Introduction to the Hungarian energy market

WHY INVEST IN THE HUNGARIAN GREEN INDUSTRY?

• Competitive investment environment
• Competitive energy prices
• Favourable implementation costs
• Government commitment in the areas of sustainability and energy efficiency
• Significant governmental investment plans, continuously developing environment
• Ambitious renewable target (13% by 2020) – active area, regarding regulations, state support, technological innovations and investment opportunities
• Advancing feed-in-tariff as well as market “green” and “brown” premium (tendering system) for renewable energy sources
• Availability of state and European Union funds
• Implementation of single energy market currently in progress in the EU
3rd Energy Package has been carried out
The liberalization of the Hungarian electricity and natural gas market was completed in 2008. Today, the free choice of energy supplier applies for every consumer, although the prices of universal suppliers are still regulated. As far as European Union legislation is concerned, the application of the 3rd Energy Package has been carried out. The new EU network code rules are under implementation.

High energy import dependency
Most of Hungary’s energy is imported, and this will remain the case for a long time. In 2017 1121 PJ energy was imported, which was twice as much as the total primary energy production (462 PJ) in the same year. According to relevant forecasts overall energy consumption in next few years will continue to increase.

Hydrocarbon dominated energy mix
Natural gas and oil products play the most important role in Hungary’s energy consumption and accounted for 60.2% in 2017.

High RES potential
Renewable energy sources (RES) play an increasingly important role in the consumption mix. The share of RES in the total gross energy consumption was 14.2% in 2016. The main contributor being biomass based power generation. In addition, geothermal generation is forecast to expand in Hungary in the coming years.
ELECTRICITY MARKET

Stable network infrastructure

Developments in the stable network infrastructure, and extension of the international connections (especially towards Slovenia and Slovakia) are in progress. Development and operation of the Hungarian transmission system is carried out by MAVIR Hungarian Independent Transmission Operator Company Ltd.

Good regional cooperation (Czech, Slovak, Hungarian and Romanian day-ahead electricity markets integrated and additional ongoing market-integration measures are in progress).

Decreasing installed capacity

The installed total capacity of the power stations in Hungary is about 8.500 MW. Electricity production capacity is continuously decreasing mainly due to the power plants being antiquated. The express goal of the Government is to expand domestic production capacity. Hungary’s gross electricity generation in 2017 was 32.2 TWh in total, with the gross consumption coming to 45.0 TWh. In 2017 the import ratio was 28.58%. The main import partners are Slovakia, Austria and Ukraine; the main export partner is Croatia (north – south direction flow).

TOTAL GROSS ELECTRICITY CONSUMPTION, GENERATION OF DOMESTIC POWER PLANTS AND RATIO OF IMPORT ENERGY 2006-2016

Source: MAVIR VER 2016, Data of the Hungarian Electricity System
High market concentration
The production and wholesale market concentration is relatively high, and incumbent players such as MVM, E.ON, RWE and NKM (national public utility companies) dominate the market. The biggest transactions in 2007: MVM acquired 50% of NKM Ltd.; and NKM Ltd. acquired EDF DÉMÁSZ Ltd. (DSO).

Important role of nuclear energy
The production side of the Hungarian electricity system is still dominated by the Paks Nuclear Power Plant, accounting for more than 50% of the total domestic production. The Paks II Nuclear Power plant with 2,400 MW installed capacity is in the preparation phase. The plant has already received the site permission and the environmental permit. Preparation of the site establishment application is in progress. According to expectations, construction of the two new blocks can start at the beginning of 2020.

Price regulated residential sector
The residential sector is under price regulation, and just a small number of households enter the competitive market. NKM Ltd. is the only player who has a universal service license for the whole country.

Competitive supply market
There are more than 150 certified suppliers on the market, out of which 30-40 are presently active.

The Hungarian Power Exchange (HUPX) is an advanced power exchange with a continuously growing traded volume (HUPX - physical futures, day ahead, and intraday market). Market integration is continuing, Transmission System Operators and Electricity Market Operators – also representing Hungary - established a Local Implementation Project (LIP) to realize the coupling of intraday electricity markets by introducing implicit allocation of cross-border transmission intraday capacities on the Czech-German, Czech-Austrian, Austrian-Hungarian, Hungarian-Romanian and Hungarian-Croatian borders. Based on the initial project timeline, the LIP parties intend to go-live in Q4 2018.

The first Hungarian financial energy exchange (HUDEX) was successfully launched on 3 January 2018 and started to operate smoothly with 24 members.
NATURAL GAS MARKET

Decreasing consumption

Hungary’s annual natural gas consumption has been gradually declining in recent years; it was 12.6 billion m³ in 2010, but in 2017 it dropped to 10.3 billion m³ (357 PJ). Because of the fact that a major part of natural gas is used for heating purposes, consumption is highly seasonal. The primary reason was the reduction of electricity generation from natural gas and the decrease in residential consumption. Another reason is the fact that energy-efficient solutions (such as insulation) are becoming more wide-spread and heating periods are becoming shorter and shorter due to climate change. Energy security and diversification of sources has become a priority issue within the country as well as in the EU.

High dependency on imports

In recent years, 20-25% of the Hungarian natural gas consumption was secured from domestic production (87 PJ in 2017) and the rest was imports (463 PJ in 2017) from Ukraine and Austria.

Available grid and storage capacity

The Hungarian natural gas system is well-developed and modern by comparison with other European systems (the system has been built up during the last 30 years). By taking the current consumption trends into account, domestic gas supply and the storage system is significantly over-sized, thus there are available capacities. The Hungarian natural gas grid is 5,874 km long, operated by FGSZ Natural Gas Transmission Ltd. (MOL Group) and MGT Ltd. (MVM Group). Hungary has 6 interconnection points, and by regional comparison high storage capacities (6.330 Mm³). Furthermore, Hungary has 5 underground gas storage facilities operated by Hungarian Gas Storage Ltd. (in Zsana, Kardoskút, Pusztaederics, and Hajdúszoboszló) and MMBF Natural Gas Storage Ltd. (in Szőreg) with a total 5.630 million Mm³ annual working gas storage capacity.

Price regulated residential sector

The residential sector is under price regulation, and just a small number of households enter the competitive market. In the liberalized market and under universal service the total amount of gas sold was 9.033 Mm³ in 2017. In 2017 NKM Ltd. acquired FŐGÁZ Ltd. (DSO) and has a universal service license for the whole country. From 11 January 2018 Égáz-Dégáz Földgázelosztó Ltd. has been operating as a subsidiary of NKM Ltd.

Developing trading and retail market

There are numerous competitors on the wholesale market and just 3 companies had more than 5% of the market share. The liquidity of the Hungarian gas exchange (CEEGEX) is growing steadily.
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), geothermal energy and, in a long term, solar energy, as well as water are the most important. Hungary’s renewable generation is presently 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) and exceeding 200 MW by the end of 2017. Hungary’s 2020 RES target is 13%. However, in the National Renewable Action Plan, the government has set a target of 14.65%.

Renewable energy support scheme

In Hungary, the Government traditionally supports renewable electricity production with different measures. Under the “old” Feed-in Tariff system entitlements could only be applied for until 31 December 2016. More than 2,400 applications covering nearly 1,400 MW were submitted for participation in the Feed-in Tariff system under the “old” system at the end of 2016. The reason behind this was that these applications could receive an entitlement providing a guaranteed profit margin (subject to electricity prices in the next 25 years). Based on EU legislation, from 2017 a new energy support scheme (called METÁR) came into force including the following main features:

- under 0.5 MW feed in the tariff system and guaranteed prices remain in place (available budget until 2026 1 billion HUF);
- for power plants between 0.5 and 1 MW (except wind) green premium prices can be given without a tendering process (available budget until 2026 0.5 billion HUF);
- above 1 MW power plants and all wind technologies can be supported through a tendering system (available budget until 2026 1 billion HUF):
  - producer sells on the market;
  - has to take the cost of schedule differences;
  - support / premium price = offered price – reference market price;
  - HEPURA (Energy Office) tender request;
- MAVIR Zrt. (TSO) manages the system.
- those demonstration projects, which have already received investment support for the implementation and entitled to the feed in tariff as well
- as a new element of the support scheme, a brown premium was introduced and came into force on 9 November 2017.
  - this serves the maintenance of the biomass and biogas power plants
  - under 5 MW brown premium prices can be given without a tendering process
  - above 5 MW power plants can be supported through a tendering system

1 Source: Hungarian Energy and Public Utility Regulatory Authority
According to the Hungarian Energy and Public Utility Regulatory body, 57 applications (covering nearly 25 MW capacity) were submitted with a total of 528 million HUF support needed in 2017. This year the number of applications have significantly increased: nearly 231 applications have been submitted covering a capacity of over 110 MW with a total of 2 billion HUF support needed (the large number of the applications were submitted under 0.5 MW power plants).

Since the available budget of 2018 has been entirely utilized the Hungarian Government has amended the RES support scheme for household sized solar power production capacity (under 500 kW) thus obligating companies to submit their applications by 26 April.

**Biofuel**

Hungary has major potential in biofuel production, supported by agricultural products. Based on an estimation by experts, more than 10% of the estimated consumption can be fulfilled just from first generation biofuels by 2020, 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 enjoys 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 requirements estimated for 2020, and bioenergy based electricity production can be planned well in advance, and is also controllable. Therefore, the limitations on 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 a plan to place emphasis on the proliferation of small and medium-capacity combined electricity and heat generating systems, according to Hungary’s Renewable Energy Utilization Action Plan.

**Waste management**

In Hungary about 4 million tons of waste is generated every year, nearly 2/3 (2.6 million tons) of which is disposed of in landfills, 0.4 million tons is incinerated (in Budapest and in the Rákosbalota incineration plant), while the remaining 1 million tons is recycled. Waste collection services and disposal is managed by a state owned company (NHKV Zrt.).

The government’s main goals are:

- to decrease the volume of waste disposed of;
- to increase the energetic based utilization (biogas recovery, co-incineration);
- to increase the volume of recycling;

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2 Source: National waste management public services action plan 2016
Solar

There is notable solar potential in Hungary, with nearly 2,100 sunlit hours per year, which in some hot periods in summer reach a value of 1,000 W/m².

Hungary’s biggest photovoltaic power plant, with a capacity of 16 MWp, 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 small amount of solar capacity has been produced, mostly through solar collectors. In 2016 MVM Group constructed a photovoltaic power plant with a capacity of 10 MWp in Pécs. In the future, the company is planning many other power plant investments such as in Felsőzsolca and Oroszlány (with total capacity of 100 MWp). In addition, the company laid the cornerstone of a 20.6 MW capacity solar power plant in Paks, at the beginning of April in 2018. In March of 2018 MOL Hungarian Oil and Gas Group began the implementation of an installation with a solar power capacity of 18.38 MWp through a brownfield investment in three of its industrial parks (in Tiszaújváros - NE Hungary, Százhalombatta - Central Hungary and in Füzesgyarmat - SE Hungary). Furthermore, the company is looking for opportunities to install solar cells onto the top of 500 petrol stations.

State and Union-level support plays a central role in the proliferation 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 1950’s. Actively operating hydro power plants today in total represent a 50 MW production capacity, capable of generating around 200 GWh of energy annually.

Geothermal

Hungary has excellent geothermal conditions and outstanding natural resources of thermal water; there are huge thermal wells both on the Great Plain and the Little Plain. Hungary’s geothermal gradient (42-45 °C/km) 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 prevailing 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 increased since.

Today there are over 170 wind turbines in the country, with growing wind energy generated electricity as a trend. As far as wind is concerned, the National Renewable Action Plan forecasts around 750 MW built in capacity and 1500 GWh annual electricity generation by 2020.
SUCCESS STORIES FROM THE ENERGY SECTOR

Mátrai photovoltaic power plant (16 MW)
As the largest coal-fired power plant in Hungary the Mátrai Power Plant has opened the way to the innovative connection of the traditional and renewable energy generations. The new power generating facility has been developed by the majority owner of the Mátrai Power Plant, the German energy company, RWE. The costs of the power plant came to 20 Million EUR, nearly half of which is covered from a development tax related allowance.

ALTEO Group
The company was established in 2008, defining energy generation as its main activity. In the following year ALTEO, with a license from the Hungarian Energy Office, launched energy trading activity that produced outstanding sales revenues even in the first year and then continuously developed increasing its base of customers and the amount of electric energy sold. ALTEO shares were launched on the Budapest Stock Exchange.

In 2017 ALTEO’s implemented a new power plant investment in Debrecen. The power plant can utilize and neutralize the landfill gas rich in methane produced through the decomposition of organic waste deposited in the Debrecen Regional Disposal Site.

Turawell geothermal power plant (3+7 MW)
Turawell combined geothermal heat and power plant has successfully been connected to the grid and as Hungary’s first geothermal power plant it began to operate in November of 2017. The plant has an installed capacity of 3 MW electric and 7 MW thermal. As a heat and electricity cogeneration plant it uses geothermal fluid derived from wells to produce electricity and helps to heat greenhouses and nearby properties in an environmentally friendly way. At the end of the cycle, the fluid is pressed back into the geothermal reservoir, enabling the production of environmentally friendly heating and electricity.