The Netherlands
Energy efficiency report

Objectives:
- 51 TWh of end-use energy savings in 2016
- 2%/year of energy savings over 2011-2020

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<td>Primary intensity (EU=100)</td>
<td>106</td>
<td>-0.9%</td>
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<td>CO₂ intensity (EU=100)</td>
<td>107</td>
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<td>10</td>
<td>-0.6%</td>
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<td>44</td>
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<td>0.34</td>
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 ++ Among the best performing countries   + Above the EU average¹     - Below the EU average¹ -- Among the worst performing countries

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

1.1. Policies: 2% / year of energy savings by 2020

The Netherlands has adopted a National Energy Efficiency Action Plan 2008-2016 (NEEAP), which sets an energy savings target of 51.2 TWh (or 4.4 Mtoe) by 2016 to be achieved in buildings (41.8 TWh), transport (14 TWh), agriculture (13.9 TWh) and small industries (excluding sectors under ETS, 4.8 TWh). According to the second NEEAP, submitted in mid-2011, the country can expect to exceed this target by 45 percent.

The Clean and Efficient Program, launched in 2007, aims to improve energy efficiency by 2 percent/year over the period 2011-2020 and to reduce greenhouse gas emissions by 30 percent by 2020 compared with 1990.

To promote energy efficiency, an Energy Tax is levied on all electricity and natural gas consumption except households’ “basic energy needs”, which are exempted. Although the tax rate has been increasing steadily since 2004, its design favors large energy consumers since the tax rate decreases as consumption increases. This tax advantage was introduced in order to avoid an excessive burden on high electricity and gas consumers.

1.2. Energy consumption trends: industry driving per capita consumption

Consumption per capita (4.7 toe in 2011) is much higher than the EU average, mainly due to the large refining and chemical industries. Total energy consumption increased at the steady pace of 0.9 percent/year between 2000 and 2008. Since then it has decreased slightly, at an average pace of 0.2 percent/year.

Natural gas occupies a privileged position and meets 44 percent of the country’s energy needs. The market share of oil stands just below 39 percent and is increasing (35 percent in 1990). The use of coal decreased slightly, accounting for 10 percent of the energy mix in 2011. The share of biomass increased over the period and reached 5 percent in 2011. The contribution of nuclear electricity is stable at 1.4 percent.

![Figure 1: Energy consumption trends](source: Enerdata)

Industry (including non-energy uses) represented about 36 percent of total energy consumption while the power sector accounted for 11 percent in 2011.

The country’s electricity consumption per capita is over 20 percent higher than the EU average, at 6,800 kWh. Electricity consumption grew by 1.1 percent/year between 2000 and 2011, including a 4.5 percent drop in 2009 as a consequence of the economic downturn. The share of electricity in final energy consumption remained stable between 2000 and 2011, at 15 percent. Industry represented 40 percent of the country’s electricity consumption in 2011.
1.3. Energy efficiency trends: sluggish energy efficiency trends since 2000

Total energy consumption per unit of GDP (total energy intensity), measured at purchasing power parity, is slightly higher than the EU average (by 6 percent).

Total energy intensity decreased at a slower pace than in the EU as a whole: 0.9 percent/year compared with 1.6 percent/year for the EU between 2000 and 2011. Industry accounted for 25 percent of this reduction.
2. Power generation: large energy efficiency improvement since 2000

The efficiency of the power sector has increased significantly since 2000 and stood at 45 percent in 2011. That trend is mainly driven by the development of gas combined-cycle facilities.

![Figure 4: Efficiency of power generation and thermal power plants](source: Enerdata)

![Figure 5: Thermal electricity capacity, by technology](source: Enerdata)

The rate of transmission and distribution losses (T&D) in the Dutch grid is very low, at about half of the European average. It has decreased since 2008 as a consequence of the increase in CHP production and stood at 3.6 percent of total power generation in 2011.

![Figure 6: Electric of T&D losses](source: Enerdata)
3. Industry

3.1. Policies: long-term voluntary agreements to improve efficiency

In industry, the Long-Term Agreements and the Benchmarking Covenant played an important role in driving energy efficiency. The Benchmarking Covenant was signed with 90 industrial companies and stipulated that they had to be among the most efficient 10 percent of industries in the world by 2012. The Benchmarking Covenant ended in 2012 and was replaced by the third phase of the EU Emission Trading Scheme (EU ETS). However, the long-term agreements in the different industrial and agricultural sectors remain in force.

The Dutch Government has introduced a tax relief (Energy Investment Allowance) of 44 percent of the amount invested in energy-efficient equipment, up to a value of 113 million euros (140 million US dollars) in the year the investment was made. In addition, Dutch companies can claim tax deductions under the Environmental Investment Deduction scheme (MIA) and can make use of the accelerated depreciation tool provided under the Random Deductions for Environmental Investments scheme (Vamil).

3.2. Energy consumption trends: natural gas meets industrial energy needs

Industrial energy consumption increased by 1.6 percent/year between 1990 and 2005, but since then has decreased significantly, at the average pace of 2 percent/year.

![Figure 7: Trends in industrial energy consumption](image)

Source: Enerdata

Natural gas remains the largest energy source in industry, despite the fact that its market share decreased from 41 percent in 2000 to 33 percent in 2011. The use of electricity has been relatively stable since 2000 and its share stood at about 24 percent in 2011. The share of coal has increased slightly since 2000, from 11 percent to 13 percent in 2011, in spite of the tax applied on coal (€14/t in 2013). The market share of heat in industrial consumption has decreased since 2005 (14 percent) and stood at 9 percent in 2011. The share of oil has been increasing steadily since 2000 and accounted for 20 percent of overall consumption in 2011, compared with 10 percent in 2000. The share of biomass remains around 1 percent.

Energy-intensive industries account for 68 percent of industrial energy consumption. The chemical industry is the largest sector, with 42 percent of overall consumption. The market share of the steel industry has remained steady since 2000, at around 15 percent. The paper and non-metallic minerals industries represent 5 percent each of industrial energy consumption.
3.3. Energy intensity trends: industrial energy intensity trends driven by the chemical industry

Industrial energy intensity (consumption per unit of industrial value added) decreased by 0.6 percent/year between 2000 and 2010. The largest reduction was seen in the chemical industry, which saw its energy intensity fall by more than 2.9 percent/year. The specific energy consumption per ton of steel and paper decreased by 1.5 and 1.9 percent/year, respectively. Conversely, energy consumption per ton in the cement industry has increased by 0.3 percent/year.
The share of combined heat and power generation in the Netherlands is high (53 percent of industrial electricity consumption in 2011) and stands far above the EU average (19 percent). The share of CHP has increased noticeably since 2006, along with the development of the use of heat and biomass in the sector's consumption.

![Figure 2: Share of industrial CHP]

Source: Enerdata

When calculated at constant structure, the energy intensity of the manufacturing industry (ie excluding mining and construction) decreased by 3.4 percent/year between 2000 and 2010, compared with the slower pace of 2.3 percent/year for the actual value. Changes in the structure of industrial value added, namely a growing share of chemicals, limited the reduction in the energy intensity of manufacturing.

![Figure 3: Trends in the energy intensity of manufacturing and structural effect]

Source: Enerdata, Odyssee