



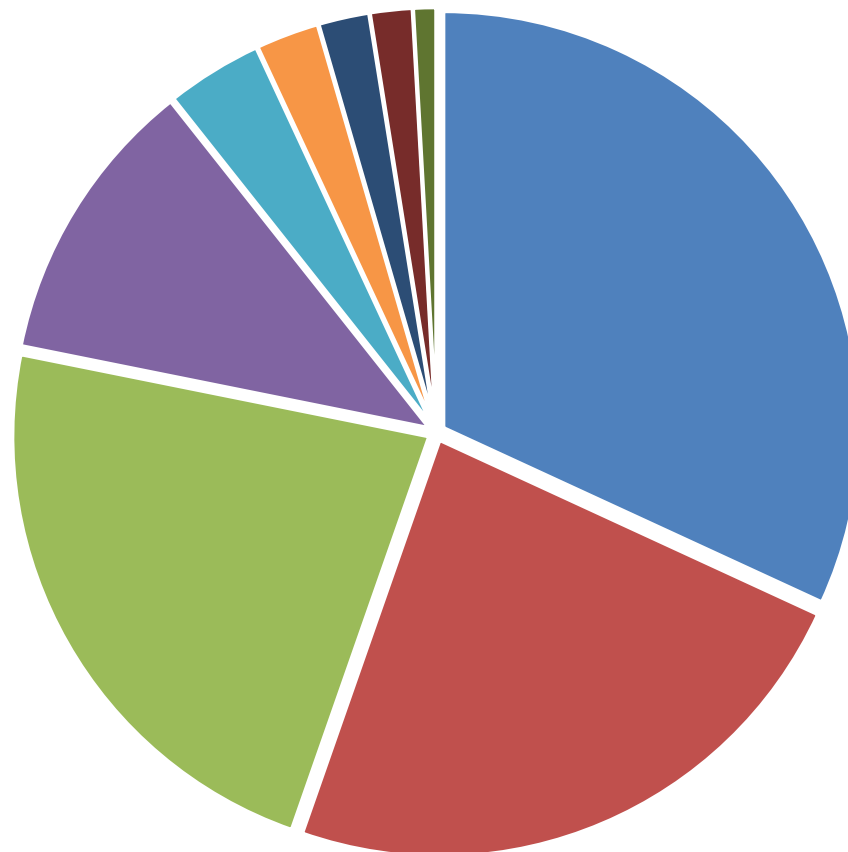
Energy and housing - Swedish and regional conditions

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Build2LC 2017-09-13

Energy supply Sweden 2014 [550 TWh]

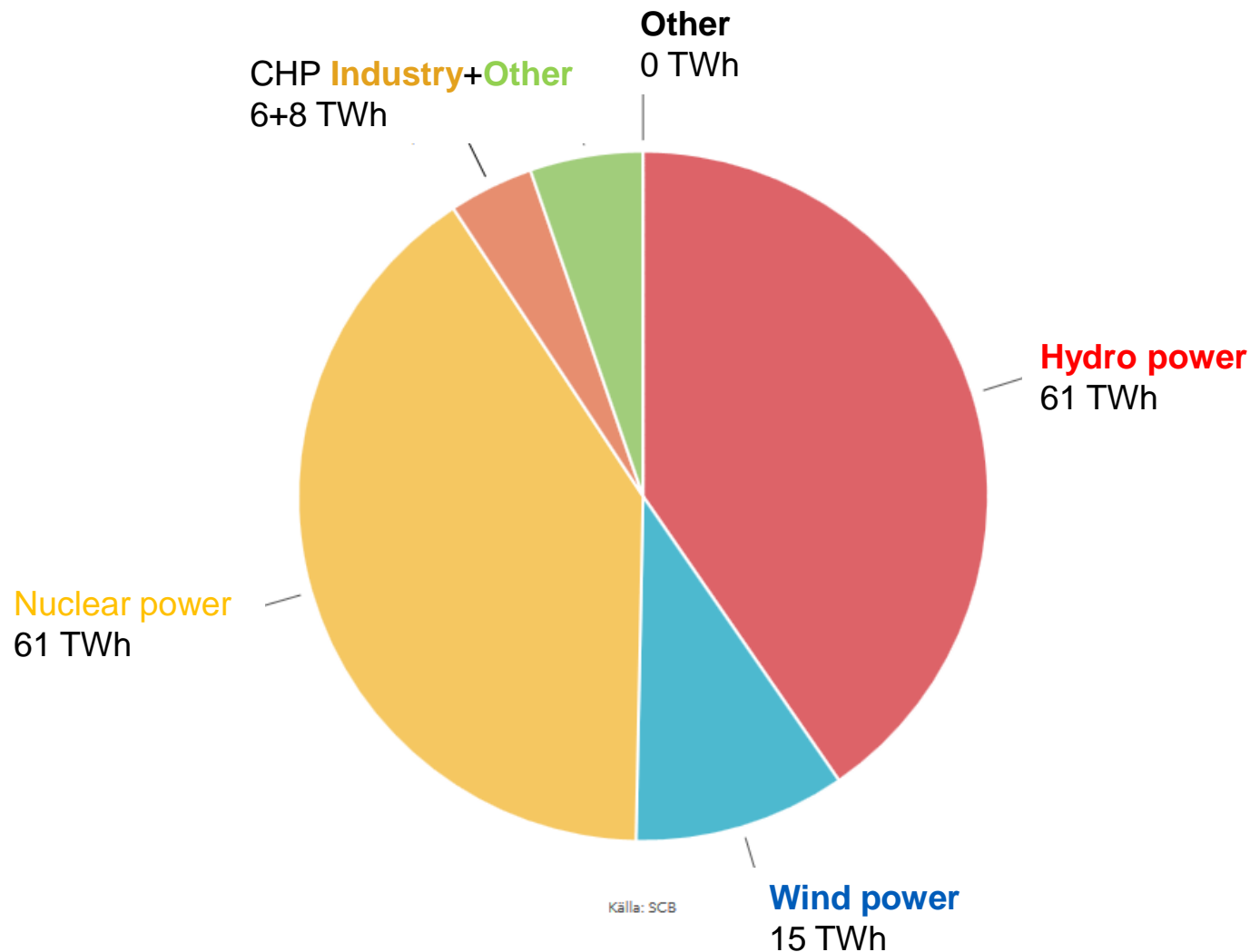


■ Nuclear fuel2
■ Hydropower
■ Wind power

■ Crude oil and oil products
■ Coal and coke
■ Natural gas, gasworks gas

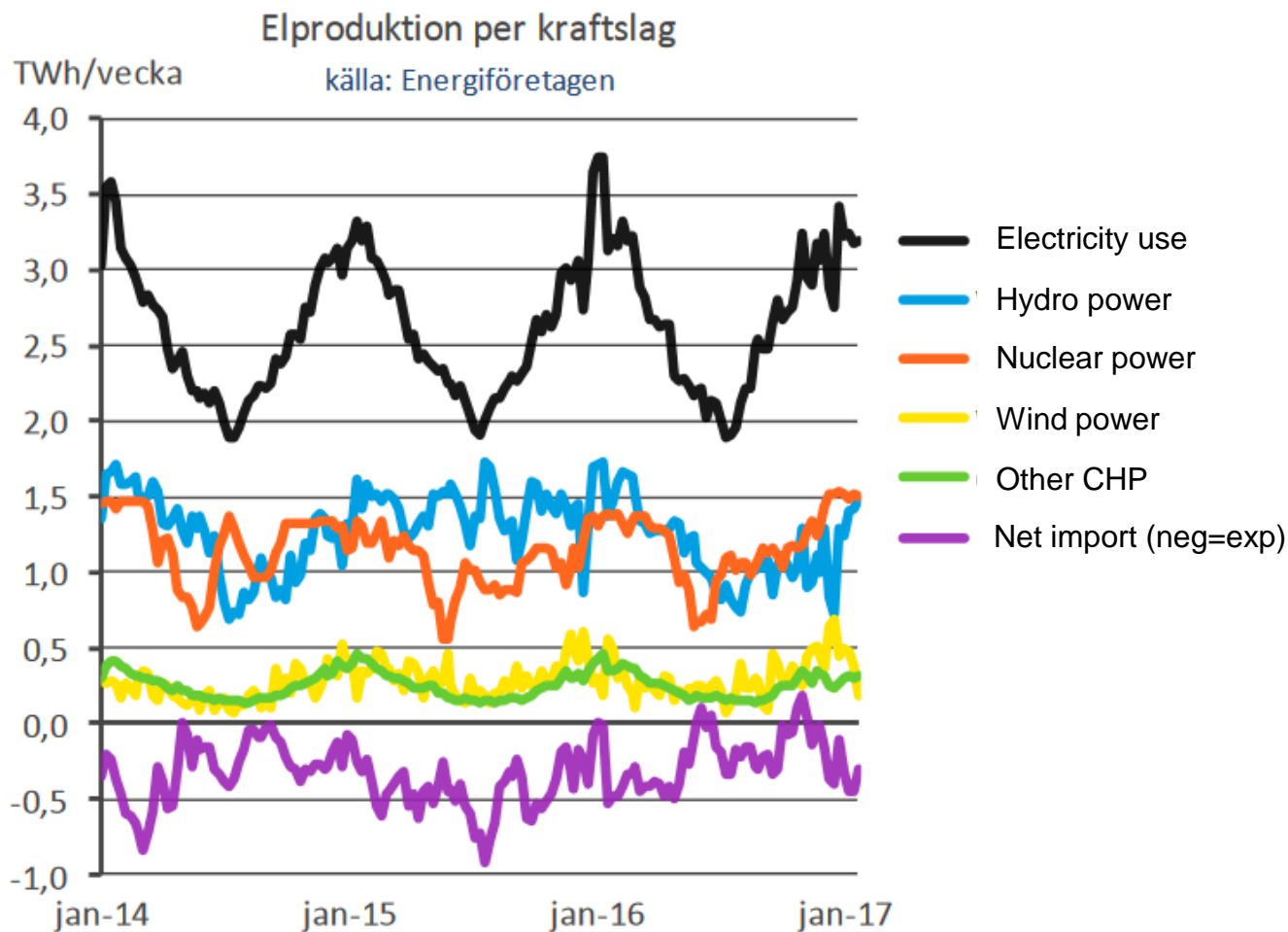
■ Biomass
■ Other fuels
■ Primary heat1

Total electricity production 2016 [150 TWh]



Källa: SCB

El. production cycle 2014-17 [TWh/w]



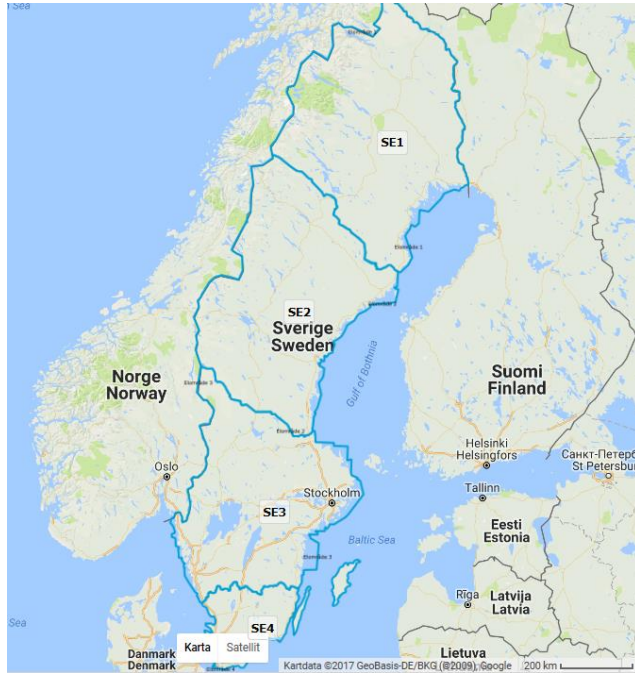
Four Electric grid areas SE1-SE4 (2016)



Four climate/temp zones for construction (up to 2017-06)



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Grid areas for comparison

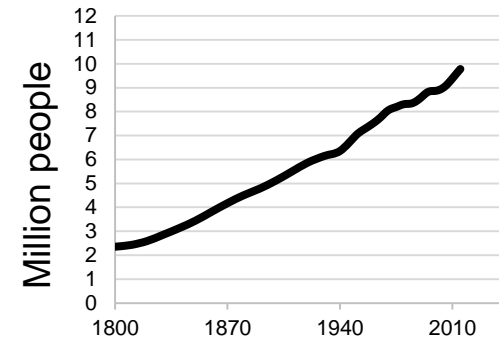


Demand for new dwellings

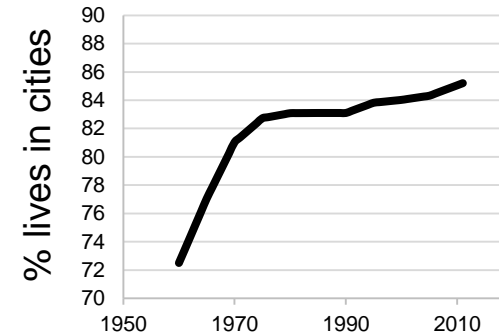


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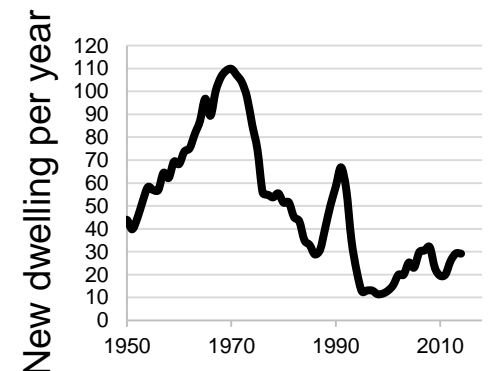
Population Growth



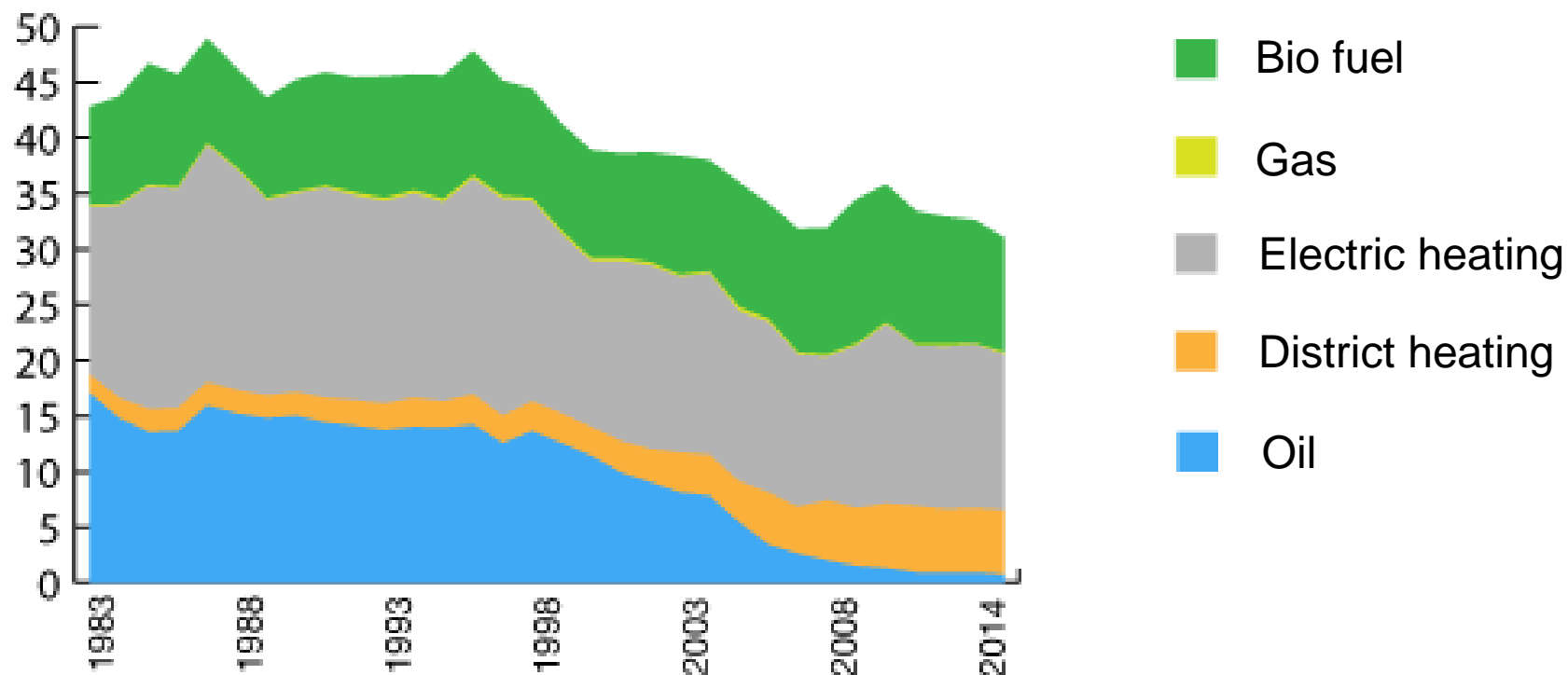
Increase level of urbanization



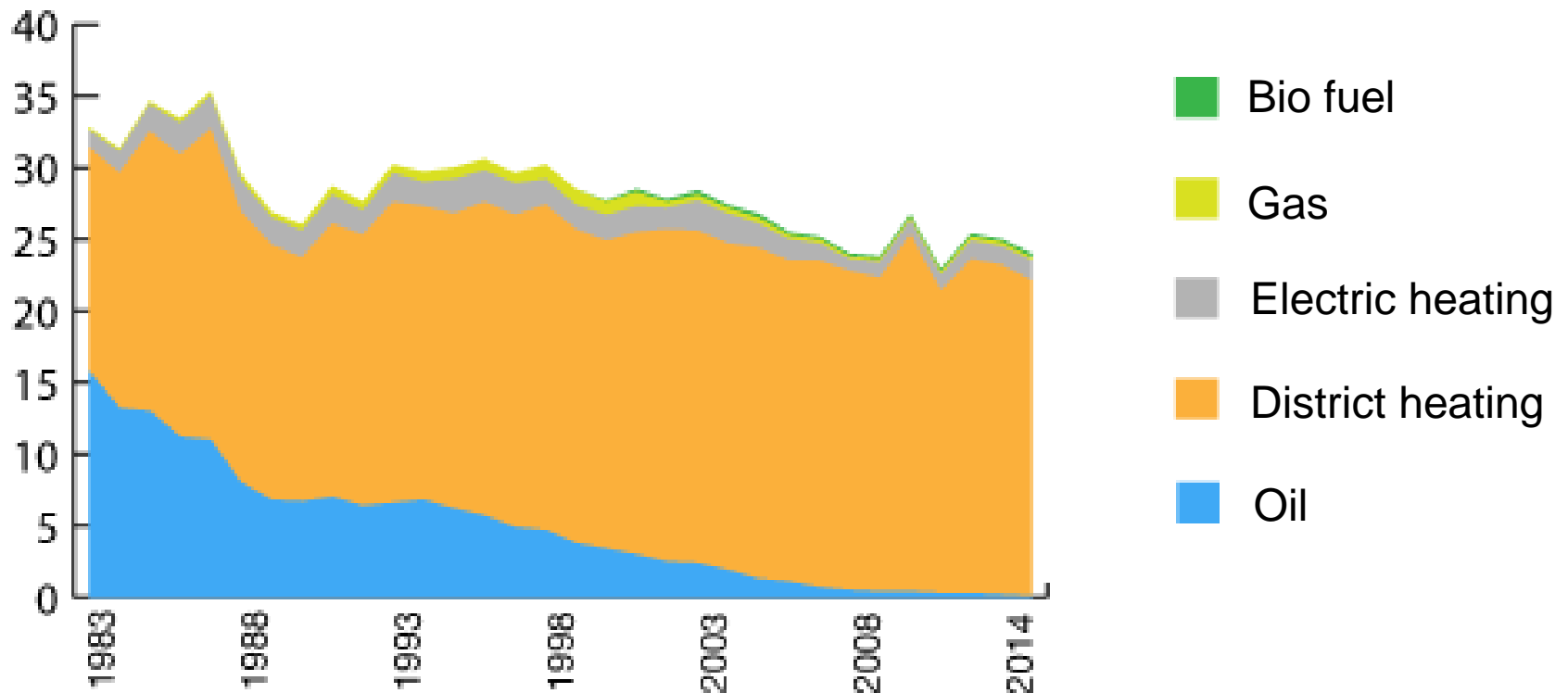
Low rate of new constructed buildings



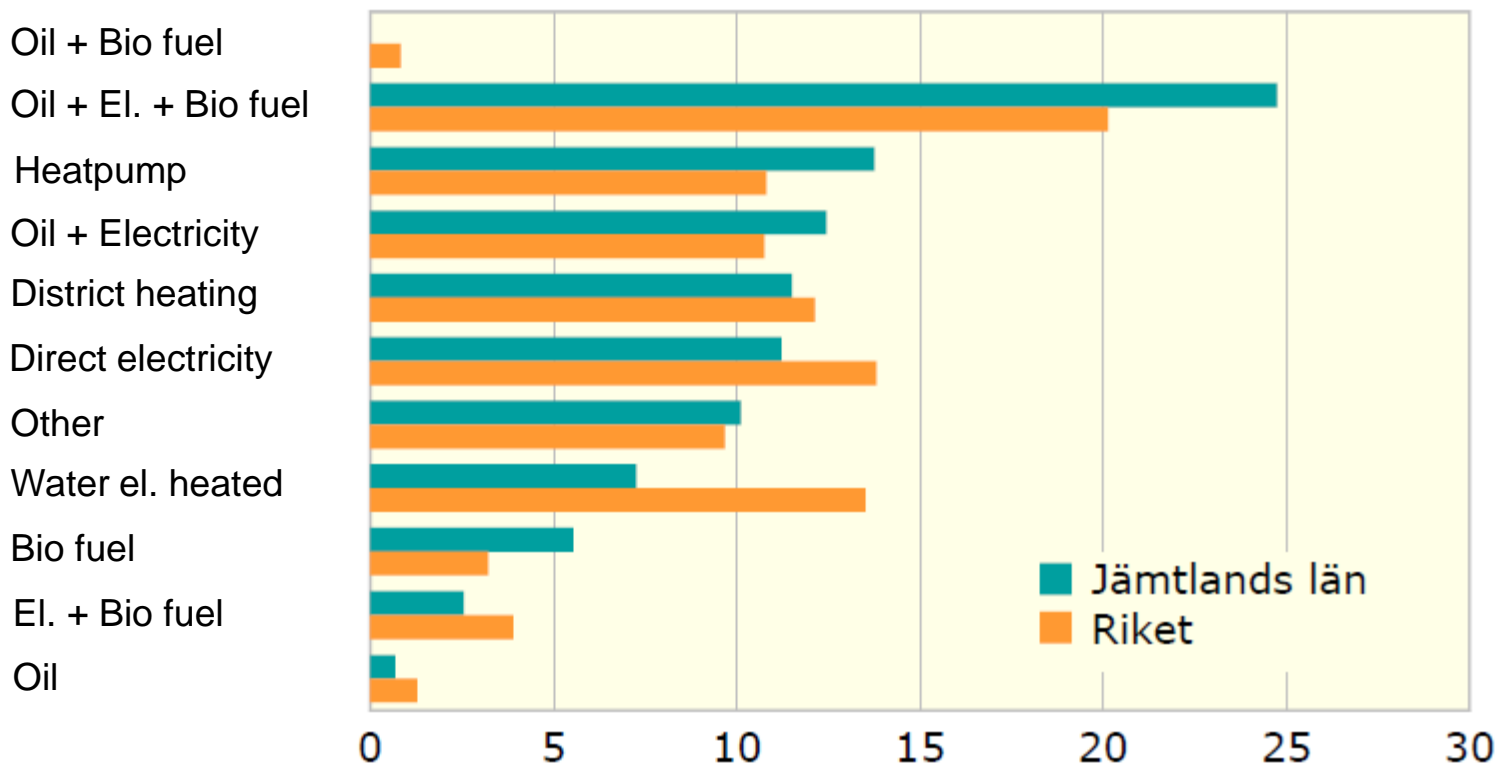
Energy use for heating/hot water in small houses [TWh]



Energy use for heating/hot water in residential buildings [TWh]



Energy source used for heating of small houses (incl farms) [%]



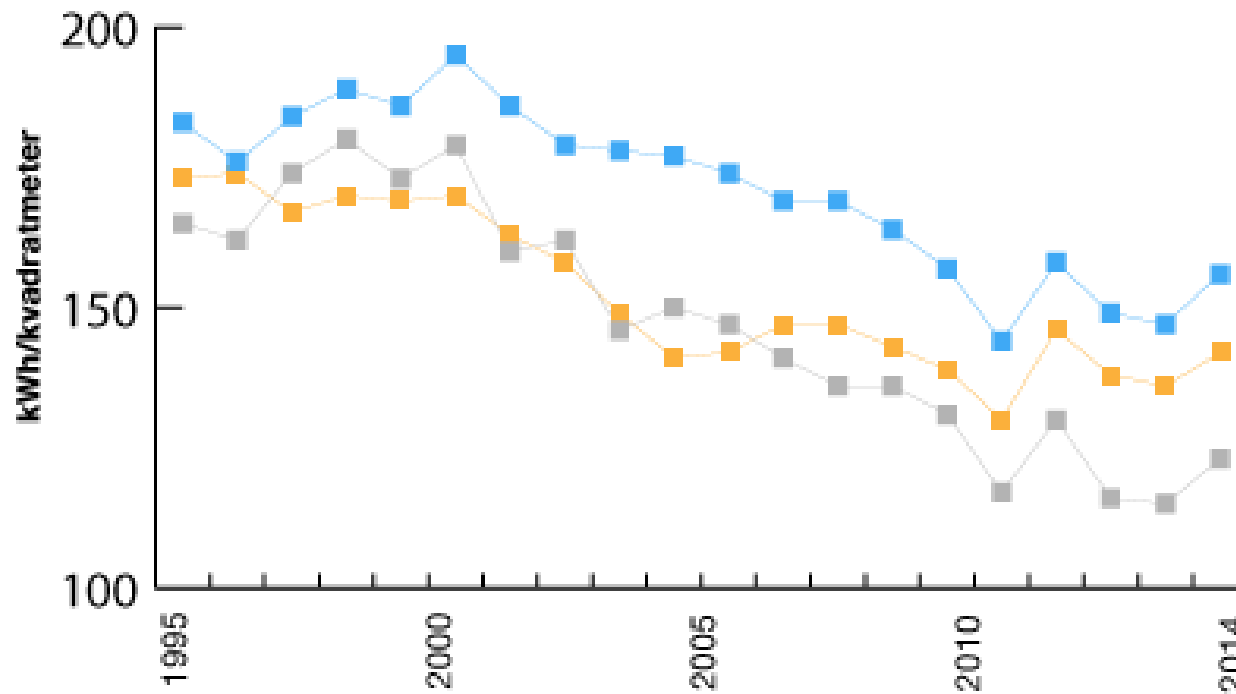
How to improve the system from an energy perspective

- 1. Reduce the energy need (reduced heat, reduced cooling etc)**
- 2. Higher efficiency in energy supply to the building**
- 3. A combination of 1 and 2**

Energy use demand new houses (from 2017-07 electric heating gone)

Demand spec energy use [kWh/m ² and year]	Zone I	Zone II	Zone III	Zone IV
Small house with other heating than electricity	130	110	90	80
Small house with electric heating	95	75	55	50
Small house with A_{temp} less than 50 m ²	No demand	No demand	No demand	No demand
Residential building with other heating than electricity	115	100	80	70
Residential building with other heating than electricity with A_{temp} larger than 50 m ² with apartments with less than 35 m ² each	125	110	90	80
Residential building with electric heating	85	65	50	45
Residential building with electric heating with A_{temp} larger than 50 m ² with apartments with less than 35 m ² each	90	70	55	50

Energy use (Temp corrected) in buildings for heating/hot water [kWh/m²]



- Residential
- Other buildings
- Small houses

Demands typical:
70-80 kWh/m²

Tabell 2:2 Indata for calculations residential buildings

Parameter	Delparameter	Delparameter	Värden
Indoor temp	Uppvärmningssäsong (°C)	Utrymmen för bostadsändamål	21
		Utrymmen för bostadsändamål i äldreboende	22
Air flow	Behovsstyrda flöden (min/dygn)	Forcering i kök ¹⁾	30
Solar shield	Beteendestyrd avskärmning (avskärningsfaktor)	Till exempel markiser, persienner och gardiner	0,71
Hot water	Energi (kWh/m ² A _{temp} år)		25/η _{tw} ²⁾
Household energy	Energi (kWh/m ² A _{temp} år)		30
	Internlast (%)	Möjlig att tillgodogöras under uppvärmningssäsongen	70
Personal radiation	Antal personer		Enligt tabell 2:3
	Tid (h/d/v) ³⁾		14/7/52
	Effektavgivning (W/person)		80

¹⁾ Beaktas enbart vid avluftsflöden.

²⁾ η_{tw} är årsverkningsgraden hos värmekällan för produktion av tappvarmvatten.

³⁾ Timme per dygn/dygn per vecka/veckor per år.

(BFS 2017:6).

Tabell 2:3 Värden för beräkning av antal personer i bostäder

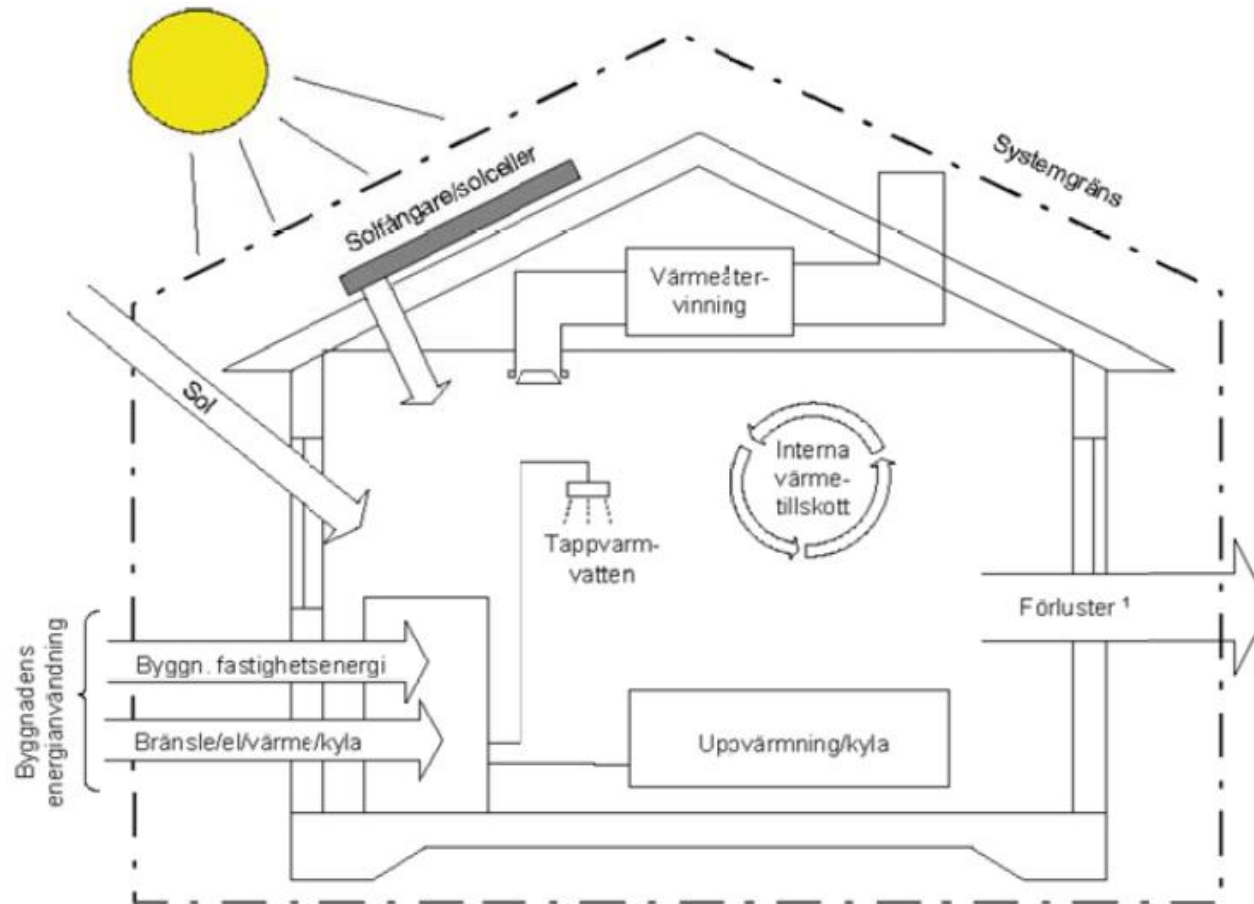
Antal rum och kök	1 ^{a)}	2	3	4	5+
Antal personer	1,42	1,63	2,18	2,79	3,51

^{a)} Inklusive 1 rum och kökvrå

Systems boarder building



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1) Transmissionsförluster, luftläckning, ventilationsförluster och dylikt.



Boverket