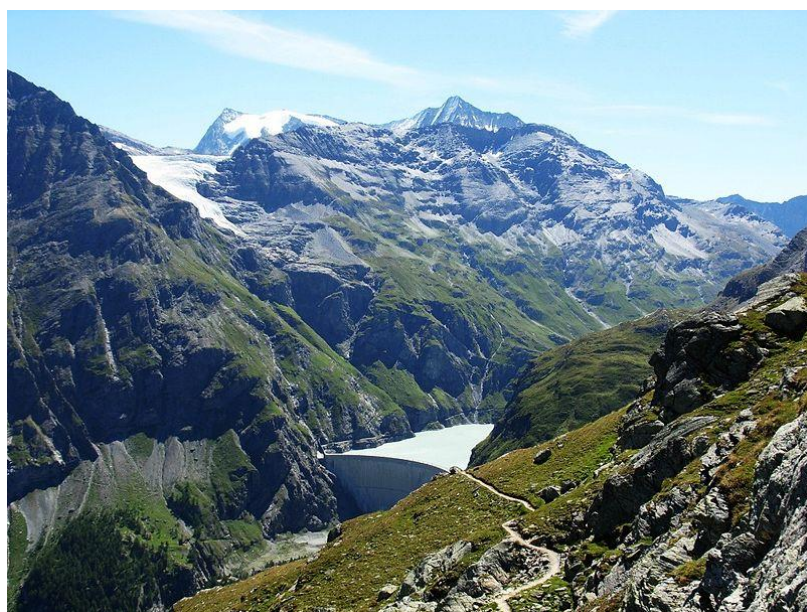


SWITZERLAND

Country at a glance

- Population: 7.66 million (2010) [1]
- Total area: 41,277 sq. km [2]
- Carbon emissions per capita: 5.72 metric tons (2010) [3]
- Energy consumption per capita: 39.77 MWh (2010) [4]
- Percentage of global carbon emissions: 0.14% (2010) [3]



The Mauvoisin Dam upon Mont Blanc in Switzerland

Set upon the scenic backdrop of the Mont Blanc mountain range, the Mauvoisin Dam at Valais, Switzerland is the eight largest dam of the world. With a production capacity of 363 MW, the Mauvoisin Dam is one of many dams in Switzerland meeting primary electricity demand.

Mauvoisin Dam in Valais, Switzerland. Permission Under CC BY-NC 1.0 License en.wikipedia.org/wiki/File:Mauvoisin.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 ^(a)			Electricity Generation ^(b)		Heat Generation ^(c)		
	unit	ktoe		%	ktoe	GWh	%	GWh	%	GWh	%
Coal, including brown coal & peat		0	0	131	153	1,782	1	0	0	0	0
Oil fuels		0	0	11,744	10,346	120,326	39	70	0	42	1
Natural gas		0	0	3,009	3,009	34,994	11	1,044	2	1,239	24
Nuclear		6,895	55	0	6,895	80,191	26	26,339	40	361	7
Hydroelectric		3,101	25	0	3,101	36,067	12	36,061	55	0	0
Biofuels and waste		2,325	18	18	2,342	27,242	9	2,426	4	3,569	68
Solar photovoltaics		7	0	0	7	83	0	83	0	0	0
Solar thermal		44	0	0	44	515	0	0	0	0	0
Tide, wave and ocean		0	0	0	0	0	0	0	0	0	0
Wind		3	0	0	3	37	0	37	0	0	0
Geothermal		259	2	0	259	3,014	1	0	0	0	0
Electricity (imported)		0	0	45	45	520	0	0	0	3	0
Sub total Renewables		5,740	45	18	12,652	66,958	22	38,607	58	3,569	68
Totals		12,635	100	14,947	26,206	304,771	100	66,060	100	5,214	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 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	5,734	95	63	5,649	100	12	0	9	0
Natural gas	17	0	0	17	0	0	0	0	0
Biofuels and waste	9	0	0	9	0	0	0	0	0
Electricity	272	5	0	0	0	272	0	0	0
Sub total Renewables	9	0	0	9	0	0	0	0	0
Total	6,032	100	63	5,675	100	284	0	9	0

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

Stand on climate change

Switzerland signed the Kyoto Protocol on 16 March 1998 as an Annex I member country. They ratified the protocol on 9 July 2003 and it was enforced on 16 February 2005. Under the Kyoto Protocol, Switzerland was subject to an emissions reduction of 0.3% from 1990 levels.

National climate change programmes

The centre-piece of Swiss climate policy is the CO₂ Act that came into force in May 2000 [5]. It limits CO₂ emissions from fossil fuel use for heating and transport to 10% below 1990 levels over the period from 2008-2012. The overall target is further divided into a reduction target of 15% on heating and process fuels and 8% on transport fuels. The primary instruments to reach the targets are:

- Voluntary actions in various areas
- Subsidiary CO₂ levy for heating and process fuels as well as transport fuels
- Measures in other policy areas that are relevant to climate change mitigation
- Emissions trading and complementary use of flexible mechanisms (cap and trade)

Within the CO₂ Act, the Federal Council is obliged to propose further reduction targets for the time after 2012. It has put a climate policy proposal forward for parliamentary discussion in August 2009 including:

- Reduction of emissions by 20% below 1990 in 2020 (possibly 30%, depending on other nations' commitments)
- Continuation of a CO₂ levy on heating fuels
- Intensified efforts to promote energy efficiency and use of renewable energy in the building sector, subsidized with up to CHF 200 million from the CO₂ levy
- Introduction of CO₂ emission limits for new cars, compatible with EU regulations; compensation of parts of the CO₂ emissions from the transport sector by domestic or international projects; option to introduce a CO₂ levy on transport fuels if other measures in the transport sector prove insufficient
- Full compensation of emissions from combined cycle power plants
- Further development of a national emissions trading scheme with a view to link it to the EU scheme of national coordination of adaptation measures

At present, the CO₂ Act is under revision and in contrast to the current version, which exclusively addresses mitigation; the revised law will also provide the legal basis for adaptation. According to Article 7 of the Act, the Federation shall coordinate and provide the basis for adaptation measures. The revised CO₂ Act will enter into force in January 2013.

Some notable sectoral and cross-sectoral policies and measures

Besides the landmark CO₂ Act, the policies and measures presented in the fourth national communication have been upheld and developed over the past years. Some of the planned policies have been implemented in the meantime and make part of the Swiss climate policy portfolio for compliance with the Kyoto Protocol. Further to these policies, some additional sectoral approaches and measures are [6]:

- Introduction of “climate cent” on fuels for transport (0.015CHF/litre) levied by mineral oil importers to fund the Climate Cent Foundation
- Second term of Swiss Energy Programme 2006-2010 (follow-up to Energy 2000 and Swiss Energy 2000-2005) [6]
- Federal decree on compulsory compensation of all CO₂ emissions from gas power stations (currently limited until 31 December 2010, but parliamentary discussion for including compensation conditions into revised CO₂ Act ongoing)
- Introduction of a levy on heating fuels on 1 January 2008 (12 CHF/t CO₂), increased to 36 CHF/t CO₂ as of 1 January 2010
- Action plans such as “Energy efficiency” and “Renewable energy” adopted
- Addendum to the contract with the Climate Change Foundation to deliver additional CO₂ credits within and outside Switzerland
- Swiss Inter-departmental Committee for Climate Policy (SICCP), inaugurated in April 2008
- Promotion of natural gas and biofuels via reduced tax rates from 1 July 2008 (with the provision of a favorable ecological balance of the biofuel)
- Earmarking of CO₂ tax revenues to fund building programme (passed by the parliament in June 2009)

Energy Sector

For the energy sector, the federal Swiss government also initiated some policy measures to ensure adequate, broad-based, secure, economical and ecologically safe energy supply, and the economical and efficient use of energy. The policies and measures in the energy sector are addressing three priority areas: the building sector, transport sector and the regulatory framework concerning renewable energy (in particular electricity). Policies and measures are allocated to various interlinked programmes and frameworks, both at federal and cantonal level. Most relevant ones are [7]:

- The Swiss Energy programme, with the target for 2010 to reduce fossil fuel consumption by 10% compared to 2000, to limit the increase in electricity consumption to 5% compared to 2000, and to increase the percentage of electricity from renewable sources by 1% and of heat from renewable sources by 3%
- Regulations in the electricity market and opening of the market in two stages
- Cantonal energy directors adopting new building codes (SIA 380/1 2007)
- Action plans for energy efficiency and renewable energies
- Short-term measures to curb the economic downturn that intensify existing initiatives in the energy sector

The following measures focus on the transport sector to reduce emissions [8]:

Emissions standards

Following the European path of reducing air pollutants from vehicles, the Swiss government introduced the Euro 4 Standard in 2006; Euro 5 in September 2009 and Euro 6 will be enforced on September 2014. With regard to reducing particulate matter (PM) and diesel soot emissions, particle filter trap systems have been introduced or are under discussion for various types of vehicles (city buses, construction machinery, etc.). The active promotion of filter systems is envisaged, e.g. via fiscal incentives for purchasing new or retrofitting old engines (on import taxes or at the cantonal level on yearly taxes).

Energy saving programmes

In 2002, the association of Swiss automobile importers signed an agreement with the Department of Environment, Transport, Energy and Communications (DETEC) to reduce specific fuel consumption of the newly released motor car fleet by 24% between 2000 and 2008. Swiss Energy supported this effort by establishing a compulsory energy label for new motor vehicles in 2003 and by launching a special campaign raising public awareness. The average fuel consumption of new cars was 15.2% below 2000 levels in 2008. Because the target of the agreement was not reached, the Federal Council currently plans to amend the CO₂ Act and limit CO₂ emission levels for the new car fleet according to EU regulations decreed in December 2008, which stipulates a target of 130g CO₂/km by 2015.

Environmental label for new motor vehicles

In 2007, the Department of Environment, Transport, Energy and Communications (DETEC) decided to further develop the energy label, which evaluates the energy efficiency of motor vehicles according to the categories A to G. In addition to the classification in categories according to their energy-efficiency, the new label will also consider ecological criteria (such as air pollution and noise). Under these schemes, a system of bonuses/penalties on new cars will be implemented.

A bonus would reward consumers who purchase “green”, fuel-efficient cars, with bonus payments to be financed by an increase in vehicle tax (i.e. in a revenue-neutral manner).

Voluntary agreements on the use of biogas in the transport sector

In 2003, an agreement between biogas producers and gas distributors regulating the purchase of biogas was reached. Biogas is injected into the natural gas grid and marketed as motor fuel in pure or mixed form. Under this agreement, the biogas purchased by gas distributors is to account for at least 10% of all gas sold as motor fuel.

Mineral oil tax reduction on biofuels and natural gas

The amendment of the Mineral Oil Tax Act that came into force on 1 July 2008 provides tax incentives for low carbon fuels. A budget neutral tax reduction of 40 Swiss cents per litre of petrol equivalent for natural and liquefied petroleum gas (LPG) and complete tax exemption for biogas and other fuels from renewable sources are granted to biofuels fulfilling ecological and social criteria. The required ecological criteria for tax exemption are: a minimum of 40% GHG reduction based on life-cycle assessment (LCA); a net environmental burden not significantly exceeding the one of fossil fuels; the cultivation of biofuels must not endanger biodiversity, in particular rainforests.

Freight/heavy goods transport

Switzerland’s freight transport policy bases on article 84 of the federal constitution, which requires transalpine freight transport to shift from road to rail. The central policy element to reach this target is the heavy vehicle fee (HVF) combined with measures to improve competitiveness of international rail transport. The original goal was to limit transalpine road transport volume to 650,000 lorries per year by 2009.

Heavy vehicle fee

The heavy vehicle fee (HVF) is applied to passenger and freight transport vehicles of more than 3.5 tonnes gross weight. The fee is calculated according to three criteria: the kilometres travelled on Swiss roads, the vehicle specific maximum authorized gross weight, and the pollutants according to EURO classes. The HVF has been implemented in three stages: the first stage in 2001 introduced a fee of 1.6 Swiss cents per kilometre and tonne, accompanied by an increase in the general Swiss weight limit from 28 to 34 tonnes per truck. With the second stage in 2005, the rate was increased to 2.5 Swiss cents, together with an increase in the weight limit up to 40 tonnes. The final stage followed in 2008, after the opening of the Lötschberg railway base tunnel.

Ministries involved in climate change/energy policy making:

Ministries involved	Web links
Federal Department of Foreign Affairs	www.eda.admin.ch/eda/en/home.html/
Federal Department of Environment, Transport, Energy and Communications (DETEC)	www.uvek.admin.ch/index.html?lang=en
Federal Department of Economic Affairs, Education and Research	www.wbf.admin.ch/?lang=en

Education institutes involved in climate change/energy policy making:

Education Institutes involved	Web links
Climate Change and Climate Impacts Research – Universite De Geneve	www.unige.ch/climate/index.html
National Center for Competence in Research Climate	www.nccr-climate.unibe.ch/
Swiss Federal Institute of Technology – Climate Geology	www.climategeology.ethz.ch/

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