Business network and corporate sustainability view on value co-creation as part of business model innovation – a case study of district heating companies in Sweden

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Abstract
Climate change and the present call for new and more sustainable heating solutions has induced development of renewable energy products and changed the competitive situation in the heating market. The Swedish district heating (DH) business has a dominant energy delivering role, but is now pressured by competition. DH utilities, often municipality owned, are required to address corporate sustainability and acts in traditional ways focusing delivery and value capture, and not on value creation for its customers, Decreasing DH energy deliveries has enforced a search for new customers and for securing business by developing new offerings and/or changing their old business models. Such processes are either initiated by top-management, or have emerged through a value co-creation process with customers and/or other significant actors. Value co-creation is a complex process requiring actor interaction, relationship development, resources and capability in terms of business model innovation. However, BMI literature is rather unexplored in terms of studies on factors facilitating value co-creation beyond the customer-supplier relationship to relationships among stakeholders in a wider perspective. The aim of this paper is thus to explore network and corporate sustainability related value co-creation with or without significant other actors in the DH industry focusing context related factors facilitating or hindering network and corporate sustainability related value-co creation. The study is a qualitative, comparative case study comprising six Swedish DH companies. The contribution to research is the development of an integrated model addressing challenges in the value co-creation process including public/private actors.

Keywords: value co-creation, business model innovation, corporate sustainability, business networks, activities and relationship.

Introduction

Climate change and the present call for new and more sustainable solutions regarding heating rules out the use of coal and oil. The focus is now on use and development of "clean" sources and products such as electricity generated by windmills, solar -panels, geothermal heat pumps and district heating. R&D related resources are fed into projects generating new technology, which in turn changes the competitive situation in the heating market. (Lygnerud, 2018). The Swedish district heating business dominates the delivery of energy for space and tap water heating multifamily houses and commercial buildings. However, the industry is put under pressure due to competition from heat pumps, and increased energy efficiency in buildings (Magnusson, 2012; Werner, 2017). District heating is a capital intensive, mature and traditional industry (Sandoff and Williamsson, 2016) delivering low temperature heat often regarded as a commodity product. Municipality ownership dominates the district heating market that works like a local monopoly excluding new actors. Notwithstanding, municipality companies need to meet the challenges from other heating solutions (Lygnerud, 2018) and be innovative, service quality providers. Thus, preventing customers switching intentions (Malhotra and Malhotra, 2013), ensuring competitiveness (Lygnerud, 2018), revenue and use of the distribution networks previously locking-in customers (Malhotra and Malhotra, 2013). The energy utilities, whether they are private or publicly owned and the business conditions, are regulated by law (District heating law (SFS 2008:263), 2008). Adding to this is the political demand on publicly owned DH utilities to address corporate sustainability (Magnusson, 2011) and thus meet the needs of different stakeholders without compromising the ability to meet future stakeholders, maintain and grow their economic, social and environmental capital base while actively contributing to sustainability.(Pedersen et al., 2017p. 269)The industry has for years

focused on delivery and value capturing price models and not on value creation for its customers, in turn being a mix of companies, public actors and individual households (Li et al., 2015; Rydén et al., 2013). However, some changes to meet external pressure are identified, even though the key resource component (distribution network and production unit) focusing economics of scale are unchanged (Lygnerud, 2018). The decreasing market share for district heating has induced companies to search for ways to attract customers and secure business by developing new offerings, identifying new groups of customers and/or changing their old business models (BM) (Sernhed et al., 2018). This implies change in management, of value capture, revenue models, strategy for long-term competitiveness (Sandoff and Williamsson, 2016), value propositions and the value creation process (Fallahi, 2017). Several studies identify the need for new BM to support or render business transformation within the district heating industry (Paiho and Reda, 2016; Sandoff and Williamsson, 2016; Sernehed et al., 2018) and generally, as globalisation, digitalisation and new technology calls for change (Chesbrough, 2010; Fallahi, 2017). However, structured business model innovation (BMI) are rare in the industry and new BM´s may be hard to implement due to the rather conservative business tradition (Sandhoff and Williamsson, 2016), the impact of government issued regulatory requirements and regulation issued by local politics requiring corporate sustainability. BMI and corporate sustainability is argued to be related in terms of performance, and shaped by the underlying values in the organization (Pedersen et al., 2018). Difficulties in changing BM´s in terms of BMI´s is also found in other fields of trade and industry (Chesbrough, 2010). However, there are few empirical studies of BMI focusing industries with the attributes of the district heating (Sandoff and Williamsson, 2016), but also generally (Chesbrough, 2010; Zott and Amit, 2010; Teece, 2010; Fallahi, 2017; Foss and Saebi, 2017) and empirical studies of network and corporate sustainability related BMI´s is hard to find (Palo and Tähtinen, 2011; Pedersen et al., 2017). The BMI process is on one hand assumed to be analytical implying that BM has to be designed and then put into action (Teece, 2010; Bankvall et al., 2017; Osterwalder and Pigneur, 2010), or discovery-driven based on trial-and-error learning and experimentation (Fallhai, 2017; Foss and Saebi, 2017; Zott and Amit, 2011).

Improved understanding of BMI processes, whether designed or emerging (co-creative) in this context may support industrial transformation into customer oriented competitive companies. Although firms emphasizing BMI have been found to grow their operating margins faster than their competitors (Velu, 2015), the role of BMI is rather unexplored (Teece, 2010) and the BMI literature is characterized by conceptual ambiguity and disconnected research efforts. Conceptual clarity as well as simplification and cumulative empirical work is thus called for in order to advance the literature (Foss and Saebi, 2017). In particular, there is a lack of studies on structures able to facilitate value co-creation that goes beyond the customer-supplier relationship to relationships among stakeholders in a wider perspective (Coombes and Nicholson, 2013; Pedersen et al., 2017)) as cooperation with customers and other significant actors is identified as a key in future BMI to handle increasing complexity (Engelken et al. 2016). Value co-creation thus implies cooperation on value creation and interaction in which different actors, resources and expertise become interdependent (Leite and Bengtson, in press).

This paper ***aims*** at addressing gaps in literature related to context factors facilitating or hindering (barriers) sustainable corporate value-co creation beyond the customer-supplier relationships (Coombes and Nicholson, 2013). It is Inspired by Foss and Saebi´s (2017) BMI model based on a literature review of the entire research - field including antecedents, novelty, value creation process, moderating factors and outcomes adding a business network and sustainable corporate view. The paper explores value co-creation with or without significant stakeholders in the district heating industry in Sweden. Thus, it contributes to the business network, corporate sustainability and BMI literature by advancing the understanding of business network and corporate sustainable co-creation process and context. Co-creation is here understood as cooperation and thus interaction between actors and their resources in turn generating relationships (Håkansson, 1987). Actors are defined as individuals, single firms or groups of firms (Håkansson et al., 2009), resources as tangible or intangible (Håkansson et al., 2009), but also heterogeneous, human, physical and mutual dependent (Blankenburg and Holm, 1990). Interaction link actor resources and related to value creation such interaction may facilitate novel products/services/BM, access to new markets or new relationships (Zott and Amit, 2011). The BMI concept has an inherent dynamic capability as it displays companies' capacity to sense opportunities, size them through development in turn reconfigure company competences and resources (Mezger,

2014).The paper is organized accordingly: first, the theoretical framework is presented, then the methodology followed by presentation of findings, discussion, conclusion and contribution.

Business models, business networks, business model innovation, value co-creation and corporate sustainability

The *BM* concept has evoked discussion due to its interdisciplinary character as it includes theory on strategic management, entrepreneurship, strategic networks, value chains and resources based theory (Palo and Tähtinen, 2011). In literature BM is defined as the logic for how firms creates and captures value in a specific business (Teece, 2010), but also as constituting a "system that is made up or components, linkages between components, and dynamics" (Zott et al., 2011, p. 1037). These components are often described in terms of value proposition, value creation, value chain architecture and value capture (Fallahi, 2017). BM´s is argued to identify market segments, specify revenue generating mechanisms, define the value chain structure, estimate cost structure and profit potential as well as describe the firm's network position and form a competitive innovation strategy (Chesbrough, 2010). BM design is a key task difficult to perform for management in terms of changing old BM models to fit future demands, as new BM often meet resistance when implemented (Zott and Amit, 2010; Chesbrough, 2010). Studies highlight interaction as a vital part of BM either performed by the focal firm and/or together with its partners, suppliers or customers (Zott and Amit, 2010). BM may be conceptualized by means of the BM canvas (Osterwalder and Pigneur, 2010). However, tools useful to explicate BM may not solve the problem of developing BM as they neither promote the necessary experimentation innovation managers will need in order to facilitate BM processes, nor release enough authority to undertake experiments, which in turn influences the ability (capability) to act according to results from those tests (Chesbrough, 2010, p. 360; Mezger, 2014). BM may promote the development of unique value offerings in a network of cooperating users (Ehret et al., 2013; Palo and Tähtinen, 2009). Studies of BM related to network embeddedness is called for, as firms are embedded in networks and may have difficulties in changing their BM without considering the consequences for their business partners (Freytag and Clarke, 2012). The role of BM thus is to guide ideas to successful implementation by means of network relationships, integration of resources and competences (Ehret et al.2013). Networks may shape the BM in terms of interaction between actors on technology, market offerings and network architecture (Mason and Spring, 2011). A networked and open BM is thus argued to "examine the creation of value between stakeholders, rather than simply considering the value created within the boundaries of a single firm" (Coombes and Nicholson, 2013, p. 658).

Business model innovation (BMI), in turn, is manifest in terms of renewal of existing BM´s and as means for diversification and competition with BM (Fallahi, 2017) and describes changes in how buyers and suppliers do business with one another (Bankvall et al., 2017). BMI refers to the search for a new integrated logic for generating stakeholder value (Casadesus-Masanell and Zhu, 2013) and is defined as discovery of a fundamentally different BM in an existing business, (Teece, 2010) or as a part of the BM concept (Bankvall et al., 2017). It can be viewed as a purposeful (designed) or unintentional (evolving) structure for business related transformation (Zott et al., 2011). However, studies on BMI unfolding processes,provide somewhat conflicting assumptions and findings (Foss and Saebi, 2017; Fallahi, 2017). BMI may occur when a company creates new activities, changes the way activities are linked in novel ways, and/or changes the setting of actors performing activities, or the structure for managing these (Amit and Zott, 2012).

Value creation through interaction in networks of stakeholders require a shift from focusing supplier processes to resources that can be made available and support the users (Yunus et al, 2010).Integrating a *corporate sustainability* perspective to the BM value construct includes value exchanges for stakeholders, society and the natural environment. The concepts are linked as they deals with change and when combined they are found to enhance firm performance. Furthermore, the BMI literature emphasizes the merits of individual companies and not on the *context* in which they are embedded. (Pedersen et al., 2017)However, studying emerging BMI emphasizes interaction between firms as a vital driving force (Bankvall et al., 2017) and in order to fulfill the aim a tentative model (fig. 1) is developed focusing business network and corporate sustainability related to value co-creation processes in terms of interaction between actors and actor resources in an external and internal context (antecedents) facilitating or hindering the process.

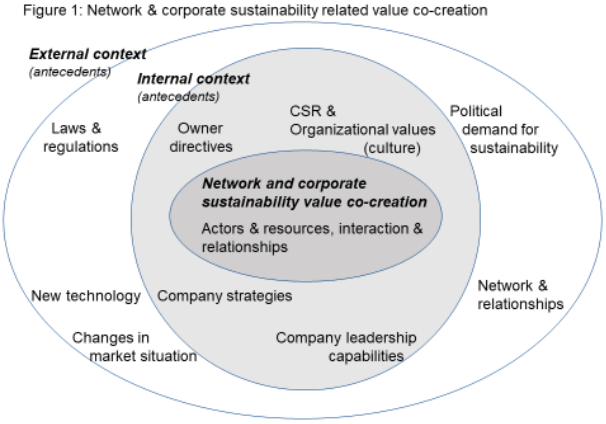
The business network and corporate sustainability related value co-creation model

The external context facilitating or hindering value co-creation are found to be multiple and related to the presence of external threats and/or opportunities for example manifested: in new *laws and legislation* (Fallahi, 2017; Foss and Saebi, 2017; Sandhoff and Williamsson, 2016), by global recession and increase in construction costs (Foss and Saebi, 2017), as a response to *technological development* such as digitalization followed by *changes in the market* situation, or as a need to acquire further resources (Fallahi, 2017), but also as changes made by other actors in the *business network* (Freytag and Clarke, 2012), public actors social motives for interacting in value co-creation (Leite and Bengtson, fortcoming) and as a society call for *corporate sustainability* (Pedersen et al., 2017).

The internal context facilitating or hindering value co-creation are related to internal threats or opportunities for example manifested in changes to *company strategies* (Foss and Saebi, 2017), but also to the organizational *values (culture)* constituting a barrier (or opportunity) as organizational models will have to change and management decisions on BM thus needs to be aligned with the organizational culture (Pedersen et al., 2017, p. 279). When addressing BMI and value creation, the organization will have to find a way to embrace the new BM and at the same time continue to work with the old one (Chesbrough, 2010). *Owner directives* may facilitate or hinder value-co creation as they constitutes rules for the company operation often issued by local politics (Westin and Lagergren, 2002). Further barriers or facilitators of BMI and value co creation may be related to *management or leadership capability* in terms of designing company structures, organizing and allocating resources in a way that do not meet resistance (Foss and Saebi, 2017). Lack of top management leadership to envision BMI, as well as the c*apability* to figure out the required structures and processes of the new BM may hinder BMI (Chesbrough, 2010; Fallahi, 2017) and thus value co-creation. However, insight on structures rendering value co-creation in terms of generating novel BMs, access to new markets or development of new actor relationships (Zott and Amit, 2010; Håkansson et al. 2009) and thus capability to manage innovative processes, will facilitate development of BMI (Mezger, 2014) as may open-mindedness and adversity to change (Foss and Saebi, 2017).

The network and corporate sustainability value co-creating *process* undertaken with customers and significant stakeholders, is a complex process demanding cooperation and thus relationship development, customer co-creation capabilities, but even knowledge on facilitating or hindering factors. The extent to which a firm is engaged in interaction with business partners can be seen as a feature of its BM (Bankvall et al., 2017). Value co-creation, as part of BMI, involves a more systemic change than product and process innovation as it includes changes to the customer value proposition, value creation and value capturing (Velu, 2015). When adding a business network and corporate sustainability perspective to BMI focusing value co-creation – *actors* will need to *interact*, (Zott and Amit, 201; Håkansson et al., 2009) with customers (users) focusing their (Palo and Tähtinen, 2009; Coombes and Nicholson, 2013) and other stakeholders needs (Yunus et al., 2010). Actor interaction will generate *relationships* among the interacting actors in turn possessing certain *actor resources* (Håkansson and Snehota, 1995) The interaction may require further process-related resources (Fallahi, 2007), but also ability to combine the resources in novel ways (Yunus et al., 2010).

Figure 1: Network & corporate sustainability related value co-creation



Methodology

A qualitative, comparative case study was conducted during March and April 2018, including five municipality owned companies offering district heating solutions in the Mid-Sweden region and one company in the south of Sweden. These companies had various numbers of business areas, but were all focusing on district heating BM and had differing BM´s for services provided to customers. However, all companies operated as business units, despite being publicly owned and were expected to generate profit. The selection of case companies was also made due to their size, context and business scope enabling comparison with both similar and differing companies. Company A was a fully integrated regional energy utility with power production and distribution beside the district heating business. Company B and C and D were municipal public companies in midsize Swedish cities (100.000 – 150.000 inhabitants). Company E and F were public companies in smaller cities (25.000 – 60.000 inhabitants). Company F had a broader business scope including fresh water, sewage and municipal waste and recycling operations.

The case study method was used in order to generate deeper understanding of the network and corporate sustainability value co-creation process, its external and internal context, facilitating or hindering factors in district heating companies (Bryman, 2008; Merriam, 1994; Eisenhardt, 1989) as the method facilitates development of detailed, intensive knowledge (Saunders et al., 2000) and allows for various types of empirical evidence and complex relationships in parallel (Yin, 1994). Focus was on how companies in the district heating industry works with BM and BMI by themselves, with customers or other stakeholders. The 16 informants selected for interviews had diverging titles, but worked with similar assignments in roles such as CEO´s (3), marketing managers (4), manager for business area heating/district heating (5) and as head of R&D (1) and had more than one position, e.g. market manager, manager of administration or as sales representative (1). An abbreviated form of the questionnaire with semi structured questions was sent to the informants prior to the interviews. The questionnaire was developed based on the business network and corporate sustainability value co-creation process model (fig.1) and categorized accordingly. At three of the companies (B, C and D), interviews were conducted with the informants individually and at the other three (A, E and F) focus group interviews were undertaken due to a limited timeframe and in order to get as deep and full information as possible. The interviews were conducted by two of the researchers in the team and lasted between one and two hours. Each interview were recorded, transcribed and manually sorted into a table following the themes of the questionnaire and. Data was also collected from company webb-sites and policy related documents. The findings were compared and analyzed through a dialogue between members of the research team.

Preliminary findings, discussion, conclusion and contribution

The external contex*t* common to all companies are the district heating industry related legislation (District heating law (SFS 2008:263) that, together with the general Swedish energy and environmental legislations governs the entire industry. *Laws and legislation* may create an unique market segment for the case companies, but restricts at the same time their ways of acting business-wise (Foss and Saebi, 2017; Fallahi, 2017). The legislation was found to affect the industry in a negative way as new laws changed taxation prerequisites and the directive for emission. Sustainability focusing environment has been a driving force for the industry since start. However, the *political demand for sustainability* was canalized to all companies through the owner directives and these were influencing business. No competing companies' offer district heating, but competition was displayed in form of customers having an opportunity to choose alternative energy solutions. However, increased competition has yet not changed the demand for district heating significantly. The increased competition coming from *new technology* in terms of heat pumps was also a context related factor common to all. Production of energy efficient buildings and forecasts of warmer climate, as a result of the climate change, reduce current and future sales volumes for all of the case-companies and may thus be regarded as an external influencing factor, which is in line with theory focusing how new *technology* may render *change in markets* (Foss and Saebi, 2017). Digitalization and development of smart energy nets (El-Hawary 2014) is another external context related factors highlighted by the respondents as incentives to change their BM´s as emphasized by Foss and Saebi (2017) and Fallahi (2017). The technological rational of district heating is cost competitive heat sale based on benefit of scale, use of low cost energy sources and co-production with electricity. There is, hence, a strong culture of cost minimization in the industry as opposed to value creation fuelled by legislation and owner directives. The studied organizations are

production-orientated in a way that do not allow for establishing creative forums for innovation and development, but a change in mind-set is ongoing, even if the actors in the industry relay on the trade organization in questions such as R&D and monitoring change as they do not perceive to have time and resources to this by themselves. Adding to this, the trade organization, Sweden Energy offer a *business network* where development is discussed. The networks in which the case companies are embedded, may thus shape their BM´s through interaction between actors/individuals on technology, market offerings (Mason and Spring, 2011) in turn offering structure - related to routines guiding joint problem solving as suggested by Bankvall et al. (2017). Changes made by other actors in the industry, or by actors in the companies' business networks related to an increased customer or user interaction (Freytag and Clarke, 2012; Palo and Tähtinen, 2009), has been promoted by the trade organization Sweden Energy. The respondents claim that there are a number of other actors (stakeholders) except for customers, influencing their operation. Examples of such are municipality officials, politicians and municipality inhabitants. They try to keep track on the most influencing ones in order to turn them into ambassadors in the dialogue with construction and real estate firms on choice of district heating for their buildings. *Networks and relationships* – the studied actors are all active in the national trade organisation Swedish Energy, but some of them have also initiated cooperation with other actors outside their business network.

The internal context identified was associated with a change towards increased user or customer focusing *strategies*, which is a trend in most Swedish energy utilities (Lygnerud, 2018). The trade organization Sweden Energy also emphasized this trend as vital to BM development which is in line with Ehret et al.,´s (2013) and Palo and Tähtinen´s (2009) findings. Company C, on the other hand, has developed a strategy for value co-creation due to results from recent BMI-activities. This is the other way around, as a BMI process emerged unintentionally (Zott et al., 2011) through activities linked to resources (Zott and Amit, 2010; Håkansson et al., 2009). In turn paving the way for development of formalised strategies found to be a common way of handling BMI processes. Thus, there is a discussion in literature regarding if strategy or BM comes first in a BMI process (Zott et., al. 2011). Company B has no formal strategy but the company initiated several projects based on a strategic plan developed at group level. The lack of top *management capability* to structure work with BM processes constituted a cognitive barrier in most of the studied companies (actors) as suggested by Chesbrough (2010) and was thus a barrier for development of BMI´s in terms of discovering fundamentally different BM´s in the district heating business (Teece, 2010). The *owner directives* were influencing the actors in a way that goes beyon the control of management, but with a potential to facilitate value co creation also in line with Foss and Saebi´s (2017).The owner directives may, on one hand, facilitate development, but on the other hand, deprive management authority and thus capability needed (Mezger, 2014) for experimentation and trial- and error learning emphasized as vital to BMI (Chesbrough, 2010; Fallahi, 2017) and sustainability processes (Pedersen et al., 2017). Such directives may steer management to perform *corporate sustainability* activities not directly related to business, but to public assignments and politics. The studied actors (case-companies) have for example composed reports on sustainability, in order to clarify their work with sustainability, and at the same time argue for DH as a sustainable energy alternative Three of the actors (C, E and F) have visions focusing sustainability (C, E, F) and local or regional responsibility, e.g economic growth, attractiveness and quality of life (company A-F) and are a reflection of the owner directives, e.g. low energy prices in (A and F), customer focus (A-E) and sustainability (A- Businesswise – the owner directives have facilitated work with value capture, cost reduction and development of new price-models, not only focusing their own customers, but also public actors and customers living far from the distribution net that in turn my imply huge investment costs for the studied actors. In terms or *organizational values and culture* the actors have "streamlined" their organization's as a result of the work with cost reduction. This has rendered an actor perception of having less time to create forums and have dialogue about new ideas or development related issues. However, a change of mind-set regarding the need for such forums was noted and the incentives for engaging in value co-creation processes were in place in several of the case-companies wanting to secure their future competitiveness in line with other utilities in the district heating industry (Paiho and Reda, 2016; Sandoff and Williamsson, 2016; Sernehed et al., 2018). The change to customer and thus user driven focus was evident in the case-companies, which is a trend that may facilitate and support emergent, but also designed BMI and value co-creating processes depending on their choice of path to follow (Freytag and Clarke, 2012; Palo and Tähtinen, 2009). F). This in turn is exhibiting municipality

driven political ambition related to problem solving, and not only business ambition, as external factors such as price regulating district heating law (SFS 2008:263), 2008) restricts BMI in the industry.

In the ***network value co-creating process*** whether emerging or designed including actors, resources, interaction and relationships differed among the companies. However, common to all was that they have worked in emerging processes influenced by other companies in the energy industry and have implemented changes as results of *interaction* with network *actors* and at trade meetings. All are emphasizing interaction on development of service, information products (A-E) and new energy-related products (B-D, F). Actor E claims to have limited *resources* to develop new solutions by themselves and their strategy is then to adopt BM developed by others. This actor is adopting capability in terms of knowledge on, and ability to combine resources linked to interaction in value creating activities (Yunus et al., 2010; Håkansson and Snehota, 1995; Mezger, 2014), which may be a resource-saving strategy. However, the capability to implement the new BM`s may thus be needed in order to achieve the expected results (Mezger, 2014).

All actors were engaged in interaction with key customers regarding new offerings, but the process has just started. Some actors have focused on development of; tools for evaluating consumption, cooling systems and technical devises for remote control of heating. Others have focused on the customer needs and even established a team with customers for interaction on value co-creation. Further one have evaluated and developed the *value co-creation process* itself. In doing so company C, D and E found technical consultants, energy related installers (operatives) and actors developing competing products for digitalization to be the key actors for value co-creation that goes beyond the business network, which can be related to the findings of Coombes and Nicholson (2013). In addition, some actors (C, D, E, F) used surveys to identify needs in differing customer segments. The case-companies customer dialogues, may facilitate change of BMI through value-co creation and in emerging processes as described by Velu (2015) as may interaction with users and other key actors outside the network and partners (Ehret et al., 2013; Palo and Tähtinen, 2009; Coombes and Nicholson, 2013; Yunus et al., 2010). Findings from the interviews indicate that new *relationships* have been created between the actors and other for them significance actors due to interaction. Consequently, the actor´s mind-sets are changing from being task-oriented to be focused on cooperation and relationship building, a novelty in co-creation in line with Amit and Zott (2011). Furthermore, actor A, D and F have established change strategies, which is a DH industry related routine to facilitate a designed value co-creation process in line with Sandoff and Williamsson (2016); Paiho and Reda (2016); Sernehed et al. (2018) findings. Several actors emphasized the importance of having a designed value co-creation process as they found it hard to work with value co-creation without such a designed process (A, B and D) in line with Velu (2015). However, Actor A and C perceive their customer value co-creating interaction process to be more designed and purposeful (Zott et al., 2011) and has used tools such as the BM canvas (Osterwalder and Pigneur, 2010).

Despite the companies expressed emphasis on generating customer value, the findings indicates that their studied actors present focus is on customer related cost issues such as the revenue part of value capture rather than value creation, and as the business offering still is energy at low prices. However, company C have tried leasing services and developed e.g. new information services based on a holistic view of the customer situation and have identified a product development process in close interaction with their customers. Company D, on the other hand, strive to monetize the "green values" of their district heating product. However, the cost, price and revenue activities performed by the case companies may due to their business related character, be regarded as activities aiming at development of new BM´s as part of value capture. Company C, is more deliberate than the other companies in their experimental learning search for new ways of conducting business (Fallahi, 2017).

The aim of this paper is to explore network and corporate sustainability related value co-creation with or without significant other actors in the district heating industry in Sweden. The studied actors have recently started working with development of DH heating services in value co-creating processes, but their work are in early stages. The value co-creating processes are emerging, but also designed and related to strategy. However, most of the actor's calls for a more distinct BMI and thus value co-creating process as the incentives for performing are in place, but laws, legislation and owner directives are circumscribing by directing business towards customer price reduction and work with society challenges from a corporate sustainability perspective. These "barriers" may at the same time facilitate value co-creation as the need and effort to interact with customers, users and other key actors in their network is clear and an important part of value co-creation, intentional or not. The interaction with actors in the

industry's trade organization Sweden Energy may further co-creation, but also prevent local interaction with customers and other stakeholders. A designed network value co-creation process will need resources and management capability. The necessity of change to customer focus is taken and partly addressed. However, the capability required to manage a complex process such as network and corporate sustainability related value co-creation of which changes in culture is a vital part (Pedersen et al. 2017), and at the same time working according to old BM´s under the influence of law and owner directives, may be a huge challenge. Adding to that is the complexity of acting as a company in a competitive market situation and at the same time be a public actor (Leite and Bengtson, in press) calls for further research. The contribution of this study is to clarify the network and corporate sustainability related value co-creation process viewed in an external and internal context. Thus by integrating business network, corporate sustainability and value creation literature in a model.

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