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Marketing Renewable Energy – Current State and Challenges

再生可能エネルギーのマーケティング ― 現状と課題

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1. Introduction

While humanity faces numerous environmental and social problems, man-made global warming has gained a particular importance both from an expert view as well as in the perception of the general public, although the latter often shows limited knowledge about climate change (Korkmaz 2018; Kim and Wolinsky-Nahmias 2014).

The future effects of global warming, which can partly be sensed already now, are serious. Extreme weather conditions (Chu 2016), reduction of crop yields in certain regions (Sousa Fragoso and Almeida Noéme 2018; Montaud et al. 2017) and a rise of the sea level (Naren and Maity 2018) are frequently mentioned as threats with severe consequences for human health (Schulte et al. 2016; Hasegawa et al. 2016), economic growth (Alagidede et al. 2016; Kompas et al. 2018), and the natural environment.

Global warming is caused by a number of influencing factors. Besides natural factors, anthropogenic factors increasing the concentration of greenhouse gases (GHG) such as methane, nitrous oxide and, most important, carbon dioxide in the atmosphere (Orsenigo and Vercellis 2018; IPCC 2014) are in the focus of the public, politicians and researchers alike. Energy production contributes a large share of anthropogenic GHG emissions, the IPCC estimated the share of CO_2 emissions from energy production to account for nearly 70% of global GHG emissions in 2010 (IPCC 2014).

A number of strategies have been devised to stop or at least slow down global warming. The IPCC lists strategies pertaining to energy supply, transport, buildings, industry, agriculture and forestry as well as infrastructure. In energy supply, the use of renewable energy is the most prominent mitigation measure (IPCC 2014). In section 2 it will become clear that many countries have developed renewable energy sources over the last decades. However, while the electricity sector makes good progress, the use of renewables for generating heat or for producing vehicle fuels for transport is lagging behind (REN 21 2018).

From the outset of the development of renewable energy, the focus has rather been on technological development, such as increasing the efficiency and the yield or bringing production cost down. The social challenges of expanding the use of renewables on the other hand have been largely neglected. Today, many researchers become aware that social issues have turned out to be a major roadblock for developing renewables further. These issues have been analyzed in social acceptance frameworks. One of the most prominent frameworks differentiates three distinct forms of acceptance: socio-political, community and market acceptance. Socio-political acceptance is acceptance of policies and technologies by the general public on a broad level. Community acceptance refers to the acceptance of specific projects at specific sites by local stakeholders. Market acceptance as the third of the acceptance categories addresses the acceptance of technologies and products by consumers and investors (Wüstenhagen et al. 2007). This paper focuses on market acceptance by consumers.

2. The development and the state of renewable energy

Before we turn to analyzing consumers' attitudes and behavior towards renewable energy products, we will look at how renewables have developed in the world and specifically in Japan.

Renewable energies can be categorized in various ways. First, they can be sub-divided by energy forms into renewable electricity, renewable heat and renewable vehicle fuel. Second, they can be divided by technology or source into renewable energy from solar photovoltaics (PV), solar thermal technology, wind power, hydropower, biomass heat/power or geothermal heat/power and others (Troldborg et al. 2014). And lastly, they can be divided by the sector in which they are used into transport, households and industry.

Renewables accounted for 18.2% of total global final energy consumption in 2016. However, 7.8%

of this is traditional biomass, e.g. wood being burnt in cooking stoves whereas modern renewables stand at 10.4%. Modern renewables (i.e. excluding traditional biomass) have been growing at a rate of 5.4% from 2005 to 2015. The share of renewables in heat consumption is 27%, but the biggest part of that is traditional biomass. In transport, the renewable share is only 3% and in power it is 25% (REN 21 2018).

Power has received most attention from policy makers in the past. Globally, renewable capacities for power production have been growing at a compound annual growth rate (CAGR) of 8% between 2008 and 2017. The total installed capacity of renewable power in the world amounted to 2.179 GW per end of 2017 (IRENA 2018). Asia has the biggest share in this with 42%, while Europe (24%) and North America (16%) are second and third. 51% of total capacities are hydropower, 23% are wind and 16% are solar photovoltaics (IRENA 2018).

Countries around the world have created different support mechanisms to foster the expansion of renewable energy. Some of the more important mechanisms are renewable portfolio standards combined with tradable green certificates, tax incentives and especially feed-in-tariffs (FIT) (Abdmouleh et al. 2015). Under a FIT regime, producers of renewable energy have the right to feed their energy into the public grid and receive prices which are fixed for a mid- to long-term period. In Germany, to name the most prominent example, the Renewable Energy Sources Act (RESA or EEG in the German form of the abbreviation) guaranteed fixed FIT for electricity from renewable resources for 20 years and thus created an environment with a high level of security and predictability for investors and operators of renewable energy production assets (Hoppmann et al. 2014). Many countries restrict their FIT schemes to electricity, but France, for example, also offers FIT for biomethane, a product that has chemical properties similar to natural gas and is produced by upgrading biogas (Herbes et al. 2018a). The FIT are often financed by energy consumers. While FIT have shown to be an effective policy instrument for achieving a fast growth of renewables (Dijkgraaf et al. 2018), they are also costly and as a consequence governments, pressed by the public, have started efforts to reduce the cost of these schemes. Ultimately, governments want to phase out their support for renewable energies and make them competitive in the market where they compete with other energy sources (MacDonald and Eyre 2018).

In many countries, beside the state-led support schemes voluntary markets have come into existence. The fundamental pre-requisite for such a voluntary market is a liberalized market regime in which customers are free to choose their suppliers and energy products. In the European Union

(EU) market liberalization has taken place since the 1990s (Eising 2002). In voluntary markets for renewable energy, consumers are not obliged to buy energy from renewable sources, but they do so for various reasons (see section 4) and usually pay a price premium, since the production of renewable energy is often still more expensive than energy from fossil sources or nuclear power. In Germany for example, 22% of all households voluntarily purchase an electricity tariff that is based on renewables (Bundesnetzagentur and Bundeskartellamt 2018). Besides voluntary green electricity markets, some countries have developed voluntary markets for renewable gas, mostly based on biomethane (Herbes et al. 2016; Herbes et al. 2018a).

Japan is one of the largest energy consumers in the world, taking the fifth place in primary energy consumption with a strong reliance on energy imports, especially after shutting down nuclear power plants in the wake of the Fukushima accident (Komiyama and Fujii 2017). Japan largely relies on coal and liquid natural gas (LNG) for its electricity generation (Institute for Sustainable Energy Policies 2017) and had been relying on nuclear power as a low-carbon source of energy before 2011 (Matsubara 2018) although renewable energy had been promoted as early as in the 1970s (Raupach-Sumiya 2017). Fukushima was the starting point of an intensified expansion of renewable energy in Japan, albeit the development is focused on electricity like in many other countries. In 2012, the Japanese government implemented a FIT system for renewable electricity, offering reliable long-term (20 years) income to investors (Raupach-Sumiya 2017) and laying the foundation for a fast growth of this sector (Ministry of Economy, Trade and Industry 2012). Moreover, the country set a target for an increased share of renewable energy in total electricity consumption: 22-24% for 2030 (Ministry of Economy, Trade and Industry 2018), a target that unfortunately does not compare favorably to the targets in other industrialized countries and regions in the world and does not fully represent Japan's potential for shifting towards renewables (Sørensen 2017). As of end of 2017, Japan accounts for 4% of total global renewable electricity capacity (IRENA 2018).

The share of renewable energy in the electricity sector has risen considerably in the years since Fukushima, amounting to nearly 15% of total power generation in 2016, up from 10% in 2010 (Institute for Sustainable Energy Policies 2017). However, half of this is hydropower, a traditional source of renewable energy. Solar came in second in 2016, representing 4.4% of electricity production. New capacities for PV amounted to around 10 GW per year in 2014 and 2015 each (Institute for Sustainable Energy Policies 2017). Excluding large hydropower, the capacity for the generation of renewable energy has risen by a factor of 2.7 from the introduction of FIT in 2012 to

the end of the fiscal year 2016/2017 (Ministry of Economy, Trade and Industry 2018). However, there are large differences between regions, end use sectors and technologies. While Oita relies in the renewable sector (excluding big hydropower) to a large extent on geothermal power and Toyama and Nagano on small hydro, many others rely on PV, some of them almost exclusively. PV has surely been the technology with the biggest expansion over the last years.

But the strong financial support for PV through FIT has led to a number of problems. The government is well aware of them. The Japanese Ministry of Economy, Trade and Industry mentions "… a concern in the increase of public burdens, non-operation of approved facilities under the scheme, and existing utilities' restriction of new entries to access power grids." (Ministry of Economy, Trade and Industry 2017). Cost containment is now a major concern of the Japanese government (Ministry of Economy, Trade and Industry 2018) and it has changed the generous FIT system considerably in 2016 (Raupach-Sumiya 2017). Moreover, like in other countries, the need for increasing the capacity of the power transmission grid has been pointed out for Japan to increase its renewable share (Komiyama and Fujii 2017).

After several reform phases since the 1990s (Raupach-Sumiya 2017), the Japanese retail market for electricity is fully liberalized since 2016 (Matsubara 2018) enabling a voluntary market for renewable power products. While before that time regional monopolists such as TEPCO were the only providers from which consumers could buy electricity, the liberalization opened the market for new entrants, and their share in total electricity demand has risen to nearly 12% as of September 2017. More than 7% of Japanese households had switched their supplier by the same date (Shinkawa 2018) and research suggests that switching in Japan has improved customer satisfaction (Shin and Managi 2017).

The liberalization has created a new market for green retail electricity products and both incumbents as well as new entrants are making use of this opportunity. TEPCO, to name one of the incumbents, has, together with other investors, launched Trende Inc., a company offering green electricity tariffs to consumers. But there are also a large number of new entrants in the electricity market. Some of these new entrants only offer electricity from fossil fuels, others both from fossil and renewable sources and a third group only from renewable sources. The latter group can be split into various types of providers: municipal utilities (jichitaikei denryoku), regional power companies (chiikikei denryoku), cooperatives (seikyoukei denryoku) and multi-region suppliers (fukusu chiiki kyoukyuu) (power-shift.org 2018). And web-based platforms already have started to

support consumers in their decision making: power-shift.org for example lists nearly 30 providers that have to fulfill a number of consumer- and renewable-centered requirements: information on underlying production technology, easy-to-understand information, procurement predominantly from renewable sources, focus on facilities run by regional communities and citizens and no capital ties with a major (incumbent) utility (power-shift.org 2018).

3. The challenges of marketing renewable energy

The previous section has outlined how voluntary markets for renewable energy products have developed. But marketing renewable energy poses a number of challenges to companies producing and selling this type of energy. The main challenges arise from the following attributes of renewable energy (Friege and Herbes 2017):

- Commodity
- Low-involvement product
- Credence good
- Partially public good
- Product requiring explanation
- Prosumer good.

Commodities such as energy are perceived by consumers to be interchangeable with no or little differentiation between of single products. This triggers a strong focus on price. Renewable energy offers the opportunity of de-commoditizing energy as such, but e.g. in the market for green electricity the products again may seem very similar. In Germany for example, a developed market for green electricity, the consumer can choose between thousands of green electricity products (Herbes et al. 2018b), but the products are rather similar, with most of them being based on hydropower from Scandinavia or Austria (Herbes 2014; Herbes et al. 2018b).

Energy is a **low-involvement product** (Lohse and Künzel 2014). Involvement was defined by Zaichkowsky in her seminal study as "… a person's perceived relevance of the object based on inherent needs, values, and interests" (Zaichkowsky 1985:342). Involvement motivates consumers to spend time and gather information in order to make a careful decision. That is not the case with most consumers for energy which again increases their focus on price.

The environmental benefits of renewable energy cannot be experienced or evaluated by consumers even after purchasing the product, which makes renewable energy, like many other environmentally beneficial products, a **credence good**, i.e. consumers have to trust that the product really possesses the attributes that the provider claims it does (Kerschbamer and Sutter 2017; Sheldon and Roe 2009). Third party certification therefore gains high importance to support consumers' trust in the ecological attributes of renewable energy products (Friege and Herbes 2017; Bougherara and Piguet 2009).

Consumers do not exclusively reap the benefit of their decision for renewable energy: they support, in the case of a really environmentally beneficial renewable energy product, the production of a good that is partially a **public good**, i.e. a good which increases the utility of all humans on the planet through e.g. containing global warming (Karlsson-Vinkhuyzen et al. 2012; Rose et al. 2002). The public-good-attribute enables free-rider behavior (Menges and Beyer 2017). But providers can also use this attribute to increase the utility of customers by supporting them in experiencing a 'warm glow of giving', a phenomenon also discussed under the phrase 'impure altruism' (Andreoni 1989, 1990), i.e. consumers are satisfied and derive joy from helping others, in this case humanity, in fighting global climate change.

Renewable energy products require **explanation** in order for the customer to understand its characteristics and benefits. First, the provider needs to explain about how, where and by whom the energy is produced. And second, the provider has to explain the ecological benefits of the product (Friege and Herbes 2017).

Lastly, renewable energy more and more transitions from a good which is produced and sold in a conventional provider-customer relationship to a good, which is at least partly, produced by the consumer who turns into a **prosumer** (Kubli et al. 2018). Many households have started to put solar panels on their roofs and produce electricity. They expect their energy provider to integrate that production into the services they receive and thus trigger new business models (Schlemmermeier and Drechsler 2017).

The aforementioned characteristics of renewable energies interact with consumers' attitudes and behaviors which are the focus of the next section. In this combination, renewable energies are a challenging product for marketing experts and an intriguing object of research for academia.

4. Consumer values, attitudes and behavior towards renewable energy products

Companies that market renewable energy products to private end-customers have to take into account consumer values, attitudes and behavior towards renewable energy in order to craft effective marketing strategies. Therefore, consumers and renewable energy have been the object of academic enquiries for decades. Especially the field of electricity from renewable resources has been covered by many empirical studies, which often are looking at the willingness-to-pay (WTP) for green electricity products (Herbes et al. 2015; Oerlemans et al. 2016).

Past research has established a number of factors that drive WTP for electricity products from renewable energy sources. The first group of factors relates to the consumer as a person, his or her attitudes, values and socio-demographic characteristics like income and education. The second group contains attributes of green electricity products such as the underlying production technology, e.g. solar power. The third group consists of factors pertaining to the provider. Apparently consumers care about the question whether their provider is a large international corporation or a small local cooperative. And lastly, the political framework for renewables that consumers perceive around themselves also influences their WTP. A strong state support for renewables can, at least partly, crowd out private consumer action (Menges and Traub 2009). Table 1 summarizes the factors.

Although past studies do not unanimously agree on the impact of the abovementioned factors, we can summarize the broad tendencies as follows: consumers that are younger, better educated, have a higher income and live in bigger households show a higher WTP for green electricity. Likewise consumers that exhibit a high degree of altruism, environmental awareness, pro-environmental attitudes, show pro-environmental behavior and have knowledge on renewable energy, tend to have a higher WTP. Products that are based on solar or wind seem to elicit a higher WTP than those from biomass or big hydropower. Also, the percentage of renewable electricity in the product seems to drive WTP. The research on the impact of the provider is still underdeveloped, but it seems that consumers value local, small providers and those in the legal form of a cooperative.

Consumers can derive different types of utilities from the purchase of a green energy product, as from other products with pro-environmental attributes (Herbes and Ramme 2014): First, the product may support the consumer's values and self-identity. Second, in close connection to that the

Table 1: Factors influencing willingness-to-pay (WTP) for renewable electricity

Factors pertaining to the consumer as a person: socio-demographics	Age (Akcura 2013; Aravena et al. 2012; Bigerna and Polinori 2011)	Income (Chan et al. 2011; Mac Pherson and Lange 2013; Andor et al. 2017)	Education (MacPherson and Lange 2013; Mozumder et al. 2011; Bollino 2009; Andor et al. 2017)	Gender (Kosenius and Ollikainen 2013; Kostakis and Sardianou 2012; Zhang and Wu 2012)	Household size (Guo et al. 2014; Zorić and Hrovatin 2012)
Factors pertaining to the consumer as a person: psychogra-phics	Environmental awareness (Zorić and Hrovatin 2012; Kostakis and Sardianou 2012; Aravena et al. 2012)	Pro-environ-mental attitudes (Kosenius and Ollikainen 2013; Ito et al. 2010; Krishnamurthy and Kriström 2016)	Altruism (Menges and Traub 2009; Ito et al. 2010)	Pro-environmental behavior (MacPherson and Lange 2013; Oliver et al. 2011)	Knowledge on renewable energy (Zografakis et al. 2010; Xie and Zhao 2018)
Factors pertaining to the product	Percentage of renewable electricity in the product (Mozumder et al. 2011; Grosche and Schroder 2011; Bae and Rishi 2018)	Underlying technology (Kosenius and Ollikainen 2013; Borchers et al. 2007; Navrud and Gronvik Braten 2007)	Voluntary vs. mandatory scheme (Guo et al. 2014; Oliver et al. 2011; Menges and Traub 2009)		
Factors pertaining to the provider	Local / regional vs. national / international providers (Sagebiel et al. 2014; Bae and Rishi 2018)	Purely commercial provider vs. cooperative (Sagebiel et al. 2014)			
Factors pertaining to state-led support	Strong state-led support for renewable energy (Menges 2003; Menges and Beyer 2017; Andor et al. 2017)				

Source: Based on (Herbes et al. 2015), additional sources added by the author

product may help consumers achieve their goals such as expanding the use of renewable energy in their home country or, more generally, furthering environmental protection. As a side aspect, a provider may enhance consumers' perceived effectiveness in achieving these goals, e.g. by giving

detailed information on the environmental benefits of the product or getting an eco-label for it. But consumers can also derive more subtle psychological benefits from their purchasing decision. They may experience the so called 'warm glow of giving' (Andreoni 1989, 1990; Menges et al. 2005; Hartmann and Apaolaza-Ibáñez 2012; Ma and Burton 2016). Finally, pro-environmental products and services can offer opportunities for conspicuous consumption satisfying consumers' symbolic motives. I.e. they can demonstrate their environmental awareness and their willingness and ability to pay a premium for renewable energy (Palm and Tengvard 2011; Noppers et al. 2014). However, it should be difficult for providers to harness the potential of conspicuous consumption in the context of renewable energy, given the fact that energy is consumed in private, is invisible and a low-interest product (see section 3).

In a choice experiment, Murakami et al. found that Japanese consumers would be willing to pay a premium of 0.31 US$ per month for a 1% increase of the share of renewables in the electricity mix (Murakami et al. 2015). They also found that solar and geothermal power is slightly more popular in Japan than wind power. An earlier study showed that Japanese households would be willing to increase their monthly bill by 17 US$ to increase the amount of renewables (Nomura and Akai 2004). Other empirical studies also found positive WTP for green energy in Japan (Kinoshita 2018; Ise 2006) and Raupach reports a number of studies from market actors that confirm a positive WTP for green electricity and partly also suggest a preference for local suppliers (Raupach-Sumiya 2017). Although cross-national data are not fully comparable, there seems to be room for renewable energy products coming with a premium in the Japanese retail electricity market like in many other industrialized countries.

We have seen that consumers can derive various types of utilities from the purchasing of a renewable energy product and that they favor certain product attributes and provider types. The next section will look at how providers respond to the consumers' wishes.

5. Marketing of renewables today and its shortcomings

While the consumer side of the market for green energy has been researched in much detail as became clear in the previous section, research on the supply side, namely the marketing strategies of providers of green energy, is still rather scarce. The few existing studies tend to focus on electricity and not on fuel, heat or biogas. This section summarizes the existing research on providers' marketing strategies and points out areas for improvement. The section focuses on

product strategy, pricing strategy and communication strategy and omits distribution.

5.1. Product strategy

In some of the developed markets for green electricity, products seem to have little environmental benefit. In Germany (Herbes 2014; Herbes and Ramme 2014) and The Netherlands (Mulder and Zomer 2016) for example, most products are based on large hydropower. The reason for this strategic choice by providers is that certificates from this source are very cheap and providers of green retail electricity products can offer their products for a very limited premium. Sourcing all necessary certificates and / or underlying electricity from solar PV installations or wind power plants instead of hydropower would entail significant extra cost and thus oblige the providers to charge much higher premia to their end customers. But turning low-cost hydropower-based certificates into green retail electricity products means that consumers do not contribute to environmental goals with their product choice. The hydropower plants have often been in operation for decades and by buying such a product, no additional renewable energy production capacities will be triggered. In other markets like the UK, the technology mix in voluntary green electricity products is less concentrated on hydropower, but the green electricity in the UK that is used in consumer products is already incentivized via public support schemes. Therefore, the consumer choice has little impact on the installation of new renewable capacities.

Putting it bluntly, these products are worthless from an environmental perspective and consumers are misled in buying them. In order for consumer choice to translate into the expansion of renewable energy capacities, we need additionality. I.e. a green electricity product has to be designed in a way that whenever a consumer buys it, he will make a contribution to building more renewable capacity. Some providers in the market try to incorporate this aspect by making sure that their products are based to a certain extent on new renewable capacities. And some third party eco-label providers make this additionality a requirement for products that apply for the label (Leprich et al. 2017).

In many cases, the abovementioned hydropower in European green electricity markets comes from Norway, Sweden or Austria, so it is not from local sources from the perspective of consumers in large retail electricity markets in Europe. The low cost of certificates is also the reason why many electricity products in Europe consist of 100% renewable energy.

Unfortunately, many providers do not disclose the source of the renewable energy in their

products to the consumers, also in developed markets like Germany (Herbes 2014). In Japan, only half of the providers reveal from where they source their electricity (Matsubara 2018).

With renewable energy being a credence good (see section 3), third-party certification can be an important element in designing green electricity products. As mentioned in section 4, labels can also help to increase perceived consumer effectiveness, an important type of utility for green energy consumers. While third-party eco-labels do not seem to play a role in the UK, France and Italy, they are widespread in Germany (Herbes et al. 2018b). The market seems to be very dynamic regarding this attribute. In a review of more than 600 green electricity products in 2014, only 12% of the products in Germany carried an eco-label (Herbes and Ramme 2014). In the meanwhile, however, a majority of products under review in a recent study are certified by a third-party, many of them even carry multiple, at times a double-digit number of labels (Herbes et al. 2018b). However, the fact that many different labels are available in the market combined with the notoriously low familiarity of consumers with the labels (Truffer et al. 2001; Kaenzig et al. 2013; Mattes 2012) leads to a situation where labels probably do not help consumers in finding trustworthy green electricity tariffs that really have a positive impact on the environment, but rather contribute to consumer confusion.

To summarize, products in voluntary green electricity markets often have limited environmental benefits and do not respond to consumers' preferences for products that support environmental protection and local production. Labels seem to be of little help in giving consumers orientation in a confusing market environment.

5.2. Pricing strategy

Energy from renewable resources offers additional utility to consumers compared with energy from fossil sources. Depending on the product, consumers can contribute to their goal of increasing the share of renewables and protecting the environment with their purchasing decision.

One would expect this extra utility to be mirrored in price premia. For a number of states in the United States, MacDonald and Eyre found price premia of 0.008 Euro/kWh compared to the cheapest non-renewable tariff at average retail electricity prices between 0.1 and 0.9 Euro/kWh. In Australia price premia stood at 0.040 Euro/kWh compared to total prices of 0.2 Euro/kWh. The German average premium was calculated at 0.025 Euro/kWh with an average total price of 0.3 Euro/kWh (MacDonald and Eyre 2018). Two years earlier, a study showed for Germany that green tariffs were on average only 2% more expensive than the average of tariffs that are not 100% renew-

able and that many consumers could actually lower their electricity bill by switching to a green tariff (Top agrar online 2012). These results can be related to green energy being a commodity and a credence good combined with the fact that the extra cost that providers incur for sourcing electricity and / or certificates from hydropower plants are rather low. Along the same lines, a study that looked at how providers of green electricity communicate about their products found that many of them put the low price of their products in the foreground instead of stressing the environmental benefits of green electricity (Herbes and Ramme 2014).

One study (Herbes et al. 2016) has explicitly analyzed pricing strategies, albeit not for green electricity but for biomethane. Biomethane is produced by upgrading biogas, which in turn can be produced from material such as household organic waste, farm manure or energy crops (Muñoz et al. 2015). Therefore, biomethane is a renewable alternative for natural gas. The study found that providers offered differentiated products with regard to the raw material for producing the biogas (energy crops vs. waste), with regard to whether the products carry a third-party certification through eco-labels and with regard to the location of the production. Moreover, some providers offered additional eco-benefits by making donations to environmental projects. Interestingly, none of these differentiating factors was reflected in price differences. The only factor that had a robust link to the price was the content (percentage) of biomethane in the product (Herbes et al. 2016).

Overall, it seems that providers do not yet make full use of the opportunities for differentiated pricing for renewable electricity. They seem to shy away from taking the burden of communicating the, admittedly sometimes difficult to explain (see section 3), environmental benefits of their products and rather rely on low prices as a key selling point. This has also to do with the fact that energy, even renewable energy, can be perceived by consumers as a commodity which increases the focus on price.

5.3. Communication strategy

In section 3, the need to explain renewable energy products to the customer was already mentioned. So, how do providers communicate the benefits of their products?

As mentioned in section 4, consumers can derive different types of benefits from using green energy. How can companies that sell green energy products help consumers in realizing these utilities? Helping consumers achieve goals like environmental protection in general or more specifically the expansion of renewables requires giving information on the environmental benefits of the prod-

uct. Helping them to achieve a 'warm glow' can be achieved by telling them about the reduction in their personal CO_2-footprint through buying a green energy product. Regarding these two points, a study from 2014 revealed, that German green electricity providers in the online marketing on their websites most often mentioned environmental protection and climate protection as benefits of their products. But price already came in the third place almost on par with quality / certification, while regionality, support of new plants, improving the customers' carbon footprint, paying into funds for ecological projects and related extra benefits were not mentioned as often. Only very few products carried a description of detailed environmental benefits (Herbes and Ramme 2014).

Helping consumers practice conspicuous consumption and thus reaping status benefits from their pro-environmental purchasing decision would require helping them to make this choice visible to relevant others. However, this is, as already mentioned in section 4, rather difficult given the fact that electricity is, other than e.g. an electric vehicle, a reusable coffee cup or other objects, invisible and thus does not lend itself easily to supporting symbolic motives. However, providers could give away T-shirts, caps or other visible objects that would identify their owner as a buyer of green energy. Another interesting approach is providing customers with short, interesting stories, e.g. about local energy production, which these can in turn relate to others and thus present themselves as a pro-environmental consumer. To date, however, such strategies cannot be observed in the market.

Overall, communication strategies for renewable energy products seem to leave a lot to wish for. Given the mass of empirical marketing research on consumers and pro-environmental products in general and more particularly consumers and green energy, there seems to be a gap between what we know about consumers' attitudes and behavior and the way this knowledge is harnessed in marketing strategies.

6. Conclusion and outlook

Renewable energies are, besides other elements such as increasing energy efficiency, an important element in the fight against global warming. Their growth has been driven in many countries by state-led policy instruments such as FIT. But the costs of such instruments that are usually born by consumers have made themselves increasingly felt. Therefore, governments want renewables to become competitive in the market. Voluntary markets for renewable energy products are a way to leverage the environmental benefits of renewable energy and turn it into utility for

consumers that purchase green energy products at a premium without being forced by the state.

However, renewable energy products pose a number of challenges for marketing experts. Amongst other attributes, they are often perceived as commodities, are credence goods and require an increased amount of explanation by the provider for consumers to understand their benefits and to be able to differentiate between the products in the market. Consumers derive various utilities from purchasing green energy products: these products help them to further their goals like environmental protection, allow them to experience a 'warm glow of giving' and could, in the future, also enable status gains through conspicuous consumption.

Unfortunately, providers' marketing strategies especially in Germany are not yet aligned with what we know about consumers. Many products in the market carry little environmental benefits and disregard consumer preferences for specific product attributes such as local production or production from specific renewable sources. Most providers still find themselves in a competition that focuses on price rather than using the differentiation potential of energy products from renewable sources.

Japan has just fully liberalized its power markets in 2016 and incumbents and new entrants alike have started to compete for customers with electricity products that are based on renewables. Given the strong mental presence of the Fukushima accident in the Japanese population and the pro-environmental attitudes that many Japanese have, the market for green electricity products looks quite promising. It would be beneficial if Japanese providers did not repeat the problematic development of other voluntary markets for green energy but offered products that meet the preferences and goals of Japanese consumers and really benefit the environment by triggering an expansion of renewable energy.

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