

General overview for investors in Hungary's energy market



WHY INVEST?

- Competitive investment environment
- Liberalized energy market
- Competitive energy prices
- Favorable implementation costs
- Government commitment in the areas of sustainability and energy efficiency
- Ambitious renewable target (13% by 2020) – active area, regarding regulation, state support, technological innovations and investment opportunity
- Feed-in-tariff system for renewable energy sources
- Availability of state and European Union funds
- Implementation of single energy market currently in progress in the EU



GENERAL OVERVIEW

The liberalization of the Hungarian electricity and natural gas market was completed in 2008. Today the free choice of supplier applies for every consumer, although the prices for universal suppliers are still regulated.

As far as European Union legislation is concerned, the application of the 3rd Energy Package has been carried out and the market competition is constantly growing.

The main market regulatory body is the Hungarian Energy and Public Utility Regulatory Authority (MEKH), with the main task of license issue and ratification of grid fees for transmission and distribution system operators.

The major part of Hungary's energy supply is imported, and it will remain so for a long time. In 2014, 35% of sources behind domestic energy demand were supplied from domestic production and the remaining 65% from import.

According to 2010-2020 forecasts, overall energy consumption in the next years will increase. In comparison to the previous year, in 2015 the total consumption increased by 4.9%, with natural gas growing by 7% and oil by 8%.

Natural gas plays the most important role in Hungary's energy consumption and accounts for 37.8%. The power generation mix is dominated by nuclear energy (50%), gas-fired generation (31%) and solid fuels (16.7%).

Renewable energy sources (RES) play an increasingly important role in the consumption mix. The share of RES in the energy mix rose from 2.2% in 2004 to 9.5% in 2014, the main contributor being biomass based power generation. In addition, geothermal generation is forecasted to expand in Hungary and increase in the coming years.

Being a country with seven neighbors, regional co-operation is a vital element of Hungary's energy market and security policy, aiming at which Hungary is actively developing the regional electricity market, including new interconnectors and market coupling.

The declared aim of Hungary is –as presented in the National Energy Strategy- to proceed towards a sustainable, low-carbon, energetically efficient economy. The main goal of the Energy Strategy is the decrease of energy dependency by energy efficiency, high ratio of renewable energy sources, nuclear energy and joining to the European energy infrastructure.

As far as future plans are concerned, there is an expected need for additional production capacity over the next decades, including a 1500 MW renewable based capacity, with special focus on biomass and wind resources.

Additional EU funds are allocated in the 2014- 2020 period within the framework of the Széchenyi 2020 program aligning to the EU 2020 Strategy. Allocated funds for the energy sector amount up to nearly HUF 755 Billion.

A national public utility company (ENKSZ) has been launched in spring 2015, with the task of carrying out unified and central control of the national public utility system, development of national public utility services, and long-term feasible operation of it in the natural gas, electricity and central heating sectors. By end 2016 ENKSZ will be supplying nearly 2.7 Million customers.

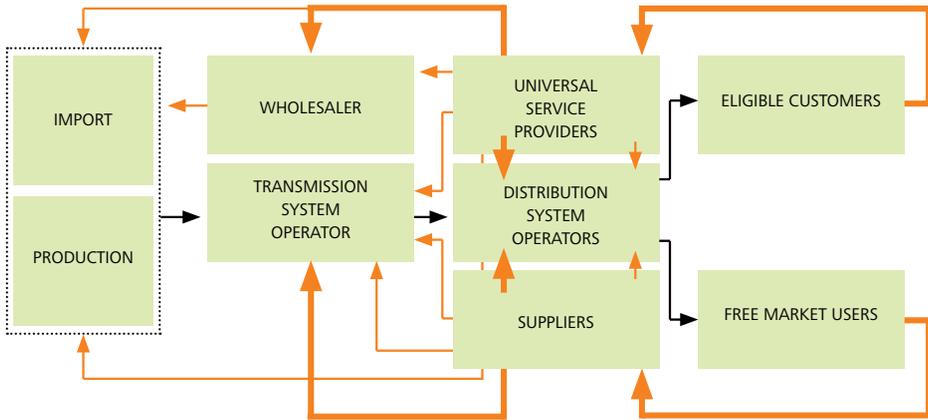
In recent years the Government has introduced a policy aiming at decreasing household energy expenses, and has made energy companies on the natural gas and electricity market decrease their prices by 25%.

In compliance with the relevant legislation, 25% of the income arising within the EU's emission trading system (ETS) provides resources for the green economy financing system (ZFR).





HUNGARIAN ELECTRICITY MARKET MODEL

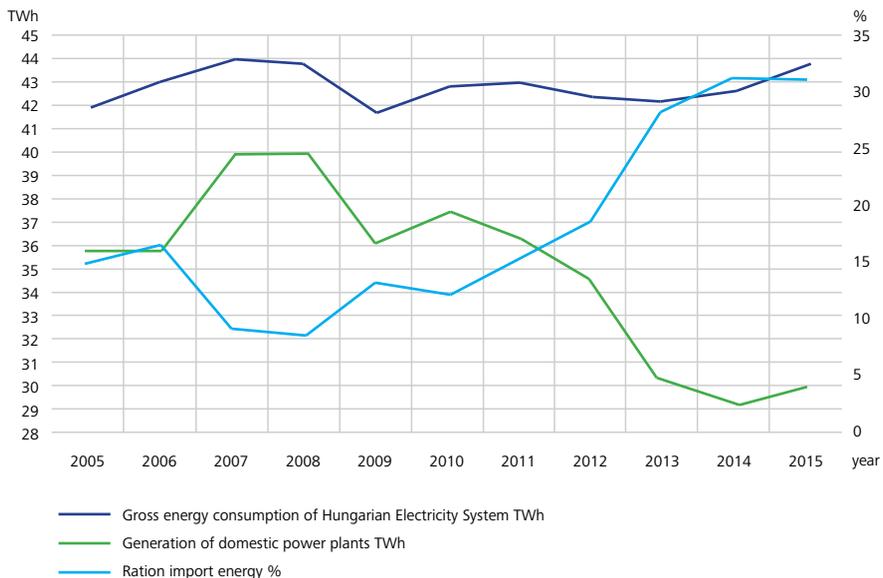


→ Physical flow → Main financial flow

Hungary's gross electricity generation in 2014 was in total 30.3 TWh, with the gross consumption reaching 35 TWh. Main import partners are Slovakia and Ukraine; main export partner is Croatia.



TOTAL GROSS ELECTRICITY CONSUMPTION, GENERATION OF DOMESTIC POWER PLANTS AND RATIO OF IMPORT ENERGY 2005-2015



(Source: MAVIR VER 2015, Data of the Hungarian Electricity System)

The resource side of the Hungarian electricity system is still dominated by the Paks Nuclear Power Plant, accounting for 50.7% of the total domestic production.

The installed total capacity of the Hungarian power stations is beyond 9.000 MW. Electricity production capacity is and will be continuously decreasing mainly due to the old age of power plants. The dedicated goal of the Government is to expand domestic production capacity.

Development and operation of the Hungarian transmission system is carried out by MAVIR Hungarian Independent Transmission Operator Company Ltd.

At present 4 so called "universal" electricity suppliers cover the whole of Hungary. According to Government plans, the national public utility company (ENKSZ) will step by step take over the customers on the public retail market.

There are nearly 170 certified players on the supply side, out of which 30-40 are actively present on the market.

Power exchange

The HUPX Hungarian Power Exchange Company Ltd. started its operation in 2009, and has achieved significant success next to a constantly improving liquidity. The continuous development of the HUPX day-ahead market has increased the interest towards organized electricity trading in Hungary, which is also shown in the significant growth of the number of admitted members. HUPX is also offering physically fulfilled futures trading. In addition to the settlement of transactions concluded on the exchange, OTC transactions can be registered as well. In November 2014 the CZ-SK-HU-RO Market Coupling was successfully launched, integrating the Czech, Slovak, Hungarian and Romanian day-ahead electricity markets and replacing CZ-SK-HU Market Coupling.

In December 2015 the traded electricity volume reached 1 237.5 GWh on the day-ahead market, which is double compared to the same period in 2014.

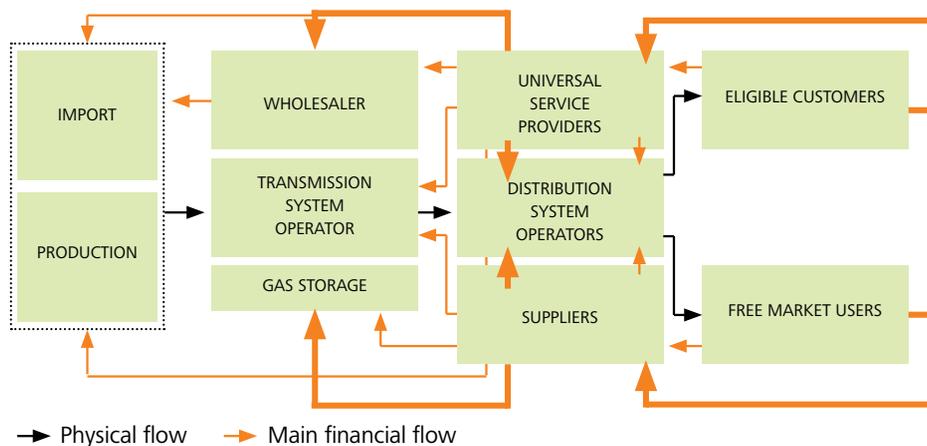
Nuclear

The first Unit of the sole Hungarian Nuclear Power Plant was connected to the grid in 1982, and since 1987 all 4 Units with the total capacity of 2000 MW have been in operation.

In January 2014 a Hungarian-Russian agreement was signed on the peaceful use of nuclear energy and the extension of the Paks Nuclear Power Plant (today 2000 MW capacity) with 2 new additional blocks (in total 2400 MW), the first expected to put into operation in 2023. The preparation is under way, with plans to start construction works in 2018.



○ HUNGARIAN NATURAL GAS MARKET MODEL



Hungary's natural gas consumption in 2015 increased by 6.6%. As a result of the fact that a major part of the natural gas is used for heating purposes, the consumption is strongly seasonal: in Hungary over 70% of annual consumption takes place during the heating season.

The majority of imported gas resources comes from Russia. During recent years, the Russian-Ukrainian gas debate has repeatedly given trouble in the gas supply of Hungary and the EU, turning the focus on the high risks of strong dependency on energy import. Thus, energy security has become a priority issue within the country and the EU. Following the supply disruption in 2006, the government has taken several important steps to manage import dependency related risks. It has enhanced storage capacity and the strategic gas storage was completed in 2010 (capacity: 1.2 billion cubic meters (bcm)), serving to improve security of supply in Hungary and the region.

The Hungarian natural gas grid is 5.783 km long, operated by FGSZ Natural Gas Transmission Ltd., a company owned by MOL Nyrt. (Hungarian Oil and Gas Company).

Hungary has direct connections with 5 countries, with an additional pipeline under construction towards Slovakia. The latter will serve source diversification via the North-South direction pipeline grid.

The operation of the natural gas distribution system is carried out by more distribution companies, but with the national public utility company (ENKSZ) dominating the market by the end of 2016. MOL is Hungary's national oil and gas company, and its activities range from exploration-production to refining and distribution.

Gas exchange

CEEGEX Central Eastern European Gas Exchange Company Ltd. began its operation in January 2013. In summer 2014 CEEGEX reached a record volume with 104.160 MWh dealt in July. Later, in October a web-based platform was launched to assist over-the-counter (OTC) trade between counterparties.

○ RENEWABLE ENERGY MARKET (RES) AND GREEN INDUSTRIES

Hungary has excellent comparative assets in certain areas of green energy sources.

Considering Hungary's geographical conditions, of the renewable energy sources, energy generation from biogenic sources (forestry and agricultural biomass, biogas and biofuels), water, geothermal energy and, on a long term, solar energy, are the most important. Hungary's renewable generation at present is dominated by biomass.

The number and installed capacity of household small power plants has significantly grown in the past few years increasing from 0.51 MW (2008) to exceeding 128 MW by the end of 2015².

Hungary's 2020 RES target is 13%. However, in the National Renewable Action Plan, the government has set a target of 14.65%.

In Hungary, the Government traditionally supports renewable energy production with a Feed-in Tariff System and guaranteed price.

In 2014, considerable changes were made in the way of cost allocation of feed-in tariffs, with the finalization of the new system still under way.

Accordingly, Hungary has turned its focus toward green industries in the recent years; environment protection and environment conscious technologies, waste and sewage utilization and management have been areas of special attention and support.

Biofuel

Hungary has a large potential in biofuel production, supported by agricultural products. On the basis of an estimate by experts, more than 10% of the estimated consumption for 2020 can be fulfilled just from first generation biofuels, while at the same time ensuring the fulfilment of food and feed provision objectives. With the emergence of second generation biofuels, through the expansion of the scope of raw materials, this volume can be increased even further depending on the seasonal variations in the amounts of agricultural produce.

At present in Hungary there are two operating bioethanol producers, namely the Pannónia Ethanol Zrt. plant (year of opening: 2012), and the Hungrana Zrt plant. Both are operating profitably with their product exported to the German market.

Biomass and biogas

Hungary possesses excellent agro-ecological conditions for a competitive production of biomass. Hungarian agriculture is capable of sustainably producing biomass in excess of food and feed demands, and at the same time there is a significant biogas production potential. The theoretical potential of energy sources of biological origin (bioenergy) could exceed, by as much as 20% of the energy source demand estimated for 2020, and bioenergy based electricity production can be planned well in advance, and is also controllable. Therefore, the limitations of the production of bioenergy mainly lie in competitiveness. Bioenergy can primarily play a more important part in fulfilling local heating demands in the future, but there is also an intent to place emphasis on the spread of small and medium-capacity combined electricity and heat generating systems, according to Hungary's Renewable Energy Utilization Action Plan.

Solar

There is notable solar potential in Hungary, with nearly 2100 sunlit hours yearly, reaching in some summer hot periods 1000 W/m² value.

Hungary's biggest photovoltaic power plant, with 16 MW capacity, opened in October 2015, on the premises of and owned by Mátrai Power Plant, the largest coal-fired power plant in the country. Apart from this, a little amount of solar capacity has been created, most through solar collectors.

State and Union-level support plays a central role in the spread of solar energy systems.

Hydro

Hungary has traditionally utilized hydro-energy up to the last century, and turned its attention back towards it again during the 1950s. Actively operating hydro power plants today in total represent a 50 MW production capacity, capable of generating around 200 GWh energy annually.

Geothermal

Hungary has excellent geothermal conditions, outstanding natural resources of thermal water; and there are huge thermal wells both on Great Plain and Little Plain. Hungary's geothermal gradient is also higher than the world average. The heat content of thermal water is also outstanding. Its temperature exceeds 120-150 °C in many areas, whereby the same amount of heat can be gained considerably cheaper than from natural gas.

Wind

The climate in Hungary is humid continental, and the ruling winds mainly blow from the rim of the basin towards the central parts. The most optimal regions for the exploitation of wind energy can mainly be found in the country's North, North-West, and some South-East areas.

The connection of wind energy to the Hungarian electricity system began in 2006, when the Hungarian Energy Office opened a 330 MW capacity quota for wind energy. This amount has not been extended since, which means that today, a wind turbine without a quota is not able to join the feed-in tariff system, but is entitled to sell the produced electricity on the market.

Today there are over 170 wind turbines in the country, with growing wind energy generated electricity as a tendency. As far as wind is concerned, the National Renewable Action Plan foresees around 750 MW built in capacity and 1500 GWh yearly electricity generation until 2020.

○ SUCCESS STORIES FROM THE ENERGY SECTOR

16 MW Photovoltaic power plant

Matrai Power Plant as the largest coal-fired power plant in Hungary, has opened the way to the innovative connection of traditional and renewable energy generation. The new power generating facility has been developed by the majority owner of the Matrai Power Plant, German energy company RWE. The costs of the power plant reached EUR 20 Million, nearly half of which is covered from development tax related allowance.

ALTEO Group

The company was established in 2008, defining energy generation as its main activity. In the following year ALTEO, in possession of license from Hungarian Energy Office launched –energy trading activity that produced outstanding sales revenues even in the first year and then continuously developed increasing the base of customers and the amount of electric energy sold. ALTEO group currently owns 11 power plants with a total of 36,5 MWe nominal installed electric generating capacity, and 237 MWth nominal installed heat generating capacity. In October 2010, ALTEO shares were launched on the Budapest Stock Exchange. In June 2011, the Hungarian Financial Supervisory Authority approved ALTEO's bond program with a total nominal value of two billion HUF.

