

## HUNGARY



### Country at a glance

- Population: 9.84 million (2010) [1]
- Total area: 93,028 sq. km [2]
- Carbon emissions per capita: 4.90 metric tons (2010) [3]
- Energy consumption per capita: 29.9 MWh (2010) [4]
- Percentage of global carbon emissions: 0.16% (2010) [3]



### Solar domestic hot water heater on the roof of a small hotel in Hungary

This unusual scheme for solar water heating, using a parabolic mirror array to focus the sun's heat radiation onto the small water heater, is an alternative to the more conventional use of solar water panels.

Solar parabolic array of mirrors for domestic water heating by Kaboldy. Permission Under CC BY-SA 3.0 commons.wikimedia.org/wiki/File:Solar\_parabola.jpg

**Table 1 Breakdown of energy use, electricity and heat generation, 2010**

	Primary energy sourced within country		Energy imports minus exports	Primary energy used within the country <sup>(a)</sup>			Electricity Generation <sup>(b)</sup>		Heat Generation <sup>(c)</sup>		
	unit	ktoe		%	ktoe	GWh	%	GWh	%	GWh	%
Coal, including brown coal & peat		1,593	14	1,132	2,703	31,438	11	6,350	17	1,957	13
Oil fuels		1,090	10	5,776	6,542	76,081	25	490	1	59	0
Natural gas		2,234	20	7,724	9,813	114,122	38	11,598	31	11,519	78
Nuclear		4,119	37	0	4,119	47,909	16	15,761	42	139	1
Hydroelectric		16	0	0	16	188	0	188	1	0	0
Biofuels and waste		1,843	17	36	1,877	21,830	7	2,449	7	989	7
Solar photovoltaics		0	0	0	0	1	0	1	0	0	0
Solar thermal		5	0	0	5	62	0	0	0	1	0
Tide, wave and ocean		0	0	0	0	0	0	0	0	0	0
Wind		46	0	0	46	534	0	534	1	0	0
Geothermal		99	1	0	99	1,147	0	0	0	65	0
Electricity (imported)		0	0	447	447	5,196	2	0	0	0	0
Sub total Renewables		2,009	18	36	6,163	23,763	8	3,172	8	1,055	7
<b>Totals</b>		<b>11,046</b>	<b>100</b>	<b>15,114</b>	<b>25,667</b>	<b>298,509</b>	<b>100</b>	<b>37,371</b>	<b>100</b>	<b>14,729</b>	<b>100</b>

Source: Based on World Energy Statistics and Balances Database 2012, "World Energy Balances." © OECD/IEA, 2012.

Notes:

Standard conversion used is 1 ktoe = 11.63 GWh

- Sum of energy sourced within country, energy imports minus exports, international marine and aviation bunkers and stock change flows.
- Includes all electricity generation, including any exported.
- Does not include electrical heating. Includes waste heat recovery from electricity generation plants.

**Table 2 Breakdown of transport fuel use, 2010**

(in ktoe)	Total transport mix	%	Domestic aviation	Road	%	Rail	Pipeline transport	Domestic navigation	Non-specified (transport)
Oil products	3,846	93	0	3,790	96	56	0	1	0
Natural gas	1	0	0	1	0	0	0	0	0
Biofuels and waste	175	4	0	175	4	0	0	0	0
Electricity	95	2	0	0	0	95	0	0	0
Sub total	175	4	0	175	4	0	0	0	0
Renewables									
<b>Total</b>	<b>4,117</b>	<b>100</b>	<b>0</b>	<b>3,965</b>	<b>100</b>	<b>151</b>	<b>0</b>	<b>1</b>	<b>0</b>

Source: Based on World Energy Statistics and Balances Database 2012, "World Energy Balances." © OECD/IEA, 2012.

## Stand on climate change

Hungary ratified the Kyoto Protocol on the 21 August 2002, but it was only enforced on 16 February 2005.

## National climate change programmes

On 14 April 2008, the new Hungarian energy policy was adopted. The key principles that The Hungarian Energy Efficiency Strategy and Action Plan covered were the security of supply of the energy sources, competitiveness and sustainability, thus highlighting the need for energy savings and efficiency to be increased. Below is a list of the main policies and measures to address climate change:

- National Energy Efficiency Action Plan which was implemented with the aim of improving energy efficiency in a bid to mitigate climate change impacts such as GHG reductions [5]
- Renewable Energy Strategy which was implemented to encourage widespread usage of renewable energy sources (RES) and reduce emissions by 6710 Mt CO<sub>2</sub> by 2010; 9223 Mt CO<sub>2</sub> by 2015; and 11 391 Mt CO<sub>2</sub> by 2020
- Renewable Energy Policies, such as the Environment and Energy Operational Programme (EEOP) which aims to promote increased RES usage [6]
- Retrofit and capacity enlargement of Parks NPP which aims to increase the capacity of the nuclear plant facility as well as extend its lifetime operation. Estimated mitigation impact via emission reduction is 800 – 1000 Mt CO<sub>2</sub>
- European Union Emission Trading Scheme (EU ETS), launched in 2005 [7]
- Transportation Development Operational Programme (TDOP) which is an implementation programme of the Unified Transportation Development Strategy that aims to improve international road access; railway and maritime access; regional access; improve inter-modalities and transport infrastructure of central economic areas; communal transportation development in urban and suburban communal transportation

## Sectoral Policies and Measures

Planned measures in the household (typically electricity and heat) sector targeted to reduce emissions in the period of 2008 – 2016:

- Supporting energy efficient modernization of residential buildings constructed with industrial technology, which aims to save 1 125 GWh per year
- 'For a Successful Hungary' household energy efficiency support and credit programme (NEP application system)
- Usage of individual measurements and mini heat centers in district heat supply so as to reduce district heat demand. Targeted energy saving by 2016: 375 GWh per year
- Development of the operation of the energy efficiency consultation network which aims to provide incentives for energy efficient modernization, with a target of 125 – 375 GWh or energy savings per year
- Regular review and labeling of household boilers, air conditioning or other household electrical appliance/equipment. This provides incentive for the exchange and refurbishment of boilers, as well as replacement of boilers/air conditioning equipment with more efficient ones
- Advocating the purchase of highly energy efficient 'A' labeled domestic appliance in exchange for ones

- Educating school students at primary and secondary level about energy efficiency thereby encouraging energy conscious behavior

Planned measures in the industrial sector targeted to reduce emissions in the period of 2008 – 2016 [8]:

- Continuation of the Energy Efficiency Loan Fund with the integration of the PHARE loan instrument
- Refurbishment of the district heat supply systems thus making district heat supply more competitive. This is aimed at reducing energy consumption from the district heating system. Estimated mitigation impact by gas emission in Mt CO<sub>2</sub> equivalent: 1,004 in 2010; 3,974 by 2015; 4,472 by 2020
- 'Efficient energy consumption instrument' in the Environment and Energy Operational Programme. Estimated mitigation impact by gas emission in Mt CO<sub>2</sub> equivalent: 7, 53 in 2010; 29,805 by 2015; 8,944 by 2020
- Reduction of transformer losses on the electricity network, which aims to reduce the quantity of energy of energy required for electricity generation. Estimated mitigation impact by gas emission in Mt CO<sub>2</sub> equivalent: 2, 3092 in 2010; 9, 1402 by 2015; 10, 2856 by 2020
- Using the heat loss from transformers thereby replacing other energy carriers. Estimated mitigation impact by gas emission in Mt CO<sub>2</sub> equivalent: 0,502 in 2010; 1,987 by 2015; 2,236 by 2020

Planned measures in the transport sector targeted to reduce emissions in the period of 2008 – 2016 [8]:

- Unified Transportation Development Strategy (UTDS) Railway modernization which involves the refurbishment of train lines. Estimated mitigation impact by gas emission in Mt CO<sub>2</sub> equivalent: 0,115 by 2015; 0,107 by 2020 [9]
- UTDS Road transport strategy which involves creating new international and national road networks and raising the standards of service. Estimated mitigation impact by gas emission in Mt CO<sub>2</sub> equivalent: 0, 25 by 2015; 0, 16 by 2020
- Integration of the modes of transport and transportation services under the UTDS: Urban- suburban transport of Budapest
- Implementation of pay toll for heavy vehicles. Estimated mitigation impact by gas emission in Mt CO<sub>2</sub> equivalent: 0, 0622 in 2010; 0, 2497 by 2015; 0, 2808 by 2020
- Increment share of renewable fuel and tax levy on ethanol and biodiesel. Estimated mitigation impact by gas emission in Mt CO<sub>2</sub> equivalent: 0, 753 in 2010; 1,172 by 2015; 1,408 by 2020
- Establishment of safe car parks at the terminuses of public transport networks. Under the P+R system for energy efficient personal transportation. And transportation modernization under the TransOP measure

Planned measures in the tertiary and public sector targeted to reduce emissions in the period of 2008 – 2016 [8]:

- Financial schemes such as third party financing under the Environment and Energy Operational Programme, as well promoting the reduction of energy consumption in the Regional Operational Programmes
- Regulative schemes such as promotion of the Energy Services Company (ESCO) type investments
- Measures to raise awareness about energy efficiency include, municipality training, awareness-raising, consultation based on the experiences of the United Nations Development Programme, Global Environment Facility municipality energy efficiency programme. As well as, Elaboration and application of energy efficiency guidelines

**Ministries involved in climate change/energy policy making:**

Ministries involved	Web links
Ministry of Rural Development	<a href="http://www.kormany.hu/en/ministry-of-rural-development">http://www.kormany.hu/en/ministry-of-rural-development</a>
Ministry of National Development	<a href="http://www.kormany.hu/en/ministry-of-national-development">http://www.kormany.hu/en/ministry-of-national-development</a>
Ministry of National Economy	<a href="http://www.kormany.hu/en/ministry-for-national-economy">http://www.kormany.hu/en/ministry-for-national-economy</a>
Ministry of Foreign Affairs	<a href="http://www.kormany.hu/en/ministry-of-foreign-affairs">http://www.kormany.hu/en/ministry-of-foreign-affairs</a>
Ministry of National Resources	<a href="http://www.nefmi.gov.hu/english">http://www.nefmi.gov.hu/english</a>
Ministry of Interior	<a href="http://www.kormany.hu/en/ministry-of-interior">http://www.kormany.hu/en/ministry-of-interior</a>
National Development Agency	<a href="http://www.nfu.hu/?lang=en">http://www.nfu.hu/?lang=en</a>
National Atomic Energy Agency	<a href="http://www.haea.gov.hu/web/v2/portal.nsf/index_en">http://www.haea.gov.hu/web/v2/portal.nsf/index_en</a>

#### Education institutes involved in climate change/energy policy making:

Education Institutes involved	Web links
Corvinus University of Budapest (with further partners)	<a href="http://www.tyndall.ac.uk/adamproject/about">www.tyndall.ac.uk/adamproject/about</a>
University of Debrecen	<a href="http://meteor.geo.klte.hu/index2-hu.html">meteor.geo.klte.hu/index2-hu.html</a>
Hungarian Academy of Sciences	<a href="http://www.socio.mta.hu/site/index.php">www.socio.mta.hu/site/index.php</a>
Hungarian Forest Research Institute	<a href="http://www.erti.hu/temak.php?id=1&amp;kn=gvop&amp;fn=gvop">www.erti.hu/temak.php?id=1&amp;kn=gvop&amp;fn=gvop</a>
Budapest University of Technology and Economics	<a href="http://www.energia.bme.hu/index.php/tudomanyosmunka/109-tudomanyos-munka/145-kutatasitemak">www.energia.bme.hu/index.php/tudomanyosmunka/109-tudomanyos-munka/145-kutatasitemak</a>
Consortium of Researchers on behalf of Ministry of Environment and Water	<a href="http://www.kvvm.hu/">www.kvvm.hu/</a>
Central European University, Budapest	<a href="http://3csep.ceu.hu/node/74">3csep.ceu.hu/node/74</a> <a href="http://3csep.ceu.hu/node/68">http://3csep.ceu.hu/node/68</a>
Regional Environmental Centre for Central and Eastern Europe with UNEP	<a href="http://www.rec.org/rec/programs/pcf/">www.rec.org/rec/programs/pcf/</a>
Systemexpert Ltd. with: Intelligent Energy for Europe EBRD/JASPERS	<a href="http://www.circle-era.net/%20www.mcpeurope.net%20http://ef.sysexpert.hu">www.circle-era.net/%20www.mcpeurope.net%20http://ef.sysexpert.hu</a>
Hungarian Meteorological Service	<a href="http://www.met.hu/">www.met.hu/</a>
Eötvös Loránd University Budapest	<a href="http://www.elte.hu/en">www.elte.hu/en</a>
Szent István University, Godolló	<a href="http://sziu.hu/">sziu.hu/</a>
National Institute of Environmental Health	<a href="http://www.oki.antsz.hu/index_en.html">www.oki.antsz.hu/index_en.html</a>
NEESPI Regional Focus Research Centre for Nonboreal Eastern Europe at University of West Hungary	<a href="http://neespi.nbeeu.nyme.hu/">neespi.nbeeu.nyme.hu/</a>

## References

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