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## Introduction

The heating market is a central player in the transition to a more sustainable energy system in Sweden, given the cold climate. It is, alongside the electricity market, the country's dominant energy market. About one fourth of all energy consumed (100 TWh/year) is used for space heating, cooling and hot tap water in homes, premises and industries. District heating, heat pumps and electric heating are today the dominant technologies.

The way heat is produced has changed considerably over recent decades. Energy efficiency and an increased share of renewable fuels have been high priorities. Currently, roughly 65% of the energy used for heating is renewables-based (IEA, 2013).

Despite the sector's already large contribution to Swedish climate goals, heating market actors continue to experience strong pressures to achieve ever more ambitious targets. The most prominent one is Sweden's aim to entirely phase out fossil fuels in heating by 2020. Overall, a complex mix of local, regional, national and EU climate ambitions emerges, affecting heating market participants' actions. This study investigates how Swedish heating market participants, spanning over several organizational fields, act in response to these pressures to reduce their climate impact.



## Purpose

This study was conducted within the frame of the collaborative cross-industry project "Heating market Sweden", stage two (2015-2017), in which 30 market participants and governmental organizations took part. Its purpose was to investigate heating market actors' sustainability goals and their potential consequences.



## Method

Data was collected through desk top studies, interviews and workshops with representatives of heating market participants.

## Research context

A web of different actors is involved in the production, delivery and consumption of heat (district heating companies, housing companies, technology providers, construction companies, home owners and tenants being the most central ones). Each actor, through his preferences, influences the configuration and development of the heating market. This dynamic development occurs in a patchwork of local and regional systems and markets.

Parallel to increasing pressures for better climate performance, shifts in the heat market lead to growing competitive tensions. New trends such as the prosumer movement challenge existing business models.

Besides, good environmental performance has increasingly turned into a competitive advantage for firms (Schaltegger & Synnestvedt, 2002). In an era of growing climate concerns, firms' efforts to improve environmental performance influence the way they are perceived by their stakeholders. Ambitious sustainability goals, e.g. aiming at the phase-out of fossil fuels, energy efficiency and environmental certifications, arguably are a way for heating market actors to gain legitimacy in the eyes of their stakeholders. Sustainability has become part of the identity of many of these firms, not least due to the fact that this also provides a competitive edge.

## Results

This study shows a multi-faceted set of sustainability ambitions pursued by heating market actors. **All actors have distinct sustainability goals** relating to energy efficiency, renewable fuels or their climate impact at large. **These goals are frequently highly ambitious and similar within each organizational field, but widely divergent in-between these fields.** Such uncoordinated ambitions are most pronounced between the district heating sector and the housing sector. **There are inherent difficulties and trade-offs resulting from the fact that each sector maximizes its own sustainability outcomes.** Actors intend to contribute to increased sustainability, but disregard the overall perspective of costs, the climate and resource efficiency on a higher level.

*This leads to conflicts, sub-optimizations and inefficiencies with actors drifting apart instead of collaborating.*

Actors	Tenants	Housing companies	District heating companies	Municipalities
Targets				
Lower living expenses	high focus	medium focus	low focus	low focus
Energy efficiency	medium focus	high focus	low focus	low focus
Increased share of renewables	low focus	low focus	high focus	high focus
Climate targets	low focus	low focus	high focus	high focus

■ high focus   
 ■ medium focus   
 ■ low focus

Fig. 1: Schematic illustration of conflicting sustainability goals.

*A further finding is that the goals' ambitions are pushed to ever higher levels, often without a comprehensive analysis.* Local and regional political aspirations to be forerunners in the transition towards sustainability, frequently going beyond national and EU goals, seem to play a major role in fueling this green race.

Although the diversity of goals can also be a strength, goals need to be well-balanced and in moderation. **The challenge for heating market actors is to set realistic goals within the firm's scope of influence while keeping a systemic view.** To mitigate the tensions between differing sustainability ambitions, there is a need for increased collaboration among heating market actors from different organizational fields, searching for synergies and development paths from a holistic perspective.

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