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STUDY

Promoting acceptance of wind and solar energy in Korea

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List of abbreviations

AEE	Agentur für Erneuerbare Energien/ Agency for Renewable Energies
EEG	Erneuerbare Energien Gesetz / Renewable Energy Sources Act
FIT	Feed-In Tariff
GHG	Greenhouse Gas
KEA	Korean Energy Agency
KEIA	Korea Energy Information & Culture Agency
KEPCO	Korea Electric Power Corporation
KOWP	Korea Offshore Wind Power
KPX	Korea Power Exchange
MSP	Maritime Spatial Planning
OECD	Organisation for Economic Co-operation and Development
RPS	Renewable Portfolio Standards
SNS	Social Network Service
UBA	Umweltbundesamt/ German Environment Agency
WTP	Willingness to Pay

Introduction

The Korean government under Jae-in Moon, who has been president of South Korea since May 2017, has initiated a change of the country's energy policy by placing an emphasis on increasing renewable energies while reducing nuclear power and coal. The government aims for an increase of renewable energy in electricity generation from about 5% in 2016 to 20% by 2030, while reducing the share of nuclear energy from 30% to 18% and the share of coal power from 40% to 24% (the so-called 3020-goals). According to the 3rd Energy Master Plan the share of renewables should be further increased to 35% until 2040 (Lim and Kim 2019).

The Korean Energy Agency (KEA) summarized the following challenges for a successful energy transition in Korea: First, resistance from both the nuclear industry and academia against expanding of renewables power generation and decreasing the role of nuclear power is very strong. They insist that nuclear energy is the better and cheaper solution for reducing greenhouse gas (GHG) emissions and criticize plans for increasing renewable energy, and have managed to cast a shadow of doubt among the general public through influential media and social network services (SNS). Other challenges for achieving the 3020 target for renewables include delays in connecting renewables to the grid (with over 5GW of PV not yet connected) and a lack of public acceptance. The latter is partly a consequence of limited willingness to pay (WTP) for renewables, as well as of concerns over potential degradation of the natural environment (Lee 2019).

This study summarizes existing acceptance problems regarding wind and solar energy in Korea, compares Korea's situation to that in Germany, and seeks possible solutions for increasing acceptance and citizen participation in Korea based on experience and best practices from Germany. The study does not make any claim to completeness but rather serves to give initial orientation regarding the existing challenges and possible solutions.

1 Status of public acceptance for renewables in Korea and Germany

The literature often divides public (or social, as the terms are generally used interchangeably) acceptance into three different types which differ with regard to their respective acceptance objects and subjects: Socio-political acceptance, market acceptance and community acceptance (compared in Table 1). This chapter provides an overview of the public acceptance for renewables and related acceptance problems in Germany and in Korea according to these three acceptance types.

Table 1: Acceptance types, objects and subjects

Acceptance type	Acceptance object	Acceptance subject
Socio-political acceptance	Renewable energy, renewable energy technologies, associated policy	General public, central stakeholders, policymakers
Market acceptance	Renewable energy plants, services associated with these products; renewable electricity	Investors, companies, electricity consumers, financing institutions, house owners
Community acceptance	Specific renewable energy project at local level, grid construction	Local stakeholders, local population, local policy makers, nature conservationists

Source: Adapted from Wunderlich (2012) and WinWind (2018a); based on definition of public acceptance first introduced by Wüstenhagen (2007)

1.1 Socio-political acceptance

The socio-political acceptance can be summarised as the, “Acceptance of both technologies and policies at the most general level. This general level is not limited to the general public, but includes acceptance by key stakeholders and policymakers,” (WinWind 2018a).

1.1.1 Germany

Socio-political acceptance for the energy transition and renewables in Germany is high. The 2018 study on environmental consciousness by the German Environment Agency (Umweltbundesamt - UBA) published in May 2019 shows that 92% of survey respondents are in favour of the further expansion of renewable energies (Umweltbundesamt 2019a). Another acceptance survey, which was conducted by the Agency for Renewable Energies (Agentur für Erneuerbare Energien - AEE) and gained 1021 respondents in October 2018, shows similar results with 93% of respondents supporting stronger expansion of renewable energies. The

respondents' preferences indicated that the most important advantages of renewable energies are their contribution to climate protection (81%) and intra-generational fairness (79%). At the same time, Germany's independence from energy imports from abroad (68%) and the opportunity to strengthen Germany's economy (59%) are seen as clear advantages of renewable energies. 61% of respondents believe that the German government should do even more to ensure a clean and climate-friendly electricity supply. Even more respondents hold this view with regard to the transport sector (73%) (Agentur für Erneuerbare Energien 2018).

A 2018 survey conducted by forsa on behalf of FA Wind on the acceptance of onshore wind also showed high public support (80%); this corresponds with the results of past annual survey results. However, more than half of the respondents do not feel well-informed with regard to onshore wind energy (Bönisch 2018).

Despite the generally high socio-political acceptance for renewable energies, controversial discussions revolving around the costs of the energy transition, security of renewables-based electricity supply and nature conservation have been a constant in Germany. People are in favour of the Renewable Energy Sources Act (Erneuerbare Energien Gesetz, EEG) in general; however, the distribution of costs is often perceived as unfair (Wunderlich 2012). A 2018 UBA survey found that 76% of respondents perceived the distribution of the costs of the energy transition as too unequal (Umweltbundesamt 2018a).

1.1.2 Korea

Although public acceptance of renewable energies in Korea has increased significantly since the 2011 Fukushima nuclear disaster, it is still lower than in many other industrialized countries. In a study on the acceptance of renewables in Korea conducted by Lee and Heo (2016), 20% of the participants had not yet heard of renewable energies. Participants with knowledge about renewable energy generally showed a higher acceptance for them. In addition, the governmental decision on phasing out nuclear power and concentrating on renewables has raised strong resistance from opposition parties and the nuclear power industry (Shin 2019). Misinformation and even fake news with regard to energy transition and renewables, spread by different parties from the nuclear lobby, are a major problem in Korea, as they have been effective in raising concerns of the public regarding the energy transition. For instance, many people believe that variability of renewable energy sources will destabilise the power system. In general, there is also lack of awareness of energy transition's role in climate and environmental protection or of the harm and risks associated with conventional energy sources.[1]

Despite these fears, many of the recent surveys show that there is a socio-political acceptance for the energy transition in a general sense, and that the approval rates for renewable energy are not much lower than those in Germany. According to a survey published in May 2019 by the Korea Energy Information & Culture Agency (KEIA), 84.2% of respondents agree with the need for an energy transition policy to increase the share of renewable energies and phase out nuclear energy. The approval was higher among younger age groups than among older ones. A total of 3,880 Koreans were surveyed, around ¾ of them living within a 10 kilometre radius of both conventional and renewable power plants (Yonhap News 2019). Confirming these results, a survey conducted in June 2018 by the Hyundai Research Institute showed similar acceptance figures with 84.6% of respondents supporting the Korean government's energy transition policy. The majority of respondents would like to see a reduction in nuclear

[1] Results from the workshop on public acceptance during a research trip for Korean energy experts to Germany (11-14.12.2018).

and coal power generation (67.2% and 75.9%, respectively) and the expansion of natural gas and renewable energy generation (63.6% and 84.2%, respectively). The respondents point out the high external costs in particular for nuclear energy, the disposal of nuclear waste, particulate matter pollution and greenhouse gas emissions (E-news Today 2018). In a survey conducted by the Korea Photovoltaic Industry Association with 1000 participants in December 2018, the majority of the respondents were of the opinion that renewable energy generation by PV systems (67.9%), bioenergy (66.6%) and wind power (61.1%) should be increased, whereas only 38.5% supported LNG, 25% nuclear power and 4.9% coal (The Today Energy 2018).

Chung and Kim (2018) conducted a survey of a nationally representative sample with 1100 participants (14 years old and older) in April 2017. The results showed that the Korean public was clearly in favour of renewable electricity generation with solar and wind power receiving 4.51 and 4.40 points on a 1-5 scale with 5 meaning “very favourable”. In comparison, the preference for nuclear power (2.71), oil (2.68) and coal (2.48) were lower. The strong rejection for fossil fuels is related to the high concerns regarding fine dust pollution. The respondents further predicted solar power to be the most used energy source in 30 years in Korea (67.6%) but also selected nuclear power as an important energy source of the future (53%). While the Korean public currently does not prefer nuclear power as energy source, people have high expectations for advanced nuclear energy technology. The study further found that the respondents’ position towards nuclear power strongly depends on their political views and environmental consciousness, but not much on technical knowledge (the study revealed that a large part of Korean public believes that nuclear power contributes to climate change). The results show that environmentally conscious and politically progressive Koreans prefer renewable energy sources.

In contrast to the results above, a survey conducted by the Korean Nuclear Society in August 2018 revealed that 71.6% of the 1000 participants were in favour of using nuclear energy in South Korea. Almost 38% of the respondents further supported an increase of nuclear power plants in the country, while only 29% preferred a reduction. Furthermore, about 50% said they were dissatisfied with the government's nuclear phase-out policy, while about 46% supported the policy (Yonhap 2018).

Another survey published by KEIA in 2019 shows there is a lack of public awareness regarding the government’s policy: the majority of respondents (60%) said they knew "little" (45%) or "nothing at all" (15%) about the government's energy transition policy. When asked about the negative effects of energy transition policy, the most selected responses were "rising energy prices" (33.6%) and an "unstable energy supply" (27.2%). The "decline in jobs in the energy industry" was more worrying for the population close to power plants than for the rest of the respondents. According to the respondents, the most important policy areas to be pursued were energy supply (38.5%), energy consumption and efficiency (21.9%) and public acceptance (17.3%) (Yonhap News 2019). Likewise, the survey conducted by Chung and Kim in 2018 shows that energy security (44.8%) was selected as the highest energy policy priority, followed by safety (31.2%), which became especially important after the Fukushima disaster, and environmental protection (30.4%). Low prices and energy independence ranked fourth and fifth at 29.7% and 29.5%, respectively. Only 13.2% selected climate change mitigation as one of their top two priorities for energy policy (Chung and Kim 2018).

1.2 Market acceptance

Market acceptance is defined as 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 2018a). It can be expressed as the purchase decision for or against green electricity or a wind or solar power plant (Wunderlich 2012).

1.2.1 Germany

In 2017 in Germany, the number of household customers consuming renewable electricity rose again and amounted to 10 million metering points (Bundesnetzagentur 2019a). According to a 2018 survey by the German Environment Agency (Umweltbundesamt – UBA), 20% of electricity consumers are consuming a 100% renewable electricity tariff. Another 25% have expressed a great interest in choosing a 100% renewable electricity tariff for their household, but have not yet changed their tariff. The main barriers for shifting consumption towards renewable electricity are price and lack of information. 64% of those not consuming renewable electricity indicate that they find it too expensive, 47% lack necessary information concerning renewable electricity products and about 30% are convinced that their electricity consumption does not contribute substantially to the overall energy transition. 20% agree with the statement that renewable electricity does not have any impact at all (Schudak and Wallbott 2018).

The deviation between the number of consumers wanting and actually consuming renewable electricity products reflects findings from environmental psychology which state that knowledge and attitudes do not necessarily lead to action or behaviour. The decision to purchase renewable electricity is not only influenced by the knowledge of climate change and the finiteness of fossil resources but also, for instance, by the price, the complexity of changing the supplier or the confidence in the security of supply (Wunderlich 2012).

According to a neuro-scientific study conducted by the Hochschule für Wirtschaft und Umwelt Nürtingen-Geislingen and The Neuromarketing Labs in 2015, consumers in Germany are willing to pay about 15% more for power from renewables than for power from conventional sources (Schmücker 2015). According to study results from 2012, the willingness to pay (WTP) of consumers increases especially if the supplier invests in new renewable energy plants (8.44 EUR cents more per kilowatt hour), if the supplier exclusively offers renewable electricity (3.60 EUR cents) and if the supplier is anchored regionally (3.41 EUR cents) (Wunderlich 2012).

According to a market analysis by the German Environment Agency (UBA) in 2017, the number of electricity suppliers offering at least one renewable electricity tariff increased from 541 in 2012 to 921 in 2017. This means that almost 80% of the 1.157 electricity suppliers in Germany had at least one renewable electricity product on offer in 2017 (Umweltbundesamt 2019b). In 2016, the market share of renewable electricity in total household electricity sales was 23.1% (Umweltbundesamt 2018b).

The overall high market acceptance for renewables in Germany is underlined by investment numbers: Investment in construction of renewable energy plants in Germany rose from 4.7 billion EUR in 2000, peaking in 2010 with investments amounting 27.9 billion EUR and levelled out at around 15.7 billion EUR in 2017 of which 46.3% were used to finance the construction of onshore wind energy plants, 21.4% for offshore wind energy plants and 10.8% for PV plants (Federal Ministry for Economic Affairs and Energy 2019). According to Bloomberg’s 2018 Global Clean Energy Investment Report, Germany ranks fifth behind China, the US, Japan

and India with clean energy investments amounting 10.5 billion USD (9.35 billion EUR). Those investments are defined as investments, “In renewable energy excluding large hydro-electric projects, but including equity-raising by companies in smart grid, digital energy, energy storage and electric vehicles,” (Bloomberg NEF 2019).

Although falling behind the overall pace, the “Big Four” conventional energy providers in Germany – namely RWE, E.On, EnBW and Vattenfall – have been expanding their planned investment and actual shares of renewable power generation as well. In 2016, their respective amounts and shares of renewable power generation in Germany accounted for 4.2 TWh or 3.1% (RWE), 1.4 TWh or 3.8% (E.On), 8.3 TWh or 23% (EnBW) and 2 TWh or 9.7% (Vattenfall) (Ameland and Bieler 2018).[2] Market acceptance of renewables also shows in the production of renewable energies by citizens. In 2016, 42% of installed renewable power capacity was owned by citizens (31.5% by private persons and 10.5% by farmers) (Wettengel 2018).

1.2.2 Korea

In contrast to Germany, market acceptance for renewables cannot be expressed in the percentage of consumers choosing a renewable electricity tariff in Korea. Due to the monopoly of the Korea Electric Power Corporation (KEPCO) in transmission, distribution and sales of electricity, consumers cannot choose between different electricity suppliers. They also do not have the option to choose a renewable electricity tariff and the electricity bills are not transparent regarding the different cost components or energy sources used for the supplied electricity.[3]

As shown in Chapter 1.1.2, an issue that leads to acceptance problems in Korea is the fear of rising electricity prices due to renewable energy expansion. Retail electricity prices in Korea are determined by the government and raising them in the past was met with strong criticism from industry and households. Retail prices for electricity, however, do not adequately reflect the costs of generating electricity and importing fossil fuels but have rather been kept artificially low (Chung 2014). In 2013, the Korean electricity price was half the OECD average (Kim and Mathews 2016), and since then, prices in Korea increased only slightly. Thus, Korea has one of the lowest electricity prices among developed countries. Korea’s electricity prices are effectively too low to encourage energy conservation and efficiency measures or to make a business case for private companies to enter the generation market (EIA 2017).

Lee and Heo (2016) estimated the WTP for replacing conventional energy sources with renewable energy in South Korea using the contingent valuation (CV) method and found that consumers are willing to pay an extra 3.3 USD (approx. 3 EUR) per month for replacing nuclear power with renewables and 3 USD (approx. 2.70 EUR) per month for replacing coal energy with renewables. The authors note that even though the WTP doubled since 2011, it is still low compared to other developed countries. According to a Gallup poll from 2017, roughly 66% of Korean consumers agree to higher electricity costs if the money is used for the energy transition (Friedrich-Ebert-Stiftung 2017). The respondents of the Hyundai Research Institute survey from June 2018 indicated an average WTP of 15,013 KRW (approx. 11.30 EUR) per month for the energy transition. This corresponds to an increase of 9.7% compared to a survey

[2] In 2016, innogy was RWE’s renewables spin-off and the numbers concerning RWE’s renewables share therefore embrace that of innogy. In September 2019 the European Commission approved E.On’s purchase of innogy and a swap deal by RWE and E.On. Innogy is split up amongst both companies : E.On concentrates on the distribution grid and end-costumer service whilst RWE takes on E.ON's and innogy's renewable businesses.

[3] Results from the workshop on public acceptance during a research trip for Korean energy experts to Germany (11-14.12.2018).

previously conducted by the Hyundai Research Institute. 67.7% of respondents were in favour of including external costs (of nuclear energy, nuclear waste disposal, particulate matter pollution and greenhouse gas emissions) in the electricity price. 57.2% of respondents agreed that energy supply should take into account not only production costs but also environmental and safety impacts (E-news Today 2018).

Due to the special situation in Korea with consumers not being able to choose between different electricity suppliers or energy sources, companies do not react to the consumer demand such as in a liberalised market. Thus, in Korea the supply side assumes the key role in the energy transition. KEPCO (or more precisely, its 6 power generation subsidiaries) and private power producers with a capacity of 500MW fall under the Renewable Portfolio Standard (RPS) and are obligated to provide a certain share of generation from renewable sources (Kim et al. 2019). They represent the main source of demand for renewable energy supply and can either invest in their own renewable energy plants or buy renewable power from other producers. In 2017, 18 private independent power producers and 1,424 new and renewable energy-related private power generators were registered at Korea Power Exchange (KPX).

According to the Bloomberg NEF report previously mentioned, investment in renewables in Korea amounted to 5 billion USD (4.45 billion EUR) in 2018 representing a 74% increase compared to 2017. Countries with comparable absolute amounts of renewable energy investment are for example France and Sweden (Bloomberg NEF 2019).

1.3 Community acceptance

High socio-political acceptance for renewable energies does not automatically lead to acceptance for individual projects which, however, is crucial in order to increase the renewable energy share (Wunderlich 2012). Community Acceptance is defined as the “acceptance of specific [renewable energy] projects at the local level” by affected residents, key local stakeholders and local authorities (WinWind 2018a).

The WinWind project described factors which influence (or might influence) community acceptance for wind power (WinWind 2018b). These acceptance factors also build a good framework to outline possible acceptance problems for renewable energy projects in communities in general. They are summarized as:

1. Technical characteristics of project:

- Visibility, number and size of power plants: Especially with wind energy, people might see a visual impairment of the landscape which increases with the number of turbines and the size of plants. However, visibility is not always perceived negatively (WinWind 2018b).
- Distance from residential and protected areas: Siting renewable energy plants close to protected landscapes or to residential areas can potentially lead to strong opposition. To prevent conflicts, nature conservation areas which do not allow for plant construction should be defined, and minimum distances to settlements should be determined. It is important to find the right balance between allowing for large enough distances from settlements on one hand, and not compromising pristine nature on the other.
- Grid infrastructure: Grid upgrades necessary for integration of renewable power can lead to opposition from the local residents. Especially new electricity lines are perceived as significant intrusions into natural and living environment.

2. Impact on Environment:

- Impact on environment is comprised of changes to the landscape, protected areas and increased traffic and the effects on biodiversity and wildlife. In Germany, NGOs and citizens often demand more thorough and independent environmental impact assessments before projects are implemented. Expansion of the road system often necessary for access to new projects, and the corresponding increase in traffic, can also have adverse effects, for example on herding in Norway.
- The effect of renewable energy projects on greenhouse gas emissions is another important driver of acceptance. If climate change mitigation is perceived as important by the local population, acceptance for renewable energy projects is likely to be higher.

3. Impact on Economy:

- Effect on the local economy (e.g. tourism, agriculture, jobs): If the tax income from a project implemented is lower than expected, this might negatively affect the acceptance for it. Another adverse circumstance is the fact that the number of newly created jobs is higher during the construction phase of a project and tends to decrease once construction has been completed. The tourism sector might be negatively affected because of a renewable energy project, e.g. due to perceived aesthetic impairment of landscape.
- Effect on individuals' economy (e.g. property values): Housing and property values might decrease due to their closeness to the site of a renewable energy project.
- Highly relevant for acceptance is distributional justice, i.e. the fair distribution of the burdens and benefits associated with a renewable energy project. Distributional justice encompasses the geographical distribution between regions on the one hand and the distribution among actors within community on the other.
- Ownership of land and plants is key for community acceptance. For example, foreign ownership might represent a significant public acceptance barrier.

4. Impact on Society:

- Health, well-being, quality of life: Concerns which reduce acceptance might exist in regards to noise pollution, visual impact, and reduced recreation values caused by renewable energy projects. With regard to wind energy, these can be, for instance, concerns about wind turbine noise (and associated health issues, such as stress, headache, sleep disturbances, cardiovascular disorders, high blood pressure, etc.), about low-frequency sound and infrasound; about optical emissions such as aviation lighting and shadow flicker, and about electromagnetic frequencies from transmission lines.

5. Individual characteristics:

- Socio-cultural values, self-identity and place attachment have to be considered in siting decisions. If a project affects a site with cultural and spiritual significance or might cause possible damage of an archaeological site, this can lead to opposition of the local communities.
- Attitudes towards renewables vary across countries and regions and are an important acceptance factor. If socio-political acceptance of the energy transition is high, this generally has a positive impact on the community acceptance. An interesting finding from past surveys has been that while support for renewables is generally lower when it comes to projects close to the respondents' homes, the acceptance is higher for citizens that already have renewable energy plants in their neighbourhood.

6. **Market:**
- Share of renewables in the energy/electricity mix in the target region. Both, very high shares of renewables in a region (already consuming a large part of the local area) as well as high shares of fossil fuels (and a corresponding fear of job losses) may contribute to form opposition against renewables.

7. **Planning and permitting process:**
- Procedural justice, access to information and transparency: The formal and informal participation of local residents as well as consultation possibilities are very important to increase community acceptance. However, local administrations often seem to lack capacities and resources necessary to facilitate appropriate citizen participation in the already complex process of renewable energy project planning. Citizens often perceive the selection of priority zones as a top-down process without great influence possibilities and often feel that they do not receive enough information and that their concerns are not sufficiently considered.

8. **Governance and regulatory framework:**
- If national or regional/local policy targets, plans and policies for renewables or their link to local renewable projects are perceived by citizens as arbitrary and not well-argued, this can have a negative influence on the community acceptance. On the other hand, clear and thoughtful targets and plans which show the benefits for the region and residents can lead to higher acceptance.

9. **Trust:**
- Trust in key actors and processes of the planning and permitting process is an important acceptance driver. This includes trust in the lawmakers and regulators, the regional or municipal decision-makers and trust in investors and planners. A typical barrier for trust is ownership of renewable plants by external investors where the revenue accrue outside of local community. Trust is also negatively influenced by a lack of transparency, e.g. with regard to land acquisition by the project developers.

Principally, these acceptance factors can be valid for both, Korea and for Germany. The extent to which each individual factor expresses itself depends on the individual project. In the following section, general information on community acceptance for renewable energies in Germany and Korea is summarised.

1.3.1 Germany

The acceptance survey by Kantar EMNID on behalf of AEE from October 2018 showed a lower but still relatively high acceptance level for hypothetical construction of a renewable energy plant in the correspondents' own neighbourhood (63%) compared to the 93% general support for renewables. The approval for solar parks (77%) was higher than for wind turbines (55%). In comparison, conventional energy plants enjoy much lower approval rates with 19% for gas power plants, 7% for coal power plants, and 4% for nuclear power plants. Generally, all plant types are more strongly welcomed by citizens who already live near a power plant. For instance, 83% of solar park residents and 69% of respondents with a wind turbine in the neighbourhood rated the respective systems as positive (Agentur für Erneuerbare Energien 2018). The survey by forsa on behalf of FA Wind regarding onshore wind comes to similar results. 78% of people with wind turbines in their neighbourhood would agree to new turbines compared to 69% of people without wind turbines in their neighbourhood (Bönisch 2018).

In Germany, especially regarding onshore wind, current opposition from the local communities has increased and initiatives against wind energy are hindering further expansion with protests and lawsuits. Different anti-wind citizens' initiatives are very well connected and organized in higher-level associations which provide help with argumentation strategies and expert contacts. They also enjoy increasing support from the extreme-right AfD party. Possible reasons for the large, emotional protests are that wind turbines are very visible and affect a large group of people, that people are emotionally bound to the landscape, and that citizens are unwilling to accept wind turbines in their immediate environment without receiving any financial benefits (Maier 2019).

In Germany, in addition to the construction of onshore wind turbines, another major area of local opposition is the grid expansion. Citizens' concerns include visual disruptions (especially with overhead lines), economic losses, health damage and the degradation of the environment. Often citizens also question the necessity of grid expansion in the context of energy transition is questioned. With regard to underground cables, farmers, forest and land owners fear soil deterioration and diminished harvests (Munk 2018).

1.3.2 Korea

In the survey of the Korea Photovoltaic Industry Association from December 2018, with regard to the acceptance of plants in the vicinity of the residence, PV received the greatest approval with 71%, followed by bioenergy (65.2%), wind power (63.5%), LNG (38.8%), nuclear power (22.6%) and coal (7.4%). However, the majority of respondents was unsure whether PV posed any risks (e.g. from carcinogens or electromagnetic waves) (The Today Energy 2018).

Renewable energy projects in Korea often encounter resistance from residents, environmental groups, communities and local governments raising issues as environmental degradation and conflicts with businesses such as farming (Lee and Heo 2016; Shin 2019). As Korea is mountainous and has a very high population density, generally sites for establishing renewable energy plants are very limited.[4] Because most of the mountains are classified as strictly preserved areas, getting approval for onshore wind farms is very difficult and environmental issues are often delaying wind farm construction (IEA Wind TCP 2018). Resistance to wind energy projects can further be attributed to health concerns due to magnetic fields and noises. For PV farms, concerns usually refer to potential landscape destruction, as well as light and heat reflection. Grid connection of renewable energy plants is often delayed due to opposition to grid expansion of the local residents; further, lack of trust in local governments also is a barrier for acceptance in Korea.[5] As for offshore wind farms, the opposition of the fishing industry is a key issue (IEA Wind TCP 2018). For a general summary of possible reasons for acceptance issues with local fisheries as well as approaches on how to increase the acceptance, please see the "Focal Point: Fishery and Offshore Wind" below.

With regard to onshore wind power, opposition at community level in Korea is also rooted in traditional spiritual beliefs which do not play a role in western debates on wind energy. Chung et al. (2018) investigate the relationship between the local perception of onshore wind power and Korean traditional religious beliefs against the background that wind energy projects are mostly planned in rural areas with a large population proportion of elderly people with traditional spiritual beliefs. For example, beliefs stemming from pungsu (fengshui) represent an obstacle for the use of straight and strong wind currents for power generation. Pungsu

[4] Results from the workshop on public acceptance during a research trip for Korean energy experts to Germany (11-14.12.2018).

[5] Results from the workshop on public acceptance during a research trip for Korean energy experts to Germany (11-14.12.2018).

literally translates to wind and water, both being forms of energies that can appear as either vital or destructive, and originates in ancient peoples' desire and wisdom to be safe from natural disasters. Additionally, the form and location of the wind turbines evoke bad memories from the Japanese colonial era when iron stakes were driven into renowned Korean mountains by Japanese imperialists to block the national vital spirit of Korea. These two points are sources for opposition to wind energy among the rural elderly. The opinion of elderly people on wind energy is hardly reflected in surveys which are often conducted online.

Focal Point: Fishery and Offshore Wind

The European Maritime Spatial Planning (MSP) Platform identified five **conflicting elements** from the fishing industry's point of view in the context of offshore wind project planning, implementation and operationalization (European MSP Platform 2019):

- Potential accidents that cause damages at the shipping vessels and/or the subsea cables.
- The disturbance of the natural habitat of fish and shellfish that might cause a displacement of or reduction in resources.
- A reduction in or loss of access to traditional fishing grounds and a displacement of activity to other fishing grounds eventually being less profitable or reliable.
- Higher economic costs for fishermen being confronted with farer navigation routes into waters (not accessible for smaller boats) as well as for project developers that need to take into account the compensation of the potential losses.
- Socio-economic conflicts with fishermen perceiving their traditional way of life and livelihood being threatened.

Additionally, concerns regarding the risk of severe environmental damages due to ship accidents such as the collision of an oil tanker and a turbine have been expressed. There are also reservations about the electro-magnetic waves of the wind farms possibly causing interference with the radar of vessel traffic (Soper 2018).

At the same time, potential new opportunities are being highlighted in the field of the emergence of new habitats for shellfish at the foundations of the wind turbines or thanks to the creation of new jobs for fishermen in the field of maintenance and supervision in the wind farm project (The West of Morecambe Fisheries 2019).

The European MSP Platform mentions the following proposals among others as **possible approaches for increasing the acceptance** of the local fishing industry (European MSP Platform 2019):

- Consultation at the high-policy level in order to assure the comprehensive consideration of the potential impacts and the best possible co-existence among fishery and wind farming.
- The acceptance and consideration of the fishing industry's interests.
- The inclusion of the fishermen's knowledge in the project planning procedure (e.g. in the evaluation of especially fruitful fishing areas) and the cautious selection of the project's location.
- A multi-stakeholder approach for an optimal mediation between the parties.
- Alignment of the project's construction phase with the fishery seasons.
- The evaluation of further fishery opportunities in offshore wind farm areas and the accordingly necessary regulations.
- The promotion of a collaboration among various sectors as well as the systematic elaboration and consideration of lessons learned from realized projects.

A study on offshore wind farms and commercial fisheries in the UK concludes that offshore wind farm development would be better managed if stakeholder consultation was more extensive and if compensation claims were standardised (Gray et al. 2005).[1]

In Korea, in order to ensure the economic inclusion of the local fishermen, the company Korea Offshore Wind Power (KOWP) in cooperation with public institutions is currently conducting two research projects that focus on the environmental impacts of offshore wind plants and their coexistence with the fishing industry. Possible ways for an effective usage of the targeted area and the support of fishing resources are being investigated, navigation rules are to be reset after a security diagnosis in order to address the fishermen's worries concerning reduced fishing areas and an IP-based offshore wind control system to protect vessels and plants alike is to be introduced. Furthermore an adequate profit-sharing plan is being developed taking into account the legal and institutional framework as well as existing national and international case studies (Energy Daily 2019).

2 Increasing acceptance and citizen participation in Korea

This chapter offers an overview of possible measures and means to increase public acceptance for renewables in Korea. These are drawn from existing literature, experience and examples from Germany, as well as from opinions by Korean experts. A more comprehensive analysis would be necessary to look at and evaluate measures in more detail.

2.1 Information and communication

2.1.1 In general

To increase public acceptance for the energy transition in Korea, Korean experts emphasize that measures to educate the public on energy transition and generally more communication of the government with industry and citizens is necessary.[6,7]

On the national level, **continuous and far-reaching information activities** on the energy transition (why and how) are important. This includes rebutting false information (e.g. as shown in other countries, security of supply can be maintained at shares of variable renewables targeted by Korea (20% by 2030)). To take into account the issue of limited trust in the government, **independent experts** should be involved in the public discussion. Information and communication activities should include the positive impact of renewables on the reduction of GHG and air pollutants. Generally, educating the public on climate change and on the connection between mitigating climate change and energy transition is of high importance.

Different kinds of **information material and channels** can be used, such as facts and figures, news on on-going processes and public relations activities, and government bodies' contact information for citizens' inquiries. Furthermore, **positive attention** on the energy transition **in the media** is important to influence attitudes of people regarding renewables.

2.1.2 For increasing community acceptance

The main influencing factors for community acceptance are the distributional justice, i.e. the fair distribution of costs and benefits; the procedural justice, i.e. a fair and participative decision-making process and trust in information and intentions of investors and key actors, "from outside the community," (WinWind 2018a).

Even though central problems related to community acceptance of renewables can be identified (see Chapter 1.3), every project faces unique challenges and chances in the respective local context. Therefore, there is no single solution for increasing community acceptance which could be successfully implemented for all projects (WinWind 2018b). A generally valid recommendation is to implement measures for improving information

[6] Discussion during German-Korean Forum of the "Korea Energy Transition Conference" (KETC), Seoul, 05.10.2018

[7] Discussion during the Fireplace Talk on "The Role of Bioenergy in the Energy Transition in Korea and Germany", 20.12.2018, Seoul.

distribution, communication and dialogue, as well as measures facilitating citizens' participation in the planning process and ultimately, citizens' financial participation in the project.

High transparency of information and early communication on renewable energy projects lead to higher acceptance. Different **information materials and channels** can be used:

- Local events, townhall meetings;
- Printed information, online information, reports on television and radio;
- Press releases, newsletters, campaigning with posters/ flyers/ videos, project websites.

Easily understandable information which answers concerns of the community is important, for example with regard to scientific evidence on the actual impact of renewable energy projects on climate change mitigation and reaching energy transition targets (see Chapter 1.3, WinWind 2018b) or on health risks associated with renewable energy plants, or the actual number of birds dying through wind turbines, . Any numbers should be set into context to make them easily understood (for instance, comparison of noise caused by wind farms to that of household appliances). Communication strategies should also address the "silent majority" of citizens (Di Nucci and Krug 2018).

Acceptance of specific local projects also can increase if the **general interest and knowledge about climate change and renewables** in the community is raised. This can be pursued by various measures of the community, such as:

- Organizing **events offering experience related to renewable energy,** such as renewable energy sightseeing or test driving of electric cars;
- **Participation in nationwide programs and projects;**
- Carrying out **projects in schools;**
- **Sharing best practices**, for instance, citizens/communities presenting other citizens/communities their example during local events;
- Initiating an **Energy Mentor Program** which only requires the initial training of the first mentors to be carried out by local professionals. Once introduced it can work as a snowball system (Müller 2016);
- **Integrating the topic in new and possibly even unconventional settings** by involving civic organizations with established structures (such as sports and cultural clubs, parishes and interest groups) in energy transition activities in order to reach other people than the ones already familiar with the topic during their leisure time activities (Müller 2016). For instance, key members of the associations could be trained as climate ambassadors who act as multipliers passing on the acquired information on strategies for climate protection to other members and their private environment. A contest could be initiated that distinguishes associations according to their energy efficiency and renewable energy activity efforts.

2.2 Electricity bill and prices

In Germany, electricity supply companies have to provide consumers with the following information on the electricity bill and on their homepage: The electricity composition, i.e. the share of fossil and renewable energy sources in the total energy mix, information on the environmental impact of the total energy mix in terms of CO_2 emissions and radioactive waste, and average comparative values of the corresponding electricity generation in Germany (Bundesnetzagentur 2019b).

According to the opinion of Korean energy experts on the topic of public acceptance during a research trip to Berlin in December 2018, **more detailed and transparent electricity tariffs** which are comprehensible for the electricity consumers are important in order to achieve market acceptance of renewables in Korea as well. Therefore the tariff should be adapted based on the costs of electricity provision. **Information on individual energy sources** and cost composition should be published for the different consumer group tariffs.

Further, electricity customers should get the **option to choose a 100% renewable electricity tariff**. This is in line with the demand by large Korean enterprises for a system that enables them to purchase renewable energy. Despite increasing pressure from global customers, Korean companies face limitations in replacing their existing power sources with renewable energy as the state-owned electricity supplier KEPCO does not classify electricity by the source of generation. This KEPCO policy represents a hurdle for the decarbonisation activities for Korean companies. For instance, Samsung Electronics and SK Hynix announced this year their plans to use 100% renewable energy in other parts of the world but were forced to exclude Korea from this voluntary commitment (Shin 2018).

Moreover, to reduce concerns regarding the costs of renewables, these should be set into context by communicating the **negative externalities of fossil fuels** such as air pollution and GHG emissions (Alsharif et al. 2018).

During the workshop on renewables acceptance in Berlin in December 2018, the Korean experts emphasized that the **support by the Korean government for energy efficiency** should be increased as well. This includes stronger support for energy efficiency measures, as well as communication of achievable energy savings and efficiency options to electricity consumers together with the related cost savings in the total electricity bill. This could help to increase the acceptance for a potential rise of electricity prices caused by the renewable energy expansion. Generally, the electricity prices in Korea are at very low levels and do not reflect the full costs of production. An increase of prices could incentivize energy savings.

2.3 Dialogue and participation in planning and decision processes

Historically, there was little space for participation of the Korean public in energy policy decisions. During the past 50 years, Korea's energy policy focused on pursuing long-run strategies for economic development, leaving little opportunity for citizen participation or other forms of democratic decision-making processes. The fact that it was mainly the government and energy industry determining the energy mix and selecting power plant sites led to social conflicts and opposition from both, residents and environmentalists (Chung and Kim 2018). In recent years, environmental and energy transition movements increased and ecological and social issues such as affordability, environmental degradation and climate change raised by energy companies and citizens have been more and more influencing the energy policy process (Friedrich-Ebert Stiftung 2017).

For increasing socio-political and market acceptance for renewables, **dialogue and consultation** of the **national government** with industry and citizens throughout processes of new political energy regulations and plans is very important.

Additionally, with regard to community acceptance, citizen participation in planning and decision procedures for specific projects is crucial. This comprises the **dialogue** between **local governments, project developers, local experts** and **citizens** on renewable energy

projects. The organization of **networking possibilities** for relevant actors within the community and with other communities can provide dialogue opportunities.

Citizens and stakeholders should be involved early and comprehensively in **planning and decision procedures**, i.e. in the consultations, the licensing process and the spatial planning processes. In Germany, public participation in the land use plan procedures (e.g. designation of areas for wind energy use in municipalities) and approval procedures is required by law through information and consultation. Informal participation goes beyond the formal participation required by law, e.g. in form of dialogue forms and working groups (WinWind 2018b).

With regard to the implementation of the Renewable Energy 3020 Plan the Korean Energy Agency outlined a concrete approach for increasing community acceptance (Figure 1). 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 approach simultaneously comprises comprehensive environmental impact assessment (KEA 2018).

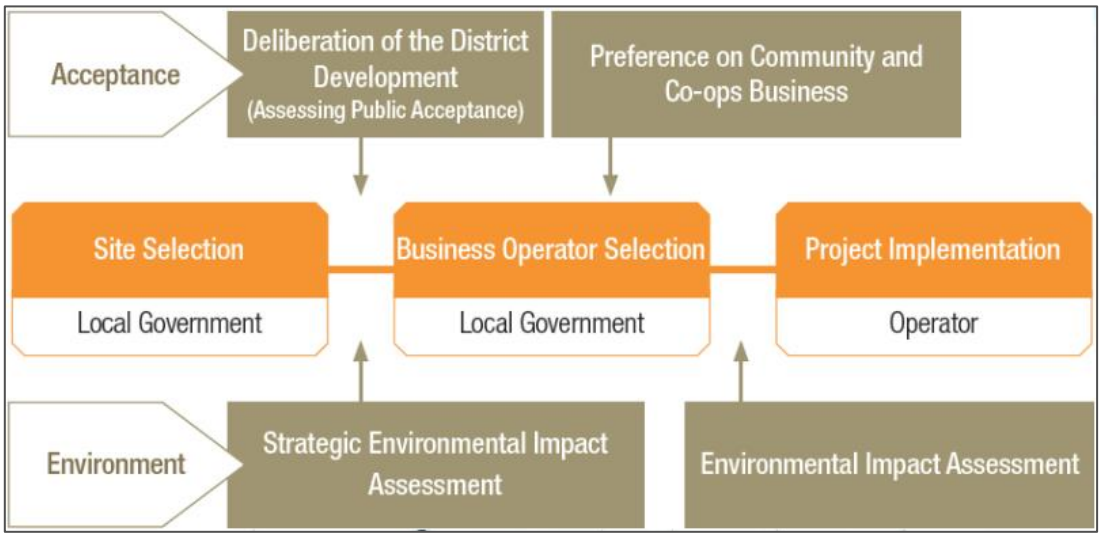

Figure 1: Approach to securing the public acceptance for renewables (Korea Energy Agency 2018)

For community acceptance, the **trust** of citizens in the key actors of the planning and permitting processes, such as the local government or the project developer, is also an essential prerequisite for acceptance (see Chapter 1.3). **Third party mediators** can contribute to credibility and conflict management as intermediary organisations with independent experts serving as point-of-contact for consultations with citizens and businesses (e.g. in form of "climate protection managers"). As municipalities might be overstrained with initiating participation procedures and measures, accompanying advisory and support services for the local government also could be provided by these intermediary organisations (Di Nucci and Krug 2018).

During the discussions on the topic of public acceptance within the research tour by Korean delegates to Berlin in December 2018, the participants suggested that local governments could conduct **conflict assessment analyses** to predict possible conflict, and based on the results prepare various measures for communication and participation. As a potential

measure, they proposed developing a toolbox with guidelines and best practices to support smooth communication between the local government and the citizens. Organising events with other local governments and communities could further help to channel information. If according to the analysis the probability of conflicts appears to be high and there is a lack of trust on the side of the citizens in the local government, a third party mediator should be involved.

2.4 Financial participation

Benefit sharing mechanisms and financial compensations for citizens and communities may support the establishment of distributive justice and thus increase community acceptance (see Chapter 1.3; WinWind 2018b). Communities and citizens should from the outset benefit financially from the construction of renewable energy plants, especially in case of onshore wind projects which more frequently face acceptance problems, at least in Germany (Maier 2019).

Profit sharing was identified as an important measure by energy experts from Korea during the research trip on acceptance to Germany in December 2018. A certain share of profits from the renewable projects should be allocated to the residents. In order to create fair opportunities for profit sharing next to cooperatives and banks, neutral 3rd party mediators should be involved. A potential barrier could be the uncertainties and high development costs for project developers that make it difficult to enable financial participation in renewable projects for private investors.

Financial participation can be either active or passive. In the case of **active participation**, citizens are actively involved in the projects as donors or co-operators; in the case of **passive participation**, they obtain a financial benefit without spending their own capital. In general, projects whose owners are private citizens enjoy a higher level of identification with the project. Financial participation opportunities which bring economic benefits to citizens and municipalities in the vicinity of renewable projects strengthen the notion that distributive justice has been provided. Thereby, it is important to consider what form of financial participation is appropriate for the particular project (Bundesverband WindEnergie 2018).

2.4.1 Active financial participation

Active financial participation on the one hand is possible through **direct participation in the equity of a project company**, so that citizens become co-entrepreneurs. Acquiring shares in an energy company is possible in a variety of legal forms (Bundesverband WindEnergie 2018). Thereby, the **energy cooperative** (Energiegenossenschaft, eG) is a form that has become widespread in Germany in the field of renewable energies. As of today, there are over 850 energy cooperatives in Germany (DGRV 2019).

On the other hand, active financial participation can take place in the form of **indirect participation**, in which citizens co-finance the project through **saving bonds, bearer bonds, silent partnerships or subordinated loans**, but the project developer makes the project decisions (Bundesverband WindEnergie 2018).

In Korea, as well, the model of energy cooperatives is already widespread. After the Cooperative Act from 2012 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. Their establishment is also supported by the Feed-in-Tariffs (FIT) the Korean government introduced in 2018 for small-scale PV plants of less than 100kW built by cooperatives, farmers or fishermen (Kang 2018). Further, in the form of a cooperative, more than 10.000 citizens will be involved in the swimming PV-plant project on Shihwa Lake in the Gyeonggi-do region with an overall capacity of 102,5 MW which is planned to be implemented by 2020. This project is planned to serve as a showcase for a successful civil-public renewable energy cooperation project (The Energy Daily 2018).

Particularly in the case of small-scale solar energy, individual citizens can of course also be owners of PV plants (roof-top PV) and thus make an active contribution to the energy transition while also benefiting financially. In Germany, this is facilitated by the EEG, which regulates the priority feed-in of electricity from renewable sources into the electricity grid and its remuneration. The Korean government also seeks to expand urban-type and small-scale PV and introduced in 2018 alongside the abovementioned FIT a FIT for PV plants under 30kW. The government furthermore plans to improve the net-metering system in order to allow for cash compensation in case of excess power in small-scale PV (KEA 2018; Energy and Environment News 2018).

2.4.2 Passive financial participation

Passive financial participation models can also have a positive effect on the acceptance of projects by providing citizens financial benefits. There are various possibilities for passive financial participation (Bundesverband WindEnergie 2018).

First, **land lease models** which facilitate rent payments to the surrounding landowners and not only to the direct owners of the project site. The direct owners of the renewable project site thus receive a certain proportion of the lease, and the rest is distributed evenly to all owners within a certain radius.

Second, **reduced electricity prices** for the local residents, enabled through cooperation between renewable energy facility operators and a local electricity supplier. During the research trip of Korean energy experts to Germany in December 2018, participants also proposed lower electricity prices for consumers close to a renewable energy generation site.

Third, **investments in the community** financed from project revenues, for instance, in the local infrastructure (by installing charging units for e-cars, solar street lights etc.) or via payments to the municipality and public institutions (Follrichs 2018).

Selected Examples from Germany:

Information and dialogue initiatives on the national level:

The "**Bürgerdialog Stromnetze**" is a neutral public information and dialogue platform on grid expansion founded by the Ministry of Economic Affairs and Energy in 2015. Citizens' offices that serve as point of contact have been established in affected regions. They provide information, communication and discussion possibilities on a case-by-case basis tailored to the needs of the specific region. Citizen's offices also listen to feedback and concerns of the public and forward it back to decision-makers. Furthermore, other formats such as citizens' conferences, discussion evenings and information markets as well as mediation services and online services are also implemented.

Another interesting example of user-oriented provision of information from the German government is the **online portal SMARD**, which is operated by the Federal Network Agency (*Bundesnetzagentur*) and provides consumers with comprehensible data on the electricity market. Users receive, almost in real time, data on electricity generation from conventional and renewable energies and electricity consumption in Germany.

Initiatives on the federal state level:

The **Energy Dialogue.NRW** (2011-2018) was introduced by the Energy Agency of the Federal State of North Rhine-Westphalia as a dialogue platform that neutrally supported municipalities, companies, NGOs and citizens in the planning and implementation of local renewable energy projects. The Energy Dialogue provided initial consultation, information services via website/blog, renewable energy project fairs, and infographics and leaflets on participation methods, and also conducted workshops on citizen participation (Gehles 2018).

The **Thüringer Energie und GreenTech-Agentur (ThEGA)** of the Federal State of Thuringia offers a wide range of information, consulting and support measures to increase acceptance of wind energy projects through its **Wind Energy Service Office**. Measures include the "Fair Wind Energy" seal, which has been issued by the Service Office since 2016 and documents a voluntary commitment by project developing companies to the guidelines for fair expansion of wind energy. The guidelines formulate special requirements for procedural and financial participation of citizens. 47 project developers received the seal by committing themselves to complying with the guidelines (Di Nucci and Krug 2018).

Examples for legislative regulation on financial participation at federal state level

Two federal states in Germany have introduced legislation on financial participation for wind turbines, which, however, have hardly been used since their decision due to the slowdown in wind projects development (Maier 2019b).

The **Citizen and Community Participation Act of Mecklenburg-Western Pomerania** from 2016 makes financial participation for citizens and municipalities mandatory within a radius of 5 km of a wind farm. The company developing a wind project must offer at least 20% of its shares for sale for the municipalities and citizens. The purchase price of a share may not exceed 500 EUR. Instead of selling its shares, it can also offer annual compensatory payments for the municipalities or a discounted local electricity tariff or savings product for the citizens (Ministerium für Energie, Infrastruktur und Digitalisierung[8] 2019).

[8] Ministry of Energy, Infrastructure and Digitalisation of Mecklenburg-Western Pomerania

The **Act on the payment of a special levy to municipalities in the vicinity of wind turbines of Brandenburg** from 2019 requires an annual compensatory payment for municipalities located within a 3 km radius of the wind farm. The special levy amounts to 10,000 EUR per wind turbine and year. The municipalities have to use the funds from the special levy for measures to increase the acceptance of wind turbines in their communities (Landesregierung Brandenburg[9] 2019).

[9] The Government of Brandenburg

3 Summary and options for the Korean-German energy cooperation

This study provides a comparative overview of the status of socio-political, market and community acceptance of renewables in Korea and Germany and showed possible options for increasing public acceptance and citizen participation in Korea drawing from literature, experience and examples from Germany. According to results of past surveys, **socio-political acceptance** is higher in Germany with over 90% of respondents in favour for renewables and the energy transition. Despite this, many German citizens perceive the distribution of energy transition costs as unfair, and acceptance problems typically appear in communities directly affected by individual renewable projects. Korean surveys show an increasing consent of the public with the energy transition. However, Korean citizens sometimes exhibit lacking knowledge with regard to renewables and the government's energy policy, and have concerns with regard to rising energy prices and an unstable energy supply. Misinformation and fake news on adverse effects of renewables spread by the nuclear lobby only exacerbate these fears. In summary, in contrast to Germany, a general consensus for energy transition in Korea cannot yet be taken for granted.

Both countries face **community acceptance** problems with strong opposition to individual projects. The grounds for opposition are also similar for both countries – potential environmental degradation, visual impairment of the landscape, health concerns and conflicts with local businesses. Additionally in Korea, traditional spiritual beliefs and lacking trust in local governments are also part the problem. Opposition in Germany concentrates on onshore wind and grid expansion; in Korea, conflicts with the fishing industry in case of offshore wind are more in focus. Another important difference is that in Germany community acceptance became a central issue at a later stage of the energy transition than in Korea. Germany in 2018 had around a 38% share of renewables in its electricity consumption compared to around 7.5% for Korea in 2017. (Federal Ministry for Economic Affairs and Energy 2019, Lee 2019). One possible explanation is that lack of space for renewable energy projects is more pronounced in Korea due to its mountainous relief and very high population density.

With high investments in renewables, 80% of electricity suppliers in Germany offering at least one renewable tariff, and 20% of electricity consumers signed up to a 100% renewable electricity tariff, **market acceptance** for renewables in Germany is also high. In Korea, too, investments in renewables and willingness to pay for renewables have been increasing in recent years. However, in the non-liberalized, quasi-monopolized market, Korean consumers cannot choose between different suppliers and electricity tariffs, and thus are not in position to contribute to energy transition through consumer choices.

Several means and measures should be considered for increasing public acceptance for wind and solar energy in Korea. Continuous and far-reaching **information activities on energy transition on the national level** via different information materials and channels is important, including positive attention on renewables in the media. Independent experts should be called upon to increase creditability of published information. Further, the public should be educated on the positive impact of renewables on climate change mitigation and the reduction of air pollution. Additionally, **dialogue and consultation of the national government with industries and citizens** in energy-related planning and regulation processes is crucial. In general, Germany has more experience with bottom-up and citizen driven processes compared to a historically very centralized top-down approach in Korea.

With regard to individual renewable energy projects **on the local level, access to information, high level of transparency and early communication** with easily understandable information directly addressing the concerns of the community are important. **Increasing general interest and knowledge about climate change and renewables** in the community also supports community acceptance. Possible measures are, for instance, school projects on renewables, sharing of best practices between communities, establishing an energy mentor program or training climate ambassadors in civic organizations such as sport clubs. It also important that citizens and relevant stakeholders are **involved early and comprehensively in planning and decision procedures** for specific projects. **Third party mediators,** e.g. independent experts, can contribute to successful participation procedures by increasing creditability and providing accompanying advisory and support services. **Establishing regional dialogue and information platforms** such as the Energy Dialogue.NRW or the Wind Energy Service Office in Thuringia or **general national online information portals for consumers** like SMARD can also be considered. In order to enhance distributive justice, measures for profit sharing, i.e. for **active and passive financial participation** of the community and the local citizens should also be considered.

Further, Korea can introduce more **detailed and transparent electricity tariffs** with information on the power sources, perhaps together with their environmental impacts, visualized in the electricity bills. A **100% renewable electricity tariff** should be available in order to support households and private companies who want to make the effort to contribute towards energy transition. Additionally, support by the Korean government for **energy efficiency and conservation measures** should be increased, along with communication of these measures to consumers with focus on the related electricity bill cost savings. This could contribute to increasing acceptance for a potential electricity price increase due to the expansion of renewables.

Several options exist in order to deepen the **Korean-German energy cooperation** on the topic of renewable energy acceptance. However, it is important to adapt measures to specific national and local contexts. Potential cooperation options comprise:

- **Sharing experience on communication measures and best practices for increasing information transparency** on the national and the regional level. German experience could prove valuable in Korean context for instance with regard to improving awareness of the role of energy transition in climate protection, or for implementing information and dialogue platforms in Korea such as regional dialogue offices or online information portals.
- **Supporting a correct communication of 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.
- **Sharing experience on energy efficiency and conservation measures** and their potential for electricity cost savings in the total electricity bill.
- **Fostering discussion on lessons-learned from approaches to involve local citizens and stakeholders** in planning and decision processes for renewable energy projects, as well as on approaches to facilitate their financial participation in renewable energy projects.
- **Establishing joint showcase projects for increasing public awareness and acceptance in communities in Korea**, for instance 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.

- **Organisation of mutual visits of best practice cases** for local citizen participation in the other country.
- **Facilitating information exchange and collaboration of energy cooperatives** in Korea and Germany.

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