



# Renewable Energy Policy review Hungary

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## 1. General

### 1-1 Population, geography

Hungary is a landlocked country in the centre of Europe. It borders on Austria, Croatia, Romania, Serbia, Slovakia, Slovenia, and the Ukraine. Hungary's surface area is 93 036 km<sup>2</sup> and the country benefits from a temperate weather. The average temperatures over many years in Hungary are around 10-11°C, the coldest month is January, with a mean temperature of  $-1\div-2^{\circ}\text{C}$ , the hottest month of the year is July, and its average temperature over many years is 20-21°C.

Hungary is characterized by a slightly decreasing demographic trend. Its population reached 10 million inhabitants in 2000, similar to the size of Portugal or Belgium. GDP per capita is 11,290 dollars using PPPs.

### 1-2 Economy

At 112.9 billion dollars (PPP –Purchasing Power Parity 1995) of Gross Domestic Product (GDP) in 2000, the economy of Hungary lies between that of Norway (118 billion dollars PPP 1995) and Ireland (104). (You do not have any more recent figures)( *These are only examples for demonstrating the global situation, we did not want to show the figures of all the OECD countries*)

GDP declined substantially between 1989 and 1994 and grew again afterwards. In the 2002 Economic Survey of Hungary, Hungary is referred at as one of the fastest growing Organisation of Economical Cooperation and Development (OECD) economies, with GDP having expanded at an annual average rate of 4.5% in the last four years. The unemployment rate also fell from 8.9% in 1997 to 5.8% in 2001. Despite rapid output growth, the pace of consumer price inflation decelerated over the same time period from 18 to 9% and the current account was reduced. From the latter half of 2001 onwards, the economy faced its first internal/domestic slowdown of the post-transition period, while a new exchange rate regime tightened monetary conditions in order to attain a more ambitious disinflation objective.

Hungary's per capita GDP reached 52 per cent of the OECD average in 2001. Hungary has managed to modernise the supply side of its economy and improve its structural performance through successive macroeconomic reforms. The principal policy challenge now is to close the still large gap in living standards as quickly as possible, This gap, measured by GDP per capita separates Hungary from advanced OECD economies. The catch-up process has already been unleashed by bold structural reforms. Key factors of productivity advance included policies that created strong pressures on firms to reduce costs, entailed a radical opening of the economy to foreign investment and imports, and established a business-friendly environment with a reasonably flexible labour market. Productivity was subsequently enhanced by massive inflows of foreign direct investment that introduced best business practices, contributed significantly to capital formation in the private sector, and upgraded the labour skills.

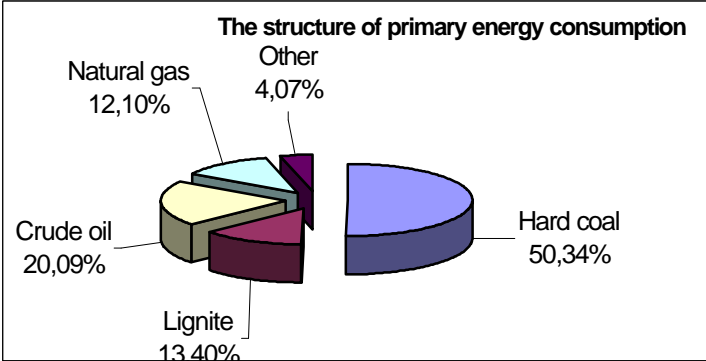
Information on agriculture could be added. *????This chapter is a general picture about the economical situation.*

## 2. Renewable Energy Policy

### Energy country profile

In 2002, the Total Primary Energy Supply (TPES) was 24.8 Mtoe, equivalent to Portugal and a little below Norway. Apart from the years 1995 and 1996, Hungary TPES has been systematically decreasing between 1990 and 2002, at the rate of  $-1.7\%$  per annum on average. The energy sector contributed 6.5% of the GDP in 2000.

The information should be added in a pie (in the pie the numbers are indicative)



Though energy supply in Hungary is fairly diversified, almost all Hungary's TPES comes from fossil fuels. Coal and oil represent large but gradually decreasing shares, respectively equivalent to 16% and 28% in 2002. Gas confirms its leading role with almost 40% of the TPES. Nuclear remains large, with 15% of the supply in 2002 and a large role in electricity supply. Combustible renewables and wastes (1.5% in 2002 compared to 1.2% in 1990) and hydro (stable at 0.1% of the supply) are still negligible. Since 1990, almost all primary energies have decreased, the main change being a fall in coal use by more than 4% between 1990 and 2002.

In a scenario implementing policies to mitigate CO<sub>2</sub> emissions and to promote energy diversification, the government (when was that scenario issued: 2001) projects primary energy supply to grow at an annual rate of approximately 1% between 2000 and 2020 and reach 27 Mtoe in 2010 and 29 Mtoe in 2020. By 2020, the share of coal is expected to decrease to 11%, oil to remain roughly stable at 31%, and gas to grow slightly to 41%. Nuclear is expected to decrease to 13%. What about renewables? This scenario estimated the growth of the share of renewales from 3,6% to about 7% until 2010.

Hungary is a small producer of oil (34 kbd or 1.7 Mt in 2002) and gas (3.2 bcm in 2002, compared to 3.4 bcm in 1999). In 2002, Hungary imported 18.0 Mtoe, out of which 5.0 Mtoe of crude oil, 2.2 Mtoe of petroleum products, 9.0 Mtoe of natural gas, 1.0 Mtoe electricity and 0.8 Mtoe of coal and coal-products. And Hungary exported a total of 2.5 Mtoe energy, 1.7 Mtoe of petroleum products and 0.8 Mtoe of electricity. In 2002, fuel and electricity represented 8.2% of imports and 1.9% of exports. Hungary's external energy dependency has been growing, from 47% in 1994 to 62.5% in 2002<sup>1</sup>. (No more recent figures- corrected)

The energy intensity of the economy, measured as a ratio of TPES to GDP, improved between 1990 and 2000, from the 10<sup>th</sup> highest in OECD countries (lower than OECD North America) to the 13<sup>th</sup>, at 0.22, roughly equivalent to the International Energy Agency (IEA) average. In 2000, Hungary displayed one of the lowest energy supply per capita of the OECD countries, at 2.5 toe, versus 5.2 for the IEA on average. With 0.13 toe of oil supply per thousand dollars (1995) of GDP in 2000, Hungary was among the highest oil intensity, largely above the IEA average of 0.08 and similar to Canada. However, oil supply measured per capita was among the lowest of IEA countries, with 0.7 toe in 2000. There are several reasons to these trends, the main one being a large change in the structure of GDP, with large investments made in light manufacturing industries (car assembling for example)

<sup>1</sup> (imports – exports)/TPES.

substituting heavier industries, and efforts made to conserve energy and improve efficiency in the residential sector and in industry. As a result there was an improvement in Hungary's ranking on an international scale of energy intensities measured as TPES per unit of GDP. However, since per capita energy consumption in Hungary is still relatively low, the margins for further gains in actual energy efficiency are large.

The total final energy consumption, in line with TPES, has shown negative growth on average in the 1990s, at the annual rate of -1.7% (1990-2002). The total final energy consumption decreased more radically in the early part of the 1990s and almost stagnated since 1995.

Information on the energy balance import and export should be added. *(The figures of energy import and export see above!)*

From the middle of the 1990s the energy import is growing, in 2002 reached 18,0 Mtoe. The energy export has no development, the annual amount is about 2,4-2,5 Mtoe.

### **Renewable Energy**

Based on the experts' estimation and several studies prepared Hungary has a limited renewable energy (technical) potential (is there any references- *different sectoral studies*), except for biomass and geothermal energy. This potential largely can be tapped, provided deployment mechanisms are in place and sufficient economic incentives are available to entrepreneurs. The main driver for renewable energy development in Hungary is to adapt successful development RES policies already implemented in the EU-15. As part of the requirements to access the EU, Hungary has to comply with the EU renewable energy source directive. The EU goal is to increase renewables as a share of the total primary energy supply energy to 12% and as share of total electricity to 22% by 2010.

Individual countries in the EU have been allocated individual targets. Hungary's accession to the EU in May 2004 is one of the main driving forces for the growth of Hungary's production of energy from renewable sources. Under this agreement the national indicative target of Hungary is to double the present share (3,6 %) of renewables in the TPES. In accordance with the EU directive 77/2002 Hungary intends to increase the share of renewables in electricity production from the present 0,5 % to 3,6 % until 2010.

The directive has set national indicative targets for electricity only and the other target you mentioned (double the contribution of RES in the TPES is a Hungarian decision?) *Yes, this is the result of the negotiated agreement between the EU Commission and the Hungarian government.*

The fact that renewable energy may contribute to lowering greenhouse gas emissions is of interest to the Hungarian authorities, but the interest on this aspect is lower than other IEA or EU countries because Hungary will have less difficulty in achieving its GHG emissions reduction target (Which is?) (6% GHG emission reduction until 2010 calculated on the basis of the average of the years 1985-1987) The government is mainly interested in the potential benefits that renewable energy may bring, such as:

- Reducing energy dependency through the exploitation of locally available energy resources (the present dependency is over 60 %);
- Contributing to energy security through the diversification of the import sources (more than 90% of the energy import of Hungary is originating from Russia), (what is the difference between bullet 1 and 2)
- Generating employment
- Reducing the emission of GHG and other pollutants.

What about the protection of environment and industry competitiveness – *Industry competitiveness is a general target of Hungary but not directly connected to the question of RES utilisation in the programmes of the government*

Hungary has so far no official RES potential assessment in the country. (Is there any provision for an assessment study – *several studies were prepared, but the results are different. Non of them is the official version.* ) The annual utilisation of RES is estimated on the basis of different data collections. Due to this fact different figures are available in the different publications and studies. The table below shows the estimation of the Energy Centre Hungary (which organisation is responsible for the national energy statistics) is it a government body (– *yes, the Energy Centre non profit Co. was established by two ministries*) for the year 2000.

Table 1

**Renewable energy statistics in Hungary, TJ, 2000 (is there any more recent figures) -most of the figures are only estimated but the estimation is not updated in every year**

<b>Type of renewable energy</b>	<b>Used heat (PJ/year)</b>	<b>% in the percentage of the renewables</b>
Firewood	29,9	82,3
Geothermal	2,8	7,8
Biomass	2,1	5,8
Household waste	0,8	2,2
Biogas	0,2	0,6
Solar energy	0,1	0,3
<b>TOTAL RENEWABLES</b>	<b>35,9</b>	<b>100,0</b>

Source: Energy Centre Hungary

In 2000, (you had figures from 2002 at the beginning of the paragraph) renewable energy represented 3.6% of the TPES. A large part of renewable energy is fuel wood consumed by the residential sector in small boilers. This share is very small as compared to other IEA countries, especially in the EU where it reached 6 %. In the last two years there were only minor changes in the structure of RES. The main difference is the development of the wind energy and the solar thermal applications: at present 6 windturbines are in operation, the total capacity is 3.2 MW, and the small scale local wind energy utilisation is also developing.

## 2-2 Status of resource exploitation

The government aims to increase the share of renewables in primary energy consumption to about 7 % by 2010. This target is part of the government's Energy Conservation and Energy Efficiency Improvement Action Programme 2000-2010.

Status of the main RES sectors

### *Biomass*

Energy from biomass is mostly from wood processing, and its use will further increase along with investments in modern wood-fired boilers and small power plants. Wood waste combustion is also considered as a complement to coal in power plants, partly to increase the life time of old coal-fuelled power plants, reducing their fuel cost. Hungarian forests grow by about 12 million cubic meters per year, 9,2 million of which were authorised to be cut down in 2000.

Hungary is experimenting with a fuel switching project at the 137 MW AES Borsod power plant, to retrofit it using fuel wood. Pannonpower plant in Pécs is also converting to wood, the capacity of the wood burning unit is 50 MW with an annual production of 325 GWh.

Fuel wood is also used in some district heating plants. The first two investments were in Tata (installed capacity 10 MW, annual heat production 85 TJ) and Sárospatak (installed capacity 2,5 MW, annual heat production 36 TJ) but several other investments have been and are being prepared.

The EU directive on biofuels aims for an average 2% use by 2005 and 5,4% by 2010. Based on agricultural possibilities, Hungary is suited for biofuel production. Legislation (name of this legislation) (18/2003 (II.19.) Government decree about the conditions of the sell and use of biodiesel in Hungary and the regulations of the state subsidy) for experimental biodiesel, and bioethanol production and use has entered into force in February 2003. Non-refundable **government** grants can be applied for with the experimental use of biodiesel. Biodiesel use is further helped by a 0 % excise tax and a HUF 30 (EUR 0,13) subsidy per liter.

Two bio-diesel plants using rapeseed (4 million liter per annum capacity) and sunflower (12 million litre per annum capacity) as raw materials are being currently built. One bio-ethanol (using corn and grain) already produces 65 million liter per annum.

### *Geothermal energy.*

There is large geothermal potential in Hungary where the water temperature gradient is appropriately high to use it for heat applications. However, it has not yet been taken up significantly because of the special technical problems caused by the high salinity of the thermal water in the Hungarian basin. (why) . Around 20% of geothermal energy is currently used for agriculture, for crop drying or greenhouse heating. The rest is used elsewhere, such as spas for tourism. Geothermal heat utilization by heat pump is also expanding in the residential sector.

Responsibility for geothermal wells lies with the water management authorities. There are no separate agencies for dealing with geothermal affairs.

Geothermal energy use in Hungary is twofold: direct heating and spas. Heating use is only seasonal, with about 180 days per year, while spa use is dwarfed in magnitudes by heat use.

Most of the hot water is used by agriculture mainly to heat plants. About 200 wells supply water to spas and baths.

The first geothermal power plant is estimated to be completed in 2005, near to the village of Inke. It is expected to have 3,26 MW electric power output and 12 MW thermal energy. The second power plant near to Nagykanizsa will have 8,1 MW electric and 13 MW heat capacity. The largest power plant is designed to be constructed near to Debrecen (in Érmellék), with an electrical capacity of 21 MW and 56,6 MW thermal power. About 65-70% of their investment costs are expected to be covered from non-refundable sources, both from Hungarian government and the European Union. The government of Hungary guarantees higher purchase prices (which are) for renewable generated electricity until December 31, 2010 for the production from > 0.1 MW installed capacities.

### *Hydropower*

What about hydro power (% of large and small)

Due to the basin location of the country Hungary has little potential for further water power development with the exception of small and micro sized power plants. Currently Hungary has a waterpower generation capacity of about 47,8 MW (net what does it mean- *without the own consumption and the auxiliaries of the power plant*), coming from nearly 30 power plants of which three are large scale (over 10 MW). The total annual water power generation is 170-180 GWh/year. What is the definition of small hydro <10 MW – yes, *small hydro is less than 10 MW*.

There are no plans for the development of the water power capacities in the following years.

### *Wind energy*

The wind energy potential in Hungary is rather low (give a figure – 70-160 W/m<sup>2</sup>)-, but despite of this fact a significant (what is the reference of this statement) development of wind energy utilisation is expected in the ten years to come. There is no comprehensive assessment and mapping of the wind power resources but it is at present under development. What is under develop – *feasibility studies are under preparation for implementing wind turbine parks*

In the last five years four wind turbines were built: 250 kW in the region of Várpalota-Inota, 600 kW in Kulcs and 2x600 kW near to Mosonszolnok. All investments were partly – 30% -(give a figure) financed by the Hungarian government. The electricity sold to the national grid will pay off the investments in an estimated ten years. There are more other large scale wind farm projects also under development. (how many and installed capacity – *figures are not available yet*)

Not only large scale wind power plants, but also small scale wind utilisation is under development: e.g. in the wind energy park in Nyíregyháza three small scale windmills are in operation for water pumping.

### *Solar energy*

Hungary lies in the middle of the Kárpát-basin, on a relatively flat surface surrounded mainly by mountains, its features for solar energy utilisation are more favourable than that of many other European countries: the number of the annual sunny hours is 1900-2200, the average annual total of the incident sunshine is 1300 kWh/m<sup>2</sup>. This fact also justifies the use of solar collectors with a selective absorber – i.e. capable of utilising even scattered light with high efficiency – in Hungary. Conditions in summer are better, that is why "only summer" utilisation is feasible with simpler and cheaper solar collectors.

The average efficiency (what do you mean by efficiency – energy efficiency: energy output/energy input) of solar collectors used in the summer months in Hungary is around 50%, in highly sunny periods it can also reach 75-80%. Based on experience with optimal size and conditions, the solar energy utilising systems are capable of covering 60-65% of the total annual energy needs.

There are no reliable surveys on the numbers of working solar collector systems and installed capacity. According to expert's estimations there are about 30 – 40 thousand m<sup>2</sup> solar collectors of various quality and durability installed in Hungary today; their number is increasing by some thousand m<sup>2</sup> every year. Solar collectors are mainly used for water heating, supplying domestic hot water, supplementing (space) heating, and swimming pool heating.

Solar power use is very limited: to some emergency phones and street lighting.

No figures available

## 2-3 Past and current renewable energy policies

The main objectives of the energy policies issued in Hungary, after the transition to the market economy, are to create the conditions for the energy sector to operate on a commercial basis, to reduce the dependence on energy imports from the former Soviet Union by diversifying supplies and to lay the foundations for integration into the European Union. Energy efficiency, promotion of renewable energy and environmental protection are also part of the policies.

This whole section should be put in a table????

Name of the policy – Des????

*Hungarian Energy Policy Principles and the Business Model of the Energy Sector  
(Parliamentary Resolution 27/07/1999)*

In 1999, the Ministry of Economic Affairs presented the "Hungarian Energy Policy Principles and The Business Model of the Energy Sector", a policy document describing a "new energy policy", approved by the Parliamentary Resolution of 27 July 1999. The main objective of this new energy policy is clearly to prepare the Hungarian energy sector for EU accession. Consequently, major emphasis is given to guidelines for establishing competitive markets for electricity and natural gas, price regulation for electricity and natural gas and the organisational and regulatory structure of the electricity and gas industries. Energy conservation and efficiency, renewable energies, district heating and environmental protection were also part of the policy.

*Energy Saving and Energy Efficiency Action Programme  
(Resolution 1107/1999)*

The Energy Saving and Energy Efficiency Action Programme was adopted in September 1999, following the former National Energy Saving and Energy Efficiency Improvement Programme of 1995. The new programme defines the following targets for 2010:

- Reduction of energy intensity by 3,5 %/year, assuming an annual growth of GDP of 5 %/year and a growth rate of energy consumption of 1,5 %/year.
- Saving of 75 PJ/year (1,8 Mtoe/year) of primary energy sources.
- Reduction of 50 kt/year of SO<sub>2</sub> and 5 Mt/year of CO<sub>2</sub> emissions.
- Increase of renewable energy production

The Energy Saving and Energy Efficiency Action Programme includes 15 actions.

Initial funding of the Action Programme is provided from the "Széchenyi Plan" Economic Development Fund of the Ministry of Economic Affairs. While the initial budget allocation was HUF 1 billion/year for the year 2000, the budget for 2001 has been increased to HUF 2 billion, supplemented by additional funding of 3 billion HUF from the Housing Programme of the Széchenyi Plan, earmarked for funding of energy efficiency measures in the housing sector.

*Establishing of Energy Efficiency, Environment and Energy Information Agency: "Energy Centre"  
(Government Decree 1031/2000)*

The action Programme is implemented by a new body. The Energy Efficiency, Environment and Energy Information Agency, founded by Government and Energy Information Agency, founded by Government Decree 1031/2000. The agency is the legal successor to the Energy Centre (formerly the EU-Hungarian Energy Centre) and the Energy Information Agency. As a non-profit company, owned by the Ministry of Economic Affairs, the Ministry for Environment and the Hungarian Energy Office, the agency has to provide a sound institutional basis to promote energy efficiency activities and to operate the energy statistics system.

*Hungarian Strategy on Climate Protection  
(Government Resolution 220/2000)*

Hungary has been a signatory state to the United Nations Framework Convention on Climate Change (UNFCCC) since 1994. Under Annex B of the Kyoto Protocol, Hungary is committed to reduce its carbon dioxide (CO<sub>2</sub>) emissions by 6 % in the time period 2008-2012 (six gases). As an economy in transition, Hungary has the right to choose its base year, and has opted for 1985-1987 as its base line period.

Hungary submitted its First national Communication under the UNFCCC in 1994. Six months after the ratification instrument as deposited. The Second National communication: Hungary; Inventories, Stabilisation and Scenarios of the Greenhouse Gas Emissions and Removals of 1998 takes into account the new and substantial developments arising since the First Communication and presents the main policies and measures adopted or planned in the field of energy efficiency.

The government adopted the Hungarian Strategy on Climate Protection on 13 September 2000 (Government Resolution 2206/2000). The Strategy identifies the most important tasks in the various sectors, namely energy production and supply, transport, industry, agriculture and forestry. The energy sector has the highest priority since two-thirds of greenhouse gases emissions come from fossil fuel combustion. One of the most important issues is the reconstruction of the district heating network.

Application of voluntary agreements and consumer-side awareness-raising programmes are also parts of the Strategy.

## 2-4 RES actors

The Hungarian Government has responsibilities for the energy policy including the energy legislation and implementing measures to promote RES utilisation. The Ministry of Economy and Transport is responsible for the preparation of the energy policy papers. The implementing agency for the operative tasks of the policy implementation is the Energy Centre which is the national energy efficiency agency. The RES related R&D activities are at present co-ordinated by the Ministry of Education. Regional level energy policies are not prepared in Hungary.

Several Hungarian municipalities prepare a local energy concept on a voluntary basis. The local utilisation of RES is, in general, part of the local energy concepts (see case study 1)(explain more this concept in one case study by instance) . The regional and local energy advice organisations have close co-operation with the municipalities and the enterprises in the region in order to promote, amongst others, RES utilisation.

### Case study 1

#### Energy concept of city Tata

Tata is a middle size city in Hungary with about 20300 inhabitants. There are 10400 flats of which 42% heated by solid fuels, 41% by gas and 17% are connected in the District Heating (DH) system. The energy concept of Tata contains the energy related obligatory and voluntary tasks of the municipality and the plans for the development of the energy supply system of the city as well as the rational use of energy (RUE) , energy efficiency (EE) and renewable energy (RES) utilisation projections.

The obligatory tasks are among others: owner and supervisor of the DH system, supervising the energy management in the public institutions, [conservancy and renovation of the energy systems in the public institutions, public lighting](#). Voluntary tasks are the [energy policy preparation and implementation, utilisation of local energy sources, supporting the energy saving actions in the household sector etc.](#)

The main results of the programmes implemented in the last few years:

- long term energy concept of the city prepared and approved,
- energy audits in 19 public buildings,
- biomass (wood chip) fired boiler installed in the DH system,
- RUE and RES demonstration park.

Plans for the near future:

- Renovation of the DH system,
- Installation of a gas-engin DH block,
- Wood gasification for the CHP heating block,
- Promotion of geothermal and solar energy utilisation, etc.

## 2-5 policy instruments for RES utilisation

In the 90s, after the political-economical system change the demand for energy saving (how does the demand) and environment protection has intensified alongside other problems (security of energy supplies, privatisation of the energy systems etc.)(which problems) , However, this objective not only requires substantial cost input both from the government's and the civil society's part but it also means the popularisation of technical knowledge and a change of approach. Today these changes take place at an accelerated pace but the some decade-long lag behind developed countries can only be made up in the long run. The demand for renewable energy utilising systems is rather small because of the still relatively low household energy prices and real wages, the turnover is some thousand m<sup>2</sup> annually, although it is definitely increasing.

Hungary's joins the European Union in May 2004 and this involves the task of reduction of environmental damages and increase in the utilisation of energy efficient technologies.

The Ministry of Economy and Transport announced tenders for non-repayable grants in year 2000 in order to achieve the energy saving and energy efficiency enhancement aims, with a budget of HUF

900 million (euro 3.6 million)(in euro) (this was announced as part of the general economic development plan, the “Széchenyi Plan”). The interest in renewable energy resources was beyond expectations, thus in 2001 the available budget for investments was augmented. Therefore the 100-million HUF budget allocated for the promotion of utilising renewable energy resources was augmented to 350 million HUF in 2001, the maximum limit for some of the investment grants has also been modified considerably.

Flat owners, housing associations, joint owners of blocks, in case of organisations entitled for investment, financing and allocation of granted resources in case they are public consumers (e.g. local authorities), entrepreneurs doing energetic modernization and economic organisations can apply for the grants.

The grant was available for those applicants – among others – who apply for the installation of solar collectors generating heat-energy or electric energy capacities by renewable energy resources, or for the modernisation of existing systems.

The amount of the non-repayable grant available: maximum 30% of the whole cost of installation in case of a flat, but not more than 250 thousand HUF, in case of housing associations, or block of flats maximum 30%, but not more than 250 thousand HUF multiplied by the number of flats involved, for the public and economic organisations – in this case including the realisation within the frame of the enterprise – maximum 30% of the whole cost of installation, but not more than 35 million HUF per application. Applicant shall ordinarily have resources of at least 25 % of the net cost of the development.

Since 2002, the following plan “Széchenyi Plan” National Energy Saving Programme is also giving a non-repayable grant with similar conditions for RES and EE investments in the different sectors of the economy.

Apart from the above introduced “Széchenyi Plan” and National Energy Saving Programme, the Ministry of Environmental Protection is also giving support of a similar magnitude to renewable energy. To avoid duplication of public funding, although it is possible to obtain financial support from various sources, the total amount of public financial support may not exceed 50% of the total costs of development excluding any reclaimable VAT, or 65% in case of any small and medium-sized enterprises. The applicant must have his own financial sources at least amounting to 25% of the total amount of the project. In addition to the evidence of his own financial sources, the promissory notes confirming the availability of any other possible sources must be attached to the application for the public support.

The Ministry of Education is giving support for research activities for the development of RES utilisation systems. The ministry encourages the researchers to take part in the European level R&D programmes (e.g. EU 6. Framework Programme).

The Electricity Act (2001) offers the possibility for independent electricity producers using renewables with a capacity above 100kW, to avail of a feed-in tariff. This tariff is the same for all renewable energy sources and is defined annually. It is paid by the main electricity producer – MVM – in the case a power plant is connected to the transmission network, or by the local service provider if the independent producer is just connected to the distribution network. Purchasing renewable electricity is mandatory. The tariff is regulated by the Ministry of Economy and Transport through a Decree. The tariff is not enough to make renewable energy projects fully independent from other support mechanisms given their current costs. (can you give details of tariffs and conditions of pricing?)

The Electricity Act of 2001 also includes reference to an intent to move towards a portfolio based system, met by a renewable energy obligation and tradable green certificates. The details remain to be finalised. According to the Act, this system could provide “an effective and transparent system of support to renewables” (...) “in harmony with the principles of energy policy”. The idea is to inform the consumers of the potential environmental benefits of renewable energy and make them bear uniformly the operating costs of the support system. Renewable energy capacity would be certified by the Hungarian Energy Office at the request of its owner or operator. The latter would in return be allowed to issue and sell a green certificate of the amount of electricity produced from renewable sources and waste.

## 2-6 Other measures for the promotion of solar energy utilisation

Participation in international programmes, in which Hungary is an associate member, support of those professional and civil organisations and initiation, which help the spreading of professional knowledge, awareness, and the participants of the market, doing away with the still existing obstacles and settling deficiencies concerning legal, technical and educational fields are also important measures for the promotion of solar energy utilisation (e.g. Phare energy programme, OPET – Organisation for promotion of energy technologies – programme, the SCORE (Supporting Co-operative Organisation of Rational Energy Use) Dutch-Hungarian bilateral programme). (Which programmes are you talking about?)

The Hungarian Board of Standards gradually introduces the standards marked EN concerning solar energy utilisation, which are accepted in the European Union, with approving publications (Hungarian titles, English content), and elaborates the Hungarian version of the most important standards in case it obtains the financial support of the Technical Committee for Solar Energy Utilisation.

### **Organisation of energy efficiency activities**

The Ministry of Economic Affairs is responsible for the design and formulation of the overall energy policy, including energy efficiency. Responsibility within the Ministry is with the Energy Department. Regulation of the energy sector (except district heating) has been delegated to the Hungarian Energy Office, which is under the authority of the Ministry of Economic Affairs. Regulation of the district heating sector is shared with municipalities (see Annex 1).

The Hungarian Energy Office regulates the electricity and natural gas sectors through licensing procedures (for the construction, starting-up and operation of new and existing projects), through the approval of purchase agreements and through the setting of prices and tariffs. Since prices and tariffs are actually accepted or rejected by the Ministry of Economic Affairs, regulation is still not free from Government influence.

Other Ministries involved in energy efficiency issues are the Ministry of the Environment, the Ministry of Agriculture and – as far as district heating is concerned – the Ministry of the Interior.

While the Ministry of the Environment has played a role in shaping energy efficiency and policy, its main concern is environmental regulation in the energy sector (emissions from energy conversion).

The role of the “Energy Centre” Energy Efficiency, Environmental Protection and Energy Information Agency Non Profit Co. is twofold: managing energy efficiency programmes and performing reporting tasks on the one side, and advising the Government on energy efficiency policies and instruments, on the other. Another key task will be the coordination of the various actors and stakeholders in energy efficiency in Hungary, including the effective coordination of the various actors receiving public national and international funding and to exploit synergies with purely market driven energy efficiency activities.

Non-governmental organisations have assumed an important role in developing awareness on energy efficiency and advising consumers throughout the country. This applies also to the less developed eastern part of Hungary.

A particularity in Hungary is the *Energy Efficiency Advisory Network* established by environmental NGOs, some of the county offices of the Enterprise Development Agency (MVA), and some county offices of the Federal Chamber of Technical and Scientific Societies (MTESZ). This means that the network has roots among the green NGOs, in the SME sector and in the technical field also.

At the moment, there are several ESCOs operating in Hungary. Third party financing is a well operating model for financing energy efficiency projects.

### **Executive summary**

Since the beginning of the political and economic transformation in 1990, Hungary has taken important steps in the process of adapting its energy economy to market principles. In particular, the energy

sector has been subject of restructuring and partial privatisation during the last decade, and further liberalisation and market opening are foreseen in the process of EU accession.

Energy efficiency policies, strategies and programmes have been developed and implemented since the mid-nineties, first with moderate success. Final energy intensities have in general been decreasing, which is largely due, however, to structural impacts. There are still major challenges ahead to improve energy efficiency in all end-use sectors: industry, residential, tertiary, transport; as well as in electricity supply and district heating.

Being aware of these challenges, the Government has intensified its efforts to promote energy efficiency and the use of renewables in all sectors of the economy. The new Energy Saving and Energy Efficiency Action Programme, adopted in 1999, is certainly a step into the right direction. The allocation of sufficient funds is a concern of the Government and first substantial steps have been taken in this direction.

An important step has also been taken to strengthen the operational capacity of the Government in the energy efficiency field by creating the "Energy Centre" Energy Efficiency, Environmental Protection and Energy Information Agency.

In relation to the promotion of energy efficiency, the Government appears to favour financial incentives, awareness rising over legislative and regulatory measures. Hungary's accession to the EU in May 2004 is one of the main driving forces for the growth of Hungary's production of energy from renewable sources. Under this agreement the national indicative target of Hungary is to double the present share (3,6 %) of renewables in the TPES. In accordance with the EU directive 77/2002 Hungary intends to increase the share of renewables in electricity production from the present 0,5 % to 3,6 % until 2010.

**Some information is missing**

- The RES players (Ministry, agency, NGO, Industry associations)) and their responsibility.
- A short executive summary (1/2 page) should be added
- A case study/regional local successful initiatives

**Some information need to be completed**

- Information on the energy balance (export – import) and on the electricity market (liberalisation)
- Information on Research and development financing should be added as indicated

**Recommendations**

- The information should be in euro if not, the currency exchange should be given.
- The tables should have a source and a date
- The text should be as illustrative as possible making comparisons enabling the reader to understand the importance of some statements
- The figures should be if possible from 2001-2002 and if not a short statement explaining why recent figures are not available.
- When acronyms are used, they must be explained the first time

**Suggestions**

- A section with references should be added
- A section with selected slovenian websites in energy and RE (+ public authorities) sorry: this is a study about Hungary – I do not know any slovenian websites