

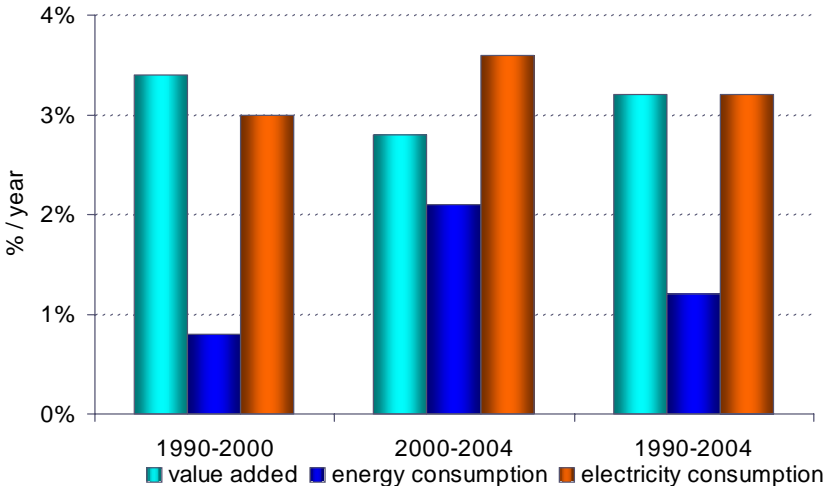
5. Energy Efficiency Trends in the Service Sector

5.1. Overall energy and economic trends

The energy consumption of the service sector comprises the energy used in buildings of the public and private service sector. This sector is also often referred to as tertiary sector. The share of the sector in the final energy consumption has increased slightly in the EU-25 (13 % in 2004 vs. 12% in 1990). The energy consumption of that sector is often calculated as a residual as the balance between the total final energy consumption and the energy consumption of industry, transport, households and agriculture⁵⁶. In the EU-10, the share of services reached 14% in 2004. It ranged from 9% in the Czech Republic to 20% in Hungary.

With the tertiarisation of the economy, the economic growth is faster for services than for industry sector or the whole economy: 3.2 %/year on average from 1990 to 2004 as compared to 1.4 % for industry and 2 % for the GDP. As a consequence, the service sector has increased its contribution to the GDP: in 2004, 64 % of the GDP was generated by services in the EU-25 up from 54% in 1990 (59% in 1996). In the EU-10, the contribution of services to the GDP is lower and the tertiarisation has been less rapid: in 2004, 56 % of the GDP was generated by services in the EU-10 up from 56% in 1996. The share of services in the GDP is the highest in Cyprus and Estonia (74% and 70% respectively). It is the lowest in Hungary, Lithuania, Czech Republic and Slovenia (52-53%).

Figure 5-1: Energy consumption and economic growth in services (EU-25)



The energy consumption of services has grown on average almost three times slower than the value added over the period 1990-2004 (1.2%/year compared to 3.2%/year);

⁵⁶ The definition used here may differ from other organisations (e.g. Eurostat for instance).

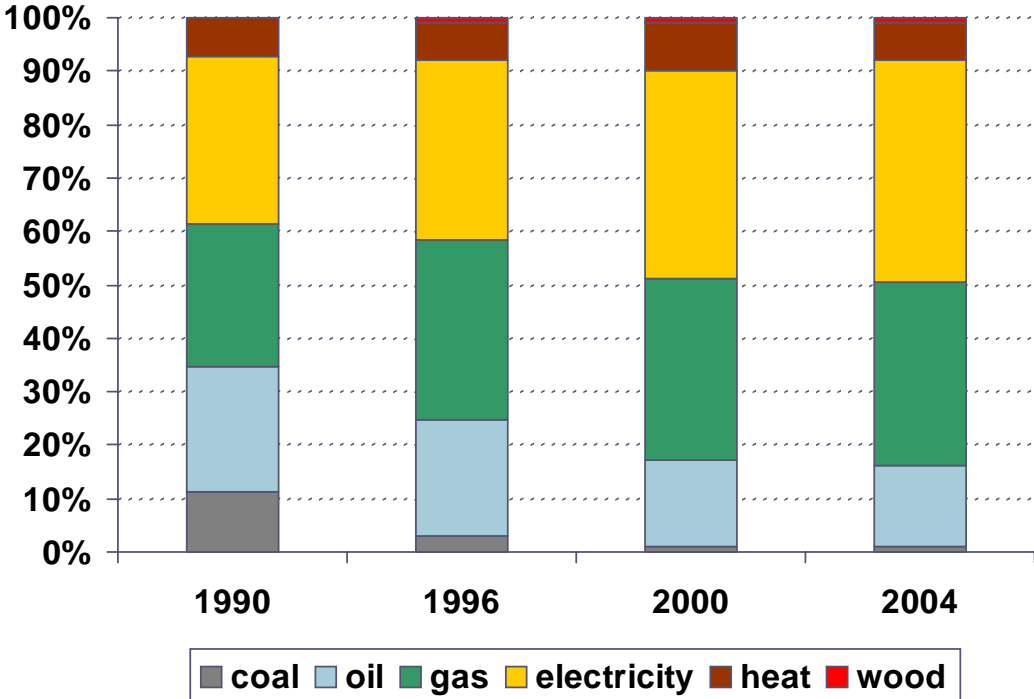
however, since 2000, it is more in line with the economic growth (2.1%/year for the energy consumption and 2.8%/year for the value added, which corresponds to an elasticity of 0.75) (Figure 5-1). Electricity consumption in services is growing at the same rate than value added.

5.2. Energy use pattern

Electricity is the main source of energy in the service sector

Electricity market share has increased a lot due the greater use of electricity, especially for information/communication technologies and air conditioning, from 31 to 41%⁵⁷. Gas met 34% of the energy consumption in 2004, up from 26% in 1990 (Figure 5-2). Together, electricity and gas met 75% of the energy demand in 2004, up from 58% in 1990. Oil and coal accounted together only for a share of 16 % in 2004, down from 34 % in 1990 and 17% in 2000. Heat has a market share of around 10%. Since 2000, the energy market share remained rather stable as most of the fuel substitutions already took place.

Figure 5-2: Energy consumption by type of energy in the service sector (EU-25)



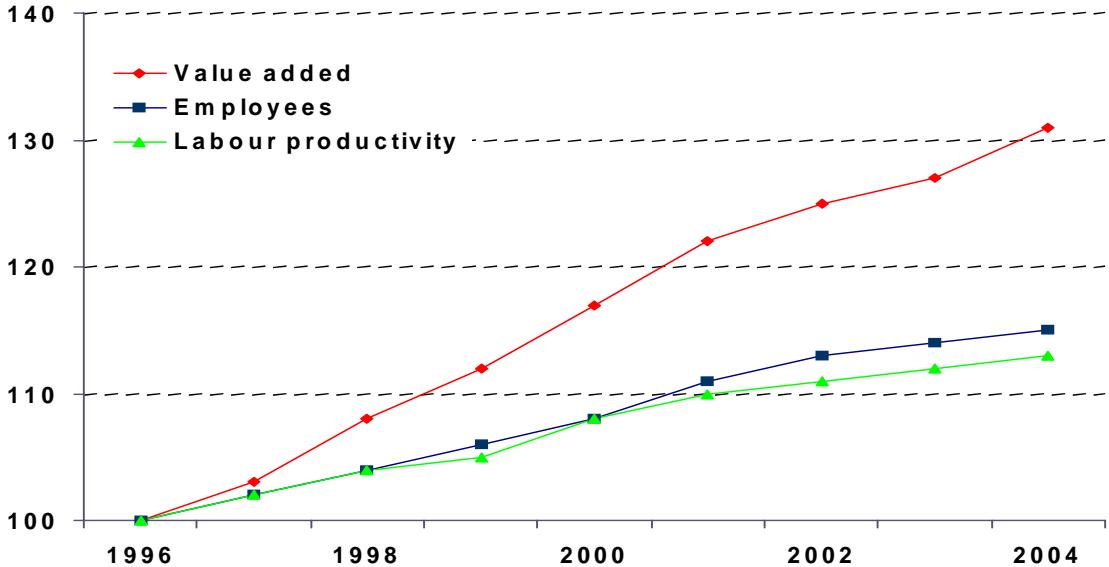
Two main indicators can be considered to characterise the level of activity in the service sector: value added and employment⁵⁸. Value added increased by almost 30 % from 1996 to 2004 and employment by 15 % (Figure 5-3). The value added created

⁵⁷ Energy consumption figures under normal climate conditions.

⁵⁸ For New Member Countries, data on floor area not available.

per employee (labour productivity) has been rising steadily since 1996 in the EU-25 (by 1.6 %/year on average or about 13 % in total).

Figure 5-3: Activity and labour productivity⁵⁹ in the EU-25 service sector



5.3. Trends in energy intensity and unit energy consumption⁶⁰

Different trends after and before 2001: stability of the energy intensity and progression of the energy consumption per employee after 2001 following a decrease of both indicators between 1996 and 2001

In contrast to other sectors where energy efficiency improvements are measured in a more refined way with index-based energy efficiency, this is not possible in this sector, because of the scarcity of statistics. Aggregate indicators such as energy intensity or unit consumption are therefore still used in this chapter to approximate progress in energy efficiency.

The energy intensity of the service sector (in toe per unit of value added) decreased rapidly over the period 1996-2001, by about 2.4 %/year and then remained almost stable since 2001 (**Figure 5-4**). As a result, the energy intensity was in 2004 11% below its 1996 level. In contrast, the energy consumption per employee decreased by 0.5 %/year until 2001 but increased by 1.1%/year since 2001: as a result, the unit consumption was in 2004 at about the same level as in 1996.

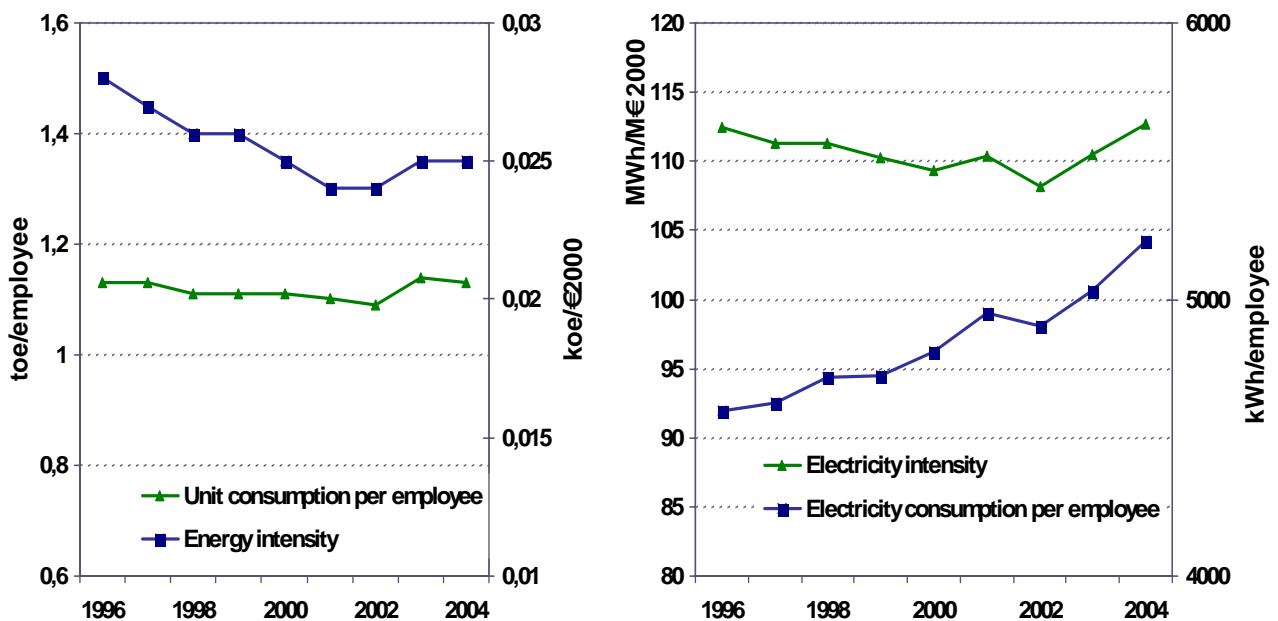
⁵⁹ Value added per employee in Euro 2000/ employee.

⁶⁰ All indicators are climate corrected.

Electricity intensity increased rapidly by 0.8 %/year since 2000; on average, the electricity consumption per employee increased by 2%/year since 2000.

Electricity intensity has increased rapidly since 2000 by 0.8 %/year while it was decreasing over the period 1996-2000 (- 0.7%/year). The electricity consumption per employee has risen even faster over the whole period by about 1.6 %/year (**Figure 5-4**). On average, employees consumed 13 % more electricity (or about 600 kWh) than they did in 1996 (5200 kWh/employee vs. 4600 kWh/employee).

Figure 5-4: Service sector intensity and unit consumption trends EU-25

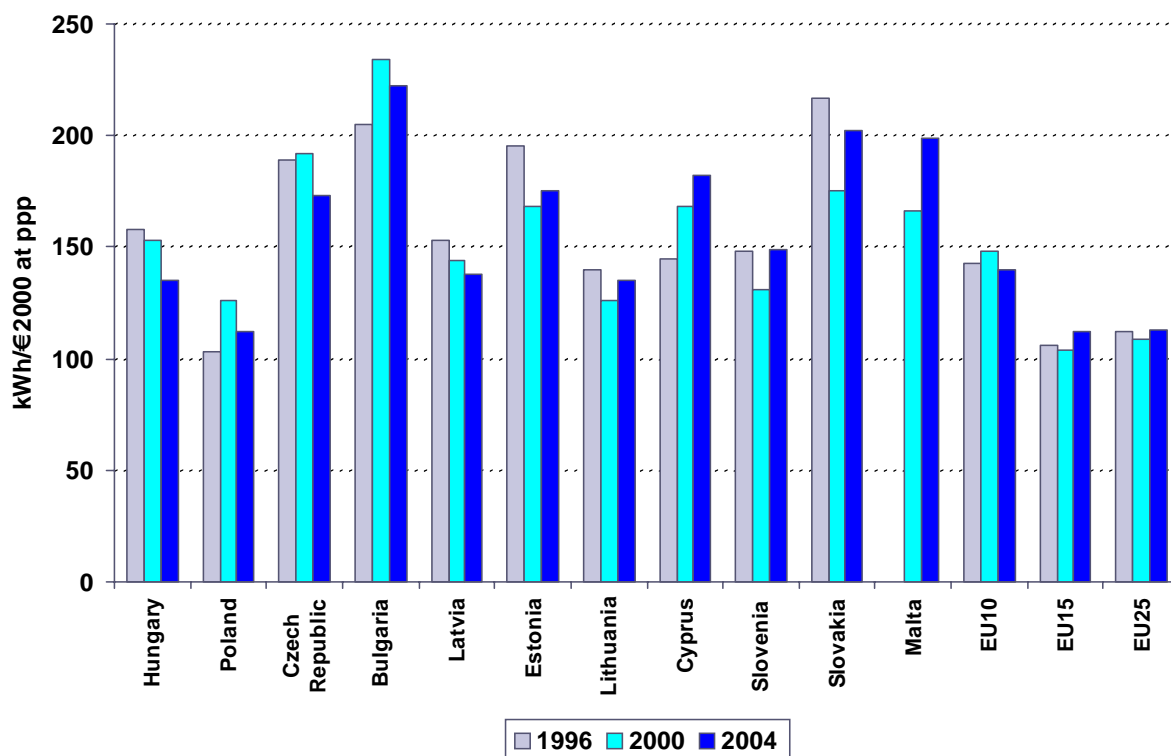


Some countries have reached a point at which electricity consumption and activity are decoupled

In the EU-10 and in 5 countries, the service sector's electricity intensity is decreasing, which means that the electricity consumption and the activity of the sector are decoupled (**Figure 5-5**). In Hungary and Latvia, this decrease can be observed since 1996. In the EU-10, Poland, the Czech Republic and Bulgaria, this intensity increased until 2000 and decreased afterwards: increase by 0.8%/year from 1996 to 2000 for the EU-10 and decrease by 1.4%/year after 2000.

In Estonia, Lithuania and Slovenia, as well as in the EU-15, the electricity intensity has first decreased from 1996 to 2000 and increased afterwards. In Cyprus and Malta, the electricity intensity is increasing rapidly over the whole period probably due to the diffusion of air conditioning and the development of tourism.

Figure 5-5: Service sector electricity intensity in EU-15 countries

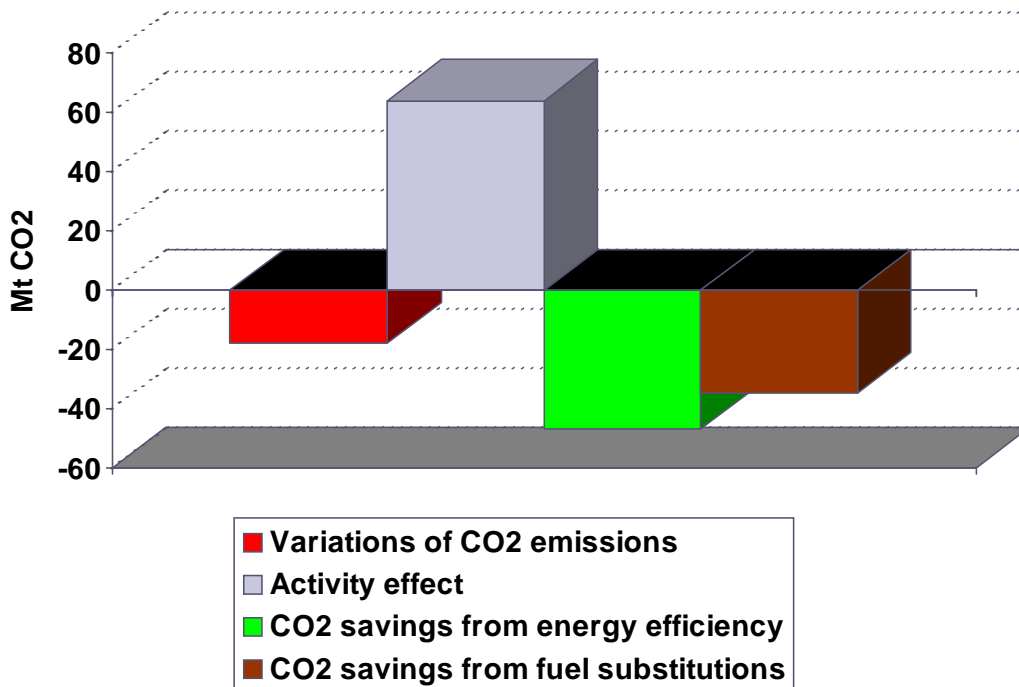


5.4. CO₂ emissions

Increased electricity penetration and substitution of gas for oil accounted for around 40 % of the CO₂ savings

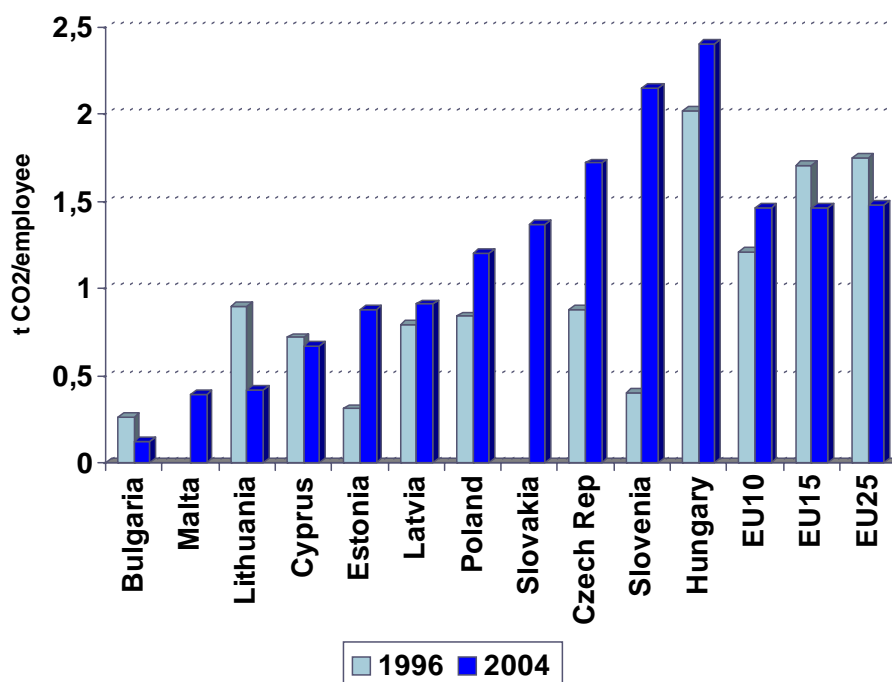
CO₂ emissions in the service sector only represent 8 % of direct CO₂ emissions in the EU-25 in 2004 (15 % including the indirect emissions from the electricity consumed in the sector). From 1996 to 2004, CO₂ emissions have decreased by 8%, even though the value added had increased by 31 % which would otherwise have implied an increase of 64 Mt CO₂ (**Figure 5-6**). Therefore, CO₂ savings at the level of consumers have completely offset the impact of economic growth. Nearly 40 % of these savings are linked to a switch to natural gas and the increased use of electricity. If indirect CO₂ emissions from electricity production are taken into account, total CO₂ emissions increased by 5 %.

Figure 5-6: Variation in CO₂ emissions in services (EU-25) (1996-2004)



CO₂ emissions per employee fell by 15 % in the EU-25 as a whole since 1996; however they increased in the EU-10 and in most EU new members (+21% for EU-10) (Figure 5-7).

Figure 5-7: CO₂ emission per employee in services for the EU-25 service sector



5.5. Conclusions

- Since 2001, the energy consumption increases as the valued added in the EU-25, whereas its progression was much slower before. The energy consumption per employee follows a similar trend: it increases since 2000, although it decreased before.
- Electricity intensity in the service sector is increasing since 2000 in the EU-25, after an average decrease of 0.7%/year from 1996 to 2000. In several New Member Countries and in the EU-10, a reverse trend is taking place, with an electricity consumption growth slower than the valued added: this reflects a decoupling between the electricity consumption and the valued added.
- Direct emissions are 8 % below their 1996 level despite a 31 % increase in the economic activity: CO₂ savings have completely offset the effect of economic growth. About 40% of these savings are coming from an increasing use of electricity and fuel switches to gas.
- The data situation is still fairly poor in the service sector, in particular concerning floor area and detailed data by sub sectors: they will have to be improved because of the expected energy demand growth in this sector.