

Factors for enhancing the market development of energy efficient heat pumps

Scaling up through European policy instruments

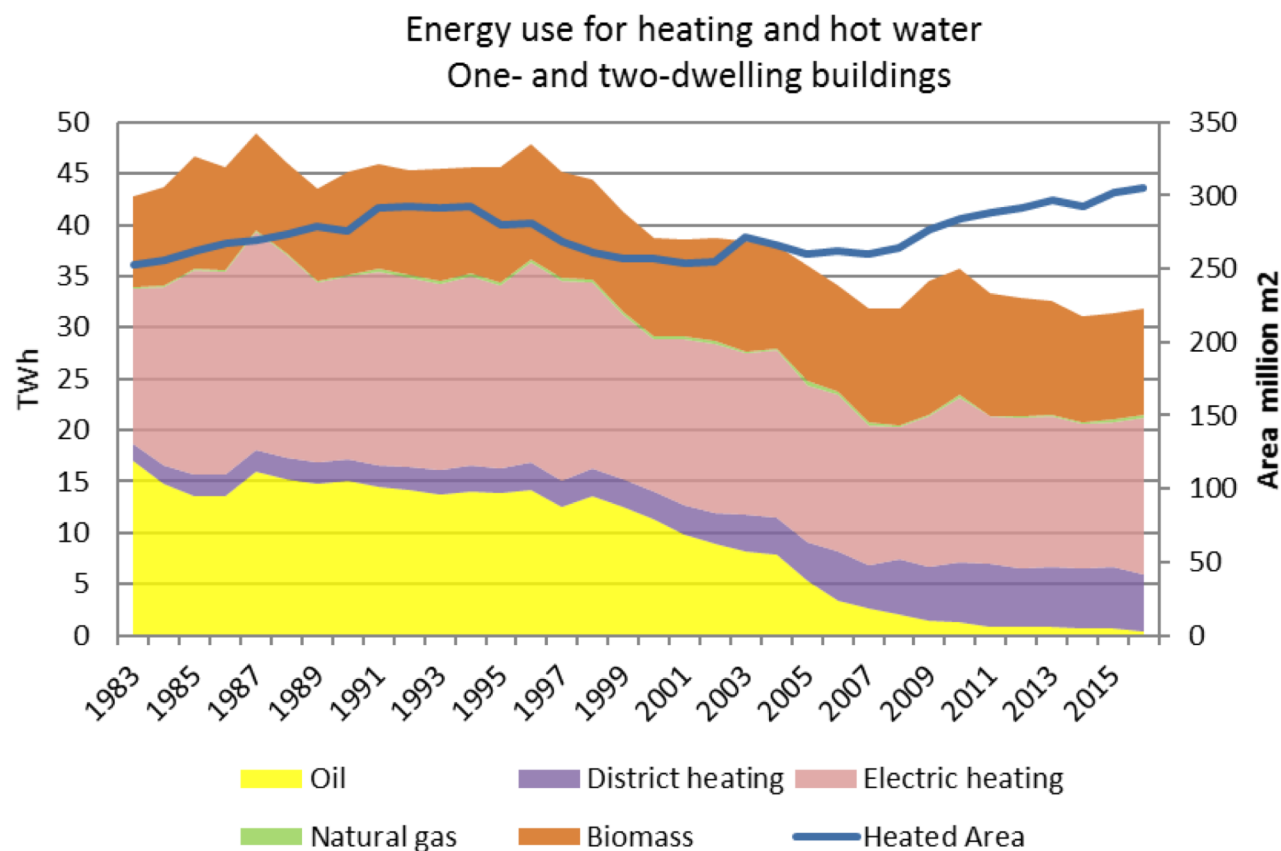
Carlos Lopes, Caroline Haglund Stignor, Emma Olsson

Presented by Carlos Lopes, Swedish Energy Agency

Eceee summer study 2019 – Is energy efficient sufficient?



Energy use for heating in detached houses



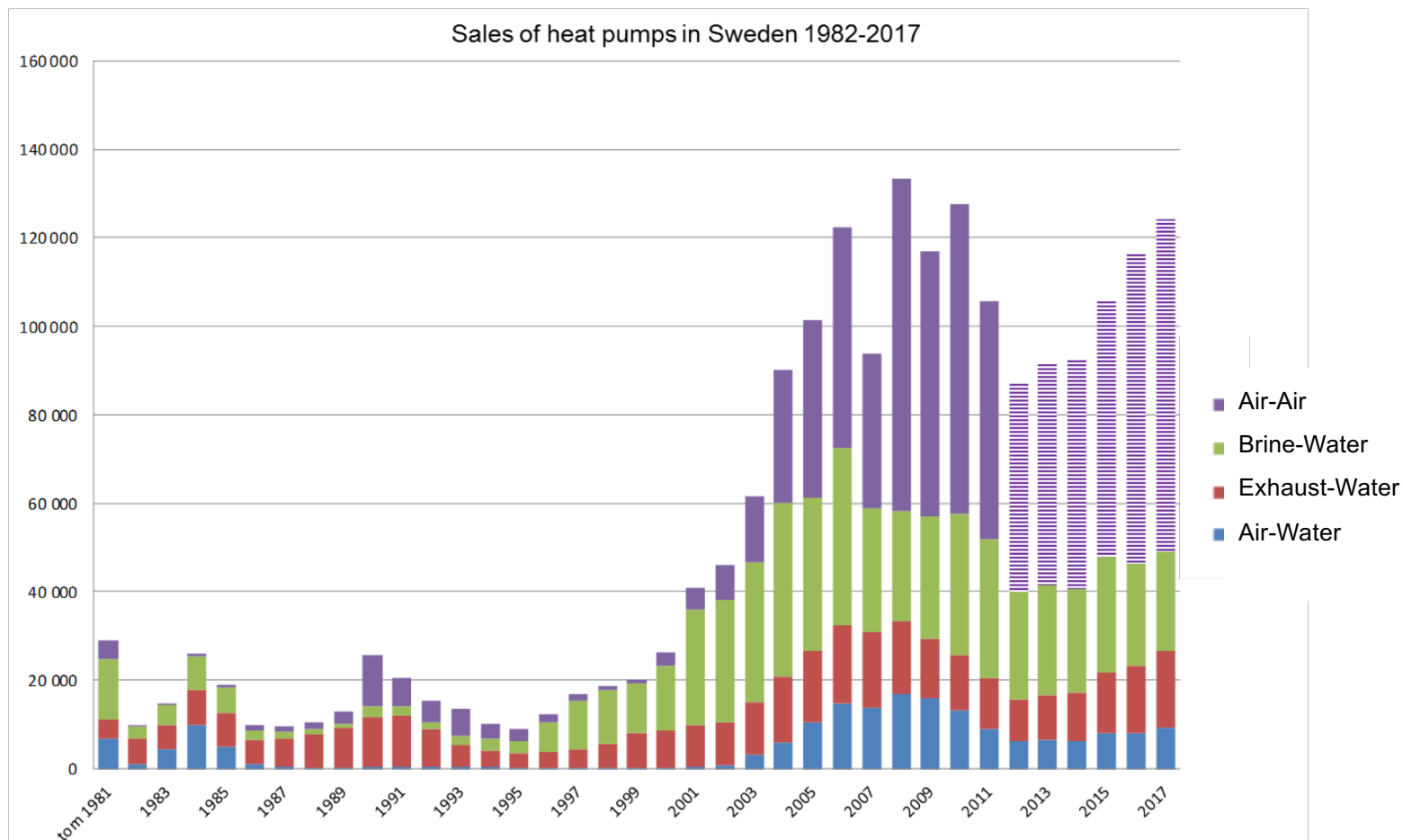
Heating oil almost phased out

Electricity heated buildings increased but consumption stable
Resistance replaced by heat pumps (incl air-air)

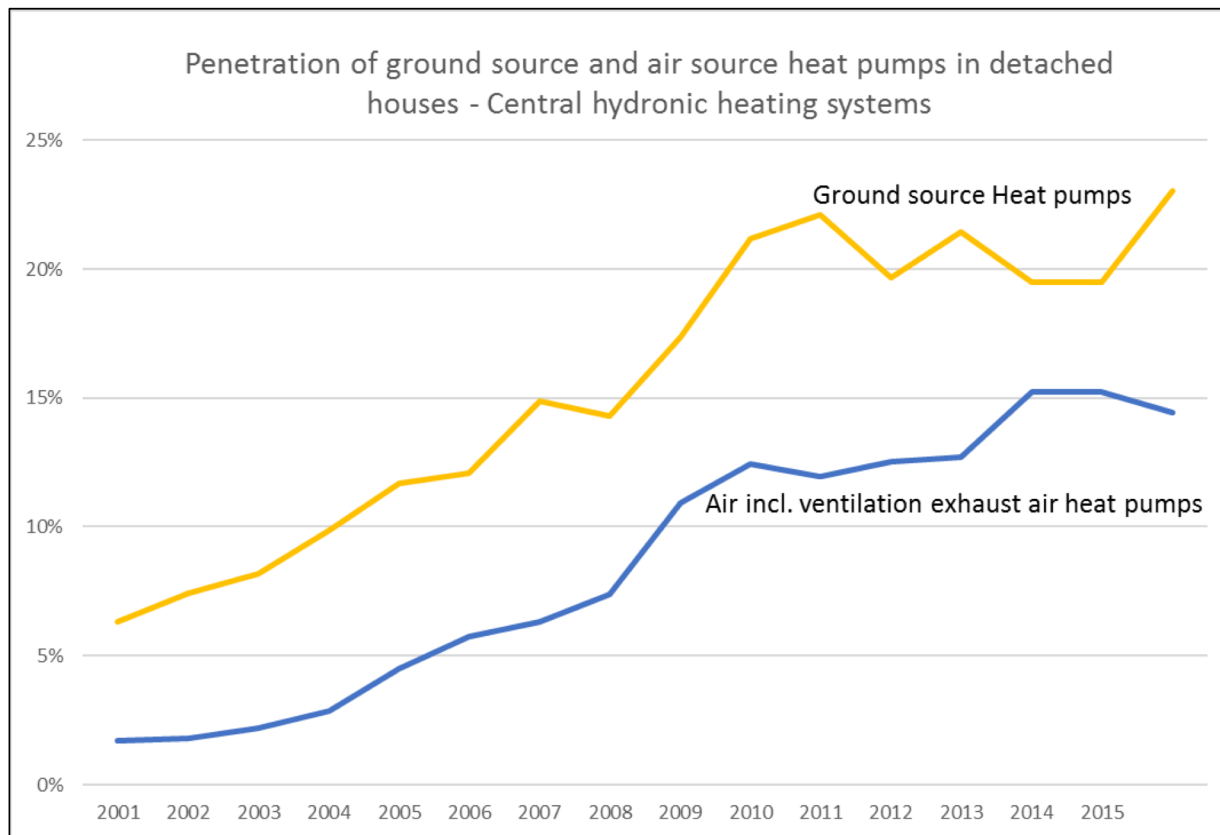
District heating increases by 225% (biomass, waste, HP)

GHG emissions reduced 91% since 1990

Heat pump market in Sweden 1981-2017



Penetration of heat pumps for central heating in detached houses in Sweden



37% of houses with heat pumps for hydronic central heating (0,75 million)

Almost a quarter of houses have ground source heat pumps .

Most common heat generator

Sweden is the largest market in the European Union with 28% of the market and 35% of the stock (EHPA, 2016)

The broad context: Energy infrastructure and prices

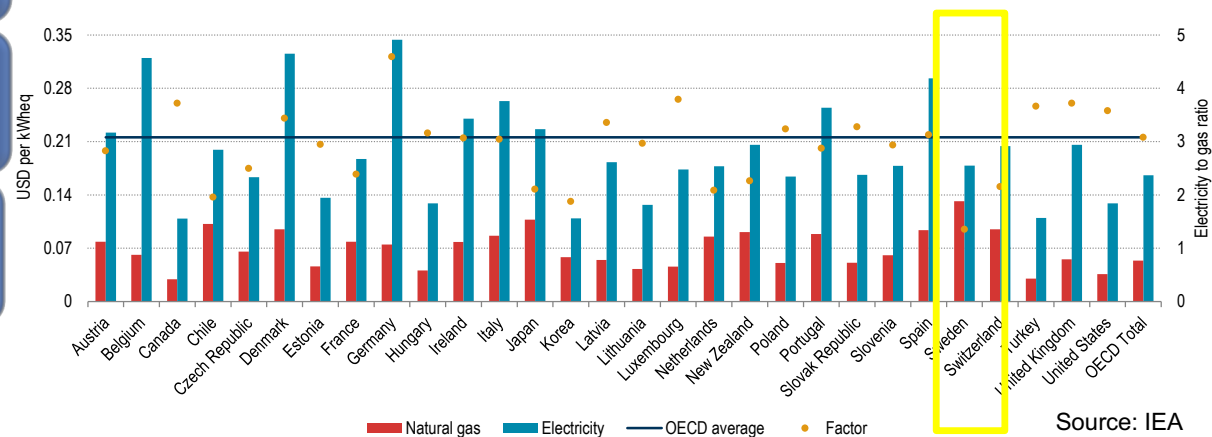
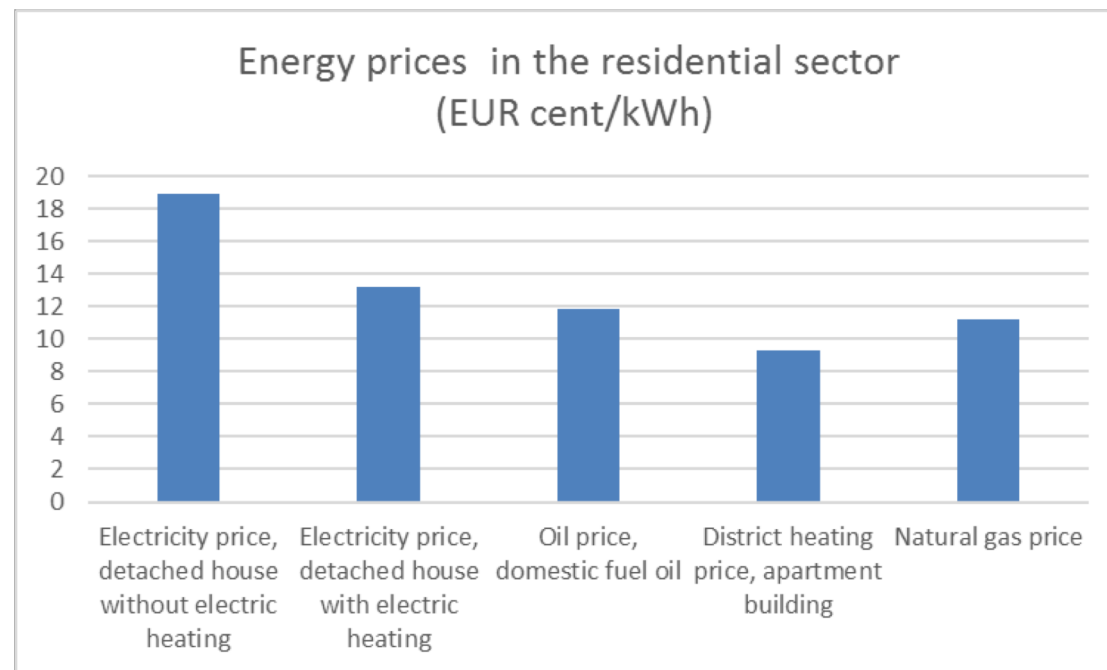
"Cheap" electricity, low electricity to oil and gas ratio
Carbon free electricity, perceived as clean

Expensive heating oil (due to taxes)

Gas almost not available

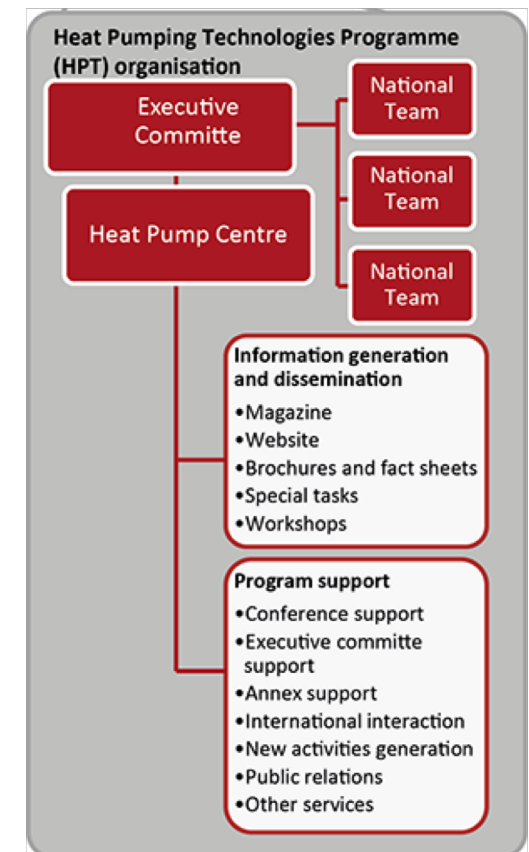
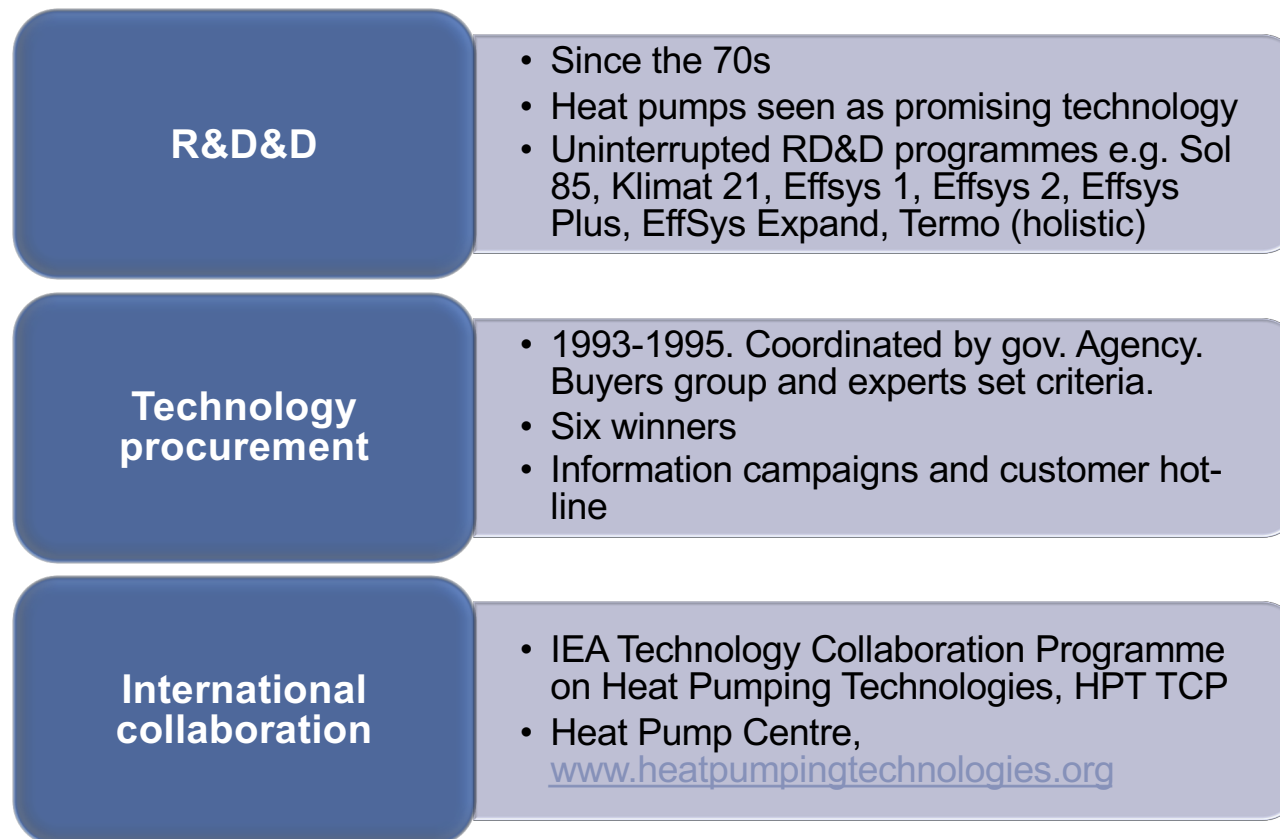
Competition with district heating

(Nuclear can have been negative for heat pumps)



A comprehensive and coordinated policy framework ?

Research, Development and Dissemination



A comprehensive and coordinated policy framework ?

Economic, administrative, information & advice

Taxes	<ul style="list-style-type: none">• Tax on heating oil
Subventions	<ul style="list-style-type: none">• 90'ies, 00'ies, tax credit for replacement of oil boiler• Tax credit for installation work
MEPS and Labels	<ul style="list-style-type: none">• Ecodesign requirements at EU-level• Energy labelling
Information, advice and testing	<ul style="list-style-type: none">• Tests and information targeted at consumers• Trained municipal energy advisers• Pressure on manufacturers and installers• "Cleans" the market from less serious actors

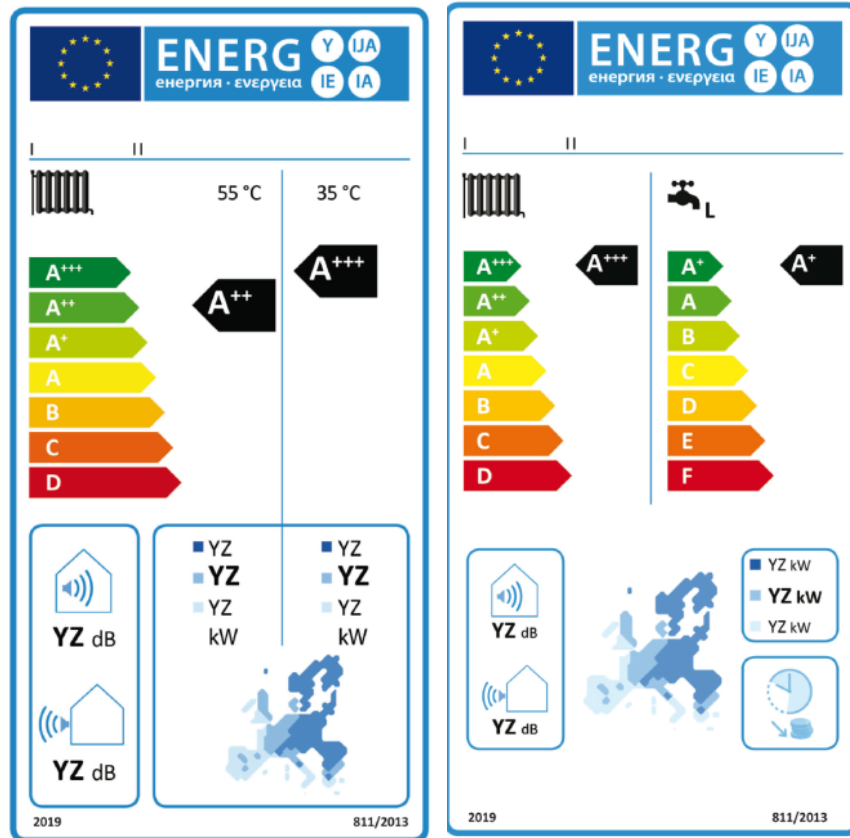
Manufacturers, installers and trade organisations

Competition AND collaboration as development factors

Collaboration within the trade organisation	<ul style="list-style-type: none">• Collaboration for competing with district heating• Collaboration for influencing the ecodesign and labelling process
Competition between manufacturers	<ul style="list-style-type: none">• Stimulates innovation• Possibility for export market and foreign investment
Skilled and efficient installers at competitive prices	<ul style="list-style-type: none">• Training programmes by manufacturers and/or trade organisation• Certification of installers started before it became an EU-obligation
Creating consumer trust	<ul style="list-style-type: none">• "Board for consumer disputes for Heat Pumps" to administer and mediate conflicts between consumers and manufacturers. Inspired on the "National Board for Consumer Disputes"

Ecodesign and energy labelling

Review on-going



Some recommendations:

- Fossil fueled boilers should be severely downgraded from A to
- More classes for HP for differentiation between and within types
- Efficiency should be on the label
- Show impact of the system temperature on the HP's efficiency
- Measurement standard should reflect ability to adapt to the load
- Show efficiency at different climates

Summary: Factors that contributed to the development of heat pumps in Sweden vs actors

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Energy Infrastructure and low electricity prices	Continuous R&D&D programmes	Qualified installers	Product testing Information, advice, Creating Trust	Taxes & Incentives	MEPS & Labels
<ul style="list-style-type: none">• Government• Market	<ul style="list-style-type: none">• Government funded• Manufacturers• Research institutes and Universities	<ul style="list-style-type: none">• Industry• Government	<ul style="list-style-type: none">• Government• Industry• Test institutes	<ul style="list-style-type: none">• Government	<ul style="list-style-type: none">• European Union• Government

Challenge: The role of heat pumps in an electricity system with increased variable renewables

- Large savings ...but electricity peaks coincide with system peaks
 - Increase efficiency at low outdoor temperatures
 - Introduce “smart” characteristics for Demand-Side Flexibility
 - the ability to adapt to the heating demand of the building and its users
 - the ability to interact with the electricity system,
 - Integrate with storage

Thank you

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Ecodesign and energy labelling

