Objectives:
- 4.7 TWh of end-user energy savings by 2016
- 35% share of cogeneration in electricity production by 2020

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

Latest update: January 2011
1. Overview

1.1. Policies: 4.7 TWh of energy savings by 2016
An Energy Efficiency Action Plan was adopted in July 2007 and revised in December 2008. It sets a final energy consumption savings target of 4.7 TWh (ie, 404 ktoe) between 2008 and 2016, 37 percent of which is to be achieved in the household sector, 10 percent in transport, 8 percent in industry, 5 percent in the commercial-public sector and 40 percent through cross-sectoral measures. Those cross-sectoral measures include building regulations, voluntary agreements with energy companies on energy efficiency (individual meters in households and industry), tax rebates and information campaigns.

The Lithuanian Housing Strategy (2004) aims to renovate and modernize the existing buildings to reduce thermal energy consumption per dwelling by up to 30 percent by 2020. The modernization program is financially supported by the State (up to 50 percent of the investment) and could save up to 1.7 TWh/year.


1.2. Energy consumption trends: low consumption per capita compared with the EU
Primary consumption per capita is 23 percent lower than the EU average, at about 2.5 toe/cap (2009). After a sharp decrease between 1995 and 2000 (of around 4 percent/year), total energy consumption (primary consumption) grew by 3.3 percent/year until 2008. In 2009, the country was hit by the global economic crisis and primary consumption fell by around 9 percent.

Figure 1: Total and final energy consumption trends

In 2009 nuclear electricity covered 31 percent of energy consumption (33 percent in 1995), followed by oil (29 percent compared with 35 percent in 1995) and gas (26 percent, compared with 23 percent in 1995). The shares of coal and heat are low (2 percent each in 2009). The share of biomass doubled between 1995 and 2009, reaching 10 percent.

Industry accounts for 31 percent of end-use energy consumption (final consumption). The share of transport grew rapidly, from 20 percent in 1995 to 28 percent in 2009, owing to the sharp increase in the sector’s energy consumption. Households and services accounted for just 41 percent in 2009, down from 50 percent in 1995.

Figure 2: Distribution of final energy consumption by sector

At 2,800 kWh, electricity consumption per capita in Lithuania is 50 percent lower than the EU average. The share of electricity in final consumption grew slightly between 1995 and 2009, from 11 percent to 15 percent.

Electricity consumption remained relatively stable between 1995 and 2000, and then grew by 4.6 percent/year until 2008. In 2009 it fell by 7.5 percent, due to the sharp drop in electricity consumption in the industrial sector. Industry accounts for 36 percent of electricity consumption in Lithuania, down from 49 percent in 1995.
1.3. Energy efficiency and CO2 trends: significant efficiency gains since 1995

Between 1995 and 2009 primary energy intensity (total energy consumption per unit of GDP) fell by 4.5 percent/year). That large improvement is linked to a drop in industrial energy intensity (-7.1 percent/year between 1995 and 2008). However, primary energy intensity in Lithuania, measured at purchasing power parity, remains 40 percent above the EU average.

CO2 intensity (CO2 emissions per unit of GDP) fell slightly faster than energy intensity over the 1995-2009 period (by 5.4 percent/year), with fuel substitutions contributing to that reduction: the share of coal in energy consumption dropped by 6 percentage points between 1995 and 2009.

2. Power generation
2.1. Policies: 21% share of renewables in electricity consumption by 2020

Lithuania’s National Renewable Energy Action Plan (2008) aims to increase the share of renewables in electricity consumption to 21 percent by 2020. Lithuania has introduced purchase promotion procedures (planned target volumes for electricity from renewable sources). To reach the 21 percent target, the national Strategy for the Development of Renewable Energy Sources established annual production volumes (installed capacity and total generation), with the aim of reaching 875 MW and nearly 3 TWh of renewable generation by 2020. Moreover, feed-in tariffs (guaranteed prices) were introduced in 2002 and discounts for network connections of renewable energy power plants in 2004.

The Lithuanian Rural Development Program for 2007-2013 includes investment subsidies (40-65 percent of the project cost) for the installation of small-scale renewable power plants. The Lithuanian Environmental Investment Fund also provides funds for projects related to renewable electricity production.

The goal under the National Energy Efficiency Program for 2006-2010 was to increase the share of cogeneration to 20 percent of electricity generation by 2010. That share could later be increased to 35 percent of electricity generation by 2020. According to the National Energy Strategy (2007), the share of CHP should be increased to 35 percent of the energy balance by 2025. Further measures, including the taxation of fossil fuels for heat and electricity production, are under consideration. Lithuania also aims to improve generation efficiency. The Law on Energy (2002) includes energy sector audits.

2.2. Power generation trends by source: over 70% of nuclear power in the electricity mix

Lithuania used to have the world’s second largest share of nuclear in power production. In 1995 it was 85 percent of total power generated and declined to 71 percent by 2009, due to the closure of the two units at the country’s nuclear power plant, in December 2004 and December 2009, respectively. Gas-fired generation grew from 2 percent to 13 percent in 2009. The share of oil fell to 6 percent in 2009, to the benefit of renewables: hydroelectricity now accounts for 7 percent (5 percent in 1995), biomass for 2 percent and wind for 1 percent.
2.3. Efficiency of the power sector: low efficiency rate and CO₂ emissions

The average efficiency of power generation is low (33 percent in 2009), due to the dominant share of nuclear power in the electricity mix. The efficiency rate of thermal power plants is also low (24 percent, compared with the EU average of 39 percent), although it is increasing following the commissioning of gas-fired facilities.

The rate of T&D losses is high (nearly 3 percentage points above the EU average), but is decreasing rapidly: whereas it stood at nearly 22 percent in 1995, it dropped to 9.4 percent in 2009.

The rate of CO₂ emissions per kWh produced is low (108 gCO₂/kWh, ie, about one third of the EU average). This performance is linked to the very high share of CO₂-free generation (above 80 percent in 2009).
3. Industry

3.1. Policies: promotion of CHP

The Ministry of Energy plans to establish voluntary agreements with industrial companies, based on energy consumption audits financed by the State, committing companies to introduce efficiency measures. These voluntary agreements would make it possible to save 370 GWh by 2020. Energy consumption reporting and energy managers in industry are mandatory.

Lithuania aims to develop small-scale cogeneration. In the framework of the 2007-2013 EU structural funds, energy audits can be subsidized and industrial companies can benefit from investment subsidies (up to 50 percent) for the implementation of CHP facilities. In 2009 tax exemptions were introduced for industrial firms that had installed CHP facilities rated less than 35 MW.

3.2. Energy consumption trends: noticeable decrease since 2007

Industrial energy consumption decreased by 5.1 percent/year between 1995 and 2000, but grew by 4.5 percent/year until 2007. It has fallen by 22 percent since then, as a result of the severe impact of the global economic crisis on Lithuania.

The structure of industrial energy consumption changed dramatically between 1995 and 2008. Oil, which accounted for 34 percent of total consumption in 1995, accounted for just 7 percent in 2009. That decline was due to the rising share of natural gas, which is now the most commonly consumed fuel in industry (31 percent compared with 21 percent in 1995), followed by electricity (25 percent compared with 23 percent in 1995) and heat (21 percent compared with 18 percent in 1995). The shares of coal and biomass also increased, each increasing from 2 percent to 8 percent.

Energy-intensive industries account for half of total industrial energy consumption, compared with 46 percent in 1995. The chemical industry is the largest consumer with 30 percent of the total (15 percent in 1995), followed by the non-metallic minerals industry (16 percent compared with 27 percent in 1995). The share of the pulp and paper industry is smaller, and accounts for just 3 percent of industrial energy consumption.
3.3. Energy intensity trends: sharp drop
Industrial energy intensity decreased at the rapid pace of 6.7 percent/year between 2000 and 2008, in line with the energy intensity trends in the two largest industrial branches, ie, chemicals and non-metallic minerals. The energy intensity of the chemical sector fell by 6.5 percent/year, while the unit consumption of non-metallic minerals (energy consumed per ton produced) dropped by 7.4 percent/year.

The share of industrial CHP in industrial electricity consumption started to increase in 2004 and currently stands at about 10 percent (compared with 17 percent in the EU).

Figure 11: Energy consumption of industry, by source

Figure 12: Energy consumption of industry, by branch

Figure 13: Trends in the energy intensity of industrial branches

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The energy intensity of the manufacturing industry (i.e., excluding mining and construction) decreased by 4.8 percent/year between 2000 and 2007. That reduction is linked to efficiency gains achieved in the industrial branches. However, structural changes played their part in limiting the decrease in industrial energy intensity: the share of non-energy intensive industries (such as food or textiles) in the gross value added decreased while that of the chemical sector increased.

Figure 15: Trend in energy intensity of manufacturing and structural effect

Source: Enerdata