Better data, better methodology, better…..

By Peter Dal, Danish Energy Agency

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Outline

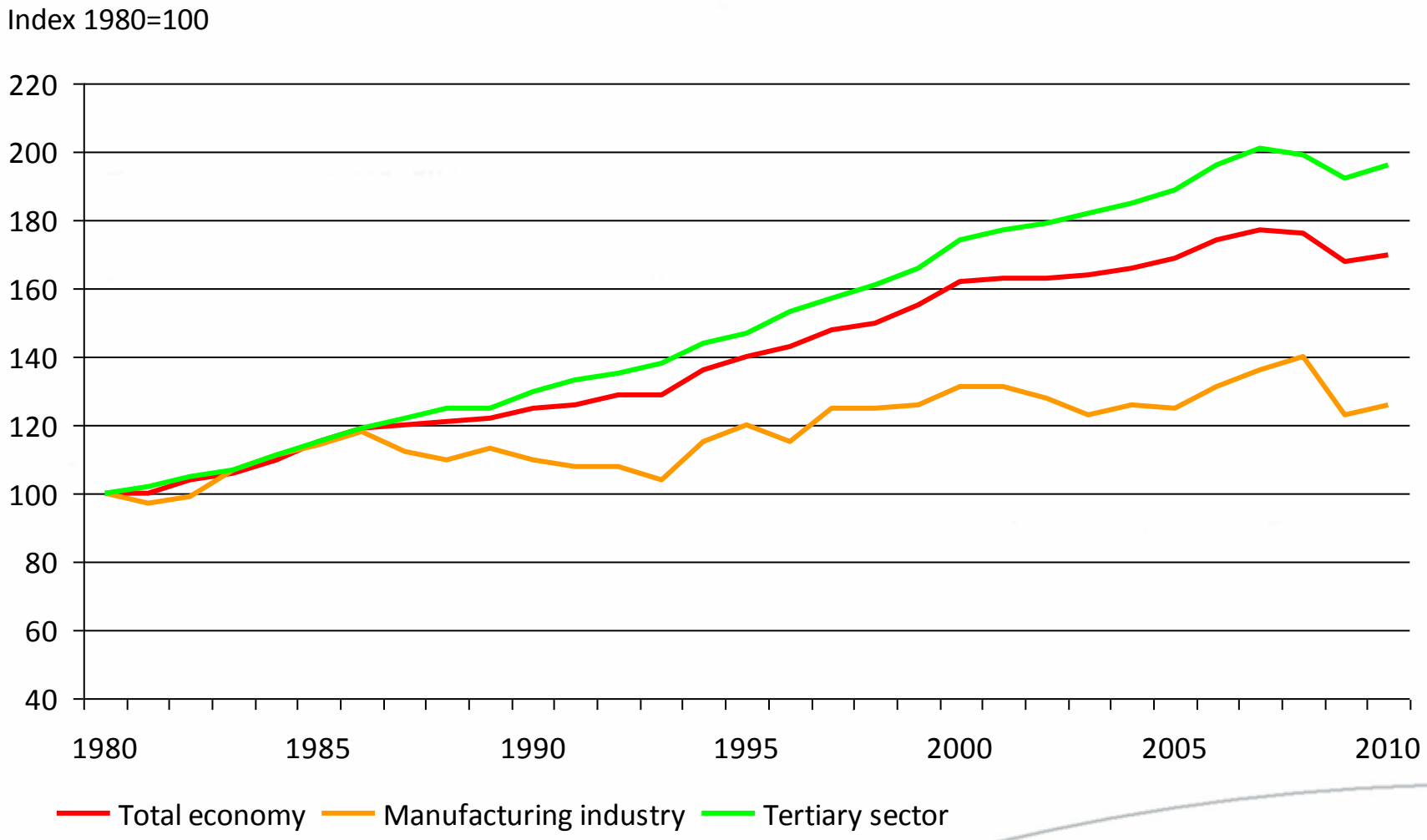
- Economy, gross and final energy consumption
- The transformation sector
- Manufacturing industry
- The tertiary sector
- Households
- Transport

Economy, gross and final energy consumption

- The tertiary sector still more important
- Adjustment necessary for comparisons
- Determination of reference year important when comparing development

Gross value added i Denmark 1980-2010

In 2010, 75% of total GVA in the tertiary sector



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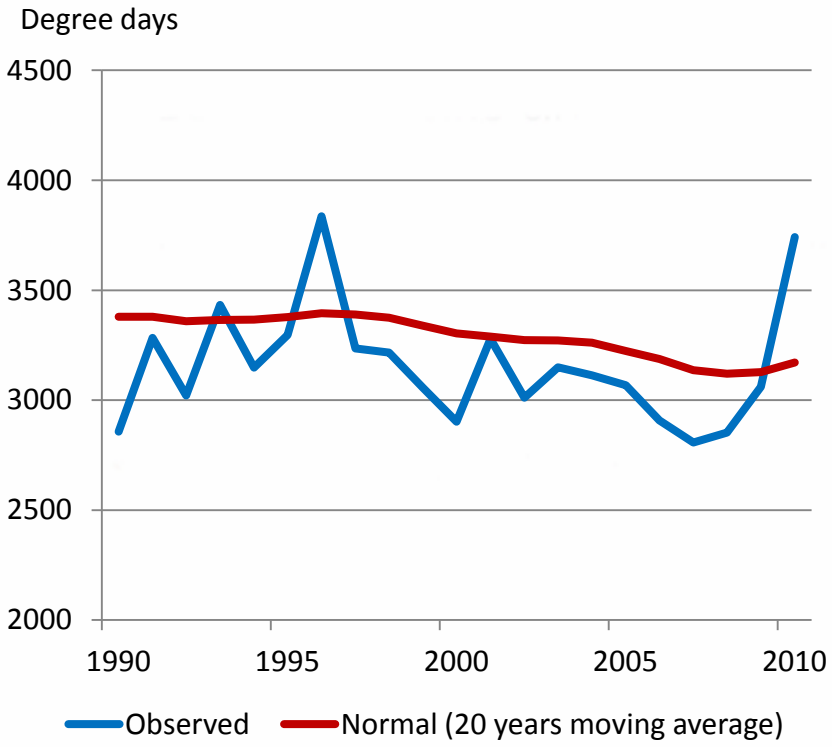
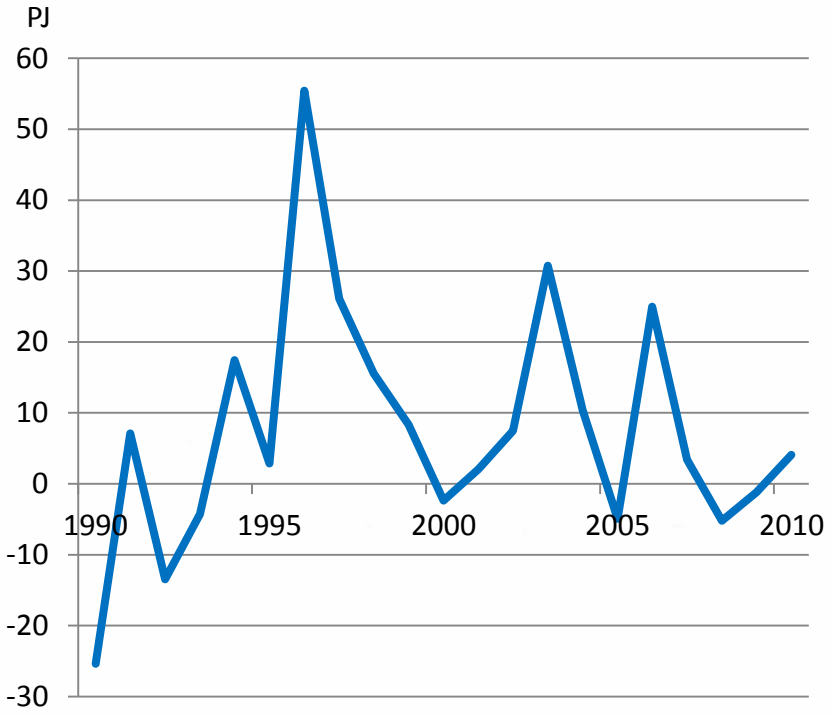
Climate adjustment needed



Net exports of electricity adjustment needed



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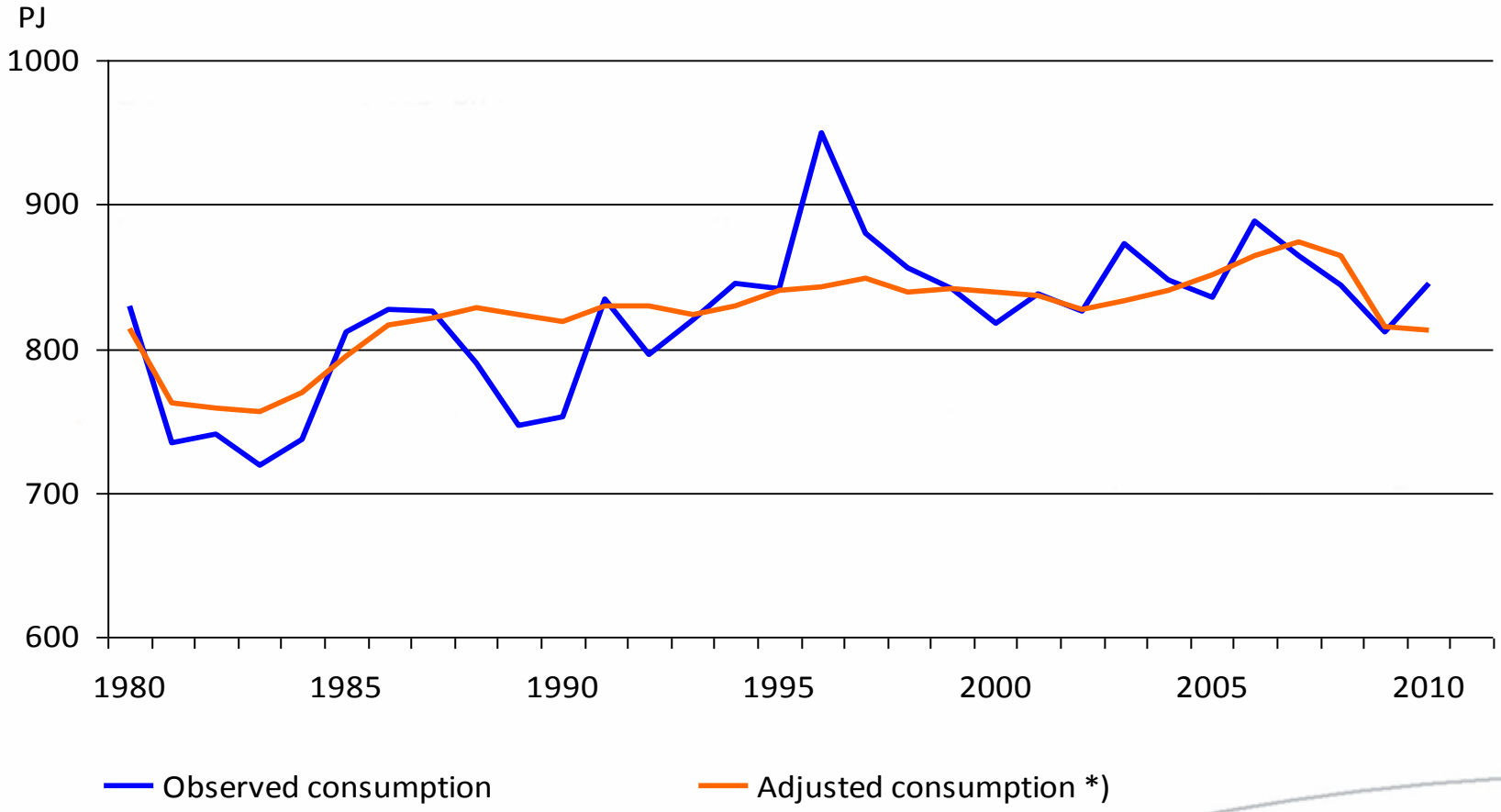
Gross energy consumption observed and adjusted

Look at energy consumption in 1990 (Kyoto reference year)



*) Adjusted for climate variations and fuels for net exports of electricity.

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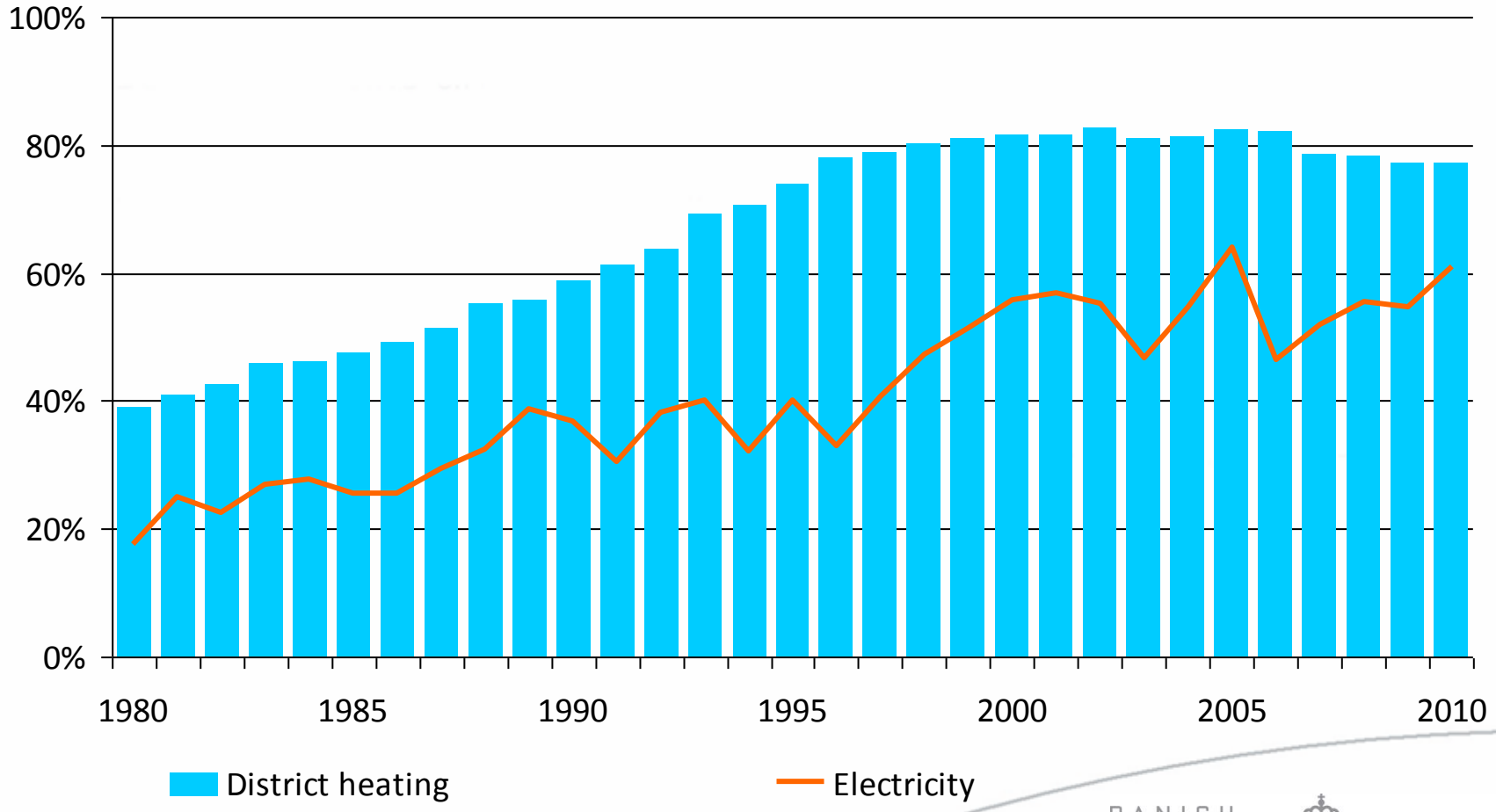
The transformation sector

- In CHP, how do we split fuel input into heat and power?
- Is increasing CHP shares still a good political target?
- Base year when comparing developments

CHP shares of thermal power and district heating production

More wind power in Denmark will result in more separate heat production



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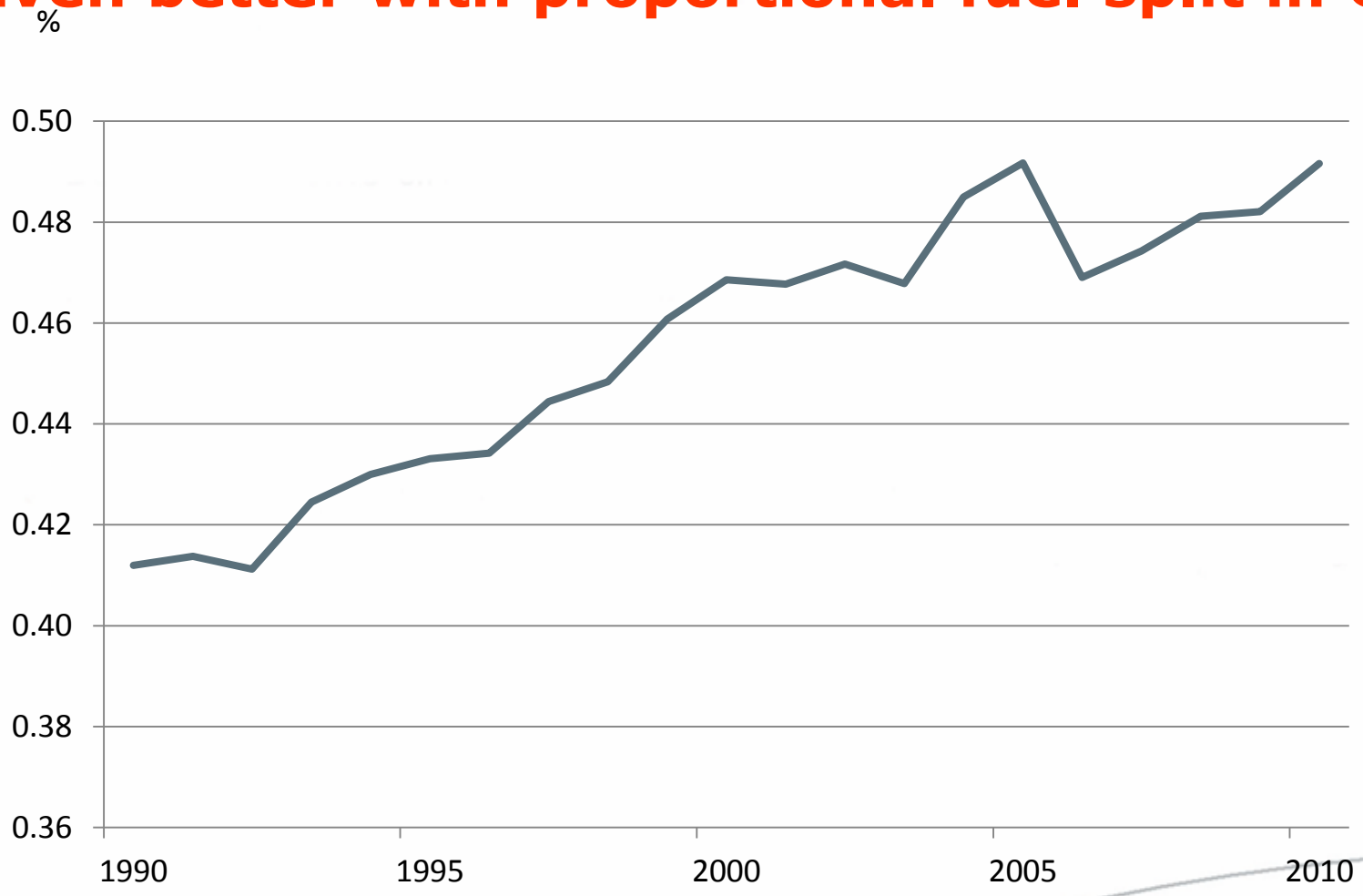
Efficiency in gross electricity production

First CHP and later wind turbines

Even better with proportional fuel split in CHP



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Manufacturing industry

- Fuel shifts can have an impact on indicators
- Significant structural changes over the last years
- Manufacturing industry by NACE-group should always be the same in statistics and indicators
- Value added (constant prices) often used as denominator in indicators: Remarkable revisions can be expected for the last years

Characteristics of manufacturing industry in Denmark

- In Denmark, the manufacturing industry is a rather small sector – and declining
- Percentage of total final energy consumption: 18.5% in 1990, 18.5% in 2000 and 15.2% in 2010
- Fuel shifts from oil toward electricity and natural gas have contributed to improved energy efficiency
- After 2000, the energy efficiency has also improved due to significant structural changes toward energy light branches

Energy intensity of manufacturing industry

Structural changes more important since 2000

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The tertiary sector

- Statistics for sub-sectors needed
- Strong increase in electricity consumption in private services
- For heat consumption, correct split between households and the tertiary sector?

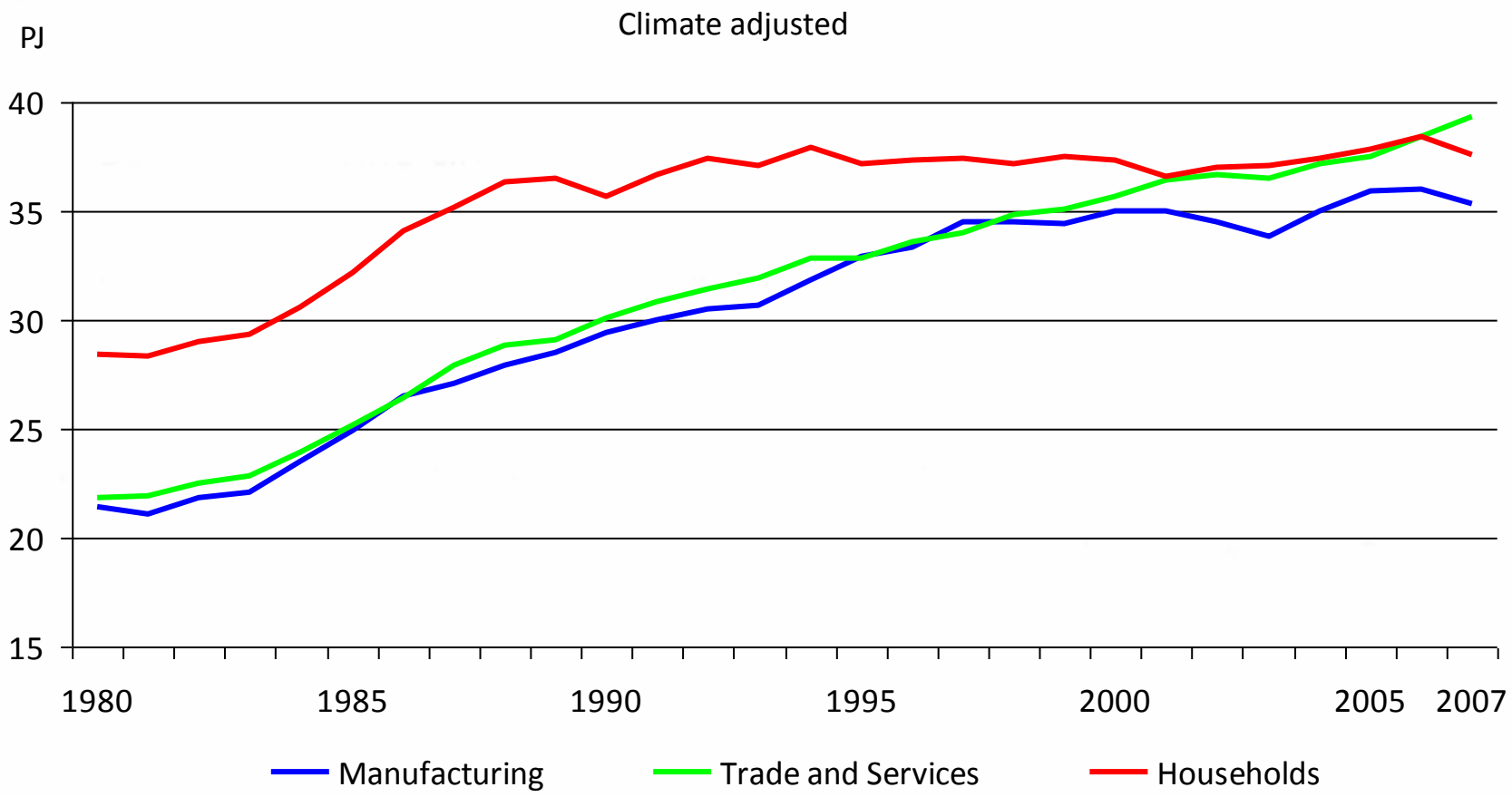
Main reasons for more detailed energy statistics in the tertiary sector

- Today, the tertiary sector is the most important economic sector
- Better monitor electricity consumption, which for long time has shown a steady and fast increase
- Energy politics: Uncovering of potential energy savings and monitoring
- Special interest on energy consumption in public services

Data and international reporting on energy consumption in the tertiary sector:

- DEA-statistics: 4 sub-sectors
- IEA-Eurostat: No sub-division of the tertiary sector
- Odyssee: 6-8 sub-sectors
- Economics: Very – and still more - detailed (Danish) national accounts statistics

Final electricity consumption by sector



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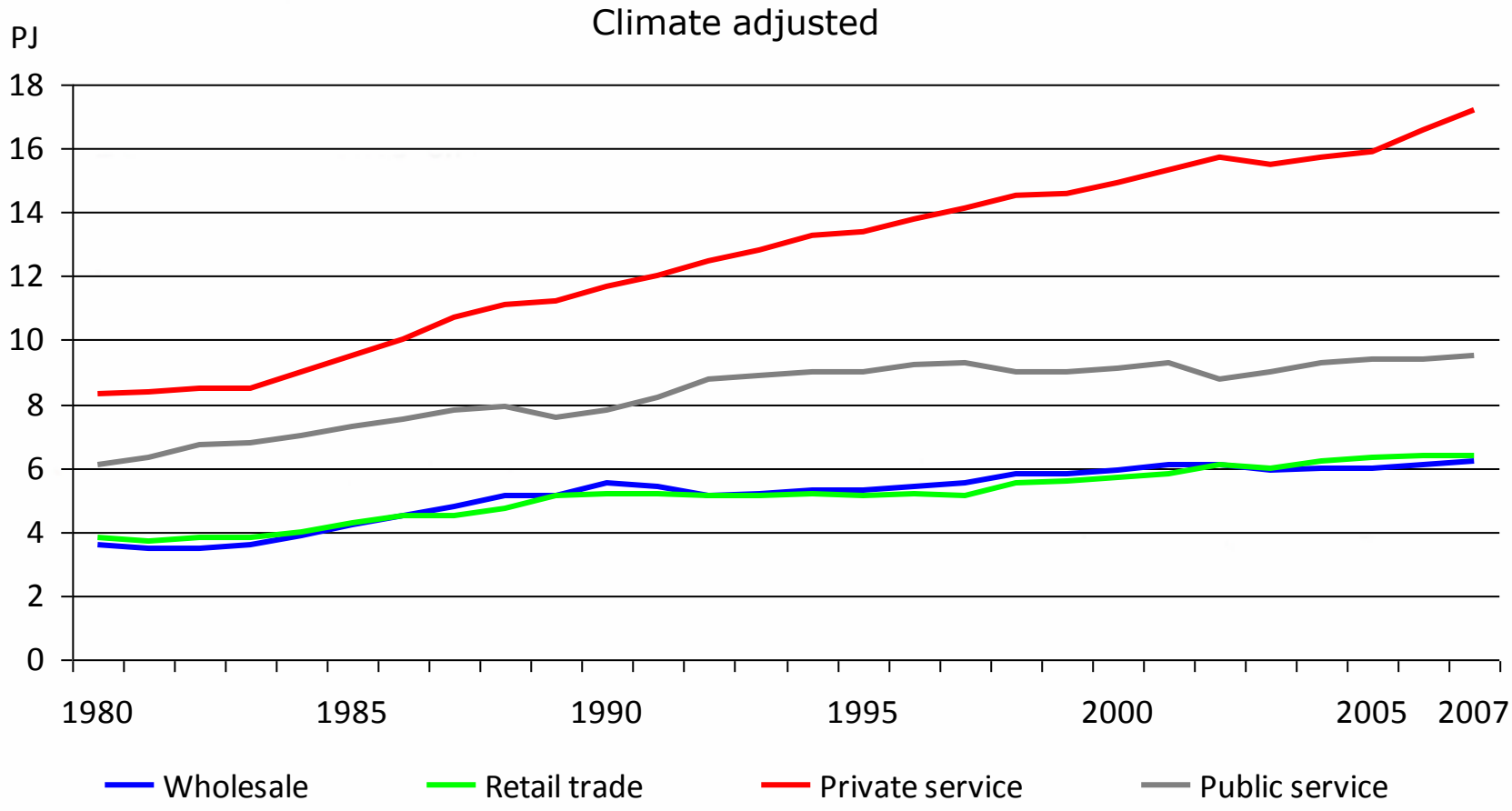
Electricity consumption in tertiary sector by sub-sector



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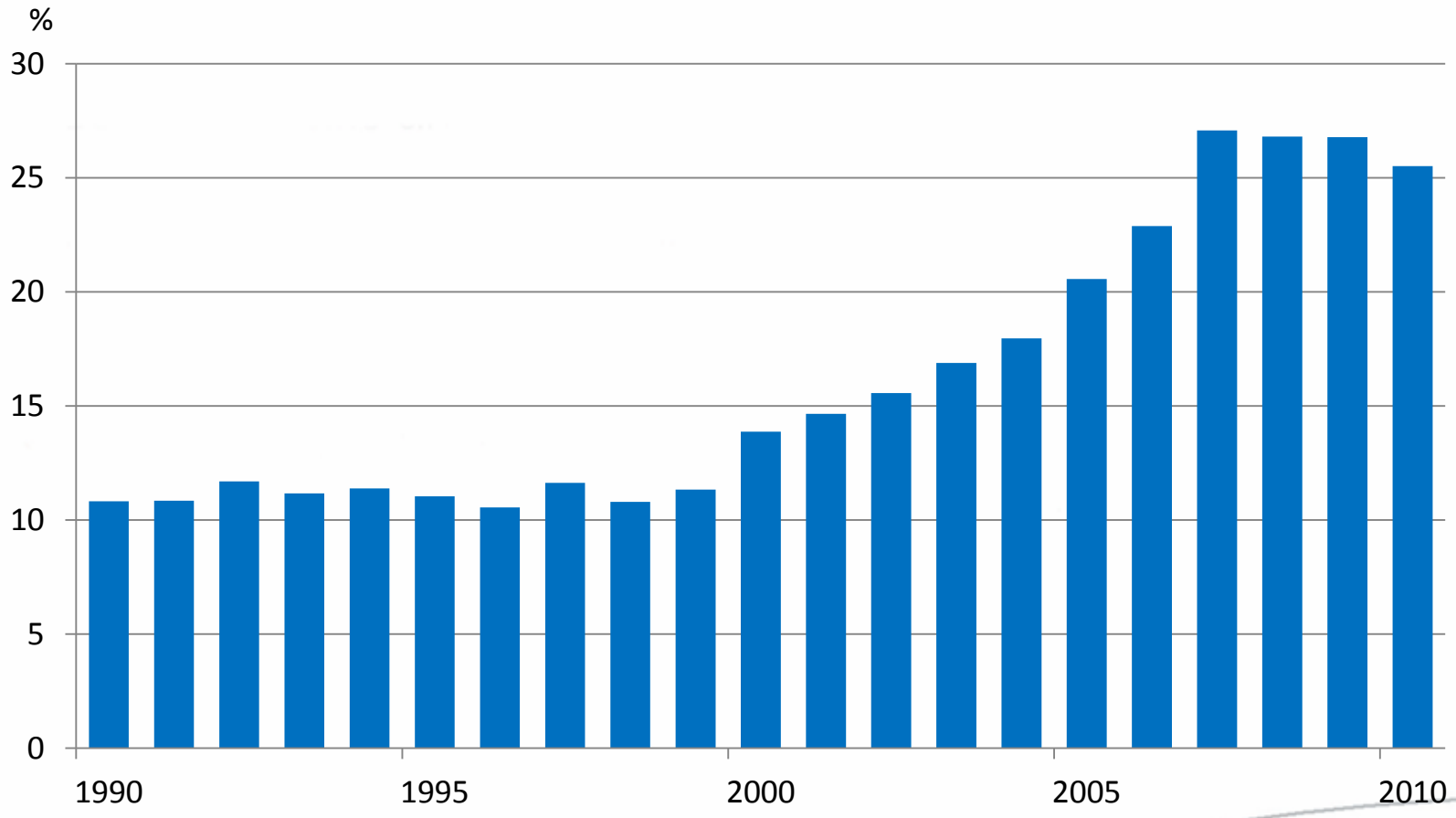
Households

- Good statistics on biomass extremely important
- Electricity consumption, own production of solar has to be added
- Can a TV set of today be compared with a TV set sold in 1990?

Consumption of wood in households
Impact on total consumption and efficiency

- The energy statistics will give a false picture of the development of energy consumption - and energy efficiency - if wood pellets and firewood are not treated correctly. This is especially important for households.
- Without surveys on wood pellets and firewood the Danish consumption of biomass in households had been seriously underestimated.
- The energy consumption in households has increased 2000-2008. Instead of reductions in the energy consumption we have seen fuel shifts.
- A shift towards wood has a negative impact on the unit consumption in households.

Energy consumption in households for space heating: Share of renewables



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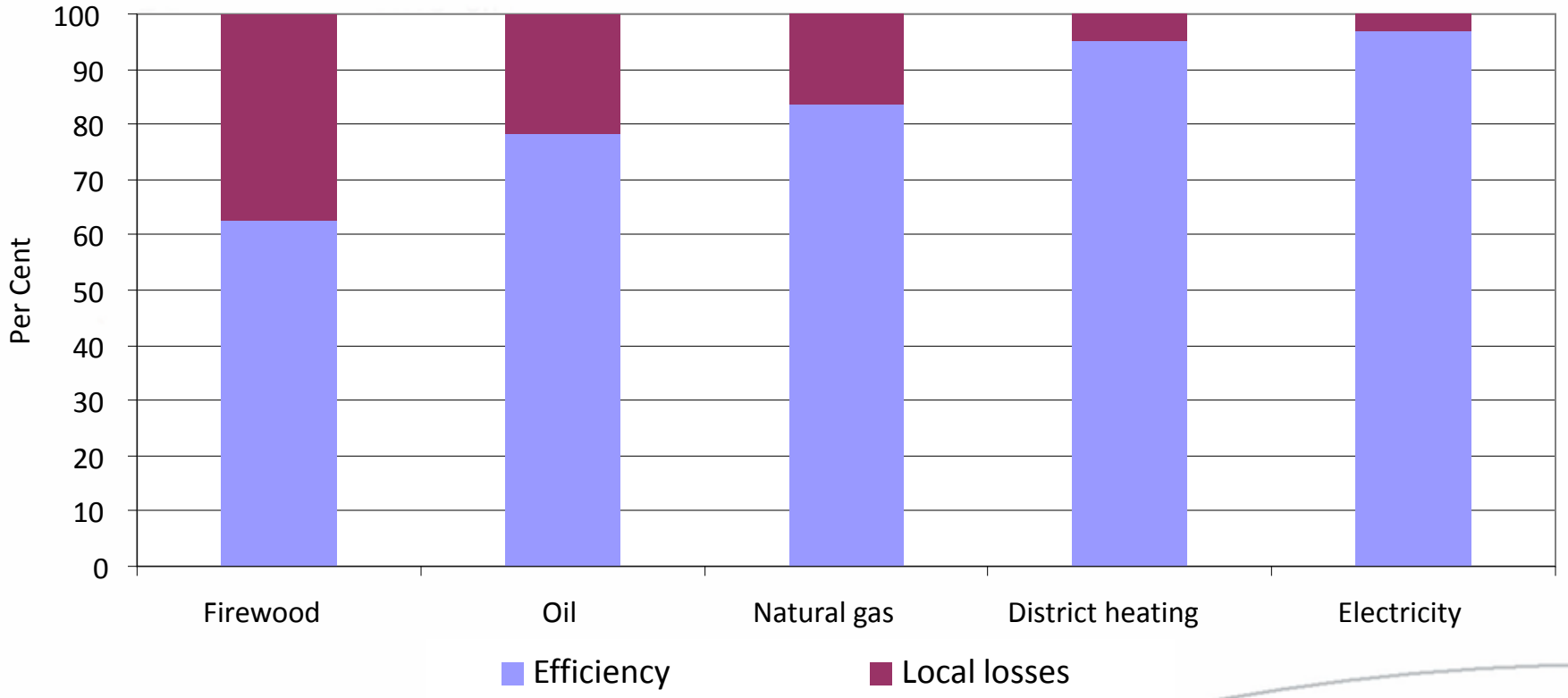
Efficiency of heating devices in households

Shifts from oil to district heating means lower energy consumption

Shifts from natural gas to firewood means higher energy consumption



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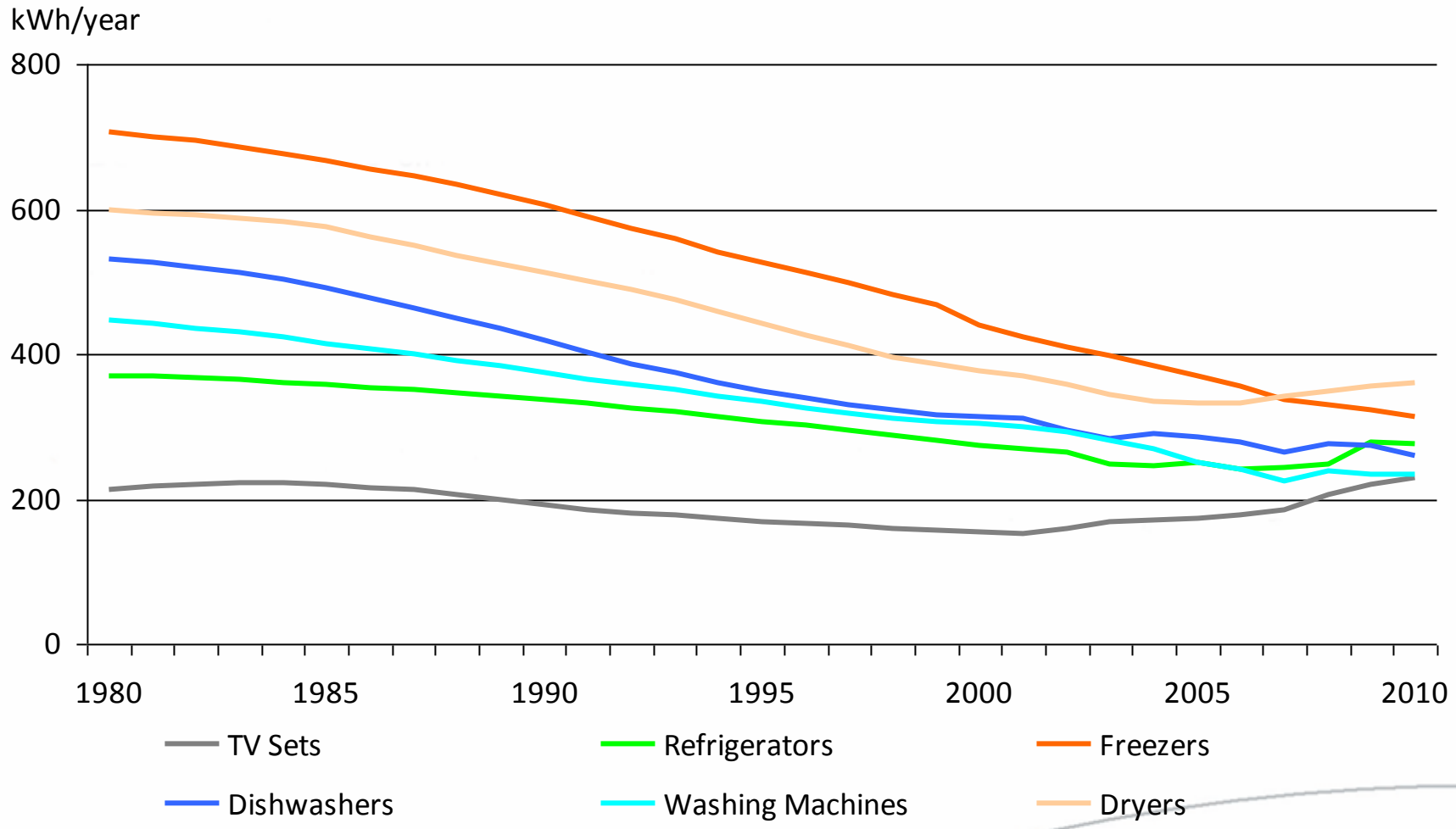
Specific electrical consumption by household appliances

Look at the development over the last years

Can a TV set of today be compared with a TV set sold in 1990?



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Transport

Statistics not easy for small countries

- Border trade
- Transport companies looking for the lowest costs
  (moving out of Denmark)

Unit consumption by trucks: Nominator versus denominator

- The nominator: All energy consumption in Denmark by trucks.
- The denominator: Tonkm by Danish trucks.
- The discrepancy has increased over the last years mainly because more and more transport to and from Denmark takes place using foreign trucks.

The EU Directive on road transport: Definitions

Transport of goods by road by Danish vehicles in national traffic

- The purpose of the statistics about transport of goods by road by Danish vehicles (> 6 tonnes) in national traffic is to analyse goods transported, traffic and transport performance of Danish road vehicles in national traffic.

International traffic by Danish lorries and road tractors over 6 tonnes

- The statistics cover international transport by Danish lorries and road tractors over 6 tonnes of permissible weight. Transport by trailers or semi-trailers registered in another country is included if the tractive unit is registered in Denmark.

Unit consumption by trucks in Denmark
GJ per 1000 tonkm

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Road transport by foreign trucks from or to Denmark (mio. tonkm)

	2003	2004	2005	2006	2007	2008
Total transport	**8 137**	**9 506**	**10 763**	**13 053**	**12 953**	**13 651**
From DK to registration country	3 371	3 831	4 390	5 574	5 615	6 137
To DK from registration country	4 766	5 675	6 373	7 479	7 338	7 514
- of which cross trade transport	..	2 851	3 480	4 635	4 517	5 243

Conclusion

- To include road transport by foreign trucks will certainly improve the value of the unit consumption of trucks as an indicator of efficiency.
- The energy statisticians will continue their work to improve the accuracy of the fuel consumption by trucks (not an easy task).
- Interest by transport statisticians in the use of their statistics for energy efficiency indicators will be very welcome.
- Cooperation between energy and transport statisticians will certainly be fruitfully.

Thank you for your attention

If you have questions, please contact me at:

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