



**SWEDENERGY**  
ENERGIFÖRETAGEN SVERIGE



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# Summary

**The heating sector will be fossil fuel free by 2030. In 2045, it will be a carbon sink that helps reducing the total Swedish greenhouse gas emissions. Collaboration is an important tool to achieve this vision.**

The roadmap for fossil free heating has been developed in collaboration between about fifty actors in the heating market (district heating companies, heat pump companies, biofuel companies, property owners and builders, municipalities, county councils and regions) with the consulting and research company Profu as the editor. In order to realize the vision, they have agreed on 42 commitments for the actors in the heating sector and 21 calls for actors outside the heating sector, primarily parliament and government.

The heating sector is a large part of the Swedish energy market. It has an annual turnover of almost 100 TWh of energy and 100 billion SEK (Värmemarknad Sverige, 2014). The heating sector in this context concerns heating and domestic hot water preparation in housing and premises. The roadmap also includes comfort cooling in buildings. Cooling is a smaller product than heating, about 5 percent of the heating's energy use, but can become of greater importance in the long run.

From a large oil dependency, the heating has been reversed and is today dominated by district heating, heat pumps, electric heating and biofuel. The direct use of fossil fuels in individual boilers in buildings amounted to 2 TWh in 2016, compared to 27 TWh in 1995. The use of fossil fuels has also decreased in the production of district heating and electricity, in district heating to 5 TWh in 2016 compared to 14 TWh in 1995. The heating sector has thus made a powerful contribution to the conversion of the Swedish energy system.

This roadmap is a first step in the continued work towards a fossil free heating sector. The signatories' ambition is to continue the cooperation on the roadmap and to use it as the basis for collaboration between different parties in the heating sector, which all participants see as valuable and want to strengthen. All actors in the heating sector who want to contribute to the development towards a fossil free heating are encouraged to join the vision and commitments by signing the road map.

The goal is for the heating sector to be completely fossil fuel free (no use of coal, fossil oil or natural gas) in 2030 and, in addition, to be climate-positive in 2045. To achieve this goal, the actors in the heating sector have, among other things, undertaken to:

- Completely phase out the use of remaining fossil fuels and base also this district heating production on recycled energy, such as residual heat from industries, businesses and buildings, energy recovery of waste and fossil free renewable fuels.

- Promote the development towards being fossil fuel free by setting ambitious energy and climate targets in municipalities, regions and county councils and implementing these, both in their own business and in collaboration with other actors.
- Integrate reduced climate impact into goals and strategies for different public functions, such as building of housing and premises, energy supply, transport, waste, resources, water and sewage, and work strategically with procurement for reduced climate impact.
- Sort and/or facilitate sorting of waste, especially plastics, in order to minimize fossil content in residual waste that goes to energy recovery, in the construction process and in the management phase.
- Recover the energy from waste in an environmentally safe manner for as long as there will be waste that is not allowed to or not possible to recycle, and reduce the amount of plastics to energy recovery.
- Through technology development, make heat pumps and system solutions more efficient and, by means of increased control and new models for business and collaboration, reduce electricity consumption and peak power requirements.
- Follow and aim to surpass the regulations stating which refrigerants that are allowed and the handling of these. Refrigerants with low climate impact should be used.
- With the help of new, more efficient biofuel boilers and smart system solutions, reduce emissions of harmful substances and, through increased efficiency, achieve a better use of biofuel from our green forestry.
- Intensify work on energy efficiency that reduces the heating and power requirement in newly produced and renovated buildings. The actors in the housing and construction sector behind this roadmap will push technology development in terms of reduced power peaks, energy storage, solar energy and solar heat. It is also important to make better use of excess heat.

The latest IPCC report shows that elimination of greenhouse gas emissions in the world by 2050 will not be enough, the international community must also bind emissions and reduce the concentration of greenhouse gases in the atmosphere in order to limit the global temperature rise to 1.5 degrees.

The heating sector is ready to take on this challenge. This means that the industry needs to bind carbon dioxide emissions, for example by using CCS (Carbon Capture and Storage) technology. This could potentially neutralize the emissions from the remaining fossil-based content of the waste being energy recovered. For the bio-based fuel, the impact could be climate-positive since carbon atoms that are already included in the natural cycle are removed. In addition, it can contribute to climate-negative emissions in Sweden as a whole.

The signatories behind the roadmap have also agreed on a common approach to implement the plan, we:

- Are positive to local energy partnerships and cross-sectoral collaboration and to develop business models that support such development

- Will work to phase out residual oil boilers and electric boilers
- Will act as an example within each business to encourage fossil free energy, energy efficiency, resource management and reduced greenhouse gas emissions
- Premiere fossil free within procurements
- Strive to avoid the use of fossil fuels in their own operations, e.g. during transport
- Strive to engage in other challenges within “Fossil Free Sweden”
- Encourage the different parties within the heating sector to develop their own roadmaps on how to become fossil free, with explicit goals and sub-goals
- Strive to create a common method for greenhouse gas calculation for different energy carriers
- Strive to understand the overall consequences of our actions through a holistic view of the energy system and by assessments from a life cycle perspective, and act on these insights

There are however obstacles that need to be eliminated for the roadmap to be realized. Therefore, the recommendation to the government, parliament and government agencies is to address the following proposals:

- After the energy agreement between five political parties, focus on the power/capacity issue in the entire energy system, including the heating sector and cogeneration, is needed.
- Redesign the building codes to stop them from controlling the choice of heating source.
- Create incentives for increased cogeneration of heat and power by valuing power and not just energy.
- Introduces policy instruments that provide incentives "early in the chain", for example, already in product design and procurement, in order to steer away plastic from residual waste.
- Support research, development and demonstration of new technology such as bio- and waste-CCS, bio-coal, solar heat, seasonal heat storage, combined heat and power production with higher electricity exchange, small-scale combined heat and power technology, fourth generation district heating and recycling refinery for plastic waste.
- Ensure conversion from electric heating to district heating, heat pump or biofuel.

To implement the heating sector's roadmap for fossil fuel free heating successfully, the actors behind it clearly see the need for increased collaboration throughout the value chain to continue the sustainable development and manage the complex challenges that it may entail. Together we have the power to change!