



MARKET INTELLIGENCE

ENERGY STATISTICS REPORT

Switzerland

Last Updated: June 2016

Energy

- Market Profile
- Energy Production
- Energy Consumption

Oil

- Oil Market
- Petroleum Production
- Gross Inland Consumption
- Fuel Prices

Electricity

- Overview
- Facts
- Liberalization
- Authorities
- Regulation
- Generation
- Retail and Wholesale
- Spot Prices Evolution
- Transmission
- Distribution
- Supply

Gas Industry

- Gas Overview
- Exploration & Production
- Production & Consumption
- Pipelines
- Gas Transmission and Distribution
- Fuel Prices

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Overview

Switzerland has taken bold decisions to gradually phase out nuclear power and to reduce by a fifth its greenhouse gas emissions by 2020 with domestic measures only.

Switzerland does not produce any fossil fuels and relies heavily on hydro-electricity and nuclear power to meet its electricity needs. Energy imports account for about 70% of the country's total primary energy supply. Oil is by far the largest contributor (40%), followed by nuclear power (26%), hydro-electric power (13%), and natural gas (11%). The rest is supplied by renewable sources of energy such as solar, wind, and combustible waste.

The importance of hydro-electric power in the total energy mix owes much to Switzerland's mountainous geography. Its central location in Western Europe makes the country an important transit route for natural gas and electricity.

Main regulatory entities in Switzerland's Energy Industry:

Swiss Federal Office of Energy: The Swiss Federal Office of Energy (SFOE) is the country's competence center for issues relating to energy supply and energy use at the Federal Department of the Environment, Transport, Energy and Communications (DETEC).

- Creates the prerequisites for a sufficient, crisis-proof, broad-based, economic and sustainable energy supply.
- Ensures the maintenance of high safety standards in the production, transport and utilization of energy.
- Creates the necessary conditions for efficient electricity and gas markets and an adapted infrastructure.
- Actively promotes efficient energy use, an increase in the share of renewable energy and a reduction in CO2 emissions.
- Promotes and coordinates national energy research and supports the development of new markets for sustainable energy use and supply.

There are no specific regulatory authorities for oil and gas as Switzerland does not produce any.

Energy Production/Consumption

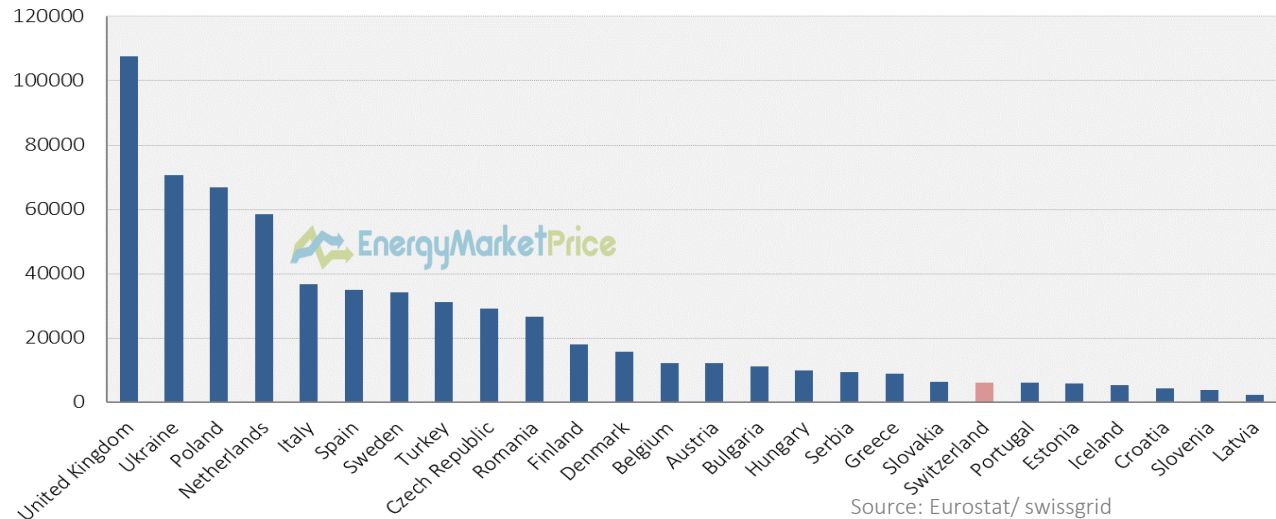
Generation:
6166.523 (2014)

Switzerland has a secure and cost-efficient supply of energy.

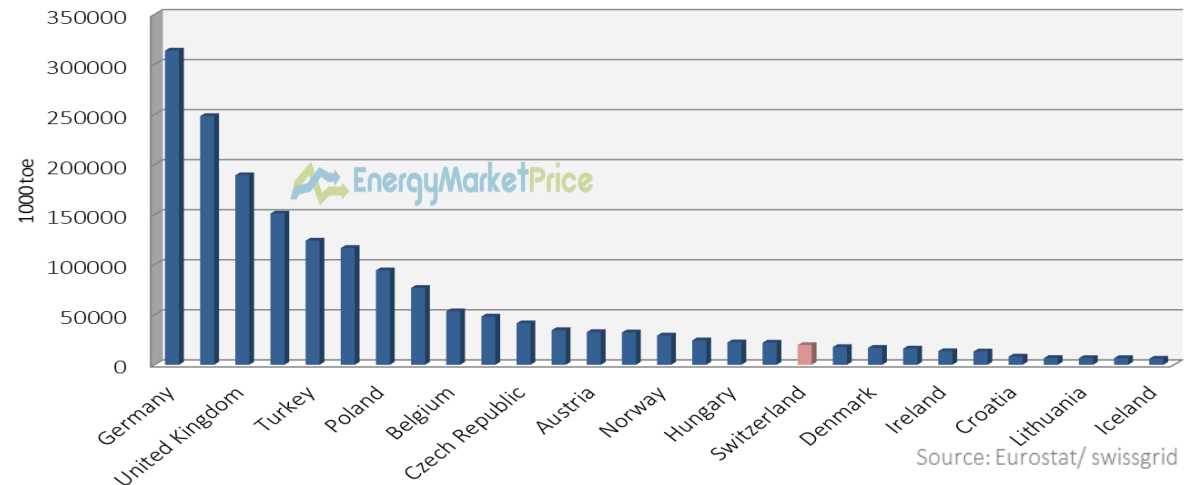
Consumption:
19723.177(2014)

The energy sector in Switzerland is, by its structure and its importance, typical of a developed country.

Primary production of energy, 2014 (Mtoe)

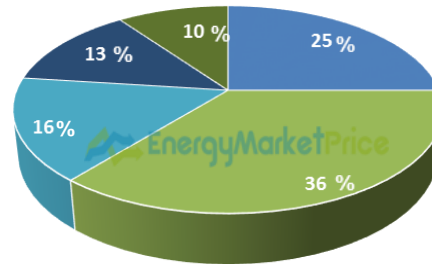


Energy consumption in 2014 (Mtoe)



Energy Consumption

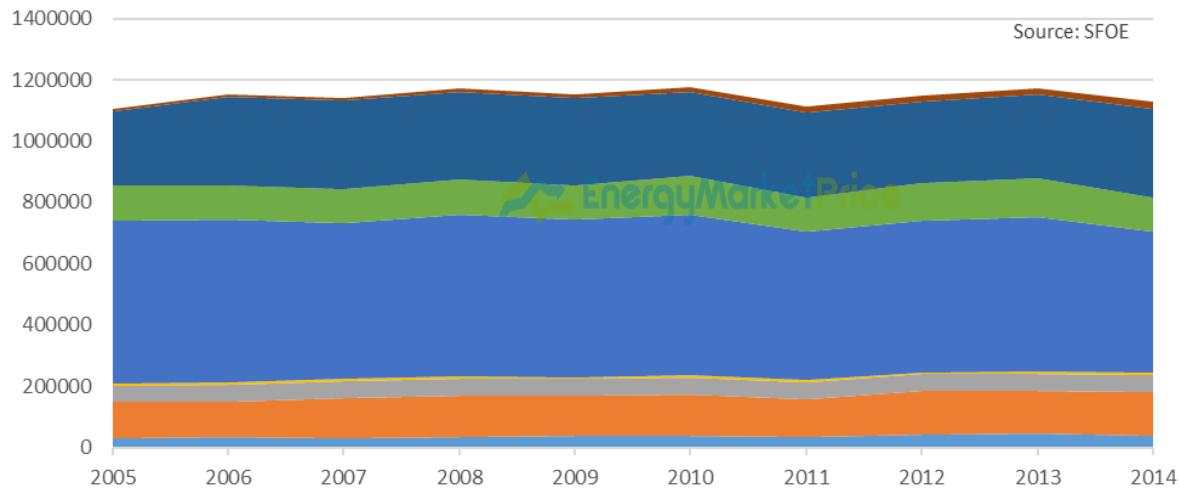
Energy consumption by source(%)



Source: SFOE

■ Electricity ■ Motor fuels ■ Fuel oils ■ Gas ■ Others

Gross energy consumption (TJ)

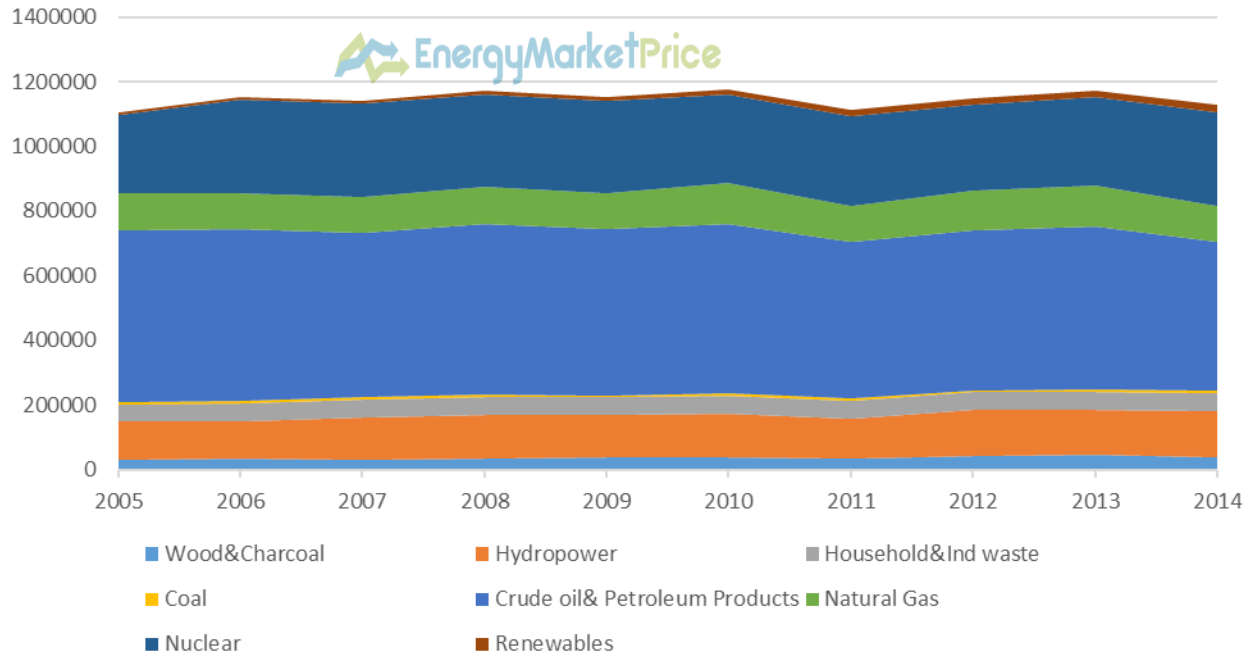


Source: SFOE

■ Wood&Charcoal ■ Coal ■ Nuclear ■ Hydropower ■ Crude oil & Petroleum Products ■ Natural Gas ■ Household&Ind waste ■ Renewables

Energy Consumption

Gross energy consumption (TJ)



Source: SFOE

Electricity Market

Federal Electricity Act Supply

Federal Electricity Supply Act - revision on 23 March 2007, published in the Swiss Federal Gazette on 3 April 2007, entered into force on 1 January 2008

- regulates the bases for a reliable and sustainable electricity supply
- opening of the market in 2 stages:

1. In the first 5 years, end-consumers with annual consumption >100 MWh have free access to the market
2. After 5 years, all end-consumers can freely choose their electricity supplier

Electricity Regulator

ElCom

<https://www.elcom.admin.ch/elcom/en/home.html>

ElCom is Switzerland's independent regulatory authority in the electricity sector. It is responsible for monitoring compliance with the Swiss Federal Electricity Act and the Swiss Federal Energy Act, taking all necessary related decisions and pronouncing rulings where required.

ElCom monitors electricity prices and rules as a judicial authority on disputes relating to network access and payment of cost-covering feed-in of electricity produced from renewable energy. It also monitors electricity supply security and regulates issues relating to international electricity transmission and trading.

ElCom is responsible for monitoring prices and tariffs in the electricity sector, and for this purpose it has been entrusted with the necessary powers. It may prohibit unjustified electricity price increases or reduce excessively high tariffs. There are no specific regulatory authorities for oil and gas as Switzerland does not produce any.

Why do electricity tariffs in Switzerland vary?

Due to differences between the costs of internal production at power plants and procurement on the market, and/or as a result of variations in ecological quality, differences can arise in basic supply tariffs.

WHOLESALE PRICES

Around 90% of wholesale electricity in Switzerland is traded over-the-counter (OTC) and is largely subject to public service obligations – and therefore likely to be below the referenced market prices. Exchange-traded volume accounts for merely some 10% of the Swiss market. OTC price indications for Switzerland are available through the Swiss Electricity Price Index (SWEP). SWEP is the volume-weighted average for deliveries at the 380 kV Laufenburg hub between 11:00 and 12:00 the following day. SWEP was initiated by ATEL and EGL, and launched in March 1998. Exchange-traded wholesale price index is offered by the Swiss Electricity Index (Swissix), which is the average price at the European Energy Exchange (EEX) in Leipzig for next-day deliveries within the Swissgrid control area. Swissix has indices for both base and peak loads. It was launched in December 2006.

RETAIL PRICES

Retail prices for electricity have been increasing for the past several years. They vary strongly according to supply area. For households, average prices between cantons vary by more than 50%. Within individual cantons, price differences can be even wider, mainly because some mountain municipalities benefit from local low-cost hydropower. For industry, price differences are smaller, but still represent tens of percentage points.

Source: elcom

Electricity Prices

	2017	2016	2015	2014	2013	2012
Grid usage						
Working tariff [cents/kWh]	0.25	0.25	0.22	0.19	0.16	0.15
Power tariff [CHF/MW]	41'000	41'000	36'100	30'900	24'600	23'500
Fixed basic tariff per weighted exit point [CHF/AP p.a.]	387'700	387'700	336'300	285'500	235'400	225'000
General ancillary services (AS)						
General AS tariff for grid operators and end consumers connected to the transmission system [cents/kWh]	0.40	0.45	0.54	0.64	0.31	0.46
General AS tariff for ML operators ¹² (SR ¹³ 734.713.3) [cents/kWh]	0.04	0.05	0.05	0.06	0.03	0.05
Individual ancillary services						
Individual AS tariff for active energy losses for distribution system operators and end consumers connected to the transmission system [cents/kWh]	0.08	0.11	0.11	0.08	0.07	0.11
Individual AS tariff for active energy losses for ML operators ¹² (SR ¹³ 734.713.3) [cents/kWh]	0.08	0.11	0.11	0.08	0.07	0.11
Individual AS tariff for reactive energy for active participants non-compliant with requirements (distribution system operators and power plants in the transmission system, since 1 January 2011) [cents/ kvarh]	1.75	1.32	1.15	0.96	0.93	0.75
Individual AS tariff for reactive energy for passive participants (distribution system operators in the transmission system, since 1 January 2010) [cents/ kvarh]	1.75	1.32	1.15	0.96	0.93	0.75
Remuneration rate for active participants for reactive energy supplied according to requirements (distribution system operators and power plants in the transmission system) [cents/ kvarh]	0.30	0.30	0.30	0.30	0.30	0.30

In accordance with calculations Swissgrid 2013-2017

Source: Swissgrid.ch

Electricity Prices

	2017	2016	2015	2014	2013	2012
Balance groups responsible party management						
Registration tariff for standard balance group [EUR]	6'250	6'250	6'250	6'250	6'250	6'250
Registration tariff for control balance group in addition to standard balance group [EUR]	3'500	3'500	3'500	3'500	3'500	3'500
Registration tariff for CH-15 balance group in addition to standard balance group [EUR]	3'500	3'500	3'500	3'500	3'500	3'500
Balance group tariff by trading volume [cents/kWh] ¹⁴	--	--	--	0.008	0.007	0.007
Balance group tariff by consumption volume [cents/kWh] ¹⁴	--	--	--	0.014	0.010	0.010
Balance group tariff for clearing houses (annual flat rate) [CHF] ¹⁴	--	--	--	87'100	81'250	81'250
On-account billing rates						
General AS on-account billing rate for power plants with a minimum electricity output of 50 MW [cents/kWh]	--	--	--	--	--	--
LTC holder ¹⁵ grid usage [cents/kWh]	--	--	--	--	0.02	0.02
LTC holder ¹⁵ active power losses [cents/kWh]	--	--	--	--	0.02	0.03

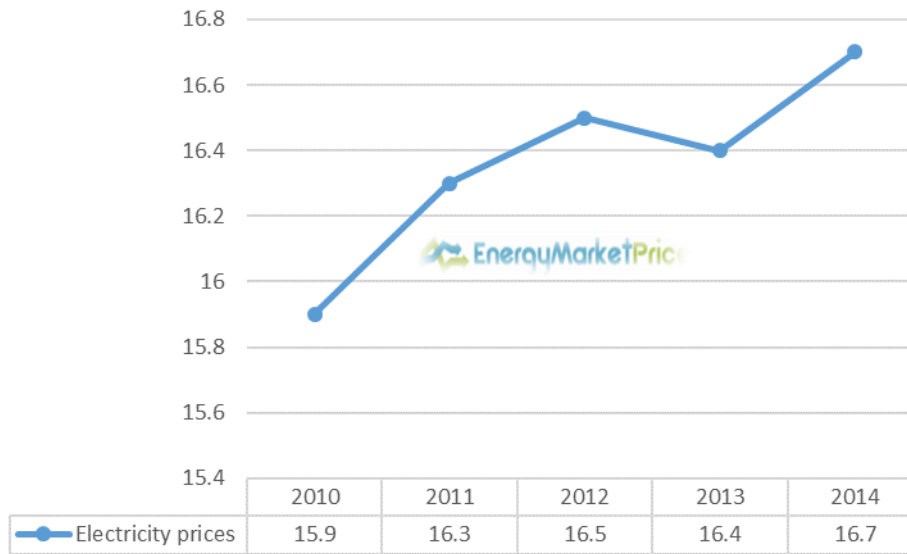
In accordance with calculations Swissgrid 2013-2017

Source: Swissgrid.ch

Electricity Prices

1 CHF= 0.91EUR
(6/10/2016)

Average of electricity prices (CHF/kWh)



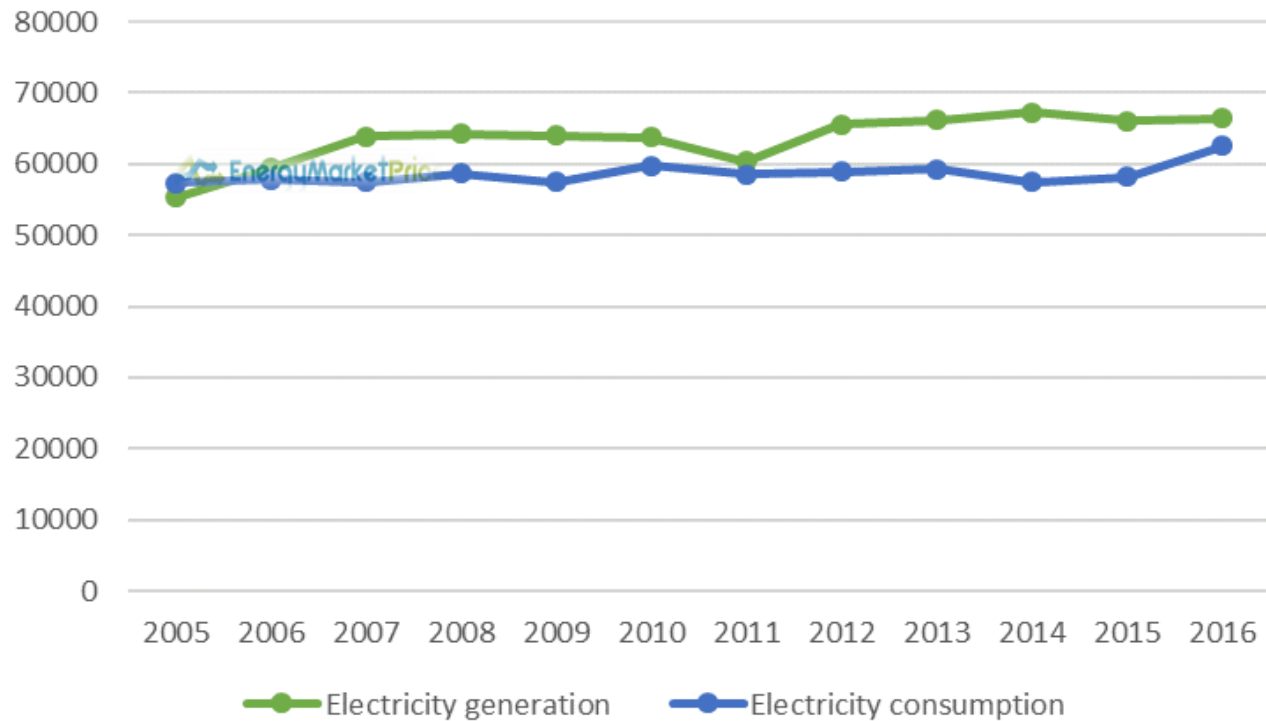
Source: Swissgrid.ch

Electricity Production/Consumption

In 2015 electricity consumption in Switzerland increased by 1.4% to **58.2** billion kilowatt hours (kWh).

Electricity production at Switzerland's power plants fell in 2015 by 5.3% to **66.0** billion kWh

Electricity generation/ consumption (GWh)



Source: Swiss electricity statistics

Transmission

swissgrid

Swissgrid operates the Swiss transmission system and secures the transport of energy across long distances. The Swiss grid has two main tasks:

Transport electricity from the producing power plant to the end consumer via the transmission system. Electricity reaches domestic power sockets via regional and local system distributors.

Electricity is traded, exported and imported in Europe. Situated at the heart of Europe, Switzerland has an important role as a transit country: electricity exports from Germany to Italy travel via Switzerland and the same happens for the East-West axis. Switzerland plays a pivotal role as a European electricity hub from which the entire national economy benefits.

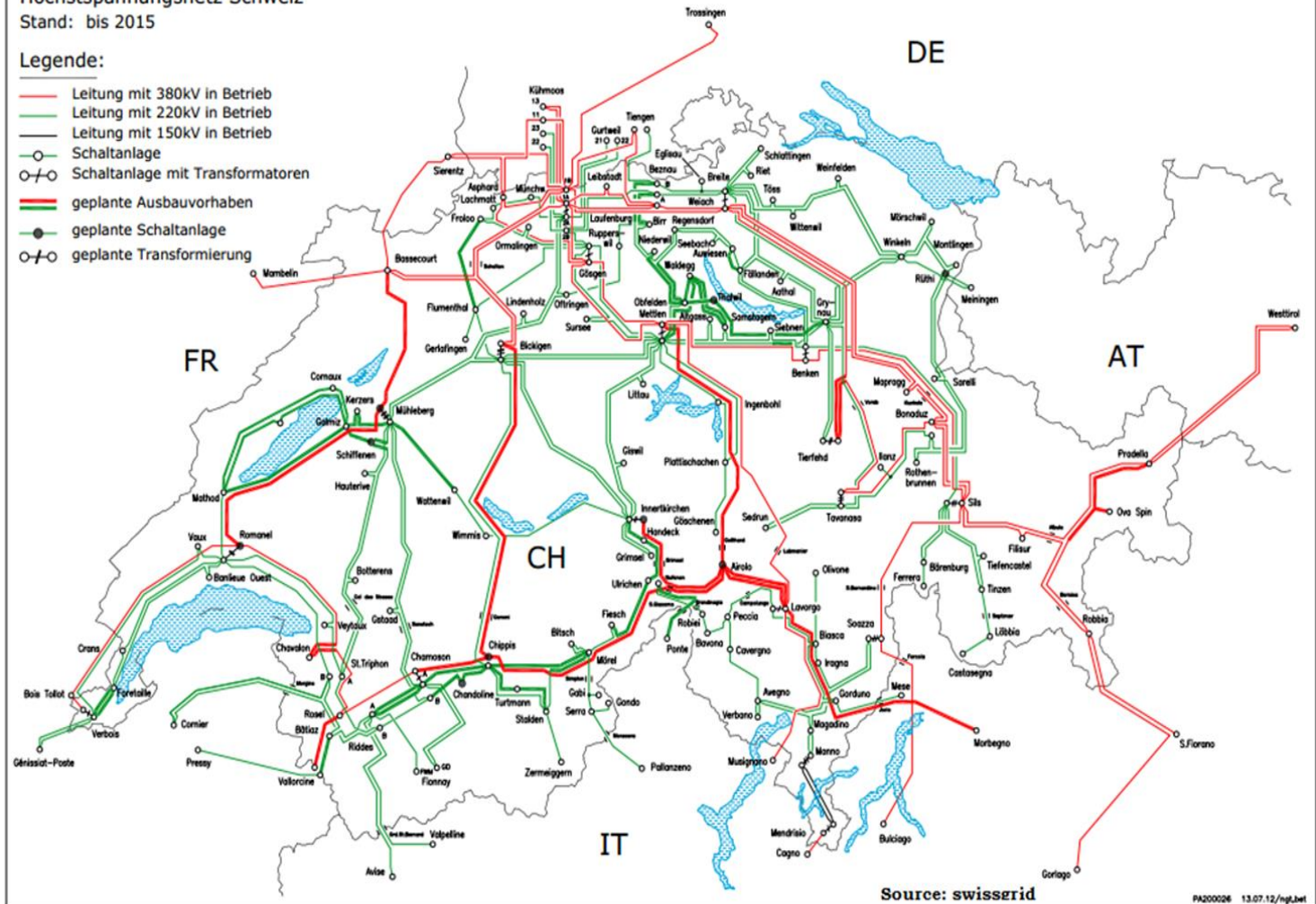
The Swiss transmission system is 6,700 kilometers long, about the distance from Zurich to Washington, D.C. The Swiss transmission system is connected to those of the neighboring countries at over 40 points.

Transmission Lines

Höchstspannungsnetz Schweiz
Stand: bis 2015

Legende:

- Leitung mit 380kV in Betrieb
- Leitung mit 220kV in Betrieb
- Leitung mit 150kV in Betrieb
- Schaltanlage
- /○ Schaltanlage mit Transformatoren
- geplante Ausbauvorhaben
- geplante Schaltanlage
- /○ geplante Transformierung



Main electricity companies



Switzerland's supply of electricity to end users is secured by approximately 700 companies.

swisselectric is the organization of Swiss electricity grid operators, whose members comprise Axpo Group (Axpo Power AG, Axpo Trading AG, CKW) and Alpiq (Alpiq AG, Alpiq Suisse SA).

swisselectric member companies represent an important factor in the Swiss economy.

They generate annual revenues from electricity of around CHF 25 billion.

To ensure a reliable, cost-effective and sustainable supply of electricity throughout the country, they are investing around CHF 30 billion in Switzerland between now and 2035.

Together they employ more than 17,000 staff.

With an annual output well in excess of 50,000 Gigawatt hours, they produce the bulk of Switzerland's electricity.

Hydropower

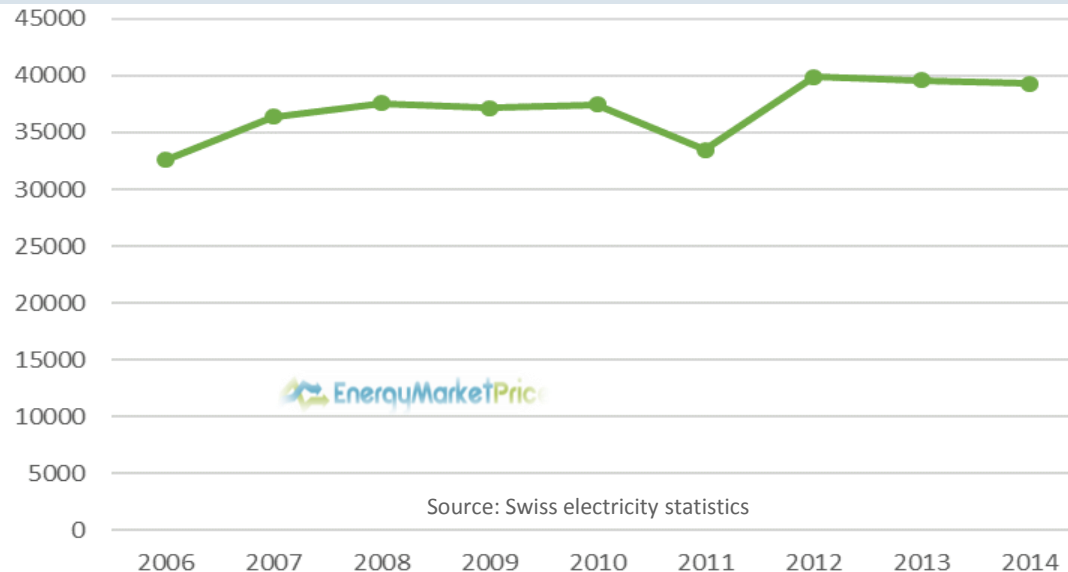
Switzerland has ideal conditions for the utilization of hydropower.

Hydropower therefore remains Switzerland's most important domestic source of renewable energy.

Hydropower plays a major role in Switzerland's energy production, with a share of around 55%. There are currently 579 hydropower power plants in Switzerland that have a capacity of at least 300 kilowatts.

In order to facilitate the planned phase-out of nuclear power, the Federal Council wants to expand hydropower within the context of its Energy Strategy 2050.

Hydroelectric power generation (GWh)



47% - produced in run-of-river power plants

49% - in storage power plants

4% - in pumped storage power plants

Nuclear Power

Switzerland has five nuclear reactors generating 40% of its electricity.

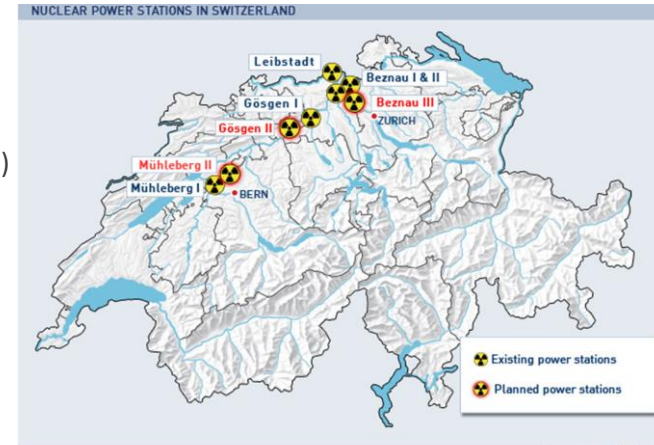
A national vote had confirmed nuclear energy as part of Switzerland's electricity mix

In June 2011 parliament resolved not to replace any reactors, and hence to phase out nuclear power by 2034, despite continuing strong public support for nuclear power.

The Swiss Federal Nuclear Safety Inspectorate (ENSI, IFSN in French) is the national regulatory body with responsibility for the nuclear safety and security of Swiss nuclear facilities. It took over from the Swiss Federal Nuclear Safety Inspectorate (HSK) in 2009, but is an independent body rather than being under the Swiss Federal Office of Energy.

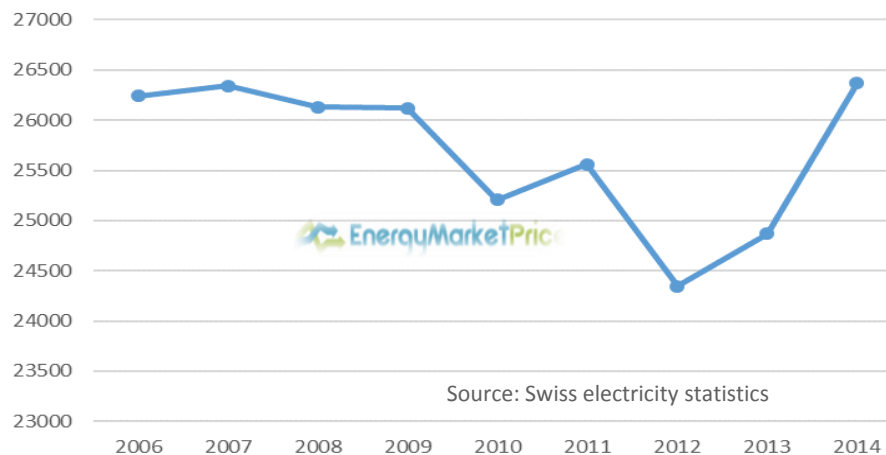
It monitors and regulates both safety and radiological protection in nuclear installations and waste facilities.

Source: world-nuclear.org



Source: swissinfo

Nuclear electricity generation (GWh)



Source: Swiss electricity statistics

OVERVIEW Oil & Gas Market

Natural gas: Switzerland also has gas reserves, but in most cases these are too small to justify exploitation. The only exception is Finsterwald (Lucerne), where a total volume of 73 million cubic meters (the equivalent of about 3% of Switzerland's annual gas consumption) was exploited between 1985 and 1994, which means that Switzerland's gas requirements have to be met entirely through imports. The natural gas supply to Switzerland is guaranteed thanks to a large portfolio of suppliers from diversified geographic locations, reliable partners and mainly long-term procurement contracts. 74% of gas used in Switzerland is supplied from Western Europe (Netherlands, Germany and Norway).

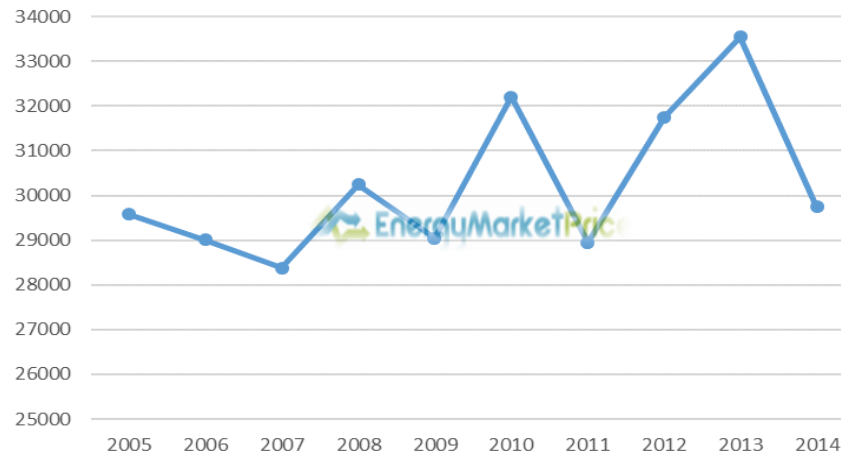
Oil: In Switzerland, as in most of the OECD countries, the two oil crises in the 1970s highlighted the risks of a unilateral energy supply. Since then, the share of petroleum products in country's energy consumption has fallen from 80% in 1973 to 51.5% in 2014, and the oil intensity of the Swiss economy decreased by almost half – as in the other industrialized countries – due mainly to the growing importance of the tertiary sector. This trend is likely to continue. However, Swiss oil consumption dropped by only 11% to about 10 million tons/year between 1975 and 2014 (0.3% of world requirements). That is why the Federal Council is envisaging more vigorous measures to reduce consumption.

Natural Gas Consumption/Imports

Switzerland – important transit corridor at the heart of the European gas market (100% gas imports).

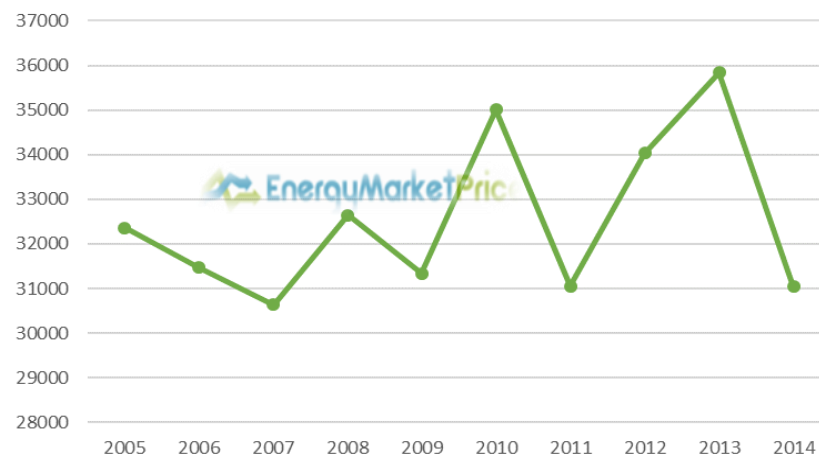
Natural Gas contribution towards the country's overall end energy consumption is around 12%.

Natural Gas consumption (GWh)



Source: Swiss electricity statistics

Natural Gas imports (GWh)



Source: Swiss electricity statistics

95% of the gas consumed in Switzerland is produced in the Netherlands, Russia, Norway, Germany and Algeria

Households represent the largest consumer group with a share of around 40%, followed by the industrial sector with around 33%.

Russian gas imported into Switzerland is mainly supplied by the German company E.ON.

The recurring political or economic tensions between Russia and its neighboring countries have not had any direct consequence on the security of supply of Switzerland who does not import gas directly from Russia.

Natural Gas Regulator

- According to present energy policy, the gas market will only be liberalised after the electricity market.
- In view of the high level of integration of the Swiss gas industry into the European supply network, the question of opening up Switzerland's market cannot be ignored over the long term, even if the majority of Swiss households and companies are in fact satisfied with the existing providers and supply quality.
- The development of the gas market opening in Switzerland is to maintain its competitiveness in the future and to adjust network access preserving the financial and operational interests of network operators. The Confederation plans within this framework to enact a law on the gas market by 2020.

The official supervisory authority

The official supervisory authority - The Swiss Federal Office of Energy (SFOE) - part of Federal Department of Environment, Transport, Energy and Communication (DETEC)

The Swiss Federal Pipelines Act – entered into effect in 1964

Other cantonal and private specialized institutions, such as:

- The Swiss Federal Inspectorate for Pipelines
- The Swiss Federal Office for the Environment (FOEN)

The Swiss Gas Industry Association – formulates principles for local gas suppliers to evaluate charges for using their networks

“NEMO” – calculation model – aims to guarantee non-discriminatory third party access to each local gas network

- based on an agreement under private law
- local distributors can reject requests for transport from third parties

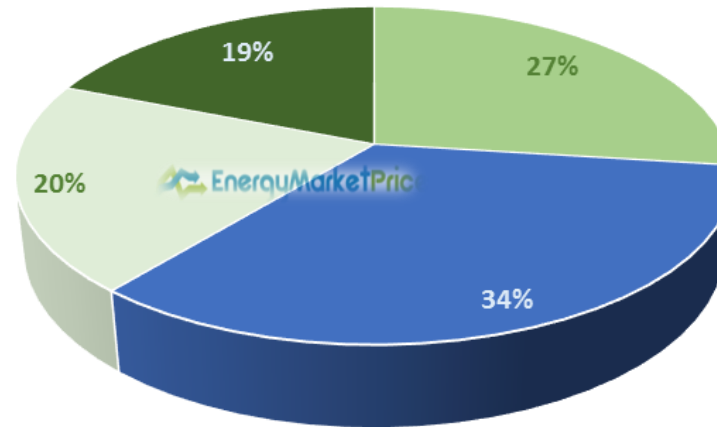
Natural Gas Main suppliers:

E.ON Ruhrgas

GasTerra

GDF Suez SA

Main suppliers: distribution (%)



Source: gaznat.ch

■ GDF Suez ■ E.ON Ruhrgas ■ GasTerra ■ Other

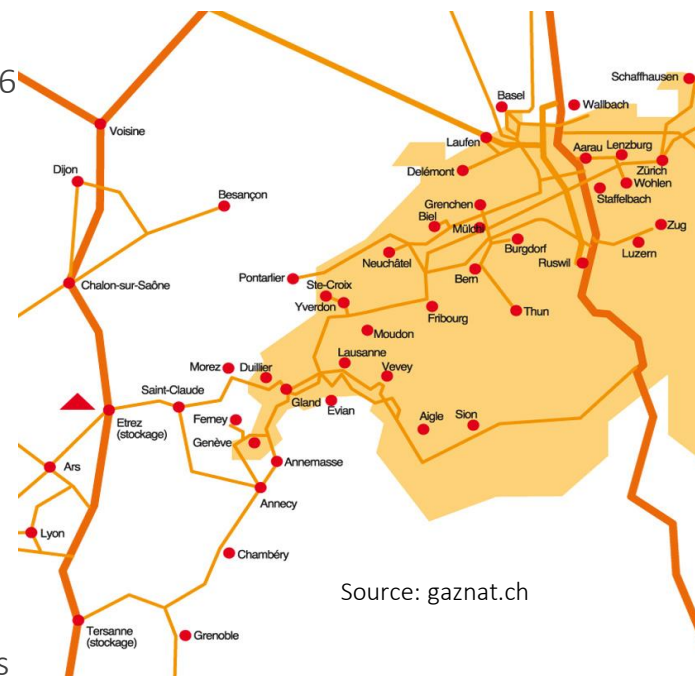
Gaznat's high-pressure transport network comprises over 600 km of pipelines as well as 56 stations. It is connected to the high-pressure European network in five different points: La Cure, La Louvière, Bardonnex, Obergesteln and Ruswil.

Gaznat draws off natural gas for its network: from the East, from the Transitgas international gas pipeline which crosses Switzerland from North to South and from the West, from the transport arteries coming from France. From Obergesteln, located in the Conches valley, the Rhône gas pipeline owned by Swissgas connects Gaznat's network to the Transitgas gas pipeline.

Natural Gas Transport

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Source: gaznat.ch

Source: gaznat.ch

Oil market overview

Switzerland does not have domestic production of crude oil. Swiss oil demand is fully covered by imports.

Switzerland imports all of the petroleum it consumes, including in the form of crude oil. The country's two refineries are majority-owned by the private sector and have a combined output covering 45% of total domestic demand for petroleum products.

The retail market is fully liberalized and dominated by BP, Exxon, Shell, and Tamoil. In addition, more than 5% of the country's filling stations sell biofuels.

Wholesale and retail prices are mainly influenced by the relevant quotation prices and exchange rates, which are driven by the global market fundamentals and expectations.

Government interference is limited to determining the level of the excise tax and VAT. In addition, contributions to the so-called Guarantee Fund ("Emergency Fund") are levied on imports of oil-products in order to finance the stockpiling system.



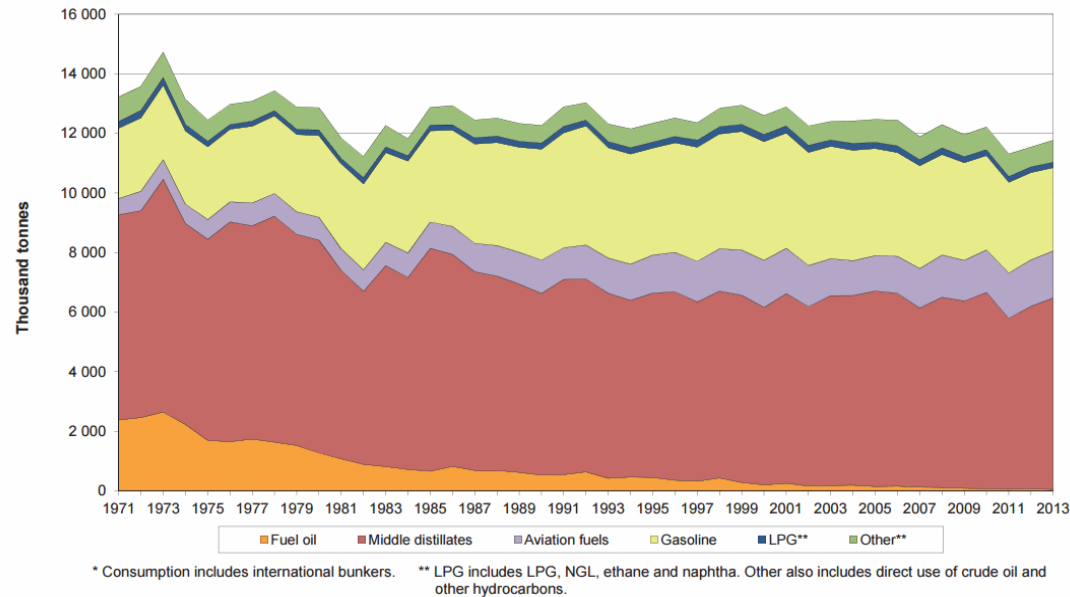
Oil Consumption

Swiss oil consumption dropped by only 11% to about 10 million tons/year between 1975 and 2014.

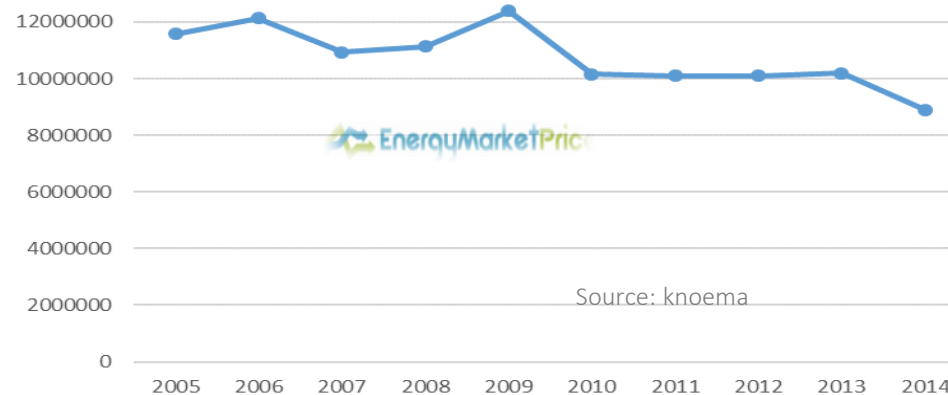
Oil consumption in Switzerland is primarily in the transport and residential sectors, which respectively represented 56% (dominantly gasoline) and 22% (heating oil) of all oil use.

The imports of crude oil and petroleum products are mainly undertaken by pipelines, rail tank cars and Rhine barges. Among these transport means, pipelines play the most important role, sharing over 43% of the total oil imports.

Consumption of oil products



Oil net imports (metric tonnes per year)

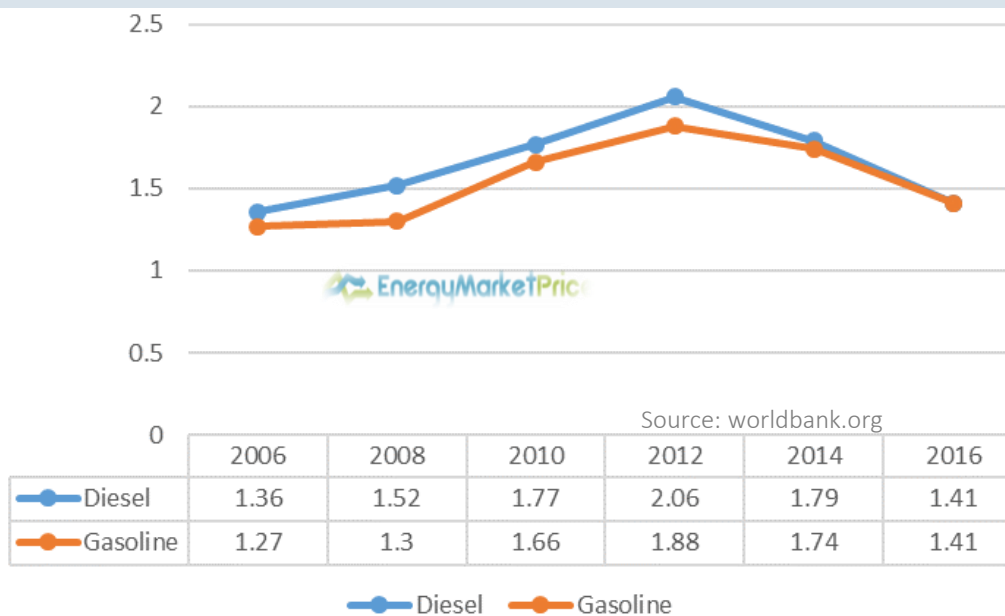


Fuel prices in Switzerland

Gasoline and diesel are the main fuels consumed in Switzerland, after the fuel oil.

Oil is bought on the spot market of Rotterdam

Pump prices for diesel and gasoline (\$)



Gasoline:

- Tax excise – CHF 0.731/liter – since 1 January 2000
- Emergency stock levy – CHF 0.0042/liter (fixed – does not fluctuate with the oil price)
- Introduction of CO2 tax is not planned
- Tax component about 50%
- The lowest gasoline prices in Europe

Diesel:

- Excise taxation – CHF 0.789/liter – since 1997
- Emergency stock levy – CHF 0.0042/liter
- Diesel is taxed more heavily than gasoline, therefore Switzerland has less diesel vehicles
- No CO2 tax planned

Renewable energy overview

As a country possessing few raw materials, Switzerland has no direct access to fossil energy carriers but has to rely on their import. It can however make use in different fields of renewable energy sources available within the country.

Three main forms are concerned:

- heat from heat pumps, solar thermal power, geothermal power and biomass;
- electricity from hydropower, wind power, photovoltaics, geothermal power and biomass;
- gas and liquid fuels extracted from biomass.

Of all renewable energy sources, biomass is the most heterogeneous. Biogenic waste, used wood, wood stemming from forestry activities, useful plants, agricultural residue or food remains can all be utilized. In Switzerland, it is currently mainly used to generate heat and electricity.

Renewable energy overview

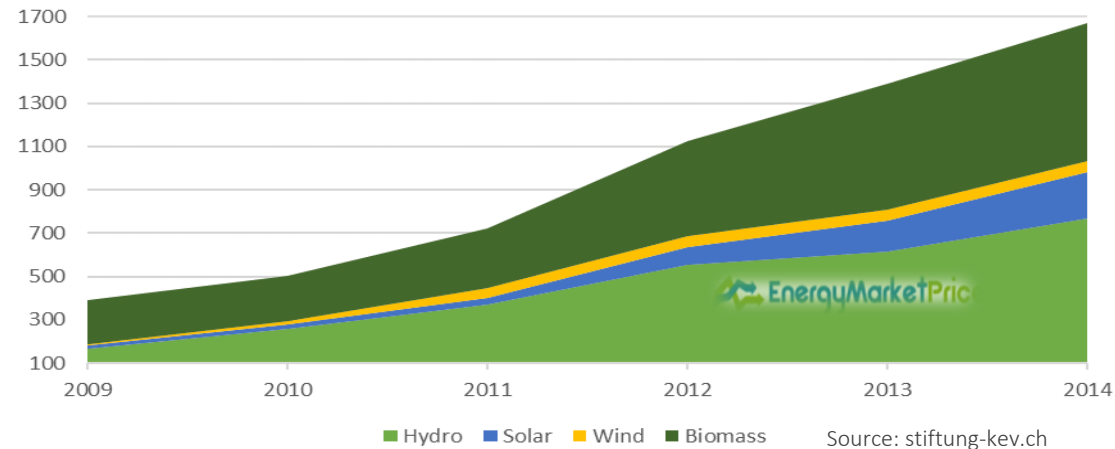
Renewable Energy sources as hydropower and wood would continue to play a leading role, while new renewable energy sources are in strong growth. Altogether, renewable energies cover about 1/5 of final energy consumption.

Wind

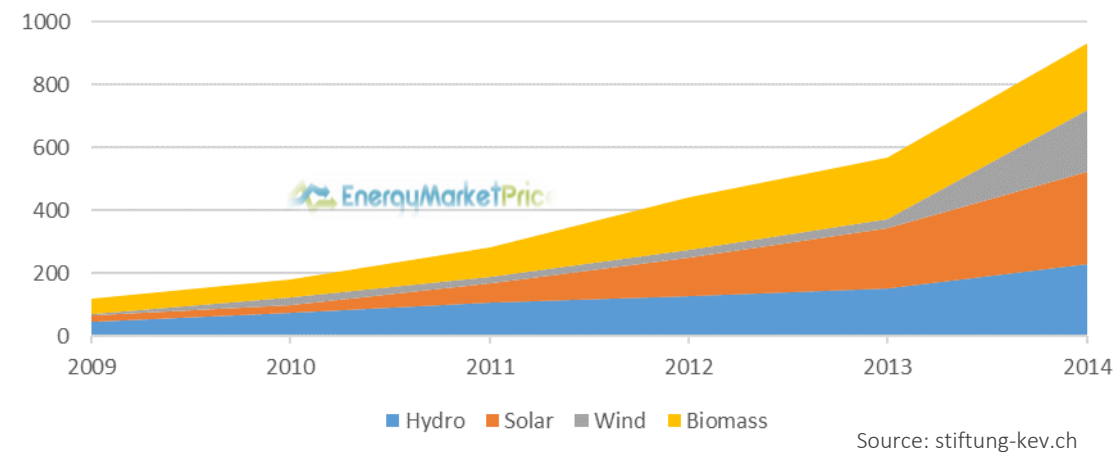
In 2014, in Switzerland, there were 37 wind farms with a total output of approx. 100 gigawatt hours (GWh) of electricity per year.

Wind power production increased by 13% in 2014 arriving at 363.2 TJ.

Primary production of renewable energy (GWh)



Installed capacity of renewable energy (GWh)

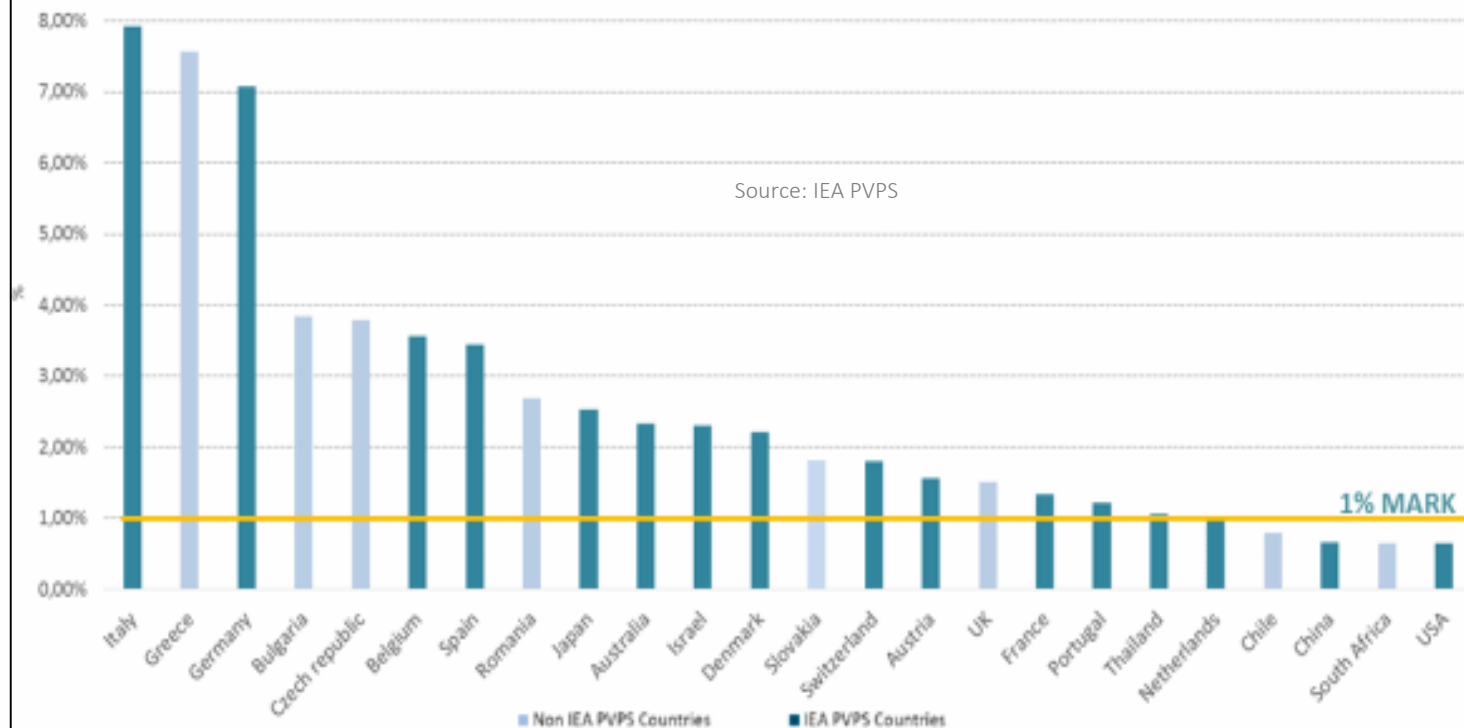


Solar

Solar power has enormous potential: by 2050 it would be possible to meet around 20 percent of the current level of electricity demand in Switzerland through the use of photovoltaic systems. Swiss PV market decreased by 5% in 2014 to about 305 MW newly installed capacity (37 W/capita). This was due to another reduction of Feed in Tariffs (FiT) by approx. 20% during 2014. However, thanks to this reduction, the Swiss Federal Office of Energy could increase the yearly cap for PV to > 100 MWp.

The future looks very bright since PV is considered to reach a quite remarkable share of possibly over 20% of the electricity demand.

2014 THEORETICAL PV PRODUCTION



CO2 emissions

Overall, greenhouse gas emissions decreased between 1990 and 2014 (the decrease in 2014 is due to the mild winter). However, the status and development of the indicator are evaluated as negative because, according to the CO₂ Act, Switzerland has committed to reducing domestic greenhouse gas emissions by 20% by 2020.

Swiss greenhouse gas emissions have decreased considerably from 97.9 in 2013 to 90.7 CO₂ equivalents in 2014.

Greenhouse gas emissions (CO₂ equivalents)



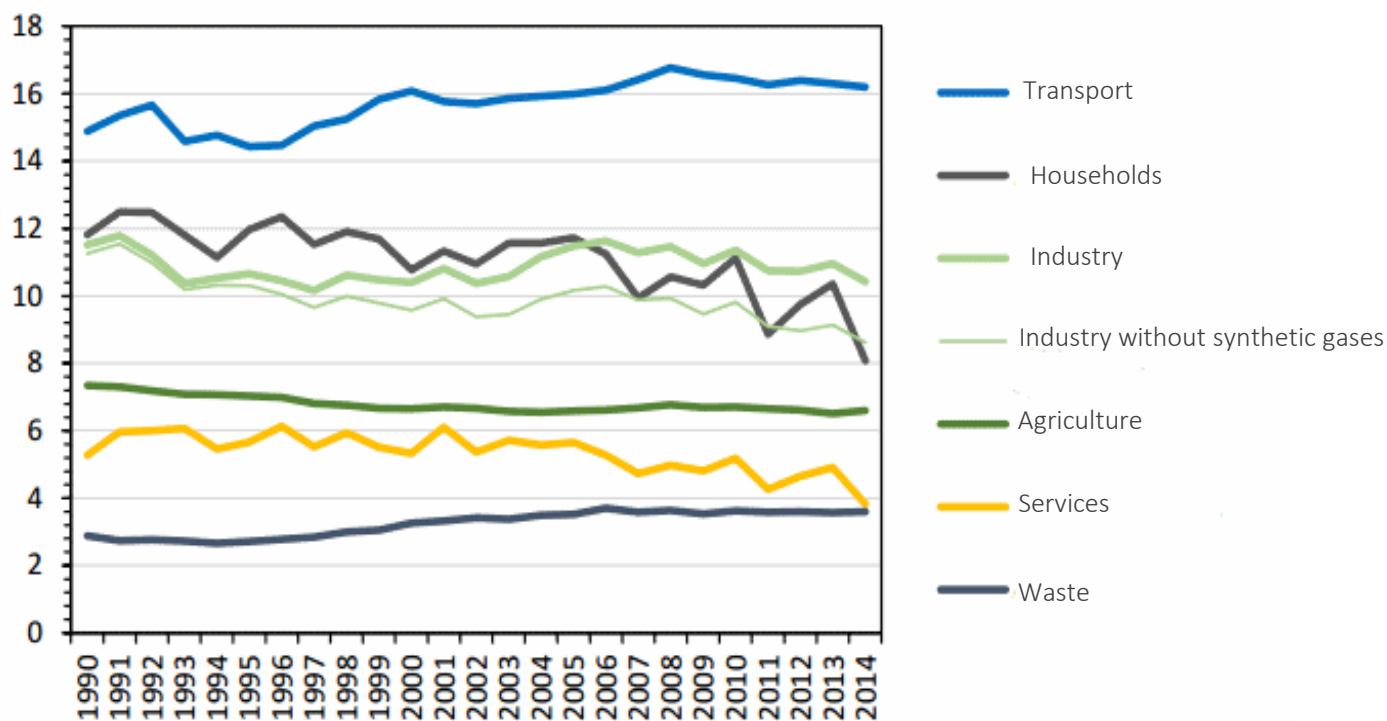
Source: www.bafu.admin.ch/co2-statistik

CO2 emissions

The transport sector accounts for 33% of Swiss GHG emissions. Road traffic is the source of 99% of transport emissions. Emissions have risen since 1990 and were 9% higher in 2014. After having reached a peak in 1984, transport emissions decrease slightly.

The industry and services sectors account for another 30% of Swiss emissions. The residential sector accounts for 17% of Swiss GHG emissions due to space heating and water heating. In 2014, the emissions attributable to this sector were approximately 32% lower than 1990 levels, which is a positive development, especially given that the building space that had to be heated increased by 39% since 1990. Agriculture accounts for around 14% of total GHG emissions. Emissions from this sector declined until 2004, but have remained roughly constant since then.

Greenhouse gas emissions by sector (Million tonnes of CO2 equivalents)



Source: www.bafu.admin.ch/co2-statistik

Want to Try Other Products?

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