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## **Exemplary Energy and Climate: The 39 joint measures**

Precise description of measures, KPIs, targets  
(as adopted by WGr and CG-ERCE)

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## Table of contents

<b>Working group on Buildings and Renewable Energy</b>	<b>4</b>
G 01 Standards for new and converted buildings .....	5
G 02 Analyses of potential of waste heat and renewable energies.....	6
G 03 Discontinuing new, fossil-fuelled heating systems .....	6
G 04 New method of assessing energy efficiency measures.....	7
G 05 Lighting standards .....	8
G 06 Standards for air-conditioning and cooling machines.....	8
G 07 Standards in the sanitary sector .....	9
G 08 Standards for electromotors .....	10
G 09 Commissioning, results monitoring and operating optimization of building installations.....	10
G 10 Procurement of green power and power from renewable energy sources .....	11
G 11 Mobility concepts for buildings.....	12
G 12 Creation of ecofunds.....	12
<b>Working group on mobility</b>	<b>13</b>
M 13 Integrating mobility management in existing management systems .....	14
M 14 Providing a central mobility information and booking platform .....	14
M 15 Making mobile-flexible forms of work possible .....	14
M 16 Promoting use of work hubs .....	15
M 17 Promoting video and web conferencing .....	15
M 18 Setting at the right level incentives for choice of mode of transport based on expenses reimbursement.....	16
M 19 Providing or co-financing PT season tickets for employees .....	17
M 20 Defining and applying criteria for choosing mode of transport .....	17
M 21 Active parking space management.....	17
M 22 Provision of bicycle parking spaces .....	18
M 23 Provision of bicycles and e-bikes.....	18
M 24 Taking account of criteria for procuring energy-efficient vehicles .....	19
M 25 Ensuring attendance of Eco Drive training courses .....	19
M 26 Promoting the use of car sharing agencies.....	20
M 27 Bringing company vehicles together to form a company carpool .....	20
M 28 Provision of charging stations for electric vehicles.....	21

<b>Working group on Data Centers (DC) and Green IT</b>	<b>22</b>
R 29 Energy in product assessment.....	23
R 30 Specifications for servers and further DC hardware.....	23
R 31 Highly-energy-efficient data centers (DC).....	23
R 32 Pushing passive cooling solutions without cooling machines in DCs.....	24
R 33 Encouraging server virtualization and storage technologies (SAN) in DCs.....	25
R 34 Bundling of DCs/ Outsourcing of IT services .....	25
R 35 Monitoring and evaluating new technologies .....	25
R 36 Promotion of waste heat recovery .....	26
R 37 Promotion of economy mode and energy-efficient solutions at workstations .....	26
R 38 Promotion of energy-efficient printing solutions .....	26
R 39 Promoting re-use of appliances .....	27

**Key**

- G Working group on Buildings and Renewable Energy
- M Working group on Mobility
- R Working group on Data Centers (DC) and Green IT

# Working group on Buildings and Renewable Energy

**Preamble:** The operators of the federally-owned infrastructure and the parastate enterprises subscribe to the ambitious objectives of the Federal Council's Energy Strategy 2050. With the Energy Strategy 2050, final energy and power consumption is to be reduced, the share of renewable energies increased and CO<sub>2</sub> emissions sustainably reduced. With this action plan focusing on buildings and renewable energies, the operators of the federally-owned infrastructure and the parastate enterprises want to play an exemplary role.

Based on the Confederation's previous programmes in the energy sector and on individual energy efficiency programmes, it can be noted that the potential of economic measures to increase energy efficiency has been recognized and implemented. Energy supply is of key importance to all federally-owned enterprises, which is why already today they have appropriate strategies, models and monitoring instruments at their disposal. The focus of the previous models and the associated measures is in line with the Federal Council's current strategy for reducing CO<sub>2</sub> emissions. The models are supplemented by measurable efficiency guidelines.

The Energy Strategy 2050 is based on the assumption that the supply of available energy in Switzerland will decrease in the medium to long term, but that at the same time the population will grow and prosperity needs to be maintained. Some of the institutions today are in a phase of striking growth, in terms of both size and the services provided. The looming conflict of objectives cannot be resolved in the medium term, based on current knowledge, without altering the scope of the services provided or the existing performance mandate. This concerns primarily the energy required for the basic mandate (IT, telecommunications, vehicles, research facilities, etc.), which far exceeds the basic energy requirement for buildings (lighting, heating, automation).

A first Action Plan offers an opportunity, in the priority action area "Buildings and renewable energies", to make initial contributions with practical measures that will also serve as a role model, in addition to having a direct effect.

Some of the measures proposed are guided by the "best practices" standard. What this means is a level above the minimum set by laws and standards. All the participating partners declare that they comply with standards and laws.

Reporting is generally done via a special report, "Action plan of the Confederation". On the subject of monitoring, the working group has been considering ideas on how an action could be measured. The aim should be to base reporting as far as possible on existing reporting procedures (RUMBA, EnAW, ACT, GVB, own reports).

The Confederation and the parastate enterprises undertake to comply with the currently valid standards and guidelines in the energy sector. Limit and target values exist for some topics; the more stringent values always apply to the Confederation and the parastate enterprises.

## G 01 Standards for new and converted buildings

The Confederation and the parastate enterprises discharge their responsibility as owners of real estate and are willing to step up their existing strategies on the annual energy consumption of their building portfolio (technical facilities including heating, cooling, light and ventilation), to explain those strategies to the public and make them accessible, and to be measured by them. These strategies may comprise aggregate energy reviews on sites. Where there are no conflicts with the site strategies, the Confederation and the parastate enterprises each define their own standards for individual buildings and for new and converted buildings, based on the characteristics of their respective building portfolio and guided by the best practice principle. They are based as much as possible on existing labels. The strategies of the Confederation and the parastate enterprises on the annual energy consumption of their building portfolio will be made available to the public by no later than January 1, 2016.

**Key performance indicator:** Standards are available from 01.01.2016, published and are complied with

**Target:** 100% compliance with the standards

**Justification:** The real-estate portfolio of the Confederation, including the parastate enterprises, is very heterogeneous and characterized by special buildings. It ranges from historic buildings such as the house of Parliament through laboratory and administrative buildings, train stations, warehouses, workshops, barracks, garages, tank hangars to buildings with a high level of technological content such as a synchrotron ring, radar stations or data centers. Some of them are used very rarely, while others are used every day, all year round. Under these circumstances, it is not possible to define a single, uniform, economically meaningful standard for the shells of all these buildings and for their annual energy consumption. Many buildings are part of a site (barracks, campuses, train stations, etc.). There, for example, an overall perspective that also takes into account the utilization of the waste heat generated on the spot makes far more sense than considering each building individually. In addition, one complicating factor is that the development of individual buildings and locations cannot be predicted with the same reliability for all real-estate owners. But compulsorily ordered renovation of old buildings, which in some cases are only rarely used and whose future may possibly be unclear, costs money without creating any added value apart from formally attaining a uniform building standard. It would be dishonest from the perspective of the representatives of the real-estate portfolios to give an undertaking to adhere to uniform standards for the Confederation's entire portfolio because it would be impossible to implement it in practice owing to limited financial and staff resources. It seems much more important to the parties concerned to have a procedure geared to the portfolio, with objectives geared to the local conditions. In this way one can ensure that limited resources can be used where they can develop the greatest effect. The Confederation and the parastate enterprises are therefore willing, as models, to step up their existing strategies on the annual energy consumption of their building portfolio, to explain these strategies to the public, to make them accessible, and to be measured bindingly by them.

It is a characteristic of armasuisse that the DDPS Department is competent for granting building permits and not the cantons or the municipality. It could therefore verify the requirements for new and renovated buildings very strictly with its own reporting system.

**System limit:** The measure relates to the buildings solely owned by the Confederation and parastate enterprises but not to buildings in which the Confederation and parastate enterprises have rented premises.

## G 02 Analyses of potential of waste heat and renewable energies

The Confederation and the parastate enterprises will each conduct an analysis of potential showing the extent to which waste heat is present/can be recovered and renewable energy could be used/produced on their sites and in their buildings and what this would cost. All renewable energies have to be included, that is, apart from solar energy and wood, also wind, hydroelectric and geothermal power, district heating and thermal utilization of waste. The FOE is consolidating these analyses of potential and drawing up a master plan called "New renewable energies in the federal government and parastate enterprises" by the end of 2015, in consensual agreement with the institutions concerned.

A working group is to be convened to conduct the analyses of potential.

**Key performance indicator:** Analysis of potential available

**Target:** Analysis of potential available

**Justification:** An analysis of potential is a prerequisite to prepare for increased own production of new renewable energies. Such an analysis should also show the costs for the Confederation and the parastate institutions. In addition, the analysis of potential should also provide information about the impact of conflicts of objectives, such as when roofs are covered with vegetation as a measure to improve the microclimate in areas near cities. Only on this basis can a debate then take place subsequently as to whether and how the Confederation and the parastate enterprises should increasingly produce renewable energies and how if necessary the additional costs compared with, for example, procuring electricity on the free market, are to be financed.

**System limit:** The measure relates to the buildings and sites solely owned by the Confederation and parastate enterprises but not to buildings and sites in/on which the Confederation and parastate enterprises have rented premises.

## G 03 Discontinuing new, fossil-fuelled heating systems

As from January 1, 2016 at the latest, the Confederation and the parastate enterprises will no longer fit any fossil-fuel operated heating systems in their buildings. This also applies explicitly to the replacement of existing systems. Justifiable exceptions are possible, for example, for micro-heating systems and special locations, emergency generating sets, emergency heating (e.g. back-up for woodchip heating systems), peak-load supply or as part of research projects. In such a case, operation with renewable substitutes for fossil fuels (e.g. biogas) should be examined. If substitutes cannot be considered either, the related quantities of fossil fuels must be set off with CO<sub>2</sub> reduction measures (e.g. certificates) within Switzerland. If co-generation units are incorporated, efficiencies of over 250% must be attained and, if required, the quantities of fossil fuels used must be set off with CO<sub>2</sub> reduction measures (e.g. certificates) within Switzerland. Furthermore, the prerequisites according to the message on the First Package of Measures of the Federal Council's Energy Strategy 2050, section 4.2.7 Combined heat and power generation plants (p. 71 ff) will apply.

**Key performance indicator:** % of newly-installed, fossil fuel-free heating systems operated (1<sup>st</sup> priority: use of renewable fuels, 2<sup>nd</sup> priority: certificate solutions) out of all newly-installed heating systems

**Target:** 100% as from 1.1.2016

**Justification :** Giving up fossil fuels reduces CO<sub>2</sub> emissions and encourages local energy sources. As a task, the switch-over can at the same time specifically trigger increases in efficiency in the individual buildings. The switch-over time-limit of January 1, 2016 is justified by the plans and procurements that are already under way. The decision not to procure installations operated with fossil fuels will in the medium term result in all heating installations being able to be operated with renewable fuels. But at the same time the installations will continue to be used until they have reached the end of their natural service lives. In this way one ensures that installations do not have to be decommissioned prematurely, which would mean a financial loss.

**System limit:** The measure relates to the buildings and sites owned by the Confederation and parastate enterprises but not to buildings and sites in/on which the Confederation and parastate enterprises have rented premises.

## **G 04 New method of assessing energy efficiency measures**

As from January 1, 2016 at the latest, the Confederation and the parastate institutions will use a medium- to long-term approach to evaluate measures to improve energy efficiency; it may be optionally a "Life Cycle Costs" (LCC) or a "Total Cost of Ownership" (TCO) approach. Investments in energy efficiency measures that pay for themselves over the life cycle of a measure are implemented. The energy prices used are those according to the latest edition of a recognized recommendation on the trend in energy prices, e.g. KBOB (Coordination conference of the building and real estate bodies of public building owners). The application of the methodology is made public in a strategy document (energy, environmental or sustainability model or the annual report, energy strategy, etc.).

**Key performance indicator:** 1-2 case studies available

**Target:** Available by 1.1.2017

**Justification:** Many companies use only the purchase price or the amortization time (pay off) for assessment purposes, without taking into account personnel, maintenance and disposal costs. But often the technology that seems more expensive at first sight is in the end the one that is ecologically and economically less costly. With the LCC approach, account is taken not only of purchase costs but also of the cost of use (e.g. personnel, maintenance, energy and consumption costs, etc.) and disposal. As a result, the technologies that are attractive in both economic and energy-related terms when considered over the entire life cycle are selected. The change of approach constitutes a small paradigm shift, but will serve as a model for other companies and ultimately boost investment in energy efficiency measures.

**System limit:** The measure relates to the buildings and sites owned by the Confederation and parastate enterprises but not to buildings and sites in/on which the Confederation and parastate enterprises have rented premises.

## G 05 Lighting standards

As from January 1, 2016 at the latest, the Confederation and the parastate institutions will procure only lighting that is guided by the “best practice” principle, i.e. which is based on the latest and most energy-efficient technology and control. They are drawing up an action strategy for building operators that determines, inter alia, the point in time from which new acquisitions of replacements (replacing lamps and controls on existing installations) can also be regarded as a new acquisition. In the case of outdoor lighting, special attention is paid to nature-related issues, and light pollution in particular.

**Key performance indicator:** % of lighting installations procured which comply with internal standards/requirements/directives/building regulations

**Target:** 100% as from 1.1.2016

**Justification:** Obsolete lighting requires greater quantities of energy, without there being a direct benefit in all cases. The switch-over to the latest technologies must also be an opportunity to check the benefit and, where possible, to phase out permanently switched-on lighting by using motion detectors. The working group thinks that it is not very meaningful to take a norm as the basis for a standard, as technological change in the lighting and control sector is very great. A norm might therefore very quickly become obsolete.

**System limit:** The measure relates to the buildings and sites owned by the Confederation and parastate enterprises but not to buildings and sites in/on which the Confederation and parastate enterprises have rented premises.

## G 06 Standards for air-conditioning and cooling machines

As from January 1, 2016 at the latest, the Confederation and the parastate enterprises will plan, procure and operate cooling machines to the following standards:

- 1) Generation of heat and cold must be designed integrally, taking into account the annual heat/cold curve, recovery of waste heat and free cooling. The best possible energy efficiency should be attained here in the course of a year.
- 2) In the case of new cooling and air-conditioning apparatus, it is essential to examine concepts not involving a cooling machine, i.e. using only free cooling or free chilling via geothermal probes, hybrid coolers, pre-heating of hot tap water, etc.
- 3) If the result of these clarifications is that a cooling machine is nevertheless necessary, the requirements of SIA standard 382/1 “Ventilation and air conditioning apparatus – General principles and requirements” (the currently-valid edition in each case) must be taken into account for its planning. The Confederation and the parastate enterprises fulfil the target values, e.g. compliance with the COPs (Coefficients of Performance).
- 4) A TEWI (Total Equivalent Warming Impact) calculation must be done that also includes a comparison of variants with natural coolants.
- 5) In order that the energy efficiency of cooling installations can be measured, they have to be able to be analysed in terms of energy via measuring points. This also provides the basis for operating optimization in terms of energy.

6) It is possible to depart from the requirements for research purposes. Cooling machines in energy grid systems can be used with a special certificate of overall efficiency even when the certificates/norms necessary for cold generation alone as per the above requirements are not complied with.

**Key performance indicator:** % of cooling machines purchased with requirements and SIA target values observed

**Target:** 100% as from 1.1.2016

**Justification:** It may be assumed that in future almost every new building will at times have to be cooled in the summer. If the planning is done according to the latest technical insights, only very few cooling machines will be required compared with today and at the same time some of the heat will be used for heating and hot water. The SIA standard 382/1 "Ventilation and air conditioning apparatus – General principles and requirements" describes the whole planning process, which comprises the permissible cold water temperatures, the coefficient of performance COP incl. recooling, recovery of waste heat and the topic of free cooling, among others. Regarding the COPs, the target values are determining for the initiative, not the limit values. The latest-published edition of the standard is the valid one; currently this is the 2014 edition.

A tool is available free of charge at EnergieSchweiz to calculate the TEWI (link: <http://www.energieschweiz.ch/de-ch/unternehmen/stromeffizienz/effiziente-kaelte/planungshilfen.aspx>). Cooling systems can be compared in respect of their environmental relevance with the Total Equivalent Warming Impact (TEWI). The evaluation also includes indications about coolants, in addition to energy values. With them, it is compulsory to conduct a comparison of variants with natural cooling agents.

In the case of aggregate energy optimizations for certain applications (particularly for technical cold generation), it may be meaningful to use absorption or steam jet refrigeration machines (e.g. in conjunction with solar heat or co-generation power plants). But of course this is only done when heat is also needed at the same time or can be stored seasonally (e.g. in Energy grids or arrays of probes). Heat and cold can be stored relatively easily in intermediate storage devices, so that such systems can also be used for load management.

**System limit:** The measure relates to the buildings and sites owned by the Confederation and parastate enterprises but not to buildings and sites in/on which the Confederation and parastate enterprises have rented premises.

## G 07 Standards in the sanitary sector

As from January 1, 2016 at the latest, cold water alone is the standard for hand-washing and comparable activities in toilet blocks and comparable places in new and renovated buildings of the Confederation and the parastate enterprises. As from January 1, 2016 at the latest, the Confederation and the parastate enterprises will procure only sanitary ware in energy class A, except for showers. For showers the energy class to be attained is at least class B. The internal guidelines and directives are to be adapted accordingly, communicated and the requirements implemented.

**Key performance indicator:** % of sanitary installations procured which comply with internal standards / requirements / directives / building regulations

**Target:** 100% as from 1.1.2016

**Justification:** The switch-over time-limit of January 1, 2016 is justified by the plans and procurements that are already under way. This measure does not concern a large proportion of the energy of the Confederation and the parastate enterprises, but it has a strong exemplary effect particularly with regard to housing units.

**System limit:** The measure relates to the buildings and sites owned by the Confederation and parastate enterprises but not to buildings and sites in/on which the Confederation and parastate enterprises have rented premises.

## **G 08 Standards for electromotors**

As from January 1, 2016 at the latest, the Confederation and the parastate enterprises will use the most efficient electromotors in each case (best practice strategy) when installing new electrical building apparatus (ventilation, air-conditioning, cooling, sanitary), replacing electromotors and other electrically-operated apparatus (new buildings and replacements) such as for example lifts, conveying equipment and compressors, while taking into account availability and operating safety. The internal guidelines and directives are to be adapted accordingly, communicated and the requirements implemented.

**Key performance indicator:** % of electrical drive systems procured which comply with internal standards / requirements / directives /building regulations

**Target:** 100% as from 1.1.2016

**Justification:** The switch-over time-limit of January 1, 2016 is justified by the plans and procurements that are already under way. Mass-produced electrical appliances, from the standard electric motor through drive systems for ventilation installations, compressors and lifts, to household appliances and office equipment, electronic apparatus and optometric devices, require considerable quantities of electricity to be operated.

**System limit:** The measure relates to the buildings and sites owned by the Confederation and parastate enterprises but not to buildings and sites in/on which the Confederation and parastate enterprises have rented premises.

## **G 09 Commissioning, results monitoring and operating optimization of building installations**

By no later than January 1, 2020, the Confederation and the parastate enterprises will subject the technical building installations that together consume at least 60% of the annual energy (heat and electricity) to continuous operating optimization. Recognized measures for increasing energy efficiency are being implemented constantly. The procedure is guided by SIA notice 2048 "Energy-related operating optimization". As a result, the necessary measures are to be recognized in order to be able to operate the technical building installations in keeping with the latest level of maximum energy efficiency. Operating optimization is continuously adapting building technology to the users' needs and comprises the trades of heating, ventilation, air-conditioning, cooling, sanitary fittings,

electrical and building automation (HVACSE + BA). This means that the consumptions of electricity, heat and water are optimized. As from no later than January 1, 2016, each time a new technical building installation is commissioned, compliance with the planned values will be consistently checked by an expert on the installation (at acceptance), if necessary, defects will be eliminated and subsequently a results check be carried out (Building technology energy inspection).

**Key performance indicator:** % consumption of apparatus with a continuous OO regime out of total annual energy consumption (heat and power)

**Target:** 60% (by 2020)

**Justification:** The technical building installations are highly relevant to energy issues. Experience shows that the potential for increasing energy efficiency in building technology is tremendous.

Increases in efficiency of between 10% and 30% are attained by means of operating optimizations. To the extent that additional financial resources are utilized for optimization measures, the latter usually pay for themselves owing to lower energy costs.

**System limit:** The measure relates to the buildings and sites owned by the Confederation and parastate enterprises but not to buildings and sites in/on which the Confederation and parastate enterprises have rented premises.

## **G 10 Procurement of green power and power from renewable energy sources**

The Confederation and the parastate enterprises will gradually increase the proportion of 50 Hz power consumption (i.e. not counting rail tractive power) accounted for by green power to at least 20% by January 1, 2020. The remaining 50 Hz power requirement should be met exclusively from renewable energy by no later than January 1, 2020.

Green power is taken to mean power complying with the naturemade star standard or equivalent power (but not power that is certified differently or not at all).

**Key performance indicator:**

1. % of green power out of total 50 Hz power consumption;
2. % of power obtained from renewable energy sources out of total 50 Hz power consumption.

**Target:**

1. At least 20% (by 2020);
2. Remainder of 50 Hz power consumption to the tune of 100%

**Justification:** Since the Confederation and the parastate enterprises taken together are a significant consumer of electricity, the increased consumption of green power places the corresponding incentives on the side of the producers. In the medium term the Confederation is supporting in this way the switch to the production of renewable power.

**System limit:** The measure relates to the total 50 Hz power consumption of the organizations.

## G 11 Mobility concepts for buildings

As from January 1, 2016, the Confederation and the parastate enterprises will only construct new buildings with more than 50 permanent jobs as part of an overriding mobility concept and take induced traffic into consideration already when choosing the location. The overriding mobility concept comprises minimum requirements for opening up areas with public transport and non-motorized traffic, as well as measures to reduce induced traffic and promote energy-efficient and environmentally-compatible mobility on the part of employees and visitors. The concept is supplemented by building-specific mobility concepts.

**Key performance indicator:** % of new buildings (> 50 permanent jobs) out of all new buildings (> 50 permanent jobs) with a mobility concept

**Target:** 100% as from 1.1.2016

**Justification:** Today the public planning requirements of the municipalities and cantons (planning and building laws) regulate mainly the number of parking spaces for a building. But apart from this, there is often a lack of requirements concerning offerings of and incentives for non-motorized traffic and the use of low-consumption vehicles. These missing requirements are to be drawn up under one's own responsibility and implemented as part of an exemplary mobility concept.

**System limit:** The measure relates to the buildings and sites owned by the Confederation and parastate enterprises but not to buildings and sites in/on which the Confederation and parastate enterprises have rented premises.

## G 12 Creation of ecofunds

The Confederation and the parastate enterprises each create an ecofund of their own. These ecofunds are financed out of the reimbursement/re-distribution of the CO<sub>2</sub> levy, reimbursement of the VOC levy and out of further reimbursements of monies connected with environmental incentive levies, provided that these are not to be used by law or under a performance agreement for other purposes. In addition, further financing sources are also conceivable, depending on the institution. The ecofunds finance measures of the action plan, general efficiency measures and further measures in the environmental area.

**Key performance indicator:** % of reimbursed environmental incentive levies (CO<sub>2</sub>, VOC, ...), that flow into ecofunds

**Target:** 100% (by 2020)

**Justification:** Measures that are cost-effective have been and are being taken already today by the operators of the federally-owned infrastructure and the parastate enterprises. But the low energy prices (ultimately the absence of internalization of external costs) and the shortage of resources constitute an obstacle to doing more. This problem could be addressed by earmarking the reimbursement of the CO<sub>2</sub> levy and further retrocessions.

## Working group on mobility

**Preamble:** The Energy Strategy 2050 sets out to reduce final energy and electricity consumption, increase the proportion of renewable energies and sustainably reduce CO<sub>2</sub> emissions. The Federal Administration and the parastate enterprises should perform an exemplary role in implementing the strategy. The Coordination Group Exemplary Energy and Climate is defining a joint action plan. Measures are to be implemented that, inter alia, effectively reduce energy consumption and CO<sub>2</sub> emissions in the area of employee mobility. The measures are aimed at both commuter and business traffic.

The objective of the working group on mobility is to develop a set of practical measures in the area of mobility that will be implemented by the Federal Administration and the parastate enterprises. In addition, appropriate indicators are to be defined with which the success of the measures can be verified. The working group offers a platform for exchanging best practices. An overriding mobility management concept is a prerequisite for coordinating, managing, controlling and reporting on the measures that have been decided on. By integrating mobility management into an existing management system, the organizations create the necessary processes and structures for implementing the measures.

By implementing a joint set of measures, a high signal effect is achieved. This is intended to make the exemplary role of the Confederation visible. The exemplary nature is brought out not so much by individual measures as by the breadth of the set of measures. The set of measures does not replace either the additional efforts which the organizations make as part of their specific mobility management.

## **M 13 Integrating mobility management in existing management systems**

Implementation of structures and processes for regular assessment and effective management of employee mobility in terms of its environmental impact.

**Key performance indicator:** degree of implementation of a mobility management system (according to the PCDA principle) and percentage of employees in whose business division such a mobility management system is implemented

**Target:** Comprehensive mobility management system is completely implemented and integrated into existing management systems (100% of the employees)

**Justification:** A necessary prerequisite for coordination, management, controlling and reporting of the measures

**Sphere of action:** Commuter traffic, business traffic

## **M 14 Providing a central mobility information and booking platform**

Provision of a central information and booking platform that allows easy access to guidelines, information on service offers and planning and decision-making tools.

**Key performance indicator:** % of employees having access at their workplace to a central information and booking platform

**Target:** 80% of the employees have access at their workplace to the platform

**Justification:** A necessary prerequisite

**Sphere of action:** Commuter traffic, business traffic

## **M 15 Making mobile-flexible forms of work possible**

Making possible forms of work that allow employees with suitable job profiles to freely choose their time and place of work (e.g. at home, when travelling, at other company sites, in work hubs), depending on the job activities. This includes equipping the relevant groups of employees with the necessary devices (e.g. mobile devices with remote access to the corporate network, e-mails, unified communication solutions) and creating the cultural preconditions by making it a central theme in management and staff development.

**Key performance indicator:** % of employees who use mobile-flexible work forms, out of the total number of workers having a suitable job profile for mobile-flexible work forms

**Target:** 30% of the employees having a suitable job profile regularly use mobile-flexible work forms

Cultural preconditions for mobile-flexible work forms are a topic covered in management and staff development.

Relevant groups of employees are equipped with the necessary tools (e.g. remote access to the corporate network, e-mails, IP telephony/web conferencing).

**Justification:** Congested traffic arteries to the urban centers (e.g.: motorways and trains to Bern, Zurich, Lausanne,...), positioning as an attractive employer (important when searching for talent)

Demonstrably higher productivity and job satisfaction with greater freedom to choose place and time of work

Risk: In some cases, it is difficult to measure and get an overview of work output done when working at home.

**Sphere of action:** Commuter traffic

## M 16 Promoting use of work hubs

Provision of and active communication on work hubs at which employees from other office sites/departments or other companies/organizations can use workstations. In addition, a review of the extent to which in the ERCE premises can be opened reciprocally or access to external hubs can be facilitated for the employees.

**Key performance indicator:** % of suitable office locations with workstations, to which internal or external (ERCE) employees from other sites have access

**Target:** All suitable office locations offer workplaces that can be used by employees from other locations.

A review is conducted of the extent to which premises can be opened reciprocally within the ERCE or access to external hubs can be facilitated for the employees

**Justification:** Congested traffic arteries to the urban centers (e.g.: motorways and trains to Bern, Zurich, Lausanne,...). Public transport.

Demonstrably higher productivity and job satisfaction with greater freedom to choose place and time of work.

**Sphere of action:** Commuter traffic, business traffic, (visitor traffic)

## M 17 Promoting video and web conferencing

Provision of access to video and web conferencing which makes personal exchanges possible over great distances.

**Key performance indicator:** % of employees who regularly use video and web conferencing, out of the total number of employees who have a suitable job profile for video and web conferencing

**Target:** 30% of the employees who have a suitable job profile regularly use video and web conferencing (or corporate collaboration solutions).

70% of the employees who make several international business trips per year regularly use video and web conferencing

**Justification:** Cooperation can only work if exchanges are as good as possible. Video and web conferencing also make this possible independently of location. This makes WorkAnywhere and Home Office significantly easier

**Sphere of action:** Business traffic, visitor traffic

## **M 18 Setting at the right level incentives for choice of mode of transport based on expenses reimbursement**

Ensuring that employees can be reimbursed through expenses for business travel done 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 private car. This is achieved by ensuring that use of PT can be reimbursed as expenses based on the ticket price (the base being the half-fare railcard, even if self-paid season tickets for a point-to-point journey, a zone or the entire network are used); or alternatively if a season ticket is provided by the employer; and by ensuring that use of private cars requires approval from one's superior in keeping with clearly-defined criteria and is reimbursed at a max. of Mobility's per-kilometer rate for business customers (category "Combi").

### **Key performance indicator:**

- Ensuring that employees can be reimbursed through expenses for the ticket price of business travel done by public transport (the base being the half-fare railcard, even if self-paid season tickets for a point-to-point journey, a zone or the entire network are used), or alternatively that they receive a season ticket provided by their employer (if fulfilled, this contributes 30% to the achievement of the target)
- Use of private cars requires approval from one's superior in keeping with clearly-defined criteria (if fulfilled, this contributes 50% to the achievement of the target)
- For business journeys done using a private car, the maximum amount reimbursed is Mobility's per-kilometer rate for business customers (Combi category, 2014 rate of CHF/km 0.64 per km). (The rate of CHF 0.64 per km is fixed as the benchmark for the whole of the reporting period 2014-2020) (20%)

**Target:** Use of PT can be reimbursed as expenses based on the ticket price (the base being the half-fare railcard, even if self-paid season tickets for a point-to-point journey, a zone or the entire network are used). Alternatively, the employer provides a season ticket.

Use of private cars requires approval from one's superior in keeping with clearly-defined criteria and is reimbursed at a max. of Mobility's per-kilometer rate for business customers (category "Combi"), 2014 rate = CHF 0.64 per km

**Justification:** Is aimed at domestic business traffic. Measure M 20 is aimed at international business traffic. Measure M 19 is aimed at commuter traffic.

**Sphere of action:** Business traffic

## M 19 Providing or co-financing PT season tickets for employees

Encouraging use of PT in business and commuter traffic by providing a half-fare railcard and/or by making a financial contribution to PT season tickets (zone, point-to-point or network-wide season tickets).

**Key performance indicator:** A minimum financial contribution to PT season tickets (zone, point-to-point or network-wide season tickets) for employees

**Target:** All employees are entitled to a half-fare railcard or an appropriate company contribution to a PT season ticket

**Justification:** No mode switching effect can be achieved by providing a half-fare railcard. The incentive to purchase a network-wide season ticket privately increases if it is possible to claim as expenses business trips done with PT

**Sphere of action:** Commuter traffic, business traffic

## M 20 Defining and applying criteria for choosing mode of transport

Introduction of a guideline with clearly-defined travel distances for rail or air travel, criteria for using video and web conferencing and corporate collaboration solutions. Provision of a simple decision-making tool and capturing all international business travel.

**Key performance indicator:** Proportion of air travel to (final) destinations that can be reached by train from Basel, Zurich or Geneva in five hours.

**Target:** All international business travel is accounted for via expense statements or a travel agency.

Proportion of air travel to (final) destinations that can be reached by train from Basel, Zurich or Geneva in five hours amounts to <20%.

**Sphere of action:** Business traffic

## M 21 Active parking space management

Charging for employee parking spaces at usual market rates and allocating them using clear criteria such as level of service by PT at place of domicile, time difference between using a private car and PT, working hours, participation in car sharing agencies and/or energy efficiency of the vehicle.

**Key performance indicator:** Proportion of parking spaces with clear allocation criteria and usual market rates.

**Target:** All parking spaces are rented out at usual market rates and are allocated on the basis of clear criteria.

New sites are planned with a minimum number of parking spaces.

**Justification:** Shift from own vehicle -> PT/non-motorized traffic

In the Federal Administration: Parking space management already regulated in an ordinance.

**Sphere of action:** Commuter traffic, visitor traffic

## M 22 Provision of bicycle parking spaces

Provision of covered and secure parking spaces for two-wheelers and the associated infrastructure (changing rooms with showers). Minimum requirements:

- safe access from the road network
- near the entrance, bike parking spaces nearer to the entrance than car parking spaces
- frames to which bikes can be padlocked (in open sites)
- can be seen from the public space, even at night
- roofed over
- at each location: storage facility or lockers for helmets, pumps, rainproof gear, etc.
- one changing room/shower per site, where possible
- power socket for electric bikes, where possible and where needed

**Key performance indicator:** % of sites with > 100 employees with a number of covered bike parking spaces to match demand which meet the following minimum requirements:

- near the entrance
- frames to which bikes can be padlocked (in open sites)
- can be seen from the public space, even at night
- roofed over,
- one changing room/ shower per site, where possible

**Target:** 100% of the sites with > 100 employees have a number of covered parking spaces to match demand which meet the minimum requirements.

**Justification:** Recommended number and requirements as per ASTRA bike parking manual. Non-motorized traffic has considerable potential, which is currently untapped. It can help to ease the burden on the environment (air, noise, CO<sub>2</sub>) and to promote health.

**Sphere of action:** Commuter traffic, visitor traffic

## M 23 Provision of bicycles and e-bikes

Provision of self-rental bikes and e-bikes for mobility between nearby sites (e.g. PubliBike stations, company bicycles).

**Key performance indicator:** % of company locations with > 100 employees needing the service, that give access to self-rental bicycles.

**Target:** All locations of organizations with > 100 employees needing the service that have access to self-rental bikes (e.g. via existing bike rental systems such as PubliBike or company bikes).

**Justification:** Raising awareness of e-bikes and sharing systems.

**Sphere of action:** Business traffic

## **M 24 Taking account of criteria for procuring energy-efficient vehicles**

Application of clear energy-efficiency criteria such as energy labels and weighting of CO<sub>2</sub> emissions with at least 15% when procuring vehicles.

**Key performance indicator:** % of newly-procured cars with up to a max. of 5 seats, not counting all-wheel-drive vehicles, intervention vehicles and goods transport vehicles, which correspond to energy efficiency class A.

**Target:** All newly-procured cars with up to a max. of 5 seats, not counting all-wheel-drive vehicles, intervention vehicles and goods transport vehicles, are in energy efficiency class A.

When procuring new vehicles (incl. delivery vans), the fuel consumption/CO<sub>2</sub> value is weighted as an evaluation criterion with at least 15% in the benefit analysis.

**Justification:** Application of the valid regulations for the procurement of vehicles of the Confederation and the DDPS:

- Ordinance on the Vehicles of the Confederation and their Drivers (VFBF)
- DDPS Energy concept 2020
- Imfeld postulate (5% gas vehicles)
- Evaluation criterion ecology >15%
- Directive on the ecological principles of procurement of administrative vehicles
- Keeping of statistics on vehicle procurement.

**Sphere of action:** Business traffic

## **M 25 Ensuring attendance of Eco Drive training courses**

Training of employees who drive more than 20,000 kilometers a year on business, by means of an Eco Drive course every three years.

**Key performance indicator:** % of employees driving more than 20,000 kilometers a year who have attended an Eco Drive course in the last three years.

**Target:** All employees driving more than 20,000 kilometers a year have attended an Eco Drive course in the last three years.

In the case of employees who use the company fleet, the employer supports privately-attended Eco Drive courses with a 30% contribution to costs.

**Justification:** Diesel savings of 9% have been measured at SBB thanks to Eco-Drive courses, with nothing but positive feedback from course participants.

The primary motivation is lower fuel consumption and the directly related reduction in CO<sub>2</sub>. A secondary reason is that the courses also lead to a safer driving style. The benefit is recurrent annually, but it decreases constantly after about 3 years, if no refresher courses are attended.

Calculation of the reduction in CO<sub>2</sub> emissions [kg<sub>CO2</sub>]: number of course participants \* 20,000 km \* 7 liters/100 km \* 7% saving \* 3,121 kg<sub>CO2</sub>/litre

Calculation of the fuel saving [litres]: number of course participants \* 20,000 km \* 7 liters/100 km \* 7% saving

**Sphere of action:** (Commuter traffic), business traffic

## M 26 Promoting the use of car sharing agencies

Provision of information on and access to an in-house or outside car sharing agency for arranging lifts and on/to carpools in commuter and business traffic.

**Key performance 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: the site has a sufficiently large number of employees who need the service to be able to operate a car sharing agency efficiently and cover its costs.

**Target:** 80% of employees who depend on the car to travel to work have access at their workplace to a car sharing agency.

**Justification:** For employees working shifts, there may in some cases be no PT link at the appropriate time (60% reason for using one's own car). When several locations are brought together (e.g. operations control centers), employees often have the same journey to work, which is suitable for car pooling

**Sphere of action:** Commuter traffic, business traffic

## M 27 Bringing company vehicles together to form a company carpool

Reducing the number of business vehicles by inter-departmental use of carpool vehicles.

**Key performance indicator:** Average length of time for which company vehicles (not counting intervention vehicles) are used per week.

**Target:** A vehicle management tool is introduced and used regionally.

Vehicles used for < 2 hrs. per day (not intervention vehicles) are incorporated into the vehicle pool.

**Justification:** Embodied energy can be reduced by having a smaller fleet. The vehicles' better utilization rate means that they are replaced sooner with more modern and therefore more energy-efficient vehicles

**Sphere of action:** Business traffic

## **M 28 Provision of charging stations for electric vehicles**

Parking spaces at larger sites are equipped with charging facilities for ordinary electric vehicles, such as, for example, electric cars and electric scooters or e-bikes.

**Key performance indicator:** % of sites with more than 500 employees that have parking spaces with charging facilities for electric vehicles.

**Target:** In new buildings, plans must ensure the subsequent installation of charging stations for electric vehicles.

All sites of organizations with company-owned parking spaces and > 500 employees have facilities for charging ordinary electric vehicles, in particular electric scooters and e-bikes.

**Justification:** This measure can be presented in public relations as forward-looking and is also important with regard to CO<sub>2</sub> reduction.

Parking space management has to be coordinated with this measure. This means that employees who commute to work with an e-vehicle must be given preference over the others when managing parking spaces

**Sphere of action:** Commuter traffic, visitor traffic

## Working group on Data Centers (DC) and Green IT

**Preamble:** The federal undertakings and the parastate enterprises should perform an exemplary role in the implementation of the Energy Strategy 2050. The Coordination Group Exemplary Energy and Climate is defining a joint action plan. Measures are to be implemented which effectively reduce electricity consumption, among other actions.

The need for ICT (information and communication services) is increasing. According to the 2012 Datentresor Switzerland study, for example, an increase in the data center (DC) surface area in Switzerland of 10% a year has to be expected. Energy-efficient IT infrastructures are necessary in order to reduce the resultant additional demand for electricity.

The working group "DC/Green IT" had the task of drawing up, between July and October 2013, joint measures with specific targets and schedules for procurement of energy-efficient hardware, energy-efficient operation and proper recycling of ICT equipment. The aim was not to identify the lowest common denominator but measures and targets of an exemplary nature, by incorporating best practices and innovations e.g. with regard to new trends in data center cooling.

Solutions for energy-efficient operation of DCs and corresponding indicators (in particular PUE) are already known in the sector, but there is no shared perspective on them among the federal undertakings and parastate enterprises. There is also a lack of a shared perspective with regard to the efficiency requirements to be met when procuring ICT equipment and to the possibilities for energy-efficient operation of terminals and printers.

In a first step the working group collected information on practice and the standards and innovations as at 2013. This information was then aggregated in a second step, the thrusts defined and joint measures devised. A consensus was subsequently found for a list of measures including targets and schedules and the list was approved by the working group. This list can still be consolidated or supplemented in future by including new technologies/innovative solutions.

The focus with this action plan is on energy consumption and energy efficiency in the utilization phase. Additional aspects of sustainability in the sense of an aggregate approach to the product life cycle are to be included individually by the organizations when implementing the measures decided on. The term Data Center (DC) as used in this action plan is taken to encompass both buildings that are intended in their entirety for IT and also individual server rooms in mixed-use buildings. The measures relevant to DCs are differentiated by IT load or DC surface area. Only civil DCs are included. DC surfaces that are rented out to third parties are excluded because their IT infrastructure and operation cannot be influenced directly. The organizations ensure that the relevant measures of the action plan are also implemented by their service providers. It has been assumed that the financing of the measures is covered primarily by own funding. But for some organizations, the target cannot be reached on a measure without additional funding because this measure has not been included in their investment plans. Possible additional funding for exemplary projects of parastate enterprises e.g. through sectoral invitations to tender within the framework of competitive tenders, are to be examined as a result. The PUEA promotion programme for DCs can also be used. In the federal undertakings, the allocation of a possible additional budget for flagship projects would have to be considered by Parliament.

## R 29 Energy in product assessment

The Confederation and the parastate enterprises assess and select for a predetermined specification their IT infrastructure according to the TCO (Total Cost of Ownership over the duration of one's own use) approach, including energy consumption. Energy consumption must be disproportionately overweighted here, unlike with the purely TCO approach. The sustainability criteria are complied with here.

**Key performance indicator:** % of the IT appliances evaluated according to the description of measures out of all IT appliances procured in new calls for tender.

**Target:** 100% of IT appliances in new tenders from January 1, 2015.

**Justification:** Energy-efficient IT appliances give rise to lower energy consumption in operation or lower overall costs over the life cycle

## R 30 Specifications for servers and further DC hardware

The Confederation and the parastate enterprises systematically call for joint state-of-the-art specifications when procuring new servers and further DC hardware:

- 1) 80 PLUS® Gold-Label or an equivalent reference such as ENERGY STAR® Programme Requirements for Computer Servers.
- 2) Environmental specifications as per standard ETSI EN 300 019-1-3, class 3.1.
- 3) Power consumption declaration (measurement and reporting as per ENERGY STAR® Programme Requirements for Computer Servers).
- 4) The hardware in the DC should support the air conditioning concept of the DC. In the case of air cooling, the preferred air flow in the server and other DC hardware is from the front towards the back.

**Key performance indicator:** compliant servers and further hardware in the DC in new calls for tender.

**Target:** 100% of new calls for tender for servers and hardware in the DC are compliant as from 01.01.2015.

**Justification:** Energy-efficient and temperature-tolerant servers and further DC hardware with standardized air flow give rise to lower energy consumption in operation. Exceptions should be justified with proof of the need.

## R 31 Highly-energy-efficient data centers (DC)

The Confederation and the parastate enterprises implement the most energy-efficient concepts and technologies in the infrastructure systems (cooling, uninterrupted power supply (UPS)) of their DCs.

**Key performance indicator:** PUE value (Power Usage Effectiveness). The PUE value is defined as the ratio of the total electrical energy consumption of the DC (IT equipment plus infrastructure components such as ventilation, cooling, UPS, light) to the electrical energy consumption of the IT equipment. The measurement method has to be defined.

**Target:** For new civil DCs with an IT load of >150 kW or a surface area of >250m<sup>2</sup>, a PUE target value of <1.2 is aimed at as from a 25% load factor. An average PUE value of < 1.3 is to be aimed at over all the civil DCs by 2030. Possible deviations are allowed, depending on waste heat recovery concepts: with a waste heat recovery rate of >50%, a PUE of < 1.3 is to be aimed at. With a lower waste heat recovery rate, this PUE value decreases linearly. With a waste heat recovery rate of <10%, a PUE of < 1.2 is to be aimed at. If the operation of cooling is not influenced by waste heat utilization, a PUE value of < 1.2 is to be aimed at.

In smaller DC sites (IT load <150 kW or a surface area of <250 m<sup>2</sup>) best efforts are expected within possible degrees of freedom to minimize the PUE values (PUE value <1.3).

**Justification:** The need for IT surface area is increasing by 10% per year. The technologies needed to attain the target exist. It would be desirable if a methodology were to be developed that would allow for an aggregate approach to input/output at the level of “usable” computing performance, or similar.

## **R 32 Pushing passive cooling solutions without cooling machines in DCs**

The Confederation and the parastate enterprises are pushing the use of energy-efficient passive cooling solutions without cooling machines by using the air-conditioning range permissible for servers as per ETSI EN 300 019-1-3, class 3.1 (addition: All planned new DCs from 2014 should meet these requirements. Immediate measure: In existing DCs with conventional cooling, the cold operating temperature is to be raised to at least 26 °C).

**Key performance indicator:** 1st part: % of existing DC surface area with a temperature > 26 °C out of the total DC surface area, 2nd part: % of DC surface area with extended temperature range or with passive cooling out of the total DC surface area.

**Target:** 1st part: 100% by 2014, 2nd part: 33% by 2025, 66% by 2035.

**Justification:** Up to now the temperature in DCs was usually set unnecessarily low and constant. As a consequence, energy- and cost-intensive cooling systems are used. Instead of a fixed temperature setting, a varying temperature allows for the use of cooling solutions without cooling machines (e.g. fresh air cooling all year round). The average annual temperature can be kept at 26°C in compliance with the FOE recommendation. If adiabatic cooling is used as a complement, its use should be limited and be covered to a large extent (>80%) with rainwater.

## **R 33 Encouraging server virtualization and storage technologies (SAN) in DCs**

The Confederation and the parastate enterprises aim for high server capacity utilization. To this end, server virtualization is being increasingly promoted. In the area of storage, storage area network technology (SAN) is also being promoted.

**Key performance indicator:** % proportion of virtual servers: number of virtual servers / (number of virtual + physical servers).

**Target:** > 85% by 2020 or > 90% by 2025.

**Justification:** By increasing server capacity utilization, the hardware can be optimized and power consumption reduced accordingly. IT outsourcing makes it possible to increase server capacity utilization.

## **R 34 Bundling of DCs/ Outsourcing of IT services**

The parastate enterprises check potential for increasing energy efficiency as part of DC consolidations, in particular between the ERCE actors. When outsourcing IT services, it is important that the provider should aim at a high degree of energy efficiency. This is guaranteed for the ERCE actors by the joint measures. If bundling or outsourcing takes place outside the scope of the ERCE, energy efficiency and power mix are to be included as criteria when selecting providers, if this is permitted by the tender procedures.

**Key performance indicator:** Checked potentials

**Target:** 100% checked by the end of 2015

**Justification:** The existing DC surface area should, if possible, be used efficiently and to capacity by incorporating the company's own strategy. This is done, if possible, also in agreement with the Confederation's existing consolidation strategy.

## **R 35 Monitoring and evaluating new technologies**

The Confederation and the parastate enterprises monitor or evaluate new technologies with energy-efficiency potential and operate a Technology Board.

**Key performance indicator:** Number of technologies evaluated

**Target:** At least one per year

**Justification:** New technologies often contribute to an increase in efficiency. Through cooperation, an exchange of experience should be able to take place between the members of the ERCE.

## R 36 Promotion of waste heat recovery

The Confederation and the parastate enterprises 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.

**Key performance indicator:** % recovery of surplus waste heat

**Target:** 50% by 2030 (DC > 250 m<sup>2</sup>)

**Justification:** By recovering waste heat, fuel consumption and consequently, CO<sub>2</sub> emissions for heating purposes can be reduced.

## R 37 Promotion of economy mode and energy-efficient solutions at workstations

The Confederation and the parastate enterprises ensure that, when not in use, computer workstations switch to the idle state after a predetermined time.

**Key performance indicator:** % of workstations with active power management

**Target:** >90% by 2015

**Justification:** Today solutions are available that enable workstations to be switched to the idle state via the network when not in use. By using these solutions and by determining suitable switch on/switch off criteria and parameters (Group Policy Power settings), it is possible to ensure that PCs are systematically switched to the idle state when not in use.

## R 38 Promotion of energy-efficient printing solutions

The Confederation and the parastate enterprises optimize the number of printers per employee and implement modern printing solutions in the office area, such as the follow-me-printing function, which make it possible to optimize printer operation and save paper and power. (Addition: Targeted and equivalent solutions are to be implemented in the area of research, for example in the ETH Domain.

**Key performance indicator:** Employees per x printers; kg of paper per employee

**Target:** 100 employees per printer by 2020 (at smaller sites a maximum of 1 printer); 5 kg of paper per employee and year (= approx. 1,000 A4 sheets) by 2020

**Justification:** Today energy-efficient printing solutions are available. Thanks to the follow-me printing function, an employee can now print at every location. In addition, the personal print queue can be looked at and unwanted print orders can be deleted (=> less erroneous print-outs than

previously). Time, paper, energy and toner can be saved with this function. The high requirements in terms of mobility and flexibility are thus also met.

## **R 39 Promoting re-use of appliances**

The Confederation and the parastate enterprises promote re-use of old, but still-serviceable, equipment by passing on old PCs to specialized companies, aid agencies or by giving them directly to employees, while complying with the corresponding safety provisions. Appliances that have to be disposed of are processed only by certified recycling companies. (Addition: Although re-use is governed by the market, criteria should possibly be determined to ensure energy efficiency. E.g. only equipment less than 8 years old should be taken in for re-use. These additional criteria can be defined per company, e.g. through own internal guidelines)

**Key performance indicator:** Guidelines for recycling no-longer used appliances are available

**Target:** 100% by 2015

**Justification:** By re-using the equipment, its service life is extended and as a result resources are saved.