MACEDONIA

Country at a glance

- Population: 2.06 million (2010) [1]
- Total area: 25,713 sq. km [2]
- Carbon emissions per capita: 3.98 metric tons (2010) [3]
- Energy consumption per capita: 16.2 MWh (2010) [4]
- Percentage of global carbon emissions: 0.03% (2010) [3]

The Kozjak Hydro Power Plant at Lake Kozjak. Permission Under CC BY-SA 1.2 en.wikipedia.org/wiki/File:Kozyak-ot-foynik.jpg

The Kojzak Hydro Power Plant in Macedonia

Set upon the picturesque site of the Kozjak lake on the river Treska, the Kozjak Hydro power plant is the Macedonia's largest hydro-electric station. With an installed capacity of 82 MW, this power station provides clean energy and also an abundance of fish in the artificial lake.

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[(a)]			Electricity Generation[(b)]		Heat Generation[(c)]	
unit	ktoe	%	ktoe	ktoe	GWh	%	GWh	%	GWh	%
Coal, including brown coal & peat	1,194	74	123	1,306	15,192	45	4,743	65	30	3
Oil fuels	0	0	927	939	10,916	33	61	1	391	40
Natural gas	0	0	96	96	1,111	3	25	0	546	56
Nuclear	0	0	0	0	0	0	0	0	0	0
Hydroelectric	209	13	0	209	2,431	7	2,431	33	0	0
Biofuels and waste	201	12	6	199	2,320	7	0	0	0	0
Solar photovoltaics	0	0	0	0	0	0	0	0	0	0
Solar thermal	0	0	0	0	0	0	0	0	0	0
Tide, wave and ocean	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0
Geothermal	12	1	0	12	139	0	0	0	0	0
Electricity (imported)	0	0	122	122	1,420	4	0	0	0	0
Sub total Renewables	422	26	6	420	4,890	15	2,431	33	0	0
Totals	**1,616**	**100**	**1,273**	**2,883**	**33,529**	**100**	**7,260**	**100**	**967**	**100**

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

(a) Sum of energy sourced within country, energy imports minus exports, international marine and aviation bunkers and stock change flows.

(b) Includes all electricity generation, including any exported.

(c) Does not include electrical heating. Includes waste heat recovery from electicity 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	448	100	0	444	100	4	0	0	0
Natural gas	0	0	0	0	0	0	0	0	0
Biofuels and waste	0	0	0	0	0	0	0	0	0
Electricity	2	0	0	0	0	2	0	0	0
Sub total Renewables	0	0	0	0	0	0	0	0	0
Total	**450**	**100**	**0**	**444**	**100**	**6**	**0**	**0**	**0**

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

Stand on climate change

The Former Yugoslav Republic of Macedonia acceded to the Kyoto Protocol in 18 November 2004. The protocol was late enforced on 16 February 2005.

National climate change programmes

In the Former Yugoslav Republic of Macedonia, many European and international organizations have assisted the country's ministries to develop their Sustainable Development Strategy. As previous there was no single document outlining the country's strategy or action plan on climate change, the issues related to resource efficiency and natural resources is covered as part of the Sustainable Development Strategy. The Ministry of Environment and Physical Planning in cooperation with the Swedish International Development Agency (SIDA), brought out a draft publication of the strategy in 2010 and then published its first Sustainable Development Strategy in 2013, highlighted key goals and strategic measures for reaching targets specified and elaborated in the directions of economy and environment [5]. They are:

- Climate Change and Clean Energy: mitigating climate change and its negative effects to society and the environment. Use of renewable sources of energy, structural changes in the industry – benefiting those facilities that do not have large energy and electricity needs and which have cumulative lower impact on the environment;
- Sustainable Transport: ensuring that our transport system meet society's economic, social and environmental needs whilst minimizing their undesirable impacts on the economy, society and the environment;
- Sustainable Consumption and Production: to decouple economic growth from environmental degradation;
- Conservation and Management of Natural Resources: to improve management and avoid overexploitation of natural resources; recognizing the value of the ecosystems services.
- Public health - to promote good public health on equal conditions and improve protection against health threats;
- Social inclusion, demography and migrations - to create a socially inclusive society, solidarity between and within generations and to secure and increase the quality of life of citizens as a precondition for lasting individual well-being;
- Global poverty and sustainable development challenges - poverty reduction, active promotion of sustainable development and consistency of internal and external policies with global sustainable development and its international commitments

In the Strategy for Sustainable Development, the natural environment, geo-diversity, renewable sources of energy, the variety of high quality traditional agricultural and forest products are being identified as areas with potential for sustainable growth. Tourism, our cultural heritage, traditional architecture, craftworks, and the economy based on small and medium sized enterprises, are all factors identified as the country's potential for sustainable development. Among the key priorities are also the pan-European corridors as a solid basis for the regional development.

Partnership with the Austrian Development Cooperation

Many international and European agencies from Sweden, Norway and Germany have provided assistance and support towards the Macedonian Government to develop its national climate change programmes and plans. The Austrian Development Cooperation or ADC has supported Macedonia in the field of environment since 1998. In both the areas of energy and water, the cooperation has evolved from a project based on technical issues into a strategic and integrated programme based approach. The initial focus of ADC in Macedonia on water and sanitation has gradually shifted to renewable energy and environmental education.

ADC also focuses on energy efficiency, renewable energy, climate change issues in alignment with the Macedonian energy policy of renewable energy and energy efficiency. The strengthening of institutional Macedonian capacities related to renewable energy and energy efficiency in the building sector is a main objective. A specific aim here is to support the Ministry of Economy and the Macedonian Energy Agency in the development of an efficient, cost-effective energy infrastructure, taking into due account supply security, accessibility and affordability for the population [6].

A programme financed by both countries is designed to decrease the country's dependency on energy imports in a mid-term perspective, e.g. by decreasing the use of electricity for heating purposes and by increasing energy efficiency in buildings. Specific interventions include:

- The legislative framework for energy efficiency in buildings; promotion of efficient energy in buildings (Ministries of Economy, Transport and
- Communication, Macedonian Energy Agency, Chamber of Commerce); promotion of renewable energy resources (Ministry of Economy and Macedonian Energy Agency);
- Environmental awareness raising and know-how transfer (Ministry of Environment, Regional Environmental Centre, NGOs);
- Capacity building involving the academia and research centers (Macedonian universities, University of Graz, Macedonian Academy of Sciences and Arts, businesses

The National Energy Efficiency Action Plan

The European Council (EC) Directive 2006/32/ of the European Parliament and of the Council on energy end-use efficiency and energy services (ESD) requires Members States to prepare three National Energy Efficiency Action Plans (NEEAP) for the period 2008 – 2016 and report them to the European Commission. The recommended model from European Commission for Member States of European Union has been used. The reported period for achievement of the indicative target for Member States of European Union under the Directive is 2008 – 2016. The primary aim is that all Member States achieve an energy savings target of 9% of the average final inland energy consumption for the period 2001-2005 for the ninth year of application of this Directive. The NEEAP identifies the following sectors in Macedonia for energy reduction targets [7]:

Residential sector

- Skopje District heating: end-use heat metering and consumption based billing
- Energy efficiency in social housing
- Building codes and enforcement certifications
- Electrical appliance and equipment labelling the energy performance standards
- Replacement of fire wood furnaces with high efficiency models
- Information centres and campaigns on energy efficiency
- Financial support for energy efficiency investments
- Solar collectors and geothermal heat pumps in old houses
- Energy efficiency retrofits in old buildings

Commercial sector and services

- Periodic management and auditing of boilers/air conditioning and other systems along with certification in commercial buildings
- Promote energy efficiency in the education sector
- Campaigns for municipal energy efficiency network
- Street lighting efficiency upgrades
- Refurbishment of hospital buildings

Industry

- Improvement of process performances
- Energy auditing structure
- Promote co-generation plants
- Improved lighting and heating systems
- Promote fuel-type change and clean development mechanism (CDM) projects
- Promote use of waste-heat in different sectors

Transport

- Renewal of national road vehicle fleet
- Promote sustainable urban transport system
- Introduce tramway in Skopje
- Renewal of public transport bus and integrated traffic management
- Promote use of bicycles
- Promote use of biofuels for vehicles and fuel economy standards

Ministries involved in climate change/energy policy making:

Ministries involved	Web links
Ministry of Foreign Affairs	**www.mfa.gov.mk/**
Ministry of Finance	**www.finance.gov.mk/**
Ministry of Education and Science	**www.mon.gov.mk/**
Ministry of Agriculture, Forestry and Water Economy	**www.mzsv.gov.mk/**
Ministry of Transport and Communications	**mtc.gov.mk/new_site/mk/**
Ministry of Environment and Physical Planning	**www.moe.gov.mk/**

Education institutes involved in climate change/energy policy making:

Education Institutes involved	Web links
Macedonian Center for Energy Efficiency	**www.macef.org.mk/**
Center for Regional Policy Research and Cooperation	**www.studiorum.org.mk/en/**
Euro-Balkan Institute for Social and Humanities Research	**www.euba.edu.mk/**

References

[1] "World Population Prospects: The 2010 Revision." Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat.

[2] "CIA - The World Factbook." Available at: https://www.cia.gov/library/publications/the-world-factbook/geos/th.html. [Accessed: 12-Mar-2013].

[3] CO_2 Emissions from Fuel Combustion Statistics database 2012, "Indicators for CO_2 emissions." © OECD/IEA, 2012.

[4] World Energy Statistics and Balances database 2012, "World Energy Balances." © OECD/IEA, 2012.

[5] Sustainable Development Strategy of the Republic of Macedonia. Office of Statistical Services, 2013. Available at: http://www.stat.gov.mk/Publikacii/OdrzlivRazvoj2013.pdf

[6] Macedonian Country Strategy – Austrian Development Cooperation. Available at: http://www.entwicklung.at/uploads/media/Country_Strategy_Macedonia_2010-2012.pdf

[7] National Energy Efficiency Action Plan – Republic of Macedonia. Available at: http://www.energy-community.org/pls/portal/docs/986178.PDF

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