The Trade and Service Sector Denmark's Data Collection Strategy

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IEA – Data and Methodology Training Session

"From Macro to Micro Energy Indicators

28 April 2006, Paris

Contents:

- Data collection, estimation and statistics
- The Danish national account statistics (130 branches) defines the sub-sectors
- Energy and electricity consumption
- Energy intensities and unit consumptions
- Conclusion

The Trade and Service Sector is dominant in all Developed Economies but the Energy Statistics lags behind

- In developed countries the trade and service sector often counts for 2/3 of GDP
- The electricity consumption is increasing fast – especially in private services
- IEA-Eurostat-UN still only collect very aggregated energy statistics
- In Denmark, the trade and service sector is divided in four sub-branches

Energy Statistics on the Trade and Service Sector: Head Lines

- Surveys conducted for the years 2002 and 2004 - but no comprehensive surveys
- Use of many data sources and estimations
- Difficult split problem: Flats >< Service Sector
- Special attention on electricity and district heating, which counts for 80% of total energy consumption
- The national accounts statistics defines the sub-sectors. That ensures correspondence with the economic statistics and facilitates the construction of indicators

Energy Consumption in the Trade and Service Sector: Collection of Data

- DEA is coordinator and responsible for the Danish energy statistics and international reporting
- Excellent co-operation between the three main actors
- Danish Energy Authority (DEA)
  - Data from the supply companies (aggregated)
  - Natural gas consumption (very disaggregated)
  - Electricity and heat survey (autoproducers)
  - Data on biomass
- Association of Danish Energy Companies (DE)
  - Electricity consumption (13 branches in the service sector)
- Statistics Denmark (DSt)
  - Surveys for the years 2002 and 2004
  - Register statistics: Return of energy taxes
  - Register statistics: Building and dwelling register

The Official Danish Energy Statistics on the Service Sector

- The energy consumption for the Total Trade and Service Sector is based on data from DEA and Association of Danish Energy Companies
- The decomposing of the total in the 4 sub-sectors Wholesales, Retail Trades, Private Services and Public Services is prepared by using data from Statistics Denmark
- The split of Total Energy Consumption into Space Heating and Other Purposes is prepared by using data from Statistics Denmark (surveys and BDR-statistics) + DEA-analysis

Energy Consumption in the Trade and Service Sector:

Type of Data and Data Sources

	Type of Data	Source
Oil	Raw data+estimate	DEA, DSt
Natural Gas	Raw data+estimate	DEA, DSt
Coal and Coke	Raw data+estimate	DEA, DSt
Renewables	Raw data	DEA
Electricity	Raw data+estimate	DE, DSt
District Heating	Key	DEA, DSt
Town Gas	Key	DEA, DSt

As a general rule the raw data comes from the supply side

DSt: Statistics Denmark, DE: Association of Danish Energy Companies

Keys are based on information in the BDR, unit consumptions and energy matrices connected to the national account statistics

Consumption of District Heating in 2004

	Tera Joule	Type of data
Production	**128 660**	**Raw data**
Distribution Loss, 20%	25 732	Estimate
Consumption	**102 928**	
Refineries	261	Raw data
Horticulture	1 985	Raw data
Manufacturing	7 398	Raw data
Consumption Left	**93 284**	
Trade and Service Sector	29 510	Key
Single Family Houses	31 083	Key
Flats	32 692	Key

Energy Consumption in the Trade and Service Sector by Fuel, 2004

	TJ	%
Total Consumption	**83 224**	**100,0**
Oil	4 806	5,8
Natural Gas	8 897	10,7
Coal and Coke	1	0,0
Renewables and Wastes	2 695	3,2
Electricity	**37 269**	**44,8**
District Heating	**29 510**	**35,5**
Town Gas	45	0,1

The Danish National Accounts Statistics defines the Sub-sectors

- The Danish national accounts statistics covers at most detailed level 130 branches of which 60 belongs to the trade and service sector
- The national accounts statistics includes energy balances (matrices), but the disaggregated consumption data is not of high quality
- DEA aggregates the 60 branches are into 4 sub-sectors. The data are –after a analytical work - used for construction of weights
- Final DEA-statistics for the 4 sub-sectors: DEA-total multiplied by the weights

Energy Consumption in the Trade and Service Sector by Branch, 2004

Unit: TJ	Energy	%
Total Sector	**83 224**	**100,0**
Wholesale	13 108	15,8
Retail Trade	9 991	12,0
Private Services	**35 195**	**42,3**
Public Services	24 930	30,0

The Danish Building and Dwelling Register (BDR)

- Established 1977, on basis of the general real property valuation
- Legal Basis: Act on Registration of Building and Dwellings
- Nation wide coverage
- Units
  - Built-up properties
  - Buildings
  - Dwelling units
  - Business and institution units
- Updating: The municipalities
- Important information about
  - Number of dwellings
  - Heated floor surface (m^2)
  - Heating installations

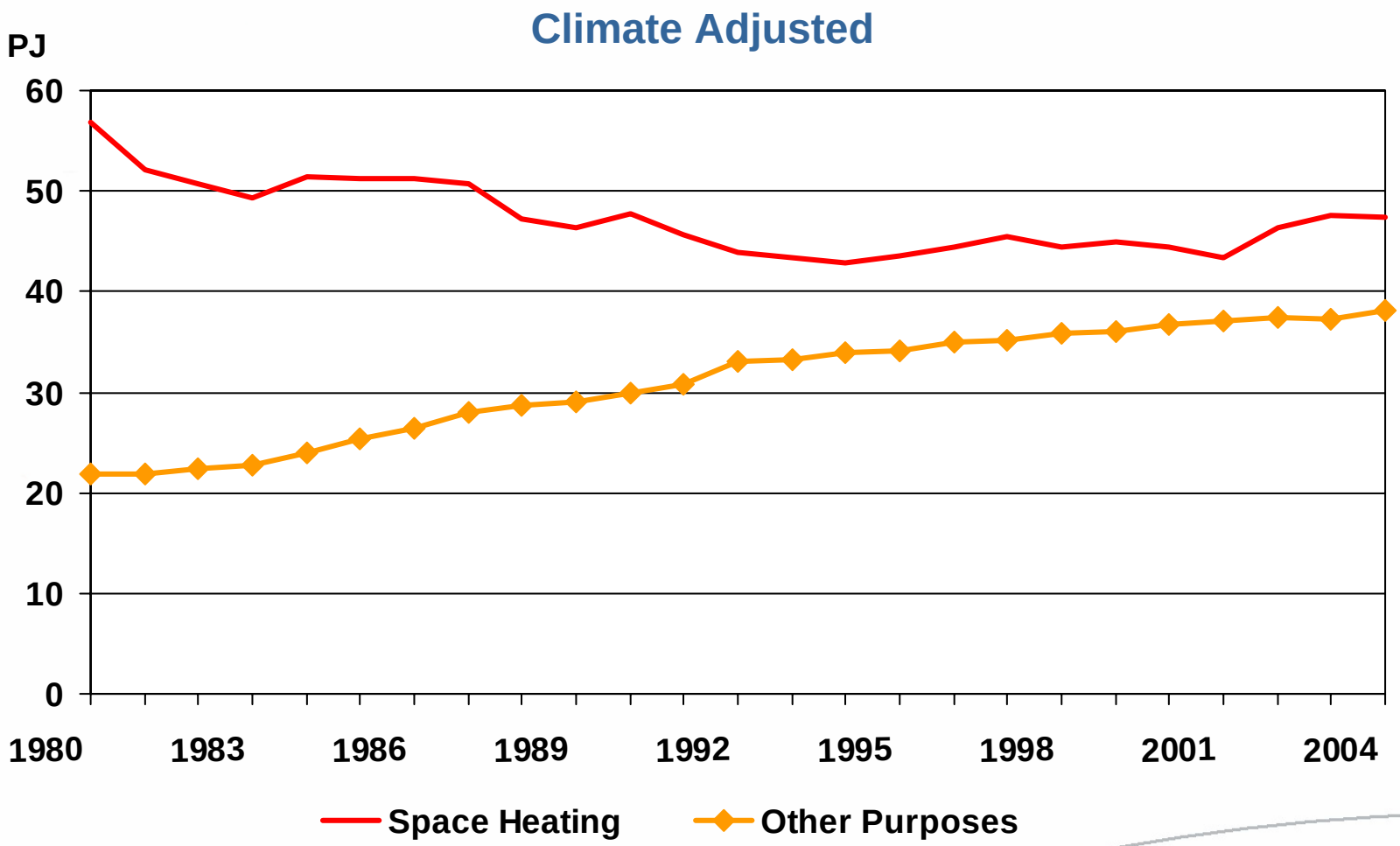
BDR: Buildings - Type of use

- **Dwelling purpose - all year**
  - Farm dwellings
  - Single - family house
  - Row house
  - Flat
  - College
  - Institution
- **Buildings for production purposes**
  - Agriculture
  - Industry
  - Office, commerce, public administration
  - Hotels, services
  - Cinemas, churches
  - Education, day care institution
- **Buildings for leisure purposes**
  - Summerhouses
  - Sport purposes

Energy Consumption outside Households: Shares for Heating

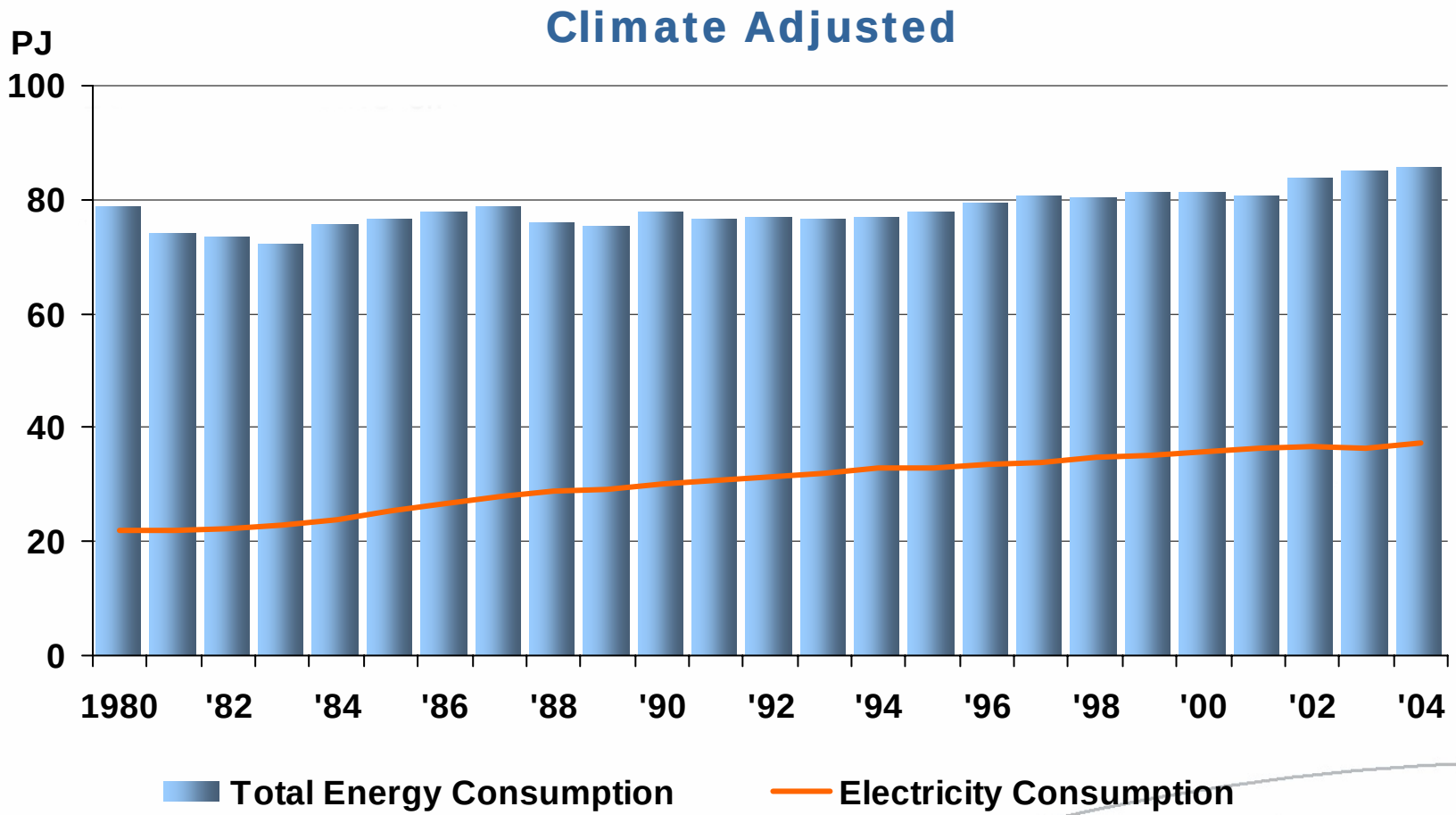
	Agriculture and Forestry	Horti-culture	Fishing	Manu-facturing	Con-struction	Wholesale	Retail Trade	Private Service	Public Service
Refinery Gas				0,00					
LPG	1,00	1,00	0,00	0,10	0,00	0,20	0,30	0,20	0,20
Gas-/diesel Oil	0,20	1,00	0,00	0,50	0,10	0,70	0,90	0,80	1,00
Petroleum	1,00		0,00	0,00	0,00	1,00	1,00	1,00	1,00
Fuel Oil	1,00	1,00	0,00	0,10	0,00	1,00	1,00	1,00	1,00
Petroleum Coke	1,00	1,00		0,00		1,00	1,00	1,00	1,00
Waste Oil				0,10				1,00	
Natural Gas	1,00	1,00		0,20	1,00	0,70	1,00	0,90	1,00
Gas Works Gas				0,20				1,00	1,00
Coal	1,00	1,00		0,00					1,00
Coke				0,00					
Brown Coal	1,00			0,00					1,00
Electricity	0,10	0,00		0,02	0,00	0,04	0,04	0,04	0,04
District Heating		1,00		0,50		0,90	1,00	1,00	1,00
Straw	1,00								
Wood	0,80	1,00		0,40				1,00	1,00
Biogas	0,00			0,00				0,00	
Wastes				0,50				1,00	

Energy Consumption in the Trade and Service Sector by Type of Use



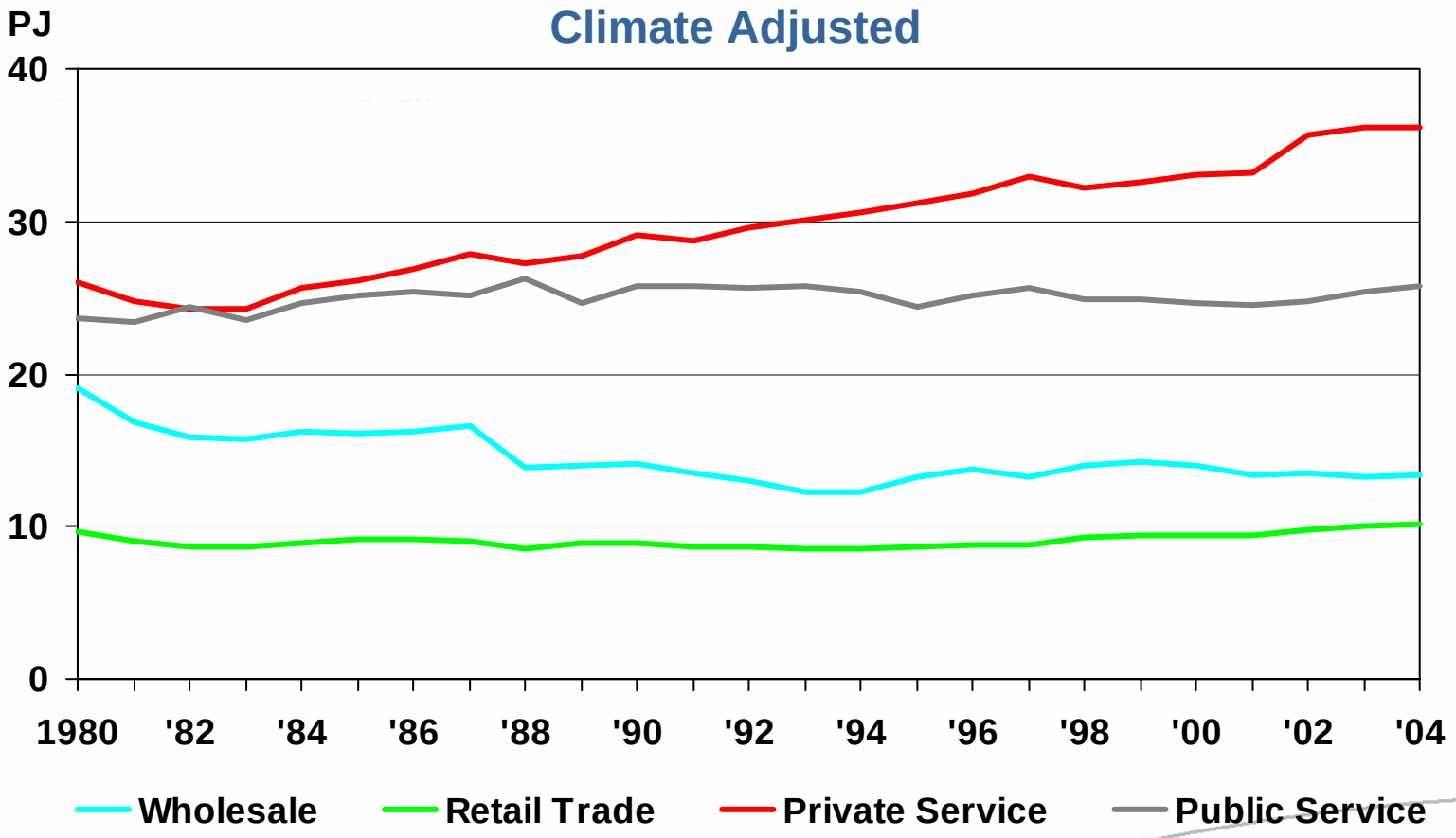
Energy and Electricity Consumption in the Trade and Service Sector

1990-2004: Total Energy +9,9% and Electricity +24,2%



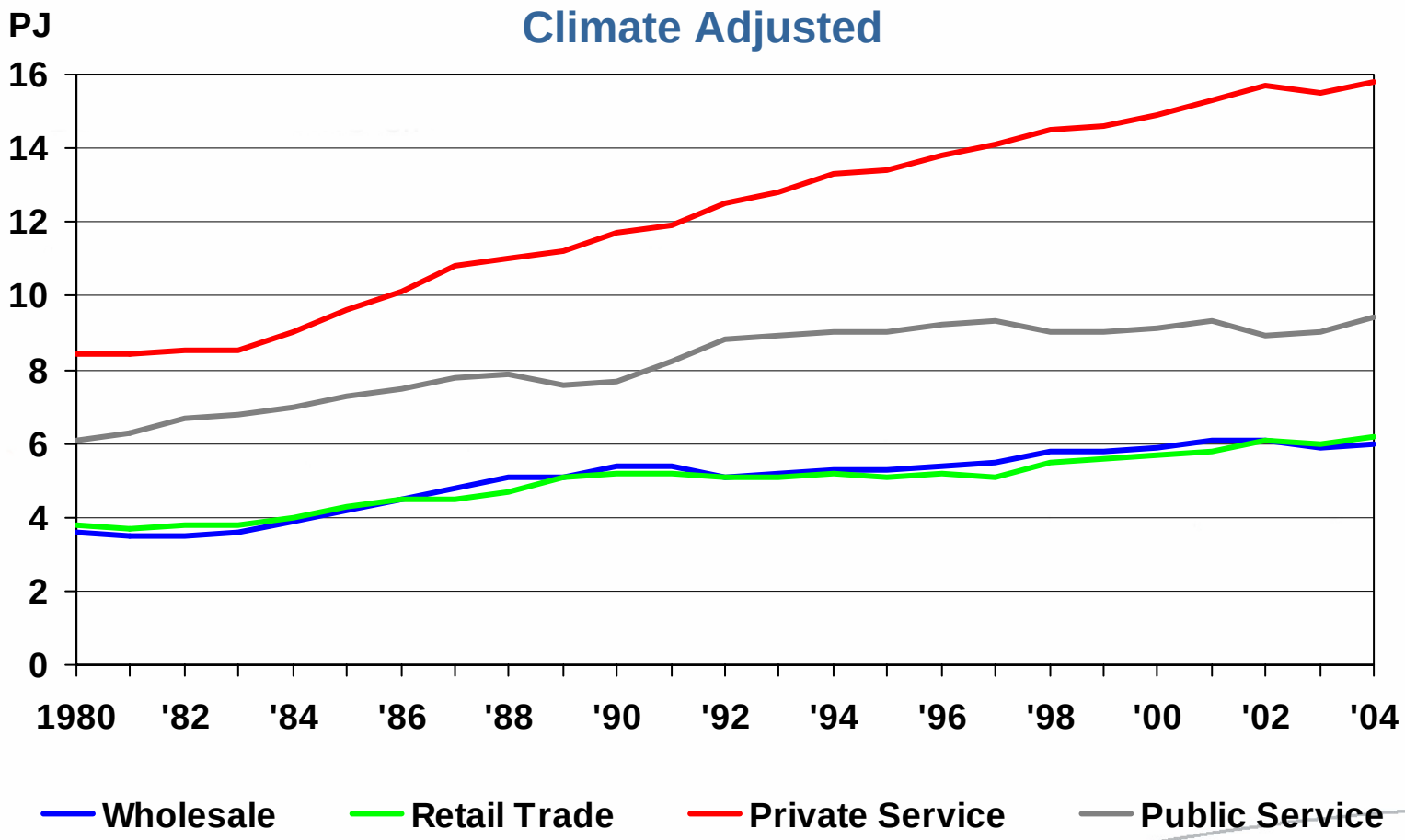
Energy Consumption in the Trade and Service Sector by Branch

1990-2004: Private Service +24,4% and Public Service 0%



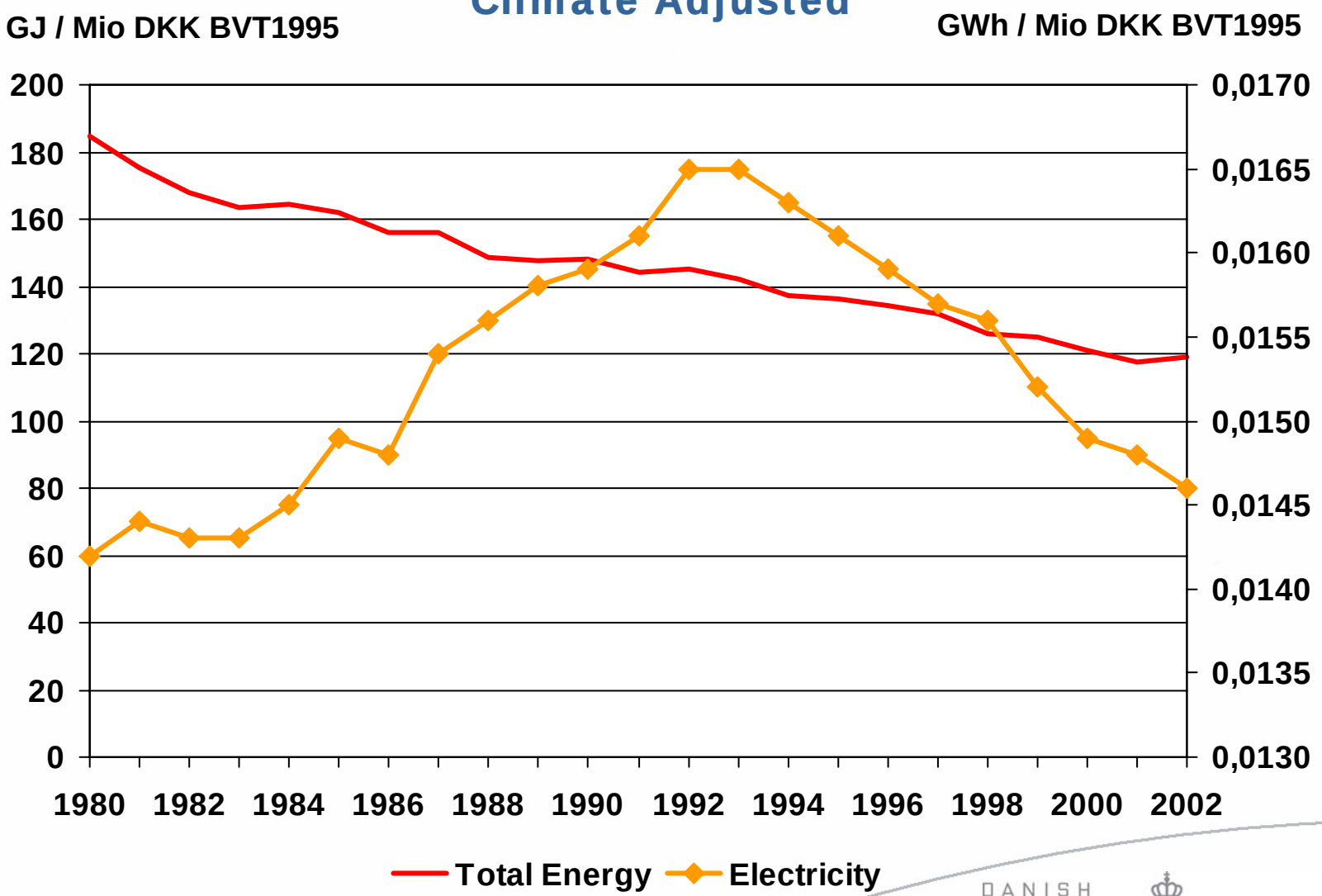
Electricity Consumption in the Trade and Service Sector by Branch

1990-2004: Private Service +35,3% and Public Service+20,8%



Intensities in the Trade and Service Sector

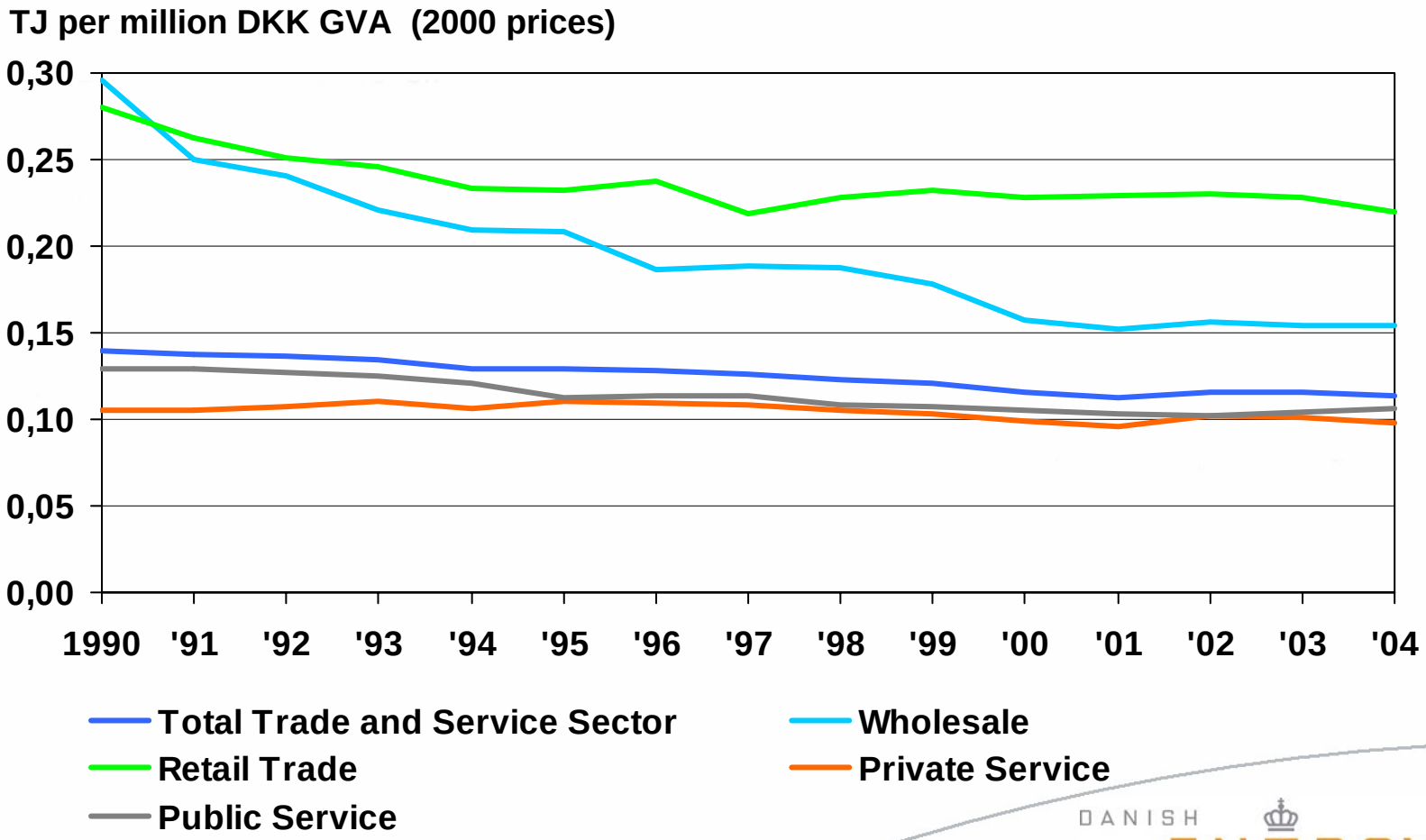
Climate Adjusted



Energy Intensities in the Trade and Service Sector by Branch

1990-2004: Total Sector -18,4% and Private Service -18,0%

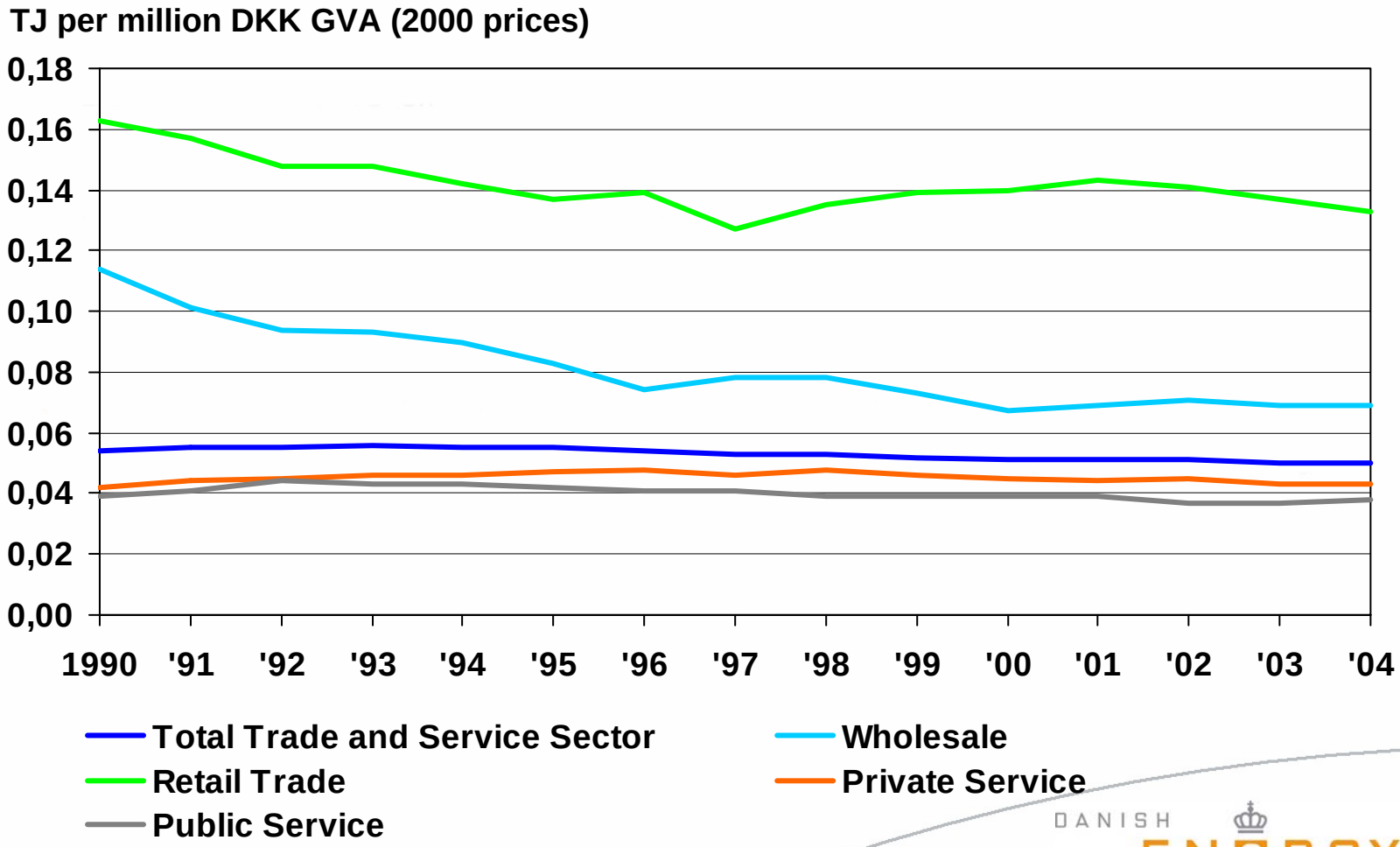
Climate Adjusted



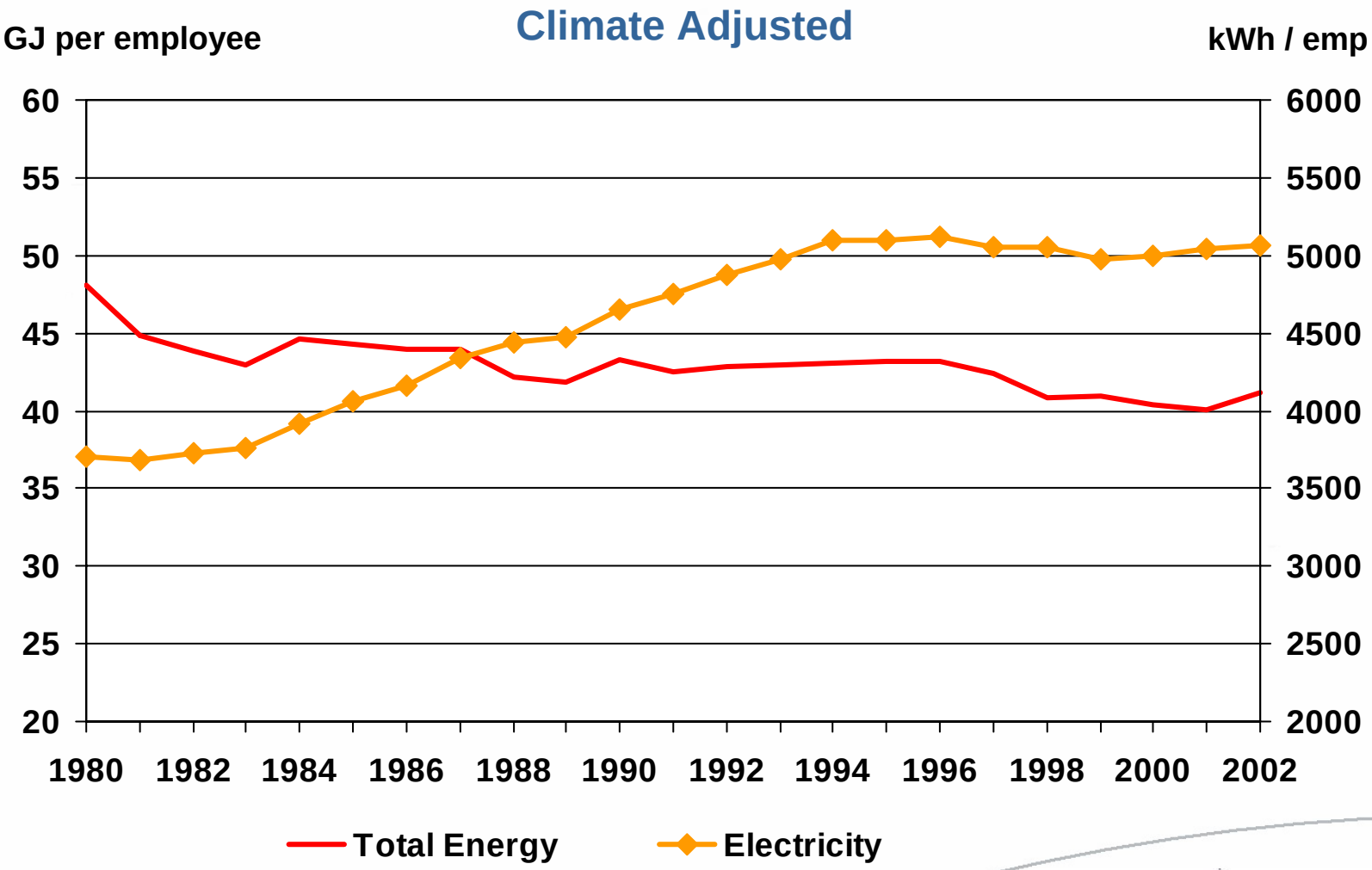
Electricity Intensities in the Trade and Service Sector by Branch

1990-2004: Total Trade and Service Sector: - 7,7%

Climate Adjusted

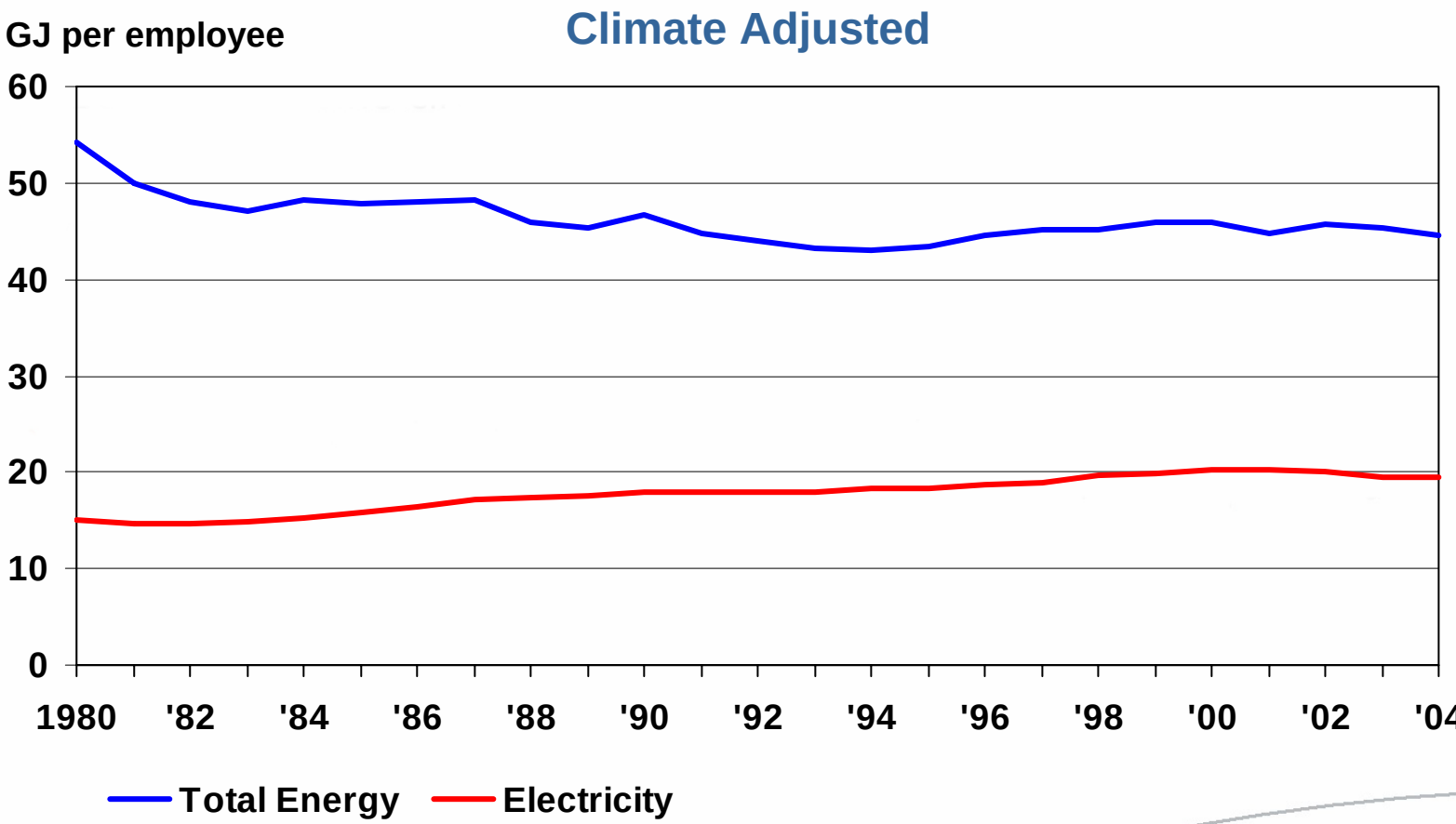


Unit Consumption in the Trade and Service Sector



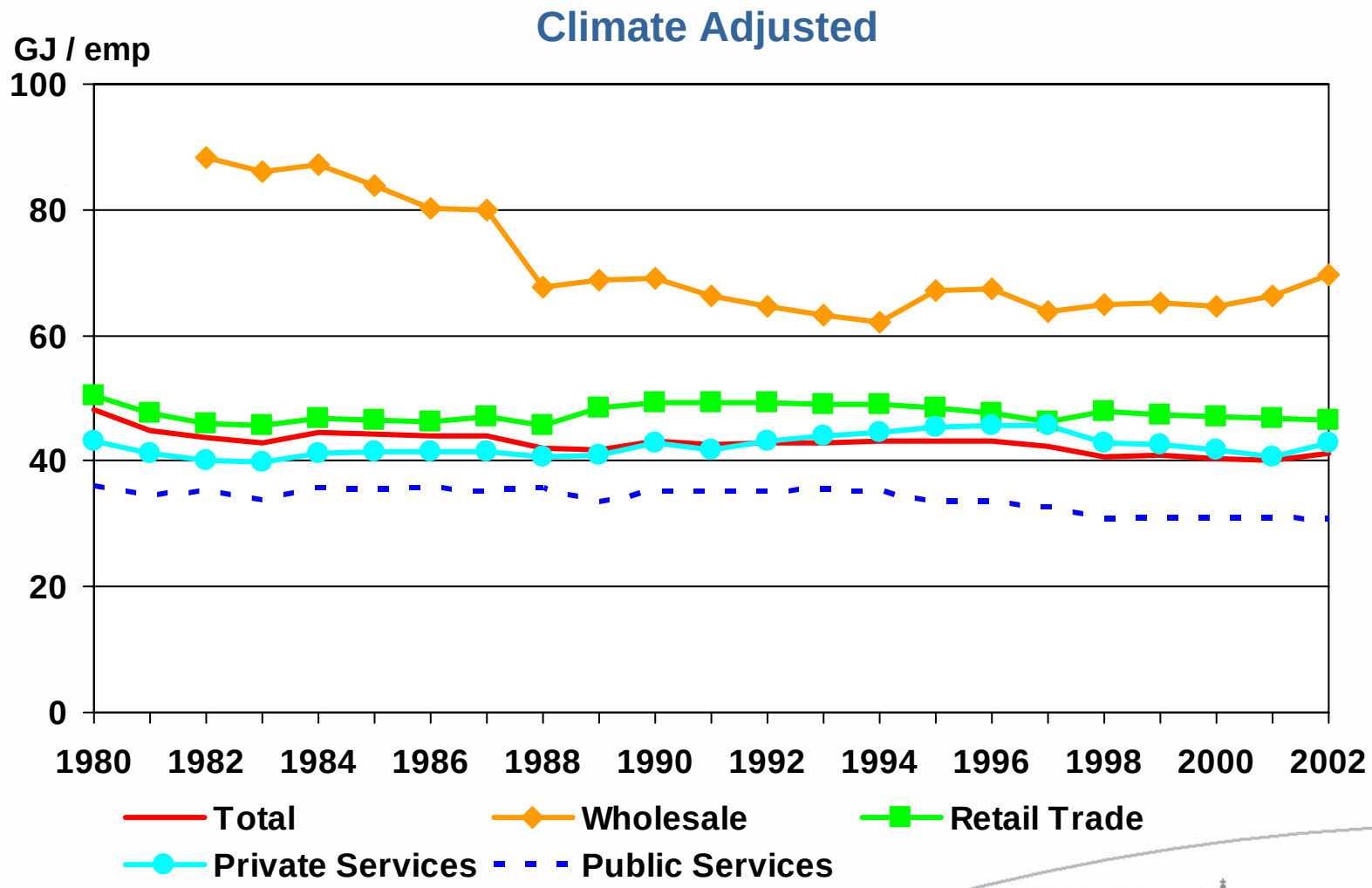
Unit Consumption in the Trade and Service Sector

1990-2004: Total Energy -4,4% and Electricity +8,0%

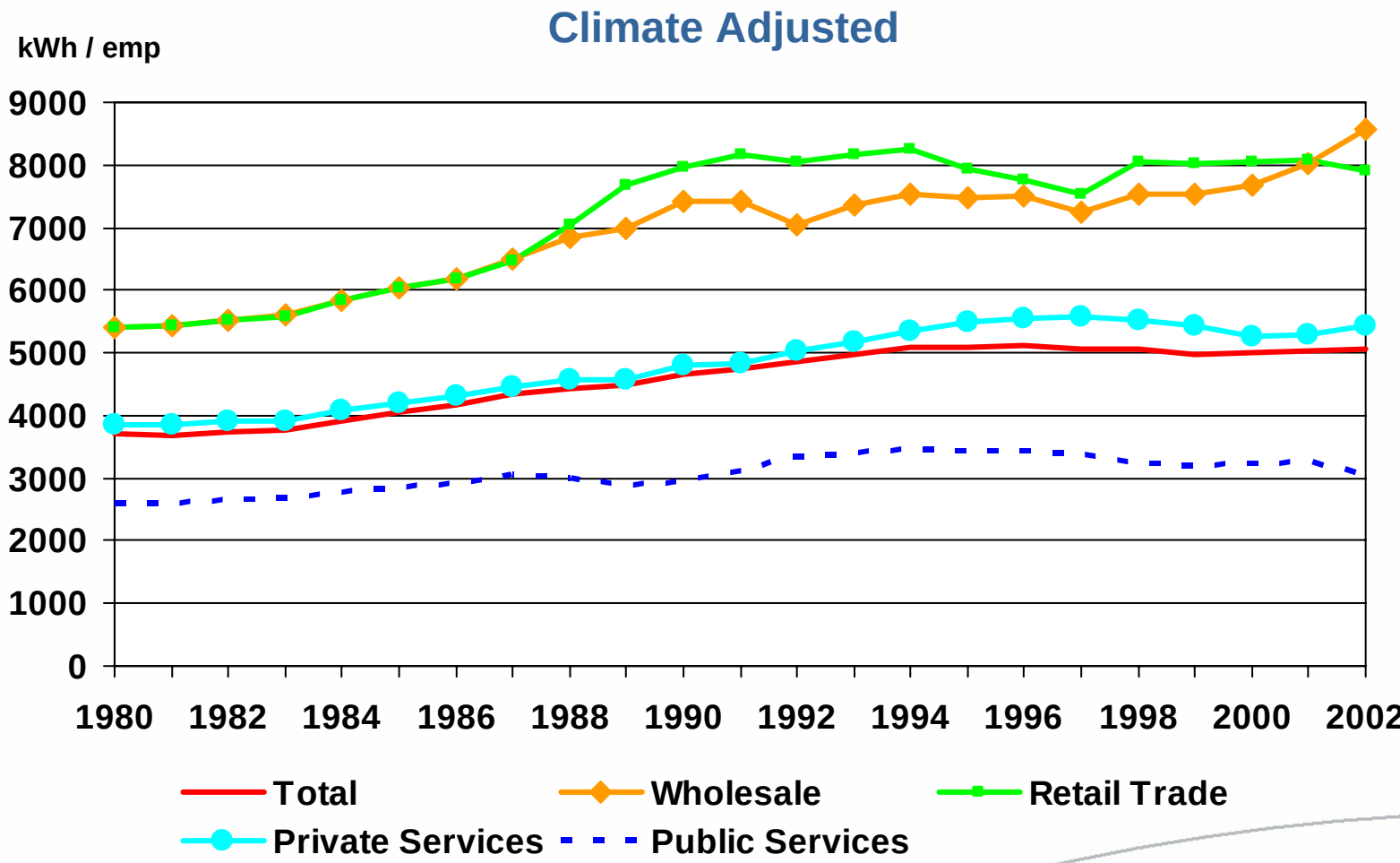


DANISH ENERGY AUTHORITY

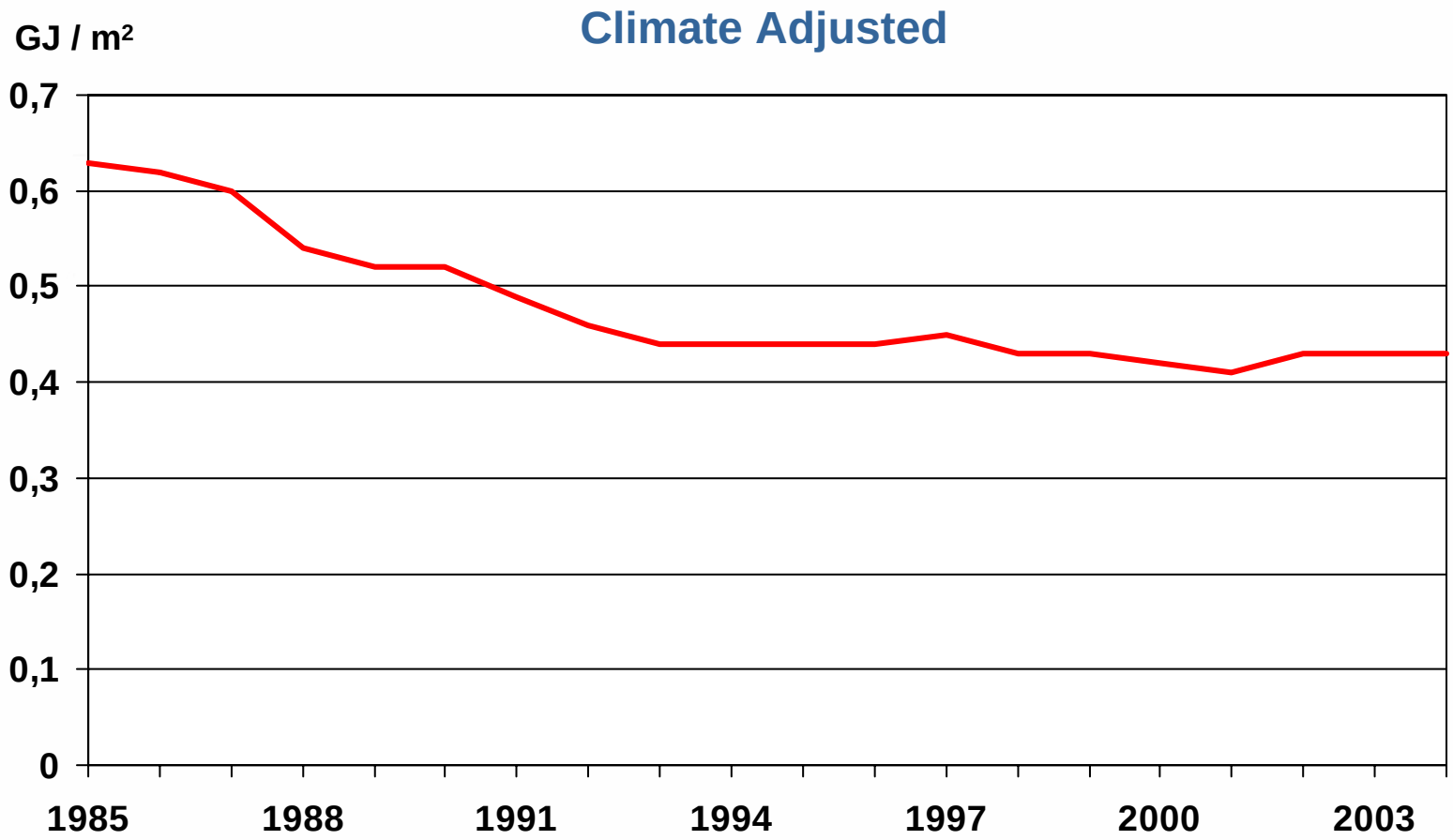
Unit Energy Consumption in the Trade and Service Sector by Branch



Unit Consumption of Electricity in the Trade and Service Sector by Branch



Energy Consumption for Space Heating per m² in the Trade and Service Sector



Conclusion:

- Energy statistics in the trade and service sector is very difficult. A good statistics requires maximum national co-operation
- All available information has to be used
- The economic development in the service sector is so strong that especially the electricity consumption continues to increase
- Special attention should be put on Private Services
- Although the energy intensity in the trade and service sector is much less than in industry IEA/ Eurostat should put much more focus on this sector
- Proposal: Adding sub-branches in the joint IEA/Eurostat/UN annual questionnaires