



Energy Efficiency Profile : Germany

October 2008

Energy Efficiency Trends

Overview

On the period 1991-2006 the energy efficiency bottom-up index for the whole economy (ODEX) in Germany decreased by 18 %, which is equivalent to an energy efficiency improvement by 1.2 %/a on average based on the ODEX, which calculates technical efficiency improvements. Since the beginning of the new century, however, the efficiency improvement measured by the ODEX slowed down. Whereas between 1991 and 2001, a continuous decrease by 1.5 %/y could be observed, the decrease in the period 2001-2006 only amounted to 0.5%, which is below the EU-27 level.

Industry

The main reason for the slowing down of the energy efficiency improvement in Germany was the reversal of the energy efficiency development in the industrial sector. During the 1990s, the energy efficiency in industry measured by the industrial ODEX progressed by about 24 %, which was at least partly due to the breakdown of industry in Eastern Germany in the first half of the 1990s. Since 2001, however, the energy efficiency improvement in some branches slowed down or even turned back, especially in the energy-intensive steel industry.

Households

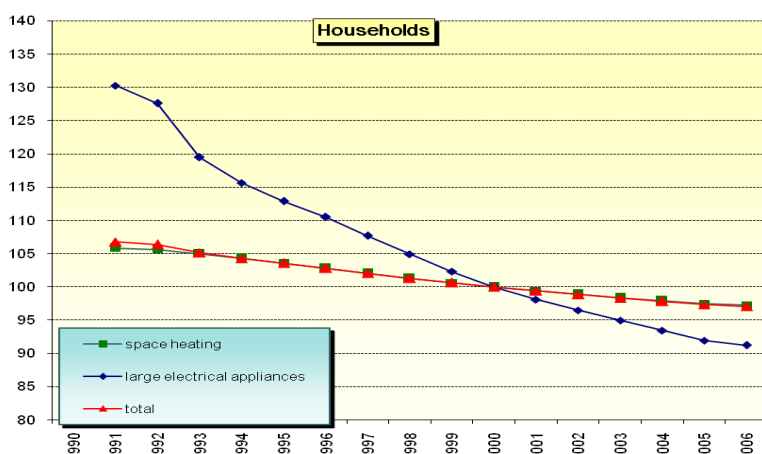
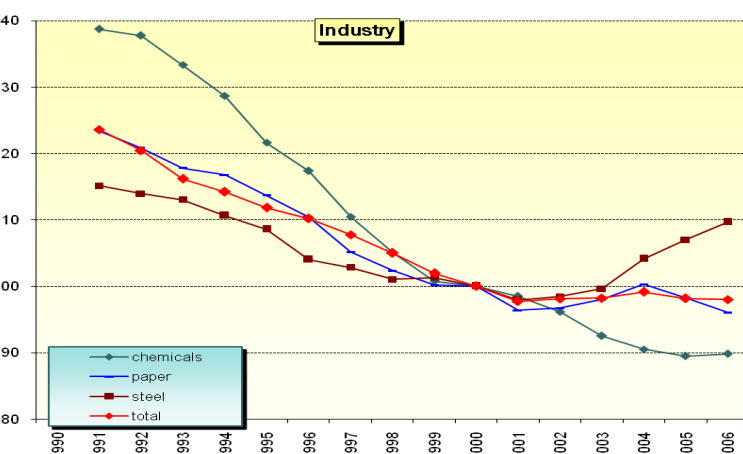
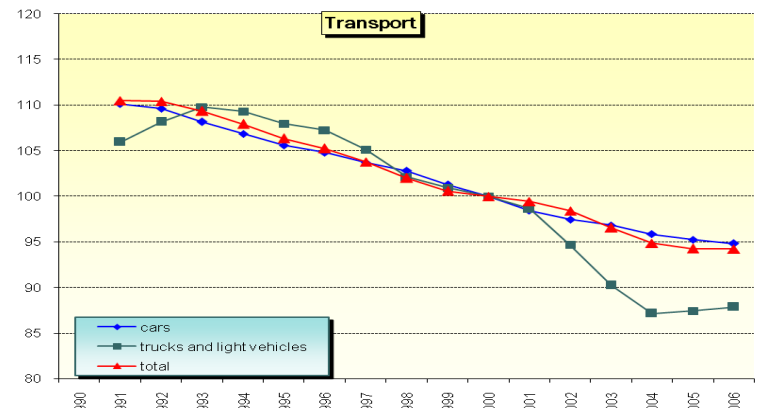
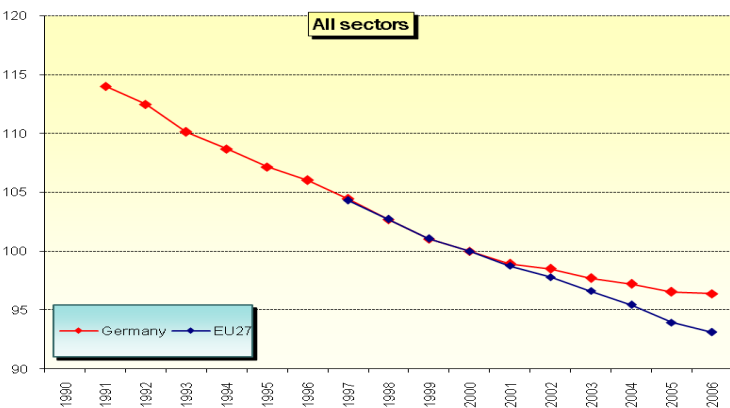
Between 1991 and 2006, the technical ODEX in the household sector as a whole decreased by about

10 %, which means a continuous improvement of energy efficiency, which is, however, smaller than in the other sectors and for the economy as a whole. Energy efficiency both improved for electrical appliances and space heating. With regard to space heating, some behavioural and lifestyle factors (increasing size of dwellings, diffusion of central heating, increasing room temperature) have been cleaned from the ODEX, too, so that the index mainly reflects technical efficiency gains.

Transport

In 2006, the energy efficiency index of transport improved by about 16 % compared to 1991. This development was mainly caused by the efficiency improvements in the car park as a consequence of the penetration of new, more efficient cars (measured by specific consumption in l/km) and a continuous trend to diesel cars which has been enforced since the beginning of the new century. Unit consumption of trucks and light duty vehicles grew until the mid 1990s, but afterwards, it also contributed to the observed efficiency gains in transport, especially in 2001-2004. During the last years, however, these efficiency improvements slowed down. The contribution of the other transport modes (air, train) and vehicle types (buses, motorcycles) is less important due to their small shares in consumption. Modal shift had therefore a comparatively small impact on transport energy consumption.

Energy efficiency index , base 100=2000



Energy Efficiency Policy Measures

Institutions and programmes

During the last year, energy efficiency policy in Germany was triggered by two developments:

In September 2007, the first **National Energy Efficiency Action Plan (NEEAP)** of Germany in accordance with the EU Directive on "energy end-use efficiency and energy services" (2006/32/EC) was submitted by the Federal Ministry of Economics and Technology (BMWi) (www.bmwi.de). It comprises a set of ongoing and planned energy efficiency programmes and measures in order to achieve the energy saving target of 9 % in the period 2008-2016 under the ESD and also includes potential measure impacts. In Germany, the authority which will be responsible for the overall control of the framework set up to achieve the ESD energy saving target, will be the Federal Office of Economics and Export Control (BAFA) (www.bafa.de), which is a superior federal authority subordinated to the BMWi. In August 2007, the German government presented an **"Integrated Energy and Climate Programme" (IECP)** consisting of 29 key elements of energy and climate policies. The aim of the package of measures is to fulfill the 40 % reduction target of greenhouse gases by 2020, compared to 1990 levels. Taking into the account the reductions already achieved until 2006 (around 18 %), this means a reduction of a further 270 Mt CO₂ equivalent. In two steps, in December 2007 and in June 2008, the German Cabinet adopted most of the measures contained in the programme. In the following, the most important measures referring to an enhancement of energy efficiency in the final energy consumption sectors are shortly described by sector.

Industry and Tertiary

The following measures are planned in the industrial and tertiary sector: smart metering of electricity consumption, the introduction of modern energy management systems, a financial support programme for climate protection and energy efficiency, the spread of energy-efficient products by a "Top-Runner" approach implementing the Eco-Design-Directive, and guidelines for public procurement for energy-efficient products and services. In addition, the energy-efficient modernisation of social infrastructure and a programme for the energy-efficient modernisation of federal buildings is only directed at the tertiary sector.

Households

In the household sector, most of the measures are directed at new or existing buildings: An amendment of the Energy Saving Ordinance shall tighten the energy standards for new buildings by 30 percent from 2009. With regard to existing buildings, a modernisation programme to reduce CO₂ emissions from buildings is foreseen.

Transport

In the transport sector, the following measures are planned: a CO₂ strategy for passenger cars, the expansion of biofuels, a reform of the vehicle tax on CO₂ basis, an improved steering effect of the toll on Heavy Goods Vehicles, the expansion of electric mobility and the incorporation of aviation and shipping into emission trading.

Impact evaluation of selected measures

In a recent study ^{1/}, the IECP measures were analysed with respect to their ecological (referring to energy and CO₂) and economic effects. The economic savings are estimated from a total cost perspective in which the additional investments (compared to a standard technology) for (possibly) more expensive efficiency technologies are set against the saved costs for fossil energy (cost-benefit analysis). Apart from these, the administrative costs for implementing the measures and the costs to the state (e.g. due to subsidy programmes) and the general public (e.g. due to surcharges for renewables) are taken into account, too. The study concentrated on a bundle of particularly important measures within the total package.

IECP measure	Title of the measure	Annually saved (fossil) energy (PJ)	Annually saved (fossil) energy (billion Euro)	Specific (net) reduction costs (Euro/t CO ₂)	Annually saved CO ₂ (Mt)
1	Combined Heat and Power Act (6)	135	-0,24	9	19,89
2	Renewables in the power sector	255	4,2	27	49,6
6+7	Energy management systems; Support programmes for climate protection and energy efficiency	128	3,2	-22	10,4
8	Energy-efficient products (in households and industry)	112	4,2	-266	15,1
10A	Energy Saving Ordinance	573	10,3	-63	39,8
10B	Substitution of electric night storage heating in households	-5	0,9	-102	6,5
12	Modernisation programme to reduce CO ₂ emissions from buildings	189	3,2	-67	13,3
13	Energy-efficient modernisation of social infrastructure	20	0,33	110	1,38
14	Renewable Energies Heat Act	210	1,1	121	17,1
15	Programme for the energy-efficient modernisation of federal buildings	6	0,10	-34	0,40
16	CO ₂ strategy for passenger cars	275	8,7	-128	17,4
17	Expansion of biofuels (9)	323	-2,1	180	11,9
20	Improved steering effect of the toll on Heavy Goods Vehicles (HGVs)	1,2	0,04	-275	0,1
Sum (with overlaps for building measures)		2220	33,8	-23	202,9
Sum (excluding overlaps for building measures)		1872	29,0	-27	173,4

^{1/} Eichhammer W. et al: Wirtschaftliche Bewertung von Maßnahmen des integrierten Energie- und Klimaprogramms (IEKP) - Wirtschaftlicher Nutzen des Klimaschutzes. Umweltbundesamt 2008

http://www.umweltbundesamt.de/uba-info-medien/mysql_medien.php?anfrage=Kennnummer&Suchwort=3517

