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Local and regional energy companies offering energy services: Key activities and implications for the business model

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HIGHLIGHTS

- Many companies providing energy services are experiencing difficulties.
- This research identifies key activities for the provision of energy services.
- Findings are aggregated to the business-model level providing managerial insights.
- This research identifies two different business model innovation paths.
- Energy companies may need to renew parts of, or the entire, business model.

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ABSTRACT

Energy services play a key role in increasing energy efficiency in the industry. The key actors in these services are the local and regional energy companies that are increasingly implementing energy services as part of their market offering and developing service portfolios. Although expectations for energy services have been high, progress has so far been limited, and many companies offering energy services, including energy companies, are experiencing difficulties in implementing energy services and providing them to the market. Overall, this research examines what is needed for local and regional energy companies to successfully implement energy services (and consequently provide them to the market). In doing this, a two-stage process is used: first, we identify key activities for the successful implementation of energy services, and second, we aggregate the findings to the business model level. This research demonstrates that to succeed in implementing energy services, an energy company may need to renew parts or all of its existing product-based business model, formulate a new business model, or develop coexisting multiple business models. By discussing two distinct business model innovation processes, this research demonstrates that there can be different paths to success.

1. Introduction

For many industrial firms, improving energy efficiency is a key strategy leading to direct benefits, such as increased competitiveness [1] and productivity [2], and to more indirect environmental benefits (cf. [3]. However, despite a growing interest in finding ways to increase energy efficiency, the industry still harbors untapped energy efficiency potential, conceptualized as energy efficiency and energy service gaps [1,4]. These gaps have been explained by factors ranging from market imperfections and asymmetries, through excessive transaction costs and institutional factors, to generally underdeveloped markets [5–7]. As such, existing research tends to be biased toward the market side, and relatively few studies examine the providers, the supply side, of energy efficiency initiatives and the challenges they face in moving toward an increased provision of services.

Companies offering various energy efficiency initiatives to industrial customers do so by means of various energy service offerings. These companies are often referred to as energy service companies (ESCos) [8]. ESCos can, for example, be technical consultancies, product manufacturers, and energy companies; and typical activities performed by these actors include energy audits, energy analyses, and implementation of new solutions within customer operations. This research considers a key actor in the energy market and among ESCos: the local and/or regional energy company, that is, the company that produces, sells, and supplies energy. There is a need for research aimed at this type of actors.

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Energy services provided by local and regional energy companies have several important macro drivers, ranging from national directives and policies, such as the European Energy Service Directive and the European Energy Efficiency Directive [9], to issues such as the greening of company strategies, corporate images, and brands (see, e.g., [3]. From a micro perspective, at the business model level, successfully implemented energy services can offer these energy companies immediate benefits, such as higher margins, differentiation opportunities, and deeper relationships with customers, as well as growth opportunities and new competitive positions.

Examining energy services from the firm-level and business-model perspectives has begun to attract researchers' attention in recent years (e.g., [10–13]. However, industry progress has so far often been limited; and many firms, including energy companies, offering energy services are struggling [10,12,13]. Recent findings by Cornelis et al. [14] reveal that some energy service markets are in fact shrinking, such as those in Belgium, Japan, and Sweden. Identified barriers to the adoption of energy services include distrust toward the providers and high transaction costs in the contractual process [14], pointing to the need for research focusing on the supply side of energy services and what is needed to succeed from that perspective.

Also, in recent years the business model perspective has been increasingly used to explain changes in the energy sector [11]. One major barrier to local and regional energy companies' success in implementing energy services is the differences between energy companies' traditional business models and what is referred to as the "ESCo model" [10] (cf., e.g., the study on US utilities by [15]. While the traditional business model emphasizes low-cost production and involves little customer interaction, the ESCo model emphasizes holistic energy solutions provided in close interaction with customers.

Rather than focusing on markets and institutions, as much other research does (e.g., [5–7], the focus here is on the actual energy service provider, that is, the energy company, and on the identification of key activities in implementing energy services with the goal of providing energy services to the market. Our overall research aim is to examine what is needed for local and regional energy companies to successfully implement energy services, that is, provide energy services to the market. This aim has been broken down into two specific questions guiding this study: (1) What are the key activities for energy companies to succeed in implementing energy services? (2) What are the consequences of the energy companies' business model? Consequently, in exploring these questions, we use a two-stage process: first, we identify the key needed activities, and second, we aggregate the findings to the business model level.

By conceptualizing the business model as comprising three elements—value proposition, value creation and delivery, and value capture—this article analyzes local and regional Swedish energy companies' implementation of energy services. Given that the Swedish energy sector shares many key characteristics with energy industries in other countries, the results should also be of general interest in the wider international context of energy service transitions.

This paper is organized as follows: First, we define the energy service concept as well as position our study in relation to previous research around energy services. Second, we review the business model literature and derive our business model conceptualization. Next, in Section 4 the method of the paper is presented. The "Results" section (Section 5) identifies key activities in implementing energy services within the case companies. Section 6 summarizes the activity configuration identified in Section 5 and offers potential managerial outcomes and implications for managers. Finally, Section 7 presents the conclusions of the paper.

2. Energy services: Definition and positioning the paper

2.1. Defining the energy service concept

Energy efficiency can be defined as when a lesser amount of energy is used to sustain a given level of output, or when the same level of energy is used to produce a higher level of output (e.g., [16]. Improving energy efficiency thus signifies a more efficient utilization of resources, and one way to improve energy efficiency in the energy system is by undertaking investments in energy services. Although the energy service concept was introduced in the early 1980s [17], today this concept is characterized by definitional confusion [12,18]. Table 1 summarizes definitions of energy services presented in some of the most cited journal articles identified using the Web of Science. Note that much research lacks a clear definition and has therefore been excluded.

As shown in Table 1, the definitions of energy services are wide-ranging. While some of these definitions (e.g., that of [19] concentrate on the production side of the service, others emphasize the customer side, especially in more complex services [20]. Bertoldi et al. [5] state that energy services can range from statistics, audits, management, project design and implementation, and maintenance and operation to various types of energy performance contracts (EPCs). Typically, less complex energy services in Sweden today include *energy statistics and information*, *energy audits*, and *energy analysis and advice*. More advanced services include *direct improvement of energy efficiency for the customer*, *financing of investments for the customer*, *operations and maintenance*, and *functional contracts* (e.g., contracts agreeing on a set indoor temperature).

One way to visualize the various types of energy services, which to the best of our knowledge has not been done in previous research, is to construct a "service ladder" (see Fig. 1). As proposed in Fig. 1, energy services range from information and analysis, through various activities and practices, to various types of advanced performance contracts. Even within each of the four steps in the ladder, different types of services are offered by different actors. The service complexity depends on the position in the energy service ladder, increasing from left to right. This also holds for the energy efficiency potential, which increases when it moves up the service ladder. While low-complexity services in the "information" category, such as statistics, have lower energy efficiency potential, more complex services in the "performance" category, such as different versions of EPCs, usually have higher potential while also involving more risk.

Both direct and indirect energy services benefit customers [21]. Direct services are ones that directly and tangibly affect the customer, for example, changing a boiler or optimizing a production process. Indirect services are ones that indirectly and intangibly affect the customer, for example, providing information or analysis on which the customer can subsequently act. Complex services such as facility operations often contain both direct and indirect services. Different services also involve the customer in the value creation process to different degrees. Value propositions in the information and analysis categories emphasize value-in-exchange; that is, they are geared toward a more passive transfer of (potential) value. In the activity and performance categories, the value propositions emphasize value-in-use for the customer instead, and the services often require customer cooperation and participation. Hence, energy services can be defined as services of various complexities that could increase energy efficiency both indirectly and directly.

2.2. Positioning the study in relation to previous research on energy services

Much energy service research has focused on describing actual service usage in various countries, regions, or sectors (see, e.g.,