition. A **citizens' initiative** formed to protest against the expansion plans. Their main concerns against the project were noise pollution, shadow casting, infrasound and a feeling of encirclement (WDR Fernsehen 2020). The eventual success of the expansion can be traced back to the personal commitment of the mayor, dialogue and compromise.

When the mayor took office, one promise was that he would get a legally secure land use plan where operators could not build wherever they wanted. Based on said land use plan, the wind turbines are distributed over five zones; there is no 'wild growth'. Viewing aisles have been created so that the residents do not feel surrounded (Deutsche Welle 2020). Lichtenau has the advantage of being the largest municipality in North Rhine-Westphalia with almost 200 square kilometres, so the wind turbines are spread out. Next to the clustering of turbines, further compromises in favour of sceptical citizens were made. For example, the citizen's wind farm would have liked to install two more wind turbines, but some citizens were against it, thus they were not built.

The decisive point for success, according to the mayor, however, is that the **citizens benefit financially** from the wind turbines. The people of Lichtenau pay considerably less for their electricity (around one third), drinking water prices have not increased for years because the city's public utilities also operate six wind turbines, and taxes remain stable because the city's trade tax has doubled. Importantly, citizens also benefit indirectly from the proceeds from the wind turbines via a foundation. Nearly all turbine operators pay 1% of their profits into this foundation, bringing in 200,000 euros every year. This money was used to renovate the two primary schools and the secondary school of Lichtenau, to sponsor sports club's activities and to organise numerous cultural events. The foundation also finances a citizens' bus, which runs daily from 7 AM to 7 PM, connecting the surrounding villages with the town of Lichtenau (Lichtenau eMobil 2020). Before this new bus started operating, there was a service by the main transport operator, which, however, only provided very few daily connections. Thanks to the new citizens' bus, people form the surrounding villages, in particular schoolchildren and the elderly, now have better access to the town and the schools or shopping opportunities there. In addition, the main transport operator, by saving on the non-profitable connections to the villages, agreed to offer more frequent bus service between Lichtenau and Paderborn, the closest major city.

Besides the passive financial participation, **active financial participation** was also available. Several cooperatives and citizen's wind corporations are active in the community: The *Bürgerwind Buchgarten GmbH & Co. KG* operates five turbines in the citizens wind park Westernfeld-Buchgarten in Lichtenau (EnergieAgentur.NRW 2017). The *Lichtenauer Bürgerwind GmbH & CO. KG* also operates five of the eleven turbines. One plant is operated by the energy cooperative *Energiegenossenschaft Paderborner Land eG*. Financial participation by citizens was possible in two ways. Citizens could on the one hand become a member of an energy cooperative (from 500 euros), or, on the other hand could purchase shares to become a limited partner in the *Bürgerwind Buchgarten GmbH & Co. KG* (from 10,000 euros). 204 limited partners have contributed the equity of *Bürgerwind Buchgarten GmbH & Co. KG* in the amount of 5.5 million euros (Lichtenauer Bürgerwind 2020).

Since two years, the citizen’s initiative against the wind farms has been inactive (ProLichtenau 2020). The success of the project can largely be traced back to the personal commitment of the mayor. The mayor was well rooted in the community and was able to build enough confidence among his constituency to realize the benefits of wind energy for the municipality. With the help of the foundation, he was able to bring the benefits to all citizens.

3.2.6 Citizen’s wind farm Brebek

In the most northern part of Germany, just a few kilometres away from Denmark, lies the citizen’s wind energy park Brebek. The *Bürgerwindpark Brebek* is a regional citizen's energy project in the adjacent municipalities of Bramstedtlund (200 citizens), Ladelund (1,400 citizens) and Karlum (200 citizens).

An original plan for a wind park with 18 wind turbines could not be implemented (Nordfriesland Tageblatt 2017), due to numerous adaptations caused by an objection by the German Armed Forces listening station in Ladelund. As a result, the project was eventually implemented in two phases with a total of twelve turbines. Besides a lawsuit filed by two local families, which was rejected in 2017, there were only a few personal objections to the project, so that the wind farm could be opened in 2017 with great approval from the adjacent communities.

Farmers and landowners who were looking for additional revenue initiated the project. They contacted a local project developer who took charge of planning and construction. According to the project developer, a key success factor were the people at the project developer’s office. All have been living in the area for many years, are well respected in their communities, and enjoy a certain sense of trust as previous projects completed by them had been well received.

The adjacent municipalities of Bramstedtlund, Ladelund and Karlum were involved in all discussions leading up to the project approval. The municipality of Ladelund, the largest municipality of the wind farm, invited all residents to a general assembly where details of the projects were presented and questions could be asked. Afterwards, the municipality held a **referendum** on the wind farm project (BWE Landesverband Berlin/Brandenburg 2019). With overwhelming support, the project had the political and civil backing necessary to advance. Such information assembly events were also held in the other two municipalities.

In order to inform citizens about the opportunity to actively participate in the wind farm, a letter was posted to every household. Interested parties could then receive more information on the process. Every adult citizen of the adjacent municipalities, but also landowners and tradespeople based in one of the municipalities were able to participate in the wind farm with a share of 1,000 euros at the time of its foundation (BWE Landesverband Berlin/Brandenburg 2019). The shareholding was later increased up to 37,000 euros as part of a capital increase in 2012. A total of 216 limited partners are involved in the project. The wind farm required an investment volume of 54.5 million euros, of which 12 million euros were raised by the citizens. The remaining 42.5 million euros of borrowed capital was financed by a private bank and from KfW (German government-owned development bank) funds (Nordfriesland Tageblatt 2017).

The trade tax for the wind park, amounting to approximately 300,000 euros a year, is divided between the three municipalities according to the installed capacity in each municipality. The tax revenue is not dedicated for any special purposes, but becomes part of the general budget of the municipalities. Furthermore, around a third of the necessary investment stayed in the region and supported local construction and planning companies. The project also created additional jobs at the local planning office and around 40 jobs during the construction phase, which is considerable given that the three municipalities involved in the project have a joint population of less than 2000 people.

The wind farm operator committed to dedicate a certain share of the revenue towards social projects in the region, as not all citizens were able to benefit directly from the wind farm through their shares. Thus, a canoe was bought for a local club, a van was bought for the *Tafel*, a volunteer organization distributing food to people in need, and high-speed Wi-Fi for public use was built together with all other wind farm operators in the region.

3.2.7 Construction of a service port for offshore wind in Helgoland

Until the turn of the millennium Helgoland, Germany’s only island in the open sea, had been renowned for the masses of day-trip tourists that took advantage of the duty-free shopping opportunities. After these duty-free shopping trips were prohibited in 1999, tourism decreased sharply. With the rise of offshore wind energy, a new economic opportunity appeared. By now, three offshore wind farms are operated and maintained from Helgoland. The wind farms with a total capacity of around 1 GW are located between 25 and 39 kilometres from Helgoland.

Before construction started, wind farm operators RWE, e.on, and WindMW expressed their desire to organise the operation, maintenance and service of their wind farms from Helgoland. In 2012, work officially began on the **offshore reaction port** in the South Port area. A total area of 3.4 ha of the 170 ha large island were renovated (Nordwest Zeitung 2012). In order to enable the financing of the land preparation and the port, the Federal State of Schleswig-Holstein alone provided 11.5 million euros. The municipality leased around 1 ha of land for warehouse facilities to the wind park operators for 20 to 30 years (Windpark Helgoland 2020).

A peaceful coexistence of **tourism and the offshore industry** was and is critical for Helgoland. Especially in the first years of construction, hotels on the island benefitted tremendously. The only wellness hotel on the island was rented out for ten years for the technicians of a wind farm operator. Even after the initial labour-intensive construction phase, the island managed to sustain high booking rates for the hotels. During the construction work, nature, island life and tourism on the North Sea island had to be aligned. An example of how integration worked well was the preparation of the above-mentioned offshore reaction port in the South Port area for construction in 2013. Locals and guests alike followed the project with great interest. Still today, excursions to the offshore wind farm area are being offered - and are also very well received (Hafenprojektgesellschaft Helgoland 2020). In general, Helgoland has greatly increased tourist numbers over recent years (Nord24 2019). The numbers increased by 30% between 2015 and 2018 to 390.000 tourists in 2018. In 2019, the number once again increased strongly, to around 450.000 (Hamburger Abendblatt 2020).

Initially, most locals were sceptical about the influx of construction workers and technicians. As the offshore industry and its employees arrived on the island, acceptance increased. The employees live on the island and with the locals. The median age on the island with 1500 inhabitants decreased from 59 to 49 years. At the same time, unemployment rates dropped to zero percent (Welt 2018), as the project created around 240 jobs for technicians and engineers and around 30 jobs around the port on the island with only 1300 inhabitants (Gemeinde Helgoland 2018). When a school roof was damaged after a storm, the offshore workers helped with repairs. Some of Helgoland’s citizens are now working on the wind farms themselves. According to the mayor (Singer, no party affiliation), the advantages for the island clearly outweigh the disadvantages (Welt 2018).

Picture 5 - Helgoland

The municipality of Helgoland has benefitted greatly from the offshore industry. The municipality, which was in a constant state of disrepair in the early 2000s, collects **tax revenues** in the double-digit millions from energy companies year after year. According to the mayor, trade tax revenues in 2016 amounted to around 22 million euros, 21 million euros more than before the offshore industry came to Helgoland (Heise online 2017). After being financed by the Federal State of Schleswig-Holstein for many years, the island now makes so much tax revenue that around two thirds go back to the Federal State. With the remaining tax revenue, it has been decided to build 100 new apartments, and other plans include improvements to the infrastructure, a luxury hotel and the renovation of the aquarium, which has been closed since 2015, to attract more tourists (Heise online 2017). According to the mayor, within ten years, Helgoland could be a top-class holiday island with island-wide free Wi-Fi (Heise online 2017).

3.2.8 Construction of a base port for the offshore industry in Cuxhaven

Cuxhaven, a harbour city in the north of the Federal State of Lower Saxony, traditionally had two economic focal points: fishery and tourism. Cuxhaven is located at the entrance to the North Sea, directly at the mouth of the river Elbe and opposite the entrance to the Kiel Canal, making it an ideal starting point for traffic to Great Britain, Scandinavia and the Baltic region.

Already in 2002, the Federal State of Lower Saxony made the decision to expand the existing port in Cuxhaven, which otherwise focuses on shipping of industrial goods, e.g. cars, by adding a **base port for the offshore industry**. In the coming years, two offshore terminals, a heavy load platform and over 100 ha of commercial space were developed. Since 2006, the state of Lower Saxony, the EU and the Cuxhaven Association for Port Development have invested over 250 million euros into improving infrastructure, both at ports and inland (Agentur für Wirtschaftsförderung 2020b). As of 2018, the offshore industry had invested around 390 million euros into production facilities. The total amount invested stands at around 685 million euros (Agentur für Wirtschaftsförderung 2020b). The multi-purpose terminal Cuxport with a collective wharf length of 270m and a water depth of 15.8m allows for servicing and handling of seagoing and specialised ships with large draughts. The heavy-duty platform at Cuxport is one of the sturdiest structures on the German North Sea coastline and is able to withstand the weight of a fully constructed offshore wind-power terminal, making it a unique selling point of the Cuxport (Agentur für Wirtschaftsförderung 2020b).

As part of a **master plan**, the local economic development agency became the lead actor in attracting and ultimately bringing Siemens Gamesa to Cuxhaven. The city had started to make advance investments, expanded roads and the loading port. The employment agency trained hundreds of skilled workers and the long-term unemployed to qualify them for work at the plant (Handelsblatt 2018). In 2015, Siemens Gamesa decided to build its first German offshore turbine production plant in Cuxhaven despite the strong efforts of the larger coastal city Bremerhaven to attract the company to its port (see case below). With an investment volume of around 200 million euros, Siemens now manufactures and ships wind turbines in Cuxhaven for the offshore wind power market, creating over 1,000 new jobs in Cuxhaven (Agentur für Wirtschaftsförderung 2020a). In addition to the new jobs in the offshore industry itself, growth in hotels, gastronomy, logistics, retail and trade followed, creating an estimated 200 additional jobs. Given that there are around 20,000 people regularly employed in Cuxhaven, this meant an increase of around 6% in available jobs (based on Agentur für Wirtschaftsförderung Cuxhaven 2019). Siemens Gamesa is however not the only relevant offshore company in Cuxhaven, as several other related companies as well as production facilities for special offshore service ships as well as offshore training and certification centres are also part of the offshore cluster at the port (Cuxport 2020).

Picture 6 – Port Cuxhaven

One of the greatest achievements in Cuxhaven was the **fast development timeline**. The above-mentioned Offshore Terminals I and II were each planned and completed within two to three years. According to the head of the local economic development agency, in today's economy, it is important that cities such as Cuxhaven or infrastructure operators for the offshore industry always have new commercial and port areas available. That way, interested companies do not have to wait for the usual 5 years before they can start building their production sites. The agency's recommendation is to create the supply for such areas and infrastructures as well as the needed compensation areas even before the concrete demand of the industry. Such a procedure is not always easy, especially in a fast-moving economy, as capital has to be tied up in order to be able to keep these sites available, and this must of course be justified if the demand for the sites is not so great after all.

A key actor in advancing Cuxhaven was the very involved and ambitious mayor at the time (Dr. Getsch, no party affiliation, but supported by CDU, FDP and Green Party). He insisted on putting a lot of money into **compensation areas** to bring nature conservation groups on board. "If we wanted to plant ten trees and they wanted 15, we planted 15," said Mayor Getsch (Handelsblatt 2018). The approach was successful, as no opposition arose. Getsch learned from the previous blockade in Bremerhaven (see case below).

The local population (around 200,000 citizens) did not oppose the development of the offshore industry and port area, because plans were communicated early and locals understood the positive job creation effect of the new industry. All measures were implemented with moderation and focus, and the majority of citizens accepted that this potential must simply be exploited, even if the port facilities in the urban area are directly adjacent to nature conservation areas. The now planned further development of 130 ha of commercial area to enlarge the areas for the offshore industry directly at the port has met little resistance so far. Public events are held in cooperation with the city to advertise the areas and to be as transparent as possible.

3.2.9 Construction of an offshore wind terminal in Bremerhaven

After the first federal expansion target for offshore wind energy was set in 2010, projects around the country flourished. In September 2011, the Bremerhaven city administration decided to close a commercial airfield in favour of a to-be-built Offshore Terminal Bremerhaven (OTB) (Prognos 2011). The construction of the offshore terminal was to start in 2013, completion was already planned for 2014; the total costs were initially estimated at 180 million euros. The costs for construction were to be raised with the help of investors, but a tender in 2012 was unsuccessful in procuring investors. Instead, the Federal State of Bremen, to which Bremerhaven belongs, invested. In 2014, the federal expansion target for offshore wind energy was reduced (from 25 GW by 2025 to 15 GW by 2030). As a result, the already struggling offshore industry took another hit and many companies went bankrupt or withdrew from Bremerhaven. In 2015, Siemens Gamesa, decided to develop its German offshore production site in Cuxhaven (see case study above) instead of Bremerhaven. This decision from Siemens Gamesa, one of the most potent producers, was not surprising in the end, because in Cuxhaven they got exclusive access to the port infrastructure, whereas at the OTB other companies would have also had access to it.

Picture 7 – Terminal in Bremerhaven

The OTB was to be built in a **bird and nature conservation area**. The hurdles for project development in such areas are high. Only overwhelming public interest could justify the approval of a project. Since the beginning, nature conservation groups had been concerned, as to the reason laid out above. Local population generally welcomed the project, as it was planned far away from any housing areas and promised to bring new jobs to the area. The fishing and shipping industry were involved in the project planning and accompanied the process with critical, but constructive feedback. During the planning process, solutions were worked out with the local shipping associations, so that, for example, the passage for them at the OTB was not impaired. A total of 15 possible sites were examined with regard to their effects on nature conservation and the shipping industry; the final decision was taken at a political level and led to minor discrepancies. Throughout the process however, solutions were found with all interest groups. As a result, the project was approved in 2015.

Driven by the decreased political target and the resulting economic downturn in the offshore industry however, the industry slowly withdrew from Bremerhaven around 2015; and without the industry and corresponding jobs and tax revenues it could no longer be argued to build in ecologically sensitive areas. The BUND, a nation-wide nature conservation group, filed a lawsuit. Consequently, the project came to a standstill in 2016. Since then, the project has been before court many times and has become a significant political matter at local level.

As of 2020, the offshore terminal has not been built and the site remains unused. Some local offshore companies, central parts of an emerging offshore wind cluster around the port, greatly reduced their number of employees in the meantime. Instead of 4000 people some years ago, only 1.300 remained employed in the offshore wind industry in Bremerhaven as of 2018 (Hellmers 2019). Even though the port operator still intends to build the terminal, the state government already allocated the funds otherwise (Otto 2020). Even though the port itself continues to function as a port for industrial as well as cruise shipping, it is very unlikely that the offshore terminal in Bremerhaven will be built.

According to the project developer, the **compensation areas** for the project were a key factor. Nature conservation groups lobbied for larger compensation areas. However, this would have significantly prolonged the project development, as such, areas would need to be found and procured first. More compensation areas would also increase the total cost of the publicly financed project. In the case of the OTB, it politically was not possible to increase the budget. One key lesson learned is thus, that local administrations should prepare plans for ecological compensation areas over several years and independently of specific projects. According to the interview partner, the project manager at the harbour management company bremenports, long-term, forward-looking spatial planning that incorporates compensatory solutions from the outset is very important because it would speed up processes, can increase the acceptance of infrastructure projects and avoid local conflicts.

3.2.10 The development of offshore wind parks in Germany

In contrast to the case studies regarding onshore wind parks and support installations for offshore wind discussed so far, the acceptance of offshore wind parks depends on a different set of conditions. This difference is also related to the fact that wind parks further offshore are difficult to associate with individual municipalities and while local residents play less of a role, associations and interest groups are more relevant. This also implies that most issues in this context are more general and less specific to individual parks. Due to this difference and because of the crucial importance of offshore wind, additional interviews were conducted with experts from related industry associations, companies and other stakeholder groups. Their answers deal with fundamental issues that played a role for several offshore wind projects in Germany. This section can therefore be seen as a foundation for the two following case studies of individual, early, and near-shore offshore wind parks.

Firstly, it has to be mentioned that there is one particularity in German laws, which supports community acceptance: The federal government is not responsible for territorial waters, but only for the exclusive economic zone, namely waters that are further than 12 nautical miles away from the coast. The responsibility for the first 12 nautical miles, and therefore the territorial waters, lies with governments of the Federal States, which implies a different regulatory framework. Due to this different, and mostly less concise, framework on provincial level and due to the fact that many coastal waters are environmental protection zones, there are very few possibilities for wind parks within this 12-mile zone and nearly all projects are being developed in the exclusive economic zone. This matters a great deal for acceptance, because it means that most offshore wind parks in Germany are not very noticeable for residents due to their distance to shore and are also less likely to be in conflict with environmental protection concerns. This is confirmed by research conducted by Hübner and Pohl (2016) showing that distance matters a great deal for acceptance in the case of offshore wind. There are however, three parks within that the 12-mile zone, in particular parks that were built very early on, which makes them more interesting for questions related to acceptance. Therefore, two of them, Baltic 1 and Riffgat, were selected as case studies for this report.

In the areas outside of this 12-mile zone, the BSH is responsible for spatial planning and, as already explained, will in the future pre-develop sites for offshore wind parks. This means that impacts on the environment and on other uses, such as shipping, are already taken into account, facilitating not only project development, but also fostering acceptance. Through this process, "substantial impacts" on other interests, such as the environment or other economic actors, can be avoided before implementation. Since German law states that such impacts need to be evaded and might otherwise lead to the need for compensation, the process makes both legal disputes and compensation payments relatively rare.

Generally speaking, there are four main stakeholder groups that matter for acceptance of offshore wind parks: Local residents, tourism, fishing, and environmental protection. Regarding the first of these groups, local residents, there are very few acceptance issues in Germany, since the acceptance of the energy transition is generally very high among the population (Agentur für Erneuerbare Energien 2018) and citizens are mostly not directly impacted by offshore wind parks due to the distance to shore, as mentioned before. Local communities and local politicians are mostly rather supportive of such developments as they hope for local value creation and jobs, which might also be reasonable given the fact that the industry has already created close to 25,000 jobs in Germany (trend:research GmbH 2019).

Similarly, there are also relatively few acceptance issues related to the tourism industry, which sometimes even benefits through bookings by service technicians or through a boost in publicity for smaller islands or communities. Even though there were some concerns related to the two near-shore case studies presented below, the significant distance to shore does not make this a crucial issue for most German offshore wind parks. It also has to be mentioned that research confirms that acceptance is higher once parks are actually built (Hübner and Pohl 2016), indicating that people might have exaggerated concerns regarding these parks, which might be solved through open communication. This is particularly relevant as financial participation, referring to directly citizen-financed projects, which is often implemented in the context of onshore wind parks, is not a viable solution for offshore parks, since upfront investments are significantly higher. Financial participation was attempted in the case of one offshore wind park in Germany, Butendiek, but the project failed and was, due to financial difficulties, eventually sold to a major developer.

Fishing was not a major acceptance issue concerning wind park developments in the past, as the area taken up by these developments was relatively limited. Furthermore, fishers are included in the official consultation process and spatial planning, which is seen as crucial by fishers themselves. However, in contrast to most other uses, there are no pre-determined areas for fishing in the current spatial plan from 2009, which is also not demanded by fishers due to their need for flexibility. This and the fact that fishers need to demonstrate a loss of over 10% through an individual offshore wind project (Bundesamt für Seeschifffahrt und Hydrographie 2019) implies that they have no meaningful way to halt development of individual wind parks or demand compensation. In the last years however, resistance has increased, as fishing grounds start to shrink and fishers are not allowed to fish within German wind parks due to concerns related to underwater cable damages. Some other countries allow fishing in wind parks to a limited extent. Experts see this as a potential area for negotiations in Germany, because even though fishing in the parks is seen as too dangerous, fishing within the security zone or passing through the parks might be an option to increase acceptance. In some other countries, such as the UK, fishers are also financially compensated, which is usually not a major issue for the projects as these compensations do not take up a significant share of the project budgets. Fishers in Germany see this as a way to increase acceptance, while they are also concerned about an over-use of such an instrument, as this could turn fishing areas into a tradeable commodity. Fishers furthermore see the employment of local fishing boats as guard vessels for the wind parks as another way through which the acceptance of projects could be improved.

The most important acceptance issue in Germany are however environmental concerns, voiced both by NGOs and by private citizens. In contrast to fishing, environmental concerns are also a legal reason to deny approval of a wind park, which makes dialogue with such stakeholders crucial for the acceptance of offshore wind parks in Germany. The environmental protection zone, which encompasses a large share of the German shore, is however already avoided through the generally large distances to shore discussed before.

Therefore, only two main environmental concerns remain for most projects, namely concerns about the impact of turbines on protected species of sea birds and about the impact of construction noise on protected marine mammals, in particular porpoises, which are protected by the Habitats Directive in the EU. Due to the legal structure of project approval in Germany, environmental concerns are dealt with early on in the development process. Firstly, they are already part of the spatial planning, which significantly reduces acceptance issues at a later stage and is also seen as an important step by industry experts. Secondly, environmental impact studies have to be created during the project approval process. These studies are then publicly available and facilitate acceptance and communication. Remaining issues are then openly discussed with environmental NGOs, often with the government as a mediator, and developers try to find either technical solutions, e.g. using of a bubble curtain to reduce construction noise, or financial solutions, e.g. environmental compensation. One additional issue that emerged recently was maintenance traffic for offshore wind parks, where more coordination between different park operators might greatly reduce environmental impact by concentrating traffic at specific times.

3.2.11 Offshore Wind Park Baltic 1

Baltic 1 was the first commercially-operated offshore wind park in Germany when it started operations in 2011 and has a capacity of 48,3 MW (EnBW 2018). Therefore, and because the park is located only 16 kilometres (or 8.6 nautical miles) from the shore, acceptance was of crucial importance for the project.

Picture 8 – Wind park Baltic 1

For Baltic 1, tourism and environmental protection were the two main acceptance issues. With regards to tourism, the main concern was that the turbines would impact the view from the shore, which is why the developer created visualizations beforehand, which were handed in together with the official project approval application. Therefore, the relevant public sector stakeholders were already aware of the minor impact early on. Furthermore, public authorities even became advocates of the project, as the park quickly became a showcase project for renewable energy transition and positive impacts on marine biodiversity within the park were predicted (for research on the issue see e.g. Dannheim, Jennifer, et al. (2013)).

More relevant were however environmental concerns being voiced by NGOs, even though there was no fundamental opposition to the project. The NGOs were mainly concerned about the impact of construction noise on marine mammals, in particular on porpoises. Some of these mammals were washed ashore during construction, but evidence that this had happened in the past and was therefore not necessarily connected to the project could be presented. Furthermore, an open dialogue was held between the authorities, environmental NGOs and the project developer. Consequently, the extent of environmental surveys was increased, an environmental foundation was created and a bubble curtain was used to reduce underwater construction noise – an innovative approach at the time, but standard nowadays. These measures led to an agreement with environmental NGOs and fostered acceptance.

Generally speaking, the project does not only provide electricity for around 50,000 households (EnBW 2018) but also creates local value in a range of different ways. A local control office was established to monitor the park, local shipping companies manage the transport of service technicians and local service companies profit from contracts related to the provision of catering, repairs and harbour services. Additionally, the park can be visited as part of tourist tours. Apart from local value creation, there was however no financial participation by local communities, even though the operating company is partly owned by different "Stadtwerke" (communally owned public utilities) in South-West Germany, where EnBW, the owner of the wind park, is located. Thereby, the communities of some of the electricity consumers are financially involved in the project.

As Baltic 1 was the first offshore wind project in Germany, external experience and support was crucial to its development. With regards to acceptance, EnBW, the owner of the park, emphasised that intensive and early communication with different stakeholders, including public authorities, NGOs and local actors, was essential to the project's success.

Picture 9 – Baltic 1

3.2.12 Offshore Wind Park Riffgat

The wind park Riffgat is in some way similar to the previous case study, Baltic 1. It was also constructed very close to shore, 15 kilometres from the island of Borkum, and is therefore visible from the island, and was furthermore the first commercial wind park in the German North Sea, which implies that it shares the special situation of Baltic 1, however under slightly different conditions. The 108 MW park was completed in 2013 and produces sufficient electricity for approximately 120,000 households (EWE AG 2013). The project was finalized within only 14 months, even though there were some delays in the grid connection, as several tonnes of World War 2 explosives were found on the sea floor and first, had to be removed.

Picture 10 – Wind park Riffgat as seen from Borkum

Since Riffgat was, as mentioned, a comparatively early wind park, there were also a number of acceptance issues. Early on for instance, fishers sued because they feared financial losses, but lost in court (Frankfurter Allgemeine Zeitung 2014). During the main part of the process however, fishing was not an issue. Tourism on the other hand played a crucial role, as the nearby island of Borkum is a tourist destination and local residents as well as representatives of the city feared the park would affect the beautiful sunset view. In order to solve this issue, the owner created digital animations depicting the actual size of the park and its effect on the view, which calmed worried residents. The company furthermore installed information steles around the city and an information board in the local public swimming pool to educate local residents about the project. This, as well as the interest of the city to commit to climate protection, supported local acceptance and led to a very constructive cooperation between the city and the developer. Furthermore, the owner built a technical maintenance office with approximately 20 employees on the island and the developer currently builds additional apartments for around 100 workers, which are going to work on the second phase of the project. The company also tried to connect the project to the island, for example by wearing the island's name on professional clothing or holding press conferences on the island, which made it better known in other parts of Germany and increased local ownership of the project.

Another acceptance issue were environmental concerns, with two environmental NGOs suing the wind park owner. The company tried to enter an open debate with the NGOs, which did not pursue the lawsuit further after the parties agreed on compensation payments for environmental projects. These compensation projects, as well as one compensation project that was mandated as part of the official project approval process, further increased acceptance, as they became positive publicity for the company and the wind park. Especially one project the company supported together with the State of Niedersachsen, namely the release of 2,400 lobsters at the foundations of the turbines, is noteworthy in this regard. It was widely reported and researchers found that even though only a part of the lobsters remain until today, the density of the populations is similar to natural levels and the lobsters actually grew faster than in captivity. This could indicate that wind parks might help to save endangered lobster populations (Deutschlandfunk Nova 2019) and most likely increases acceptance of the parks. Generally speaking, the creation of a feeling of "ownership" by residents of the island as well as a clear and comprehensive communication by the owner of the wind park were crucial to ensure the success of the Riffgat project.

Picture 11 - Riffgat

3.3 Lessons learned from the cases: discussion and best practices

As elaborated in chapter 2, community acceptance for wind energy projects can be generated through financial participation and public participation. The case studies have shown that these elements are critical for the success of a project. Furthermore, the cases have shown that other elements such as the political framework, compensation areas and personal commitment contribute to the success of a project. Previous studies have also examined factors influencing community acceptance. While this study has a limited number of cases, many findings reflect the ongoing academic discussion.

3.3.1 Public participation

As explained in chapter 2.3, public participation entails two concepts. **Formal public participation** comprises the legally required participation in planning, and approval procedures, while **informal participation** goes beyond the participation required by law and includes all measures that project and planning authorities implement on their own initiative in order to prepare and support projects well. The importance of public participation, the transparent provision of information and the possibility for citizens to state their opinions in such a way that it can be taken into account in the development and implementation of wind energy projects is significant. One study on public participation in wind energy projects located in Germany even finds that informative participation is perceived to be preferred over financial participation (Langer et al. 2017). The case of Brebek has shown the relevance of informal public participation. The mayors of the three municipalities put large **emphasis on the opinion of their constituency**. Each municipality invited its citizens to a large community assembly, where the project was presented. Citizens thus had the opportunity to familiarize themselves with the plans, could ask questions and discuss. Each citizen got the opportunity to vote on the project in a referendum held after the assembly. The intensive public participation proved valuable – an overwhelming majority of citizens voted in favour of the plans. The municipality thus knew it could approve the plans, according to wishes of the community.

In the case of Lichtenau, public participation also proved to be a critical element. The **mayor** made the expansion of wind energy a key topic of his campaign and, after the election, a priority for his time in office. He also made the promise to implement a legally sound and sensible spatial planning plan, prohibiting the 'wild growth' of individual turbines. Instead, turbines were clustered in zones, all 1,000 metres away from the nearest residential areas. Furthermore, intricate landscaping helped reduce the visual impact on affected citizens. The mayor even has several wind turbines visible from his backyard. Thus, he did not enforce a burden on others, that he was not willing to carry himself. Throughout all steps of the project, the mayor was accessible for discussion. Even when a citizens' initiative against the project formed, the communication channels stayed open and constructive. With the help of the financial participation (more details below in 3.3.2), even the most sceptical citizens accepted the wind farms in the end. The combination of transparency about the plans, commitment to stick with and implement compromises and public accessibility were a key factor for success.

In Büttstedt, the municipality held about 70 public information meetings on the wind energy expansion plans in the municipality. Citizens could raise concerns in the meetings, and ultimately work on **compromises** with the municipality. As an example, the minimum distance to houses was raised from 600 to 1,000 metres. This compromise, together with the transparency about plans, helped increase acceptance.

In Ahaus-Heek-Legden, the project developer sought **individual meetings** with the immediately affected neighbours of the wind farm. While the total time invested in the public participation increased vis-à-vis the previously held general gatherings for citizens, concerns by citizens could be addressed more directly and discussions with opponents with radicalized views could be avoided. All other interested citizens were able to inform themselves through local media and the municipality.

In Arzfeld, thanks to the unusual process, where the municipality initiated the negotiations about the land for the wind park, a lot of the public participation happened before the project developer came on board. The **initiative from within the community** as well as the committed mayor helped increase acceptance for the project.

In Dardesheim, the **quarterly newsletter** was used to keep citizens informed about developments, sponsored activities and news surrounding the wind park. The newsletter informed early and transparently about any expansion plans. Furthermore, it shed light on the many initiatives that were financed and realized with the profits from the wind park.

In Bremerhaven, during the discussions on the offshore terminal, the importance of **involving stakeholders**, and even more importantly, keeping said stakeholders involved became apparent. While the participation by the fishing industry and local citizens was successful in finding compromises with the project planners, conflicts with nature conservation groups emerged. After they had initially accepted the project, acceptance decreased with time. When the industry withdrew from Bremerhaven, they took their concerns to court. In hindsight, more frequent exchange with this group and compromise on their demands could have been a key to keeping the project alive. Their demand for more compensation areas for the affected wildlife habitat was not met.

Cuxhaven is a primary example of a variety of stakeholders, namely the Federal State, the city administration, the local economic development agency and the Cuxhaven Association for Port Development, **working together towards a common goal**. On their way, these stakeholders communicated early, were transparent and had a comprehensive strategy making sure as many locals as possible would benefit from the offshore industry. Thousands of jobs were created and by offering training, it was ensured that benefits stayed in the city.

In the case of the offshore wind parks **Baltic 1 and Riffgat**, open communication about the projects and about their potential impacts on the landscape and nature were crucial in fostering local acceptance. As argued before, there is a risk that local residents overestimate the impact of such parks, which means on one hand that acceptance concerns might matter less in the long run and on the other hand that clear communication is the most important tool. In addition to clear communication, an early dialogue with relevant stakeholders was also crucial for both projects in order to avoid larger conflicts or long legal disputes.

Of course, next to the cases and best practices examined in this study, there are many others in Germany, also highlighting worst practices. For example, such a **negative case** can be found in Beelitz, a city with 12,000 citizens in the Federal State of Brandenburg. In Beelitz, the area for potential wind turbines was located in the immediate vicinity of the two towns of Borkheide and Borkwalde. However, since the area exclusively belonged to Beelitz, planning took place entirely within Beelitz, as it was not legally necessary to include neighbouring communities. Therefore, the residents were not informed about the planning at first. A previously established citizens' initiative against noise pollution from highways and a nearby airport quickly got involved. In the coming years, more citizens' initiatives formed and grouped together to protest the development of wind energy in the region. Soon after, the citizens' initiatives held a public event discussing their concerns. Only two years later, the regional planning community organized an information event for local residents themselves. At that point, turnout and community acceptance by citizens was low (Eichenauer 2016).

While there are many other elements about the Beelitz case, the public participation process certainly played a big role. The perceived procedural fairness was a prominent conflict factor, especially concerning representation of interests in decision-making and information access.

3.3.2 Financial participation

The academic literature widely acknowledges the positive effect of financial participation on acceptance. In a comparative case study, Musall and Kuik (2011) tested the effect of a community co-ownership model in two communities in Eastern Germany. In Zschadraß, a part of the city of Colditz, a local project developer planned new wind turbines in co-ownership with the local community. Twenty percent of shares are owned by a local foundation and a club. In contrast, in the control case, the city of Nossen, there was no co-ownership initiative for the wind energy development. Measured by a survey with 100 respondents from each community, the citizens of Zschadraß were overwhelmingly more positive towards wind energy. "When asked about their general opinions on the local windmills, 62% of the respondents in Zschadraß stated a positive opinion, […] while in Nossen only 26% of the respondents stated a positive general opinion […]." "In Nossen 39 participants stated that there are already enough wind mills in the area. In Zschadraß only eight participants stated that there are already enough wind mills in the area." (Musall and Kuik 2011)

In another case study by Jobert et al. (2007) two wind parks in Germany were examined. One wind park included the option for direct financial participation. While residents ended up purchasing less shares than available, the gesture itself increased local acceptance. In the second case, no such opportunity was offered, thereby widening the gap between the few winners such as landowners and the losers, i.e. citizens who did not directly profit from the project and still had to live with the visual impairment of the landscape.

The positive effect of financial participation on community acceptance was also observed in the cases of this study. The case of the wind park Brebek is a primary example of how **active financial participation** can lead to high community acceptance. Every interested adult citizen in the municipalities, or people owning land in one of the municipalities, was able to acquire a share. No matter the size of the individual investment, every shareholder had the same decision weight. It was important to the management that no individuals had shares large enough to veto decisions.

In Arzfeld, citizens could benefit from a different form of financial participation, by purchasing a *Windsparbrief* (a **wind savings certificate**). The amount invested earns interest at a fixed rate over the term of the savings certificate. The investment amount is repaid at the end of the term. The municipality, in cooperation with the wind park operator, chose this form of participation, as it is less risky for investors.

One important factor for high acceptance is closing the previously mentioned gap between winners and losers of wind energy developments. The need for **distributive justice** can be high among citizens. According to Langer et al. (2016), "envy can be generated and accelerated when citizens perceive the distribution of profit as being unfair". Jobert et al. (2007) found in their case study that "In the second case, in which the developer contracted with private landowners, statements like 'They profit and we have to look at it' were frequent and were perceived as disrupting the 'local peace' as well as the project".

The wind park in Ahaus-Legden-Heek made great effort to achieve distributive justice among stakeholders. With the three-zone lease model, 25% of the lease income is paid to the landowners of the specific sites on which the wind turbines are erected (zone 1). However, the majority of the lease income, i.e. 75%, is distributed over the entire area of the designated wind farm (zone 2) and the residents in the direct vicinity of the wind turbine site (up to 3H) through the so-called 'neighbourhood money' (zone 3).

Besides the active financial participation, **passive financial participation** can also be key to achieving community acceptance. The previously mentioned study by Musall and Kuik found that "14 residents in Zschadraß stated 'generated income/benefit for the community' as their main reason [for their opinion on the local wind mills] […]. In Nossen […] no one mentioned 'generated income/benefit for the community'." (Musall and Kuik 2011)

The cases of Lichtenau, Büttstedt and Helgoland are great examples of how municipalities make different **use of tax revenue**. In Lichtenau, a foundation was set up, into which the wind parks pay a share of their profit. This money, amounting to around 200,000 euros a year is used for the benefit of the community, while directly communicating the connection between the wind parks and the added value. Similarly, in Büttstedt, where the tax revenue was invested in the renovation of the multi-purpose hall and the local primary school. In Helgoland, the added tax revenue made significant change on the island possible. The island was able to invest into internal matters (new housing) while also using the money to attract more tourism to the island, thus strengthening another economic pillar of the island. While oftentimes wind energy development is viewed critically by tourism, in the case of Helgoland it allowed the necessary investments to revive tourism and offer better-quality services.

Interestingly, in the case of Brebek the wind farm operator itself was very active in giving back to the community. While the three municipalities add the extra tax revenue to the general budget, the wind park operator has made an effort to let all citizens benefit indirectly, not just the shareholders, by supporting social clubs and investing into broadband internet for the region.

For offshore wind parks, financial participation is more difficult, as the cases of Baltic 1 and Riffgat and especially the failed project of an offshore citizen's wind park mentioned before demonstrate. In contrast to smaller onshore parks, the necessary investments are too large to allow residents active financial participation and since there are no leasing fees that have to be paid, as local residents do not own the sea area, passive financial participation is not an easy option either. In some cases, revenues might benefit coastal communities, if the operating companies have local offices and pay local taxes, even though this is rarely the case. Generally, there is a more significant disconnect between communities and the parks in the case of offshore, which grows larger the further the parks are away from the coast. Coincidentally however, the larger the distance, the smaller are also acceptance issues related to local residents or the tourism industry, which makes this less of an issue. This however does not necessarily apply to fishing, where financial compensation, even though not allowed or practiced in Germany, might help with solving acceptance problems.

Seeing financial participation in a broader sense however, coastal communities and islands, which generally tend to be more economically disadvantaged might greatly benefit from services related to the operation of offshore wind farms, as in the case of Helgoland discussed before. Such local value creation has to be promoted and communicated well and can thereby support acceptance.

3.3.3 Other factors influencing community acceptance

3.3.3.1 Political setting

One reoccurring topic in the case studies for this paper was the political and regulatory framework. In the interview with the citizen's wind park in Brebek, it was mentioned that without the feed-in priority for renewable energy and the **feed-in premium**, small investors would not be able to present a business case to banks for the needed capital.

The case of Bremerhaven showed how a change of federal **expansion targets** has had a direct effect on a project. The reduction of the target caused a wave of bankruptcies in the offshore sector. That in turn caused the project in Bremerhaven to derail. A credible, long-term energy policy is needed to attract investors and make projects economically viable.

Langer et al. (2016) also mention the perception of political processes and the stability and consistency as important factors for acceptance. As described in chapter 2.1 there have been many **discussions on a minimum distance rule**. In their analysis on Bavaria, the authors state that the political development towards wind energy has been especially inconsistent in the Federal State of Bavaria. In particular, the enacting of the 10H regulation had severe consequences for acceptance (Langer et al. 2016). The 10H regulation assumes higher acceptance by citizens through a legally binding regulation that ensures wind turbines are built at a far distance to residential houses. However, as previously stated, studies have shown no significant relevance for the distance of the wind farm to the place of residence (Fachagentur Windenergie an Land 2015). Study results rather emphasize that people, who have already experienced wind turbines, think more positively about wind energy (Langer et al. 2018).

This finding could be observed in the case of Brebek, where local landowners initiated the idea to build a wind farm because they had seen the benefits in other parts of the region. The citizens were accustomed to wind energy, knew about its benefits, and thus accepted the farm.

The political setting is also fundamental with respect to offshore wind parks. As discussed before, one of the crucial reasons why there are only few parks close to shore in Germany are the less concise and clear rules on state level. On federal level however, marine spatial planning from the government's side that takes all stakeholders and environmental concerns into account can significantly facilitate project development later on by avoiding public conflicts between stakeholders and project developers and thereby supporting acceptance.

3.3.3.2 Nature conservation

Nature conservation takes a special role in both the spatial planning of wind parks and in the approval process at a specific site. This is guaranteed by laws at European level as well as at federal and state level (BWE 2019b). If the project comprises between three and five wind turbines, a site-related preliminary examination must also be carried out. In the case of wind farms with between six and 19 turbines, a general preliminary examination must be carried out. For projects with 20 or more turbines an environmental impact assessment must be conducted. The results must be made available to the public and stakeholders must be consulted. **Environmental assessments** are a means to contribute to the acceptance of a project through transparency and public participation in the decision-making process.

According to the impact regulation of German nature conservation law, wind farm project developers are obliged to avoid impairments of nature and the environment as far as possible (BWE 2019b). If avoidance is not possible, measures must be taken to adequately compensate for the impact with compensatory or replacement measures. The difference is that compensation measures must be implemented in the same way (e.g. grassland for grassland) and at the site of the intervention itself. Replacement measures, on the other hand, are equivalent (e.g. orchard meadow for grassland) and must be implemented in the affected natural area (in the immediate vicinity).

Nature conservation groups can be a powerful stakeholder with large effect on community acceptance. There are many cases in Germany, where nature conservation groups ended project developments with lawsuits due to concerns for nature conservation (NABU 2020b). Citizens' initiatives are also a powerful obstacle. A survey based study found that by far the most wind turbines are sued by environmental/nature protection associations (Fachagentur Windenergie an Land 2019a). For 61% of the turbines covered, such an association is one of the plaintiffs. The second most frequent plaintiffs (15%) are private individuals, organized in citizens' initiatives.

In the cases of Bremerhaven and Cuxhaven, the role of nature conservation groups could be observed very well. In Bremerhaven, a lawsuit by a nature conservation group ultimately brought the project to a standstill. While other factors certainly also played a role, the size of compensation areas for the new construction was important. The publicly financed project did not have the budget to acquire more compensation areas than legally required. The project in Cuxhaven on the other hand, especially in the persona of the local mayor, made generosity about compensation areas a priority. He wanted to make sure that conservation groups accepted the project, which they did. Cuxhaven had been strategically purchasing compensation areas for projects in advance. This saved a lot of time in the planning phase.

For the two offshore wind parks in this study, environmental conservation was also of crucial importance. Experiences from these cases show that early and open dialogue with environmental NGOs and environmentally concerned residents is crucial, as this allows project developers to take potential concerns into account early on, thereby avoiding larger conflicts and associated broader acceptance issues. Furthermore, the relevance of distance to shore as well as spatial planning in advance, both of which were already mentioned, has to be stressed once again, as they also help to reduce environment-related acceptance issues.

3.3.3.3 Project developer

In his study, Wolsink (2013) describes that conflicts of interest at local level often arise because wind power is polarized as either a public interest or a private interest of the project developer of the wind farm. Citizens are much more likely to support wind energy development if the project developer emerges from within the community (Wolsink 2013). Such a **local project developer** can be crucial in building a support network of local actors around a project. On the contrary, if a project developer does not emerge from within the community, wind farm developments may create a feeling of unfairness among community members (Wolsink 2013). In such an instance, a project developer may be understood as an outsider who is only interested in the profit, not in the region's development (Jobert et al. 2007). Also, the project developer can be perceived as being imposed on the community making participation and acceptance more difficult (Wolsink 2013).

The case studies in this paper have generally supported this understanding of the general literature. Especially in the case of Brebek, the locally known project developer and its staff were key to earning trust and support for their project. A similar success was possible in Dardesheim, where the mayor and project developer of the wind park Druiberg were the same person. Citizens thus had a competent and available contact person to address their questions and concerns to. In cases where the project developer comes from outside the community, communication and building trust with the local citizens is important. A third party expert or a local consultant who helps answering questions and addressing concerns of the community can support this. For instance, in the case of Ahaus-Legden-Heek, while the project developer itself was not an outsider, the local rural citizen's wind consultant was key to finding equitable solutions for all stakeholders involved.

A similar effect could be observed for the Baltic 1 wind farm, where several communal public utilities (Stadtwerke) were involved. Even though they were not from the region where the park was built, they might have changed opinions about the project as they created an impression of a bottom-up energy transition project. One of the interviewed industry experts furthermore stressed that a diversity of actors is crucial for acceptance. Even though multinational corporations might be needed for their expertise, a higher diversity of actors involved in the planning, including smaller local or regional actors and investors, could also increase acceptance.

3.3.3.4 Tourism

Acceptance of wind farms is generally higher, if no adverse economic effects for the community can be expected. Tourism is often considered as an industry that does not go well hand-in-hand with wind energy development. Wolsink (2013) finds that "community acceptance is adversely affected by the perceptions that clients, the tourists, would not like turbines". Wind turbines would alter the landscape in the area, thereby potentially making it less attractive for tourists. Noteworthy is that it is not always clear whether the tourists really do not like the turbines or if that is a primarily untested fear of actors in the tourist sector. Affected stakeholders, such as hotel owners, are especially reluctant to new wind energy developments, fearing their economic viability.

Studies on the effect of wind energy on tourism in the Czech Republic and Scotland have shown ambiguous results, determined by the type of landscape and tourism (Frantál and Kunc 2011; Riddington et al. 2010). Equally from Scotland, a study has shown that in some cases, wind turbines may add to the touristic value of a community (Warren and McFadyen 2010).

A great positive example from Germany is the municipality of Mörsdorf (BWE 2018). The municipality was able to use the income from its eleven wind turbines on site to build the longest suspension rope bridge in Germany, the '*Geierlay*'. It attracts large numbers of visitors to the region and has become a nationally known figurehead.

A special case is **offshore wind energy** development. A study from 2014 on the acceptance of offshore wind energy development at the German North Sea and Baltic Sea coast found high community acceptance among locals and tourists alike (Hübner and Pohl 2014). However, acceptance is higher if the plants are erected far from the coast and the safety of shipping was paramount to the individuals surveyed. It is worth noting that tourists rated offshore wind parks more positively, on average, than local residents - including on the Darß peninsula, where the Baltic 1 wind park has been visible from the shore since 2011. Tourists also rated the advantages of offshore wind parks more positively on the whole. With two exceptions: Tourists were more critical of the impact on the marine environment and the safety of shipping. If there are however some concerns, for example regarding the view, good information and detailed renderings of the actual impact of the turbines might help to foster acceptance as shown in the two offshore wind project cases in this study.

Tourism was mentioned in several of the case studies, especially in relation to offshore wind energy development. In Cuxhaven, the local actors communicated early and transparently about the developments and were able to marry tourism and industry at the same time. In Helgoland, the arrival of the offshore industry to the island sparked new investments in the tourist sector, reviving the sector. Tourists take great interest in the wind parks and book boat trips to visit the offshore wind parks. Similarly, in Dardesheim, visits by renewable energy professionals created a tourist industry in an area, which was previously characterized by agriculture.

4 Policy Suggestions for Benchmarking Strategy

The Korean government under Jae-in Moon has initiated a change of the country's energy policy towards higher shares of renewable energies in 2017. The government aims for an increase of renewable energy in electricity generation from about 7.6% in 2017 to 20% by 2030 (MOTIE 2018). That includes adding 16.5 GW of new wind energy capacity. In 2030, the Korean government targets to have 17.7 GW of installed wind energy capacity, making up 28% of total installed renewable energy capacity. In its Renewable Energy 3020 Implementation Plan, the government also announced that of the newly added wind capacity **until 2030 12 GW are planned to be offshore wind energy** (offshoreWIND 2020), while onshore wind energy additions are expected to total at 4.5 GW between 2018 and 2030. According to the 3rd Energy Master Plan the share of renewables should be further increased up to 35% until 2040 (Pulse news 2019; Linklaters 2019).

The Korean president sees **strategic importance in the offshore wind energy** development. At an engagement in July 2020, he was reported to have said "The government's goal is clear and is to become one of the world's top five offshore wind energy powerhouses by 2030, taking advantage of our geographical advantage of being surrounded by water on three sides" (offshoreWIND 2020).

While starting from a lower initial point, Korea's renewable energy expansion plans until 2030 are ambitious. One crucial difference between Germany and Korea is the much larger emphasis on offshore wind energy compared to onshore wind in Korea, due to the geographical characteristics of the country. In contrast to Germany at the beginning of its energy transition, Korea's onshore space has been very limited from the outset by the mountainous and forested landscape and a very high population density. According to an offshore wind energy producer, the industry sees potential for up to 30 GW of offshore wind energy in Korea (IEEFA 2019), which is larger but comparable to the current German target for offshore wind of 20 GW by 2030. Thus, despite the different starting points, the technical potential and the level of ambition between the countries for offshore wind are comparable.

4.1 Challenges in adopting German experiences for South Korea

Many factors need to work together in order to achieve the above mentioned expansion goals for renewable energy and wind energy specifically. Community acceptance of wind energy developments is certainly critical. In many regards, the **community acceptance issues** faced in Korea and Germany are **similar**. Individual projects can be strongly opposed due to the visibility of wind turbines, environmental degradation of landscapes, health concerns such as noise impairment and siting issues affecting other industries such as fishery or tourism (Narita and Cames 2019). Like Germany, uses of the maritime space are in competition in Korea. In Korea, there is concern on the side of the military, that offshore wind parks may impede the effectiveness of radar bases by jamming signals. Additionally, in Korea, traditional spiritual beliefs and lacking trust in local governments can also lead to acceptance issues (Narita and Cames 2019).

In Germany and Korea alike, the model of energy cooperatives is widespread as a means to increase acceptance through financial participation. In 2012, in Korea, after the Cooperative Act paved the way for their establishment, the first energy cooperative was established in Seoul in 2013 and today, more than 100 registered energy cooperatives exist, many of them founded by NGOs and environmental groups (Narita and Cames 2019). In comparison, at the end of 2018, there were 869 energy cooperatives organized under the roof of the German Cooperative and Raiffeisen Confederation.

Contrasting issues can be found as well. In Germany, offshore wind energy expansion is generally more accepted, while onshore wind energy expansion (as well as the needed grid expansion) are often strongly opposed at a community level. As explained above, in Korea there is a much larger emphasis on offshore wind energy, thus there is a stronger focus on conflicts arising here. Crucially, many conflicts arise when wind farms compete with the economic viability of the fishing industry. As discussions with industry experts and the fishing association in Germany show, this issue is however, not unsolvable. Even though fishing within the parks might be associated with high risk, financial compensation, the hiring of fishing vessels as guards for the wind parks or allowing fishers to fish within the safety zone of the parks, where higher yields could be expected due to the role of the parks as fish refuges might be viable options to foster acceptance. The German experience furthermore shows that spatial planning in advance and an open dialogue with fishers and other stakeholders could solve some of the potential conflicts and that fishing is not significantly affected during the first stages of offshore wind park development.

In Germany, wide-ranging community acceptance issues with the (onshore) wind energy development arose at a much later point in the energy transition, when Germany already had well above 30% renewable energy share and space for the construction of new wind parks became scarcer. While the general acceptance of the energy transition is still very high, the notion of 'Not in my backyard' seems to have increased with the numbers of turbines, while local opposition grew more organized and misinformation more widespread over the years. In Korea, acceptance issues are already prevalent today, with a share of renewable energy below 10% of renewable energy. According to Narita and Cames (2019), one possible explanation lies in the mountainous relief and very high population density. Due to these factors, the lack of space for renewable energy projects is more pronounced in Korea, thus citizens experience the energy transition more closely.

One major difference in Germany, compared to other European countries, is that local authorities have to accept wind turbines on their territory (Jobert et al. 2007). Before 1997, German wind park developers often had to cope with arbitrary decisions and excessive demands from authorities. A change in Germany's Federal Building Law gave wind turbines a privileged status. According to the revised law, local communities could define zones for wind energy parks, concentrating them on one appropriate site, but could not refuse them totally (Jobert et al. 2007). With the privileged status, developers can get a 'foot in the door' in promising localities, while municipalities can regulate the expansion of wind energy in their regions by concentrating it in appropriate places. This has reduced fear of uncontrolled growth and increased community acceptance of wind parks.

Increasing public acceptance and participation is part of the **renewable energy strategy** of the Korean government. It aims to ensure the inclusion of local citizens in the project development from assessing the initial project acceptance after site selection, deliberating the district development, to financial participation of local stakeholders through prioritisation of community and co-op business models. The government wants to add 48.7 GW of new renewable energy capacity by 2030. Of that, 19.9 GW are intended for projects with citizen participation, such as small-scale projects and agricultural PV. The government wants to incentivize small-scale PV for farmers, fishers and cooperatives by offering a 20-year fixed feed-in tariff (MOTIE 2018).

As explained in 2.1, the German government also had a work plan with measures to increase community acceptance. One element was the minimum distance of wind turbines from residential areas. Given the geographic characteristic of Korea, an adoption of the approach (which has yet to prove its effectiveness) cannot be recommended.

4.2 Policy suggestions for improving local acceptance of onshore and offshore wind farms in South Korea

Policy suggestions and recommendations for improving local acceptance of onshore and offshore wind farms in Korea are listed below. However, it should be noted, that there is no one-size-fits-all approach for a successful project, in each instance, the local conditions should be respected. In addition, not every recommendation may be sensible for every project. This list should rather be considered a starting point from which the local stakeholders can design the project that best works for them.

4.2.1 Recommendation 1: Involve citizens and stakeholders as early, inclusively and transparently as possible

While this recommendation is certainly not innovative, it yet holds great importance: citizens should be involved as early, inclusively and transparently as possible. Local communities can already be informed in the run-up to planning and approval procedures. That way, the project developer can enter into dialogue with the public while the land is still being secured. Dialogue procedures should integrate as many relevant interest groups and persons as possible. The public must be informed about processes and contents. In this way, the scope and limits of the participation procedure can be clarified, interests can be disclosed and excessive expectations can be prevented. There must be room for manoeuvre - only in this way those involved can make a difference at all.

Relevant information must be comprehensibly disclosed, disseminated, explained and continuously documented. Information should address concerns of the community, for example with regard to the impact of wind farms on the landscape, scientific evidence on health risks associated with renewable energy plants or bird mortality through wind turbines. As observed in the case studies, there are many ways to do so – through a website, the local newspaper, one-on-one meetings, town hall meetings, excursions, information letters and more. It is important that plans are communicated in a way that is generally understandable, thereby ensuring that everyone who wants to inform themselves can do so. It has however to be kept in mind that getting the information to local citizens is the responsibility of the government or developer, as it cannot be assumed that every citizen will inform themselves. Not being proactive about providing information can make citizens more vulnerable to misinformation, making it significantly more difficult to convince them otherwise.

State initiatives (which is equivalent to initiatives on the provincial level in Korea) can support the public participation efforts of project planners and municipalities and can increase trust in the process and ultimately acceptance (see Chapter 2.3.2).

4.2.2 Recommendation 2: Communicate the financial benefits for the community and local value creation

In many of the cases studied, the financial benefits took first place in the reasoning for a wind park. For most municipalities, wind energy was the best option to generate income for the municipality. Municipalities that were previously net beneficiaries of the fiscal equalization of their respective Federal State were now able to invest into their community. Especially in the case of offshore wind parks, where local communities might benefit less, it should be ensured that at least a part of the value creation happens locally. The creation of local high-quality jobs should not only be especially fostered by developers, but also openly communicated.

In order to increase acceptance, the tax revenue from the wind park should not become part of the general municipal budget, but should be earmarked for investments that are well visible for the citizens. For instance, acceptance is much higher, when citizens receive the information that the wind park's taxes paid for the renovation of the local Kindergarten or gym. Communication on the use of the tax revenue and the selection of investments are key to achieving acceptance.

4.2.3 Recommendation 3: Enable active financial participation

The cases as well as the literature review have shown the relevance of active financial participation for community acceptance. Active financial participation can take many forms; the most prevalent is the energy cooperative.

Both Korea and Germany allow energy cooperatives to own and operate a wind park. The literature review and case studies have shown the positive effects of this form of direct financial participation on community acceptance. When people are in an energy cooperative, they concentrate less on the visual impairment of the wind park on their community, but are more likely to celebrate the turn of the rotor blades, because they profit financially of the project. This might however not be a viable option for offshore wind parks, even though financial compensation might be an option for some stakeholders, e.g. fishers.

4.2.4 Recommendation 4: Respect the need for distributional justice

Wind farms can create winners and losers in a local community. Winners can be the landowners benefitting from lease payments, while losers can be all other citizens who live in vicinity of the wind park. The project should include elements that create distributional justice. The case studies have shown examples such as the three-zone lease model in Ahaus of how benefits can be pooled and redistributed so that more citizens benefit.

4.2.5 Recommendation 5: Encourage local project developers

One element, which according to the case studies was valued highly, is the origin of the project developer. In every examined case, where the project developer was a local actor, the interviewees and the literature research confirmed a positive effect on community acceptance. People feel like the project developer, being local, will have the community's best interest at heart and would work to achieve the best possible outcome for all. When the project developer is an outsider, citizens may be more sceptical and assume that the project developer is just working for its own profit, not for the benefit of all. If local project developers are not an option, having a wide range of investors, including local or regional actors might be a way to create a similar effect.

4.2.6 Recommendation 6: Engage local politicians as advocates

It became very clear in some case studies that local politicians, who are well respected in their community, can have great leverage over the community acceptance of a wind farm. Wind farms need local advocates who understand the local conditions, who know about the concerns of the community, who have the ear of many and who can serve as a contact person. When the project developer, the local mayor and the administration work in unison for the benefit of the community, citizens profit. This also relates to the communication of a local wind farm as part of a local effort to boost the energy transition and combat climate change.

Interestingly, the case studies showed that the decision of a mayor to support wind energy did not primarily depend on the party affiliation. The engaged mayors in the presented cases were either independent or had affiliations with a range of parties, including both the conservative Christian Democrats (CDU) and the Social Democrats (SPD).

4.2.7 Recommendation 7: Make political targets credible and long-term

Investors value the credibility of political targets. Knowing that a certain technology will be supported at a certain level for a pre-defined period can make investments more attractive. Especially in the context of offshore wind energy, where project development can take around ten years, a credible long-term target is important. In addition, the debate on the regulatory setting at the political level can influence the development of projects. The discussions in Germany on the minimum distance rule have caused a backlog in project development and local opposition to projects intensified due to the political debates.

Energy cooperatives as a form of active financial participation can also be encouraged with a fitting regulatory framework. In Germany, the 2017 EEG reform to competitive auctions had implications on the business case of energy cooperatives. While the reform introduced restrictions, it also guarantees that the successful bids of cooperatives receive the uniform price, i.e. the highest value still awarded in the respective bidding round. At the European level, the RED II Directive included provisions on Renewable Energy Communities. Member states have to promote and facilitate the development of RECs.

Furthermore, clear and openly communicated political targets can also foster acceptance by the general population. If the government commits to the energy transition and specific goals and communicates this commitment as a joint societal pathway that is being taken collectively to reach a common goal, in this case the modernization of the economy and the protection of the climate, there is likely to be less opposition against individual projects. The German case of a high acceptance of the energy transition show that if people are aware of the challenges and risks associated with climate change, they are also likely to support the government in such an endeavour. It also makes opposition of local politicians less likely.

4.2.8 Recommendation 8: Plan thoroughly

The literature review showed that many wind projects are challenged in courts over errors in the planning and permitting process. Such errors reduce confidence of the community in the wind park developer. Without confidence, community acceptance cannot be achieved easily. Instead, project developers should plan inclusively with all stakeholders and consider all rules and regulations accurately.

In the case of offshore wind development, spatial planning by the government with the inclusion of all major stakeholders can critically simplify project development later on. In this context, the government is also in a better position than individual developers are, as the government benefits from scale effects, can do spatial planning and stakeholder engagement for a large area and have furthermore a better connection to some stakeholders, e.g. the military. The government is also able to mediate potential conflicts better, especially if it clearly communicates a will to expand wind power, thereby making it clear to stakeholders that consultation processes are about finding solutions that work for everyone, and not a way to halt wind park development. This also extends to necessary onshore infrastructure. The German experience shows that if developers are themselves responsible for grid connection on-shore and act in an un-coordinated manner, with different companies trying to buy land from local residents, this can create substantial local opposition. If the government however does this task, or coordinates the actions of individual developers, including e.g. mandated underground cables in some sections, there is likely to be less opposition.

4.2.9 Recommendation 9: Honour concerns about environmental impacts

For many citizens, wind farms create concerns with regard to nature conservation and wildlife protection. In many cases in the literature review and in some of the cases in this study, nature conservation associations have been key to the success or failure of a project. The analysis has shown that concerns regarding environmental impacts, both by private individuals and associations, should be taken seriously. Project developers should share all information on the environmental impact of the wind farm on the area and enter in an open discussion with relevant associations early on in order to allow for changes before the project is actually implemented. Furthermore, they should consider acquiring more compensation areas than legally necessary, as a means to guarantee support from nature conservation groups, ultimately leading to higher community acceptance. Such compensation projects could also be communicated openly, supporting a positive perception of both the company involved and the project itself.

4.2.10 Recommendation 10: Build offshore wind parks in a distance to the shore

Even though this was more an indirect consequence of existing laws and regulations in Germany, implementing most wind parks further offshore had a range of benefits. It fostered acceptance by local residents and tourism, as they were not concerned about having their view blocked by the farms, and greatly reduced environmental concerns by removing potentially protected or valuable coastal areas from consideration. It also implied fewer impacts on shipping and local fishers, supporting acceptance even further.

4.2.11 Recommendation 11: Fight misinformation through general information campaigns and public discourse

As stated in the beginning of this report, there are several stakeholders, which are set to benefit from misinformation being circled around. If this happens, it can make local resistance to projects very hard to overcome. Research has shown that even the acceptance measures discussed in this report might not be helpful in increasing acceptance by a person who is already strongly engaged against wind energy. Even if such a discourse might not be very prevalent on national level, it might also still play a crucial role in a local context.

In order to address this issue, public information campaigns, both about the energy transition and its benefits, such as protection of the climate or reduction of pollution, as well as about climate change in general could be an option. Furthermore, it can be helpful to attempt to understand whether concerns and conflicts on a local level are productive. If actors try to reach an agreement through measures like additional compensation, design modifications, slight relocations and the like, concerns should be honoured and discussed to increase acceptance. In case conflicts are not productive and presented arguments mostly relate to why wind parks should not be built at all, a clear communication by the government that the energy transition itself is not negotiable as well as one-on-one discussions with relevant stakeholders could be an option. In such a setting, it might be easier to convince stakeholders and have a fact-based discussion.

4.2.12 Recommendation 12: Emphasize the importance of wind energy for climate protection

Across many countries, measures to protect the climate, achieve high acceptance and support. There is a chance that in the context of a local wind energy project, this broader acceptance is forgotten. Thus, the importance of every single wind farm for the achievement of the Paris Agreement and national climate protection goals should be emphasized and communicated regularly. Where needed, general information on climate change and the role of renewable energy should also be communicated. This works especially well if the government's commitment to an energy transition and climate protection is communicated openly and as a joint societal endeavour.

4.3 Cooperation plan or agenda between Germany and South Korea

In December 2019, the (South) Korean - German energy partnership was established. Within the bilateral partnership, one working group focuses on energy transition issues. Given the relevance of community acceptance for the achievement of energy transition targets, the topic could be integrated into the working group discussions. As the analysis has shown, there are many issues where Korea and Germany face similar challenges and can benefit from an intensified exchange. However, during the discussions, national and local contexts need to be considered and respected. Within the Korean-German energy partnership, the following options for cooperation could be considered:

- **Increase public participation:** Within the energy partnership, there could be discussions on lessons-learned to increase public participation in wind energy projects. The discussions could be both on informal and formal public participation (information sharing etc.). An even more intensified exchange could be created through meetings in Korea with German experts and vice versa. The exchange could also include study trips to successful wind projects in Germany.
- **Encourage financial participation:** Given the active use of energy cooperatives in both countries, Korea and Germany could exchange on best practices for active financial participation. Experts from each country could present the positive implications of financial participation to interested local representatives. A second step could be study trips to successful examples of financial participation, to learn first-hand about the best practices that could be derived.

- **Joint showcases:** The energy partnership could establish joint showcase projects to increase public awareness and acceptance in communities in Korea, for instance through school projects on climate change and energy transition. German experts could also help in establishing energy-mentoring programs or training climate ambassadors in civic organizations.
- **Information sharing**: Germany and Korea could exchange experiences on communication measures and best practices for increasing information transparency on the national and regional level. The German experience could be valuable for instance with regard to increasing awareness about the role of renewable energy in climate protection, or for implementing information and dialogue platforms in Korea such as regional dialogue offices or online information portals. Such an exchange could be made in cooperation with the Korea Energy Information Culture Agency, to support their mission to help the public better understand about energy issues by distributing objective and scientific energy information.
- **Energy transition journalism**: Germany and Korea could work to improve communication on the energy transition in Korea as measure against fake news. This could be achieved by creating opportunities for Korean journalists to learn from the energy transition in Germany, e.g. by organizing study trips to Germany, and by publishing interviews and articles from German energy experts in the Korean media.

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Annex

Annex 1: List of interviewees

Name of section or location of wind park	Name	Function/Title	Institution
Ahaus-Heek-Legden	Heinz Thier	Managing Director	BBWind
Arzfeld	Kristof Frank & Lena Fritsche	Project Manager & Media Relations Manager	ABO Wind
Arzfeld	Andreas Kruppert	Mayor	Municipality of Arzfeld
Baltic 1	Tobias Borde	Project Leader Wind Energy	EnBW Erneuerbare Energien GmbH
Brebek	Reinhard Christiansen	Managing Director	Bürgerwindpark Brebek GmbH & Co. KG
Bremerhaven	Ulrich Kraus	Manager Approval Planning	bremenports GmbH & Co. KG
Cuxhaven	Marc Itgen	Agency Director City of Cuxhaven	Cuxhaven Agency for Economic Development
Dardesheim	Ralf Voigt	Mayor / Project Manager	Municipality of Dardesheim / Energiepark Druiberg GmbH
Offshore	Jens Meyer-Holtz		RWE Renewables GmbH
Offshore	Gunnar Herzig	Managing Director	World Forum Offshore Wind e.V.
Offshore	Peter Breckling	General Secretary	Deutscher Fischerei Verband e.V.
Offshore	Prof. Dr. Martin Skiba	Chairman	World Forum Offshore Wind e.V.
Riffgat	Irina Lucke	Technical CEO	EWE Offshore Service & Solutions GmbH

Annex 2: Questionnaire

1. Local situation

1.1. What was the economic situation in the project area at the beginning of the project? *(e.g. rural farms, industrial area, local recreation area, etc.)*

Open answers

1.2. What were the main concerns of the population or other groups before or during the project? *(e.g. competition for land with agriculture, restrictions on tourism, shadowcasting, etc.)*

Open answers

1.3. Were there conflict situations with (local) nature conservation associations or other organizations?

Open answers

1.3.1. What measures were taken to settle the conflict?

Open answers

1.3.2. How could these conflicts finally be overcome?

Open answers

1.4. Was/Is there any resistance/concerns regarding the health effects of wind turbines on humans?

Open answers

1.4.1. What measures were taken to settle the conflict?

Open answers

1.4.2. How could these conflicts finally be overcome?

Open answers

2. Public participation

2.1. Which actors are/were involved in the planning and implementation process?

Open answers

1.1.1. Were the following (further) actors involved?

- Nature conservation associations
- Citizens of the surrounding villages
- Climate protection/energy use manager of the municipality

2.2. Was there a kind of "driving force" - a person or organization that was particularly driving the process? *(e.g. motivated mayor, nature conservation association, etc.)*

Open answers

2.3. Which forms of participation/communication were used and how did the participation process develop? *(e.g. community meetings, round tables with representatives, information events, inspections, etc.)*

Open answers

2.4. To what extent were local citizens involved in the planning and development process beyond the legally required participation? *(e.g. community assemblies, round tables with representatives, information events, inspections, etc.)*

Open answers

2.5. How was the offer of participation taken up by the citizens?

Open answers

3. Financial participation

3.1. How was the project financed?

Open answers

3.2. How were citizens involved in the financing process?

Open answers

3.3. Was/Is a participation through shares planned and carried out?

Open answers

3.4. How are the profits distributed?

Open answers

3.5. To whom do trade and sales taxes go?

Open answers

3.6. Was a green electricity tariff introduced? If so, how was it designed?

Open answers

3.7. Is there a financial participation possibility for other municipalities in the area?

Open answers

4. Local value creation

4.1. How does the project create local value?

Open answers

4.2. Do revenues from the project benefit social/local organizations?

Open answers

4.3. What measures are taken to protect the environment?

Open answers

4.4. What impact did the project have on tourism in the region?

Open answers

5. Offshore wind energy

5.1. What form does local cooperation with the fishing industry and fishing associations take?

Open answers

5.2. What form does local cooperation with nature conservation associations take?

Open answers

6. Final questions

6.1. Is there a specific innovative approach to this project?

Open answers

6.2. Which lessons learned do you take from this project?

Open answers

6.3. Were there any federal or state initiatives/laws that were of particular importance here? Can best practices be derived from them? *(e.g. EnergieDialog.NRW, "Fair Wind Energy Thuringia" seal)*

Open answers

6.4. Are there sources/documents that could help us in our research?