Objectives:

- 9% of end-user energy savings by 2016 (1.4 Mtoe)
- 14.6% share of renewables in final energy consumption in 2020
- 10.9% share of renewables in electricity production in 2020

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*2008 and 2000-2008 for steel

++ Among best countries  + Better than the EU average  - Below the EU average  -- Among countries with lowest performances

Latest update: January 2011

1 The European Union, as the best-performing region, is used as the benchmark.
1. Overview

1.1. Policies: 1.4 Mtoe energy savings target for 2016

Hungary’s National Energy Efficiency Action Plan for the period 2008-2016 lays down a final energy savings target of 9 percent between 2008 and 2016, i.e., 1.4 Mtoe (15.9 TWh). Around 40 to 50 percent of the planned energy savings should come from the households and services sectors (equally split between these two sectors), industry should account for a further 40-50 percent of the savings and transport for 10 percent. According to the new Renewable Plan adopted in January 2011, by 2020 energy savings should amount to 10 percent.

According to the EU Directive on the promotion of the use of energy from renewable sources, the national target is to increase the share of renewables in the country’s final energy consumption to 13 percent by 2020; that target was reassessed in the new Renewable Plan adopted in January 2011 and is now 14.6 percent by 2020.

1.2. Energy consumption trends: little change since 1990

Hungary’s energy consumption per capita is 25 percent below the European average (2.5 toe/capita in 2009).

Total energy consumption has remained relatively stable since 1990. After a fall between 1990 and 1992, primary energy consumption increased slightly until 2005 and has been declining since then. In 2009 alone it decreased by 6 percent as a consequence of the global economic slowdown.

Oil and nuclear electricity represent 28 percent and 16 percent of total consumption, respectively. The share of coal has steadily decreased and now accounts for 10 percent, compared with 20 percent in 1990, to the benefit of natural gas (37 percent in 2009 compared with 32 percent in 1990). Other sources (including biomass) account for 7 percent of total consumption (2009).

The households-services sector absorbs 47 percent of final energy consumption, followed by the transport sector, which has seen its share grow on a regular basis since 1990 (from 14 percent to 24 percent in 2009). The share of industry (including non-energy uses) accounted for 28 percent of final consumption in 2009, down from 39 percent in 1990.

Hungary’s electricity consumption per capita is about 40 percent lower than the EU average (3,500 kWh in 2009). After a fall between 1990 and 1993, electricity consumption rose by 1.8 percent/year up to 2008. In 2009, electricity consumption fell by 5.4 percent, in line with the reduction in demand from industry and from the households-services sector. The households and services sector is the largest electricity consumer in Hungary, with 63 percent of electricity consumption in 2009 (compared with 50 percent in 1990), and its share is increasing. The share of electricity consumed by industry fell over the period, from 46 percent in 1990 to 34 percent in 2009.
1.3. Energy efficiency and CO₂ trends: significant energy intensity reduction

Total energy consumption per unit of GDP (primary energy intensity) has decreased by 2.1 percent/year since 1990. This gain in overall energy efficiency was faster than the improvement in the EU (1.7 percent/year between 1990 and 2009), but Hungary’s primary energy intensity, measured at purchasing power parity, remains 20 percent higher than the EU average.

Hungary’s final energy consumption per unit of GDP (final intensity) decreased by 2.3 percent/year between 1990 and 2009, thanks to efficiency gains in the industrial sector. Owing to the high share of low-efficiency power plants in electricity production (over 80 percent between 1990 and 2000), these efficiency gains were only partially transferred to the primary energy intensity. Efficiency gains in the power sector since 2000 (replacement of oil and coal-fired facilities by gas-fired units) contributed to the reduction in primary intensity between 2000 and 2009.

CO₂ intensity (CO₂ emissions per unit of GDP) dropped by 2.9 percent/year between 1990 and 2009, i.e., slightly faster than primary energy intensity, due to the use of alternative low-carbon fuels. Fuel substitutions account for about 20 percent of that reduction, while the reduction in energy intensity explains the remaining 80 percent.

2. Power generation

2.1. Policies: 9.5 TWh of renewable electricity by 2020

Hungary’s strategy on renewable energy sources 2007-2020 aims to increase the power production from renewable energies to 9.5 TWh by 2020. In the new plan on renewables adopted in January 2011, a target of 10.9 percent of total electricity production was set for renewables by 2020. To improve CO₂ emissions, new developments in the country’s nuclear capacity are under consideration.

In 2003 Hungary introduced feed-in tariffs for electricity produced from PV, wind, biomass and biogas, and small hydro. Feed-in tariffs can be applied to CHP installations. The government is introducing green certificates, which will be mandatory for power producers (from CHP) and sellers from Jan. 1, 2012. This system could later replace the feed-in tariff for Renewable Energy Resources (RES)-electricity.

Investments in renewable energy are supported through grants by the Environment Protection and Infrastructure Operative Program (EIOP). As planned in the National Energy Conservation Program 2008 (NEP 2008), investments in facilities producing electricity from renewables are eligible for subsidies covering 25 percent of the investment.

2.2. Power generation trends by source: nuclear and thermal

Hungary’s electricity mix is divided between nuclear power (43 percent in 2009, compared with 48 percent in 1990) and thermal generation (49 percent in 2009, compared with 51 percent in 1990). Within fossil fuels, the share of natural gas in power production has risen steadily, from 16 percent in 1990 to 38 percent in 2008, while the shares of coal and oil have decreased steadily, from 30 percent and 5 percent, respectively, to 18 percent and 2 percent. In 2009, the lower electric-
ity demand altered the fuel mix to the benefit of nuclear energy. Biomass-fired generation now accounts for 7 percent (compared with 1 percent in 2003) and wind remains marginal (1 percent).

Figure 5: Power generation by source

![Power Generation by Source](image)

Figure 6: Efficiency of power generation and thermal power plants

![Efficiency of Power Generation and Thermal Power Plants](image)

2.3. Efficiency of the power sector: low, but improving

The efficiency of the power sector in Hungary is poor, since low-efficiency technologies (nuclear and coal-fired power plants) dominate the power mix. However, the electricity sector has improved its efficiency over the years, from 29 percent in 1990 to 33 percent in 2009, thanks to efficiency improvements in thermal power plants, an increasing share of CCGT facilities in the thermal mix (from 8 percent in 1990 to 18 percent in 2009) and a shift to gas.

Figure 7: Thermal electricity capacity, by technology

![Thermal Electricity Capacity, by Technology](image)

The rate of T&D losses was slightly above 9 percent in 2009, ie, 43 percent higher than the EU average, despite a significant decrease since 1993 (~40 percent). Those losses were over 13 percent between 1993 and 2001, and were mainly due to electricity theft rather than technical problems.

Figure 8: Electric T&D losses

![Electric T&D Losses](image)

The average CO₂ emission factor for electricity generation fell dramatically between 1993 and 2009, from around 440 gCO₂/kWh to 310 gCO₂/kWh, and is now 9 percent lower than the EU average (340 gCO₂/kWh). This improvement is due to the declining share of coal-fired and oil-fired generation, to the benefit of gas-fired generation. The high share of nuclear also helps limit CO₂ emissions (the increase in the carbon factor in 2003 is linked to a drop in nuclear generation).
3. Industry

3.1. Policies: up to 7.8 TWh in savings by 2016

The National Energy Efficiency Action Plan sets an energy savings target for the industrial sector of between 5.6 TWh and 7.8 TWh over 2008-2016. To reach that goal, Hungary will continue the Energy Efficiency Credit Fund included within the Poland and Hungary Assistance for Restructuring their Economies (PHARE) program since 2000, which includes a soft-loan credit facility to support energy-efficiency investments by small and medium enterprises (mainly for the installation of CHP units and the reconstruction of heating systems). The PHARE program could save 1.4-1.6 TWh by 2016. The Environment and Energy Operational Program (KEOP), which aims to reduce energy use in industrial buildings through subsidies for small and medium enterprises, could help save 1.9-2.2 TWh by 2016.

Since 2008, large energy consumers in the industrial sector have been obliged to employ energy managers and to deliver an energy consumption report, followed by an energy savings plan and implementation report. These two measures are expected to save 0.8-1.5 TWh by 2016. In 2008, voluntary agreements were launched in the energy-intensive sectors targeting a reduction in energy use, the application of more efficient technologies and the development of products with higher energy efficiency indicators.

In 2003, a feed-in tariff scheme for CHP installations was adopted, including industrial cogeneration facilities (not belonging to the district heating network) under 50 MW. Industrial companies that install CHP facilities or renewable systems can benefit from subsidies, as established in the Environment Protection and Infrastructure Operative Program (EIOP).

3.2. Energy consumption trends: declining energy consumption in industry

Energy consumption in industry was halved between 1990 and 2009. Industrial consumption dropped by 33 percent between 1990 and 1992 and has declined by 1.8 percent/year since then.

The share of natural gas in the energy consumption of the industrial sector has decreased steadily since 1990 (49 percent) and now stands at 36 percent. Electricity represents 25 percent of the energy consumption of industry, up from 18 percent in 1990. Biomass and coal consumption have increased over time, reaching 4 percent and 19 percent, respectively, in 2009. Oil represents just 6 percent, compared with 14 percent in 1990.

The share of energy-intensive industries in industrial energy consumption is around 60 percent and has been relatively stable since 1990. In 2008, steel, chemicals and non-metallic minerals each accounted for about 20 percent (18 percent, 19 percent and 20 percent, respectively). The share of paper is low at 5 percent.
3.3. Energy intensity trends: noticeable energy efficiency improvement

Between 1992 and 2008 industrial energy intensity decreased by 6 percent/year. That improvement was due to efficiency gains in the steel sector (-5.4 percent/year), but also to changes in the structure of industry (rising share of industrial branches with lower energy intensity). The increases in the specific energy consumption of other energy-intensive industries have limited the effect of these energy efficiency improvements.

Between 1992 and 2008 the energy intensity of the manufacturing industry (i.e., excluding construction and mining) fell substantially, by 7.7 percent/year. This improvement was due to efficiency gains in the industrial branches, but also to changes in the structure of the industrial value added: the share of the equipment sector - the branch with the lowest energy intensity - in the total value added of manufacturing increased by nearly 17 percentage points between 2000 and 2008. Structural changes explain about 40 percent of the overall reduction since 1992 and 30 percent since 2000.

The share of industrial CHP in the electricity consumption of Hungarian industry is far below the EU average (around 3 percent in 2009 compared with 17 percent in the EU) and has been decreasing since 1996.