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Country at a glance

- Population: 8.39 million (2010) [1]
- Total area: 83,871 sq. km [2]
- Carbon emissions per capita: 8.26 metric tons (2010) [3]
- Energy consumption per capita: 46.9 MWh (2010) [4]
- Percentage of global carbon emissions: 0.23% (2010) [3]

From Glacier to Electricity by Paul van Soest. Permission Under CC BY-NC-SA 2.0 License www.flickr.com/photos/paulvansoest/3731754233/in/datetaken/

From Glaciers to Hydroelectric Power Generation in Austria

Water from the Austrian Westliches Stillupkees alpine glacier, shown in this picture, feeds the the Stillupbach river which supplies the Stillup Speicher reservoir and its hydroelectric power plant.

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	0	0	2,995	3,409	39,644	10	6,704	10	852	4
Oil fuels	1,026	9	11,596	12,300	143,050	36	1,275	2	2,072	9
Natural gas	1,486	13	6,113	8,212	95,507	24	14,346	21	9,736	44
Nuclear	0	0	0	0	0	0	0	0	0	0
Hydroelectric	3,303	28	0	3,303	38,413	10	38,406	57	0	0
Biofuels and waste	5,558	47	466	6,029	70,122	18	5,034	7	9,271	42
Solar photovoltaics	8	0	0	8	89	0	89	0	0	0
Solar thermal	164	1	0	164	1,904	0	0	0	0	0
Tide, wave and ocean	0	0	0	0	0	0	0	0	0	0
Wind	178	2	0	178	2,064	1	2,064	3	0	0
Geothermal	35	0	0	35	402	0	1	0	149	1
Electricity (imported)	0	0	200	200	2,331	1	0	0	4	0
Sub total Renewables	9,244	79	466	9,716	112,994	29	45,594	67	9,420	43
Totals	**11,756**	**100**	**21,371**	**33,837**	**393,526**	**100**	**67,919**	**100**	**22,084**	**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	7,119	89	34	7,024	94	51	24	0	10	0
Natural gas	140	2	0	4	0	0	0	137	0	0
Biofuels and waste	472	6	0	468	6	3	2	0	1	0
Electricity	298	4	0	0	0	155	74	12	0	130
Sub total Renewables	472	6	0	468	6	3	2	0	1	0
Total	**8,029**	**100**	**34**	**7,495**	**100**	**209**	**100**	**149**	**11**	**130**

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

Stand on climate change

Austria ratified the Kyoto Protocol on 30 May 2002 with the European Union [5].

National climate change programmes

On 29 May 1994, Austria signed the United Nations Framework Convention on Climate change[6].

In 2002, the Austrian Climate Change Strategy was finalized and it includes a package of possible measures and activities to reduce the national GHG emissions for different sectors. In 2004, an innovative and long term programme was launched in order to support the achievement of the goals of the Austria Climate Change Strategy. Its aim was to support energy efficiency and increase the use of renewables in all sectors of the economy, through direct grant support and accompanying measures, such as information and advice. It is an innovative add-on to common instruments, introducing target group oriented programmes in the areas of buildings, mobility, municipalities and renewable energy sources [7].

Sub-programmes are designed to support the grant, regulations and fiscal measures used in the climate strategy, to give incentives for the use of climate impact reducing products. The thematic sub-programmes develop technological and organizational solutions which are able to compete on the market, take care of innovative quality standards and promote training of all relevant groups [7].

Furthermore, investment subsidy programmes and legal and fiscal instruments provide targeted support such as further education and vocational training of people for quality management.

The thematic sub-programmes are categorised as:

- Building & Renovation
- Energy Saving
- Renewable Energy
- Mobility

For building and renovation, the major goals are to:

- Increase the market share of ecological buildings in the residential and service building sector
- Establish the building standard as the orientation benchmark for ecological building throughout the whole of Austria
- Further develop the funding policies and legal framework conditions in the building sector
- Innovation: implement marketable results of research

For energy saving, energy consultants in manufacturing companies are given further training by experts from the Austrian Energy Agency. Guidelines were developed and audits were carried out.

For renewable energy, it promotes the efficient and qualitative use of biomass and renewable raw materials by means of technology improvements, support programmes and consultations. The "heating system matrix" is available for single family houses as well as for touristic and large residential buildings.

For mobility, the transport climate protection programme offers local communities, companies and different associations comprehensive support within the framework of the following five modules:

- Good advice: Free consultation and support are given to develop and implement climate friendly mobility management as well as solutions that help minimize CO_2 emissions. Help is also provided for application of subsidies.

- Efficient support programmes: Financial support is given to companies to encourage them to use climate friendly traffic measures especially for switching their vehicle fleets to alternative drives and fuels. Promotion of bicycle traffic or climate-friendly mobility plans such as mobility centres or community buses are also supported financially.

- Motivating information: Information campaigns and media help to promote the opportunities and advantages of climate-friendly traffic, alternative vehicles, renewable fuels and fuel-saving driving behaviours.

- Trained and certified: Offers for training courses, certifications and the chance to achieve higher qualifications in green jobs are increased.

- Awarded: Companies, towns and cities, states, associations, schools and youth groups and other project coordinators who supported the programme are awarded the status of mobile project partners by the Environment Minister.

According to the Burden Sharing Agreement signed jointly with the other members of the European Union in 2007, the reduction target of Austria for HFCs, PFCs and SF_6 was set to 13% from 2008 to 2012 compared to that of 1990 [8]. In order to achieve this, the federal government and states adopted the climate strategy used in 2002 as the basis for the new national climate strategy. This new set of national measures includes thermal renovation of houses and expansion of public transport to reduce the emissions. Other than the national climate strategy, in 2003, the Austrian JI/CDM Programme was also set up to discourage large emissions. Companies and industries are able to purchase emission credits which allow them to release a fixed amount of emissions. The purchasing target of this programme is 45 million tons for 2008 to 2012.

In 2009, Environment Minister Berlakovich and Economy Minister Mitterlehner launched a participative process to work out the Austrian Energy Strategy [9]. The Austrian Energy Strategy indicates which priorities and measures are appropriate to achieve the objectives set in 2008 as part of the agreement and show how energy can be provided in an environmentally friendly, safe and affordable way as a measure to reduce emissions from production of energy. Measures proposed include increasing renewable energy by utilizing the potential of hydropower, wind power, biomass and solar as well as the use of waste heat such as district heating in cities and use of biomass in rural areas. Expansion and modernization of transmission and distribution grids are also part of the strategy to improve efficiency.
There were also series of measures that were put in place for the different sectors [7]:

- For residential: Smart metering systems
  The Electricity Industry Organization Act is to provide electricity that is environmentally friendly, reasonably priced, sufficient and of high quality while creating a market organization according to the EU guidelines and principles of national law and to further a greater part of renewable energy in the electricity production sphere[10]. In October 2011, a decree was issued by the Austrian Energy Regulatory Authority E-Control that determines the requirements of smart metering systems. Also in 2012, the Austrian Minister of Economy issued a decree that determines the mandatory timetable for the rollout of smart metering services. With this decree, at least 95% of all metering points will be equipped by 2019.

- For transport: Environmental bonus (Ökoprämie)
  This bonus amounted to 1500 Euros and was limited to 30,000 vehicles. The amount was split evenly between the federal government and domestic car dealers. It aimed to fight the effects of global downturn on domestic car sales, preserve jobs and encourage people to replace older and inefficient cars with the latest technology. The limit was reached by July 2009.

- For tertiary:
  Various energy advice and promotion programmes for local authorities are easily available. The aim is to support them through the planning of measures through to the implementation. This includes the e5 programme for energy efficient local authorities, Climate Alliance, energy saving programmes, environmental local authorities, EKKO energy and climate model regions. The cost for these projects amounts to about 3 million Euros per year.

Ministries involved in climate change/energy policy making:

Ministries involved	Web links
Foreign Ministry	**www.bmeia.gv.at/en**
Federal Ministry of Agriculture, Forestry, Environment and Water Management	**www.lebensministerium.at/umwelt**
Federal Ministry of Economy, Family and Youth	**www.en.bmwfj.gv.at/Seiten/default.aspx**
Council on Climate Change	**www.accc.gv.at/**
Energy Regulatory Authority E-Control	**www.e-control.at/en/home_en**

Education institutes involved in climate change/energy policy making:

Education Institutes involved	Web links
University of Graz - Wegener Center for Climate and Global Change	**www.uni-graz.at/en/igam7www.htm**
University of Natural Resources and Applied Life Sciences	**www.boku.ac.at/home.html?L=1**
Austria Institute of Technology	**www.ait.ac.at/**
University of Technology- Institute for Energy Systems and Thermodynamics (IET)	**www.tuwien.ac.at/en/research/**
Austrian Energy Agency	**www.energyagency.at/**
Environment Agency Austria	**www.umweltbundesamt.at/en**

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/id.html. [Accessed: 13-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] "Austria's Initial Report under the Kyoto Protocol." Federal Ministry of Agriculture and Forestry, Environment and Water Management, 2006.

[6] "Climate Policy." Available at: http://www.accc.gv.at/klimaschutz.htm. [Accessed: 28-Mar-2013].

[7] "Energy Efficiency Policies and Measures in Austria." Austrian Energy Agency, 2010.

[8] "• EUROCONSTRUCT •." Available at: http://www.euroconstruct.org/service/cotm/austria07_05/country_otm.php. [Accessed: 28-Mar-2013].

[9] "The Austrian Energy Strategy: lebensministerium.at." [Online]. Available at: http://www.lebensministerium.at/en/fields/environment/Renewableenergy/Energystrategy.html. [Accessed: 28-Mar-2013].

[10] "FAOLEX." Available at: http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=111764&database=faolex&search_type=link&table=result&lang=eng&format_name=@ERALL. [Accessed: 28-Mar-2013].

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