

## BULGARIA

### Country at a glance

- Population: 7.49 million (2010) [1]
- Total area: 110,879 sq. km [2]
- Carbon emissions per capita: 5.85 metric tons (2010) [3]
- Energy consumption per capita: 27.7 MWh (2010) [4]
- Percentage of global carbon emissions: 0.14% (2010) [3]



### Solar Parks in Bulgaria

Bulgaria has good sun radiance for solar parks. Several large parks are in operation. The largest of the country is at Sbar region and has a capacity of around 60MW.

Photovoltaic power station in Sbor, Bulgaria by Edal Anton Lefterov. Permission Under CC BY-SA 3.0 commons.wikimedia.org/wiki/File:Photovoltaic-power-station-in-Gelemenovo.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	ktoe	GWh	%	GWh	%	GWh	%
Coal, including brown coal & peat		4,937	47	1,705	6,914	80,406	39	22,606	49	6,052	38
Oil fuels		22	0	4,212	3,868	44,990	22	393	1	1,465	9
Natural gas		59	1	2,130	2,300	26,746	13	1,967	4	8,050	51
Nuclear		3,997	38	0	3,997	46,479	22	15,249	33	262	2
Hydroelectric		435	4	0	435	5,058	2	5,057	11	0	0
Biofuels and waste		961	9	-56	913	10,621	5	35	0	22	0
Solar photovoltaics		1	0	0	1	15	0	15	0	0	0
Solar thermal		10	0	0	10	119	0	0	0	0	0
Tide, wave and ocean		0	0	0	0	0	0	0	0	0	0
Wind		59	1	0	59	681	0	681	1	0	0
Geothermal		33	0	0	33	380	0	0	0	0	0
Electricity (imported)		0	0	-726	-726	-8,448	-4	0	0	55	0
Sub total Renewables		1,499	14	-56	1,451	16,874	8	5,788	13	22	0
<b>Totals</b>		<b>10,514</b>	<b>100</b>	<b>7,266</b>	<b>17,803</b>	<b>207,047</b>	<b>100</b>	<b>46,003</b>	<b>100</b>	<b>15,906</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

(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 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	2,440	90	15	2,405	97	20	0	0	0
Natural gas	207	8	0	66	3	0	141	0	0
Biofuels and waste	20	1	0	20	1	0	0	0	0
Electricity	34	1	0	0	0	25	2	0	7
Sub total	20	1	0	20	1	0	0	0	0
Renewables									
<b>Total</b>	<b>2,702</b>	<b>100</b>	<b>15</b>	<b>2,491</b>	<b>100</b>	<b>45</b>	<b>143</b>	<b>0</b>	<b>7</b>

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

## Stand on climate change

Bulgaria signed the Kyoto Protocol on 18 September 1998 and ratified it on 15 August 2002. The Protocol was later entered into force on 16 February 2005.

## National climate change programmes

The Ministry of Environment and Water of the Republic of Bulgaria released the Third Action Plan on Climate Change on May 2012. The core themes of the plan are preservation, rational and responsible use of resources but at the same time to achieve sustainable economic growth and increase the competitiveness of the economy. The plan is for the period of 2013 to 2020 [5].

Some notable government legislation measures in the plan are:

- Environmental Protection Act (EPA)
- Energy Act (EA)
- Renewable Energy Act (REA)
- Energy Efficiency Act (EEA)
- Clean Ambient Air Act (CAAA)
- Forestry Act (FA)
- Local Government and Administration Act (LGLAA)
- Spatial Planning Act (SPA)
- Waste Management Act (WMA)
- Geological Storage of Carbon Dioxide Act (GSCDA)
- Draft Climate Act

Other strategies and programmes are:

- A. Energy Strategy of the Republic of Bulgaria Until 2020: It covers four areas for tackling climate change: reducing energy intensity and increasing energy efficiency, reducing dependency on imported energy, promoting economic growth and employment and provision of secure and affordable energy
- B. National Energy Efficiency Programme till 2015: Adopted under the repealed EEA (2004)
- C. National Action Plan on Renewable Energy Sources (RES): based on the projected final (end-use) consumption of energy in the period 2010-2020
- D. Programme for promotion of use of biofuels in the transport sector: national targets and instruments for meeting the targets are set and indicated

Other than legislation and programmes, the Third Action Plan includes various sectoral measures such as:

### **Energy sector**

- Improving production efficiency in existing coal-fired power plants and fuel substitution to natural gas through European ETS and according to Article 10C of the 2003/87/EC Directive [6]
- Implementation of pilot projects with clean technologies through national programmes
- Initiate geological studies for determining CO<sub>2</sub> storage sites in line with the Geologic Storage of Carbon Dioxide Act
- Introduction of mandatory efficiency requirements for new coal-fired power plants through legislative changes
- Increase of highly efficient co-generation plants through system of preferential pricing
- Institutional support for investments in nuclear energy under the National Action Plan for Renewable Energy Sources
- Increase the share of electricity from renewable energy sources (RES)
- Increase the capacity for generation of pumped-storage hydroelectricity
- Increase the share of heating and cooling networks from renewable energy sources (RES)
- Rehabilitation of existing and building of new low-carbon district heating networks
- Energy efficiency in the transportation of energy through “Smart” energy storage networks and facilities

### **Household and service sector**

- Implementation of different measures such as promotion of flexible financial schemes for sale of energy and incentives for combined and integrated solutions to reduce energy consumption
- Introduction of mandatory energy efficiency scheme such as registration of state-owned and public buildings with total floor space over 250m<sup>2</sup> and periodic energy audits under the Energy Efficiency Directive
- National Plan to increase zero energy through inter-institutional working groups with participation from all stakeholders, analytical reports, new standards and introduction of market mechanisms
- Introduction of standards for sustainable buildings and energy management by encouraging and planning target resources for buildings
- Introduction of a public registry for issuance and maintenance of Energy Efficiency Certificates and Technical Papers of buildings

### **Industry Sector**

- Implementation of prescribed measures under the Energy Efficiency Act such as regular audits for energy efficiency
- Use of biomass in the combustion units of power plants under the Waste Management Act

### **Agriculture Sector**

- Financial support for improving equipment and technology of production by developing measures for investment and support in agricultural rice fields
- Establishment of specialized units for implementation on climate change mitigation related to agriculture

### **Transport sector**

- Ensure optimum driving modes of automobile engines through regular updating of designs and developing and modernizing existing road infrastructure
- Introduction of intelligent transport systems along the national and urban road network
- Increasing the share of biofuels in the transport sector under the Renewable Energy Sources (RES) Act
- Developing and promoting use of hybrid vehicles through tax incentives and permits
- Building infrastructure and streamlining procedures for charging stations of electric vehicles
- Reduction of trips with private motor vehicles by introducing road charges and promoting non-motorized transport such as bicycles by constructing cycling infrastructure and systems

- Fiscal policy measures to limit use of conventional fuels through efficient implementation of “polluter pays” and “consumer pays” principles
- Increasing the share of public electric transport in rail, tram and metro under financing from European and national funds

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

Ministries involved	Web links
Ministry of Environment and Water	<a href="http://www.moew.government.bg/?&amp;lang=en">www.moew.government.bg/?&amp;lang=en</a>
Ministry of Foreign Affairs	<a href="http://www.mfa.government.bg/setlang/en/">www.mfa.government.bg/setlang/en/</a>
Ministry of Education, Youth and Sciences	<a href="http://www.minedu.government.bg/news-home/">www.minedu.government.bg/news-home/</a>
Ministry of Regional Development and Public Works	<a href="http://www.mrrb.government.bg/index.php?lang=en">www.mrrb.government.bg/index.php?lang=en</a>
Ministry of Economy, Energy and Tourism	<a href="http://old.mee.government.bg/eng/">old.mee.government.bg/eng/</a>
State Energy and Water Regulatory Commission	<a href="http://www.erranet.org/AboutUs/Members/Profiles/Bulgaria">www.erranet.org/AboutUs/Members/Profiles/Bulgaria</a>
National Trust Eco Fund	<a href="http://www.ecofund-bg.org/NDEF/index.php?pageid=1&amp;lng=en">www.ecofund-bg.org/NDEF/index.php?pageid=1&amp;lng=en</a>

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

Education Institutes involved	Web links
Bulgarian Academy of Sciences	<a href="http://www.cu.bas.bg/">www.cu.bas.bg/</a>
National Institute of Meteorology and Hydrology	<a href="http://www.meteo.bg/">www.meteo.bg/</a>
Bulgarian Academy of Sciences – Forest Research Institute	<a href="http://www.bas.bg/fribas/">www.bas.bg/fribas/</a>
Institute of Nuclear Research and Energy	<a href="http://www.inrne.bas.bg/">www.inrne.bas.bg/</a>
National Center for Public Health and Analysis	<a href="http://ncphp.government.bg/en">ncphp.government.bg/en</a>
Sustainable Energy Development Agency	<a href="http://www.seea.government.bg/index.php?lang=en">www.seea.government.bg/index.php?lang=en</a>

#### 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<sub>2</sub> Emissions from Fuel Combustion Statistics database 2012, “Indicators for CO<sub>2</sub> emissions.” © OECD/IEA, 2012.
- [4] World Energy Statistics and Balances database 2012, “World Energy Balances.” © OECD/IEA, 2012.
- [5] Third National Action Plan on Climate Change – Ministry of Environment and Water of the Republic of Bulgaria. Available at: [http://www3.moew.government.bg/files/file/Climate/Climate\\_Change\\_Policy\\_Directorate/THIRD\\_NATIONAL\\_ACTION\\_PLAN.pdf](http://www3.moew.government.bg/files/file/Climate/Climate_Change_Policy_Directorate/THIRD_NATIONAL_ACTION_PLAN.pdf)
- [6] European Union Emissions Trading Scheme – Article 10c of 2008/87/EC Directive. Available at: <http://www.emissions-euets.com/energy-climate-legislatory-package-implementation/906-implementation/53-article-10c2-of-the-directive-200387ec-burdened-with-internal-contradiction>