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REPUBLIC OF HUNGARY
MINISTRY OF TRANSPORT,
TELECOMMUNICATION AND ENERGY

COUNTRY REPORT

on electricity produced from renewable energy sources

(Provision of information required under Article 3(3) of Directive 2001/77/EC)

Article 3

National indicative targets

(3) Member States shall publish, for the first time not later than 27 October 2003 and thereafter every two years, a report which includes an analysis of success in meeting the national indicative targets taking account, in particular, of climatic factors likely to affect the achievement of those targets and which indicates to what extent the measures taken are consistent with the national climate change commitment.

Budapest, October 2009

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1. Expectation from Hungary under Directive 2001/77/EC

Directive 2001/77/EC of the European Parliament and the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market sets the objective that the share of electricity produced from renewable sources in total electricity consumption should be increased to 22.1% by 2010. The EU expectation from Hungary is to meet the national target of 3.6%, which is also included in Point 12 of Annex II to Act XXX of 2004 on accession.

2. Government measures to increase the use of renewable energy sources

2.1. National requirements for electricity produced from renewable energy sources laid down in acts of Parliament (and incorporated in subordinate legislation)

Act CX of 2001 on electricity

The key requirements laid down in the act of 2001 are the following:

— In the sale of electricity produced from renewable energy sources, competitive disadvantages shall be reduced by price support schemes. The level of support shall be established by taking into account the natural conditions of the country and the different payback periods of technologies related to each energy source.
— The responsibilities of the Hungarian Energy Office related to electricity supply shall include the establishment and certification of the amount of electricity produced by producers of electricity or operators of small plants from renewable energy sources or waste.

Act LXXXVI of 2007 on electricity

The act of 2007 upholds the provisions of Act CX of 2001 and adds clarifications to them.

The new Electricity Act provides for the continued maintenance of the system based on the mandatory off-take of electricity produced from renewable resources and cogenerated electricity at support prices – with changed conditions. The Office remains responsible for establishing the amount of electricity subject to mandatory off-take and the period of mandatory off-take (which shall last until a given investment is returned at the off-take prices set on an annual basis in accordance with the law) by taking into account the criteria laid down in the law. The Office issues certificates of origin to producers subsequently, on an annual basis. As regards cogenerated electricity, compliance with the provisions of

Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand is an additional condition of participation in the mandatory off-take system and the issue of a certificate of origin.

Under the mandatory off-take system, electricity reaches users in several steps: the transmission system operator plays a central role in the “collection” and distribution of electricity subject to mandatory off-take. Producers of electricity subject to mandatory off-take join balance groups created by the transmission system operator for the specific purpose of the settlement of balancing energy. Then the transmission system operator takes off the produced electricity in accordance with the decision of the Office on the right to mandatory off-take. Balancing energy is settled by the transmission system operator with the electricity producers at the prices determined in the law and then the electricity taken off is transmitted to electricity traders or universal service providers. Under the provisions of the Electricity Act, traders and universal service providers take off electricity sold under the mandatory off-take system in proportion to the amount of electricity sold to the users having a contract with them. The basis of settlement between the system operator and the traders and universal service providers is determined by the average price established from the prices paid to the producers of electricity by the system operator. The mandatory off-take system provides a guarantee for purchasing the electricity concerned, and purchasing supported electricity is ultimately the obligation of electricity users.

Legal regulations provide for the technologies which may be used for producing electricity to be sold under the mandatory off-take system, and several price categories are established for electricity subject to off-take. The criteria of differentiation are based on the used energy sources, the applied production processes, plant capacity, energy conversion efficiency and the date of plant establishment, having regard to the payback period of investment. Mandatory off-take may be implemented at market price or support price. The highest initial rate of the support price was “HUF 24.71 Ft / kWh x k”, which was increased to a reference price of HUF 26.46 / kWh (where “k” is the value of the consumer price index for the preceding year) as from 1 January 2008 under Government Decree No. 389/2007.(XII.23.) Korm. The act of 2007 ensures that the rights of power plants working at the time of the publication of this act, as granted by Act CX of 2001 on Electricity and Decree No. 56/2002. (XII. 29.) GKM on the rules of mandatory electricity off-take and fixing the prices of electricity subject to mandatory off-take, are not prejudiced in the new off-take system.

Heat produced from renewable energy sources and electricity produced by using sawing logs or timber of higher order may not be supported under the mandatory off-take system (except plants producing electricity from biomass authorised under the earlier Electricity Act). The promotion of electricity generated from wind power must take into account the limited technical capacity of system level services. The Hungarian Energy Office published a call for proposals for the generation of additional 410 MW beyond the 330 MW authorised earlier.

The regulations in force comply with Article 5 of Directive 2001/77/EC of the European Parliament and the Council, which provides that Member States shall ensure that a guarantee of origin is issued for electricity produced from renewable

energy sources (this was a gap in the system earlier). It also reinforces compliance with the Directive that the new regulation does not only enable the Government to introduce green certificates – considering the international experiences from the green certificate systems and the state of the Hungarian renewable energy market – but also requires the Office to inform the Government on the conditions of introducing a green certificate system on a biennial basis.

The advantages of the new regulation include the requirement of providing evidence that the biomass used for electricity production from biomass originates from sustainable farming.

In conclusion, the guaranteed sale and the statutory prices to be applied in selling represent a positive economic impact for producers of electricity subject to mandatory off-take. The off-take system only provides compensation to newly established plants using renewable energy sources or waste for their competitive disadvantages arising from their specific technological features until the end of the payback period of the investment. The principles of the system include that a right to mandatory off-take must be granted in consideration of other state aids received by the producer concerned from other sources and that the electricity produced in the same generation unit may not be subject to off-take as both electricity produced from renewable energy sources or waste and cogenerated electricity. Users can perceive the economic impact of the system directly in the price of electricity, because the cost of electricity subject to mandatory off-take is incorporated in the acquisition costs incurred by traders or universal service providers.

2.2. Promotion of investment in electricity production from renewable energy sources in Hungary

1./ The Energy Saving Loan Fund provides loans at favourable interest rates to promote investment aimed at increasing energy efficiency and the use of renewable energy sources. The Loan Fund was established in 1991, and the value of its assets exceeded HUF 2.4 billion in late 2008. The fund manager is Energia Központ Nonprofit Kft., and the loans are disbursed by Kereskedelmi és Hitel Bank Rt. The supported loan facility is available for businesses and local authorities by way of application, and the scheme is currently operational.

2./ In 1999, a long term energy saving programme was launched. Its application system – called Energy Saving Programme in 2000, as part of the Széchenyi Plan in 2001 and 2002, and called National Energy Saving Programme (NEP) from 2003 to 2006 – was managed by the Ministry of Economy and Transport (MET). The aim of the programmes was to support projects in the field of energy saving and the use of renewable energy sources, which the Ministry supported by providing loans with favourable interest rates and non-repayable grants until 2000 and fully non-repayable grants from 2001. In 2007, the programme was continued by the residential grant scheme “For a Successful Hungary” to promote energy saving and the use of renewable energy resources, whose budget for providing non-repayable grants amounted to HUF 2.6 billion in 2007, which was supplemented by a HUF 16 billion loan facility at favourable interest rates. The

programme was continued with a total budget of HUF 3.3 billion in 2008 and HUF 1.5 billion in 2009, and the loan facility also remained available at favourable interest rates.

3./ With accession to the European Union in 2004, Hungary became eligible for development assistance provided by the EU. Within the framework of the First National Development Plan, the Environmental Protection and Infrastructure Operational Programme (EIOP) enabled the implementation of developments co-financed by the EU, using assistance granted under the Structural Funds for the objectives of regional policy, in three sectors: environmental protection, energy and transport. Under the EIOP, funding amounting to HUF 3.35 billion was awarded to 18 applicants in order to support projects using renewable energy sources in the period 2004-2006. The key data of the investments implemented in the field of renewable energy sources as a result of assistance are the following:

Outcome of EIOP projects in the energy sector, 2004-2006	
Foreseen annual green energy production by supported projects	442968 GJ/year
Foreseen green energy production by supported projects over a 25-year life cycle	11074200 GJ

4./ In the period 2007-2013, Hungary – as a Member State of the European Union – is entitled to EU assistance for development purposes amounting to several thousand billions of forints. The total budget of EUR 4,916 million (cca. HUF 1,300 billion) of the Environment and Energy Operational Programme (EEOP) of the New Hungary Development Plan (NHDP) will be used to support Hungarian energy projects proposed for two priorities: 5.15% of the total budget may be spent on the objectives of the priority axis “Increasing the Use of Renewable Energy Sources”, while 3,14% on the objectives of the priority axis “Efficient Energy Use” promoting energy saving. Investors may apply for funding. The intensity of support may vary from 10 to 70% in the case of projects focusing on the use of renewable energy sources, but the final intensity of support is defined on an individual basis for each project.

5./ In addition to the EEOP, the use of renewable energy source in Hungary is also promoted by the measures of the New Hungary Rural Development Plan (NHRDP). The NHRDP is aimed to enable rural areas to make intensive contribution to the development of the bioenergy segment beyond the production of the necessary source materials. Under the NHRDP, the production of renewable energy sources is supported along three strategic strands: liquid biomass (bioethanol and biodiesel), solid biomass (energy grass and energy tree plantations), and biogas. The primary source of assistance is the European Agricultural Fund for Rural Development (EAFRD), which provides funding for competitive biomass production and processing into primary semi-finished products and for ensuring the producers’ own energy supply.

2.3. Hungary's strategy and national objectives in the field of renewable energy sources

The Government adopted Hungary's renewable energy strategy for the period 2008-2020, forming part of domestic energy policy, (X.31.) Korm., by way of Decision No. 2148/2008. The aim of the strategy is to set ambitious but realistic strategic targets – meeting the requirements of the European Union – concerning the use of renewable energy in Hungary in the period from 2007 to 2020. The goals and objectives of the renewable energy strategy define quantitative targets. The main strategic target is to increase the use of renewable energy sources in Hungary from 59.5 PJ in 2007 to 186.3 PJ by 2020.
This strategic target is broken down to sector specific objectives as follows:

- The share of renewable energy resources used in electricity production should increase from 1887 GWh in 2007 to 9470 GWh by 2020;
- The share of renewable energy resources used in heat generation should increase from 38.77 PJ in 2007 to 87.05 PJ by 2020;
- The share of biofuel in total fuel consumption should increase from 1.21 PJ PJ in 2007 to 19.6 PJ by 2020;

The national overall target to be notified to the European Union will be defined in consideration of the above strategic targets, as required under Directive 2009/28/EC. The overall national target is based on the requirement of the Directive, whereby the share of energy from renewable sources must reach 13% of the final consumption of energy forecast for 2020, and an action plan on how to achieve this must be developed by the end of June 2010.

3. Use of renewable energy sources in Hungary

3.1. Use of renewable energy sources in the period 2001-2008

Table 3-1 shows the composition of the use of renewable energy sources in Hungary in the years 2001-2008.

In 2008, the share of renewable energy sources, including municipal waste, in total domestic energy use was 68.4 PJ, which amounts to 6.1% of total energy use in the country. In 2008, electricity produced from renewable energy sources amounted to 2362.8 GWh, which represents 5.4% of the gross electricity consumption of 43.98 TWh.

Table 3-1

Use of renewable energy sources and consumption of electricity produced from renewable energy sources in 2001-2008

Description of energy source	Unit:	**2001**	**2005**	**2006**	**2007**	**2008**
Geothermal energy	TJ	3 600	3 627	3 600	3 600	4 000
Sun collector	TJ	60	81	83	105	159
Fuel wood	TJ	13 539	22 189	22 519	23 224	24 053
Other source (waste wood + agricultural waste)	TJ	17 061	21 368	22 900	24 955	27 015
Biogas	TJ	126	297	512	700	906
Electricity generated by hydropower plants, in TJ (using a physical equivalent of 3.6 MJ/kWh)	TJ	669,6	728	670	756	767
Wind	TJ	3,24	36	156	396	738
Photovoltaic	TJ	0,216	0,36	0,36	1,08	1,98
Biofuels			214	450	1215	6900
Total renewable expressed in Joules	TJ	**35 059**	**48 540**	**50 890**	**54 952**	**64 540**
Total renewable expressed in Joules	**PJ**	35,1	48,5	50,9	55,0	64,5
Municipal waste	TJ	2 597	2 764	**3 920**	**4 528**	3 863
Renewable + municipal waste	**PJ**	**37,7**	**51,3**	**54,8**	**59,5**	**68,4**
Primary electricity						
Hydropower plants	GWh	186	202	186,0	210	213
Wind power plants	GWh	0,9	10,1	43,4	110,0	205,0
Photoelectric	GWh	0,06	0,1	0,1	0,3	0,6
Total	GWh	186,9	212,3	229,5	320,3	418,6
Electricity produced from renewable energy sources as a result of conversion						
Biomass	GWh	7	1585	1171	1379	1766
Biogas	GWh	7,6	25	36,7	47	69
Total electricity produced from renewable energy sources as a result of conversion	GWh	14,6	1610	1208	1426	1835
Produced from municipal waste	GWh	112	118	187	281,7	219,4
Electricity produced from renewable energy sources + municipal waste	GWh	**257,5**	**1881,3**	**1531**	**1887**	**2362,8**
Gross electricity consumption	GWh	39 588	41 982	43 066	43 945	43 928
Electricity produced from renewable energy sources + 50% of municipal waste incineration	GWh	257,5	1881,3	1531,1	1887,2	2362,8
Share of electricity produced from renewable energy sources + 50% of municipal waste incineration in total gross electricity consumption	**%**	**0,65**	**4,48**	**3,55**	**4,27**	**5,40**
Primary energy consumption by national economy	PJ	1087,2	1153,2	1152,0	1125,4	1126,3
Renewable energy sources + 50% of municipal waste incineration	PJ	37,7	51,3	54,8	59,5	68,4
Share of renewable energy sources + 50% of municipal waste incineration in total primary energy consumption	**%**	**3,5**	**4,4**	**4,8**	**5,3**	**6,1**

3.2. Electricity production form renewable energy sources in Hungary until 2008

Electricity production from renewable resources showed a more than nine-fold increase in the period 2001-2008. Electricity consumption in 2001 was 39.6 TWh, of which electricity produced from renewable energy sources amounted to 257.5 GWh, based on the statistics. The share of electricity produced from renewable resources in gross electricity consumption was 0.65% in 2001 (green electricity production includes 50% of waste incineration).
Power plants converted to biomass burning became fully operational by 2005, with three biomass burning blocks with a total capacity of 100 MW – *Ajkai Er•m•, Pécsi Er•m•* and *Kazincbarcikai Er•m•* – working at full capacity. Green electricity production was further increased by the fact that two power plants – *Tiszapalkonyai Er•m•* and *Mátrai Er•m•* – mixed coal and lignite burning with the use of renewable energy sources and, as a result, electricity production from biomass reached 1881.3 GWh by 2005 (representing a share of 4.48%).

Electricity production from renewable resources showed an 18% decline in 2006. The reason was that biomass burning power plants used various agricultural residual products (e.g. grape marc, meat meal) in addition to fuel wood, but the availability of these raw materials was not stable. This was partly the reason why the Hungarian Energy Office reduced the mandatory off-take of "green electricity" produced by *Mátrai Er•m•* and other biomass burning power plants in 2006. There were also financial reasons: the application of a reduced off-take quota was justified by the serious deficit of the "KÁP", a fund used to finance the green electricity off-take tariff, at the beginning of 2006.

By 2008, electricity production from renewable resources reached an all time high of 2362.8 GWh, and its share increased to 5.4%.

Under Directive 2001/77/EC, the EU requirement from Hungary is that the share of electricity produced from renewable sources must reach 3.6% by 2010. Hungary fulfilled this expectation in 2005, and the 2008 share is 1.8% higher than the required 3.6%.

Under Directive 2009/28/EC, the European Union expects Hungary to increase the overall share of renewable energy sources to 13% by 2020, and the renewable energy sources strategy adopted by the Government sets a target of around 20% for the share of green electricity by 2020. It appears justified to treat and promote green electricity production and increasing the use of renewable energy sources for thermal energy production as a priority programme in order to improve the security of energy supply and to realise environmental and agricultural benefits.

4. Progress toward achieving the 2010 target set in the 2006 country report on a *pro rata temporis* basis

4.1. Commitment for the period 2005-2010

The country report submitted to the EU in February 2006 considered the following targets – to be viewed as an overall national target – realistic for the period 2005-2010:

- As regards electricity generated from hydropower, the existing capacity may be increased by approximately 5 MW on a realistic basis, which will enable a 27.5 GWh increase in electricity production every year.
- As regards electricity generated from wind power, new capacity of over 200 MW is expected to be added by 2010.
- Due to the high production costs, only a very limited increase in electricity production from solar energy can be expected.
- In electricity production from solid biomass (wood, waste wood, energy crops), a capacity enlargement of at least 30 MW is likely, in addition to the already existing power plant developments, by 2010, which may lead to an increase in electricity production from biomass by 180 GWh per year.
- As a result of EU requirements and regulations, the purification of municipal and animal farm wastewater is becoming a priority, and wastewater purification plants are being built. Biogas containing methane can be used by the energy industry for electricity production. The production and use of energy from biogas already amounted to 25 GWh in 2005. Further units producing and using biogas may be installed on the wastewater purification systems to be built by 2010, which will allow some 55 GWh additional electricity to be produced.
- In the field of geothermal energy, with adequate support and technological development, the installation of 5 MW additional capacity is expected by 2010.
- As regards waste incineration, approved production meeting EU standards may approximate 165 GWh in 2010, on a realistic basis, considering the difficulties in the field of selective waste collection.

The 2006 overall national target implies an annual increase of 750 GWh for the period until 2010.

4.2. Progress toward achieving the 2010 target on a *pro rata temporis* basis

Green electricity production grew from 1881 GWh to 2363 GWh in the period 2005-2008, which is a 482 GWh increase and represents 64% of the 750 GWh commitment considered realistic to be achieved by 2010.

Based on the developments expected to take place until 2010, it is likely that the initial 2010 national target will be exceeded for the following reasons:

- The Hungarian Energy Office authorised the establishment of 330 MW new wind power generating capacity and published a call for proposals for the establishment of additional 410 MW. Based on the Hungarian wind conditions, 2000 hours of utilisation can be expected, which means that the total generating capacity of wind power plants may increase to as much as 1480 GWh when the proposed capacity has been implemented. Even if the capacity is only implemented in part, the higher than expected potential of wind power plants will in itself ensure the fulfilment or overfulfilment of the target.
- As regards biomass, including solid and gas, the new capacity put into operation in 2005 was in itself higher than the 30 MW planned initially on the basis of 2004 conditions, which means that the forecast increase was achieved earlier than expected. Electricity production from biomass further grew by 225 GWh between 2005 and 2008, which takes us very close to the 2010 commitment of 235 GWh.

In conclusion, considering all these aspects, it can be established that Hungary has not only fulfilled the requirements of Directive 2001/77/EC, but also overfulfilled the 3.6% share of green electricity set as a target in the Directive. Furthermore, it can be established that Hungary has already achieved 64% of the growth forecast for the period until 2010 in the 2006 country report and this commitment is also likely to be exceeded.