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Swiss Confederation

Federal Department of the Environment,
Transport, Energy and Communications DETEC

Swiss Federal Office of Energy SFOE
Office for the Exemplary Role of the Confederation in Energy ERCE

The Confederation: exemplary in energy

Annual report 2016

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Contents

A joint commitment

In 2013, the Civil Federal Administration, the Federal Department of Defence, Civil Protection and Sport (DDPS), the entire domain of the Swiss Federal Institutes of Technology (ETH Domain) and SBB, Swiss Post, Skyguide and Swisscom set themselves the objective of improving their energy efficiency. The goal: a 25% gain by 2020 compared to 2006. By the end of 2015, the group had achieved its objective. The efforts are being continued, however, in order to at least maintain or further increase this level of efficiency and make further improvements in renewable energy, mobility and the measures that have been defined.

This year, the actors committed to the project are presenting the construction standards they are applying to their building stock. I call on other actors in the Swiss economy to follow their example and adopt ambitious standards, be they Minergie, the SNBS sustainable building standard or the 2000-watt sites.

At the end of 2016, the Swiss Federal Office of Energy (SFOE) published a consolidated analysis of the potential for renewable energy and waste heat recovery by the actors in the project. The analysies revealed that the actors have realistic potential for development of more than 230 GWh/year in terms of producing their own renewable power. The greatest potential lies in harnessing solar energy, followed by hydro-electricity and wind power. At the moment, the entities in the group are devising action plans that will define how the potentials and obstacles that have been identified will be managed. I am very pleased about this.

If you want to go fast, go alone. If you want to go far, go together. Bearing this adage in mind, the secretariat of the SFOE's "Exemplary in Energy" group set out to look for new partners. Genève Aéroport, which already had a strong commitment in the areas of energy efficiency and renewable energy, officially joined the group last year. I hope this example will be followed in the coming years by other undertakings affiliated to the Swiss Confederation.

I would be pleased if all the actors in the Swiss economy were following in the foot-steps of the group's members by 2020. Swiss Post, ETH Domain, Genève Aéroport, SBB, Skyguide, Swisscom, DDPS and the Civil Federal Administration can be particularly proud of their contribution to taking up the challenges faced by our country's energy policy.

Toni Eder Secretary General
Federal Department of the Environment, Transport, Energy and Communications

Giving a clear signal

The Federal Council intends to increase energy efficiency in the federal administration and parastatal enterprises by 25% between 2006 and 2020. The participating actors are planning and coordinating some of their measures within the framework of the Confederation: exemplary in energy initiative.

Ready for tomorrow's energy policy
With the first package of measures for the Energy Strategy 2050, the Federal Council committed the Confederation four years ago to setting a good example in the energy sector and to optimising its energy consumption. The Confederation is responsible for 2% of Switzerland's total energy consumption.

As a result, the federal administration and parastatal enterprises joined forces in the Confederation: exemplary in energy initiative. A coordination group defines the binding action plan and steers the joint activities. Its office is managed by the Swiss Federal Office of Energy. Starting from the base year 2006, the actors aim to increase energy efficiency by 25% by 2020.

Comprehensive measures
The action plan of the Confederation: exemplary in energy initiative comprises 39 joint measures in three action areas plus a series of specific measures determined by each actor individually.

Buildings and renewable energy
Measures for energy-efficient new and converted buildings, electric power and heat from renewable energy, green power and further measures.

Mobility
Measures to encourage use of public transport, promotion of mobile-flexible forms of work, charging stations for electric vehicles and further measures.

Data centres and green IT
Highly energy-efficient data centres, waste heat recovery, re-use of appliances and other measures.

Specific measures
Alternatively powered Postbuses, optimised railway point heating systems, continuous descent approach at Geneva Airport, fresh air cooling in telephone exchanges, low-rolling-resistance tyres, photovoltaic installations and further measures.

Major actors
Some very different public actors have committed to the Confederation: exemplary in energy initiative:

– The Confederation is represented by the Civil Federal Administration and the Federal Department of Defence, Civil Protection and Sport (DDPS).

– Of the parastatal enterprises, Swiss Post, the Swiss Federal Railways, Skyguide and Swisscom have signed up. The Confederation sets these organisations strategic objectives, which in some cases also concern energy targets or require at least a sustainable corporate strategy.

– The two Federal Institutes of Technology and four research institutes are grouped together in the ETH Domain. Their purpose is specified in the ETH Act and is translated into practice following the Federal Council's strategic objectives for the ETH Domain.

– Genève Aéroport was the first cantonal public enterprise to join the initiative in 2016. Discussions with other actors are under way at the national and cantonal levels.

SWISS POST

ETH DOMAIN

GENÈVE AÉROPORT

SBB CFF FFS

skyguide

swisscom

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
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Swiss Confederation

Federal Department of Defence, Civil Protection and Sport DDPS

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Civil Federal Administration

Stefan Dürig, CEO, Post Real Estate Management and Services Ltd

"Swiss Post is performing its exemplary role as a large real-estate owner: We will be reducing energy consumption in our own buildings by over 16% with 220 measures by 2024."

Swiss Post

As a mixed group, Swiss Post operates in the communications, logistics, financial services and passenger transport markets. Every year Swiss Post carries about 2.1 billion letters and some 122 million parcels. PostBus transports nearly 152 million passengers, while PostFinance has more than 4.8 million customer accounts. With nearly 53,545 employees in Switzerland (36,290 FTEs), Swiss Post is one of the largest employers in the country.

Energy strategy implementation
As the largest logistics company in Switzerland, Swiss Post operates an energy-intensive business. In order to increase energy efficiency, it is renewing its vehicle fleet and building stock, using more alternative drive systems and optimising delivery rounds.
It is also replacing fossil fuels with renewable energy sources.

www.post.ch

Wolfgang Seifert, Energy Officer, ETH Zurich

"Optimising our operating facilities saves energy and money. To do so, it is necessary to have motivated employees and a very good knowledge of the particular facilities in the ETH Domain."

ETH Domain

Academic achievement at the highest level: this is what the ETH Domain provides with over 21,000 staff members, more than 30,000 students and doctoral students and a faculty of about 800 people. The ETH Domain encompasses the Federal Institutes of Technology in Zurich (ETH Zurich) and Lausanne (EPFL), the research institutes Paul Scherrer Institute (PSI), the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), the Swiss Federal Laboratories for Materials Science and Technology (Empa) and the Swiss Federal Institute of Aquatic Science and Technology (Eawag), along with the ETH Board as the strategic supervisory body.

Energy strategy implementation
The common environmental model of the ETH Domain has been coordinated with the targets of the federal government's Energy Strategy 2050. The ETH Domain's institutions support the common objectives on their own responsibility and with their own environmental management systems.

www.ethdomain.ch

Dino Gazzola, Head of Building Management

"Genève Aéroport is encouraging the construction of new buildings with the Minergie-P label. The topic of sustainable development is paramount and has been defined as a cross-cutting strategic objective for all the airport's activities."

Genève Aéroport

In 2016, 16.5 million passengers used Geneva Airport. Specialising in point-to-point flights (the airport's function is to link Geneva to Europe's major cities), the airport nevertheless serves a few distant destinations.

Energy strategy implementation
In terms of energy strategy, the objectives set by the airport are based on cantonal and federal policies. They consist of three pillars: efficiently consuming and limiting the energy required for operations; producing and distributing energy in the most efficient possible way; giving priority to our supply of sustainable energy sources. New buildings are required by law to include one or more means of producing renewable energy.
In 2016, the cumulative savings amounted to nearly 13 GWh for the entire site, which is equivalent to the annual consumption of 3,250 households.

www.gva.ch

Peter Wicki, Head of Portfolio Management, SBB Real Estate

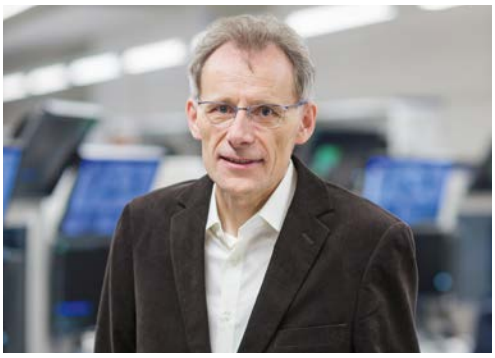
"SBB's new buildings are better than state of the art, and in renovation operations we rely consistently on renewable energy."

SBB

With about 33,000 employees, the Swiss Federal Railways move people and goods, connect centres and different parts of the country at home and abroad, and are at the same time one of the largest real-estate companies in Switzerland. As an efficient, forward-looking and sustainable mobility enterprise, SBB provides its customers with positive travel experiences and transports their goods reliably and resource-efficiently: a rail journey in Switzerland is about 4 times more energy-efficient and emits 20 times less CO_2 than a journey by car over a comparable distance. With its sustainable and energy-efficient mobility offering and real-estate concepts, SBB thus contributes significantly to the implementation of the federal government's Energy Strategy 2050.

Energy strategy implementation
From 2025 onwards, the SBB's trains are to run on power from 100% renewable energy. SBB is planning to save about 20% of the annual consumption forecast for 2025, or a total of 600 GWh of energy per year, with an extensive package of measures.

www.sbb.ch



Daniel Vauthey, Corporate Real Estate Project & Planning

"We are working to reduce our environmental impact both on the ground and in the air, by taking steps to optimise air traffic and by constantly improving the energy efficiency of our infrastructure."

Skyguide

On behalf of the federal government, the Swiss air navigation services provider Skyguide provides safe, efficient and economical management of air traffic in Swiss airspace and in delegated neighbouring areas for which it is responsible. With its 1,500 employees, Skyguide controls civil and military air traffic in collaboration with the Swiss Air Force and international industry associations.

Energy strategy implementation
Skyguide gives a high priority to resource-efficient air traffic management. The company is committed to reducing emissions from air traffic and its own energy consumption through operational improvements. Skyguide invests in efficiency measures on the ground and in improved traffic management in the air while maintaining or even improving safety standards.

www.skyguide.ch

Jöri Engel, Head Corporate Real Estate Management & CEO Swisscom Immobilien AG

"Based on energy analyses conducted on our entire real-estate portfolio, we make significant energy savings every year as a contribution to Swisscom's energy efficiency."

Swisscom

With 6.6 million mobile phone customers, 1.4 million television subscribers and 2.3 million broadband connections for private and business customers, Swisscom is the leading telecommunications company and one of the leading IT companies in Switzerland. In addition, Swisscom builds and maintains mobile phone and land-line infrastructure, broadcasts radio signals, builds and operates data centres and operates in the banking, energy, entertainment, advertising and health sectors. In 2016, Swisscom generated sales of CHF 11.6 billion with 21,100 employees.

Energy strategy implementation
Swisscom is one of the most sustainable companies in Switzerland and meets 100% of its electricity requirements from domestic renewable energy. Together with its customers, Swisscom intends to save twice as much CO_2 by 2020 as it generates in its operations and supply chain.

www.swisscom.ch

Caroline Adam, Air and Noise Competence Centre

"By giving the instruction to take into account the latest standards in all building projects, we are making an important contribution to increasing energy efficiency."

DDPS

The DDPS is divided into seven administrative units: Defence, General Secretariat, Civil Protection, Sport, armasuisse, the Federal Intelligence Service and swisstopo. The department's core activities are security and physical exercise: security, protection and assistance from the Armed Forces and Civil Protection, physical exercise and health through sport. In 2016, the DDPS had 11,616 full-time employees, while the Armed Forces performed 5,918,334 days of service.

Energy strategy implementation

The DDPS adopted an energy policy for the department for the first time in 2004. It was renewed in 2013. The aim is to anchor modern and resource-efficient environmental and energy management in the DDPS and to achieve the specific targets based on the SwissEnergy programme by 2020.

www.ddps.admin.ch

Paul Eggimann, Head of the KBOB Sustainable Construction Section

"The Federal Council expects the Civil Federal Administration to display exemplary behaviour in line with its Sustainable Development Strategy, including in matters of energy. We're putting this into practice."

Civil Federal Administration

The Civil Federal Administration, with around 23,000 full-time employees, assists the Federal Council in its multifaceted and demanding tasks. It maintains relations between states, creates good general conditions for society and the economy, provides national infrastructure and ensures the security of the state and citizens. It supports parliament in its work and, as an independent judiciary, guarantees the enforcement and implementation of Swiss law.

Energy strategy implementation

The Federal Office for Buildings and Logistics FOBL obtains 100% of the power it needs for the Civil Federal Administration's buildings from renewable sources. In converted buildings, energy efficiency is consistently improved and new buildings are constructed according to the Minergie-P-ECO standard. Work-related travel is reduced by promoting work-at-home and the modal split is improved by means of contributions to public transport season tickets. The efficiency of data centres and other large-scale consumers is continually being increased.

www.admin.ch

From energy research to building management systems

The media event for the Confederation: exemplary in energy initiative in June 2016 gave an insight into Empa's energy research in building and mobility. A discussion for experts was held in the autumn.

A practically relevant media event

At the end of June 2016 the Confederation: exemplary in energy initiative presented the 2015 annual report at the Swiss Federal Laboratories for Materials Science and Technology (Empa, part of the ETH Domain) in Dübendorf. The report details exemplary measures taken by all the actors. Subsequently the media professionals were given an insight into two of Empa's research platforms. NEST is a modular innovation building in which new technologies are researched under real conditions. And in the "move" mobility demonstrator, concepts are developed for the transportation of the future without fossil fuels. The event met with a good media response.

Current topics for experts

In September 2016 a whole-day internal event was held for experts, focusing on two topics: First, the progressive commissioning of a building management system and subsequent optimisation of its operation were carefully examined. Secondly, participants presented and discussed their experiences of implementing mobility management systems. The feedback on the event was very good and it was already decided to continue the series this year.

Empa researches new technologies under real conditions in the modular innovation building NEST.

Energy-efficient office buildings are widespread

The Office for the Exemplary Role of the Confederation in Energy has for the first time surveyed the minimum building standards defined by the actors. Many of them use established labels and certificates. A comparison among new office buildings shows that Minergie standards are the most widespread. The Civil Federal Administration follows the Swiss Sustainable Building Standard (SNBS) for larger office buildings, while the SBB is primarily oriented to the Swiss DGNB certificate.

Minimum building standards for the construction of new office buildings

MINERGIE®

Minergie has been the Swiss standard for comfort, efficiency and value since 1998. The three well-known building standards Minergie, Minergie-P and Minergie-A can be supplemented with three-freely combinable additional products. ECO takes into account the issues of health and building ecology, MQS Construction guarantees quality in construction, while MQS Operation optimises utilisation and thus maximises comfort.
www.minergie.ch

- **Swiss Post**
  Minergie, various office buildings of a higher standard such as headquarters with a DGNB gold certificate
- **ETH Domain**
  Minergie-(P)-ECO
- **SBB**
  Specific objectives based on Minergie-ECO in office buildings up to CHF 5 million
- **DDPS**
  Minergie-P-ECO, test building to the SNBS standard in implementation phase
- **Civil Federal Administration**
  Minergie-P-ECO

SNBS

SNBS is a comprehensive sustainable building standard encompassing the societal, economic and environmental dimensions. It incorporates all essential Swiss standard-setting and regulatory principles on construction and sustainability (SIA standards, etc.). Numerous associations have contributed to its development.
www.snbs.ch

- **Civil Federal Administration**
  In office buildings over CHF 10 million

DGNB System Schweiz

The DGNB system involves taking a holistic view of sustainability over the whole life cycle of real estate and takes into account the technical, locational and process-related quality of real estate, in addition to its ecological, economic and sociocultural quality.
www.sgni.ch

- **SBB**
  In office buildings over CHF 5 million

The other actors' approaches

Genève Aéroport
No standard defined, as there are few new buildings. The most recent ones were built to Minergie-P or better.

Skyguide
No standard defined, as no new building projects are envisaged.

Swisscom
The standard is determined in each case by the investor and is therefore not uniform. Of the last three office buildings, two were built to Minergie-P-Eco and one to LEED Gold standard (Leadership in Energy and Envrionmental Design).

Note

Sometimes the actors construct their buildings to a higher quality than the standard requires. In the case of buildings that are part of a larger site, some actors (e.g. ETH Domain and the DDPS) place greater emphasis on a holistic energy assessment of the site than on individual building standards. For sites, SBB also relies in some cases on the 2000-watt site certificate. More information on the actors' various building activities is available at: www.confederation-exemplary-in-energy.ch.

The 80-metre-high Andreas tower is being constructed by SBB Real Estate at Zurich Oerlikon station and is due to be completed by 2018. It is pre-certified to DGNB Platinum, the highest rating level of this building standard.

Building across the entire spectrum of sustainability

In this interview, Peter Wicki, Head of Portfolio Management at SBB Real Estate, explains why the company is relying on comprehensive building standards.

With its real estate, SBB is firmly in the public eye. What influence does this have on its building standards?
SBB is one of the largest real-estate owners in Switzerland. We are currently investing more than CHF 500 million a year in our stations and the adjacent sites in order to transform them into sustainable urban neighbourhoods. Our responsibility for urban development is correspondingly great. Building standards help us to assure the quality of the project portfolio.

How important are building standards in your energy strategy?
Our new buildings are better than state of the art in terms of sustainability. They exceed the current statutory requirements. We rely primarily on the DGNB System Switzerland. For our stations, we have specially developed a standard derived from the DGNB in order to be able to ensure a high level of quality here as well. We also follow the development of the Sustainable Construction Standard Switzerland (SNBS).

What is the situation with regard to the existing building stock?
We manage about 3,500 buildings. They include 800 railway stations and many industrial and commercial buildings as well as maintenance workshops. We have defined binding sustainability objectives to be achieved by 2030 for the 90 most important high-rise buildings, which account for 70% of SBB Real Estate's total energy consumption. We align our renovation operations and developments with these objectives. For example, we have replaced about 20 oil-fired with wood-fired heating systems since 2015. This alone achieves a saving of 220,000 litres of fuel oil per year. In doing so, we are implementing one of the objectives of the Confederation: exemplary in energy initiative and are consistently switching from fossil fuels to renewable energy.

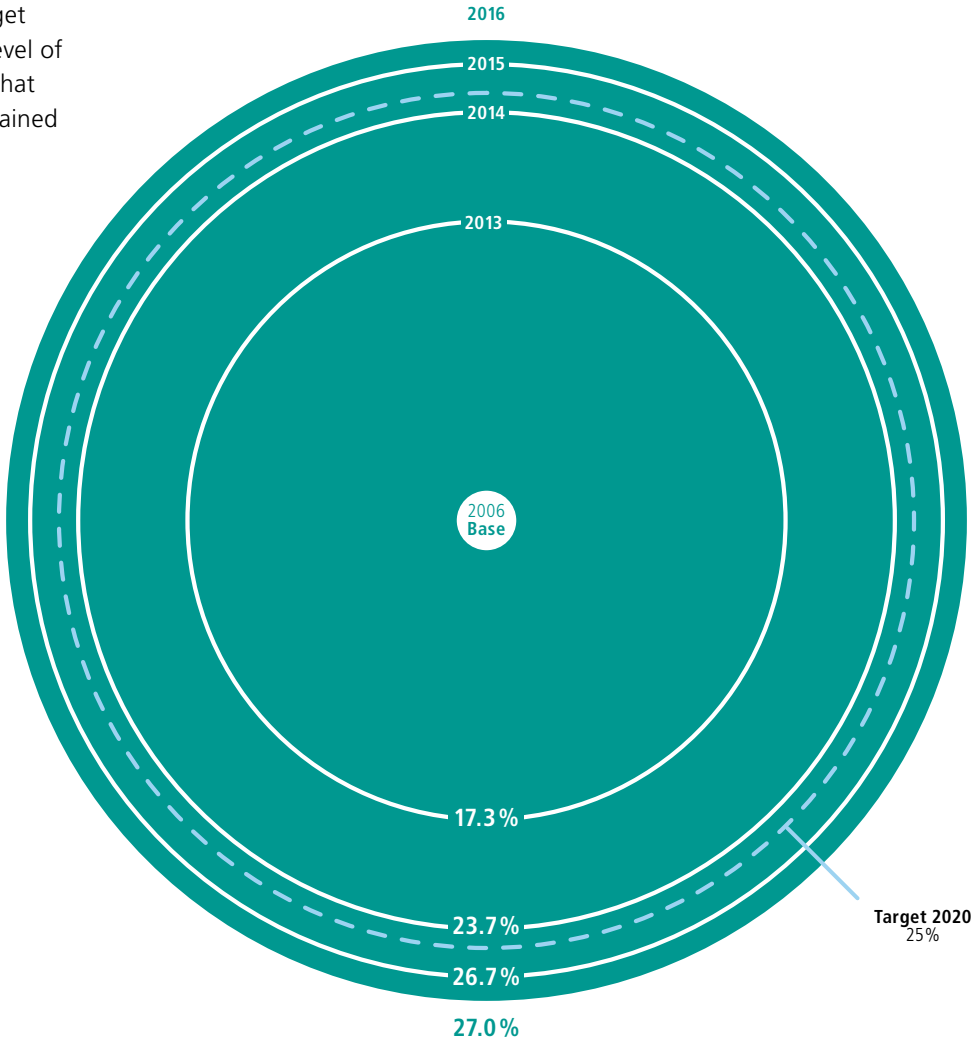
Do you feel there is a tangible demand from tenants and buyers for corresponding labels?
Yes, we are noticing a growing awareness. Our railway stations and development sites are mostly situated in central locations. The demands of tenants, buyers and other stakeholders such as towns and cities, local residents and politicians are correspondingly high and varied. Examples of this are mobility concepts, the inclusion of local residents in project development, 2000-watt sites, low-cost housing, etc. We are operating here across the entire spectrum of sustainability: functionality, environment, energy, efficiency and socio-cultural aspects. This makes the task we have in development demanding and exciting.

Visible progress

In 2016, the eight actors increased their energy efficiency beyond the original target of an average of 25%. It remains a challenging task to maintain and further improve this level in the coming years.

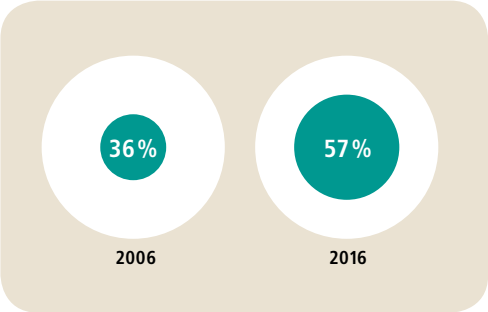
Energy efficiency

In 2016 the actors increased their energy efficiency by 0.3 percentage points to 27% compared to the previous year. They have thus already exceeded the original target of 25% by 2020. However, a certain level of efficiency in one year does not mean that this efficiency will automatically be attained in the following year as well.



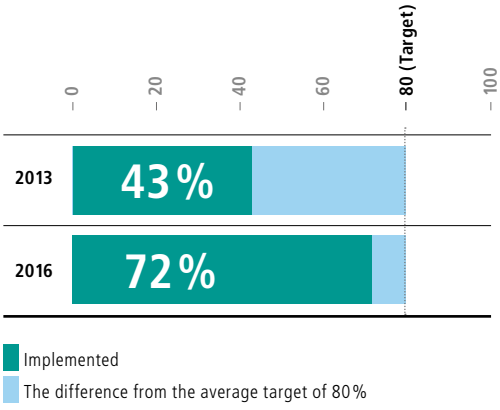
Renewable energy

In 2016, the average share of renewable energy out of total energy consumption decreased from 59% to 57% compared to the previous year. The decrease was due in particular to the fluctuating shares of hydro-electric power in railway power supply.



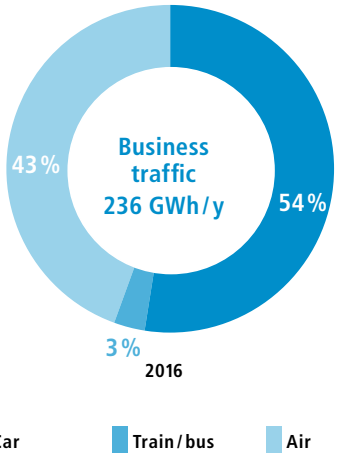
Joint measures

By the end of 2016, the actors had attained an average attainment rate of 72% for the 39 joint measures. They are thus well on track to implementing 80% of the measures by 2020.



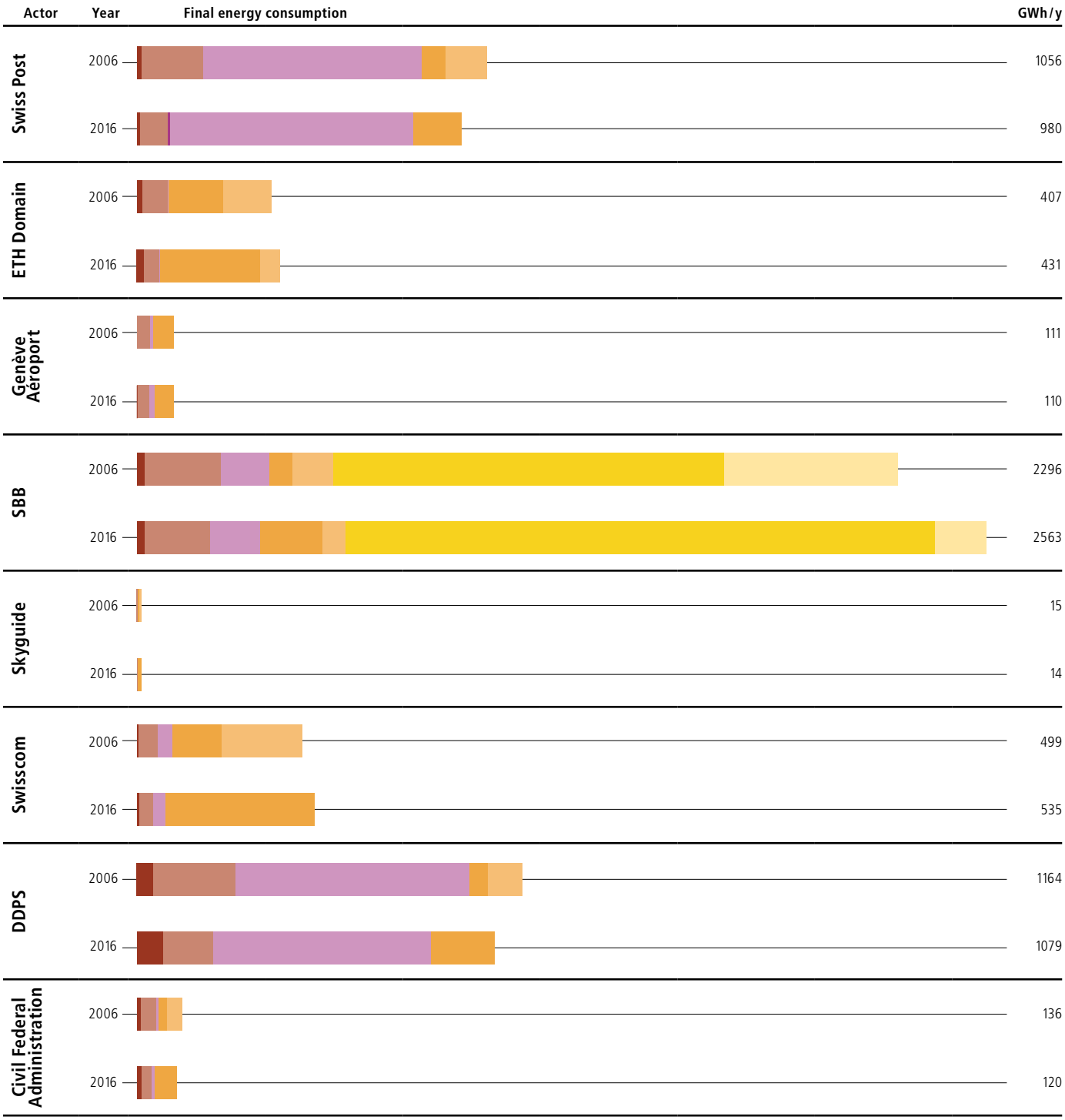
Mobility

For the first time, this year's annual report provides data on the actors' business and commuter traffic (cf. the individual action plans from p. 22). The average for all actors can only be calculated for business traffic. Uniform data are not yet available for commuter traffic.

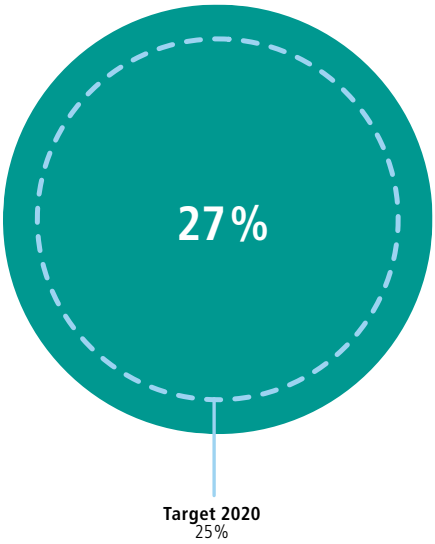


Note: The diagram shows the breakdown of business traffic by mode of transport, based on energy consumption. Passenger traffic is not counted as part of business traffic. The average does not include Genève Aéroport and the DDPS.

Final energy consumption and energy efficiency



Increase in energy efficiency attained	Reference variable(s)
26.7 %	Depends on the corporate unit: number of consignments, customer business, passenger kilometres, transactions, total useful floor area, full-time equivalents (FTE)
19.7 %	Efficiency indicator 1: 19.7 % based on full-time equivalents (FTE), total useful floor area, days instruments deployed, patient treatments (PSI) Efficiency indicator 2: 147.9 % calculation as for 1, but including efficiency increase on mainframe computer
21.5 %	Depends on the number of user units (passengers and cargo), total useful floor area
18 %	Efficiency indicator 1: 18 % based on operating output in passenger and net tonne kilometres and traction energy consumption (final energy) Efficiency indicator 2: 72.2 % calculation as for 1, but based on primary energy
30.3 %	Depends on the corporate unit: full-time equivalents (FTE), total useful floor area, number of flights
42.9 %	Efficiency calculation based on energy efficiency measures implemented (Energy Agency of the Swiss Private Sector [EnAW] methodology)
3.3 %	Staff level in full-time equivalents (FTE); work days are converted into FTE
53.9 %	Full-time equivalents (FTE)



Efficiency target exceeded

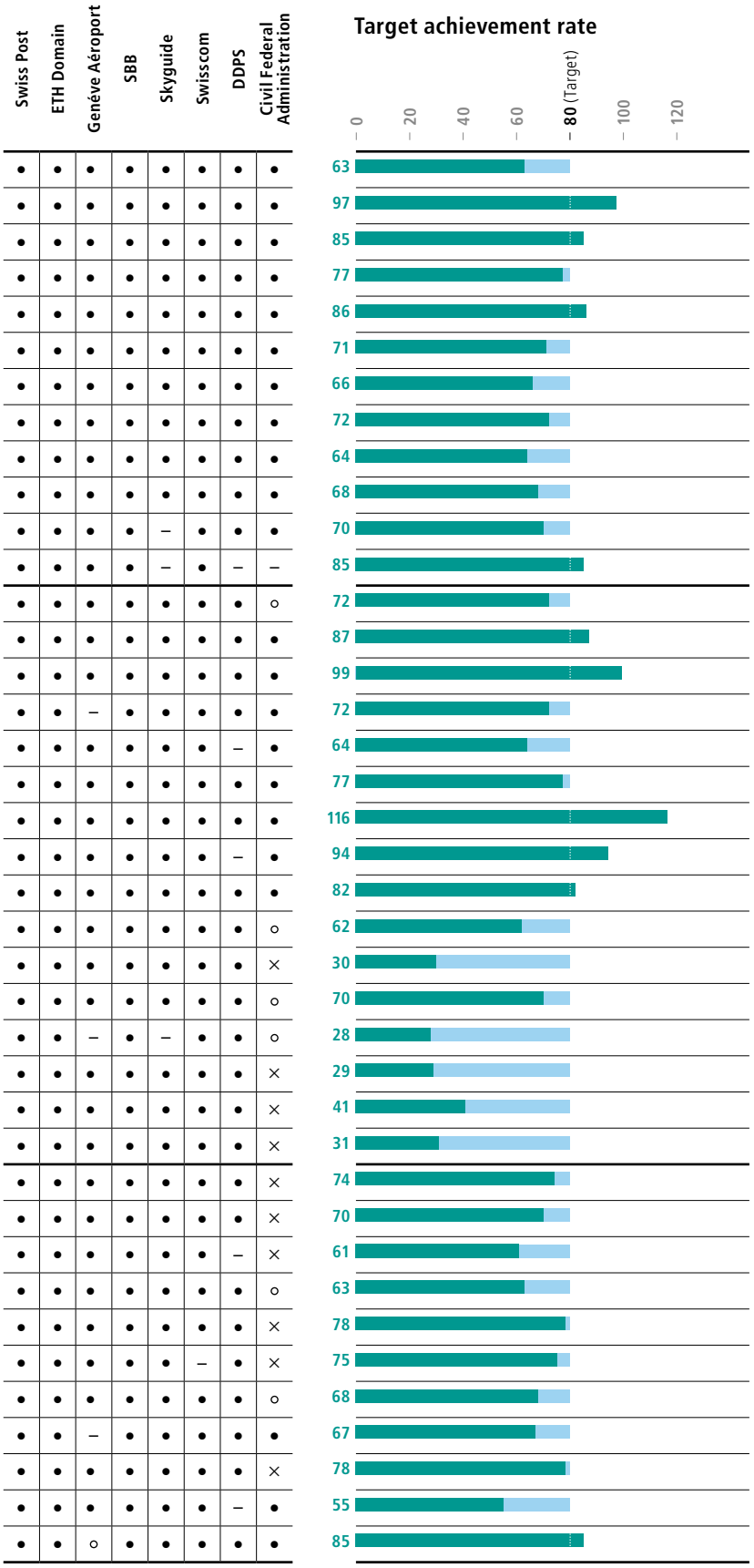
With an average increase in energy efficiency of 27%, the actors are already above the 25% they are targeting by 2020. Even if absolute energy consumption increases, an actor may have increased efficiency if its organisation is growing.

Calculation methodology

Energy consumption and energy efficiency are calculated by each actor for its own buildings, infrastructure and vehicles in Switzerland. But the precise system limits vary from actor to actor. The actors also define individually the calculation methods and reference variables so that they can base these on their existing environmental reporting. Further information is available at www.confederation-exemplary-in-energy.ch.

Average degree to which joint measures have been implemented

Area of action	No.	Measure	Performance target
Buildings and renewable energy	01	Energy-efficient new and converted buildings	100% from 01.01.2016
	02	Analyses of potential of waste heat and renewable energy	Analyses of potential available
	03	No new fossil-fuel powered heating systems	100% from 2016
	04	Full cost accounting of energy efficiency	1–2 case studies available from 01.01.2017
	05	Energy-efficient lighting	100% from 01.01.2016
	06	Energy-efficient cooling machines	100% from 01.01.2016
	07	Energy-efficient sanitation facilities	100% from 01.01.2016
	08	Energy-efficient electromotors	100% from 01.01.2016
	09	Building technology with operating optimisation regime	60% by 2020
	10	Procurement of green power and hydroelectricity	20% and 80% respectively by 2020
	11	Mobility concepts for buildings	100% from 01.01.2016
	12	Creation of ecofunds	100% by 2020
Mobility	13	Integration of mobility management	100% by 2020
	14	Central information and booking platform	80% of employees
	15	Encouragement of mobile-flexible forms of work	30% of employees with an appropriate job profile
	16	Promoting work hubs	100% of sites by 2020
	17	Promotion of video and web conferencing	30%/70% of employees
	18	Incentives for using public transport	See detailed description on page 56
	19	Providing or co-financing PT season tickets	Half-fare card or contribution to PT season ticket
	20	Criteria for choosing mode of transport	Air travel less than 20% for short distances by 2020
	21	Active parking space management	100% of parking spaces
	22	Provision of bicycle parking spaces	100% of sites equipped to cope with demand
	23	Provision of bicycles and e-bikes	100% of sites with over 100 employees
	24	Criteria for procuring energy-efficient vehicles	100% of newly-procured cars by 2020
	25	Eco-driving training courses for frequent car users	100% of employees
	26	Promoting the use of car sharing agencies	80% of employees
	27	Joint use of a company carpool	See detailed description on page 57
	28	Provision of charging stations for electric vehicles	100% of sites with over 500 employees
Data centres and green IT	29	Full cost accounting of energy efficiency in procurement	100% of appliances in new calls for tender
	30	Specifications for new servers and new data centre hardware	100% of new calls for tender
	31	Highly energy-efficient data centres	See detailed description on page 57
	32	Pushing passive cooling solutions in data centres	See detailed description on page 57
	33	Encouraging server virtualisation in data centres	Over 85% by 2020
	34	Bundling of data centres / outsourcing of IT services	100% checked by end of 2015
	35	Monitoring and evaluation of new technologies	At least one evaluation per year
	36	Promotion of waste heat recovery	50% by 2030 (data centres > 250 sq. m.)
	37	Promotion of economy mode at computer workstations	Over 90% by 2015
	38	Promotion of energy-efficient printing solutions	See detailed description on page 58
	39	Promoting re-use of appliances	100% by 2015



Average target achievement rate
for all joint measures

72 %

Great differences in the implementation of mobility measures

By the end of 2016, the actors involved in the Confederation: exemplary in energy initiative had attained an average attainment rate of 72% for all joint measures. In the action area mobility the emphasis has been placed up to now on a range of different forms of implementation. That is why attainment of the target varies most widely in this area. Overall, the action area buildings and renewable Energy comes closest to the target attainment rate of 80%.

- ● Selected measure
- ○ Selected, no data yet
- – No leeway for action
- × Responsibility for implementation open

Implemented
The difference from the average target of 80 %

Swiss Post

Swiss Post's final energy requirement in 2016 was 980 GWh. It has fallen by 7% compared with the base year 2006, despite strong business growth in some areas. Swiss Post increased its energy efficiency by 26.7% over this period. Over the past year, the company renewed its transport fleet with more energy-efficient trucks and rail wagons and completed the conversion of all its petrol-engine scooters to electric models, among other measures. In addition, Swiss Post has begun to replace neon tube lighting with LED lights in its sorting centres.

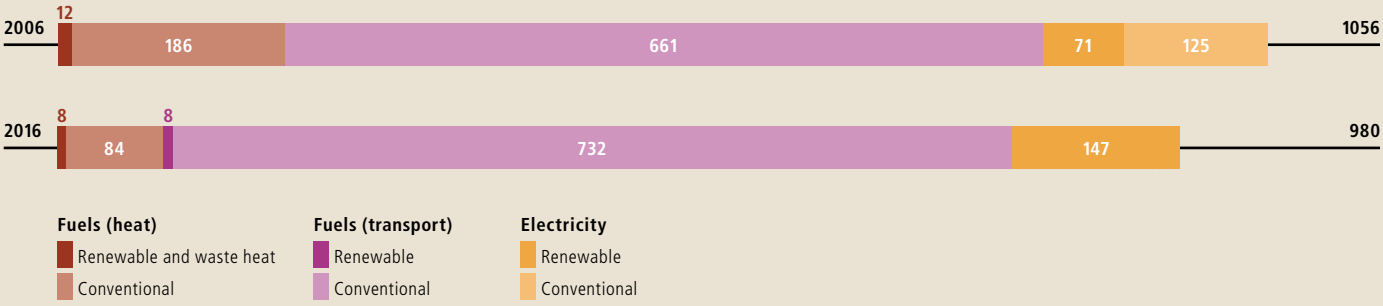
Success story

Reducing energy consumption together

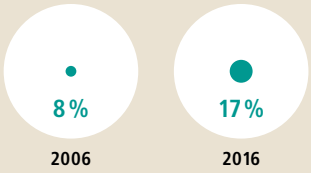
Rail where possible, road where necessary – that is the motto of Swiss Post for transporting letters and parcels between its six sorting centres. Although carriage is performed exclusively by third parties, the rail wagons and semi-trailers are owned by Swiss Post. Fifty-five new rail wagons have been operating on the Swiss rail network for Swiss Post since January 2016. The old fleet of rail wagons has been withdrawn from service, with the exception of 20 open-space wagons. The approximately 350 million tonne kilometres that are covered each year by rail correspond to an energy saving of 86.9 GWh compared to transportation by road. Swiss Post is also improving energy efficiency in road transportation. Last year it re-ordered 16 of the latest generation of double-decker semi-trailers. Although a journey with a total weight of 40 tonnes requires 10% more fuel, 36 wheeled containers with parcels can be transported instead of 24. The result: about 110 MWh are saved per semi-trailer per year. Owing to this successful development, 38 of these vehicles are in operation for Swiss Post today, saving 4.2 GWh of energy a year.

Final energy consumption by energy source

in GWh / y

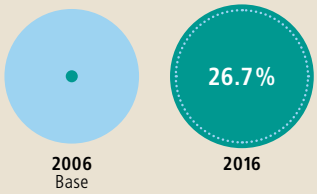


Renewable energy as a proportion of total consumption



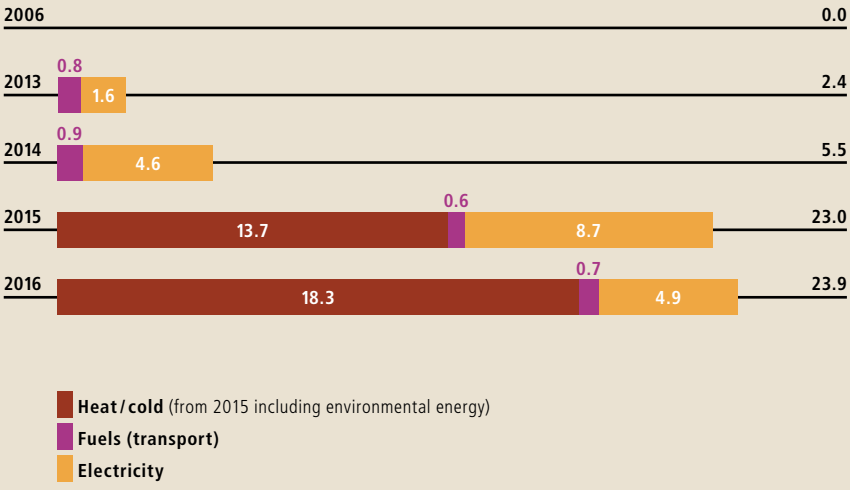
Increase in **energy efficiency**

Target 2020: 25%

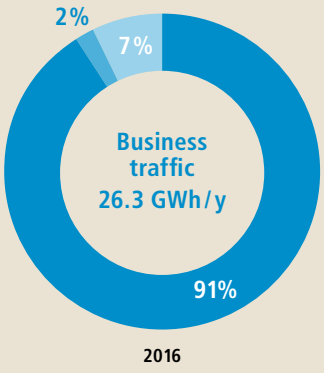


Production of renewable energy

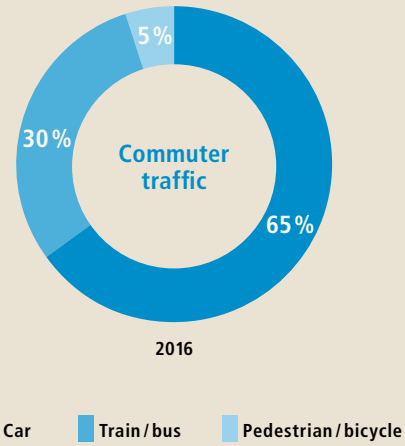
in GWh / y



Energy consumption for **mobility**



Note: Percentage shares based on energy consumption. Passenger traffic is not counted as business traffic.



Swiss Post

Joint measures

No. Measure

Buildings and renewable energy

01 ● Energy-efficient new and converted buildings
02 ● Analyses of potential of waste heat and renewable energy
03 ● No new fossil-fuel powered heating systems
04 ● Full cost accounting of energy efficiency
05 ● Energy-efficient lighting
06 ● Energy-efficient cooling machines
07 ● Energy-efficient sanitation facilities
08 ● Energy-efficient electromotors
09 ● Building technology with operating optimisation regime
10 ● Procurement of green power and hydroelectricity
11 ● Mobility concepts for buildings
12 ● Creation of ecofunds

Mobility

13 ● Integration of mobility management
14 ● Central information and booking platform
15 ● Encouragement of mobile-flexible forms of work
16 ● Promoting work hubs
17 ● Promotion of video and web conferencing
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20 ● Criteria for choosing mode of transport
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26 ● Promoting the use of car sharing agencies
27 ● Joint use of a company carpool
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36 ● Promotion of waste heat recovery
37 ● Promotion of economy mode at computer workstations
38 ● Promotion of energy-efficient printing solutions
39 ● Promoting re-use of appliances

● Adopted and at least 80% achieved
● Adopted and in implementation phase
○ Adopted, no data yet
– No leeway for action

05

Energy-efficient lighting

The outdated neon tube lighting in sorting centres is to be replaced with power-saving LED lights by the end of 2018. When the work has been completed, Swiss Post will save 8.6 GWh of power per year. The Härkingen sorting centre is launching the process. Starting in autumn 2016, all of the outdated ceiling lighting is being replaced in stages with energy-saving light-emitting diodes (LEDs). Specifically, the existing lighting tracks are being equipped with 3,500 LED lights over a length of about 7 kilometres. In parallel, a research project managed by the Lucerne University of Applied Sciences and Arts in cooperation with SUVA, SECO and further partners is investigating the biological impact of the new LED light. The results should help to enhance the overall well-being of employees, occupational safety, health and productivity.

Swiss Post

Specific measures

No. Measure
Target (target year)

01 ● Replacement of all petrol-engined scooters used to deliver letters with electric scooters. The 6,300 vehicles are operated with entirely naturemade star certified power.
13.9 GWh/y (2016)

02 ● Energy-efficient logistics management at PostLogistics
2.1 GWh/y (2014)

03 ○ Replacement of conventional Postbuses with fuel-cell and diesel-hybrid buses (saving per Postbus)
15.0 MWh/y (2020)

04 ● Use of modern EcoLife transmissions and updates of the transmission software in Postbuses
6.0 GWh/y (2014)

05 ● Targeted replacement of installations for ensuring an uninterrupted power supply (UPS) in the data centres of PostFinance Ltd with latest generation installations
1.0 GWh/y (2014)

06 ○ Procurement of certified biogas
5.5 GWh/y (2020)

07 ● Management of subcontractors in logistics: monitoring of average fuel consumption with the 16 largest transport logistics partners.
1.1 GWh/y (2015)

08 ○ Photovoltaic installations on post office buildings
5.0 GWh/y (2020)

09 ○ Procurement of biodiesel
3.3 GWh/y (2017)

10 ● Optimisation of lifting beams in sorting centres
114.0 GWh/y (2015)

11 ○ Smart metering in transporters
1.0 GWh/y (2020)

12 ○ Smart temperature regulation in post office buildings
Pilot projects (2020)

13 ○ Fast charging stations for electric cars at post office buildings
Pilot projects (2020)

● Reduction target attained
○ Target

12

Smart temperature regulation

The room temperature in PostFinance's data centre in Zofingen has been controlled since spring 2016 by means of the MeteoViva Climate optimisation process. Based on the weather forecast, the internal loads – apparatus as well as employees – and the building structure, this process calculates one to two days in advance how the room temperature will change. In this way, the building is only heated, cooled or ventilated as much as is necessary. MeteoViva Climate controls the energy requirement gradually with a smaller power input over a longer time interval. By doing so, it reduces the peak load of the energy producers. The result: energy and cost savings with greater room comfort for the 380 or so employees.

01

13.9 GWh/y

Switch to electric scooters

On 7 December 2016 the last of 6,300 petrol-engined scooters was taken out of service in Stein am Rhein. The conversion of Swiss Post's scooter fleet from petrol to electric has thus been completed. This enables Swiss Post to reduce energy consumption by 13.9 GWh per year or 2.2 MWh per vehicle.

13

New fast charging station at the PostParc in Bern

Since August 2016 there has been a public fast-charging station for electric cars at the short-term car park at the PostParc in Bern. It is equipped with the plug types most commonly used today and provides certified green power (naturemade star) with an output of up to 60 kW.

ETH Domain

Since 2006 the ETH Domain has been characterised a very rapid expansion in teaching and research, fast-growing student and teacher numbers, and novel large-scale research facilities. The extent to which technology is used in the buildings is constantly increasing as a result of the latest laboratory technology and other innovations. Thanks the modernisation of building technology, increased recovery of waste heat and great endeavours to ensure that large-scale research facilities are as energy-efficient as possible, energy efficiency has been improved by 19.7% since 2006, although total energy consumption has risen by 5.7%.

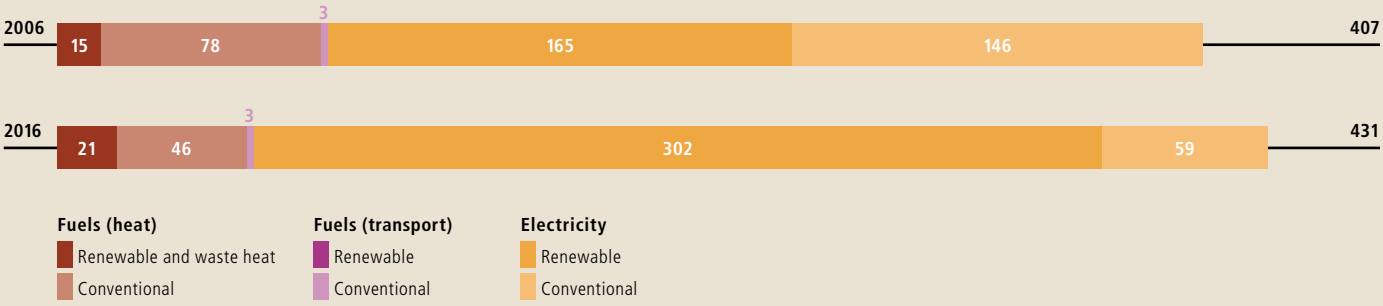
Success story

Reducing the energy requirement and producing power

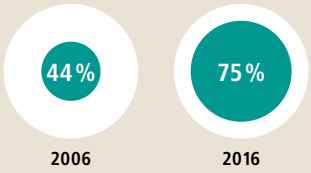
The Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) consistently pursues a CO_2-neutral strategy for its building stock. It has renovated two buildings dating from the 1950s to ultra-modern energy standards. Thanks to better thermal insulation of the buildings, for example with an additional facade layer made of 24 cm of glass wool, a weather layer made of sustainably-produced wood and high-insulation windows, the existing woodchip heating system is now sufficient, together with heat recovery, to heat all of WSL's buildings in Birmensdorf CO_2-neutrally. The existing oil heating is used only as a back-up for emergencies. Since January 2017 the new solar panel roofs have been producing about 110 MWh of renewable electricity per year, which WSL consumes itself. Moreover, thanks to sensor-controlled LED lighting, the buildings also require significantly less power. The two renovated buildings are the first in the canton of Zurich to fulfil the requirements for both the Minergie-P-ECO and the Minergie-A-ECO standards. As plus energy houses, they produce more energy than they themselves consume.

Final energy consumption by energy source

in GWh / y

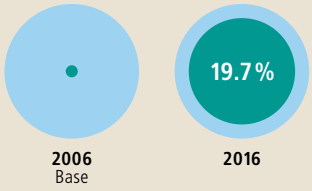


Renewable energy as a proportion of total consumption

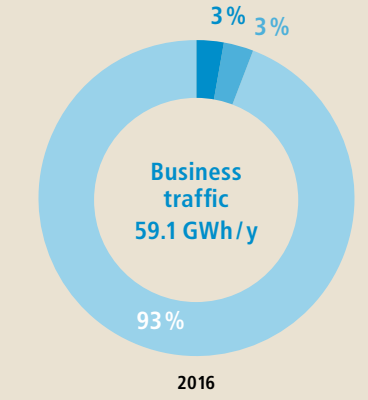


Increase in **energy efficiency**

Target 2020: 25%



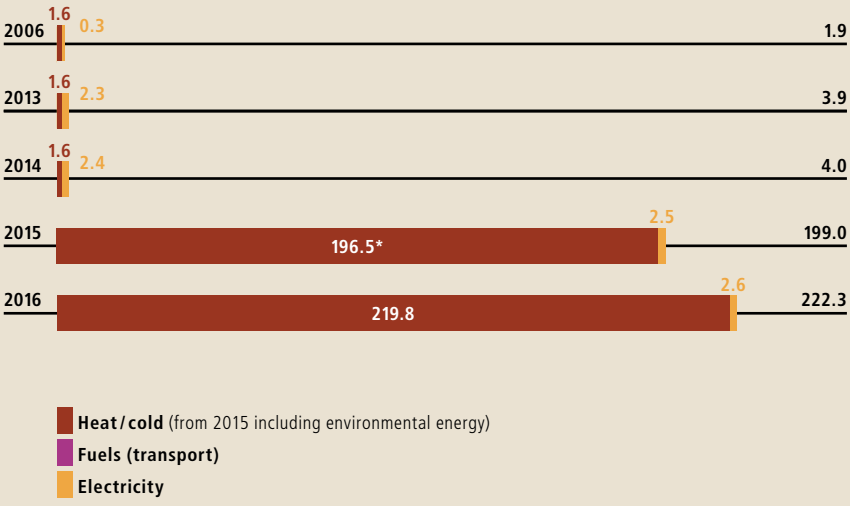
Energy consumption for **mobility**



Note: Percentage shares based on energy consumption. Commuter traffic has not yet been measured.

Production of renewable energy

in GWh / y



*The figure for the production of renewable heating and cooling energy had to be corrected retrospectively.

ETH Domain

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○ Adopted and in implementation phase
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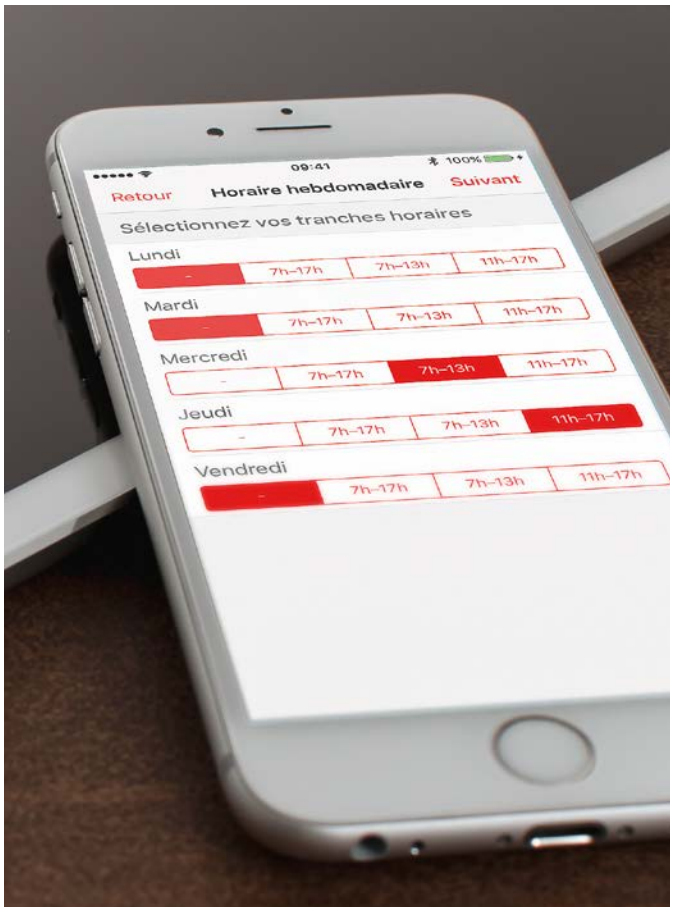


21

Active parking space management

EPFL's mobility plan took effect in 2016 with a 260% increase in the price of the car parks. The proceeds from these increases are paid into a mobility fund which finances accompanying measures promoting sustainable forms of transport. For example, EPFL offers a 15% discount to holders of public transport season tickets in addition to a zero charge for the SBB half-fare travelcard. Management of the car parks has been digitised and so it is now possible to charge for use by the half day / full day / month, with invoicing to the internal electronic wallet (CAMIPRO). It is one way of encouraging multimodality of journeys, according to the seasons or personal and work schedules, and of reducing the modal share of private vehicles on the campus.

ETH Domain

Specific measures

No. Measure
Target (target year)

01 ● Research in the field of exemplary energy measures
- Implementation of the Swiss Competence Centers for Energy Research (SCCER): research on energy topics such as "Power supply", "Storage", "Grids and their components, energy systems", "Efficient concepts, processes and components in mobility" and "Biomass".
- NEST, a practical laboratory for intelligence in the building
- Smart Living Lab, a research and practical laboratory for integrating systems to generate energy from renewable energy in buildings.

New research projects (2020)

02 ● Teaching in the field of energy
Exemplary offerings from the new study and continuing education programmes
- Introduction of a master's course in Energy Science and Technology at ETH Zurich.
- Master's course in energy management and sustainability at EPFL

New study courses (2020)

03 ● ETH Zurich: Construction of the Anergy Grid on the Hönggerberg campus
14.0 GWh/y of heat (2020)

04 ● PSI: Improved waste heat recovery on the research site
75% waste heat (2018)

05 ● EPFL: EPFL's autonomous heat supply. Target: heating without fossil fuels by 2019, maximisation of the use of renewable energy for heating and cooling (100% heat pump with lake water) by 2019; minimisation of CO_2 emissions, use of potential synergies with other projects on the campus.
100% renewables (2019)

06 ● WSL: Conversion of all WSL's own sites to CO_2-neutral heating. Target: reduction of CO_2 emissions by 97% from 2006 to 2020, reduction of the heat requirement by 25% by 2018.
CO_2 reduction (2020)

● Reduction target attained
● Target

02

Teaching in the field of energy

Mobility is key to achieving the climate objectives and implementing the Energy Strategy 2050. This is the field of research of the Swiss Competence Center for Energy Research – Efficient Technologies and Systems for Mobility (SCCER Mobility), one of eight research competence centres under the Coordinated Energy Research Switzerland action plan. ETH Zurich is offering for the first time the MAS/CAS Mobility of the Future continuing education programme. The programme is part of the strategy of linking SCCER Mobility's research with practice and of promoting a continuous exchange. The participants – specialist executives and managers of national and regional transport providers as well as people from industry and administration – develop knowledge and technologies that enable a switch to a sustainable transport system.

01

Ganymeth methanisation plant

In 2016 a further important component of the Energy System Integration platform at the Paul Scherrer Institute was established with the Ganymeth test installation. In this installation, different variants of the power-to-gas process can be tested on a fluidised bed reactor: mixtures of hydrogen, carbon monoxide, carbon dioxide and hydrocarbons can be converted into pure methane, which is suitable for being fed into the gas grid.

01

Energy-efficient sweeping vehicle: hy.muve II

At the end of August 2016, a two-year field test was launched in Dübendorf to refine the technology of the hydrogen-powered sweeping vehicle. The vehicle is refuelled at Empa's hydrogen filling station and consumes 60% to 70% less energy than a conventional diesel vehicle.

Genève Aéroport

As a new actor in The Confederation: exemplary in energy initiative, Genève Aéroport is presenting its figures for the first time in this annual report. The company has increased its energy efficiency by 21.5% to date compared to the base year 2006. Some important measures taken last year were the installation of a photovoltaic system on a noise-absorbing structure, the construction of the INAD centre to the Minergie-P standard and improvements to the shuttle bus system for employees working the night shift.

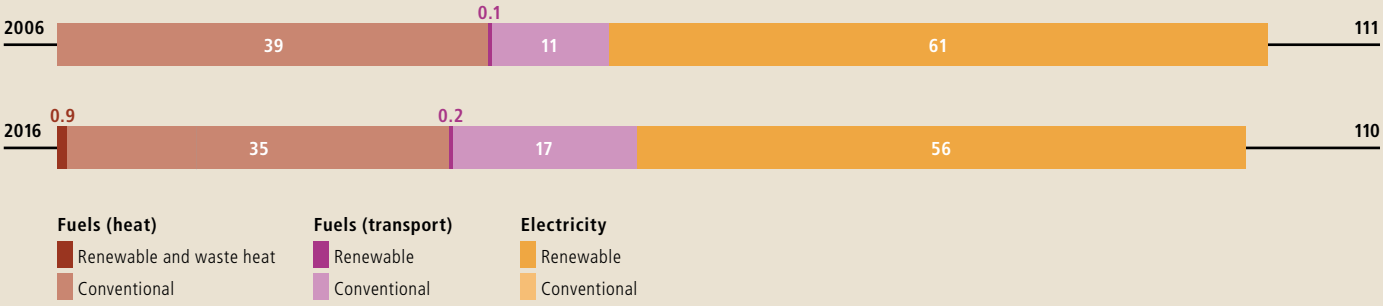
Success story

Remote meter reading and EDM systems

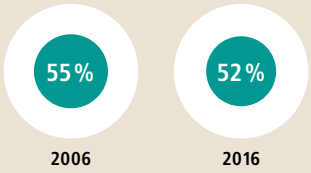
All of the 1,000 or so electricity meters on the site have been replaced in recent years with new meters that allow networking for the purpose of reading consumption levels. These meters no longer measure only total electricity consumption, but also the profile of this consumption. This remote reading system can thus go back in real time to all the consumption data from all the meters, which is stored in a centralised database. The Energy Data Management (EDM) system enables this data to be analysed and automatically generates the consumption invoices. Based on a detailed analysis of the 2015 consumption data, a calculation was done for each meter to find the best tariff to be applied as from the beginning of 2016.

Final energy consumption by energy source

in GWh / y



Renewable energy as a proportion of total consumption



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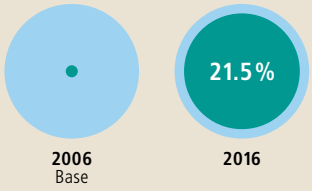
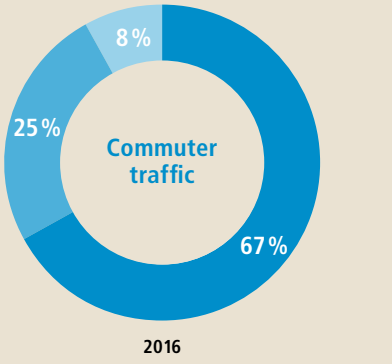
Target 2020: 25%



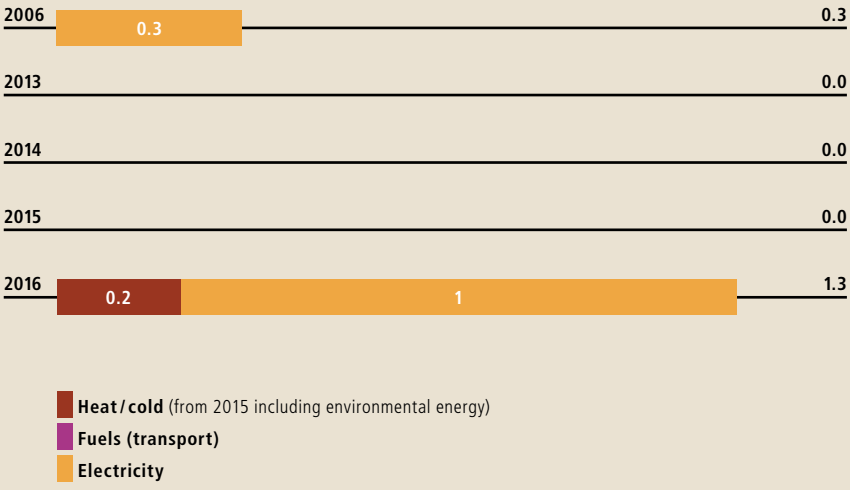
Energy consumption for **mobility**



Note: Business traffic has not yet been measured.

Production of renewable energy

in GWh / y



Genève Aéroport

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● Adopted and at least 80% achieved
● Adopted and in implementation phase
○ Adopted, no data yet
– No leeway for action

01

Energy-efficient new buildings

The new INAD building (administrative detention in closed airport areas or for persons without valid visa) is designed to accommodate a maximum of forty people and meets the needs of its designated purpose. All the rooms are built on a single level, are arranged around a central corridor and benefit from natural daylight. The structure combines reinforced concrete slabs and Aggloplein load-bearing walls, which provide sound insulation. Heating is provided by a heat pump with coupling via geothermal probes, which also allows air to be cooled by geo-cooling. Solar thermal collectors contribute to hot water production, while photovoltaic panels cover part of the electricity consumption. The building has thus obtained the Minergie-P label.

Genève Aéroport

Specific measures

No. Measure
Target (target year)

- **01** ● Supplying own energy with photovoltaic installations
  3% (2020)
- **02** ● Producing renewable heat on the airport site
  100% (2025)
- **03** ● ISO 50001
  Certification (2017)
- **04** ● Shuttle service for staff outside public transport hours of operation
  Existing network (2016)
- **05** ● Electric vehicles and machines on the taxiway
  40% environmentally friendly vehicles, all companies (2020)
- **06** ● Electricity for aircraft (auxiliary power units turned off)
  120 GWh/y (2020)
- **07** ● Smart metering of energy flows
  80% (2020)
- **08** ● E-invoicing
  80% (2020)
- **09** ● Airport Carbon Accreditation (ACA), Level 3+ (neutrality)
  Certification (2017)
- **10** ● Energy savings in line with IPMVP protocol / Energy Efficiency Directive (EED)
  100% (2015)

01

200 MWh/y

Noise absorber with solar panels

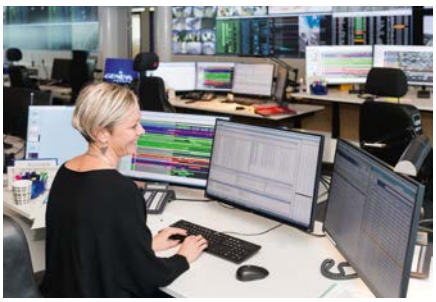
In 2016 the airport authority inaugurated a noise absorber that allows engine tests to be conducted at full power by limiting the noise nuisance sustained by local residents. Until now these engine tests, which are compulsory after each maintenance, were carried out in the open air. The walls of this noise absorber are covered with sound-absorbing panels. Perforated with thousands of small holes and filled with glass wool, they reduce the noise emitted to the surrounding area by about 20 decibels. In addition, it is covered with 909 solar panels capable of producing 200 MWh / year. This figure represents the consumption of about 60 four-person households.

04

+13%

Increase in the frequency of airport shuttles in 2016

A significant proportion of the 11,000 employees who work the night shift on the airport site (from 4am or who go home after 0.30am) can benefit from the airport staff shuttle network (NPA). This network carried more than 57,000 people to and from the airport site in 2016 (+13% versus 2015).



10

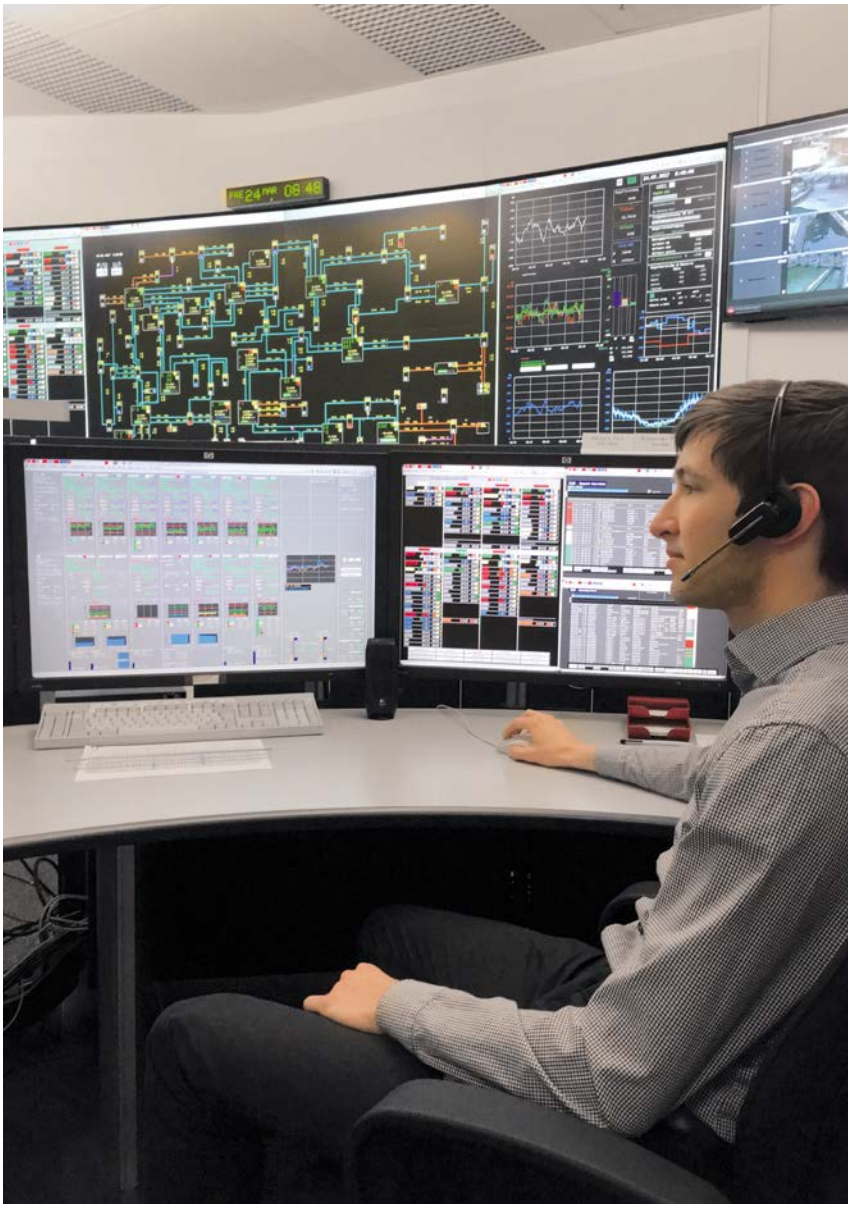
Airport Operation Center (APOC)

When setting up a coordination centre with its partners, Genève Aéroport wanted to optimise its technological ergonomics. Communications tools for the operators and information systems were pooled as much as possible in order to reduce their number and minimise the impacts. The cooling and energy-supply adaptations for the control room were limited to what was strictly necessary.

● Reduction target attained
● Target

Swiss Federal Railways

SBB plans to save 600 gigawatt hours per year with a comprehensive package of measures. This reduction corresponds to 20% of the annual consumption projected for 2025. In 2016, the company further optimised the rail power supply, invested in energy-efficient buildings with flexible workplaces, and trained locomotive drivers in energy-saving driving behaviour, among other measures. Despite a strong increase in passenger traffic performance, SBB has increased its energy efficiency by 18% to date compared to the base year of 2006.



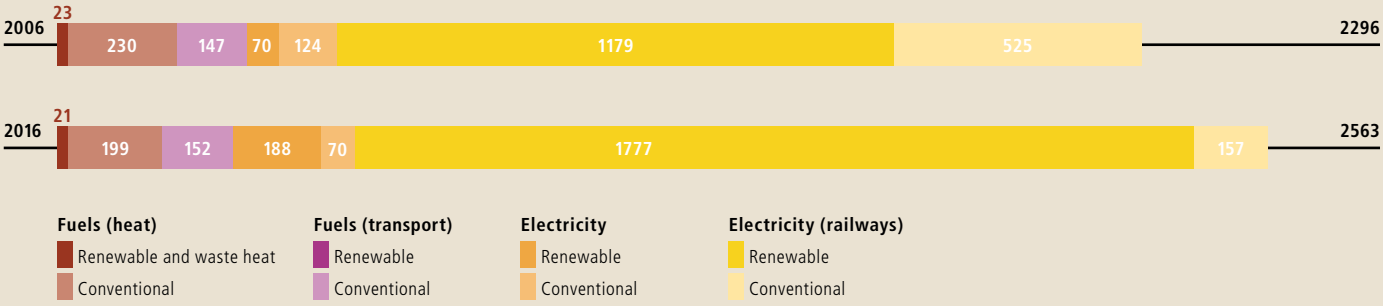
Success story

Smart optimisations of rail power supply

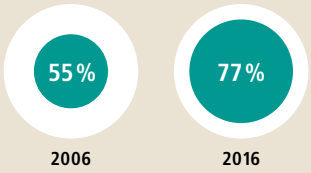
SBB operates its own electricity grid to provide its trains with power. Power generation is assured with seven frequency converters and hydroelectric power stations. They are centrally managed via a control system and form the nervous system of the rail power supply. When the control system was renewed in 2014, various functions for improving energy efficiency were developed and implemented. Among the optimisation measures, the innovative Optimal Power Flow (OPF) function stands out with a power saving of 10 GWh/y. By using many parameters, the software optimises deployment of the production sites, taking into account transmission and plant losses. The overall efficiency of the rail power supply is increased and the losses thus reduced. In addition to the measures for increasing energy efficiency, a load management system is in the implementation phase. The aim is to use central control software to switch off power-consuming equipment, such as rail point heaters, for a short time to even out load peaks in the rail power grid.

Final energy consumption by energy source

in GWh / y

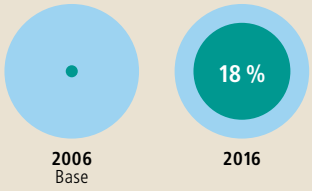


Renewable energy as a proportion of total consumption

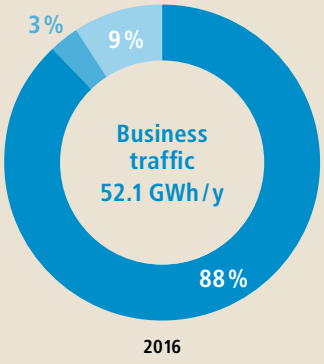


Increase in **energy efficiency**

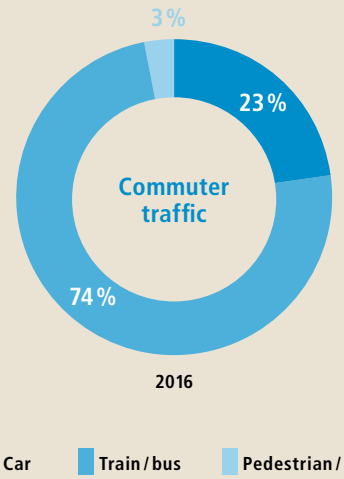
Target 2020: 25%



Energy consumption for **mobility**

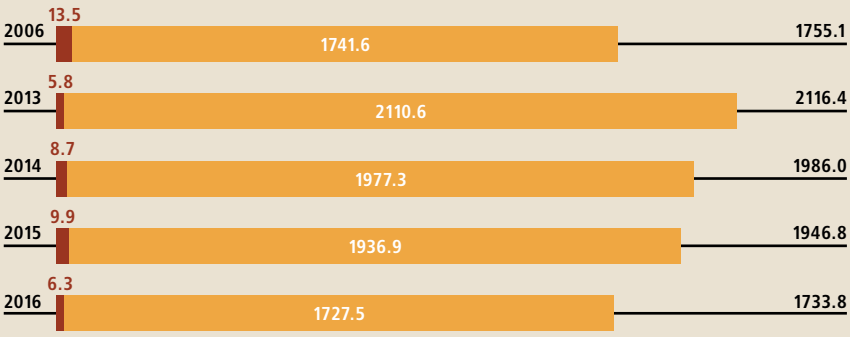


Note: Percentage shares based on energy consumption. Passenger traffic is not counted as business traffic.



Production of renewable energy

in GWh / y



Swiss Federal Railways

Joint measures

No. Measure

Buildings and renewable energy

01 ● Energy-efficient new and converted buildings
02 ● Analyses of potential of waste heat and renewable energy
03 ● No new fossil-fuel powered heating systems
04 ● Full cost accounting of energy efficiency
05 ● Energy-efficient lighting
06 ● Energy-efficient cooling machines
07 ● Energy-efficient sanitation facilities
08 ● Energy-efficient electromotors
09 ● Building technology with operating optimisation regime
10 ● Procurement of green power and hydroelectricity
11 ● Mobility concepts for buildings
12 ● Creation of ecofunds

Mobility

13 ● Integration of mobility management
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38 ● Promotion of energy-efficient printing solutions
39 ● Promoting re-use of appliances

● Adopted and at least 80% achieved
● Adopted and in implementation phase
○ Adopted, no data yet
– No leeway for action

01 and 15

Energy-efficient buildings and mobile-flexible forms of work

Energy-efficient new and converted buildings are good, a reduction of the required floor space is better. SBB is promoting Work Smart – flexible forms of work for tasks that can be performed anywhere and at any time. The mobile workplace is already a reality for over 9,000 employees. In this way, SBB helps to relieve pressure at peak travel times and creates more free seats for passengers. At the same time, Work Smart and Desksharing enable more office workers to work on less usable floor space. By moderately increasing occupancy density, other sites can be given up and rented buildings can be vacated. SBB saves 4.5 GWh of energy a year by densifying usage in its new, energy-efficient headquarters in Bern-Wankdorf, on the Aarepark premises in Olten and at the WestLink in Zurich-Altstetten.

Swiss Federal Railways

Specific measures

No. Measure
Target (target year)

- **01** ● Adaptive control (ADL): a green wave for rail traffic
  72.0 GWh/y (2017)
- **02** ● Energy modernisation of the Re460 locomotive, including replacement of the power converters
  28.7 GWh/y (2022)
- **03** ● Energy-optimised shutdown of passenger trains (intelligent hibernation mode)
  34.0 GWh/y (2017)
- **04** ● Refit of double-deck push-pull train: optimisation of heating, ventilation, air-conditioning
  13.3 GWh/y (2017)
- **05** ● Double-deck multiple-unit train: optimisation of drive software and control, heating, ventilation, air-conditioning
  13.0 GWh/y (2015)
- **06** ● Demand-dependent outside air control with air pressure or CO_2 sensors (IC 2000, ICN)
  11.4 GWh/y (2022)
- **07** ● Timetable-based train preparation time (HVZ-D, IC 2000, double-deck multiple-unit train, new trains)
  9.5 GWh/y (2018)
- **08** ● FLIRT Regi0lten dry-type transformers
  0.6 GWh/y (2018)
- **09** ● Optimisation of load distribution and nozzle control for Pelton turbines in the Amsteg hydroelectric power station
  3.5 GWh/y (2015)
- **10** ● Load flow optimisation through energy management and traction power control system EMS / FSL
  10.0 GWh/y (2017)
- **11** ● Increasing the efficiency of the Göschenen hydroelectric power station with new impellers and transformers
  5.0 GWh/y (2020)
- **12** ● Optimisation of lifts / elevators and escalators
  2.7 GWh/y (2025)
- **13** ● Migration of old telephone equipment to VoIP technology
  2.0 GWh/y (2016)
- **14** ● Optimisation of rail points heaters by renewing them and optimising operation
  12.4 GWh/y (2025)
- **15** ● LED lights in and around the station; platform and track area lighting
  5.5 GWh/y (2025)
- **16** ● Optimisation of passenger guidance and information systems (signage) in station access areas
  1.1 GWh/y (2025)

● Reduction target attained
● Target

01

72 GWh/y

Training courses for energy-saving driving behaviour and adaptive control

The use of both energy-efficient vehicles and demand-oriented supply planning is important for the reduction of traction energy consumption. But the employees' behaviour also plays a decisive role. The skills for using energy-saving driving modes and adaptive control are therefore taught as part of the basic train driver's training. In addition, the 2017 Further Training Days are focusing on the interaction needed between train crews and train traffic managers to make optimal use of the Adaptive Control System. In conflict situations or if a train is early, this collaboration sends driving recommendations directly to the driver's cab, thus enabling stable, punctual and energy-efficient railway operation.

08

0.6 GWh/y

FLIRT Regi0lten dry-type transformers

SBB has opted for dry-type transformers instead of oil-cooled transformers for the eight new FLIRTS of the RegiOlten type. Using a dry-type transformer yields an energy saving of about 10% with a typical SBB driving profile. The expected saving from the eight vehicles is 0.6 GWh per year. The first such FLIRT has been in operation since autumn 2016.

15

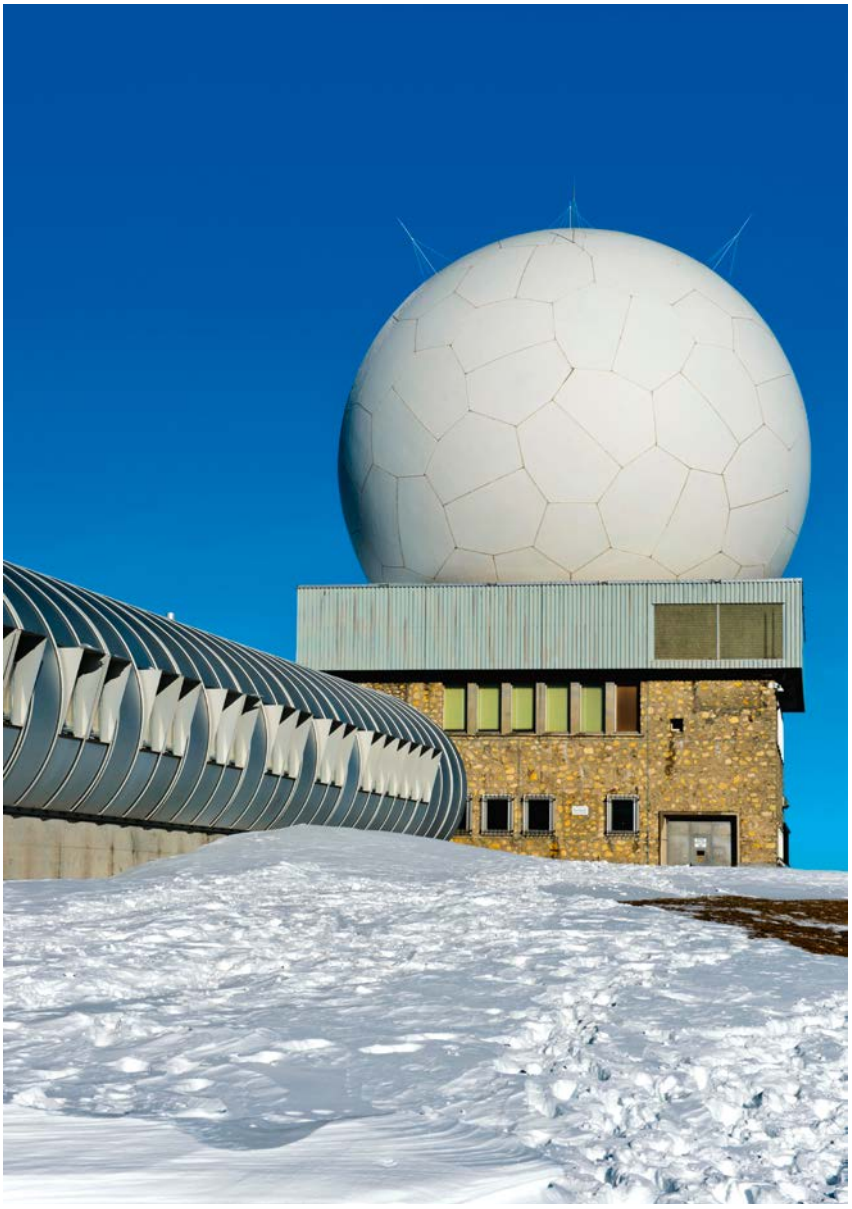
4.8 GWh/y

LED lights in the track field

About half of the 50-Hz power required in the infrastructure sector is consumed by lighting systems. The energy requirement is reduced with new lighting technologies (LED) and optimised control and adjustment of light intensities. The saving will be around. 4.8 GWh per year by 2025.

Skyguide

In order to reduce kerosene consumption and greenhouse gases emitted by air traffic, Skyguide is committed to guiding aircraft to their destination as directly as possible. It has therefore developed a network of direct routes over Switzerland, reduced aircraft waiting times before takeoff and improved a number of technical systems. The company also aims to maximise the energy efficiency of its own infrastructures. Skyguide increased its energy efficiency by 30.3% from 2006 to 2016, while keeping its total consumption virtually constant.



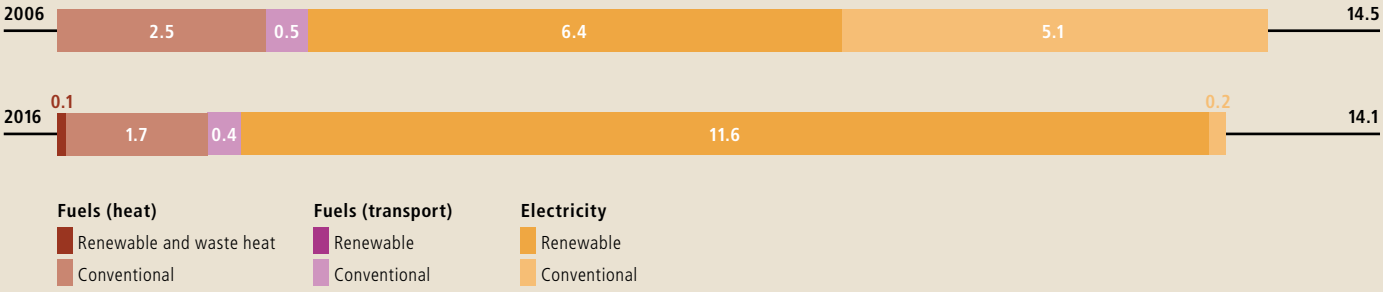
Success story

La Dôle: modernisation of the HVAC system

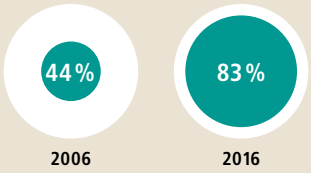
The peak of La Dôle in the Vaud Jura mountains rises to 1,677 metres above sea level and houses Skyguide's radio and radar station. Its main mission is to collect information on the identification, positioning and flight altitude of the aircrafts flying through this area of airspace; this information is then used by Skyguide air traffic controllers in Geneva. La Dôle station has become a real technological complex and continues to modernise in environmental terms as well. Taking advantage of the climatic conditions at La Dôle, Skyguide has renovated the heating, ventilation and air conditioning (HVAC) facilities of its station. The new facilities installed in 2016 include an air cooler using free cooling, refrigeration machines and electronic control (MMC) in order to optimise operation in the coming years. These measures have helped to reduce the energy consumption of the station's HVAC system by 15%, which is an energy saving of about 35 MWh/y.

Final energy consumption by energy source

in GWh / y

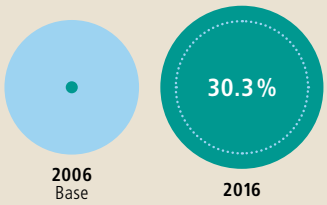


Renewable energy as a proportion of total consumption



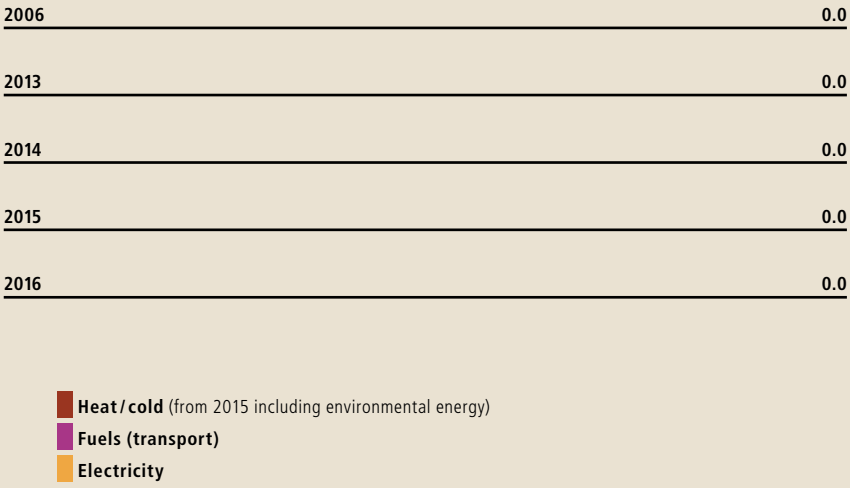
Increase in **energy efficiency**

Target 2020: 25%

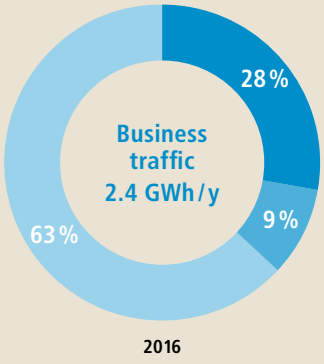


Production of renewable energy

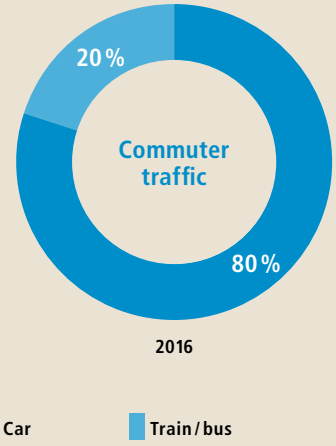
in GWh / y



Energy consumption for **mobility**



Note: Percentage shares based on energy consumption.



Note: The proportion of pedestrian / bicycle traffic was not recorded.

Skyguide

Joint measures

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● Adopted and at least 80% achieved
● Adopted and in implementation phase
○ Adopted, no data yet
– No leeway for action

05

TOSIM: replacement of the projection system

In 2012, Skyguide inaugurated its new 3D control tower simulator in Dübendorf. Called TOSIM green, this facility supplements the infrastructure of the Skyguide training centre, which currently has three tower simulators in Dübendorf and one in Geneva. Its projection system, which was replaced in 2016, is now equipped with LED technology, a measure that has reduced annual energy consumption from 11,900 to 7,140 kWh / y, that is a saving of 4.8 MWh / y (15%). Together with the savings attained by replacing the TOSIM yellow and TOSIM blue projection systems in 2013 and 2014, the total energy saving amounts to 12 MWh / y, which is equivalent to the average annual electricity consumption of three households in Switzerland.

Skyguide

Specific measures

No. Measure
Target (target year)

01 ● Introduction of expanded approach management for the Zurich region (XMAN)
37.0 GWh/y (2023)

02 ● Implementation of direct routes (FRA 2018/2021)
43.0 GWh/y (2021)

03 ● Improvement of vertical flight profiles
7.8 GWh/y (2014)

04 ● "Green Wave" for morning approaches of long-haul aircraft of the airline Swiss at Zurich Airport
7.0 GWh/y (2012)

05 ● Continuous descent approach for the airports of Geneva and Zurich
133.0 GWh/y (2014)

06 ● Shorter taxiing times when departing from Geneva (A-CDM)
9.0 GWh/y (2014)

07 ● Optimisations of heating, ventilation and air-conditioning systems and replacement of cooling machines in the Geneva control centre
1.7 GWh/y (2023)

08 ● Optimisations of heating, ventilation and air-conditioning systems and change of lighting to LED in the Dübendorf air navigation services centre
0.5 GWh/y (2023)

● Reduction target attained
● Target

03

7.8 GWh/y

Improvement of vertical flight profiles

The energy efficiency of an aircraft in flight depends on its cruising altitude. The longer it flies at its optimum altitude, the less fuel it will consume and the fewer CO_2 emissions it will produce. International letters of agreement (LoAs) govern the handover of responsibilities between the controllers of the different centres. For safety reasons, they impose cruising altitude constraints. Since air traffic is seasonal in nature, different LoAs have been produced in order to optimally adjust flight profiles according to the differences between the summer and winter periods. This measure makes it possible to optimise the energy efficiency of the aircraft using Swiss airspace.

02

43.0 GWh/y

Implementation of direct routes (FRA 2019/2021)

When air traffic controllers are in radio contact with pilots, they frequently propose them to take direct routes. An initial network of direct routes was published in 2015 and 2016; further routes will follow by 2021, in order to better plan flights passing over Switzerland. In this way, flight routings can be shortened, reducing the quantity of kerosene carried on board. The result is a considerable saving in kerosene consumption.

06

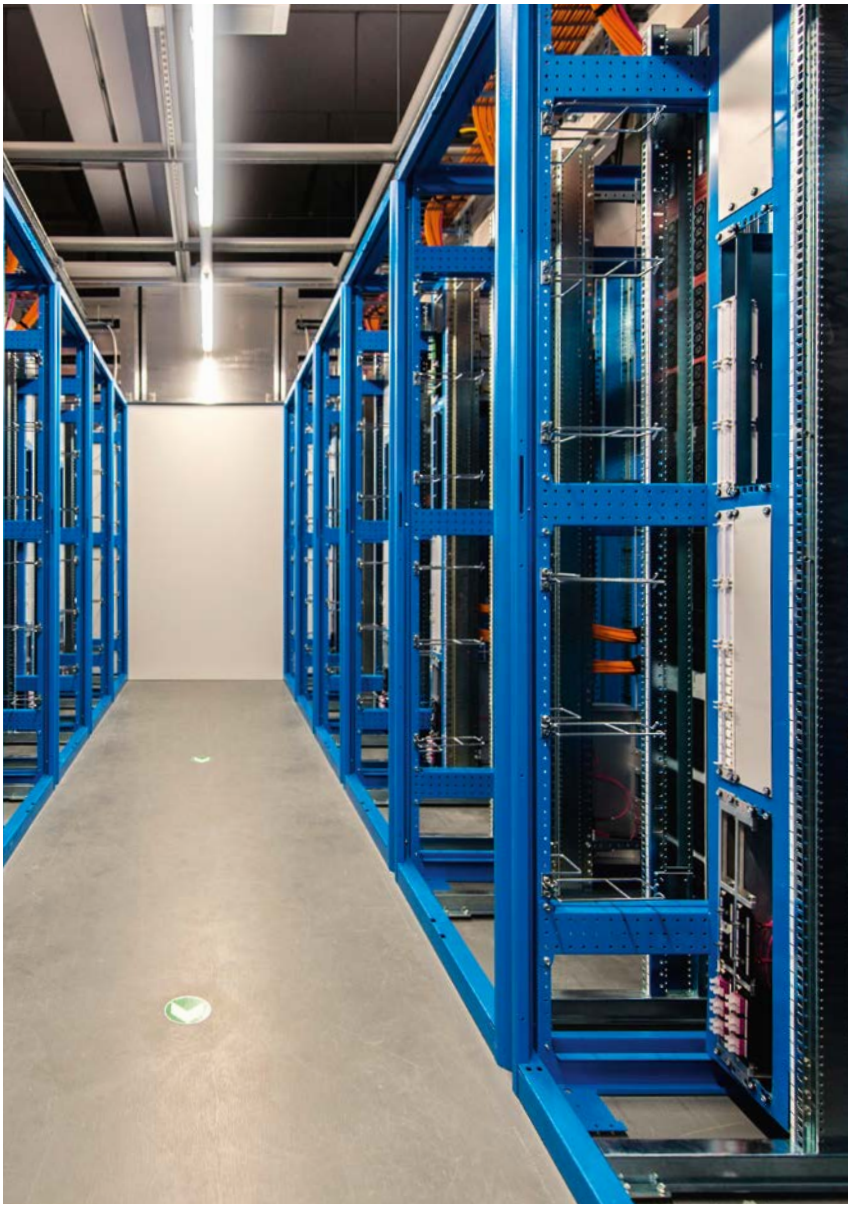
9.0 GWh/y

Shorter taxiing times when departing from Geneva

The Airport Collaborative Decision Making (A-CDM) is a decision-making process into which all actors at Geneva airport are integrated. It is aimed at improving traffic efficiency when sequencing departures and at reducing waiting times for aircraft on the taxiway and at the runway access points.

Swisscom

Swisscom's sustainability management focuses on increasing energy efficiency and using electrical energy that has little impact on the climate. Last year, for example, the company further expanded its resource-saving server virtualisation, opened nine repair centres for mobile phones all over Switzerland, brought out a more energy-efficient TV box and completed the Mistral energy-saving project to cool telephone exchanges with fresh air. Between 2006 and 2016 Swisscom boosted energy efficiency by 42.9%.



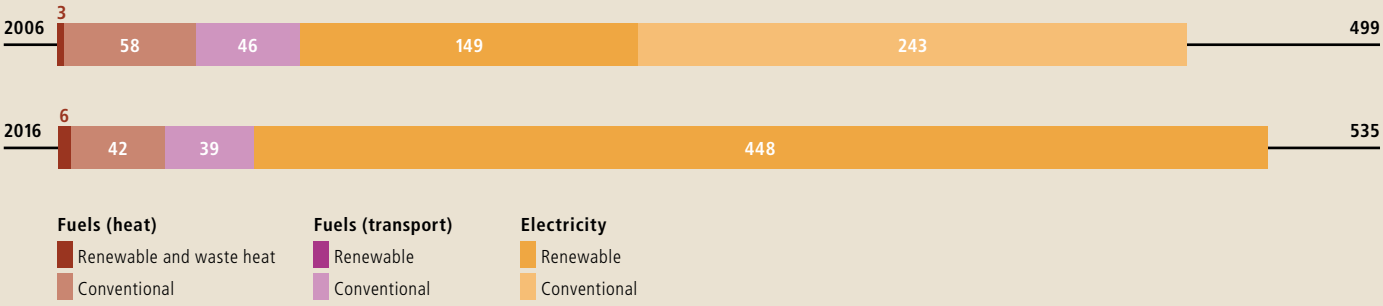
Success story

Energy efficiency thanks to virtualisation

IT hosting, storage and backup services make it possible for companies to outsource their IT infrastructure to external partners such as Swisscom. Outsourcing makes the hardware capacity more scalable. In addition, the servers are virtualised. This means that resources are grouped together on the provider's premises and are made available to users as and when needed. By reducing unused server services, IT hosting enables more energy-efficient IT services to be provided and at the same time generates economic benefits for customers. Although server virtualisation is used in many companies, it is often not implemented consistently or efficiently enough. In its data centres Swisscom is increasingly relying specifically on shared use of servers. As a result of this server virtualisation, the company requires less IT infrastructure, and in 2016 already saved an additional 17.9 GWh.

Final energy consumption by energy source

in GWh / y



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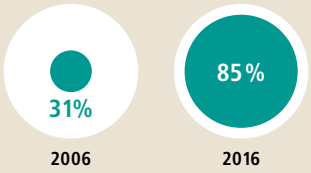
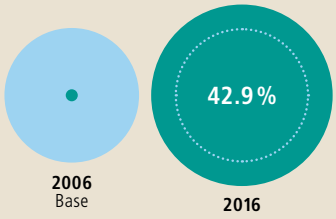


Increase in **energy efficiency**

Target 2020: 25%



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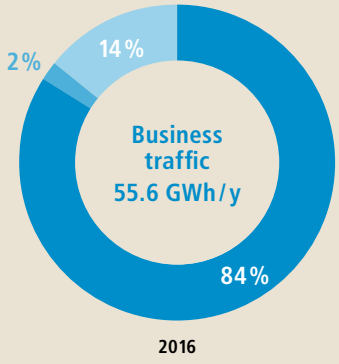
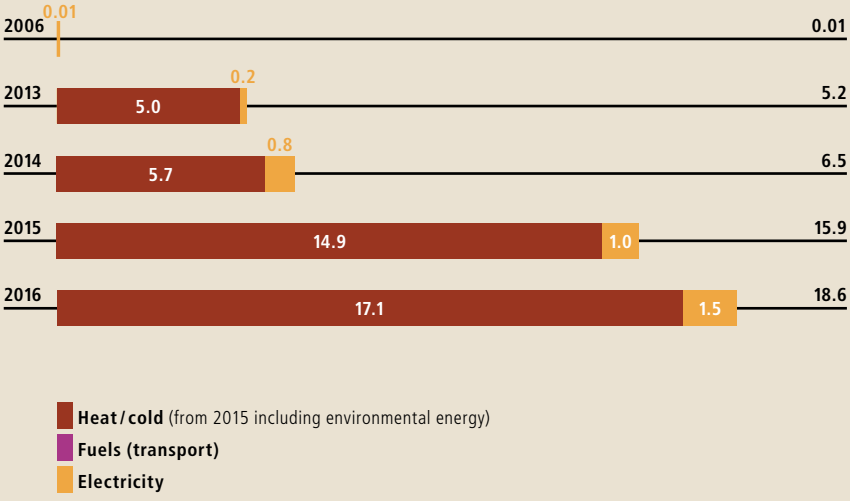
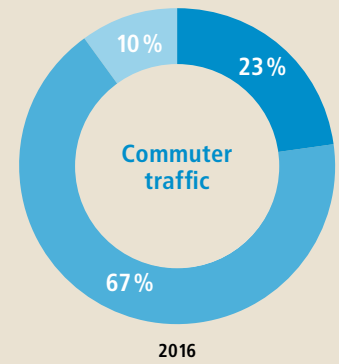


Note: Percentage shares based on energy consumption.

Production of renewable energy

in GWh / y





Swisscom

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● Adopted and at least 80% achieved
● Adopted and in implementation phase
○ Adopted, no data yet
– No leeway for action

39

Promoting re-use of devices

One in five of all mobile phones purchased from Swisscom is repaired at least once in its service life. Damaged mobile phones can be repaired at the Swisscom Shop. The devices are repaired by certified specialists, which means their manufacturer's warranty is not invalidated. The most frequent repairs are for displays and to solve battery and software problems. Following successful tests, Swisscom had opened a total of nine repair centres all over Switzerland by the end of 2016. Last year a total of 15,400 devices found their way there. As a result, Swisscom is expanding its existing range of services for re-use of mobile phones, in particular the Swisscom Mobile Aid programme and the buyback programmes for private and business customers.

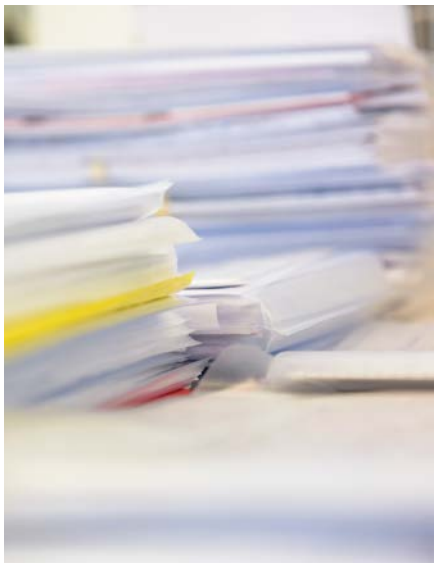
Swisscom

Specific measures

No. Measure
Target (target year)

- **01** ● Fresh air cooling in telephone exchanges
  45.0 GWh/y (2016)
- **02** ● Green IT offerings for customers
  57.0 GWh/y (2014)
- **03** ● Energy-efficient terminal devices for private customers
  25.0 GWh/y (2019)
- **04** ● Dematerialisation thanks to online invoicing
  2.1 GWh/y (2015)
- **05** ● Energy efficiency in the mobile phone network
  16.0 GWh/y (2015)
- **06** ● Recycling of mobile phones
  12% (annual)
- **07** ● Promoting mobile-flexible forms of work on customers' premises
  1 million (2020)

● Reduction target attained
● Target



04

2.2 GWh

Dematerialisation thanks to online invoicing

Online invoicing is an attractive, environmentally-compatible alternative to paper-based invoicing. The proportion of customers who have opted for online invoicing rose from 25% in 2015 to 31.5% by the end of 2016. This corresponds to an annual saving of over 2.2 GWh. Swisscom intends to further increase the proportion of online invoices.

03

9 GWh

Energy-efficient terminal devices for private customers

Swisscom TV 2.0 no longer saves photos on the set-top box but in the cloud. Therefore the box can function without a hard drive and consumes about 40% less power than its predecessor. In 2016 Swisscom launched a new, UHD-enabled TV box on the market. Despite a much higher output, this box consumes no more power than the previous TV box. By the end of 2016, Swisscom had won over 1.4 million customers for Swisscom TV; the majority of them were already on Swisscom TV 2.0. Thanks to the progressive migration from the old to the new, cloud-based TV product, the electricity consumption of all Swisscom TV customers has fallen by over 9 GWh since 2013 despite growth in the number of customers.

01

1.8 GWh

Fresh air cooling in telephone exchanges

In 2016, Swisscom completed the successful energy-saving project Mistral to cool telephone exchanges with fresh air. This corresponds to a further increase in the saving of 1.8 GWh in 2016. As at the end of 2016, Mistral was cooling 841 telecommunications installations in telephone exchanges. The project continues to run under the name of Mistral Future and is again doubling the energy efficiency of telephone exchange cooling.

DDPS

Compared to 2006, the DDPS reduced its total energy consumption last year by 7.3% to 1079 gigawatt hours. The successful measures included the DDPS building energy certificate (DDPS-BEC), the training of employees and members of the army, a pilot project with gas-powered trucks and the use of resource-saving low-viscosity engine oils.

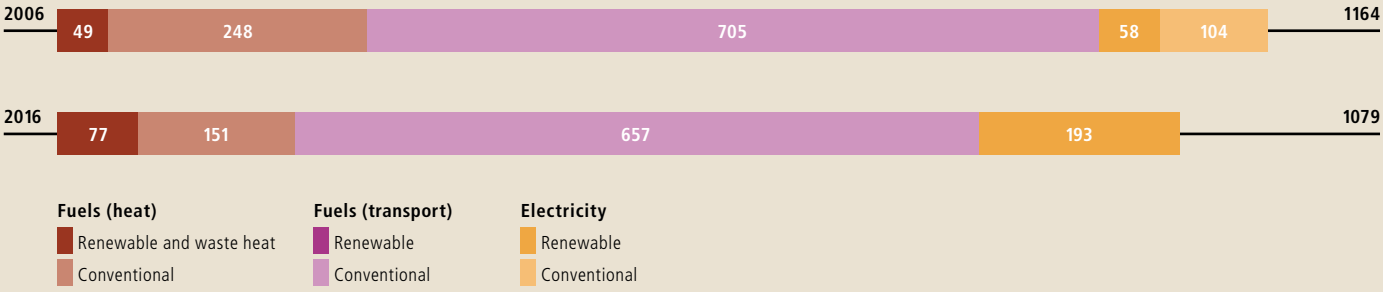
Success story

Gas-powered truck for goods handling

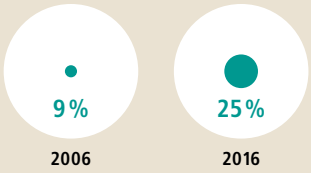
The army is examining the suitability of gas as a fuel substitute for diesel and petrol. It is considering using alternative fuels in order, first, to make the army autonomous in the area of operating materials and, second, to achieve the army's environmental objectives, as required by the DDPS General Secretariat. A pilot project is currently being used to test the extent to which gas could actually be used in military applications. The Othmarsingen army logistics centre (ALC-O) has been equipped with a gas filling station for this purpose. Currently, the existing fleet of gas-powered vehicles at the army's logistics base is being grouped together in stages at the ALC-O so as to attain an adequate utilisation rate for the gas filling station. In addition, a gas-powered truck has been acquired for goods handling and is being used to transport non-hazardous goods within the perimeter of the ALC-O. After completion of the pilot project in 2020, it will be decided whether the natural gas/biogas filling station will continue to be operated and whether further such filling stations should be built to supply the army.

Final energy consumption by energy source

in GWh / y

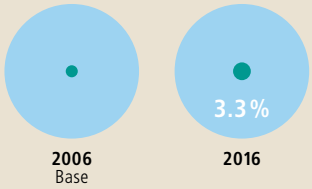


Renewable energy as a proportion of total consumption



Increase in **energy efficiency**

Target 2020: 25%

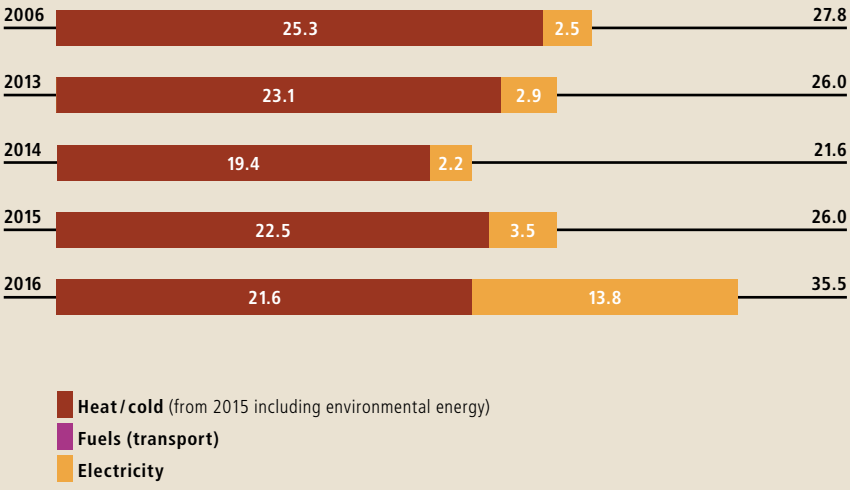


Energy consumption for **mobility**

Note: Commuter and business traffic have not yet been measured.

Production of renewable energy

in GWh / y



DDPS

Joint measures

No. Measure

Buildings and renewable energy

01 ● Energy-efficient new and converted buildings
02 ● Analyses of potential of waste heat and renewable energy
03 ● No new fossil-fuel powered heating systems
04 ● Full cost accounting of energy efficiency
05 ● Energy-efficient lighting
06 ● Energy-efficient cooling machines
07 ● Energy-efficient sanitation facilities
08 ● Energy-efficient electromotors
09 ● Building technology with operating optimisation regime
10 ● Procurement of green power and hydroelectricity
11 ● Mobility concepts for buildings
12 – Creation of ecofunds

Mobility

13 ● Integration of mobility management
14 ● Central information and booking platform
15 ● Encouragement of mobile-flexible forms of work
16 ● Promoting work hubs
17 – Promotion of video and web conferencing
18 ● Incentives for using public transport
19 ● Providing or co-financing PT season tickets
20 – Criteria for choosing mode of transport
21 ● Active parking space management
22 ● Provision of bicycle parking spaces
23 ● Provision of bicycles and e-bikes
24 ● Criteria for procuring energy-efficient vehicles
25 ● Eco-driving training courses for frequent car users
26 ● Promoting the use of car sharing agencies
27 ● Joint use of a company carpool
28 ● Provision of charging stations for electric vehicles

Data centres and green IT

29 ● Full cost accounting of energy efficiency
30 ● Specifications for new servers and new data centre hardware
31 – Highly energy-efficient data centres
32 ● Pushing passive cooling solutions in data centres
33 ● Encouraging server virtualisation in data centres
34 ● Bundling of data centres / outsourcing of IT services
35 ● Monitoring and evaluation of new technologies
36 ● Promotion of waste heat recovery
37 ● Promotion of economy mode at computer workstations
38 – Promotion of energy-efficient printing solutions
39 ● Promoting re-use of appliances

● Adopted and at least 80% achieved
● Adopted and in implementation phase
○ Adopted, no data yet
– No leeway for action

23

Provision of bicycles and e-bikes

E-bikes are perfect for covering short distances quickly. Both ladies' and men's e-bikes are therefore newly available to DDPS employees at selected locations for off-premises meetings in the city. With e-bikes, users can get through urban traffic quickly, they have no parking problems and they do their health some good – without getting into a sweat. The employees have been informed about the new bikes and instructed how to use them; the e-bikes can be booked online for the desired time via a reservation system. The bikes may also be lent for private use. The introductory phase was successful and the e-bikes are being used keenly to get around quickly in urban traffic.

Specific measures

No. Measure
Target (target year)

- **01** ● Introduction of a DDPS building energy certificate in buildings and on sites (GEAVBS)
  60% GEAVBS (2020)
- **02** ● Own production of renewable energy
  4.0 GWh/y (2020)
- **03** ● Systematic introduction of central transport agencies in all military formations
  100% structures (2020)
- **04** ● Use of low-viscosity engine oils where operationally and technically possible
  100% use (2020)
- **05** ● Low-rolling-resistance tyres, where operationally and technically possible
  5.6 GWh/y (2020)
- **06** ● Optimisation of the air force's equipment in terms of fulfilment of its constitutional mandate and energy consumption. The indicator is the average ratio of actual to target flying hours (minimum)
  Indicator < 1.1 (2020)
- **07** ● Training and information. Indicator: all relevant corps have a trained environment representative at their disposal
  100% (2020)

01

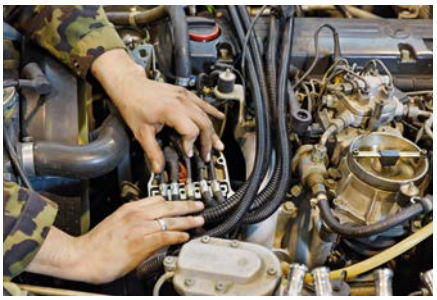
Building energy certificate

The Cantonal Building Energy Certificate (CBEC) cannot really be used due to the special conditions in the DDPS's building stock. That is why the DDPS building energy certificate (DDPS-BEC) was developed, based on the CBEC. It takes into account the specific structure and usage of the buildings in the DDPS's real-estate portfolio. The DDPS-BEC pursues the objective of the 2000-watt society. Under the "Site Energy Plan" project, DDPS-BECs are issued for the heated buildings and measures derived from them to achieve the objective.

07

Training and information

DDPS employees and members of the army receive further training in energy, among other areas, as part of the DDPS's annual regional planning and environmental training conference. Furthermore, senior army officers receive energy efficiency training as part of environmental training and on subject-specific training courses, according to their position.



04

2% to 6%

Use of low-viscosity engine oils

Engine oils have a significant influence on fuel consumption. DDPS uses a fully-synthetic oil with lower viscosities in all vehicles where this is technically possible instead of the 10W-40 oil usually used by DDPS. As a result, fuel consumption can be reduced by 2% to 6%, depending on driving behaviour.

● Reduction target attained
● Target

Civil Federal Administration

Last year, the Civil Federal Administration further increased its energy efficiency. Compared to 2006, the increase is now 53.9 %. Total energy consumption fell by 12 % to 120 gigawatt hours over the same period. Current measures taken by the Civil Federal Administration are, for example, energy-efficient tunnel lighting and the construction of an ecological motorway maintenance depot by FEDRO, as well as the construction of photovoltaic installations and the updating of the ecological assessment data for the construction sector by the FBL.

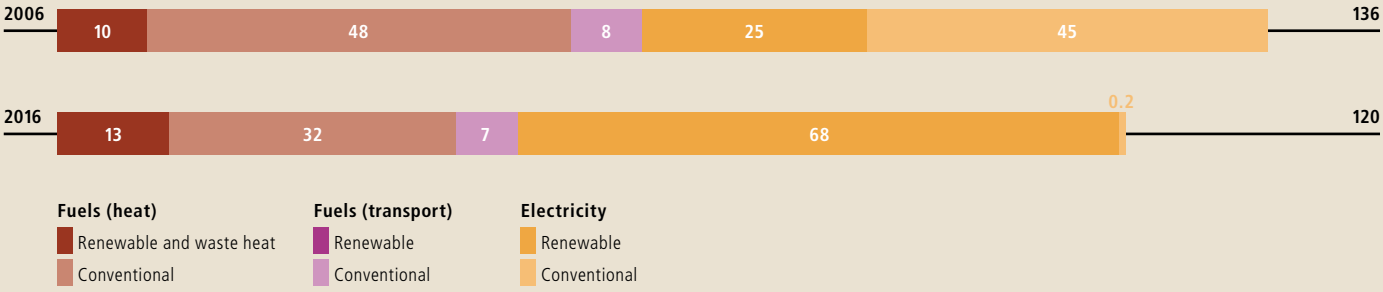
Success story

New motorway maintenance depot in Bern

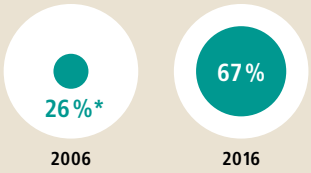
The A1, A6 and A12 motorways in the Greater Bern area are operated and maintained from the Bern motorway maintenance depot. A new building is needed if the service is to continue to be guaranteed. The aim was to develop a high-quality and sustainable project. Following a competition, the architects' team of Büro B, Architekten und Planer AG in Bern was commissioned with the task. Their project, called Linus, provides for a long-drawn-out building with spacious halls and an office area above them. An important distinguishing feature is, in addition, three large wooden salt silos. The Swiss Federal Roads Office (FEDRO) started the construction works in 2015. They will be under way until 2018. The new maintenance depot sets high standards with regard to ecological sustainability. In addition to the wooden construction and the continued use of components in good condition, the depot scores points with various facilities. A grey water recovery facility is one of the features being incorporated. The building is illuminated with LED technology and heated with woodchips. Electric power requirements are met with a photovoltaic installation.

Final energy consumption by energy source

in GWh / y



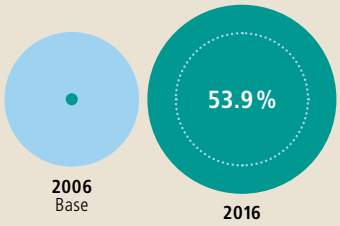
Renewable energy as a proportion of total consumption



*The figure was corrected retroactively.

Increase in **energy efficiency**

Target 2020: 25%

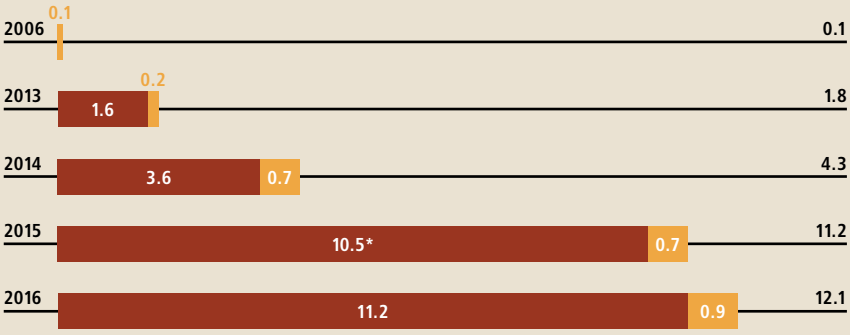


Energy consumption for **mobility**

Note: Commuter and business traffic have not yet been measured.

Production of renewable energy

in GWh / y



*The figure of the production of renewable heating and cooling energy was corrected retroactively.

Civil Federal Administration

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38 ● Promotion of energy-efficient printing solutions
39 ● Promoting re-use of appliances

● Adopted and at least 80% achieved
● Adopted and in implementation phase
○ Adopted, no data yet
– No leeway for action
× Responsibility for implementation open

23

Provision of e-bikes

Five e–bikes (45 km / h) are available on the DETEC campus for the employees of the Federal Offices FEDRO, FOCA and SFOE to use during working hours. The bikes, like the service vehicles, are organised in a joint pool and are used to cover short distances as an alternative to private and service vehicles or public transport. The three federal offices thus promote the health of their employees and, at the same time, make a contribution to careful resource management. The e-bikes are regularly reserved and are very popular with the employees.

Civil Federal Administration

Specific measures

No. Measure
Target (target year)

01 ● Resources and Environmental Management programme of the Federal Administration RUMBA (incl. business travel)
2.3 GWh/y (2020)

02 ● Reduction of energy consumption from business travel
0.5 GWh/y (2020)

03 ● Energy-efficient enveloping system
75% saving (2013)

04 ● Construction of new photovoltaic installations; replacement of fossil energy with renewable energy
0.6 GWh/y (2020)

05 ● Application of Swiss Standard for Sustainable Construction to CH buildings abroad
Introduction (2018)

06 ● Update of "Ecological assessment data for the construction sector" to promote energy-efficient construction (KBOB)
Every 2 years (2020)

07 ● Sensitising employees to energy-efficient and environmentally compatible behaviour at the workplace
2 measures per year (2020)

08 ● Voluntary target agreement with the Energy Agency of the Swiss Private Sector (EnAW)
2200 t CO_2/y (2022)

09 ● New tunnels fitted, and existing tunnels refitted, with LED lighting.
Ongoing

● Reduction target attained
● Target

09

50 % saving

Energy-efficient tunnel lighting

FEDRO is relying on LED, bright tunnel walls and a bright road surface to provide energy-efficient tunnel lighting. In addition, the last remaining lighting systems are gradually being refitted to LEDs as part of maintenance projects. Lighting is already being completely dispensed with on open sections of the Swiss motorway network.

04

Construction of new photovoltaic installations

As part of a total renovation of the bridge at the St. Margrethen-Höchst border crossing point, FBL has built a photovoltaic installation with a capacity of 48 kWp on the St. Margrethen customs building. It was mounted directly over the carriageway and serves at the same time as a roof.

06

Update of ecological assessment data for the construction sector

KBOB has updated its recommendation, which provides a high-quality basis in the construction sector for assessing the environmental impact of building materials and entire buildings. It forms a basis for SIA leaflets, which in turn serve as a basis for building standards such as Minergie-ECO, SNBS and the eco-products of the association eco-bau.

The 39 joint measures taken by all actors in detail

The Confederation: exemplary in energy initiative plan has defined 39 joint measures in the three action areas buildings and renewable energy, mobility, and data centres and green IT. Here you can read the detailed descriptions, including the relevant indicators and targets.

Action area buildings and renewable energy

01 Energy-efficient new and converted buildings
The actors' strategies for buildings and sites are guided by best practice. For specific building standards they are based as much as possible on existing labels, such as MINERGIE-P-ECO.
For sites, strategies with an aggregate energy review are appropriate.
Indicator: standards existing, published and complied with.
Target: 100 % compliance with the standards from 1 January 2016.

02 Analyses of potential of waste heat and renewable energy
The actors each draw up an analysis of potential. It is intended to show the extent to which waste heat could be utilised and renewable energy produced on their sites and in their buildings and what this would cost. The FOE is consolidating these analyses and drawing up a master plan called "New renewable energy in the federal government and parastatal enterprises".
Indicator: analysis of potential available.
Target: analyses of potential available.

03 No new fossil-fuel powered heating systems
The actors no longer build any fossil-fuel operated heating systems in their buildings. This also applies explicitly when replacing existing systems. Justifiable exceptions are possible, for example for special sites or functions. In such cases renewable substitute energies such as biogas should be used or, as the second priority, emissions should be offset by CO_2 reduction measures.
Indicator: newly-installed heating systems operated without fossil fuels.
Target: 100 % from 1 January 2016.

04 Full cost accounting of energy efficiency
In order to evaluate energy efficiency measures, the actors use life cycle costs (LCC) or total cost of ownership (TCO) approaches. Investments in energy efficiency measures that pay for themselves over the life cycle of a measure are implemented. The application of the methodology is made public in a strategy paper.
Indicator: 1–2 case studies available.
Target: available from 1 January 2017.

05 Energy-efficient lighting
The actors now only procure lighting that is guided by the best practice principle, i.e. which is based on the latest and most energy-efficient technology. In the case of outdoor lighting, special attention is paid to nature-related issues, especially light pollution.
Indicator: internal standards available and complied with.
Target: 100 % from 1 January 2016.

06 Energy-efficient cooling machines
The actors plan, procure and operate cooling machines to best practice standards: first of all, generation of heat/cold has to be designed integrally and, if possible, without a cooling machine (taking account of the annual heat / cold curve, use of waste heat, free cooling). If a cooling machine is nevertheless required, it has to be implemented according to the latest SIA standard; in addition, a greenhouse gas effect evaluation should be carried out.
Indicator: proportion of cooling machines procured

in compliance with the requirements.
Target: 100% from 1 January 2016.

07 Energy-efficient sanitation facilities
Cold water alone is the standard for hand-washing and similar activities in toilet blocks and comparable facilities in new and renovated buildings. In addition, the actors now only procure sanitary ware in energy class A, except for showers (energy class B).
Indicator: internal standards available and complied with.
Target: 100% from 1 January 2016.

08 Energy-efficient electromotors
When installing (in new and replacement buildings) new electrical building apparatus (ventilation, air-conditioning, cooling, sanitary), electromotors and other electrical apparatus (e.g. lifts, conveying equipment, compressors), the actors use the most efficient electromotors in each case (best practice strategy).
Indicator: internal standards available and complied with.
Target: 100% from 1 January 2016.

09 Building technology with operating optimisation regime
The actors subject their building apparatus to continuous operating optimisation (OO). Recognised measures for increasing energy efficiency are being implemented constantly.
In addition, whenever a new apparatus is commissioned in a building, an acceptance procedure is consistently carried out; any defects are rectified.
Indicator: consumption of apparatus with a continuous OO regime as a percentage of total annual energy consumption.
Target: 60% (by 2020).

10 Procurement of green power and power from renewable energy
The actors will gradually increase their proportion of green power (naturemade star or equivalent) to 20% by 2020. The remaining power requirement should be met by no later than 1 January 2020 exclusively with power from renewable energy sources.
Indicator: 1. green power as a percentage of total consumption, 2. power obtained from renewable energy as a percentage of total consumption.
Target (not including rail traction power): 1. 20% (by 2020), 2. 80% (by 2020).

11 Mobility concepts for buildings
From now on, the players only construct new buildings with more than 50 permanent employees when there is an overriding mobility concept, and take the traffic volume into consideration already when choosing the location. The concept comprises minimum requirements for opening up areas with public transport (PT) and non-motorised traffic, as well as measures to reduce induced traffic and promote energy-efficient mobility.
Indicator: new buildings (> 50 permanent jobs) as a percentage of all new buildings (> 50 permanent jobs) with a mobility concept.
Target: 100% from 1 January 2016.

12 Creation of ecofunds
The actors each create an ecofund of their own. These ecofunds are financed out of the reimbursement of the CO_2 and VOC levies and out of further reimbursements of monies in connection with environmental incentive levies, provided that these are not to be used by law or under a performance agreement for other purposes, or from other financing sources. The ecofunds finance measures in the energy or environmental sector.
Indicator: % of reimbursed environmental incentive levies that flow into the ecofund
Target: 100% (by 2020).

Action area mobility

13 Integration of mobility management
The actors implement structures and processes for regular assessment and effective management of employee mobility in terms of their environmental impact.
Indicator: % of employees for whose business divisions a mobility management system has been implemented.
Target: 100% (by 2020).

14 Central information and booking platform
The actors provide a central, web-based information and booking platform that allows easy access to planning and decision-making tools, guidelines and other information on service offers from the mobility sector.
Indicator: % of employees having access at their workplace to a mobility information platform.
Target: 80% (by 2020).

15 Encouragement of mobile-flexible forms of work
The actors enable forms of work that allow employees with suitable job profiles to choose, as freely as possible, their time and place of work (e.g. at home, when travelling, at other company sites). This includes equipping them with the necessary devices (e.g. mobile devices with remote access to the corporate network) and creating the cultural

preconditions by picking a central theme in management and staff development.
Indicator: employees who regularly use mobile-flexible work forms as a percentage of all workers with a suitable job profile.
Target: 30% (by 2020).

16 Promoting work hubs
The actors provide work hubs at which employees from other sites or other companies and organisations can work temporarily. In addition, they create the cultural preconditions for working at work hubs.
Indicator: % of suitable office locations with workstations to which in-house or outside employees from other sites have access.
Target: 100% (by 2020). In addition, reviews are conducted of the extent to which premises can be opened reciprocally within the Confederation: exemplary in energy plan.

17 Promotion of video and web conferencing
The actors' employees have access to video and web conferencing or, as applicable, corporate collaboration solutions, which make personal exchanges possible over great distances.
Indicator: employees who regularly use video / web conferencing as a percentage of all employees with a suitable job profile.
Target: 30% of the workforce, 70% of the employees making several international business trips per year (by 2020).

18 Incentives for using public transport (PT)
The actors ensure that employees can be reimbursed through expenses for business travel with PT even if they use season tickets they have paid for themselves, and that the expense regulations do not give them any incentive to use their own car. The use of private cars requires approval from one's superior in keeping with clearly-defined criteria, and is only reimbursed with a cost-covering per-kilometre rate.
Indicator: expenses reimbursement for using PT, rules for use of private cars, kilometre rate.
Target: expenses reimbursement of the PT ticket price based on the half-fare travelcard, even if self-paid PT season tickets are used, clearly-defined criteria for using private vehicles, km rate for private cars, max. CHF 0.64 per km.

19 Providing or co-financing PT season tickets
The actors encourage the use of PT for business and commuter journeys by providing a half-fare railcard and / or by making a financial contribution to other PT season tickets (zone, point-to-point or network-wide season tickets).
Indicator: minimum contribution to PT season tickets for employees.
Target: all employees are entitled to a half-fare travelcard or a corresponding company contribution to a PT season ticket.

20 Criteria for choosing mode of transport
The actors introduce a guideline with clearly-defined travel distances for rail or air travel as well as criteria for using video and web conferencing and corporate collaboration solutions. They provide a simple decision-making tool and cover all international business travel reimbursed via the expense accounts or the travel agency.
Indicator: proportion of air travel to destinations that can be reached by train from Basel, Zurich or Geneva in a maximum of five hours.
Target: less than 20% (by 2020).

21 Active parking space management
The actors charge for employee parking spaces at usual market rates and allocate them using clear criteria such as level of service by PT at place of domicile, time difference between using a private car and PT to travel to work, working hours, participation in car sharing agencies and / or energy efficiency of the vehicle. New sites are planned with a minimum number of parking spaces.
Indicator: proportion of parking spaces with clear allocation criteria and usual market rates.
Target: 100% (by 2020).

22 Provision of bicycle parking spaces
The actors provide covered and secure parking spaces for two-wheelers and the associated infrastructure (changing rooms with showers). Minimum requirements are, for example, that the spaces should be covered, be near the entrance or have structures to which the bike frame can be padlocked.
Indicator: % of sites (> 100 employees) with a number of bike parking spaces to match demand, as per minimum requirements.
Target: 100% (by 2020).

23 Provision of bicycles and e-bikes
At larger sites, the actors provide self-rental bikes and e-bikes for mobility between nearby sites (e.g. PubliBike stations, company bicycles).
Indicator: % of sites (> 100 employees needing this service) with access to self-rental bikes.
Target: 100% (by 2020).

24 Criteria for procuring energy-efficient vehicles
The actors apply clear energy-efficiency criteria such as the energy label when procuring vehicles. For all new vehicles (incl. delivery vans), the fuel consumption / CO_2 value is weighted as an evaluation

criterion with at least 15% in the benefit analysis.
Indicator: % of newly-procured cars with up to a max. of 5 seats in energy efficiency class A, not counting all-wheel-drive vehicles, intervention vehicles such as ambulances and goods transport vehicles.
Target: 100% (by 2020).

25 Eco-driving training courses for frequent car users
Employees who drive more than 20,000 kilometres a year on business are trained every three years on an eco-driving course. In the case of employees who use the company fleet, the employer supports privately-attended eco-driving courses with a 30% contribution to costs.
Indicator: % of employees driving more than 20,000 kilometres a year who have attended an eco-driving course in the last three years.
Target: 100% (by 2020).

26 Promoting the use of car sharing agencies
The actors provide information on and access to their own or an outside car sharing agency for arranging lifts and to carpools in commuter and business traffic.
Indicator: % of employees who depend on the car to travel to work and who have access at their workplace to a car sharing agency (prerequisite: a sufficiently large number of employees).
Target: 80% (by 2020).

27 Joint use of a company carpool
The number of business vehicles is reduced by inter-departmental use of carpool vehicles. A vehicle management tool is introduced and used regionally.
Indicator: average length of time for which company vehicles are used (not counting intervention vehicles such as ambulances).
Target: Vehicles used for < 2 hours per day are incorporated into the vehicle pool.

28 Provision of charging stations for electric vehicles
Parking spaces at larger sites are equipped with charging facilities for ordinary electric vehicles, for example electric cars, electric scooters and e-bikes. In new buildings, plans must ensure the subsequent installation of charging stations for electric vehicles.
Indicator: % of sites (> 500 employees) with charging facilities for electric vehicles.
Target: 100% (by 2020).

Action area data centres and green IT

29 Full cost accounting of energy efficiency in procurement
The actors assess and select for a predetermined specification their IT infrastructure according to the total cost of ownership (TCO) approach, including energy consumption. Energy consumption must be disproportionally overweighted here, unlike with the purely TCO approach.
Indicator: % of the IT appliances evaluated according to the description of measures in new calls for tender.
Target: 100% from 1 January 2015.

30 Specifications for new servers and new data centre hardware
The actors systematically call for joint state-of-the-art specifications when procuring new servers and further data centre hardware. The state-of-the-art specifications are based on existing labels (for example, 80 PLUS Gold-Label or ENERGY STAR Programme Requirements for Computer Servers) or standards.
Indicator: % of compliant servers and further hardware in the data centre in new calls for tender.
Target: 100% from 1 January 2015.

31 Highly energy-efficient data centres
The actors implement the most energy-efficient concepts and technologies in the data centres' infrastructure systems (ventilation, cooling, uninterrupted power supply, lighting).
Indicator: average PUE value (power usage effectiveness) over all of the data centres. The PUE value is defined as the ratio of the total electrical energy consumption of the data centre to the energy consumption of the IT equipment.
Target: < 1.3 by 2030. (In new and larger data centres, smaller PUE values are expected, while best efforts are expected in smaller data centres).

32 Pushing passive cooling solutions in data centres
The actors push the use of energy-efficient passive cooling solutions without cooling machines by using the air conditioning range permissible for servers as per current standards. As first measure, in existing data centres with conventional cooling, the cold operating temperature is raised to at least 26 °C.
Indicator: 1st part: existing data centre surface area with temperature > 26 °C; 2nd part: data centre surface area with extended temperature range or with passive cooling.
Target: 1st part: 100% from 2015; 2nd part: 33% by 2025, 66% by 2035.

33 Encouraging server virtualisation in data centres

The actors aim for a high server capacity utilisation. To this end, increasing reliance is placed on server virtualisation and on memory technology (SAN) in the storage area.
Indicator: percentage share of virtual servers: number of virtual servers / (number of virtual + physical servers).
Target: > 85% (by 2020).

34 Bundling of data centres / outsourcing of IT services

The actors check potential for increasing energy efficiency as part of data centre consolidations.
Indicator: checked potential.
Target: 100% by the end of 2015.

35 Monitoring and evaluation of new technologies

The actors monitor or evaluate new technologies with energy-efficiency potential and operate a technology board within the Confederation: exemplary in energy initiative.
Indicator: number of technologies evaluated.
Target: at least 1 per year.

36 Promotion of waste heat recovery

The actors promote the feeding of their surplus heat from civil IT production into district heating grids, provided that suitable heat customers exist and a contractor is prepared to take on the project in full. Financing, planning, construction and operation from the heat production site are a matter for the contractor.
Indicator: % use of surplus waste heat.
Target: 50% by 2030 (data centres of > 250 sq. m.).

37 Promotion of economy mode at computer workstations

The actors ensure that, when not in use, computer workstations switch to the idle state after a predetermined time.
Indicator: % of workstations with active power management.
Target: 90% by 2015.

38 Promotion of energy-efficient printing solutions

The actors optimise the number of printers per employee and implement modern printing solutions in the office area, such as the follow-me-printing function. As a result, printer operation is optimised and paper and power can be saved.
Indicator: no. of employees per printer; kg of paper per employee.
Target: 100 employees per printer or at smaller sites a maximum of 1 printer by 2020; 5 kg of paper per employee per year (= approx. 1,000 A4 sheets) by 2020.

39 Promoting re-use of appliances

The actors promote re-use of old, but still-serviceable, equipment by passing on old PCs to specialised companies, aid agencies or by giving them to employees. Equipment that has to be disposed of is processed only by certified recycling companies. (In order to ensure energy efficiency, the actors can define additional criteria, for example that only equipment less than 8 years old should continue to be used.)
Indicator: guidelines for recycling no-longer-used equipment are available.
Target: 100% by 2015.

You will find a detailed description of the measures at www.confederation-exemplary-in-energy.ch.

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The eight actors

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Front-runners in energy efficiency and renewable energy

The actors involved in the Confederation: exemplary in energy initiative are pursuing ambitious targets for the implementation of the Energy Strategy 2050. SBB, for example, is planning to save about 600 GWh on its annual energy consumption by 2025 with an extensive package of measures. The SBB's trains are also to run on power from 100% renewable energy sources from 2025 onwards.