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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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.

Keywords

German Energy Transition; Actor Analysis; Market Integration of RES-E; Policy Instruments

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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[2] 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[3] and had focused on mainly conventional power generation and supply in Germany[4].

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[5]), 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[6] (Jacobsson and Lauber, 2006). After that time, the German electricity system was characterised by parallel developments. Under the secure

[2] 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).

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

[4] 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 percent of the competitive electricity generation capacity in 2012 (Bundesnetzagentur/Bundeskartellamt 2013, p.14f.).

[5] 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 (cf. Bundesregierung, 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.

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

Table 1: Operator types

	Ownership (in % of installed capacity)							
	Privates	Farmers	Banks + Funds	Project developers	Municipal utilities	Industry	4 major utilities	Others (contractors, internat. utilities)
Wind (onshore)	51,5	1,8	15,5	21,3	3,4	2,3	2, 1	2,2
Biogas	0,1	71,5	6,2	13,1	3,1	0,1	0,1	5,7
Biomass	2,0	0	3,0	6,9	24,3	41,5	9,6	12,7
PV	39,4	21,2	8,0	8,3	2,6	19,2	0,2	1,1

*Source: trend: research 2011, based on market data of the year 2010. Ownership groups are defined as following: Privates "Individuals are as natural persons (humans in his role defined as a legal entity". Farmers "*Owner or tenant of an agricultural firm (as main livelihood or sideline).

investment conditions of feed-in-tariffs (FIT) challengers intensified their activities in the RES-E niche[7], 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).

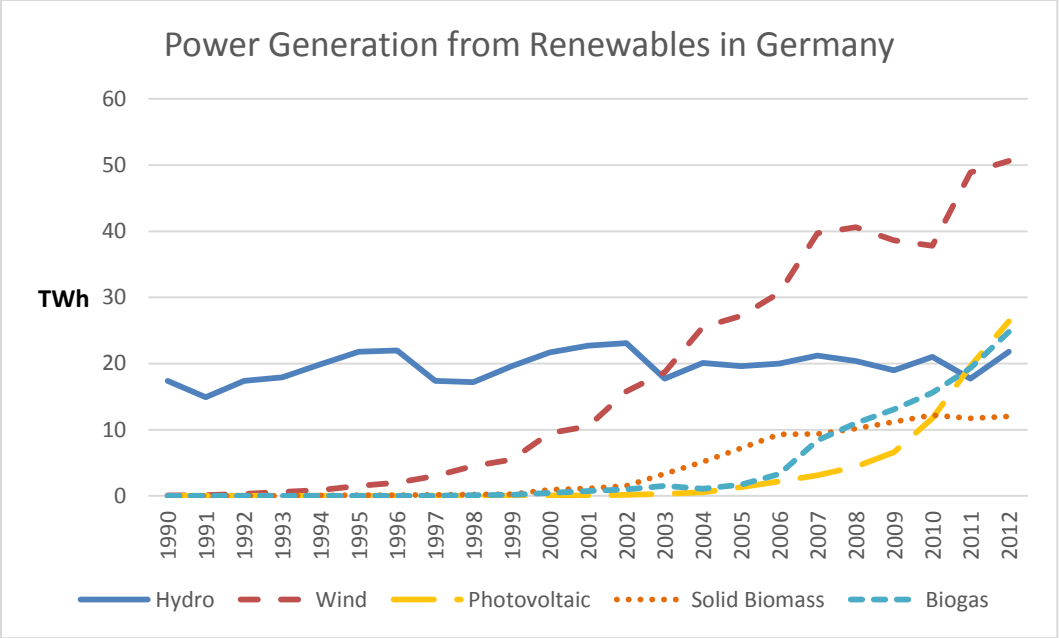
With the ultimate nuclear phase-out in 2011, conflicts of former co-existing niches of RES-E and the conventional system were transferred onto a new level of field contention. The conventional system was put under severe pressure not only by the nuclear phase-out but also by the broad consensus among 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

[7] 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).

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 figure 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.

Figure 1



Source: BMU 2013a

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 sub-fields 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[8] - which has been developed in reaction to requests for market integration[9] 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[10] (GEP) and via the introduction of the optional floating market premium[11] (MP) in 2012 and soon has reached an astonishing stage in terms of market volume (50 Hertz, amprion, TenneT, Transnet BW, 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

[8] 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).

[9] 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.

[10] "Green electricity privilege" (GEP) means that utility companies can be partially exempt from the EEG surcharge if at least 50 percent 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).

[11] 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.

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 McAdams, 2011, p. 9f). In the social sciences, a widely used framework in order to describe and analyse such interactions and conflicts between niche activities on the one hand and dominating technologies and infrastructures on the other hand is the Multi-Level Perspective (MLP) (Rip and Kemp, 1998; Geels, 2002; Geels and Schot, 2007). The MLP seeks to understand niche-innovations of challenger actors that deviate substantially from existing socio-technical regimes. Those regimes are dominated by incumbent actors, technologies and infrastructures that are typically supported by stabilised rules and routines. Furthermore, regimes are influenced by socio-technical landscapes, which consist of general social discourses and social and technical structures. The MLP has received some criticisms, that it only offered a monolithic understanding of regimes (Smith et al., 2005) or due to its lack of agency and politics (Geels, 2011).

2.1 The theoretical perspective and method

Market sociological concepts in the tradition of sociological neo-institutionalism such as the theory of strategic action fields (Fligstein and McAdam, 2011; 2012) offer an alternative theoretical perspective to the MLP, explicitly focusing on actors and market power. They suggest analysing how competing market actors enter supporting coalitions with governance units in order to co-design market structures and institutions. Furthermore, this theory interprets society as a complex web of strategic action fields and can explain how actors with different field backgrounds develop competing ideas how the field should be (re-)structured

and (re-)shaped (Fligstein and McAdam, 2011, p. 2)[12]. Such a perspective is helpful in order to understand how heterogeneous actors are shaped by different cultures, institutions and rules. In this paper, we will use the theory of strategic action field in order to contribute to the analysis of the transformation process of the German electricity system. In this context the German electricity system can be understood as an encompassing strategic action field, consisting itself of multiple sub-fields (Fligstein and McAdam, 2011, p. 8).

The analysis of direct marketing as an emergent sub-field of the German electricity system was carried out as a single case study using the method of process tracing (Hall, 2003; George and Bennett, 2005). The aim was to get detailed knowledge of the process of the market formation activities, considering all theoretical implications and intervening independent variables. Methods included document analysis, initial expert interviews with energy economists and a bank representative, 14 semi-structured interviews with actors from the field and a stakeholder-workshop (Reeg et al., 2013).

2.2 Field of investigation and research question

The analysis was conducted for activities related to market-integration of RES-E. Those activities (various forms of "direct marketing") of selling electricity from RES on electricity markets were interpreted as phenomena that take place in an emergent strategic action field within the encompassing field of electricity marketing and trading. In order to understand competing interests and identities of field's actors, their origins and backgrounds were analysed, because it was assumed that actors would try to shape the emergent field in accordance with the rules and habits of their fields of origin (Fligstein and McAdam, 2011). Direct marketing activities were understood as strategies of competing actors with different field backgrounds to organise market integration of electricity from RES and/or to influence the future design of electricity markets and the role of electricity from RES on those markets.

In order to better understand those activities, the German regulative framework in the field of RES-E have to be sketched very briefly. The Renewable Energy Sources Act (EEG) was passed in 2000 as a typical policy instrument of strategic niche management (Lauber and

[12] This idea can also be found in the MLP perspective. Some authors in the tradition of MLP left the sometime criticised monolithic bird perspective and suggested in-depth analyses of sub-regimes (Gruenewald et al., 2012, p. 451).

Jacobsson, 2006). It regulates the priority connection of installations for the generation of electricity from RES to the public electricity supply grids, the priority purchase and transmission of this electricity, and specifies a consistent FIT to be paid by the grid operators, generally over a 20-year period (EEG, 2012)[13].

But with an increasing share of RES in the German electricity mix, discussions on market integration of RES-E started. Incumbents argued that RES-E should be forced to leave their sheltered niche and instead should take responsibility and be offered to the markets just like conventional electricity. Also some actors from the field of RES-E were concerned about a better market integration because they thought it would be crucial in order to maintain the broad general acceptance of RES-E in Germany[14].

Selling electricity from RES (especially electricity generated by VRE) directly to the electricity markets would require completely new business models and actor cooperation, since marketing strategies between RES-E and conventional power differ substantially - as for instance VRE are not able to hedge price risks on the future markets (Reeg 2014). Our research question was: Who were the actors who organised the new field of direct marketing and how did they do this? Who was successful with which strategy and what conclusions can be drawn for policy makers in order to further transform the electricity system according to the goals of the energy concept of the German government of the year 2010?

3 Results: The emergent field of direct marketing

3.1 Actors

The investigation focused on the development of new business models and cooperation-strategies of intermediary actors, who organised the new field of direct marketing. Since the big part of RES-E producers did not have the knowledge to participate in or even organise direct marketing, they depended on intermediaries. Intermediaries were new actors who developed new business models and who acted as entrepreneurs and developed new technologies and services, i.e. organised direct marketing of electricity from RES:

[13] The EEG had been revised several times in the meantime, particularly adjusting the feed-in tariffs.

[14] Even though there were also critics from the field of RES-E who explicitly rejected the idea of market-integration

1) They convinced RES plant operators to opt out of the fixed feed in tariff (FIT) remuneration and sell the electricity on the open market.
2) They bought electricity and choose suitable marketing strategies (optional market premium (MP), green electricity privilege (GEP)[15] or staying in the FIT niche).
3) They undertook technical and organisational tasks (forecasting wind and sun or purchasing external forecasting services, making respective day-ahead electricity output-projections).
4) They developed technical services (electronic interconnection and monitoring of plants and real-time electricity outputs).
5) They scheduled communications with the grid operators.
6) They bid products on the wholesale spot and balancing energy markets.
7) They purchased balancing energy.

Furthermore, they developed ideas for an adjusted regulatory framework and consistently aimed to forge coalitions with governance units trying to implement those ideas. At this point, governance units had also set up actors workshops in order to gain insight into the activities, problems and solutions of the direct marketing actors from reality.

The actual producers of RES-E were the consumers of those innovative services, mainly playing the role and fulfilling the function of passive followers (however, some of the big plant operators behaved as lead users and were engaged and involved in the co-design of services and business models).

According to our analysis, the following types of intermediaries could be specified: major national utility companies (the "Big-4": E.ON, RWE, Vattenfall and EnBW), municipal utilities (sub-divided into "large", "small" and "with strategic cooperation with RES project-developers"), international utilities, green electricity providers (sub-divided into "end consumer-type", "business consumer-type" and "local direct-marketing type") and traders (sub-divided into "with experience in electricity trading" and "without experience"[16]).

[15] For explanation of the MP and the GEP see footnotes 12 and 13.

[16] Traders without experience started with their activities when direct marketing began to emerge and at times in which it was almost clear that direct marketing of RES-E will be important for market integration of RES-E and a lucrative business in the near future. Typical spin-offs of this type of intermediary have been for instance start-ups from research institutes or related fields."

For all types it could be asserted that their company strategies, business models, and choice of cooperation partners were clearly shaped by the rules and routines[17] of their fields of origin.

Table 2: Intermediary types

Intermediaries	Actor sub-types	Field of origin	Orientation
Big-4	-	Incumbents from various sub-fields of the conventional electricity system	International centralised structures
Municipal utilities	• Big • Small • Strategic cooperation with project developers	Incumbents from various sub-fields of the conventional electricity system (experience in electricity trading as well as links to the RES field were depending on size and status as pioneer).	Medium-sized structures
International utilities	-	Challengers from abroad (various sub-fields of the conventional electricity system), with specific knowledge and experience in green electricity trading	International and medium-sized structures
Green electricity providers	• End customers type • Business customers type • Local green electricity type	Challengers from the field of renewable energy	Decentralised structures
Traders	• With experience in electricity trading • Without experience	Challengers from the field of conventional electricity trading	Integrating decentralised structures with existing centralised infrastructures

3.2 First niche activities

Only very few of the actors shown in table 2 had been actively taking part in first niche activities which had already started in 2006, when two different ideas of direct marketing of electricity from RES were developed. One of those initial strategies was the hourly direct marketing of electricity on the spot market during those hours when prices were exceeding the FIT. Those challengers (type "traders") pursued the aim to build up infrastructures and knowledge, which were needed for trading electricity on the spot markets, something that was traditionally not present in the field of RES. Their idea was to connect many small operators (a first idea of a virtual power plant) and build up a powerful network in order to compete with the incumbent actors in the field of conventional electricity trading

[17] Those "rules and routines" included all forms of business-related activities. Apparently, there was a huge difference of routines and rules between trading on wholesale markets or delivering green electricity to end-customers. There were also different strategies of forecasting activities or diverging ways of approaching and convincing power plant operators to sign contracts.

(Zimmermann, 2011, p. 36). But hourly marketing was banned from 2008 on. In 2009 an amendment of the EEG (§17 EEG 2009) supplied the first regulation on selling power from EEG power plants on the spot-market on a monthly basis[18]. But those first actors, who had developed the idea of organising an hourly "opting-out from the FIT" for interested RES-E operators, complained that their model would not work on a monthly basis. Furthermore, due to low electricity prices on the spot market caused by the financial crisis after 2009, achievable profits by direct marketing under §17 EEG were not attractive compared to the EEG-tariffs anymore (Krewitt et al., 2011). Hence, this attempt of challengers and the first idea of organising a new field of direct marketing were put to an end immediately.

Another first niche activity of direct marketing followed the idea of selling EEG-power as green electricity. Actually, EEG-power was not competitive with green electricity from non-EEG-plants (such as big hydro from Germany or abroad), which originally had been sold as green electricity in Germany within the European Renewable Electricity Certificate System or via bilateral contracts between RES-E plant operators and electricity suppliers. But the regulative framework, §37 EEG 2009 (called the 'green electricity privilege' (GEP)), supported the idea of also selling EEG-power as green electricity[19]. Some challengers (type "green electricity providers") started to contract savage and landfill gas plants and operators of older wind power plants on low FIT remuneration rates. Those wind power plants delivered green electricity directly to the supplier so that those challengers could develop a business model pursuant to §37 EEG 2009. These challengers aimed to offer a portfolio, which featured as much electricity as possible generated in German EEG power plants; the rest was topped up with green non-EEG-power (Zimmermann, 2011). Also this second pioneering idea of direct marketing was (without regard to economic reasons) led by the leading principle of supporting RES (by labelling the electricity produced in RES plants as "green").

[18] In the entire forerunner versions of the EEG there were no paragraphs which had addressed direct marketing directly.

[19] The power from EEG-plants which is not in direct marketing is by law bought by the TSOs and sold since 2010 on the Spot markets as "usual" grey electricity. The possibility of selling green electricity from EEG plants existed since the initialization of the EEG in the year 2000 (EEG 2000 § 11 (4), EEG 2004 § (3), EEG 2009 $ 37 (1), EEG 2012 § 39 (1)) but was demolished in the latest amendment of the EEG in the year 2014, although an authorisation to issue ordinances to create a new green electricity market has been re-established in the last days of negotiation.

Summing up both forms of intermediaries' niche activities, apart from common economic goals, challengers pursued goals such as contributing to the transformation of Germany's energy system (which at that time was not political common sense). They aimed at supporting RES, and both actor types ("traders" and "green electricity providers") had specific ideas on how direct marketing of green electricity could further contribute to the successful expansion of RES. The hourly marketing-business model was banned right from the beginning on in order to avoid "cherry picking". More successful was the GEP business model.

3.3 Conflicts and competition in the field: the situation in 2010 and 2011

In the time from 2009 to 2012, when the EEG-surcharge has - due to different reasons - risen tremendously from 1.30 € ct/kWh to 3.59 € ct/kWh, taking advantage of the GEP became very attractive for many actors. At this point, direct marketing left its niche and became a genuine sub-field of the energy system with specific rules, routines and actors playing specific roles in this field according to their origins. This is what happened in 2010 and 2011. The process was accompanied by struggles about the regulative framework.

Incumbent actors in the field of (conventional) power trading observed the niche activities and either copied the activities or developed own ideas of direct marketing of electricity from RES. Some of those incumbent actors were municipal utilities that operated solid biomass plants. Many of those big biomass plants were rather old and in a low FIT remuneration and hence direct marketing via the GEP became an attractive alternative (interviews with representatives of municipal utilities). Some of the bigger municipal utilities organised this way of direct marketing by themselves, others cooperated with green electricity providers. Also the Big-4 began imitating the business model using the GEP, founding their own small companies to offer a portfolio which consisted of 50% of electricity generated in their own EEG plants (run-off river or biomass), topping up the rest of the portfolio with grey power. But goals and strategies of the Big-4 did not focus on this new field. For them direct marketing was a rather small side-business and a strategy for better public acceptance. The general attitude of the Big-4 was hesitant. On the one hand they claimed that direct marketing of RES would be easy for them due to their knowledge and infrastructures and equity base. On the other hand they were badly positioned in handling

decentralised structures and cooperating with small and heterogeneous actors (interview with one representative).

When field activities had started and only few power plants (on low remuneration rates) were suitable for direct marketing, the majority of actors (apart from few green electricity providers) considered direct marketing only a side-business. The situation changed, when the political and scientific discussions of a new regulative framework to actively support direct marketing of RES via the wholesale power markets concretised (Sensfuss and Ragwitz, 2009; Sensfuss and Ragwitz, 2011). Many actors became aware that the original idea of some pioneering intermediaries to trade electricity from RES on the conventional electricity markets might finally turn into a profitable future business. In mid-2010 some municipal and international utilities started to strategically invest in the new field. They quickly defined the goal of becoming the most important and biggest actors in the field (interview with a representative of a RES association). The same held true for some new intermediaries which on the one hand had links to the field of RES, but were on the other hand very familiar with electricity trading. Actors like big municipal utilities (some of them built up strategic cooperation with project developers) or international utilities had their origins in conventional electricity trading and complementary big hydro plants on the European scale. Being smaller than the Big-4, they interpreted the “Energiewende” as their chance to rebuild main parts of the field of electricity. In their view, the new field (and also the sub-fields) should be shaped and structured by medium-sized enterprises and technologies (interviews with three representatives of municipal and international utilities). Hence, for those actors direct marketing of electricity from RES was an important possibility to build-up strategic coalitions with small actors and decentralised technologies in the field of RES. Bigger than the majority of the small actors in the field of RES, they claimed such cooperation as perfect matches in order to jointly build-up medium-sized structures and shape the new field of direct marketing in a way that the Big-4 could not repeat their traditional strength and success which they were used to from the conventional energy fields. Mainly for strategic reasons, those medium-sized actors then quickly defined direct marketing as an important future core-business and invested a lot of time and money in order to find partners among the RES operators. They were successful in doing so, because many actors from the field of RES also claimed the necessity of medium-sized structures. An interesting example of such a cooperation was the coalition between Trianel (a consortium of about 50 municipal utilities),

Enertrag (a project developer) and Arge Netz (a group of cooperatives) who jointly formed the Gesy network (Ristau, 2012) in order to build-up medium-sized structures to successfully organise direct marketing.

Smaller actors, challengers from the field of green electricity providers as well as traders were well aware of the strategic behaviour of the medium-sized actors and the situation in the emergent field became highly competitive. Competition also intensified because RES operators were increasingly attracted by the idea of direct marketing as additional incomes could be generated through new support instruments or privileges. The associations had successfully spread information and offered courses and seminars on the possibility of direct marketing as an alternative for FIT contracts (interviews with two representatives of RES associations). Whereas in 2010 the business was in the niche, in 2011 the field emerged and activities left the niche.

This development was accompanied by ongoing debates on the regulative framework. The situation in 2011 was quite unique: Although almost everyone of the new market participants knew that the newly built-up GEP business model would economically only be profitable for one year, as the GEP was highly contested, many actors were still entering the market to participate at least for one year. Only the few challengers from the field of green electricity providers, whose portfolios were based on a solid economic foundation with EEG plants in very low FIT remuneration classes, were likely to be able to continue the GEP business model after 2011. But everyone was hoping that the cooperation, networks and knowledge they had built-up in 2011 could be used as a basis to develop a new and even more profitable business under a new regulative framework from 2012 on. Therefore, all relevant actors formulated proposals for an adjusted regulative framework in the revised EEG 2012.

Not only from the part of politicians but also from the part of those actors who had originally developed the GEP model in the niche, windfall profits by the new beneficiaries were complained (EWS Schönau et al., 2011; Bundesregierung, 2011; Nick-Leptin, 2012). Another strong argument (by big and medium sized actors as well as intermediaries who pursued the idea of integrating the decentralised structures into the conventional markets) against the integration of RES-E via the utilities directly using the GEP was its accompanying increase of the EEG surcharge for all other end-consumers.

Finally, relevant changes and reforms to support direct marketing were introduced in the new amendment of the EEG 2012 (EEG, 2012): From 2012 on, direct marketing was explicitly encouraged and flanked by a new support mechanism called the 'optional market premium' (MP) (§ 33g EEG). It established an option to transfer the duties of selling electricity from RES directly to the electricity markets from the transmission system operator to either the RES operator or an intermediary respectively. In this model direct marketing was supported by a) compensating the differences between FITs and spot-market prices and b) an additional management premium (12 €/MWh in 2012, 10 €/MWh in 2013, 8.5 €/MWh in 2014, 7 €/MWh in 2015) for wind and solar power plants to cover mainly profile service costs. The management premium was also offered to dispatchable plants, albeit at a much lower level than wind and solar. Furthermore, a 'flexibility premium' mechanism was introduced for the operators of biogas plants who switched into direct marketing[20].

Thus, big and medium sized actors as well as intermediaries who pursued the idea of integrating the RES-E via the conventional wholesale power markets were successful in terms of shaping the field[21]. Even though this new regulative framework was supported by a broad coalition, not only from the conventional field of electricity but also from the field of RES, some economists criticised high costs and windfall profits (Gawel and Purkus, 2013; Wetzel, 2012). Supporters on the other hand claimed that it would further trigger innovations and learning processes in the field like improved forecast prognosis and real time RES feed-in data (Zimmermann, 2011a; 2012; Klobasa et al., 2013). It was also expected that the MP would avoid the formation of negative wholesale power prices and trigger a more demand-oriented feed-in of RES as well as pooling in virtual power plants (Sensfuss and Ragwitz, 2011).

Challengers of the type "green electricity providers" were critical concerning the new conditions for the GEP. As the applied rules for using the GEP of the year 2012 resulted in

[20] The premium could be claimed for the provision of additional installed capacity for on-demand use (§ 33i EEG).

[21] The finally implemented optional MP model had been developed by scientists from the Fraunhofer Institute (ISI) (Sensfuß and Ragwitz, 2011) together with actors favouring the integration via the wholesale markets. There had been constant talks and meetings about possible variations of the ISI-model. Even though the BDEW (the association which traditionally represented the interests of the Big-4 and other conventional utilities) did not manage that its ultimately favoured version was chosen, the newly implemented regulative framework reflected many of its ideas.

higher costs for the rest of the not privileged end-consumers paying the EEG-surcharge, they stated that an adjusted GEP mechanism would have been the best mean of promoting market integration (EWS Schönau et al., 2011; Hummel, 2012). Technical system integration of RES-E could only take place when the supplier contracted the RES-E plant operator directly - as in the case of the GEP, where the fluctuation of some RES-E would really have to be integrated into the portfolios. Even though the "green electricity providers" had agreed on the need to develop the GEP further, they were harshly critical of the new conditions, because besides the newly implemented floating MP models, requirements for the use of the GEP (now regulated under §39 of EEG 2012), were far more restrictive than under the previous §37 of EEG 2009[22]. Exemption from the EEG surcharge (2011: 3.53 € ct/kWh) was now limited to not more than 2 € ct/kWh. Furthermore, the GEP could only be used by those actors who met - in addition to the already existing requirement that at least 50 % of their electricity was generated in EEG plants – the precondition, that now at least 20% of the portfolio should be derived from VRE (wind or PV). These qualifications have to be met in average throughout the whole year and additionally in eight out of twelve months. Critics estimated that the GEP would be no longer a profitable business model under the 2012 amendment (EWS Schönau et al., 2011; BEE, 2011). Obviously, those challengers had not managed to forge sufficiently strong coalitions with governance units, and therefore were unable to get §37 EEG amended in such a way that it would still support this business model, while banning windfall profits and eroding solidarity of the RES-E support costs[23].

Another concept of direct marketing, which had also been developed and supported by green electricity providers together with some challengers from the field of RES was the idea of selling local green "citizen" power[24]. Selling local green power was an example of "other forms of direct marketing" (§33b, Nr. 3 EEG), also mentioned in the EEG 2012, but not explicitly promoted by a support mechanism. For this reason the promoters of this idea complained that the EEG 2012 would not explicitly support this - in their point of view - innovative and decentralised form of direct marketing (interview with a representative of a

[22] In the current legislation process for the revised EEG 2014 the GEP has been abolished completely.

[23] Contrary to the situation in 2000, when the EEG was passed as the successful policy-outcome of an advocacy coalition between RES-actors and supporters on the one hand and representatives of the government at that time (Lauber/Jacobsson 2006; Hirschl.2008).

[24] This means that electricity was sold to a supplier who connected the power plant (e.g. the wind farm) directly to end consumers, thus avoiding the electricity tax (§9, Abs. 1, Nr.1. StromStG).

project developer), which was supposed to be especially suitable to achieve high RES acceptance by the local residents.

3.4 Field settlement

The market premium (MP) model was specifically designed to make direct marketing via the wholesale spot markets more attractive and to shepherd it out of the niche. When the MP model came into force in January 2012 the majority of the actors solely focused on this new business as it was economically way more attractive compared to other direct marketing concepts. Within a couple of months there were only few actors left who used the GEP model for direct marketing (Hummel, 2012, p. 49). Hence, the business model which had originally shaped the emergent field was pushed back into a niche.

In stark contrast to those niche activities, the MP business model was very profitable for the actors right from the beginning. Since actors had been very active in promoting their innovative services and offers to power plant operators (especially to on-shore windparks) in 2011, from the beginning of 2012 on 40% of the installed capacity of on-shore wind energy sold its electricity to the wholesale power market by using the MP model, in July 2012 already 70% of the installed wind capacity used this model (Rostankowski et al., 2012)[25]. Due to the high support level of the management premium (MP) for variable renewable energies (VRE) in order to attract the power plant operators to opt for direct marketing via the MP model, again windfall profits were complained. Consequently, new discussions on a further modification of the regulative framework started, calling for a reduced MP (Thomas, 2012).

Since January 2013 the MP was down to 6.50 €/MWh (4.50 €/MWh in 2014 and 3 €/MWh in 2015) for wind and PV power plants. For some actors, especially the smaller ones, the reduced MP made it impossible to keep up their business activities in the field of direct marketing (e21.info, 2012). Smaller actors generally suffered because economies of scale in energy trading as well as portfolio effects of RES were crucial competitive advantages (cf. Reeg et al., 2013; Nestle, 2011) and as they were faced with the disadvantage that they had more difficulties to offer bank-guarantees compared to medium-sized and big actors. But bank-guarantees were important success factors because RES operators with debt financing

[25] At the end of 2013 85% of the installed capacitiy of wind, 12% of photovoltaics and almost 50% of biomass energy were using the MP model (Rostankowski et al., 2013).

had to inquire their banks before opting-out of their FIT-contracts and signing contracts with intermediaries for direct marketing (interviews with various intermediaries and a bank representative).

Another important success factor was to have close links both to the field of RES and to the field of conventional electricity trading. For this reason incumbents with strategic cooperation with project developers were successful and also some challengers (traders) with experience in conventional electricity trading on the spot markets. Both actor types had been very active in investing and developing new technologies: An important idea to better balance VRE, was the organisation of virtual power plants by interconnecting and monitoring distributed plants (energy2market, 2014; BWK, 2013) and by developing intelligent remote control technologies (ZfK 2013; Wehrmann, 2013). Once this technology was established it soon became the standard among the market leaders, furthermore promoted and supported by the adjusted regulative framework: From 2013 on, the management premium was higher for those power plants, which were equipped with remote control technologies (7.50 €/MWh in 2013). Consequently, the more innovative actors could raise their competitiveness because they could support power plant operators technically and sometime even financially to equip their wind parks with remote control technologies and hence could offer more interesting tariffs compared to less innovative actors (interview with one representative)[26]. Hence, the original idea of market integration of RES-E to foster innovation actually was successful.

When the MP model had been implemented, the focus of the activities was on the spot markets. But due to the new technologies, which had been developed, an increasing amount of actors successively started to offer electricity from dispatchable RES on the balancing market (Energy2Market, 2014a; Next Kraftwerke, 2013). Those efforts were widely approved and considered as an important demonstration how RES could take over responsibility for the various challenging tasks like ancillary services (IWR, 2014; IWES 2014).

But challengers who kept on to the vision of supporting decentralised structures (some of the green electricity providers as well as actors who had developed ideas of local direct marketing) were highly critical about the narrowed interpretation of “market integration”

[26] Real-time feed-in data and better forecast can also reduce balancing energy cost leading to more attractive bonus rates/payments for the plant operators.

that only focused on trading electricity from RES on the conventional wholesale power markets. They kept on developing alternatives to the existing dominant form of direct marketing as well as ideas for an adjusted support scheme, like the "eco-power-market-model" (EWS Schönau et al., 2013; LBD, 2014).

On the contrary, incumbents as well as the international challengers and some traders tried to consolidate the actual shape of the field. Those actors, who had managed to set-up the most profitable business models and already traded huge portfolios, were actively promoting the idea of "obligatory direct marketing" and to abolish the FIT remuneration mechanism in the EEG (BDEW, 2013; 2014).

As it is shown in table 3, the most successful actors (in respect of their market shares) were all equipped with big portfolios and remote control technologies and/or set up virtual power plants to further reduce profile service costs.

Table 3: Major actors*

Company	**Actor type**	**RES portfolio size [MW] in February 2014**	**Remote control capability**	
			Virtual power plant	**Remote control**
Statkraft Markets	International utility	8500	x	x
Energy2Market	Intermediary with experience	3230	x	x
Gesy	Strategic cooperation between RES developer and big municipal utility	2750	?	?
Clean Energy Sourcing	Providers for business customer / intermediary with experience	2530	x	x
MVV Energie	Big municipal utility	2500	x	x
Grundgrün	Intermediary with experience	2450	x	x
WE² (EWE und WPD)	Strategic cooperation between RES developer and big municipal utility	2300	x	x
Nordjysk Elhandel A/S	International utility	>2000	?	x
Vattenfall	Big-4	1000	x	x
Quadra Energy	Strategic cooperation between RES developer and big municipal utility	>1000	?	?
Axpo	International utility	>1000	?	?
E.on	Big-4	1000	x	x
RWE	Big-4	870	?	?
Next	Intermediary with experience	862	x	x

Sources: Köpke, 2014; Lessner, 2014

*The table only lists companies with RES portfolios of 800 MW and above.

4 Discussion

Focusing on the analysis of competing actors and their activities to shape the sub-field of "direct marketing", we gained more in-depth knowledge of the current transformation process of the German power system. By offering an alternative to the often-used theoretical perspective of "monolithic"[27] energy regimes vs. niches, the field perspective and the focus on actors firstly showed that there were huge differences among challengers as well as among incumbents. Secondly, those differences could be explained by the respective origin of the actors. Furthermore, the analysis showed how the transformation process is accompanied by struggles over field rules and coalition-building-processes (Rosenbloom and Meadowcroft, 2014).

Neither the Big-4 nor the majority of the municipal utilities are market leaders at present, even though they had been quite successful in co-designing the regulative frameworks. Instead, those actors were succeeding (in respect of their market shares), who had entered the field very early when it was still in the niche and who built-up strategic cooperation or already had close links with actors from the field of RES. Those actors also successfully triggered innovations – not only in respect of technologies and services but also in developing new rules and routines. They could do so, because they invested a lot of time and money and quickly defined direct marketing as a future core-business and as their chance to re-shape the originally distributed project of the "Energiewende" according to their ideas of medium-sized structures. Medium-sized and international actors, experienced in trading-practices on central markets on the one hand and with close networks to RES actors on the other hand, are dominating the new sub-field today.

At the first glance, the success of medium-sized actors could back recent discussions on the role of municipal utilities as important actors in the German "Energiewende" (Berlo and Wagner, 2013). But not the small and newly founded (challenger type) municipal utilities were successful (due to lacking financial resources and trading-practices on central markets), but rather big but still innovative incumbent municipal utilities. Furthermore, those small actors, who had originally started niche activities of direct marketing, were not able to build-up close coalitions with governance units in order to find support for their suggestions of an

[27] See the criticisms by Smith et al. (2005) and Geel's suggestions for further research (2011).

alternative eco-power-market model. Hence, the field of direct marketing is neither shaped by big structures of the Big-4, nor by the leading principles of distributed and small structures, as challengers of the green electricity provider's type had pursued.

Those findings can also be discussed in a more general assessment of Germany's project of electricity system transformation. The field development has been accompanied by debates on the actual purpose and necessity of market integration of RES. The German government clearly called for market integration (BMU, 2013; BMWi, 2014) so that decentralised structures of electricity generation would be compatible with existing market structures. The majority of the actors in the field of direct marketing shared this perspective, especially those with the big market shares on the conventional energy field. Even though there were new actors involved and medium-sized structures were more successful than in other electricity-related fields, the overall field logic is dominated by the field of conventional electricity trading: The successful direct marketing activities are led by the motivation to make RES comparatively manageable as conventional electricity, to prepare them for large scale markets and infrastructures.

5 Conclusion

Reflecting the results of our analysis in the light of current scientific and political debates, it can be derived that the outcome of the German "Energiewende" in respect to future power structures and field logics is much unknown. Even though RES are currently leaving the niche and are on the verge of becoming the dominant electricity sources, it is to question if this development leads to a new decentralised system, new market structures and logics. As long as the majority of actors support the idea of market integration via the wholesale market, decentralised and local solutions of market integration will stay in the niche.

There are only few critics of the idea of an integration of RES-E via the conventional wholesale markets. Their claims (that the maintaining existing market structures would forestall a thorough transition of the system and conventional power plants are to become more flexible (Leprich et al., 2012)) are currently not taken-up by powerful governance units. Those scientific actors who are stressing the importance of integrating RES-E into the existing structures have closer links to governance units (Klobasa et al., 2013). Keeping in mind that the transformation process is characterized by high uncertainties, there is

currently lack of evidence which of the discussed frameworks will proof as adequate in the future.

As the analysis has shown, market actors do not only contribute to the development of technical and service-related innovation but they are explicitly engaged in developing and promoting ideas for future regulative frameworks. This process is highly contentious, but this triggers innovations and can help to overcome path dependencies and lock-in effects – or at least can contribute to the formulation of alternative paths and visions. The transformation process has still a long way to go and is highly dependent on innovative actors. In the past, neither the Big-4 nor the medium sized utilities have shown strong innovative behavior (Fuchs and Wassermann, 2008). The same holds true for their current activities in searching and building-up new business models and services (Richter, 2013). Instead, mainly challengers from the niche had and still have completely new visions and disruptive new ideas on the future electricity system. The field of direct-marketing showed similar phenomena – and it showed furthermore in detail how innovative ideas and suggestions for an alternative and/or additional regulative framework by challengers has been contested by incumbents and was not supported by governance units.

Some policy-related conclusions can be derived from the analysis: Keeping in mind the uncertainty of the transformation process and the innovative potential of challengers, decision makers should strategically use their potentials and provide additional frameworks, e.g. like it is intended for end-customer-related direct marketing (§ 95, EEG 2014). As shown in Reeg et al. (2013) direct marketing activities of RES-E by intermediaries are strongly characterized by economies of scale. As investigations show and as market participants expect, the current market design and support mechanisms logic of RES-E trading via wholesale power markets might lead to a consolidation of the market in the next years. Respecting the switch from an optional to a mandatory direct marketing in the revised EEG 2014 (EEG, 2014), it is possible that the market for direct marketing services will switch from a supplier to a demand market with inherent changes in market power execution possibilities by big intermediaries. Considering that one political goal of the liberalisation was and still is to ban oligopolistic structures and secure a competitive power market, this possible development should be carefully observed in the future. Hence, as long as there is no evidence of how the VRE can be integrated most effectively and efficiently, path-

dependencies and lock-in effects should be avoided. Policies should maintain different direct marketing strategies like via the market premium or promoted end-customer-related or local direct marketing to find out which strategies serve the needs the best.

A further policy-related conclusion from the analysis of one emergent sub-field in the course of the transformation process is, that conflicts over field rules and competing actors strategies and innovations may well occur also in other emergent fields. It is therefore highly recommended to observe, how current competing debates on flexibility measures like storage technologies or the question of the necessity of capacity markets are reflecting power structures in the field besides from objective and rational needs and solutions. Hence, also for other emergent fields we would suggest not to ignore the challengers' perspectives and visions and to draw on their capacities and potentials for innovations.

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