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Current challenges of Germany's energy transition project and competing strategies of challengers and incumbents: The case of direct marketing of electricity from renewable energy sources

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HIGHLIGHTS

- Innovation sociological analysis of the market integration of electricity from renewables in the German electricity markets.
- Direct marketing of RES-E seen as a new strategic action field in the German "Energiewende".
- Strategies of incumbent and challenger actors to shape the rules of the field.
- Suggestions for the future design of policy instruments for direct marketing of RES-E.

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ABSTRACT

Electricity generated by renewable energies (RES-E) already accounts for 25% of Germany's electricity supply. This has led to recent discussions for a better market integration of RES-E. The paper examines how competing actors and their ideas on market integration developed new services for direct marketing according to their respective origins and tried to shape the regulatory framework. The paper analyses this process and explains the current shape of the field of direct marketing. Medium-sized structured actors, who favoured RES-E integration via the conventional wholesale power markets, and who formed early close coalitions with RES-E power producers at the same time, have been most successful in terms of market shares. Moreover, they have been very successful for different reasons in building-up coalitions with governance units and influencing the field rules and routines. Based on those findings, the paper will conclude with some policy advices for the future adjustment of the current regulative frameworks. As long as there is no evidence of how RES-E can be integrated most effectively and efficiently, policies should maintain a competition between different direct marketing strategies to find out which strategies serve the best in terms of achieving a successful energy transition.

1. Introduction

One main pillar of Germany's energy transition project is the transformation of its electricity system. Transforming a "large technical system" (Mayntz and Hughes, 1988) or a "socio-technical system" (Geels, 2004) implies fundamental effects on actors and infrastructures. When the German energy concept was proclaimed in 2010[1] and even stronger after the ultimate nuclear phase-out in 2011 (BMU, 2011), incumbent actors in the field of electricity generation were shocked (Becker, 2011), because until then they had mainly ignored the field of national renewables in their business concepts[2] and had focused on mainly conventional power generation and supply in Germany.[3]

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[1] The energy concept includes ambitious renewable energy development targets for the future electricity mix of 35% in 2020, 50% in 2035 and 80% in 2050 (BMWi and BMU, 2010).

[2] Apart from some projects of offshore wind parks (cf. Stenzel and Frenzel, 2008) and hydro power plants.

[3] In this field the big four utilities (E.ON, RWE, EnBW and Vattenfall) were dominating: Until 2001 they had controlled up to 90% of this market (cf. Brunekreeft and Twelemann, 2005). They are still dominating, even though in recent years, market shares in production capacity have declined as a consequence of the nuclear phaseout and due to the expansion of RES-E to approx. 73% of the competitive electricity generation capacity in 2012 (Bundesnetzagentur/Bundeskartellamt, 2013, p. 14f.).

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Unlike the situation in Spain or the UK, where incumbents from the field of conventional electricity soon invested into RES-E and shaped the developing fields according to their big and centralised structures from their field of origin (Stenzel and Frenzel, 2008), in Germany the field of RES-E was shaped by small challenger actors. Those actors were originally not coming from the field of conventional electricity but rather had their origins in environmental and anti-nuclear movements (Fuchs and Wassermann, 2008) or completely different backgrounds, for example as privates, farmers or project developers (as shown in Table 1[4]), who mainly invested in small scale RES power plants.

Whereas early local initiatives of challengers in the 1990s had often been impeded by incumbents (Heymann, 1995), open opposition stopped when the German Act of Renewable Energies (EEG) was passed in 2000[5] (Jacobsson and Lauber, 2006). After that time, the German electricity system was characterised by parallel developments. Under the secure investment conditions of feed-in-tariffs (FIT) challengers intensified their activities in the RES-E niche[6] , whereas incumbents were confident that also in the future the electricity system would be characterised by a centralised architecture and that distributed activities related to RES-E would not be able to leave the niches of the field. Instead of strategically investing in RES-E (Oesterwind, 2014) they increased their efforts in corporate political activity and pro-nuclear lobbying (Rossbach et al., 2010; Flauger et al., 2010).

With the ultimate nuclear phase-out in 2011, conflicts of former co-existing niches of RES-E and the conventional system were transferred onto a new level of field contention. The conventional system was put under severe pressure not only by the nuclear phase-out but also by the broad consensus among almost all political parties which officially acknowledged that RES-E were asked to leave the niche and to become the dominant technologies in the electricity system in the future. Thus, the formerly parallel developments of RES-E on the one hand and conventional technologies on the other hand came to a sudden stop and conflicts intensified—also on the question of who would be the actors to organise and hence, shape the process of transformation.

The majority of RES power plant operators were privates, farmers or project developers who did not have the knowledge and the experience to take over typical coordination tasks between electricity supply and demand. In addition, they missed infrastructural prerequisites, such as access to the wholesale power markets. But with an increasing share of variable RES (VRE) – such as wind and PV – in the German electricity mix, as shown in Fig. 1, those tasks will become more challenging, since there are by far not enough power storage and/or grid capacities in the system for aligning demand and supply in a system with high shares of VRE.

Generally, due to the EEG mechanism, which guarantees fixed feed-in tariffs, electricity generated in RES power plants is usually fed-in regardless of market prices (which typically reflect the current demand and supply). For those reasons incumbents started to cite critics who claimed that an increasing share of RES-E might cause overproduction during off-peak hours (Brandstätt et al., 2011; Hiroux and Saguan, 2010).

Recently, uncertainties and challenges connected to a high share of VRE have started to be discussed strongly, particularly in the context of future designs of the regulative framework for electricity systems and markets. The debates reflect an overall conflict based on contradictory assessments of the future interplay of existing market and system structures on the one hand and VRE on the other hand. The overall question of market and system *integration* vs. *transformation* became manifest in various subfields and aspects. In order to better understand this conflict between integration and transformation of RES-E it is crucial to mention that first niche activities in the field of power generation from RES in Germany were ideologically motivated and cannot only be understood in a technological sense. Early niche actors in Germany had always stressed the distributed, small scale and democratic character of RES-E (Scheer, 2006). They feared the notion of "integration" in terms of adaptation with the consequence of being forced to give up their original distributed, small scale and democratic logic. Whereas the idea of "transformation" stands for the opposite: In this understanding the old big infrastructures and central markets would be forced to adapt to the feed-in of VRE.

In order to better understand the ongoing conflict, this paper will analyse a specific sub-field of the field of electricity – the field of direct marketing of RES-E[7] – which has been developed in reaction to requests for market integration[8] of RES-E. An investigation of a rather small and new sub-field of the electricity systems seemed to be promising in so far, as it enabled a more detailed analysis of all kind of actors and strategies. The field had only emerged a couple of years ago via the so called green electricity privilege[9] (GEP) and via the introduction of the optional floating market premium[10] (MP) in 2012 and soon has reached an astonishing stage in terms of market volume (amprion et al., 2014). The paper will try to trace back this process and will analyse different actors (competing firms) and their strategies of organising the field—often with the help of supporting actors from the scientific field or from governance units. It will conclude with some propositions derived from the analysis of the sub-field on firstly how to interpret ongoing changes in the electricity field and secondly what policy advices can be derived from the results.

2. The theoretical perspective, method, and research question

High uncertainty and legitimising strategies of challengers and incumbents are typical phenomena of sectors that undergo transformation processes, when dominant technologies and infrastructures are displaced by new ones (Geels, 2010, p. 500; Fligstein and

[4] It is important to note, that in the Stromeinspeisungsgesetz, the first RES-E feed-in law of the year 1990, utilities in public ownership by at least 25% shares in stocks were not allowed to receive a feed-in-tariff for new renewable power plants (StrEG, 1990). After the start of the liberalisation process in the year 1998, the big 4 utilities of today have been mainly shaped out of the major public utilities through different merger and acquisitions activities.

[5] A forerunner of the EEG was the Feed-in law which was implemented in 1990.

[6] In 2000 the share of RES accounted for about 6% of the German electricity supply. In 2009 it was at 16% and in 2013 it was already at 25% (cf. BMU, 2013a).

[7] The analysis was conducted as a subproject of an interdisciplinary research project of the Helmholtz Alliance "Future infrastructures for meeting energy demands. Towards sustainability and social compatibility" as well as in the context of the project "Advancement of an Agent-based Simulation Model for the Analysis of Stakeholders' Patterns and Options of Action Regarding the Issue of Market Integration of Renewables under Various Policy Frameworks." (funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety).

[8] So far, there has been no uniform understanding of the term "market integration". Therefore, people refer to the point that VRE should also manage their feed-in in respect to wholesale power prices, other refer to a refinancing of VRE over the electricity markets in the long run.

[9] "Green electricity privilege" (GEP) means that utility companies can be partially exempt from the EEG surcharge if at least 50% of the electricity they provide is renewable electricity pursuant to the EEG. The exemption applies to the whole electricity portfolio, including electricity from non-renewable sources (BMU, 2011a).

[10] The Market Premium (MP) incentives direct marketing via the wholesale power markets by paying a floating premium on top of the day-ahead spot market price. The premium covers the difference between the market price and the FIT as well as marketing costs.