

A set of indicators to monitor energy efficiency

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CA ESD
2011-10-26

The Swedish Energy Agency

- Is a government agency for national energy policy issues.
- Promotes the development of a Swedish energy system that is ecologically and economically sustainable. Energy must be available at competitive prices and energy generation must make the least possible impact on people and the environment.

The assignment

- The government assigned the Agency to investigate and propose a set of energy efficiency indicators and related assessment methods
- The overall set of indicators should be used to obtain an overall perspective and to follow up existing Swedish and European energy efficiency targets and cover (i) primary energy use as well as final energy use, and (ii) the entire economy as well as individual sectors.
- In addition, an assessment of how indicators to monitor economic efficiency can be developed.

Indicators depend on targets

- Savings? (Performed actions)
- National energy use? (primary or final)
- Carbon Emissions?
- Other?

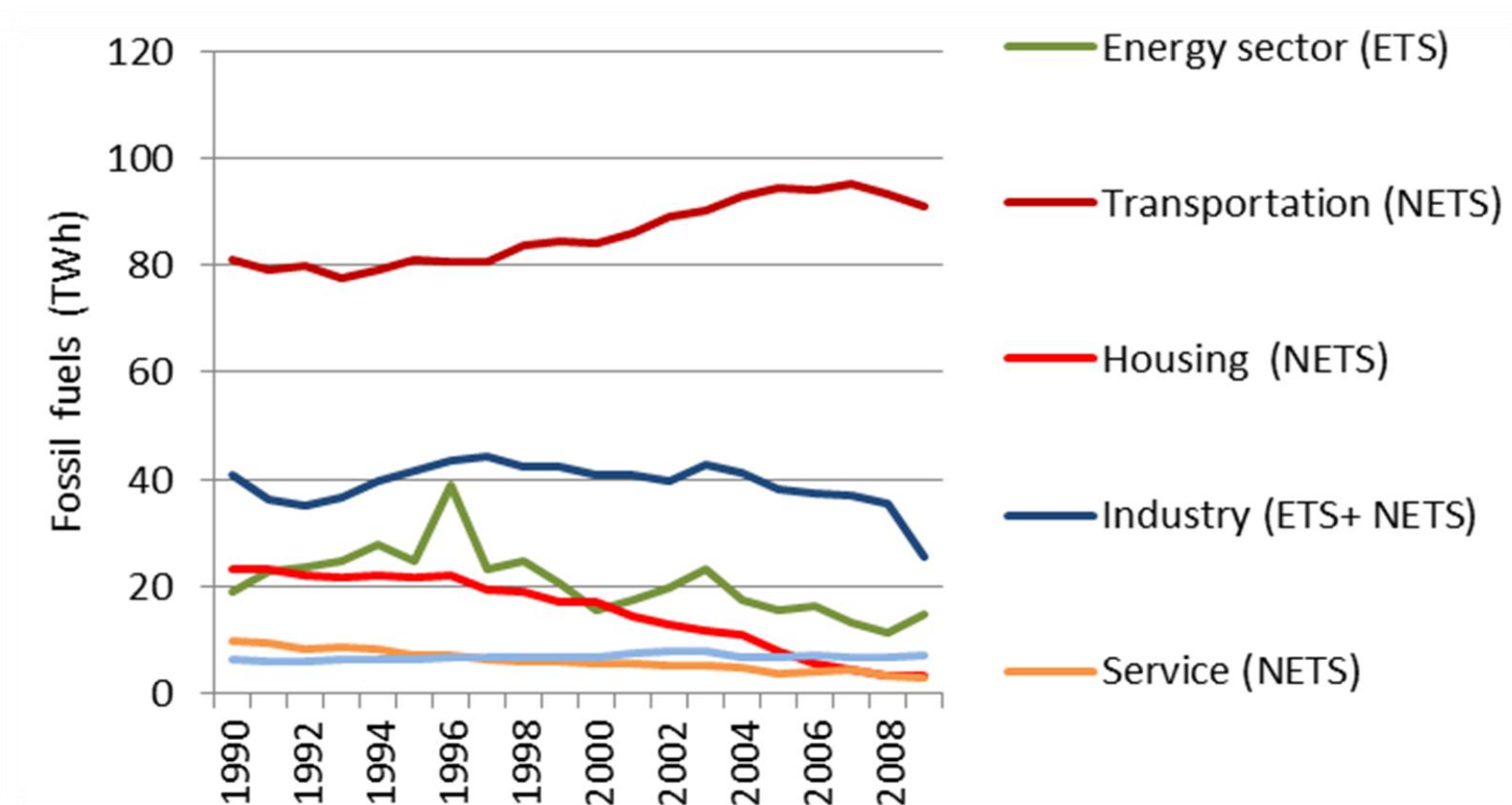
Overall energy policy targets

- ecological sustainability (climate)
- security of supply
- competitiveness

Indicators for overall targets

Targets	<i>Ecological sustainability (climate)</i>		<i>Security of supply</i>		<i>Competitiveness</i>	
Indicator	Use of fossil fuels per ETS/NETS sector		Functioning Markets	Indicators for socio-economic efficiency	General indicators	Energy costs as a proportion of companies' variable costs
	Carbon dioxide per GDP	Carbon dioxide per supplied energy		Energy use per added value		Generation of knowledge
	Carbon dioxide per capita	Energy supplied per GDP	Buildings' capacity to retain heat		Industry initiatives	Proportion of companies with energy management systems or which have conducted an energy audit
		Carbon dioxide per GDP	Distribution of energy production by energy carrier and source	Supplied energy per energy carrier		
	Carbon dioxide per supplied energy			Electricity production per source		The number of patents in the area of energy efficiency

Fossil fuel use in sectors where emissions are/are not limited by the EUETS



Energy efficiency targets

- EU targets
 - Savings, 9% to 2016 (end use)
 - Energy use, 20% down to 2020 (primary energy)
- Swedish targets
 - Energy intensity, - 20% by 2020 compared to 2008 (primary energy)
 - Energy use / m² in buildings, - 20% (-50%) to 2020 (2050) (end use)

Indicators for efficiency targets

<i>Sector</i>	<i>The entire economy</i>			
Indicator	<p>Energy supply (for domestic energy purposes)</p> <p>Final energy for energy purposes plus losses</p> <p>Savings</p> <p>Energy supplied per GDP</p>			
<i>Sector</i>	<i>Industry</i>	<i>Housing and Service</i>	<i>Transport</i>	<i>Energy conversion sector</i>
Indicator	<p>Energy use in industry per energy carrier</p> <p>Energy use per added value</p> <p>Energy use per Physical production</p>	<p>Energy use in housing and service per energy carrier</p> <p>Total energy use per heated unit of space</p> <p>Energy use for heating and hot water in housing per heated unit of space</p>	<p>Energy use for domestic transport per energy carrier</p> <p>Energy use per passenger km and vehicle type</p> <p>Energy use per ton km and vehicle type</p>	<p>Electricity production per source</p> <p>Electricity production in CHP /total combustion-based electricity production</p> <p>District heating use/ total supply for energy for district heating production</p> <p>Electricity production /total supplied energy for electricity production</p> <p>District heating production in CHP/total district heating production</p> <p>Combustion-based electricity production/Energy supplied for combustion-based electricity production</p>

Energy efficiency is a complex policy area

- Effects on aggregate level not corresponding with effects of individual actions
 - Other factors affecting energy use/intensity
 - Definition of energy efficiency
- Price-raising energy and climate policy instruments makes energy efficiency actions more profitable
 - Are prices right?
 - Access to information ?

Sweden: successful and unsuccessful

- Final savings (ESD):
 - In 2010: 34,3 TWh (24 TWh)
 - In 2016: 53,8 TWh (33,2 TWh)
 - Sweden exceeds the ESD - target
- Primary energy intensity (National):
 - To 2020: -13% (-20%) *according to forecast*
 - Sweden seem not to reach the intensity target

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Conclusions

- A set of indicators
 - A trade-off between holistic picture and administrative simplicity and cost
- Show effect on targets
- Swedish example – energy intensity forms the basis.

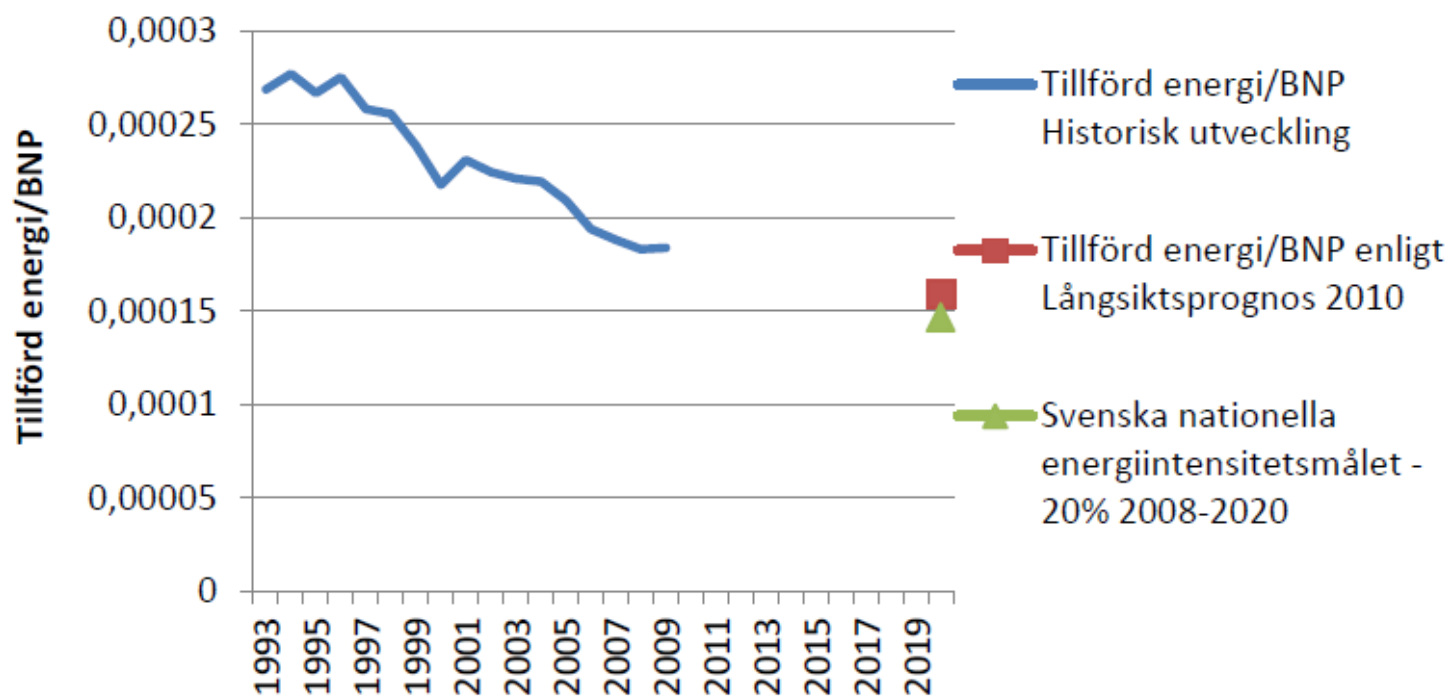
Thank you for listening!

Contact:

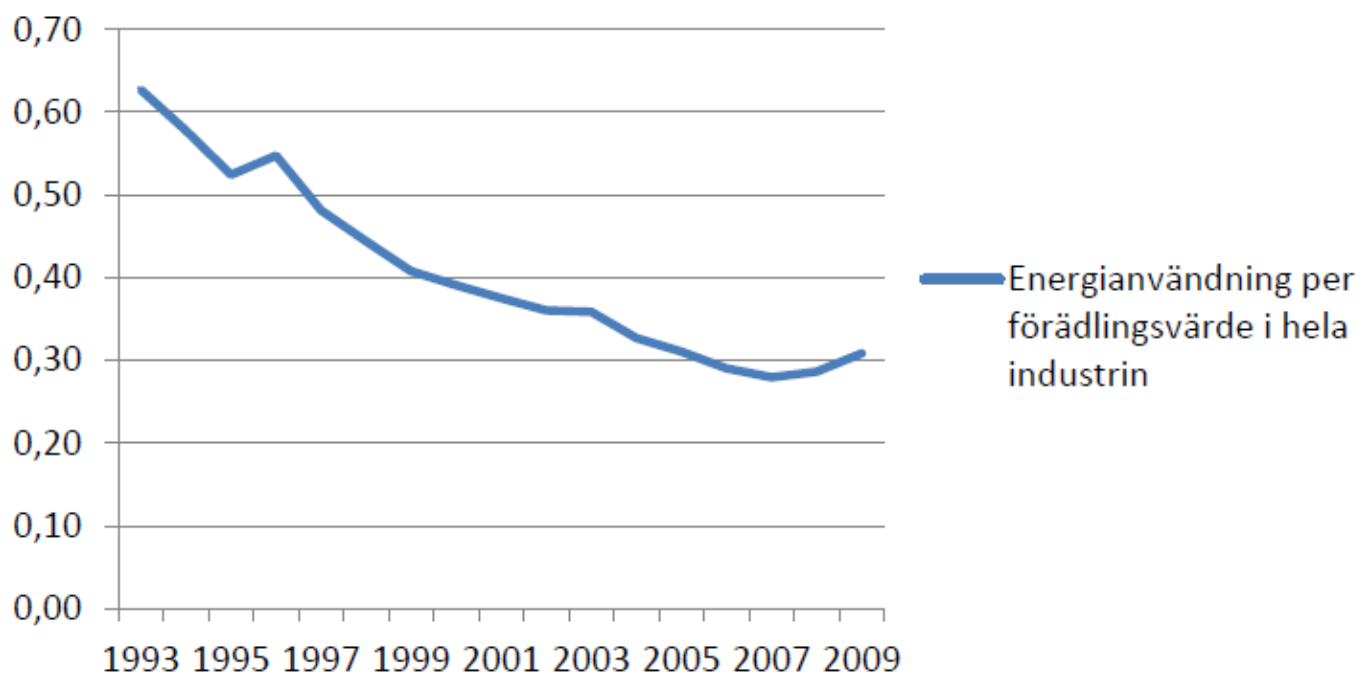
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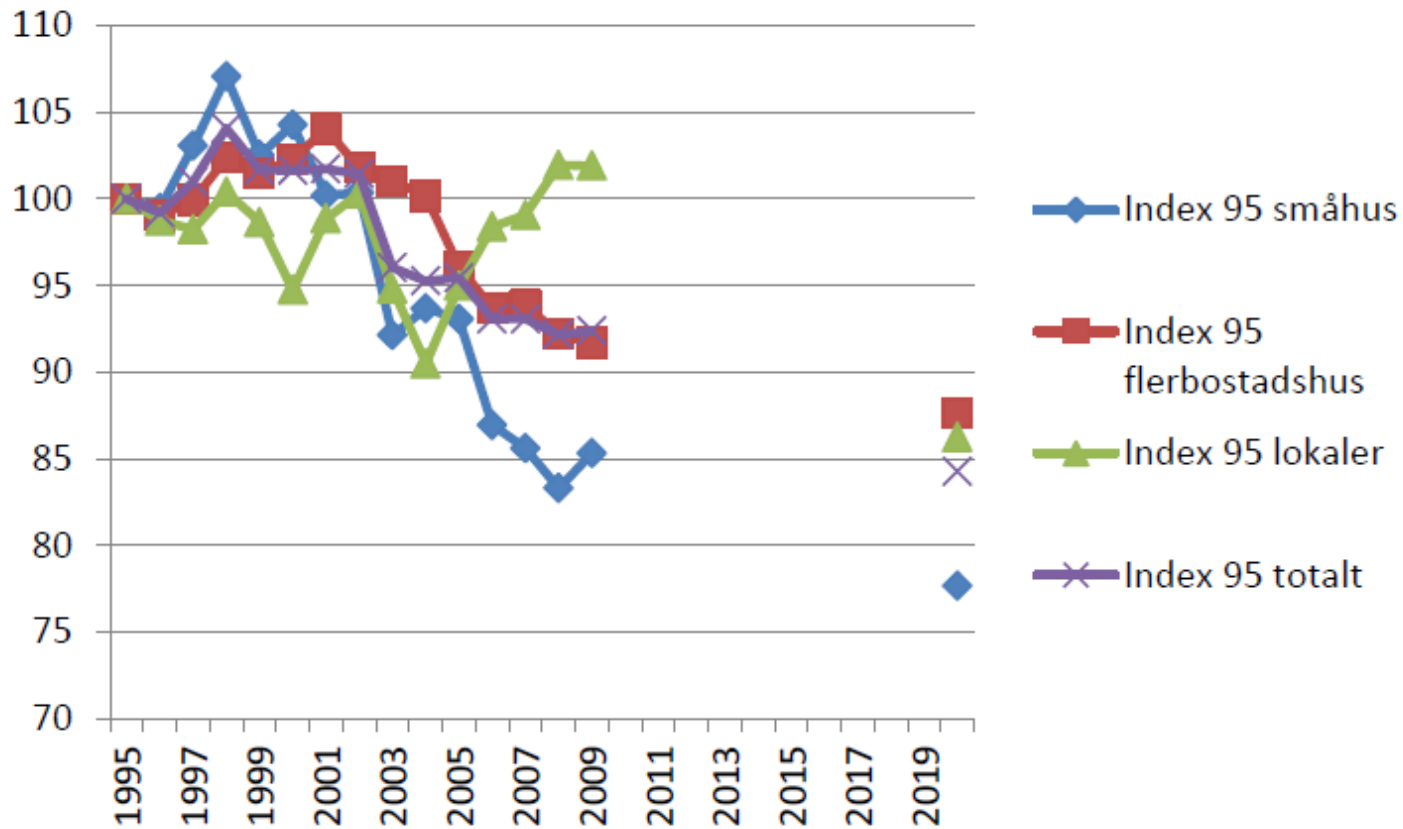
Energy supplied per GDP (Energy intensity)



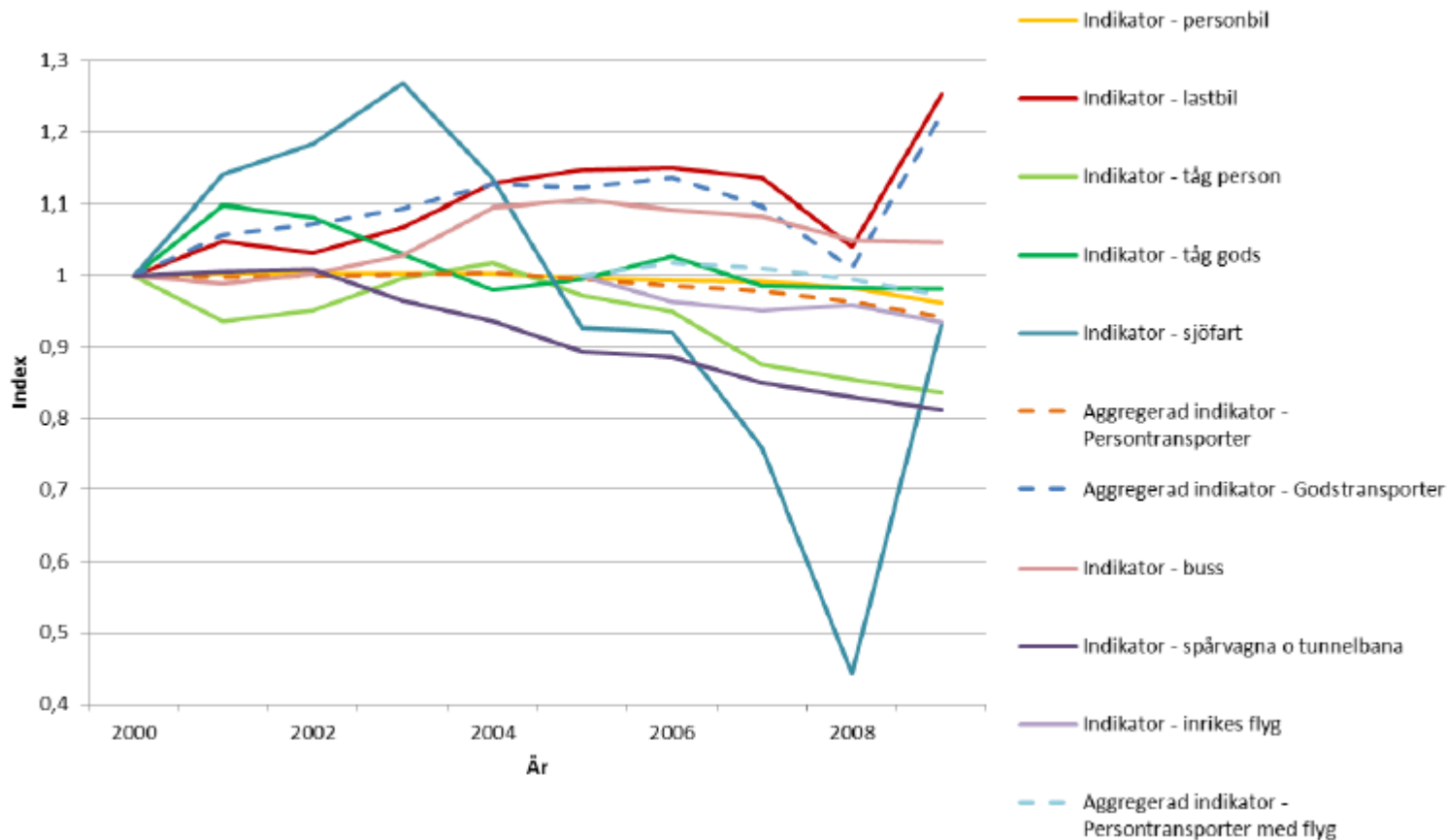
Energy use per value added - industry



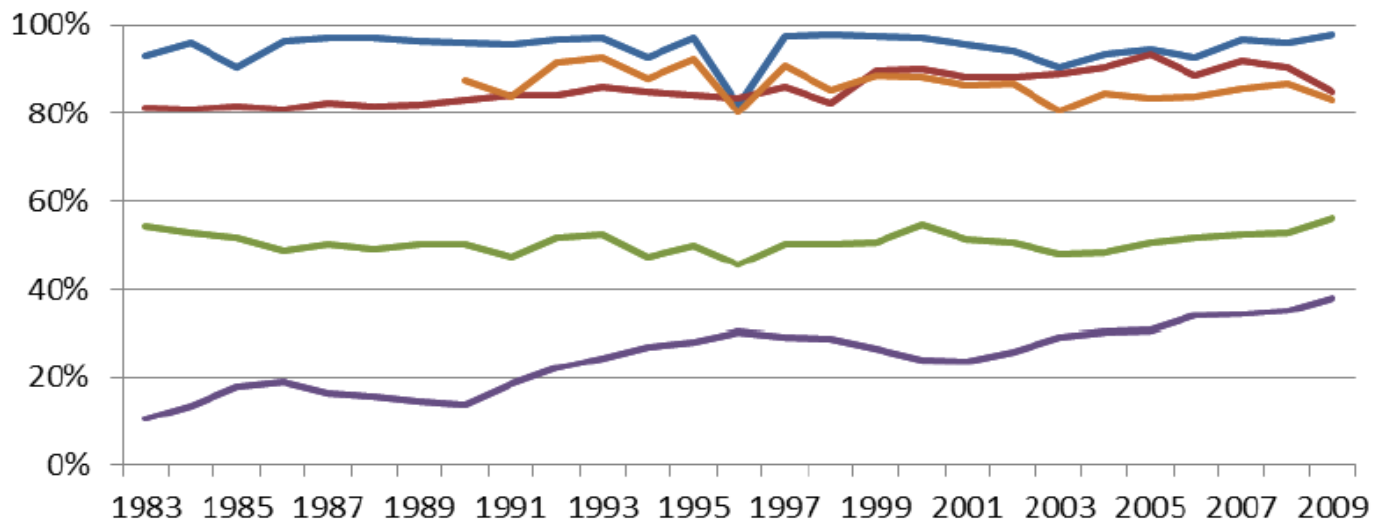
Total use of energy per heated unit of space (m²)



Energy use per personkm and tonkm



Energy conversion efficiency and CHP



- Elproduktion i kraftvärmedrift/Total förbränningsbaserad elproduktion
- Fjärrvärmeanvändning/Total tillförd energi för fjärrvärmeproduktion
- Elproduktion/Total tillförd energi för elproduktion
- Fjärrvärmeproduktion i kraftvärmeverk/Total fjärrvärmeproduktion
- Förbränningsbaserad elproduktion/Tillförd energi för förbränningsbaserad elproduktion