Highlights 2017

-33.5 kT/y CO₂
Extended arrival management

-12 MWh/y
Power consumption of tower simulators

+30%
Energy efficiency since 2006

Table of Contents

03 Editorial
04 Environmental strategy
06 Operations and the environment
12 Energy efficiency
17 Eco-responsible behaviour
Dear Reader,

Although aviation accounts for only two per cent of man-made CO2 emissions worldwide, it is considered to be a major cause of environmental damage, especially as the number of flight movements is increasing rapidly.

At skyguide, environmental protection is an integral part of our mission. To this end, we have adopted a strong environmental policy comprising three main topics: operations, infrastructure, and the involvement of our employees.

We have fully embraced the European Commission’s Performance Plan for the establishment of the Single European Sky (SES), which declares environmental efficiency to be a key objective in air traffic activity. As a member of both the Functional Airspace Block Europe Central (FABEC) and Single European Sky Air Traffic Management Research (SESAR), and also being a government-affiliated company, skyguide is closely involved in implementing their environmental strategies.

The Swiss Federal Council approved the Energy Strategy 2050 in 2013. In line with the federal administration, the Department of Defence, Civil Protection and Sport (DDPS), the Federal Institutes of Technology and government-affiliated companies, skyguide has been involved since 2014 in the Swiss Confederation’s “Exemplary in Energy” programme. Environmentally friendly practices have become part of our business strategy, and with the promotion of the coexistence between wind farms and air traffic control infrastructure, the use of drones instead of planes for certain calibration operations, green IT and other innovative technologies, we are at the forefront of progress.

This report describes the multi-layered efforts of skyguide, both in Air Traffic Management – its core business – and in other action areas like buildings and renewable energies, mobility and green IT.

I am proud to say that, thanks to substantial improvements, we have already achieved several of our long-term targets.

Alex Bristol
CEO skyguide
As part of the aviation value chain, skyguide is dedicated to improving the sustainability of air traffic operations, and is contributing to national, European and global initiatives to improve the environmental credentials of air traffic and to reduce its own ecological footprint. Thierry Brégou is responsible for environmental affairs at skyguide. This includes leading the Green Team, whose main goal is to implement a range of good practices in the areas of buildings and renewable energy, mobility and green IT.

Safety is still the top priority of ATM. How does skyguide reconcile safety requirements with measures for the protection of the environment? Safety – skyguide’s DNA – cannot be compromised. But safety and the environment are not competing domains. Our technical systems and operational procedures are continuously improved to offer increased safety and capacity to airspace users. This in turn usually shortens flight trajectories, thus saving fuel and lowering CO2 emissions.

Skyguide is determined to reduce the environmental impact in the fields of operations, infrastructure and mobility. What are your options in attaining these goals? On the operational side, flight efficiency, consisting of reducing the distance flown on a trajectory, is the key challenge. The airspace is shared between various civil and military users, which could result in extra flown miles. Good cooperation between all aviation stakeholders is key to improving the system. Concerning the infrastructure, more energy-efficient buildings and systems have a positive impact.

How is skyguide collaborating with other Air Navigation Service Providers (ANSPs)?
Switzerland is part of the Single European Sky (SES) initiative and as such receives performance targets. The environmental target on flight efficiency is set by the European Commission for the Functional Airspace Block Europe Central (FABEC), grouping Switzerland, Germany, France, Luxembourg, Belgium and the Netherlands. We work with the corresponding ANSPs to meet these targets. This includes a quantitative performance target for horizontal flight efficiency. In this context, we have been collaborating on the development of a tool to measure flight efficiency that should help to identify further potential improvements. However, climate change must be addressed globally. Therefore, we are participating through the Civil Air Navigation Services Organisation (CANSO) in the International Civil Aviation Organisation’s (ICAO) Committee on Aviation Environmental Protection (CAEP).

How does this tool work? The tool, called CARPE DIEM, measures the difference between the planned or flown trajectories and the great-circle distance (the shortest distance between two points on the surface of a sphere). This allows the identification of inefficiencies within a specific airspace or at the interface between different airspaces.

The European Commission’s plan for a Single European Sky (SES) has declared environmental efficiency to be a key objective. In which ways are you involved in the SES Research and Development programme (SESAR)? We aim at developing solutions to reduce environmental impact. SESAR is the ATM innovation platform in which the European aviation stakeholders exchange and experiment new concepts with the goal of improving their performance. Through validation exercises conducted within this framework, we were – together with other aviation stakeholders –
able to drastically reduce holding-time over Zurich Airport. Other examples are our participation in research on optimum flight-descent profiles, satellite-based navigation in terminal areas, and free routing. All of these demonstrate significant potential savings in fuel and reductions in CO2 emissions.

**Skyguide strives to offer direct routes to its customers. What are the consequences?**

Flying more directly enables fuel savings, which is good for CO2 emissions, but also reduces airspace users’ costs. They can plan new direct routes, thus reducing the fuel load and, in turn, energy consumption. The predictability of traffic is enhanced, further improving performance at network level.

Skyguide is working on a project within Europe’s SESAR research and development programme that is intended to improve the approach profiles for airports. Have you obtained any results yet?

A first phase of the project was implemented in Zurich. The prevailing ATC concept of “first come, first served” had the drawback of queuing aircraft at the arrival route entries just before the end of the curfew at Zurich Airport. As a result of assigning a four-dimensional slot to all Swiss Air Lines aircraft prior to starting the approach in the early morning arrival wave, CO2 emissions have been reduced by 2100 tons per year.

**Skyguide has created a “Green Team”. What are its tasks?**

The Green Team is transversal to the departments with representative participation of management and staff. It uses existing skyguide structures and competencies, and this embedded set-up works quite well. Its main task is to implement the Federal Action Plan. Examples of successes include optimised heating, ventilation and air-conditioning systems, changing lighting to LED, improvements in system architectures and virtualisation.

And how do you convince the employees of the necessity and advantages of environment-friendly behaviour?

Fortunately, there is no need to convince them. I am more concerned that the Green Team might not live up to expectations. People at skyguide are passionate about what they do and are committed to protecting the environment.

Do you think that the aviation industry as a whole will ever be able to get rid of its reputation as being a major contributor to environmental damage?

The efforts by the aviation industry over the last four decades to reduce noise and CO2 emissions should be recognised. The aviation industry accounts for 12 per cent of CO2 emissions from all transport sources. Admittedly, the growth rate of traffic is actually higher than that of the savings in fuel burn, but the actors have committed to stabilising CO2 emissions by 2020 and reducing them by 50 per cent compared to 2005. The aircraft industry is making good progress in this direction, especially in terms of biofuels. The new global, market-based ICAO measures from the International Aerospace Carbon Offset and Reduction Programme (CORSIA) and carbon pricing will also help to curb the growth of CO2 emissions after 2020.
Skyguide is working actively with local and international bodies to reduce its ecological footprint.”
Reducing the impact of growing traffic

The impact of air traffic on the environment is an international challenge which requires global solutions. However, our environmental policy and management system already apply at a local level. In that regard, skyguide is working actively with local and international bodies to reduce its ecological footprint.

Aviation is a driver of the world economy, and particularly in powering emerging markets. With over 3.3 billion passengers a year, air transport is an essential connector in the modern world. A third of world trade by value, and half of all international tourism, is by air. The industry generates around 60 million jobs and creates 3.5 per cent of global GDP. However, even though aviation was the first industry to set ambitious environmental targets, and only causes two per cent of man-made CO2 emissions, it is often criticised for contributing to environmental damage. Therefore, the big question arises: how can we reconcile increasing air traffic and our obligation to minimise its impact on the climate?

Working locally and globally

Skyguide is determined to be at the forefront of progress and innovation through its collaboration with bodies such as the Functional Airspace Block Europe Central (FABEC) and the Civil Air Navigation Services Organisation (CANSO), and its participation in various projects, for example the Single European Sky Air Traffic Management Research Program (SESAR). With these partners, skyguide is devising tools and procedures that improve performance while minimising its environmental impact.

The efforts begin at the terminal. Pilots at Swiss airports do not receive permission to start their engines until shortly before pushback. Also, as aircraft taxi from the gate to the runway, there are techniques either in operation, such as single-engine taxiing, or in development, such as electric taxiing systems, which allow aircraft to reach the runway without using the full power of their engines.

Efficient flight handling

New route structures, flight procedures and support tools should reduce fuel consumption and noise emissions. Four examples are iStream, XMAN, the improvement of vertical flight profiles and the implementation of direct routes (Free Route Airspace or FRA). Skyguide, together with other air navigation service providers, airlines, airports and Eurocontrol has undertaken trials concerning early morning flights into Zurich. The former ATC concept of “first come, first served” had the drawback of queuing aircraft at the arrival route entries just before the end of the night ban at Zurich Airport, causing unnecessary noise and pollution. Now, with the introduction of Target Time management, a precise slot is assigned to each aircraft. Thus, the fluidity of air traffic is increased, reducing noise as well as fuel consumption.
As Eurocontrol states, “the objective of XMAN (extended arrival management) is to optimise arrival flows by managing the speed of aircraft already in the airspace of adjacent control centres. The aircraft’s holding time at congested airports is cut by reducing their cruising speed during the final en-route phase of flights, often several hundred kilometres away from the airport. In doing so, flight efficiency is increased by reducing the overall fuel burn and CO2 emissions.” Less airborne congestion in terminal areas will also contribute to improving operational safety by reducing the workload of pilots and air traffic controllers and limiting noise. Currently, more than 75 per cent of Zurich arrival traffic is covered. With XMAN, by 2023 a reduction in CO2 emissions of 33,5 kT per year is expected.

**New techniques, new procedures**

The improvement of vertical flight profiles makes it possible to optimise the energy efficiency of aircraft using Swiss airspace. International letters of agreement for the Summer and Winter seasons have been signed concerning the hand-over of responsibilities between the controllers of different centres. This helps to optimally adjust flight profiles according to the differences between low- and high-traffic periods, governed by the principle that the energy efficiency of an aircraft depends on its cruising altitude. Thus, 7,8 GWh per year can be saved.

Finally, major savings will stem from the gradual introduction of more direct routes. Improvements are implemented every year within the framework of the Direct Routing Airspace project. This enables better planning of flights passing over Switzerland, with shorter flight routings. An even more ambitious project – Free Route Airspace – is intended to be implemented by 2022.

Skyguide has also been participating, together with Swiss International Air Lines and the Zurich airport authority, in the Atlantic Interoperability Initiative to Reduce Emissions (AIRE) programme. This is taking place under the aegis of SESAR in a joint undertaking into ATM research, to help improve the efficiency of Zurich-bound long-haul flights.

When approaching the airport, flights descended from cruising altitude to landing in several steps, moving from one altitude to the next, then “levelling out” by powering up the engines. New technology allows much more accurate surveillance of where each aircraft is located in the airspace, and therefore a more comprehensive picture of the traffic. This has led to a new technique – continuous descent operations – which allows aircraft to almost “glide” into the airport, with engines at a very low setting, thus reducing fuel consumption and noise. Once implemented at the Geneva and Zurich airports, continuous descent will result in energy savings of 133 GWh per year.
Environmental and economic benefits of drones

An increasing number of unmanned aircraft, or drones, are using lower airspace. The European Commission estimates that 7 million leisure drones, plus 400,000 for commercial and government missions, will be flying by 2050. This creates additional safety challenges, but at the same time new opportunities for innovation and environmental protection.

The automatic landing systems at Swiss airports have to be calibrated every six months. This is currently performed by means of calibration flights operated at various heights and angles. An aircraft with specialised equipment has to be flown in from Germany for this purpose. This is expensive, and causes greenhouse gas emissions and noise during low traffic periods, usually during the night. By employing drones to check the instrument landing system (ILS), in the immediate future skyguide will be able to considerably reduce costs and the impact on the environment.

By using drones equipped with measuring instruments, the number of calibration flights and their measurement programmes will be reduced by 50 per cent from 2020 and by 70 per cent from 2023, thus cutting CO₂ emissions by 142 tons and energy consumption by 541 MWh per year from 2020. From 2023, we will see a reduction of 199 tons of CO₂ and a cut in energy consumption of 757 MWh per year, according to skyguide’s forecast.

Another project deals with maintenance flights, for high-voltage lines and railway tracks, using drones. Two programmes called Skyopener and ViaDrone will demonstrate the use of Remotely Piloted Aircraft Systems (RPAS) for commercial applications. Skyopener is a European-funded project, while ViaDrone is funded by Switzerland. Being part of both consortia will substantially minimise skyguide’s expenditure in research and development.
DCT - direct routes

- 63 direct routes have been implemented in 2017

- Previous situation: 700 T/year
  - CO2 emissions: 2.1 kT/year

- DCT - direct route: 527 T/year*
  - CO2 emissions: 1.7 kT/year*

* Savings for the route segment between the areas around Pontarlier (Jura Mountains) and Chambéry (Savoie) through the Geneva region.

iStream

- Previous situation: 11 kT/year
  - CO2 emissions: 33.5 kT/year

- iStream: 700 T/year
  - CO2 emissions: 2.1 kT/year

XMAN

- Current situation: 700 T/year
  - CO2 emissions: 2.1 kT/year

- XMAN Project: 11 kT/year
  - CO2 emissions: 315 kT/year

- Early speed adaptation

- Arrival management / Speed reduction
We have to reconcile environmental measures with safe procedures

Manuela Berger Lochbrunner, originally trained as an air traffic controller, is responsible for ATM (Air Traffic Management) procedures aimed at improving safety. An expert in her field, she supervises the introduction of new and better procedures emanating from management decisions, business partners’ requirements, regulatory authorities and international rules and regulations.

What kind of ATM measures can have an influence on the environmental impact of air navigation?
There are a lot of things we can do to influence the environmental impact of air navigation, but we must not forget that we have to reconcile environment-friendly measures with safe procedures and also political interests. Take Zurich Airport as an example: we could save time and fuel and also enhance safety by introducing straight departures. Within SESAR, we have undertaken trials for continuous descent operations, which will also save fuel. This procedure is very promising and we are currently analysing where we might implement such continuous descents.

What are the advantages for skyguide’s customers and partners?
With a continuous descent, for example, our customers would save fuel and gain time. There are other procedures with a positive environmental impact that make it easier for the airline operators to predict their arrival and departure times.

What are the underlying objectives of such measures?
Let me be very clear about this: above all the legitimate concerns for the environment, safety still comes first. All measures concerning the environment have to be tested for their impact on safety. However, once new procedures have been proven to maintain or even enhance safety, we certainly strive to reduce our carbon footprint as well as noise pollution.

As you have emphasised, safety is skyguide’s raison d’être. How do environmental factors influence the decision-making process of an air traffic controller?
Shortened routes seem to be good for the environment, but they may disturb entire flight plans that ensure, as far as possible, the most efficient and economic profile for the intended flight. Eurocontrol and the European Commission state very clearly that the aircraft operator and air traffic controller must adhere to the flight plan. We need to weigh the consequences: which procedure would use more fuel? – sticking to the original flight plan and landing immediately, or choosing the fast route and then spending half an hour in a holding pattern?

What is the impact on an air traffic controller (ATCO) when integrating such measures into his or her daily work?
If you introduce new procedures, the people in ATM have to be trained and assessed from a safety standpoint. Continuous descent operations or straight departures imply a change to the working methods of the controllers.

How exactly are the ATCOs – who are at the end of the chain and implement the measures – collaborating with those involved in the design of ATM procedures?
New procedures are established together with the so-called Domain Managers, who work partially as air traffic controllers and partially in the office supporting projects and changes. They have a far-reaching view of the general situation and they represent the ATCOs to the management. Thereafter, new procedures are assessed from a safety perspective, with an emphasis on human factors, to ensure that they do not contain any unforeseen risks. Finally, the new procedure is implemented with adequate information and training for the ATCOs. It is the same process for all types of changes, including environmental adaptations of procedures.
Skyguide has already exceeded the goal set by the Confederation of improving its energy efficiency by 25% by 2020 compared with 2006.
In its efforts to implement new measures for protecting the environment, skyguide goes beyond activities directly related to ATM. The company takes the necessary steps to reduce its own environmental footprint by actively participating in the Action Plan of the Swiss Confederation.

Participating in the Federal Action Plan are the Civil Federal Administration, the Federal Department of Defence, Civil Protection and Sport (DDPS), the Swiss Federal Institutes of Technology (ETH), Geneva Airport, the Swiss Railways (SBB), Swiss Post, Swisscom and skyguide. These companies, institutions and administrations set themselves the objective of improving their energy efficiency by 25 per cent by 2020 compared with 2006. To this end, 39 common measures have been defined, and a target achievement rate of 80 per cent is set to be achieved by 2020. In addition, each participant undertook to implement sector-specific measures.

In 2016, the group’s overall energy efficiency was already improved by 27 per cent, while 72 per cent of the planned measures had been implemented. Skyguide, for its part, achieved, up to the end of 2016, an improvement of over 30 per cent, and is committed to continuing its efforts. The Action Plan is making good progress, with about two-thirds of the measures already taken.

**Energy-optimised premises**

Technology for optimising energy use has made rapid strides in the last few years. When it opened in 1998, skyguide’s Geneva control centre was provided with (then) state-of-the-art, energy-efficient technology such as free-cooling facilities. In 2011, the company replaced the heating system at its Geneva premises with a new solution which uses the district heating grid of Geneva’s local industry.

The Dübendorf Air Navigation Centre (ANZ), which commenced operations in early 2009, is one of the newer generation of energy-optimised premises. In addition to construction features, the centre is equipped with movement sensors that save on lighting and air-conditioning, a centralised “smart” building master control system, waste heat recovery, and heating pumps, all designed to ensure that energy consumption can be reduced in all areas. Former lighting systems in ANZ facilities (such as data centres, simulation, hallways, reception, cooling and heating distribution facilities, underground parking, etc.) were changed over to more energy-efficient LED technology in 2016. The combined power consumption in these facilities dropped significantly from 395 to 118 MWh per year.

In 2012, skyguide inaugurated its new 3D control tower simulator (TOSIM) 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 11.9 to 7.1 MWh. Together with the savings achieved by replacing the projection systems of the other two tower simulators in Dübendorf, in 2013 and 2014 respectively, the total energy saving amounts to 12 MWh per year, which is comparable to the average annual electricity consumption of three households in Switzerland.

For communication between air traffic controllers and pilots, skyguide operates a radio-based system consisting of 600 radio communication devices and 34 transmitting and receiving stations all over Switzerland. In 2012, skyguide launched a project called “Smart Radio” to renew its entire radio system. The new equipment is harmonised nationwide, and increases flexibility while improving energy efficiency. By using a central, external power supply unit, the chosen solution consumes up to 30 per cent less energy. As a result, skyguide is saving nearly 200 MWh of power per year. In addition, the new system can be maintained remotely. Therefore, most of the maintenance journeys to the external sites are no longer necessary, so 13,000 travel kilometres are thus saved. By 2020 all main radio stations in Switzerland will be equipped with the new apparatus.
A major step in energy saving was achieved in skyguide’s radio and radar station at La Dôle in the Vaud Jura mountains, at 1677 meters above sea level. Taking advantage of the climatic conditions at La Dôle, skyguide renovated the heating, ventilation and air conditioning (HVAC) facilities in 2016. They include an air cooler using free cooling, refrigeration machines and electronic controls for optimising operations. These measures have helped to reduce the energy consumption of the station’s HVAC system by 15 per cent or about 35 MWh per year.

The introduction of green IT will further reduce energy consumption at skyguide.

Land use and conservancy

Some of skyguide’s facilities stand on the company’s own land, and some are on (or in) leased property. Wherever possible, skyguide adopts and maintains a joint approach to providing the associated utilities with the partners involved. These include airport authorities, Swisscom, Armasuisse, the Swiss Air Force and the cantonal police. Since it is subject to civil building permission procedures, skyguide also works closely with regional and cantonal environmental specialists and, on a case-by-case basis, with private environmental protection organisations.

Energy-optimised IT systems

Green IT is intended to reduce carbon dioxide emissions from the company’s IT systems. Electrical power used by IT devices is later released as heat. Condensing data centre equipment produces even more heat, which must then be drawn off. This is necessary to avoid overheating, which could cause system failure.

At skyguide, we are addressing the problem of the energy consumption of IT systems from two angles. On the one hand, we are improving energy efficiency in our technical rooms: one of the solutions for doing so is the physical separation of hot and cold corridors – all devices that give off heat are bundled together in one aisle or on one side of a cabinet. Cold and hot zones are then partitioned off from one another. By implementing this measure, we avoid mixing hot and cold air, thus allowing more efficient refrigeration. The dissipation of heat is optimised, the demand for cooling and the running time of refrigeration systems is reduced, and their life span increased. The recent refurbishment of the Geneva control centre’s technical facilities has also included the installation of the very latest cooling systems.

As a result of its endeavours, skyguide has met the Swiss Confederation’s goal in this field four years ahead of schedule. Already at the end of 2015, some 43 per cent of the “Exemplary in Energy” initiative’s green IT actions had been implemented, and in the meantime further improvements have been made.

On the office computer front, virtualisation – reducing the use of physical servers – is already well advanced, with corresponding substantial savings. The same approach should now be adopted with skyguide’s air traffic management and monitoring facilities through the development of the Virtual Centre.
Fostering the coexistence of wind energy and aviation

With the Energy Strategy 2050 coming into effect next year, the Confederation has fixed the political target to increase the production of wind energy to 4300 GWh per year. This corresponds to 600 to 800 wind turbines in Switzerland. To this end, skyguide is striving to foster the safe coexistence of wind turbines and aviation.

Because of their considerable height, of up to 230m, wind turbines pose a challenge to air traffic control, as they can present a physical obstacle and interfere with air traffic control systems. This interference impacts the smooth, efficient and economic provision of air navigation services. Thus, skyguide is willing to evaluate and offer solutions wherever possible.

Early involvement of our specialists by wind energy developers and planning authorities alike fosters a dialogue on mutual needs and increases the probability of finding solutions. As a result, the quota of positive impact study increases and the risk of costly misinvestments in wind energy decreases.

Skyguide ensures the provision of safe air traffic services in Swiss airspace and in sections of the airspace of adjacent countries. To accomplish this task, skyguide ensures that technical installations are not compromised by external influences, and determines through impact assessments whether a projected wind farm will be compatible with Communication, Navigation and Surveillance (CNS) installations, as well as Instrument Flight Procedures (IFPs).

On the other hand, skyguide is aware of the significance of wind energy from an energy and environmental perspective. Therefore, skyguide has created a communication platform for important stakeholders like Suisse Eole, FOCA, the Office of Energy, and also the Swiss Air Force, to nurture exchange and dialogue on the compatibility of wind energy and aviation.

In addition, skyguide has specifically invested in electromagnetic calculation tools to improve its assessment methodology. We also cultivate an intensive exchange with experts from academia, research programmes and the air navigation industry in Europe and the US, to ensure that the latest industry standards apply. When we renewed our radars at the main airports in Zurich and Geneva, we ensured that they were better equipped to handle interference arising from wind farms.
Stefan Meyer is Head of Corporate Real Estate Management and Infrastructure at skyguide, accountable for all buildings and associated infrastructure services. Concerning the Federal Action Plan, he is the primary contact between skyguide and the Swiss Confederation. Furthermore, he is participating in skyguide’s Green Team, where the Action Plan is one of the driving elements.

In its Action Plan, the Swiss Confederation has specified 39 measures. Skyguide has selected 36 of these. Which ones have the greatest influence on the environment?

All 36 have a direct or indirect impact. The biggest reduction of energy consumption is, however, achieved by efficient heating and air conditioning systems and their intelligent management. At another level would be the installation of new lighting in our premises (LED). A third important measure is green IT. Fostering housing and passive cooling solutions for our data centres is the first step, followed by waste heat recovery and the implementation of server virtualisation and pooling solutions.

Skyguide actively supports the Swiss Confederation’s “Exemplary in Energy” initiative that aims at improving energy efficiency by 25 per cent by 2020 compared to 2006. Has skyguide achieved that goal yet, and if so, how?

We are working to optimise concepts, designs and procedures. To underline our determination, we have signed universal target agreements with the cantons of Zurich and Geneva, on top of the Federal Action Plan. We are also evaluating new technologies, for example plans to use cold lake water to cool our data centre and control rooms in Geneva.

Since 2006, we have already improved our energy efficiency by about 30 per cent. In addition, we should achieve the set target to implement 80 per cent of all selected measures by 2020.

And how, using which measures, will you achieve it?

We are taking measures in three areas: buildings and renewable energy, mobility and green IT. We have installed LED technology in Dübendorf and Geneva. At La Dôle, we have introduced energy-efficient solutions for air conditioning and ventilation. We are also installing radio systems using new power-supply concepts that optimise energy consumption. Now, with green IT we aim to introduce more energy-efficient data centres, passive cooling systems, waste heat recovery and the re-use of certain materials.

How did the idea of this initiative emerge, and why was skyguide involved?

Originally, the Federal Council commissioned the administration to define a concept for the presentation of “Exemplary in Energy”. In 2012, state-affiliated companies such as Swisscom, the SBB and skyguide were invited to join the initiative.

The current Action Plan should be achieved by 2020. Are there any plans for the following years?

Yes. Based on the Swiss Energy Strategy 2050, we are already having discussions about the years after 2020. All stakeholders are meeting regularly under the auspices of the Federal Department for the Environment, Transport, Energy and Communications. In the course of 2018, we aspire to agree on a letter of intent for the following ten years.

We are working to optimise concepts, designs and procedures

Stefan Meyer
ECO-RESPONSIBLE BEHAVIOUR

Ongoing commitment and daily efforts

As a company in the service sector with a strong emphasis on safety and punctuality, skyguide relies on the commitment of its employees. As an incentive, employees are offered flexible ways of working wherever possible; for example working from home on some days to avoid unnecessary travel. Skyguide also encourages environment-friendly behaviour by offering incentives for using public rather than private transport, and by installing modern videoconference systems for communication between its sites, to avoid travel.

Skyguide takes permanent action, not only to reduce the environmental impact of air traffic, but also to contribute as a company to the task of protecting the environment. With this in mind, it has developed its own Environmental Management System and sets itself concrete enhancement goals. To achieve maximum effect, a Green Team, made up of employees from various departments, is constantly upholding the principles of environmentally friendly behaviour and spreading the message (read the interviews on page 19).

Using various actions and incentives, skyguide encourages its personnel to use public rather than private transport, and to take the train instead of flying. Furthermore, the company intends to develop its videoconferencing facilities in order to avoid any unnecessary travel. However, these are not the only measures being taken to save energy and reduce our ecological footprint. Skyguide’s “Dynamic Working Environment”, teleworking and the company’s “FlexWorks” programme are also designed to improve both energy efficiency and work quality.

Time and space used more efficiently

Within its “Dynamic Working Environment”, skyguide is taking a number of actions to enable more mobile working arrangements, including the creation of open office areas in Geneva and Dübendorf to facilitate interpersonal communications. Flexible and dynamic working also makes great business sense. Research shows that, by working for a flexible employer, employees are more motivated and committed, and also develop better relationships with each other. In addition, working hours and the available workspace can be used in a more productive way.

Skyguide also maintains its “FlexWorks” programme, which allows more flexible working from home or elsewhere, and extended this option to all its administrative, operational and technical personnel in 2016. Today’s communications technologies also allow more unrestricted working and help eliminate unnecessary travel. Since both programmes reduce the volumes of heated office space required on its premises, they also enhance skyguide’s ecological credentials. The energy savings resulting from these measures are currently being studied, but interim results are very encouraging.
There are a number of other measures we can take to reduce energy consumption. For example, skyguide has gained better control of paper consumption by centralising its printer facilities and standardising their settings. Moreover, by using printer paper of a thinner quality, skyguide has saved approximately one ton of paper each year since 2015. The company is working to further reduce its paper consumption, aiming at a maximum of five kilos per employee and per year.

Local and Seasonal Produce
Skyguide has established a partnership with the operator of its Dübendorf staff restaurant, SV (Schweiz) AG, to establish an individual sustainability plan to minimise carbon dioxide emissions in logistics, operations, sourcing and the product range. SV group itself is committed to using local and seasonal produce and to reducing the proportion of meat on its menus. These actions have enabled the carbon dioxide emissions generated by the Dübendorf staff restaurant to be substantially reduced.

The implementation of various ambitious programmes would not be possible without the commitment and daily efforts of skyguide’s staff. Their response is generally very positive and understanding, so that skyguide can justifiably call itself a company at the forefront of environmental protection.

Multi-layered efforts to encourage eco-friendly mobility

Business travel and commuting to work by skyguide’s personnel are consuming more energy than the company’s entire facilities, with work commutes accounting for almost 83 per cent of the total 15 GWh of mobility-related energy consumption. Therefore, skyguide encourages its staff to use public transport by issuing half-fare rail cards or subsidising the costs of local and regional season tickets.

The carbon dioxide emissions generated by travelling and commuting amounted to almost 390 tons in 2015. This has however now been reduced – especially between its two main operating sites in Geneva and Dübendorf – by developing the company’s videoconferencing facilities, which have also been extended to its Bern-Belp premises. If physical travel cannot be avoided, the company’s business travel administration is offering to monitor and control it.

Skyguide currently owns around 60 vehicles, which are used mainly in connection with maintenance work at remote installations. New guidelines introduced in 2016 make energy efficiency a key criterion in the procurement of new vehicles. It has also acquired its first electric car based in Geneva. And to encourage eco-friendly mobility, the company has installed six electric-car charging stations in Dübendorf.
The Green Team – a platform for launching actions

**Kerstin Knopf**

As part of her job in Facility Management, Kerstin Knopf is a member of the Green Team and responsible for implementing the Federal Action Plan in the field of mobility. She also manages the skyguide:ho programme, which aims to promote the principles of a High Reliability Organisation.

What impact does the work of the Green Team have on the organisation of skyguide?

The Green Team leverages its influence by making recommendations to the management. Here are some examples concerning mobility: working from home can have a significant environmental impact, and we need to make the home office a central theme. In the area of mobility, we want to support our employees in their choice of transport. Another example is the purchase of greener company vehicles whenever possible.

What, so far, is the biggest success of the Green Team in the area of mobility?

One big success is the promotion of public transport through subsidies. Another success is the purchase last year of skyguide’s first electric car, which reduces fuel consumption, noise levels and CO2 emissions.

**Daniel Vauthey**

Daniel Vauthey is managing complex projects in the field of heating, air-conditioning and power supply within skyguide. Within the Green Team, Daniel Vauthey is accountable for all questions concerning buildings and renewable energy.

What impact does the work of the Green Team have on the organisation of skyguide?

The Green Team cannot directly influence operations. Therefore, it is concentrating its efforts on the line organisations to consider the environmental aspects the team has identified.

What, so far, is the major success of the Green Team concerning infrastructure?

The integration of energy assessments in 2015 in the innovation and change process is an important milestone in implementing an environmental strategy at skyguide.

And what are the major obstacles?

Mobility is influenced by the geographical set up of our company. We have project and work teams composed of members from different sites. Virtual collaboration is used whenever possible, but face-to-face meetings are often necessary, which means travelling.

Is it easy for you to develop your ideas within the Green Team?

Developing ideas is easy, although I think we should allow more employees to contribute their knowledge and experience. All ideas and projects must be in line with the company’s priorities however.

How can each member of the Green Team personally help to reduce skyguide’s carbon footprint?

It is our professional role to show where there is room for improvement. The skyguide mobility survey provides me with a well-established database and highlights concrete possibilities. It is now my job to develop and present proposals that achieve our goals.
This report is also available in German and French. The original English version shall prevail.

© 2018

Skyguide, swiss air navigation services ltd.

© photo: Alamy, GettyImages (cover), iStock, Shutterstock