

Green Power in liberalised electricity markets: Market experiences and policy implications as examples for transdisciplinary research

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Abstract

Green Power, which is electricity from environmentally friendly sources, is a new product on electricity markets. With ongoing market liberalisation Green Power products respond to customers' demand and, at the same time, represent a means to promote a more sustainable energy system in the future. In order to identify conditions for further market development, both, the micro- and the macro-economic aspects have to be assessed in a joint approach.

Market experiences shows, that the demand for Green Power has a significant potential and is highly dependent on suppliers marketing activities as well as on the economic and policy framework. Governmental support policies and third party information tools like an eco-label for Green Electricity can interact synergetically and establish a stable environment for the use of renewable energy in electricity supply.

Evaluating customer preferences, marketers' positions and policy impacts in a transdisciplinary approach of research has proven as a promising way not only regarding dissemination and application of research results but of establishing a direct feedback loop from practise. In a field of numerous diverging interests of economic actors and complex relationships research has to provide a multidimensional perspective with a close link to practise.

In a certain way, transdisciplinary research will play the role of a marketer with a product fulfilling his customers needs while at the same time keeping his independent profile. The consequence for the business and policy world as well as for the scientific community is a change of financing and evaluation paradigms in order to promote transdisciplinary research.

Introduction

With ongoing electricity market liberalisation, customers get the choice not only between different suppliers, but also between different electricity products. Electricity marketers in turn have to face the necessity to differentiate themselves and their products from their competitors. Instead of just participating in fierce price competition, suppliers increasingly follow quality-oriented strategies. Focusing on the attribute of clean generation they sell Green Electricity from RES or highly energy efficient co-generation plants. The basic principle of these products is that within a certain period (usually one year), the supplier guarantees to generate or purchase the amount of electricity from Green resources which corresponds to the customers' demand.

In recent years the market for Green Electricity developed dynamically. In completely liberalised markets there is competition between traditional electric utilities as well as newcomers like Green Power marketers, traders or renewable energy developers and producers. As a consequence, the number and variety of Green products grew considerably.

In contrast to monopoly conditions, customers now have to face the new situation of product choice. This requires reliable and comparable information about price and quality (i.e. environmental quality as long as Green Power is concerned) especially in a field where complex technical, economical and ecological issues arise.

Green Power marketers are primarily interested in an increasing market and reasonable profits. Key for their success is to communicate the ecological benefits of the product and to assure credibility. For that reason, suppliers will appreciate a broadly accepted eco-labeling scheme, which on one hand serves as a powerful marketing tool and on the other hand sets up common guidelines for product design.

Policy actors in this field have to represent the public interest in an ecologically oriented transformation of the energy system, which inter alia is expressed in quantitative goals for the use

of RES and instrumentalised in different national support mechanisms. On the other side, the government has to establish an appropriate framework for a fair competition on the electricity markets in general.

Micro-economic aspects: Early Green Power Marketing Experiences

While the Green Power market is emerging in almost every European and North American country, there are different levels of maturity. In Switzerland with its not yet liberalised market, suppliers are usually local or regional electric utilities. Most of them focus on photovoltaics. The prices of these products are cost-based, and hence about 7 to 8 times higher as conventional electricity.¹ Marketing efforts reflect the traditionally low importance of marketing in the electric power industry. For example, typical means of communication are supplements to the electricity bill and brochures that can be obtained at the utility office. Not surprisingly, the market share of green power products in Switzerland is still very low, in the range of 0.1-0.4 % of sales. Nonetheless, successful marketers like the municipal utilities of Zurich and Bern achieve response rates of up to 4 % of the households in their respective supply areas.²

The situation in the liberalised US markets in California and Pennsylvania is already more dynamic. In the early days of the liberalisation of the Californian market, about 50 % of the domestic customers who switched supplier have chosen a green power product.³ In the meantime, this figure has risen to more than 90 %. This is due to the fact that conventional competitors have either pulled back from the domestic market because of the very thin profit margins, or switched all of their customers to green power, making use of a 1.5 ct/kWh incentive payment granted by the California Energy Commission for green power customers. Among the Californian green power customers are a number of businesses and public authorities, such as Patagonia, Toyota, Birkenstock, the Los Angeles Airport or the City of Santa Monica.

In Pennsylvania, on the other hand, there is a much more intense price competition. This has resulted in a much higher rate of switching. Within six months after the market was opened, already 12 % of the customers had chosen a new supplier. The relative share of green power customers is about 15-20 % which is lower than in California, but corresponds to a higher absolute number of customers.

The dynamic development of the green power market in the two US states has been facilitated by both the early existence of a widely recognised labeling and certification scheme and the professional marketing strategy of the market leader GreenMountain.com. The Vermont-based start-up has spent significant amounts of money on a spectacular campaign with advertising on TV, radio, billboards, the Internet and print media as well as on a hot air balloon, to set the stage for a large direct mail campaign. In a second phase, a giant rock festival was organised in Philadelphia, entitled "Know Your Power Festival".

As for the comparison between the Swiss and US cases discussed above, it seems clear that the cautious beginnings of green power marketing in Switzerland are far from having achieved the bottom line in terms of professionalism and market success. Designing innovative, easily accessible products, realising competitive pricing strategies and embedding this into an attractive branding concept will be necessary prerequisites for further market success.

When it comes down to actual figures, the US market experience given above also indicates a potential in the two-digit percent range. Looking at the European situation, as for instance the German green power market, results are (until now) less encouraging. Apart from the fact that the competition as a whole is still in its infancy, a couple of reasons can be identified which as well give some indications for the discussion of the policy-market interface.

¹ For the information provided in this paragraph, cf. Wüstenhagen 1998. See also on the internet <http://www.strom.ch/erneuerbar/sonne/stromew.htm> for a current list of utilities offering solar power in Switzerland.

² These response rates are higher than the actual market share, though, because customers usually cover only a small part of their consumption (e.g. 150-200 kWh per annum in the average of 10 Swiss utilities) by green power (cf. Frauenfelder 1999).

³ It has to be noted, however, that only about 1 % of all customers decided to switch supplier in the first nine months of California's market liberalisation (cf. Wyser 1999, p. 6), hence the green power market was still a niche market when compared to the entire electricity market.

- The absence of a uniform and widely accepted green power labeling scheme.
- The competitive situation in Germany with aggressive marketing campaigns of the established utilities for low-price products.
- The unclear regulatory framework with regard to grid access.

As a preliminary conclusion, we can see that if the regulatory environment is designed in a favourable manner, it may cause synergy effects for the Green Power market. Furthermore, if there are active and professional marketers, green power products can successfully achieve significant market share.

Macro-economic aspects: Green Power as a Complementary Energy Policy Instrument

Knowing that there are also various interactions between market deregulation framework (eligible customers, grid access, unbundling etc.) and the Green Power market, the following will concentrate on the support policies for RES. On a mid-term scale, environmental policy will play a major role for significantly increasing the market share of RES in electricity supply throughout most of the EU member states. The goal of doubling the share from 6% in 1995 to 12% in 20104 can only be achieved with an appropriate design of the electricity markets' regulatory framework by means of governmental support instruments. Experiences with the Green Power market underline that there is little reason of thinking about substitution of governmental policy by a deregulated market as long as environmental objectives are concerned.⁵

In many cases governmental support policies and the Green Power market will therefore interact which is of importance because

- the renewable support framework can have significant influence on the voluntary market (cf. the Californian example),
- the interactions get the more relevant the more the Green Electricity market grows and
- the majority of support policies were designed and established without regard to the implications of liberalization (and without regard to the Green Power market emerging).

To achieve optimal ecological benefits policy actors will have an interest to use the Green Power market's potential in order to complement policy instruments. In a couple of situations such supplementary interaction is basically given because of different scopes (e.g. if large hydropower plants are excluded from governmental support schemes, their environmental benefits can only be sold on the Green market). But as soon as the same generation facilities are concerned there are two different options:

- the exclusion of instrument and market („either - or“) and
- the inclusion, i.e. the addition of both („as well as“).

The idea of the first option is to sell the ecological benefit of RES production at only one point, which can either be the market for Green Power or the demand created by the policy instrument. The second option, on the other hand, assumes that the benefit can be shared somehow and funded from both sides.

Economical analysis shows, that there are positive and negative effects of interaction, which are just inverse for price- and quantity-

	price-regulation (feed-in tariff)	quantity-regulation (minimum purchase obligation)
exclusion	A: constant price / rate for producer no additional environmental benefit shift of financial load to Green Power customers	B: increase of total demand, higher prices – windfall profits additional environmental benefit Green Power customers cause support
inclusion	C: increase of payment rates, higher prices – windfall profits additional environmental benefit Green Power customers cause support	D: constant price / total amount of support no additional environmental benefit shift of financial load to Green Power customers

⁴ see EU 1997, p. 11

⁵ cf. chapter above and Markard 1998, p. 70 as well as Wüstenhagen 1998

regulation.⁶ Joining market and price-regulation in an exclusive way will cause no additional environmental benefits but a shift in financial load of RES support to the Green Power customer. Designing an inclusive interaction, i.e. allowing payments from the feed-in tariff be added by price premiums from the Green market, will prepare ground for new investments in RES and therefore cause additional environmental benefits. In the case of quantity-regulations it is just the exclusion which will create ecological benefits: the obligatory demand and the demand driven by the Green customers act as two complementary forces. The results are rising prices for RES and – on the negative side – windfall-profits for the producers which could have already “existed with the support mechanism alone”. The table resumes the effects of interaction.

As to the results of that assessment the design of the support instruments has to be adapted to overcome some of the negative impacts. Options B and C seem to be the most appropriate for further development of the Green market, because otherwise the customers will lose a main motivation for purchasing these new products. On the other side, the eco-labeling schemes as well have to face the challenge of synergetic interaction of market and support schemes by implementing transparent rules in the case of exclusion and inclusion.

The Strengths and Weaknesses of Transdisciplinarity

The above mentioned outcomes underline that research which is related to highly dynamical and urgent issues may successfully choose a transdisciplinary approach. With this, research can provide a direct and therefore efficient input for practise which has a positive influence on the dissemination and the application of results. Apart from that and even more important is the reverse influence, i.e. the feedback from real world. Listening carefully to the voice of practise, research can develop products which are highly important to fulfill the stakeholders' needs. The challenge for transdisciplinary research in this context is to keep its “unique selling proposition” which is its independency and, while responding to the customers' demand, its comprehensive approach with additional benefits beyond the a priori mentioned needs. In other words, practise asks for the piece and from transdisciplinary research gets the whole cake and – has to eat it!

The chances of such bidirectional approach can not be discussed without regarding the risks. As dynamic developments ask for flexible reactions and short-term inputs which in most cases do not correspond to systematical research. Moreover, real world's influence tends to define the priorities with little regard to specific scientific context or time cycles. In the end, the researcher may have to face the choice of either to become a full time manager and mediator or to ignore practise context and public attention.

From that point of view, transdisciplinary research not only calls for numerous personal skills which are not part of the scientific curriculum but also threatens the research profile of the person involved. What is practical relevance worth in the scientific community? And what is the research background worth in the business world? The significant trade-off between a mostly full time manager and good researcher cannot be solved by the individual alone.

If transdisciplinary research shall keep and improve its special meaning at the border between theory and practise, an institutional and social framework has to adapt to those challenges. In the scientific community, criteria for success on the individual and the project level have to change in order to integrate not only interdisciplinary but also transdisciplinary issues. Actors from practise on the other hand will have to appreciate the special implications of research which may in some cases not correspond to their picture of time and money budget, simplicity or compatibility. On the level of national and international research support schemes evaluation of transdisciplinarity has to change as well and guidelines have to get more flexible to respond to the new challenges of scientific research on the edge of market and policy.

⁶ see Langniss / Markard 1999

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