The Netherlands
Energy efficiency report

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

Overview 2010 2000-2010 (%/year)

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2000-2010 (%/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary intensity (EU=100)</td>
<td>110</td>
<td>-0.1%</td>
</tr>
<tr>
<td>CO₂ intensity (EU=100)</td>
<td>112</td>
<td>-0.8%</td>
</tr>
<tr>
<td>CO₂ emissions per capita (in tCO₂/cap)</td>
<td>11</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

Power generation

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2000-2010 (%/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency of thermal power plants (in %)</td>
<td>43</td>
<td>0.7%</td>
</tr>
<tr>
<td>Rate of electricity T&amp;D losses (in %)</td>
<td>4</td>
<td>0.2%</td>
</tr>
<tr>
<td>CO₂ emissions per kWh generated (in gCO₂/kWh)</td>
<td>365</td>
<td>-1.0%</td>
</tr>
</tbody>
</table>

Industry

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2000-2010 (%/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy intensity (EU=100)</td>
<td>120</td>
<td>-1.9%</td>
</tr>
<tr>
<td>Share of industrial CHP in industrial consumption (in %)</td>
<td>51</td>
<td>6.1%</td>
</tr>
<tr>
<td>Unit consumption of steel (in toe/t)</td>
<td>0.38</td>
<td>-0.4%</td>
</tr>
</tbody>
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++ Among best countries  + Better than the EU average  -- Below the EU average  --Among countries with the lowest performances

Latest update: March 2012

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, transport and small industries (excluding sectors under ETS). The second NEEAP, submitted in mid-2011, stated that 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. The program uses different measures to achieve its objectives, including energy efficiency standards.

1.2. Energy consumption trends: industry driving per capita consumption

Consumption per capita (5.1 toe in 2010) is much higher than the EU average, mainly due to the large refining and chemical industries. Total energy consumption increased by 1.2 percent/year between 1990 and 2010. It decreased slightly in 2008 (-0.7 percent) and more significantly in 2009 (-2.2 percent) as a result of the economic slowdown, but in 2010 stood well above its pre-crisis level.

Natural gas occupies a privileged position and meets 47 percent of the country’s energy needs. The market share of oil stands just below 38 percent and is increasing (35 percent in 1990). The use of coal decreased slightly, accounting for 9 percent of the primary energy mix in 2010. The share of biomass increased over the period and reached 4 percent in 2010. Nuclear electricity accounted for around 1.5 percent in 2010 (2.6 percent in 2008).

Industry (including non-energy uses) is the largest consuming sector, with about 45 percent of final energy consumption.

The country’s electricity consumption per capita is over 20 percent higher than the EU average, at 6,700 kWh/capita. The share of electricity in energy consumption increased slightly between 1990 and 2010, from 12 percent to 14 percent. Until 2008 electricity consumption grew steadily, by more than 2 percent/year, but in 2009 it fell by 5.5 percent. In 2010, it resumed its long-term trend and grew by 1.3 percent/year. Industry represents 35 percent of the country’s electricity consumption.
1.3. Energy efficiency trends: sluggish energy efficiency trends since 2000

Total energy consumption per unit of GDP (primary energy intensity), measured at purchasing power parity, is only slightly higher than the EU average (by 8.5 percent).

Primary energy intensity decreased at a slower pace than in the EU as a whole: 1 percent/year compared with 1.6 percent/year for the EU between 1990 and 2010. Industry and the power sector each contributed to about 20 percent of this drop. Between the period 2000 and 2010, energy intensity gains slowed down dramatically, with average energy intensity reductions of just 0.1 percent per year.
2. Power generation: energy efficiency soared during the 2000s

The efficiency of the power sector has increased significantly since 2002 and in 2010 stood at 43 percent. That trend is mainly driven by the development of gas-combined cycle facilities.

The rate of transmission and distribution losses (T&D) in the Dutch grid has remained stable over time, at 4 percent of the distributed volumes.
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, as did the emission trading scheme (ETS). The Benchmarking Covenant was signed with 90 industrial companies and stipulated that they have to be among the most efficient 10 percent of industries in the world by 2012. Although the Benchmarking Covenant has been abandoned, the long-term agreements in the different industrial and agricultural sectors remain in force. An Energy Tax is levied on electricity and natural gas to promote energy efficiency. Since 2004, the level of the tax has depended on the energy consumption of a customer: the higher the consumption, the lower the tax levied. This tax advantage was introduced in order to avoid an excessive burden on high electricity and gas consumers.

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 decreased significantly in 2008 and 2009 following the economic downturn (by 7.5 percent and 6 percent, respectively). It recovered slowly in 2010.

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

Natural gas remains the largest energy source in industry, despite the fact that its market share decreased from 50 percent in 1990 to about 40 percent in 2010. The use of electricity has risen slightly since 1990 and its share stood at about 25 percent in 2010. The share of coal fell slightly, from 17 percent to 15 percent in 2007 (and even 12 percent in 2010 following the industrial recession). The market share of heat in industrial consumption surged until 2005 following a greater distribution of cogeneration. It stood at 9 percent in 2010. Oil accounts for 16 percent of overall consumption while biomass is developing, although its share remains around 1 percent.

Energy-intensive industries account for 70 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 decreased slightly since 1990, and was 18 percent in 2010. The paper and non-metallic minerals industries represent 5 percent and 4 percent of the sector’s consumption, respectively.
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 0.8 percent/year between 1990 and 2009, with an acceleration since 2000. Over this period the largest drop was seen in the chemical industry, ie the largest consuming sector, which saw its energy intensity fall by more than 2.5 percent/year. The decrease in the specific energy consumption of the steel industry was low, while energy consumption per ton of paper and per ton of cement decreased by around 1 percent/year.

The share of combined heat and power generation in the Netherlands is high (51 percent in 2010) and stands far above the EU average (18 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.
When calculated at constant structure, the energy intensity of the manufacturing industry (i.e., excluding mining and construction) decreased by 2.4 percent/year between 1991 and 2009, compared with the slower pace of 2.2 percent/year for the actual value. Changes in the structure of the industrial value added, namely a growing share of chemicals, limited the reduction in the energy intensity of manufacturing. That effect was even more pronounced over the period 2000-2009.