Finnish District heating

EHP Board

Marko Riipinen
Finnish Energy Industries
29.1.2014

Finnish Energy Industries

District Heating Year 2013

District heat in Finland year 2013

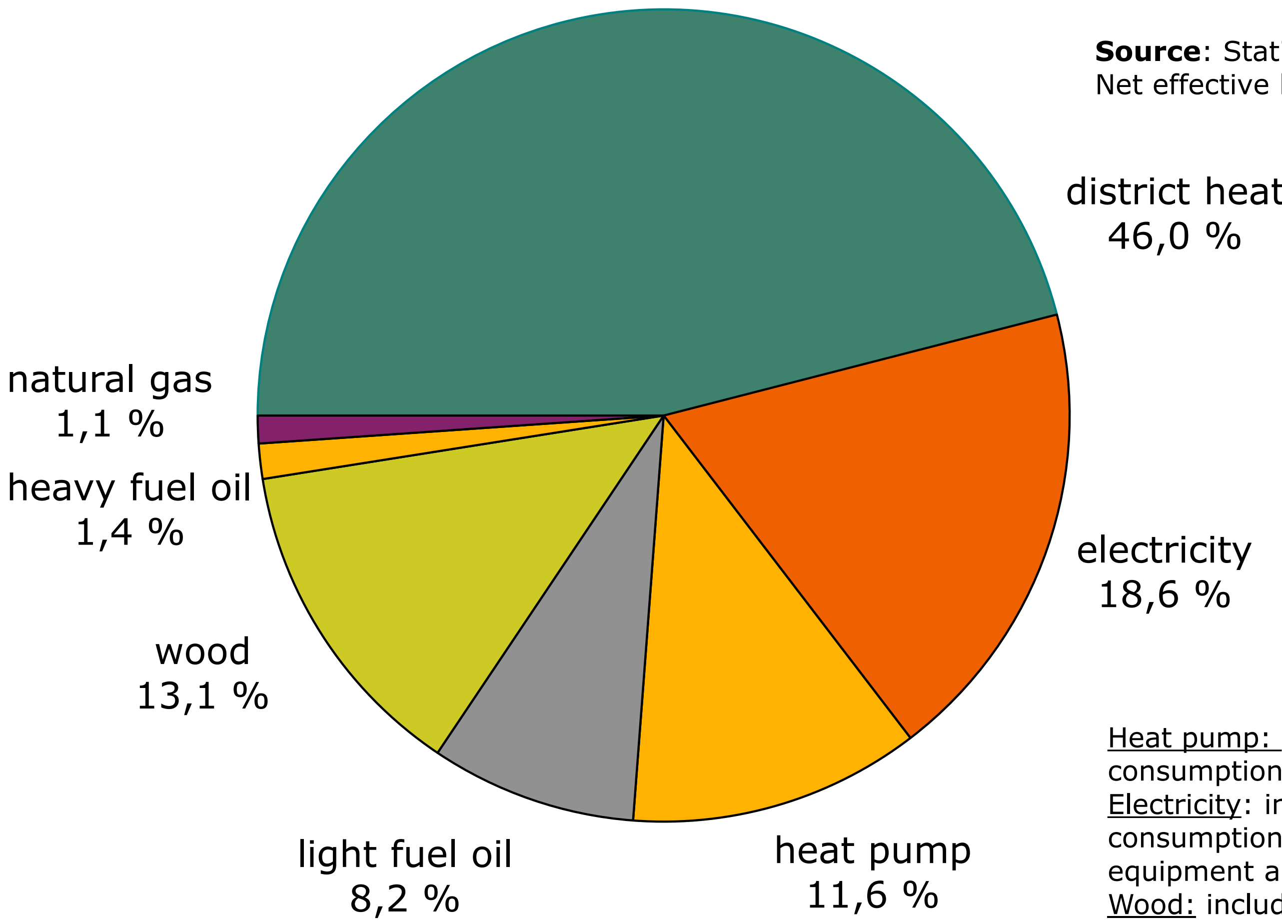
Heat sales (incl. taxes)	2,33 billion €
Sold heat energy	31,6 TWh
Share of CHP in DH production	74 %
DH networks (trench length)	13 800 km
Average price of dh (incl. taxes)	7,4 c/kWh
Market share of district heat	46 %

- District heating in new construction (2012)

• Detached houses	17 %
• Building blocks	96 %
• Office buildings	95 %
• School buildings	78 %
• Commercial buildings	83 %
• Industrial and storage buildings	45 %

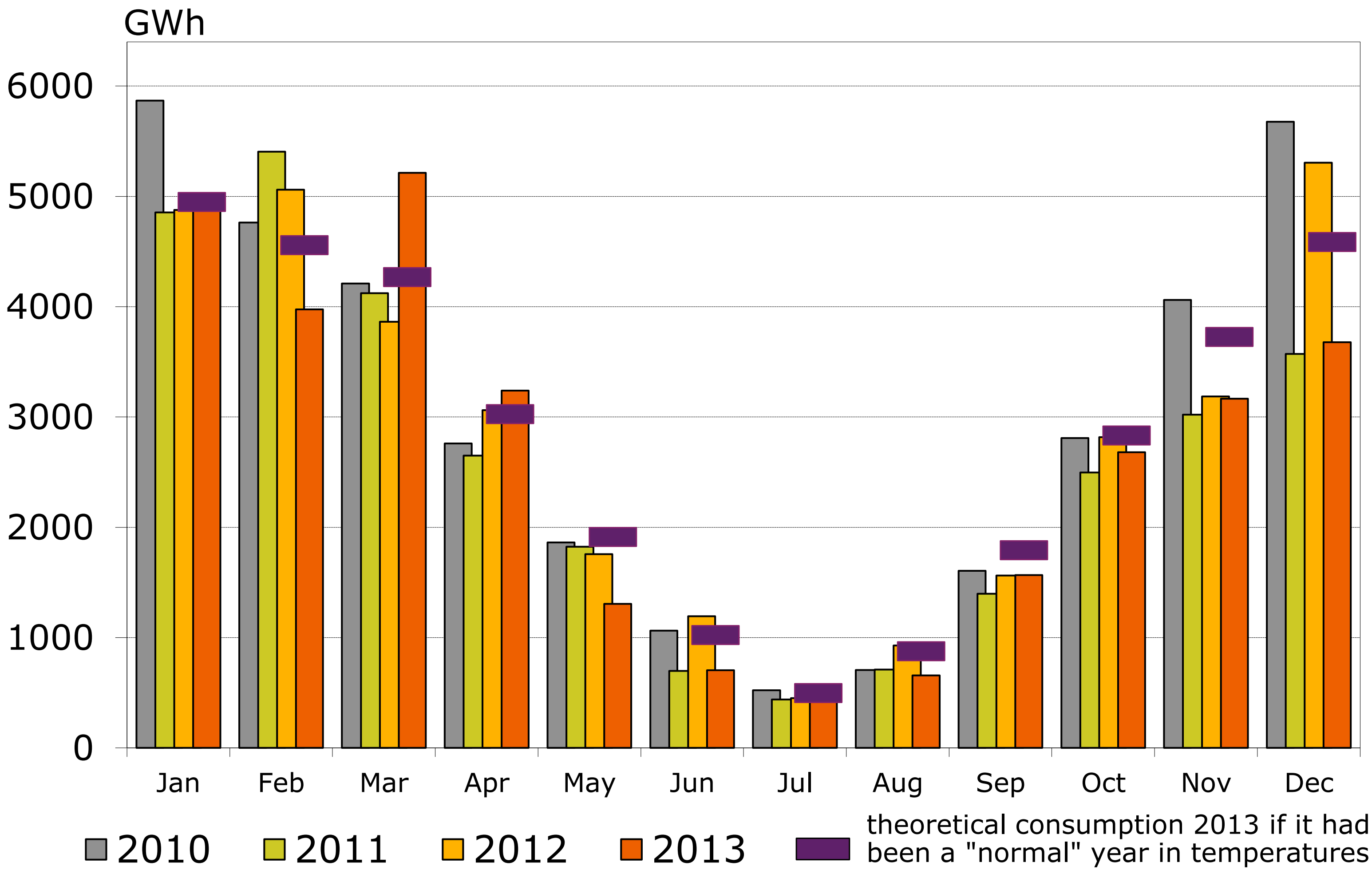
Market share of space heating
Residential, commercial and public buildings

Source: Statistics Finland
Net effective heating energy, 2012

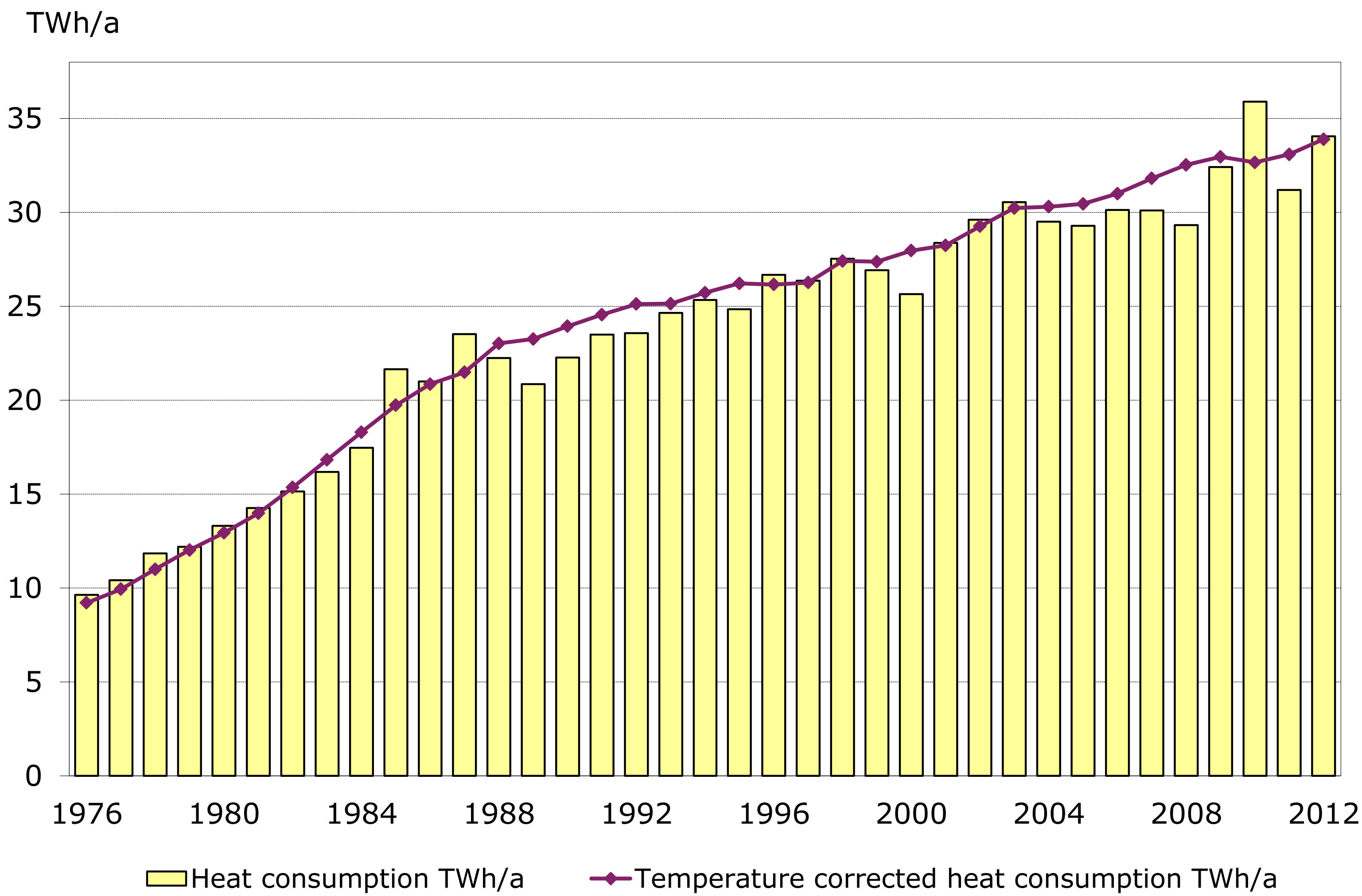


Heat pump: includes the electricity consumption of heat pumps
Electricity: includes the electricity consumption of heat distribution equipment and electric sauna stoves
Wood: includes the wood used by sauna stoves

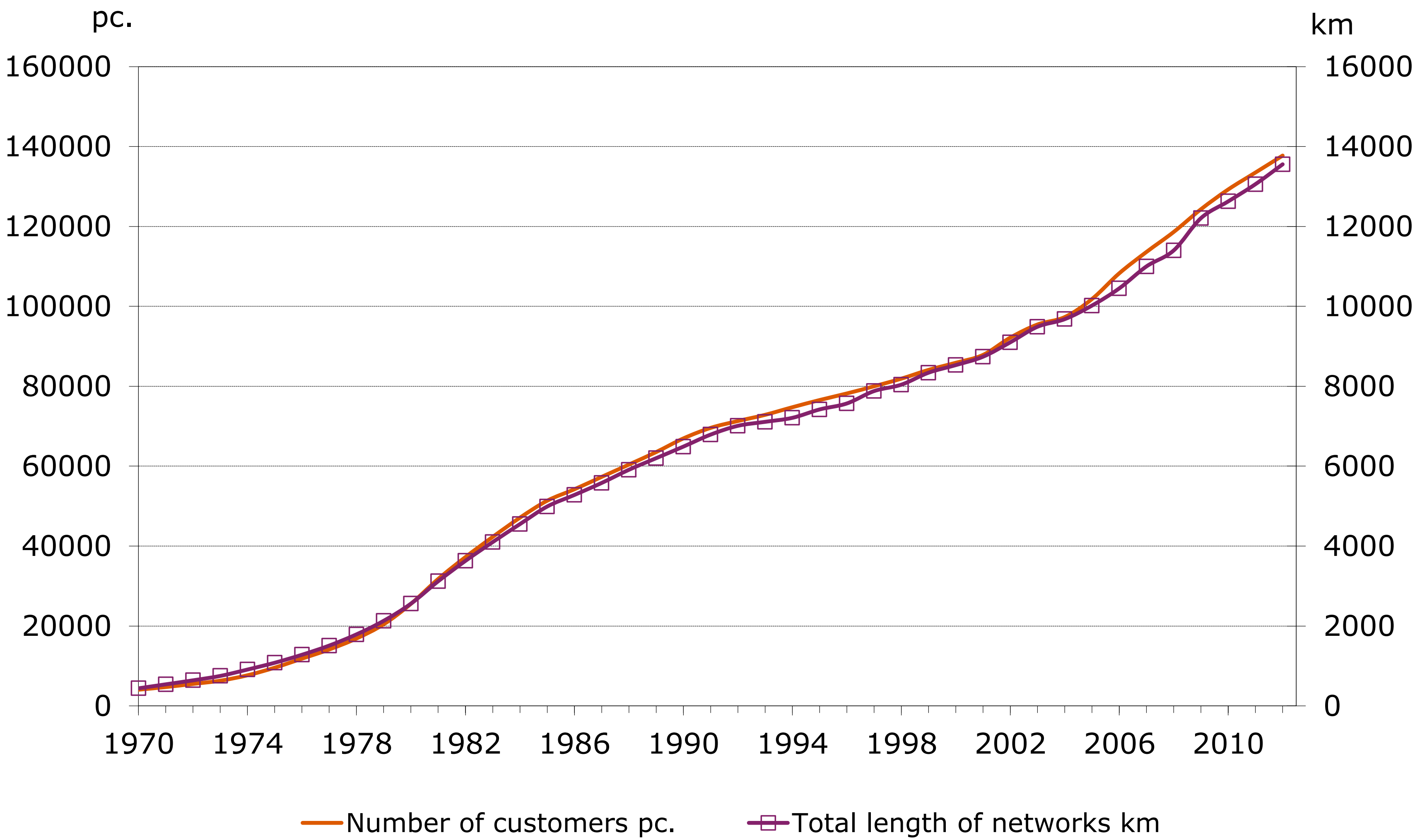
District heat consumption



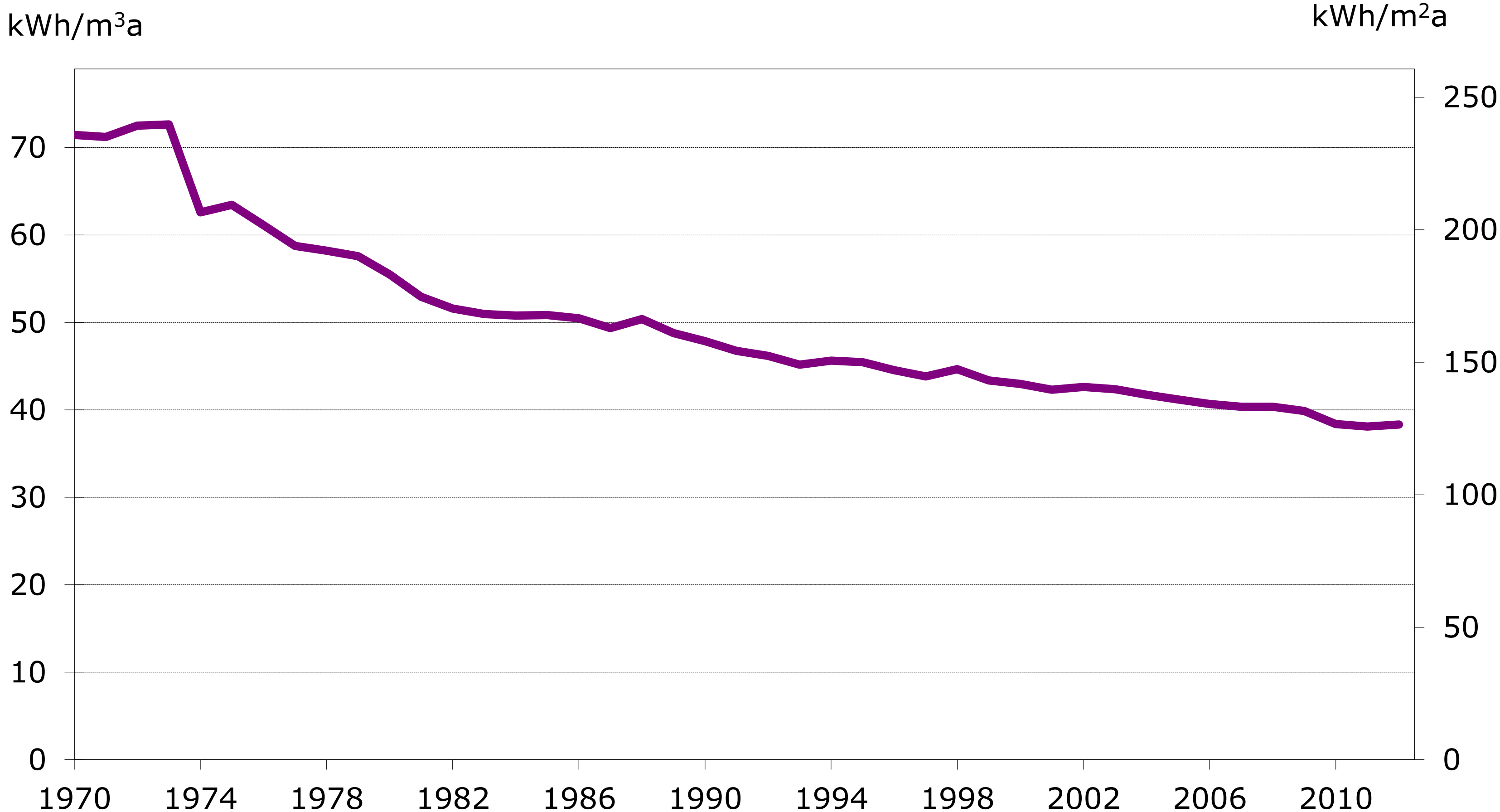
Temperature corrected heat consumption



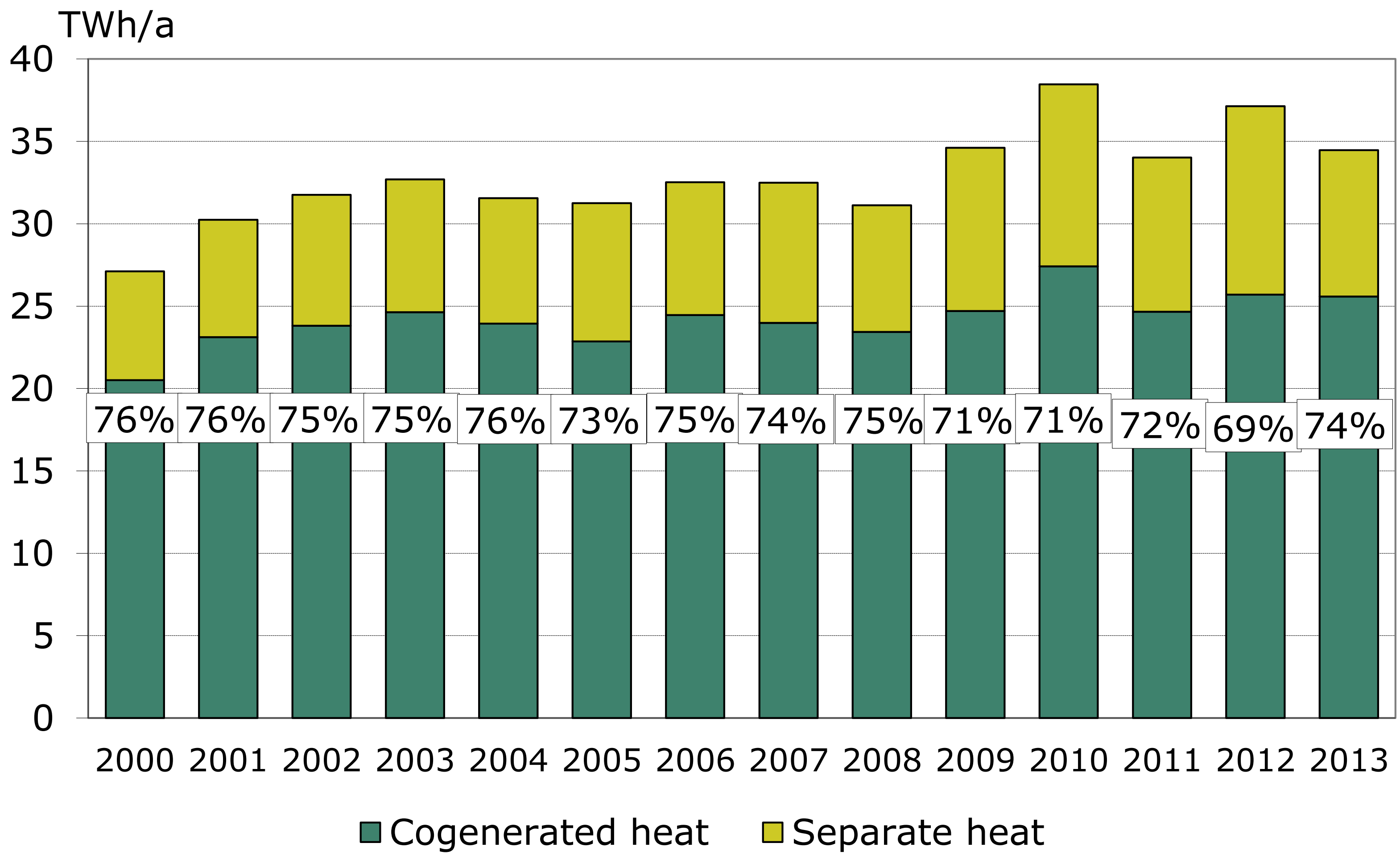
Number of customers and length of networks



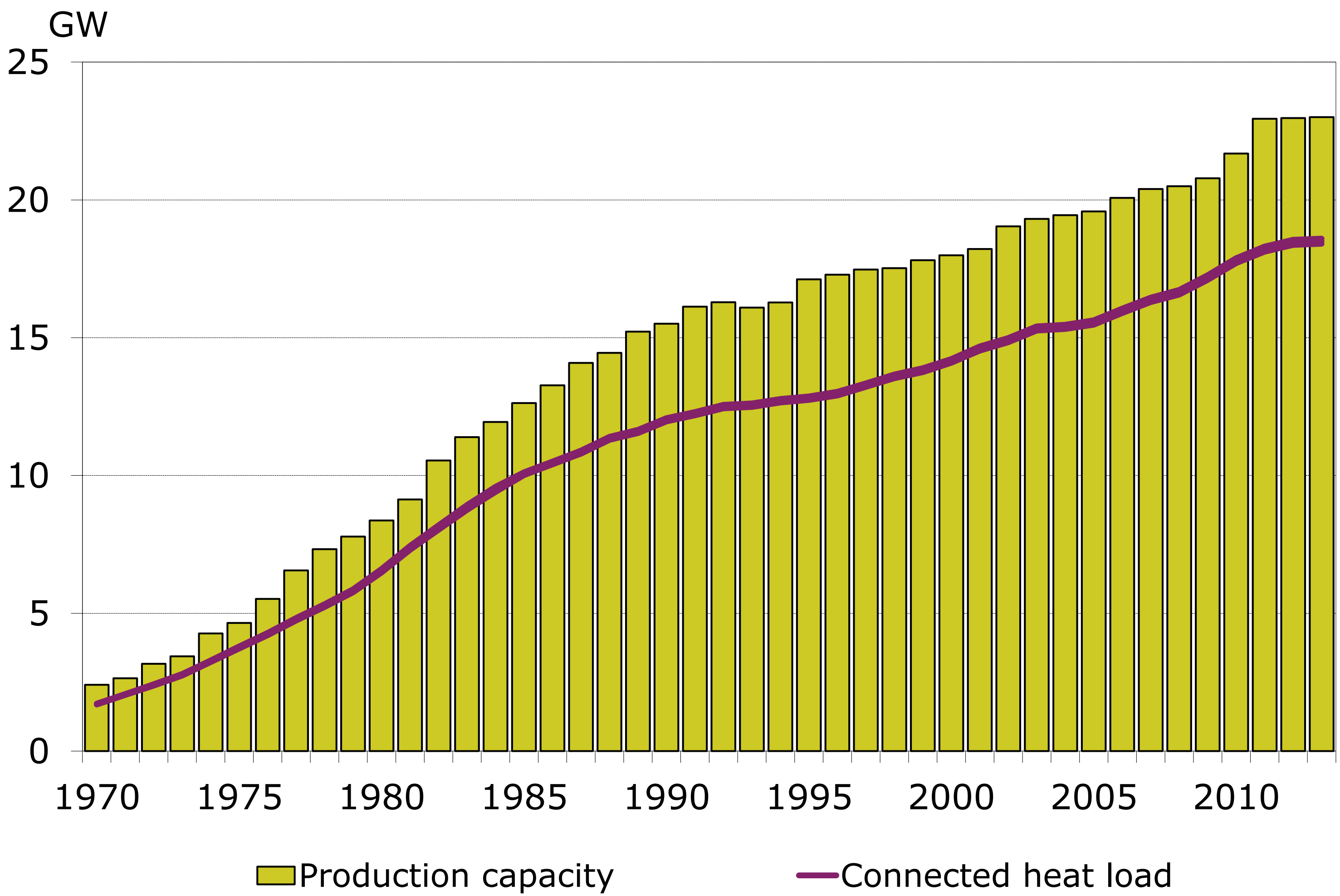
Specific heat consumption in district heated buildings incl. energy for heating hot tap water



District heat production and the share of cogenerated heat



Production capacity of district heat and connected heat load of the customers

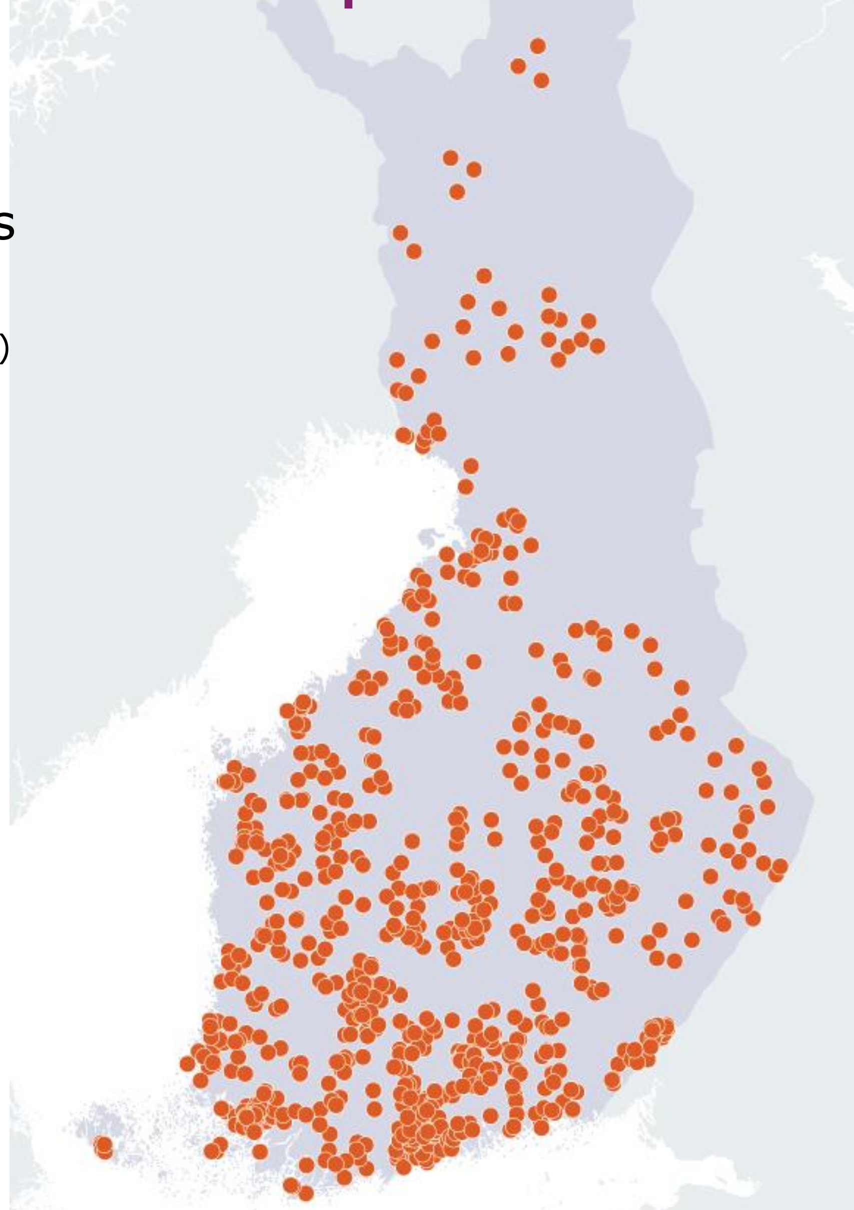


District heat production plants

Combined heat and power plants as well as stationary heating plants and heat plants

- 104 CHP plants
- 711 stationary HOB's
- 372 transportable HOB's (not in the map)

Source: District Heating in Finland 2012, Finnish Energy Industries



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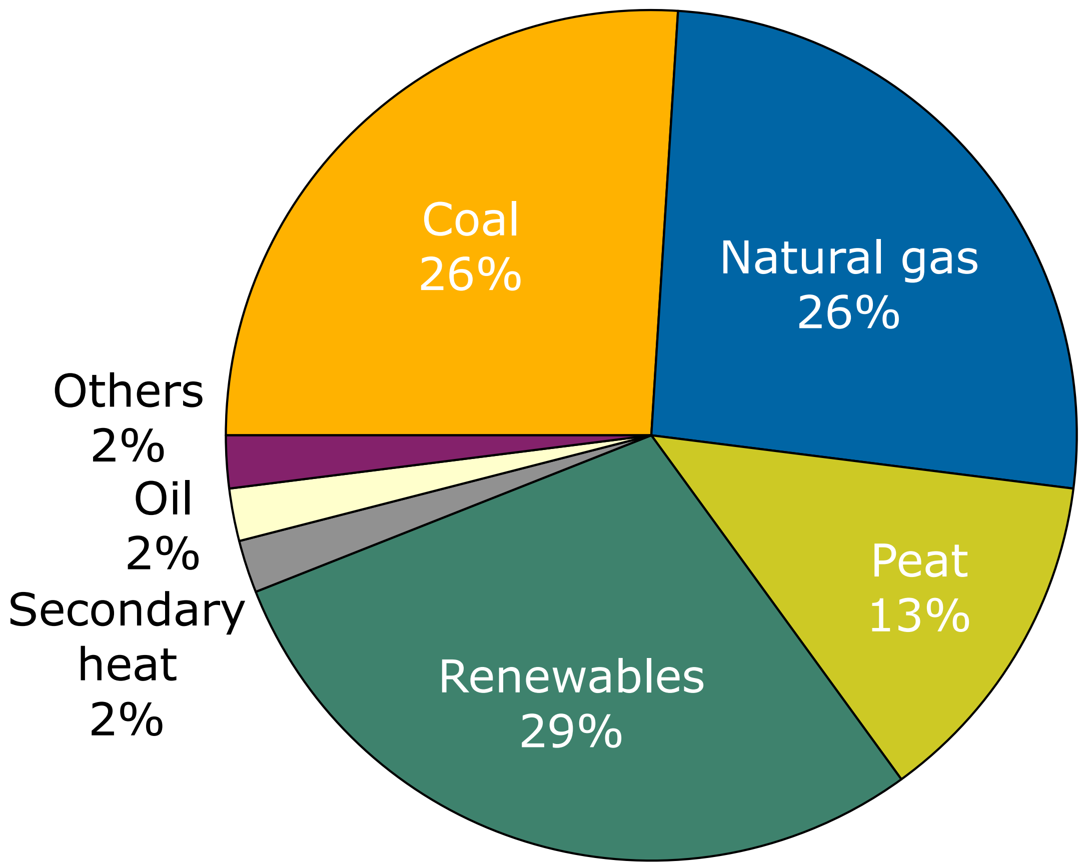
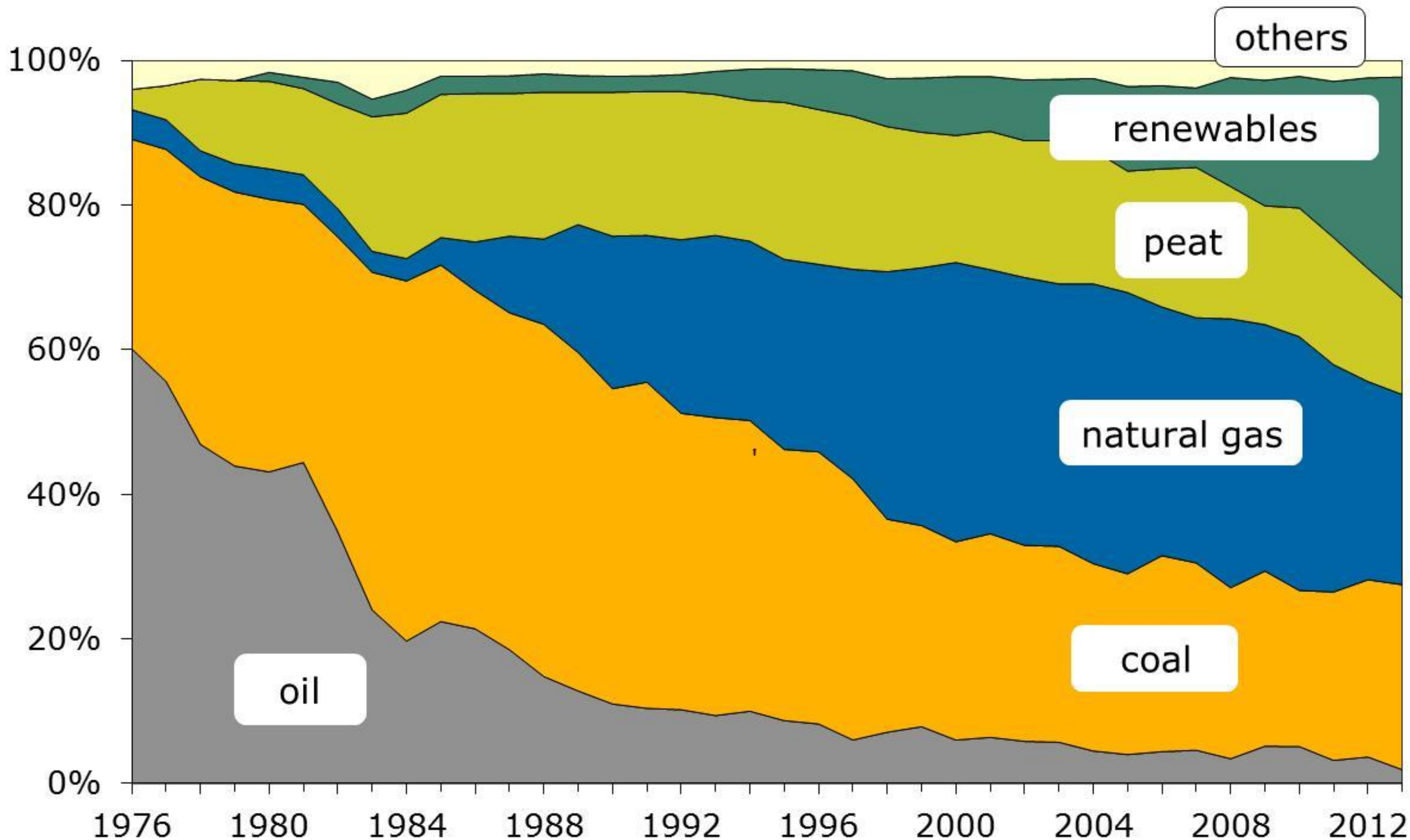
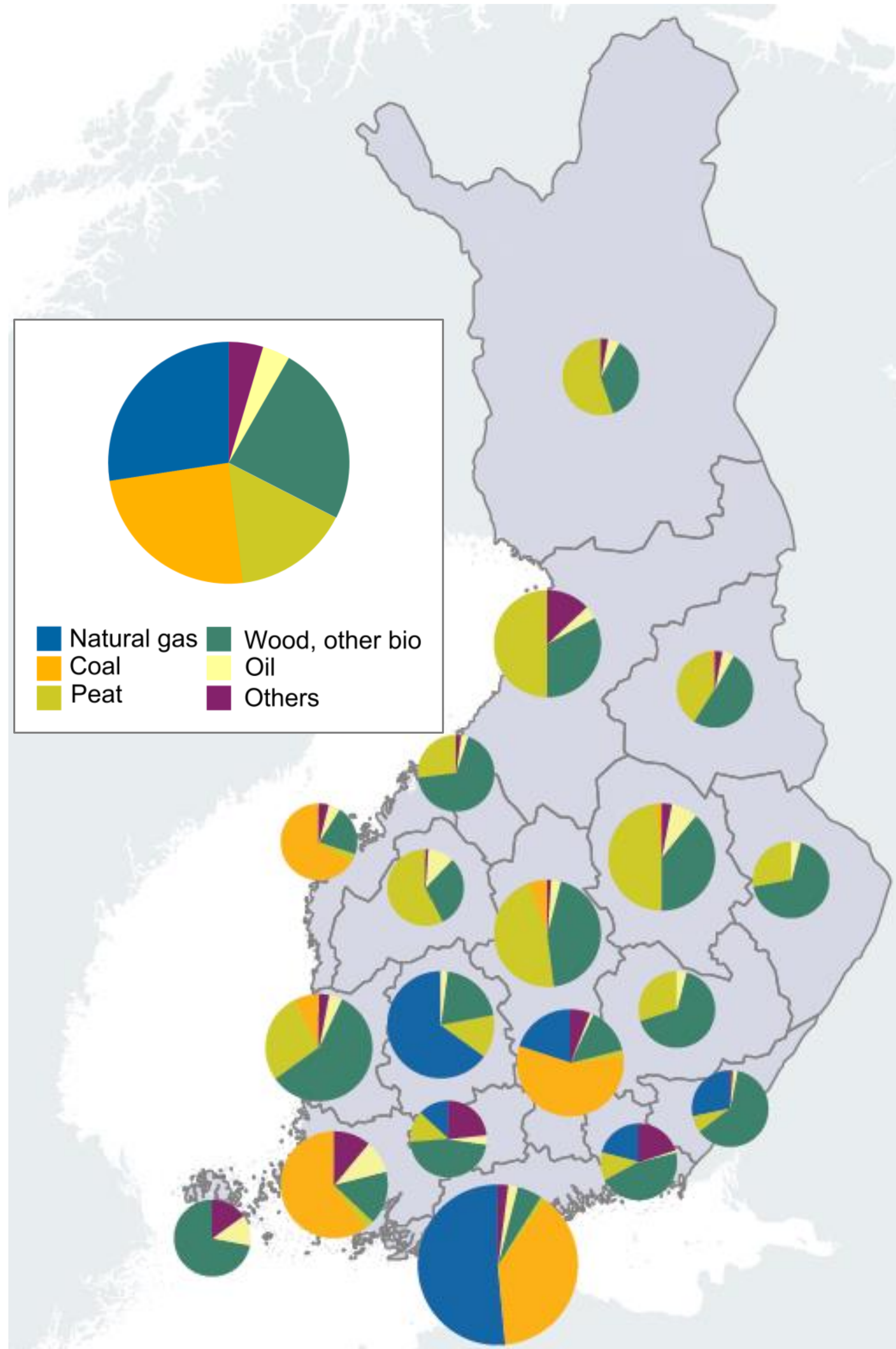
Fuel consumption in production of district heat and CHP 2013
- fuel consumption 56,3 TWh



Fuel consumption in production of district heat and CHP



Fuels used in district heat production and CHP production
year 2012



Source: District Heating in Finland 2012, Finnish Energy Industries

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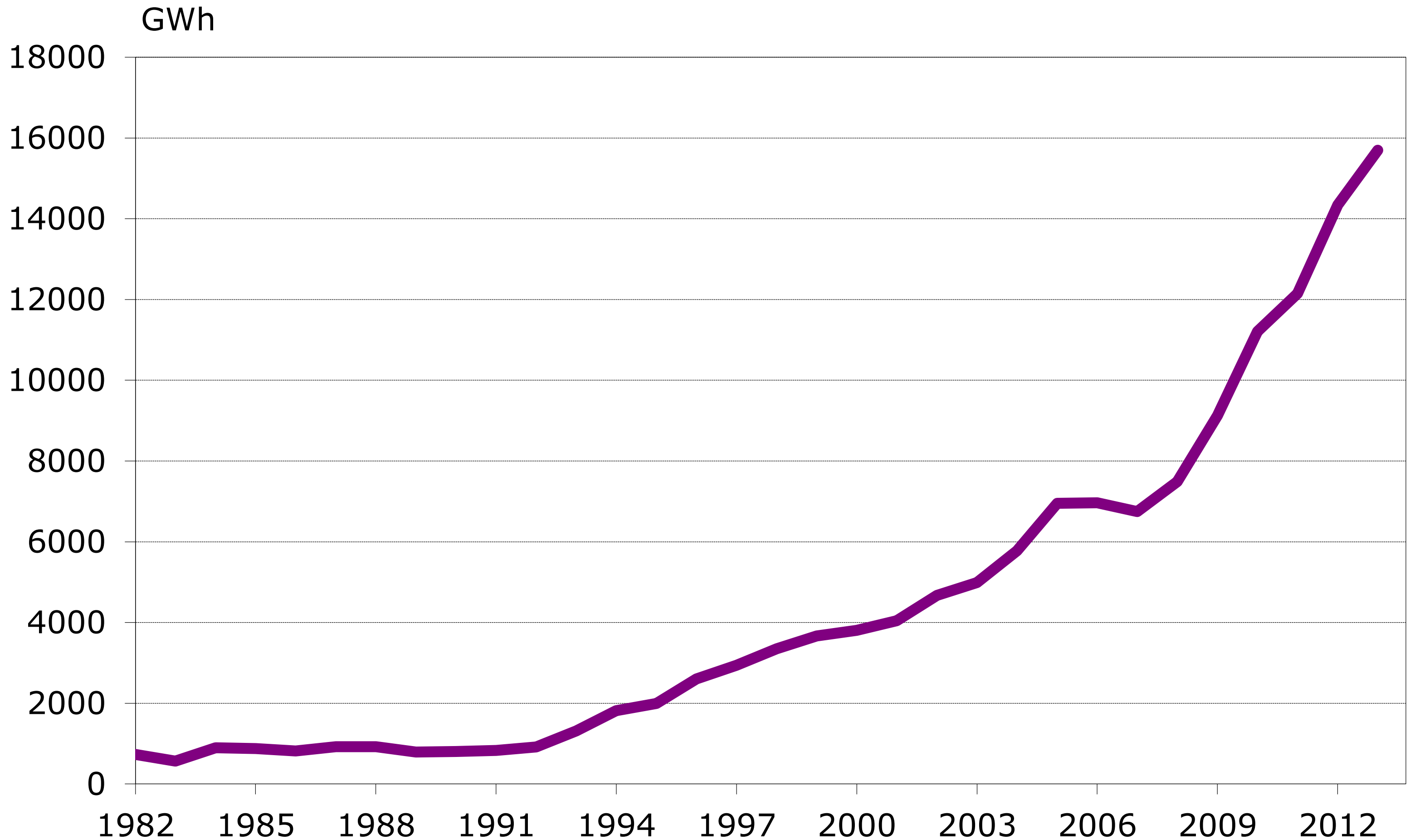
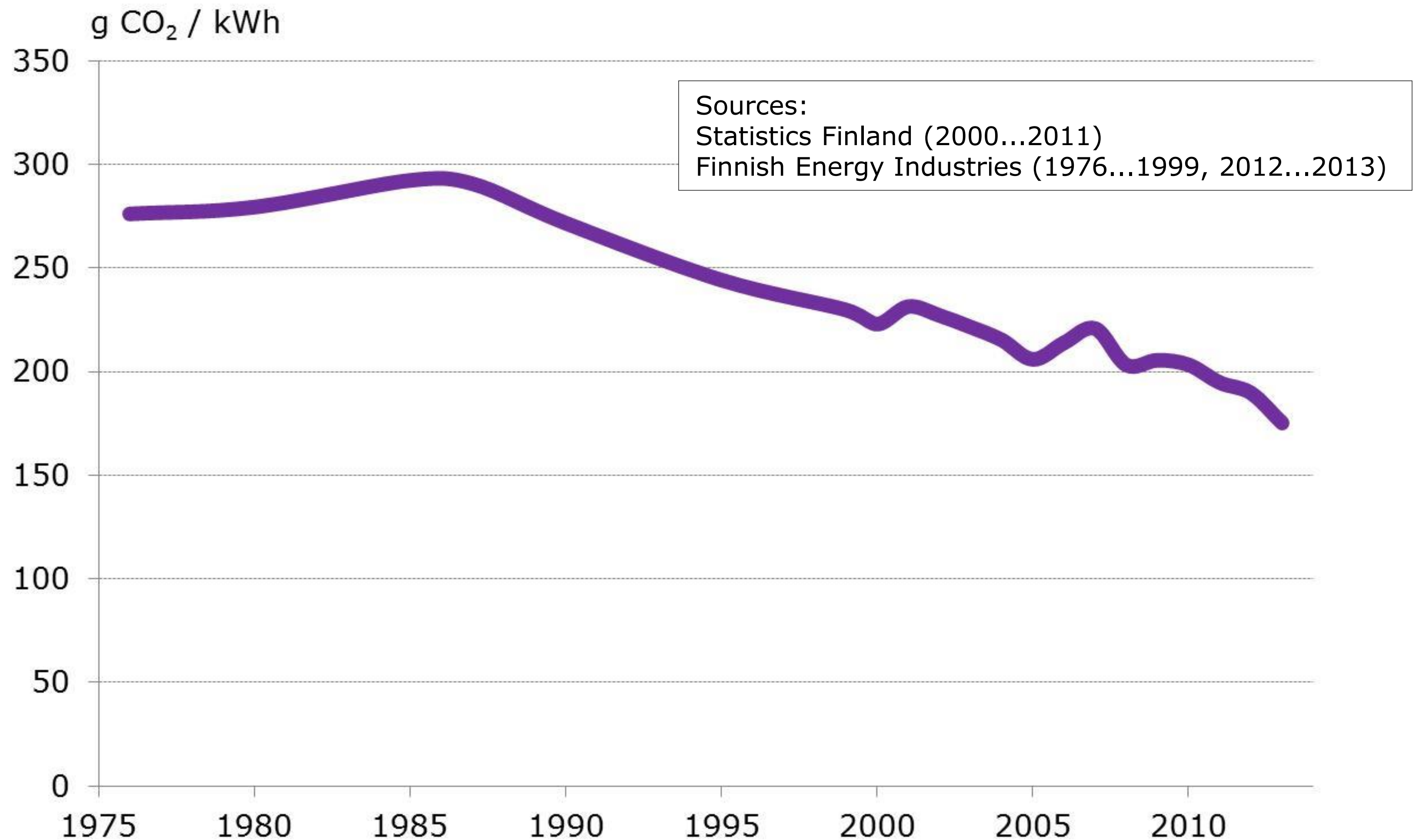
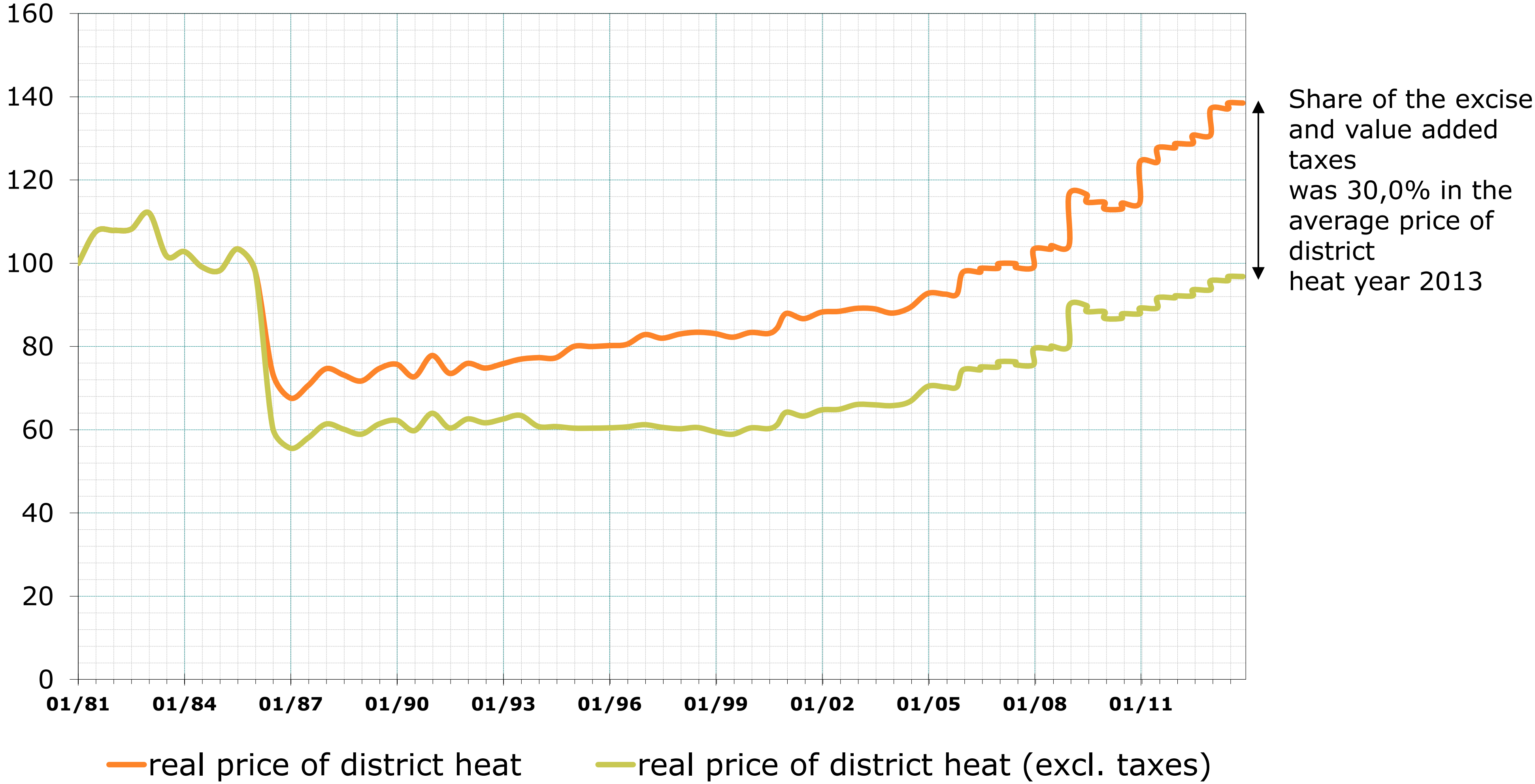
Domestic renewable energy sources in production of district heat and CHP



Specific carbon dioxide emissions from district heat production



Real price of district heat
Corrected with cost-of-living index, 1.1.1981 = 100



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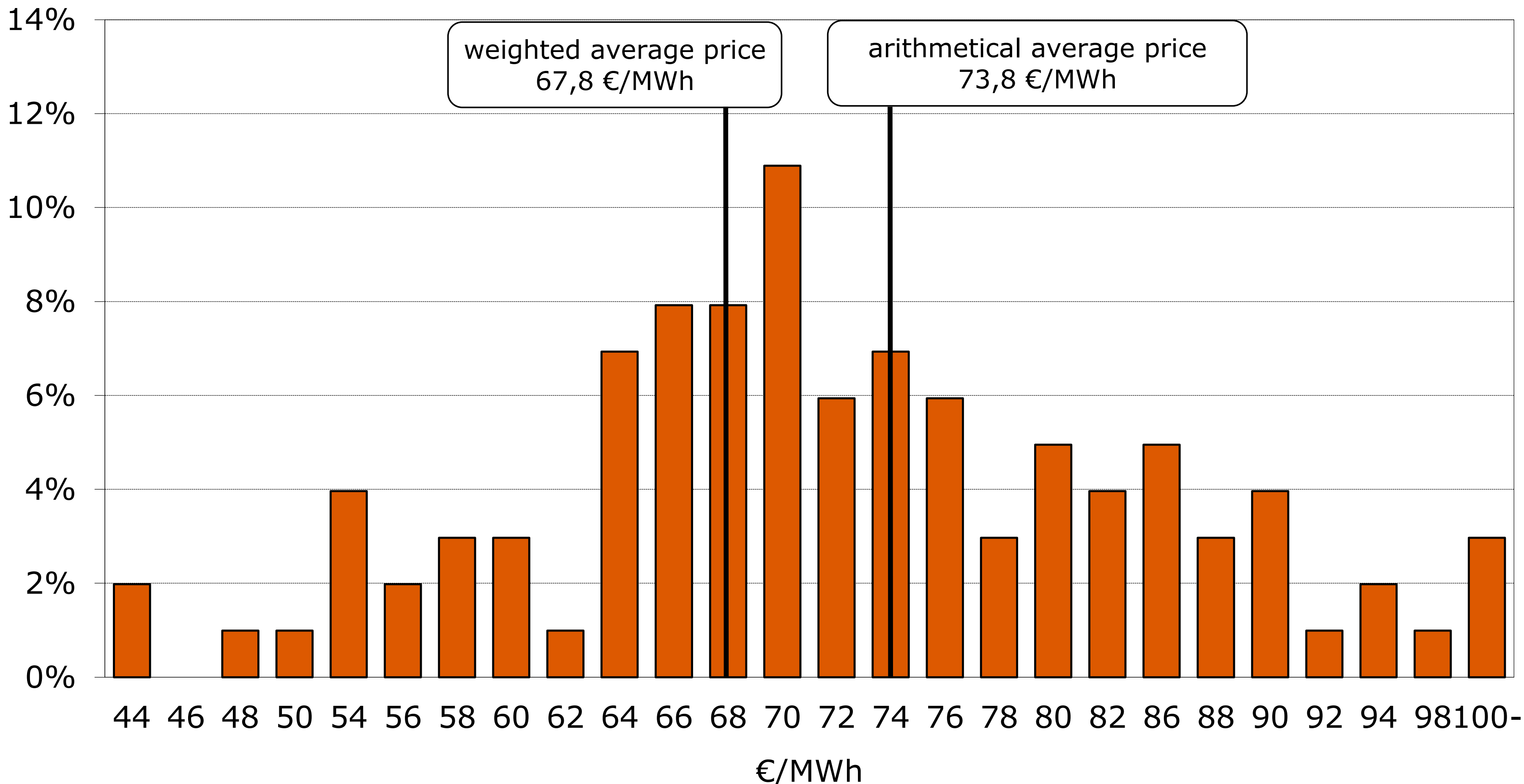
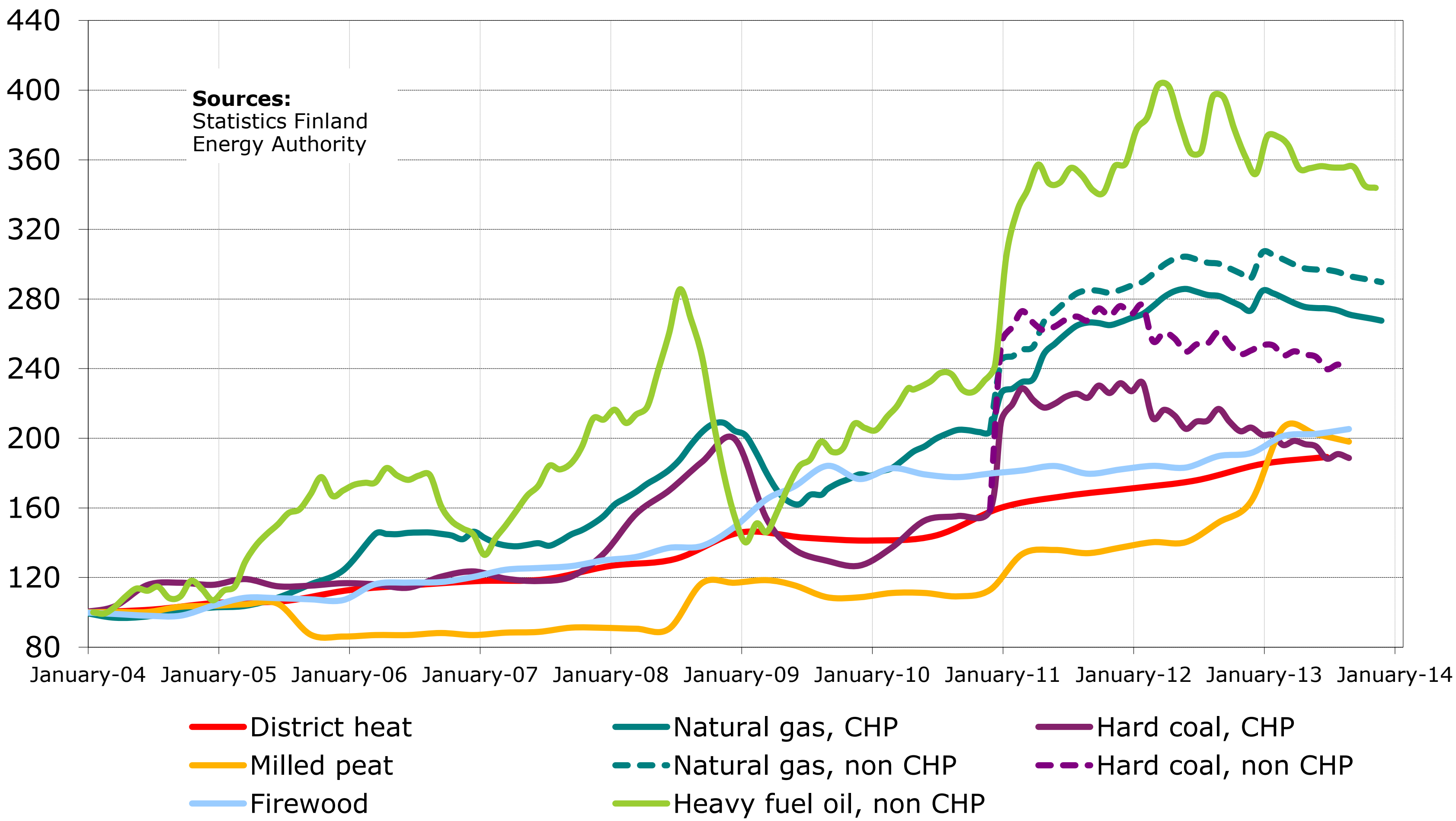
The share of district heating companies according to the average heat sales price year 2012 (incl. VAT)



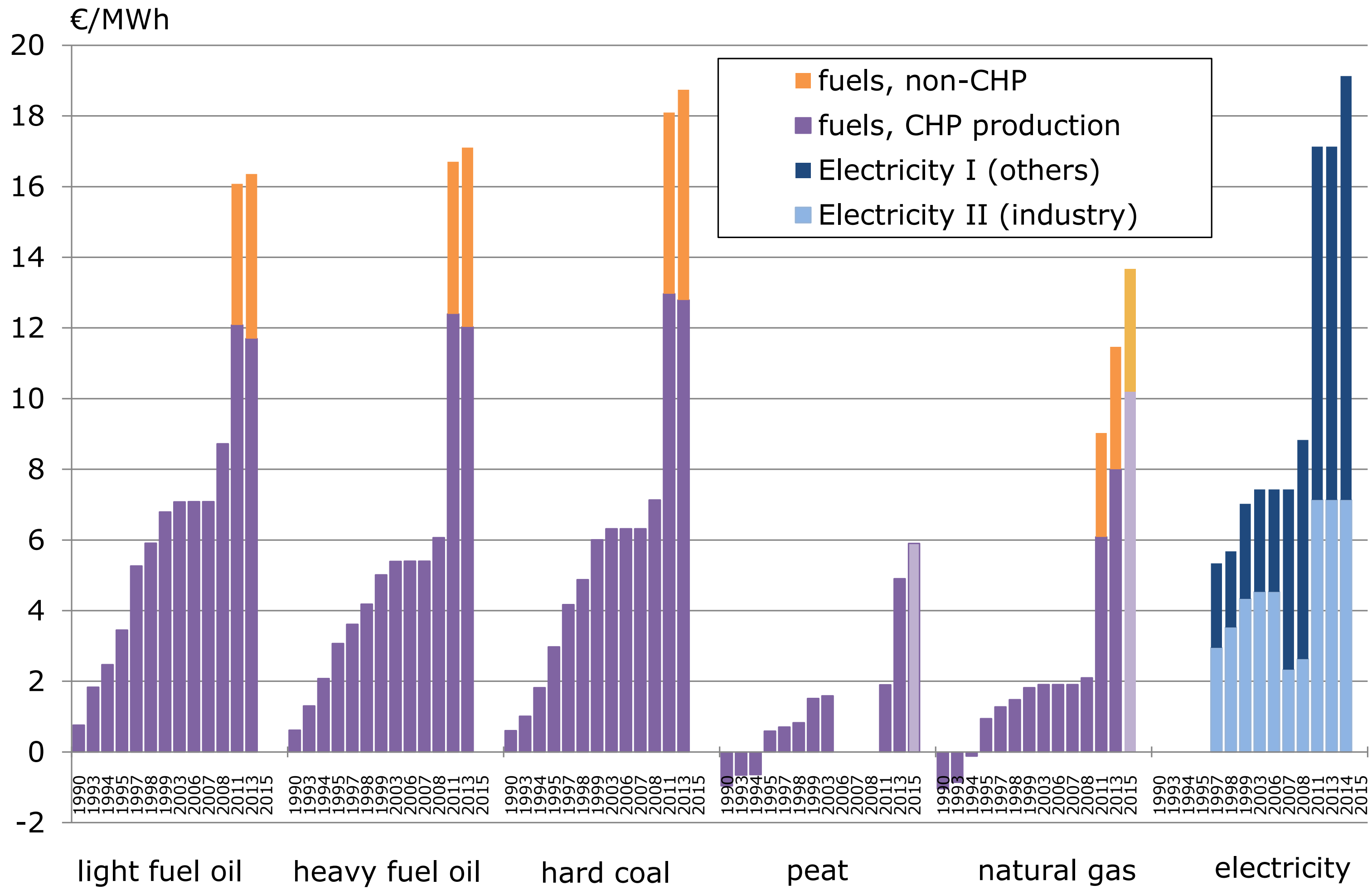
Prices of district heat and fuels in heat production
index, January 2004 = 100



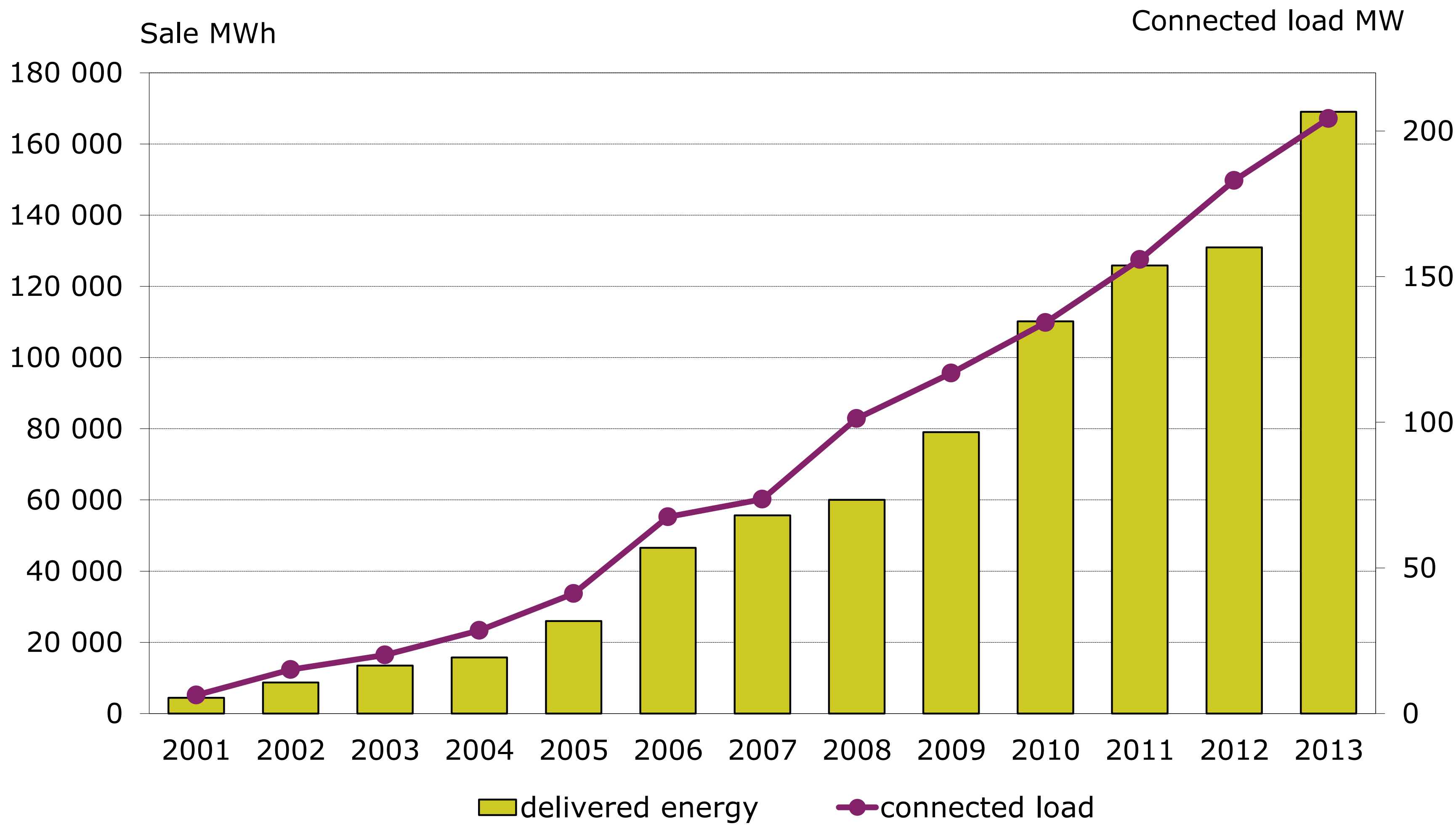
CHP = combined heat and power production

Development of energy taxes

Excise taxes of fuels in heat production, consumption tax of electricity



District cooling – delivered energy and connected heat load



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District Heating in Finland – Regulation and Pricing

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District heating companies in Finland

- Around 150 independent district heating companies
  - Own strategies, prices, contracts, customers
- Typically owned by municipalities,
  - 97 % of companies, 86 % of sales
- Around 50 district heating companies produce also electricity (CHP)
- One third of district heat is produced by another company than the one, which distributes it

No specific regulation for district heating

- Traditionally market-oriented approach
  - Free competition between different heating forms in heating markets

- District heating companies are mainly supervised by general legislation like competition and consumer protection legislation, and related authorities

- The Finnish Competition and Consumer Authority considers that DH companies are in so-called dominant market position towards their customers
  - Competition legislation prohibits the misuse of the dominant market position

Voluntary measures

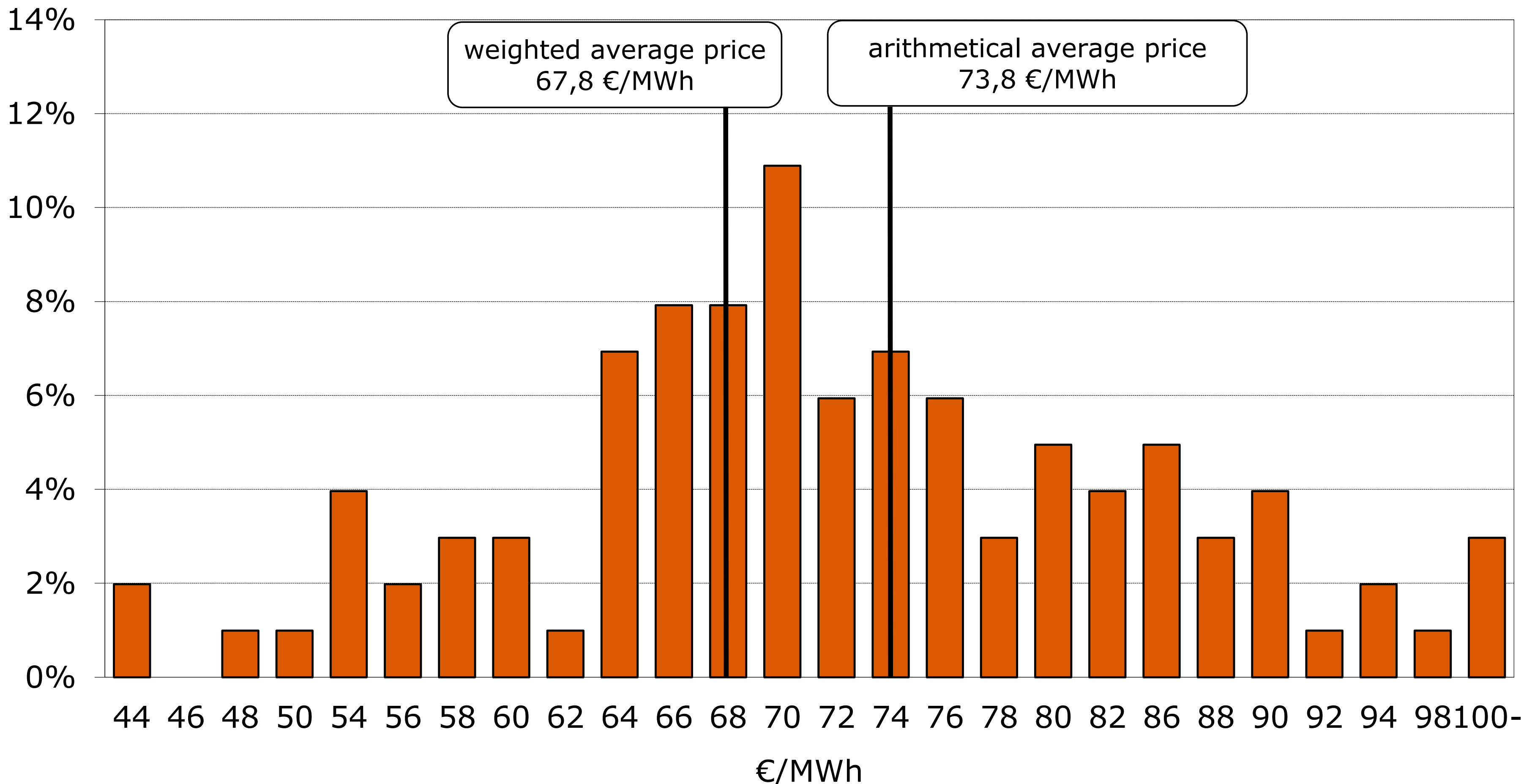
- The branch has strong tradition of voluntary cooperation between companies within the branch association (Finnish Energy Industries)
  - Technical and economical recommendations, guidelines and reports, advice and guidance, education, training, events and seminars, statistics, coordination and funding of research

- Fair District Heating (Reilu kaukolämpö)
  - Voluntary policy instrument, certification of DH companies
  - Some of the requirements:
    - Grounds of the pricing have to be understandable, open and comprehensive
    - Prices have to be public and available for everyone
    - Dialogue between DH-companies, customers and interest groups as well as representatives of them

District heating prices in Finland

- The DH companies are operated on a business basis
- Each company decides its tariffs and prices itself
- No price regulation
- Same tariffs for same kind of customers (residential, industrial, public etc.)
- The prices vary a lot between different companies, depending on the actual operating costs

The share of district heating companies according to the average heat sales price year 2012 (incl. VAT)



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Outcomes of the free competition

- Lowest district heating prices in western Europe and lowest in the EU compared to purchasing power
- Most reliable DH system – availability of 99.98 %
- Average network heat loses 9...10 % - lowest in Europe
- Average make-up water replenishment need per year is 1...1,5
- Highest overall efficiency of CHP-plants (83 %)

Outcomes of the free competition

- Finnish Competition and Consumer Authority gets only a few complaints annually
- DH connection and sales terms of DH companies are mainly uniform in accordance with the recommendations of the Finnish Energy Industries
- Based on the customer satisfaction surveys DH customers are satisfied with DH

Future – no need for regulation

- Studies on regulation and official supervision of district heating

→ **Conclusions**
  - No need for DH specific legislation
  - No need for changing the current official supervision and roles of different authorities
  - No cost-effective basis for opening the DH networks (TPA)
  - No problems with the price level of DH
  - Price raises have been justified by increased costs

Strategy for the DH Sector

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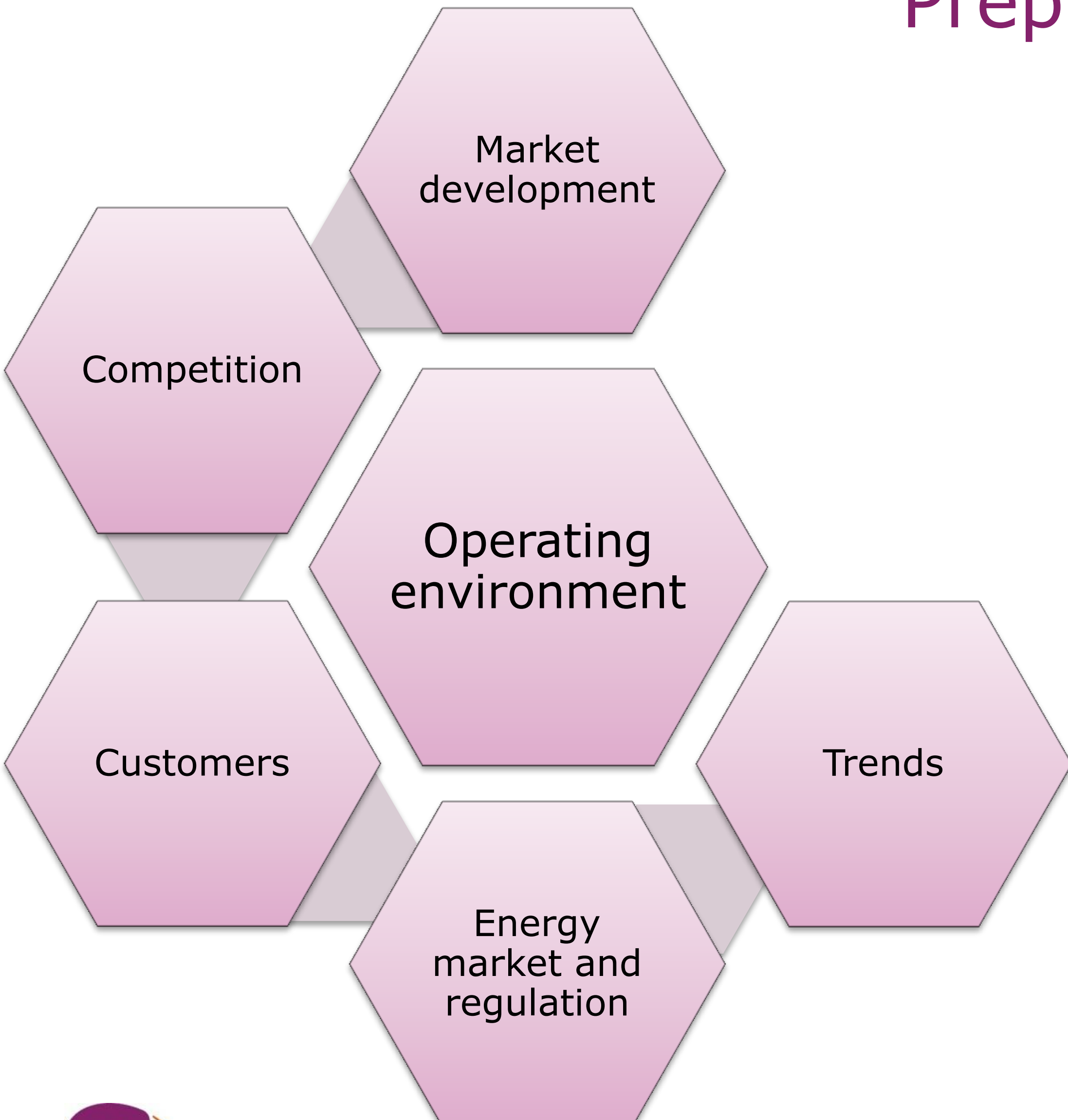
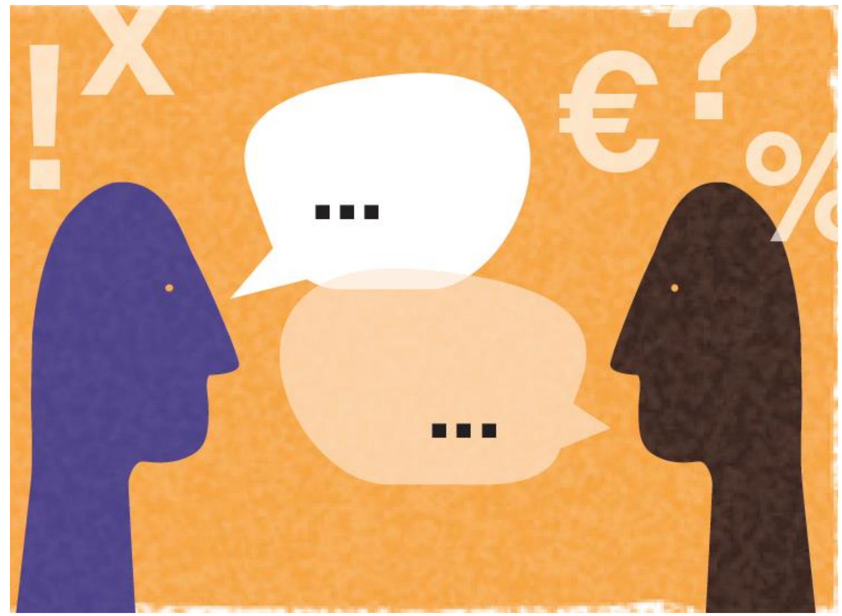
Preparation



- Surveys charting customer satisfaction and customer orientation
- Interviews with the sector's interest groups
- A member survey
- Regional events
- FEI's DH Committee meetings in spring 2013
- Release at the DH Days in Kuopio on 28.8.2013

Strategic objectives

- Increasing flexibility and integration
- Developing new business from services and partnerships
- Committing to a carbon-neutral future



Strategic objectives: Increasing flexibility and integration

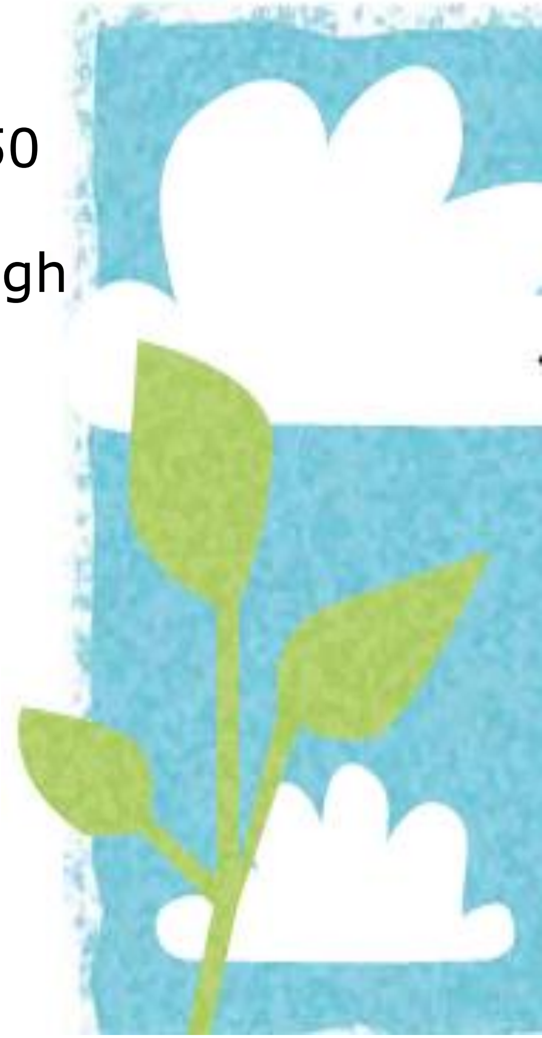
- Together with customers, DH companies are looking for solutions and operational models to benefit both customers and DH companies
- DH systems are developed in such a way that they permit utilization of customers' surplus heat in the DH network on a commercial basis
- The DH business reacts to changes in customers' energy consumption and output requirements through both technical and business solutions
- The competitiveness of DH is ensured in the heating market. A special attention is directed to the competitiveness of CHP.

Strategic objectives: Developing new businesses due to services and partnerships

- The DH sector improves its understanding of customers' business and technical systems
- DH companies improve the openness of their business and clarify their pricing
- Services supporting the present DH product as well as separate service products are developed
- Cooling solutions become part of the product range of companies in the sector

Strategic objectives: Committing to a carbon-neutral future 2050

- The sector will ensure a carbon-neutral future by 2050
- The pace of concretization must be speeded up through an increasing number of corporate investments and other measures
- The wood fuel market will be developed
- The sector actively participates in developing technological solutions and those enabling carbon-neutral production
- The aim is to make the use of fossil fuels possible during the transition period



Strategic projects 2013-15

- Estimated cost for FEI is around 300 000 euros
- Modification of FEI’s institutional structure of the district heating division to correspond to the new strategy (-10/2013)
- Investigation of the sector’s educational needs and measures to increase necessary education (-6/2014)
- Investigation and popularization of the effect a dominant market position has on business development on the one hand and on the customers on the other hand (according the interpretation of the competition act) (-6/2014)
- Identify ways to engage the customer on price formation. The target is to increase customers understanding on price formation (-8/2014)

Strategic projects 2014-15

- Survey on the potential of small-sized heat production of DH customers (-12/2014)
- Studies on the cooling market (technologies, trends, competitiveness of different solutions, as well as the potentials) (-9/2015)
- Studies on the establishment of new service products, the business opportunities and market values (-9/2015)
- Investigation into utilizing customers' surplus heat in district heating systems on a technical and commercial basis (-12/2015)
- Investigation of new ways of utilizing district heating and cooling and iinvestigation of possibilities to increase customers' choices and the potential of more diverse product categories. (-12/2015)

Vision

Diverse energy solutions and services based on district heating and cooling are most wanted by customers. They make it possible to find a shared road to a carbon-neutral future.

Thank you!

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