Energy Policy 91 (2016) 98–112

Contents lists available at ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

Asset transformation and the challenges to servitize a utility business model

Thorsten Helms

Chair for Management of Renewable Energies, Institute for Economy and the Environment, University of St. Gallen, Tigerbergstr. 2, CH-9000 St. Gallen, Switzerland

HIGHLIGHTS

- The paper analyses the expected transformation of utilities into service-providers.
- Service and utility business models possess very different attributes.
- The former is based on intangible, the latter on tangible assets.
- The transformation into a service-provider is related with great challenges.
- Asset transformation is proposed as a barrier for business model innovation.

ARTICLE INFO

Article history:
Received 26 January 2015
Received in revised form
30 December 2015
Accepted 31 December 2015
Available online

Keywords:
utility
EUCo
Business model innovation
Servitization
Energy service
Asset transformation

ABSTRACT

The traditional energy utility business model is under pressure, and energy services are expected to play an important role for the energy transition. Experts and scholars argue that utilities need to innovate their business models, and transform from commodity suppliers to service providers. The transition from a product-oriented, capital-intensive business model based on tangible assets, towards a service-oriented, expense-intensive business model based on intangible assets may present great managerial and organizational challenges. Little research exists about such transitions for capital-intensive commodity providers, and particularly energy utilities, where the challenges to servitize are expected to be greatest. This qualitative paper explores the barriers to servitization within selected Swiss and German utility companies through a series of interviews with utility managers. One of them is 'asset transformation', the shift from tangible to intangible assets as major input factor for the value proposition, which is proposed as a driver for the complexity of business model transitions. Managers need to carefully manage those challenges, and find ways to operate both new service and established utility business models aside. Policy makers can support the transition of utilities through more favorable regulatory frameworks for energy services, and by supporting the exchange of knowledge in the industry.

1. Introduction

Countries such as Germany and Switzerland aim to realize the low carbon energy transition by reducing the consumption of energy and increasing the share of renewable energies (BFE (Bundesamt für Energie), 2013; BMWi (Bundesministerium für Wirtschaft und Energie), 2015), which will fundamentally transform power markets (Richter, 2013a; Schleicher-Tappeser, 2012). European energy utility companies (EUCo) are facing serious threats to their established business model (e.g., Eurelectric, 2013). But they are also major stakeholders of the energy system, and thus are expected to "be at the core of the energy transition." (Apajalahti et al., 2015: 76). By servitizing their business models, they could fulfill this crucial role (Apajalahti et al., 2015; Hannon et al., 2013; European Commission, 2011).

Thus, scholars and managers agree that utilities need to fundamentally innovate their business models (BMs) to overcome their role as commodity suppliers and become service providers for comprehensive energy solutions (Boston Consulting Group, 2011; Duncan, 2010; Klose et al., 2010; PWC, 2013; Richter, 2013a, 2013b; Schleicher-Tappeser, 2012; Schoettl and Lehmann-Ortega, 2011; Servatius, 2012).

Business model innovation (BMI) has been recognized as a vehicle for corporate transformation and a source for competitive advantage through the development of new ways of creating, delivering and capturing value (Chesbrough, 2010; Richter, 2013a; Schneider and Spieth, 2013; Teece, 2010; Zott et. al., 2011).

E-mail address: thorsten.helms@student.unisg.ch

http://dx.doi.org/10.1016/j.enpol.2015.12.046
0301-4215/

Table 1
Business model components, and considered intangible assets (Sources: Kaplan and Norton, 2004; Osterwalder, 2004; Osterwalder and Pigneur, 2010; Richter, 2013a).

Business model component	Description
Value proposition	Defines the package of offered products and services.
Customer interface	Comprises all interactions with customers, and describes the customer relationship management, the targeted customer segments and the corresponding communication channels.
Infrastructure	Defines the internal architecture of value creation, and includes the required assets as the source of the company's value creation, including the *intangible assets*: • *Human capital* (skills, talent, and knowledge of employees). • *Informational capital* (information systems, networks, technology infrastructure). • *Organizational capital* (leadership, degree of alignment of employees with the firm's strategic goals, knowledge sharing capabilities, company culture).
Revenue model	Describes the relationship between costs and revenues, and its origins.

Servitization represents a specific form of BMI (Maglio and Spohrer, 2013; Nair et al., 2013; Velamuri et al., 2013; Visnjic Kastalli and Van Looy, 2013). It requires the holistic innovation of an organization, wherein it shifts from selling products to selling services or product-service bundles (Baines et al., 2009).

However, BMI, and the servitization of firms, can create significant managerial challenges (Baines et al., 2009; Gebauer et al., 2005; Kindström, 2010). Despite the expected importance of services for utilities, scholars have paid little attention to the challenges of servitizing a utility BM. Scholars have described numerous market barriers related to energy service adaption, such as low energy costs, ambiguous or absent legislative framework, lack or mismatch of financing, perceived business and technical risks, mistrust among actors, and low information levels regarding energy services (Hannon et al., 2013; Marino et al., 2011; Suhonen and Okkonen, 2013; Vine, 2005). However, intra-organizational barriers for the servitization of utilities have been hardly addressed. One exception is Apajalahti et al. (2015), who argued that the unbundling of energy companies and the split of involved business units result in increased complexity for service offering. The literature on servitization indicates significant challenges, but is largely focused on the manufacturing sector, "where product and service differentiation are easily achieved" (Robinson et al., 2002: 164). In the context of capital-intensive[1] commodity suppliers, such as electric utilities, even greater challenges can be expected (Robinson et al., 2002): literature on service and servitization highlights for instance the crucial importance of intangible input factors such as workforce, innovative capabilities, and customer orientation (e.g., Baines et al., 2009; Kindström, 2010). These factors have previously played a minor role in the utility sector. Instead, it has been characterized by high capital intensity (e.g., Kleindorfer and Wu, 2003) low personnel intensity (destatis (Statistisches Bundesamt), 2011), low innovation intensity (ZEW (Zentrum für Europäische Wirtschaftsforschung GmbH), 2015: 6) and a limited customer orientation, due to the low change rate of electricity customers, for instance in Germany (BDEW, 2014b).

Analyzing the difficulties of servitizing a utility BM requires a close look at each of the BM components, such as the value proposition, the customer interface, the infrastructure, and the revenue model (see Table 1) (Osterwalder, 2004; Osterwalder and Pigneur, 2010; Richter, 2013a), as well as the dynamics of their interactions, and the relationship between the status quo and the new BM (Demil and Lecocq, 2010; Zott et al., 2011). These relationships can foster or inhibit the transition; illuminating these relationships may enhance our knowledge on barriers of BMI and the role of the established BM. The research question is thus: *What are the distinct attributes of utility and service-oriented BMs? What are the resulting inhibiting and fostering relationships affecting the transition?*

First of all, the paper contributes to the discussion of managers and policy makers on the future of utilities, particularly in the context of energy services. It maps the major challenges and discusses implications for managers and policy makers. In particular, it highlights the significant challenges that utilities have to overcome to remain leading stakeholders in a more service-oriented energy landscape. Second, the paper contributes to the literature on BMI barriers, by proposing and introducing asset transformation as a novel concept. Asset transformation captures the change in underlying BM assets and their subsequent challenges, not adequately acknowledged by previous concepts. Therefore, it enhances knowledge on the difficulties of particular BM transitions. Third, this paper adds the case of servitizing a capital-intensive commodity BM to the manufacturing-oriented servitization literature.

The paper is organized as follows: Section 2 outlines the background, i.e. drivers for servitization in Germany and Switzerland, and introduces relevant literature and the analytical framework. Section 3 specifies the applied methodology. Section 4 displays the empirical findings. Section 5 discusses the results. Section 6 derives the conclusions, and the policy and managerial implications.

2. Research context and theory

2.1. Research context: drivers for service-oriented BMI in the power sector

The low carbon energy transition is related to a number of drivers that drive utilities to servitize their BMs. First, many utilities in Europe face a severe crisis of their established BM. European utilities have lost more than half of their one trillion EUR company value since 2008, and stocks performed significantly worse than the market as a whole (MSCI, 2014; Eurelectric, 2013; The Economist, 2013). Eurelectric (European Union of the Electricity Industry) concludes that the "average company…is undergoing a value destruction process" (Eurelectric, 2013: 5). Exogenous shocks, such as this, are a recognized trigger for BMI (Chesbrough, 2007; Demil and Lecocq, 2010; Sosna et al., 2010).

Second, the electric power sector in Germany[2] faces saturation. The significant growth of renewable energies and the resulting increased generation capacity comes at a time of declining

[1] The electric power sector is commonly regarded as a capital-intensive industry. Capital intensity can, for instance, be measured as 'depreciation/number of employees' or 'gross plant assets/number of employees' (Stickney and McGee, 1983).

[2] The growth of renewable energies has been much greater in Germany than in Switzerland, because in contrast to the German Renewable Energy Act, the Swiss support scheme is capped, limiting the annual installed capacity.