Business model challenges for energy firms

ANALYSIS OF MARKET DESIGN BARRIERS FOR THE IMPLEMENTATION OF INNOVATIVE BUSINESS MODELS IN THE ENERGY SECTOR

Lena Holzner, 29th June 2017
Business model challenges for sustainable energy firms

Agenda

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New energy business models emerge in a dynamically changing market

Introduction

Environmental changes
- Renewable energy
- Regulatory changes
- Smart technologies
- Demanding customers
- Competition

Novel business models
- Technology oriented business models
  - Energy firms as service providers

Challenge
- No unified approach for decentralization of the European electricity market

What market design barriers hinder the implementation of innovative business models?
Business model innovation creates challenges and opportunities for energy firms

“*The successful deployment of the energy transition relies on a deep reorganization of the energy market. Business model innovation is recognized as key driver of this process.*” (Facchinetti et al., 2016, p.1)

### Advantages

- Accommodation of renewable energy assets
- Digitization of the electricity system
- Adaptation to energy policy and regulation

### Disadvantages

- Asset transformation
- Lack of competencies and systems for innovation management
- Path dependency
Business model innovation in a changing electricity market

Traditional electricity value chain

Emerging electricity value chain

Source: IBM Institute for Business Value.

A diverging EU electricity market creates new barriers for business model innovation

1. Industry Structure

- Increasingly liberalized, energy-only market with capacity mechanisms emerging with the rise of renewable energies
- Third Energy Package: increasing competition in wholesale markets, market coupling, renewable energy as key electricity source
- Differences in wholesale market electricity prices, trading volumes and renewable capacity remain
EU electricity market design differences

Wind energy capacity in the EU Member States

Sources: BMWi, 2016, p.43 ; European Commission, 2016, p.10.
A diverging EU electricity market creates new barriers for business model innovation

European electricity market design

2. Politico-institutional factors

- Differences in regulatory cultures across European countries (Bohne, 2011)
- Divergent application in renewable energy support schemes and self-consumption policies
- Fragmented smart-metering roll-out across Europe
EU electricity market design differences

Renewable energy support instruments implemented across EU countries

Cost-benefit analysis for electricity smart metering large-scale roll-out


A diverging EU electricity market creates new barriers for business model innovation

3. Socio-institutional factors

- Cultural issues and attitudes towards renewables

- Differences in European households with regards to electricity demand, usage and installed capacity due to different equipment, lifestyles and comfort levels (De Almeida et al., 2011)

- Different levels of social acceptance of smart meter technologies (Curtius, 2012; Lopes et al., 2016)
Methodology

The following research question results from the previous findings:

What market design barriers hinder the implementation of innovative business models in decentralized electricity systems at national and international scale?
Semi-structured interviews were conducted with ten European energy firms for this qualitative research.

**Methodology**

1. **Explorative qualitative research**: Why do firms in the electricity industry fail to innovate their business model in changing market environments?

2. **Semi-structured interviews** with ten European energy firms along the electricity value chain

3. **Three-step data analysis**:
   1. Transcript analysis for recurring response patterns
   2. Analysis of business model innovation and internationalization processes under the impact of market design changes
   3. Analysis of resources and capabilities for business model innovation
Successful business model innovation is hindered by the external environment

Results & Discussion

Market
- Cultural attitudes
- Product acceptance
- Competition
- Wholesale market differences

Regulation
- Lack of regulatory standardization
- Lack of support schemes
- Legal barriers

Technology
- Differences in technology systems and standards
- Challenge of grid balancing

Firm-specific
- High costs and lack of funding
- Human resources
- System integration
- Lack of market knowledge

"We are still looking for the best business model. So we keep trying and addressing the market business needs." (I)

"We have to deal with the technology requirements in each country." (I)

"We have to harmonize the regulatory requirements of all the countries. It could be a barrier." (A)

"A lot of research had to be done before the product started. We needed hardware framework programmers and had to integrate all systems." (D)
Policy implications to drive business model innovation

Conclusion & Future research

**Policy Implications**
- Harmonization of EU energy regulation
- Provision of market incentives for energy efficiency solutions
- Standardization of demand response schemas
- Regional cooperation and regulatory oversight
- Increasing consumer empowerment
- Adequate price signals to promote flexible resources

**Business Implications**
- Deep understanding of electricity market design as pre-requisite for successful business model innovation
- No *One size fits all energy* business model for all markets
- Market design as heuristic for business model innovation and internationalization

**Future Research**
- Impact of market design on energy business models outside EU
- Market design barriers by company type
- Strategies for business model adaptation to overcome barriers

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The Market Design Canvas as useful tool for business model adaptation to market design changes

**Proposal**

**Political & Legal Conditions**
- Which regulatory bodies influence business model design in which way?
- Are there any explicit or implicit regulatory barriers to the implementation of the business model?
- How standardized is regulation with EU regulation?
- What legal requirements and technology compliance standards must be met?

**User Practices**
- What is users' electricity consumption behavior and attitude towards smart meter technology and renewables?
- How does culture influence user practices?
- How are consumers engaged in energy management?
- How do consumers interact with service providers?

**Economic Conditions**
- How does wholesale/retail electricity market structure hinder business model implementation?
- What is the level of competition in the market?
- What economic incentives and support mechanisms are provided by the state?
- What market entry barriers and opportunities exist?

**Technology Infrastructure**
- Does the necessary technology infrastructure exist?
- What technology equipment/ installations are available?
- Is the technology applicable to the local grid?
- How can customer data be produced and collected?

**Current Market Characteristics**

**Adaptation**

**Existing / Ideal Business Model**

**Value Proposition**

**Customer Interface**

**Value Chain**

**Revenue Model**

**Business Model Core**

**Limitations**
- Regulatory gaps & differences

**Habits & cultural attitudes**

**System differences**
- Lack of technology infrastructure & different installations

**Red Flag Solutions**

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Thank you for your attention!

Questions?

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References


