EUROPEAN GREEN OFFICE
HANDBOOK

This Handbook was created by the Partners of a Leonardo da Vinci Program financed by the European Union, as tool of a European Green Office Initiative.

Project number:
510859-LLP-1-2010-1-HU-LEONARDO-LNW

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TIME Foundation (Bulgaria)
Umanotera (Slovenia)
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Introduction

In the beginning of the 21st century masses of employees spend their life's' significant part in offices. Additionally some of the micro- and small enterprises holds the office activity in overlapping private life area. Everyday operation of business sector and of households, leads to considerable environmental impact by human input, such as consumption, as well as output, such as emission and discharge.

Companies and non-profit organisations have to play a (pro-) active role in preventing and solving environmental problems. Worldwide, 40% of raw materials and resources are consumed by offices. To reduce this impact one of the most efficient ways is "greening" the offices, ergo create an environmentally and human-friendly place to work. Despite of numerous initiatives, presently there is an articulated demand by office managers on Green Office standard, structured EU Green Office trainings and also for tools to measure office's environmental impact.

Companies often have sustainability policies, but do not have the expertise and/or resources to train office managers on how to manage their offices to make them "green." Furthermore, Since SMEs (Small and Medium Enterprises) have significantly fewer resources and less motivation, they are in particular need of a standardized tool which contains all the elements needed to make a more liveable workplace.

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The main goal of the European Green Office (EGO) Network was to develop standardised EU Green Office Guidelines and Office Ecological Footprint Calculator. These tools will help to transform offices into more environmentally and human-friendly spaces that also enhance the skills and knowledge of employees. There is a need to provide complex, innovative training for office managers which not only transfers information, but also motivates employees to act. This contains new, fresh, more effective methodologies such as experience-based learning. Professionals need to learn new skills in order to be able to provide trainings based on experience-based learning.

We, EGO Network, as mainly composed of environmental management system practitioners organised in 6 different European countries would like to help all the office managers who want to change their lifestyle, by changing the old habits. All the elements of the toolkit we provide are essential in the Green Office process.

Our European Green Office Tools are:

- Office **Ecological Footprint Calculator** (online-based office calculator to measure the office status and development);
- European **Green Office Handbook** (paper-based Green Office guideline, which gives tips, ideas and knowledge in three different levels of each topic);
- **Green Office Checklist** (Self Evaluation Tool for offices);
- **Face-to-face trainings** (Would you like to learn how to involve your colleagues in greening their day to day work ? Become a super dynamic Green Office manager and subscribe to our face-to-face training);
- **Virtual Office** (online-based learning application for those who didn't participate on the trainings and would like to understand the need of Green Office)

Let's start the organizational responsibility on the very fundamental operation: work in Green Offices!

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Prologue

Man and its working environment

We, modern humans, first appeared about 200,000 years ago. It took us quite some time to move from the state of contemplating and fearing the surrounding environment and existing within it, to what we are today. In the beginning we may have understood little of the processes around us but we probably had that profound feeling that we were part of something powerful that supported our needs and was generous to our skills, that we drew our force from and were grateful to. We had clean air to breath, clean water to drink and swim in, dangerous animals to compete with over tasty food. We were an integral part of the surrounding environment – the natural world. Throughout the years we worked our way through this world and took a dominant role over it. Today the majority of us still conquer the environment by living in societies that replace natural environments with agricultural fields' and factories and natural processes with techno-industrial inputs and outputs. Increasingly in the "developed" techno-industrial societies of Europe and North American we exercise this control over our environment at arms length from our desks and offices. Let's have a walk in history to see how we got so detached from nature and so attached to our chairs and screens, to reflect on the past, to understand the present and prepare to change the future.

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Agriculture

Our first move was from a lifestyle of hunting and gathering to one of agriculture and settlement. The zenith of that era one finds in the Middle Eastern Sumerian cities, still there to see from around 3,500 BC. Our first success had been achieved – plants and animals were domesticated. We kept walking that path for quite some time. Between the 1st and 19th century Romans, Arabs, Anglo-Saxons and other inhabitants of the great civilizations that developed on the planet cultivated the land and took care of the beasts. The details of who selected the original crops and domesticated and bred agricultural animals is not so important. What we need to remember is the working environment where man was in close contact with nature, where time was mostly spent outside in physical labour observation and communication, where time was measured by the passage of seasons and the working hours were dominated by the natural cycles. The agricultural era is now different with the Green Revolution where thanks to research and development we have increased agricultural output around the world and where industrial and agricultural revolutions have converged to provide continuous growth in some of our bank accounts at the expense of others' and to ensure the degradation of our global environment.

Industry

During the 18th and 19th century man created partnership with the machines, put blue-collars on and continued supplying the factories with a more or less continuous flow of resources from the natural world, in the process destroying the balance between mankind and the natural environment. Now man was the master of his environment rather than an integral part of it. A big part of this was happening as a result of the discovery and exploitation of fossil fuel, firstly coal then oil. Fossil fuels powered the production lines as well as the vicious wars that some still remember clearly. We worked hard in those times wrenching more and more resources away from the environment. Mines were squeezing our lungs, bullets were tracing our bodies. Those resources weren't needed for our basic survival but they did supply us with material and energy, to allow us to build cities, provide health and educational systems, to prosper and become the most dominant species on the planet. We were taking all from the environment without paying attention to what was left behind. We later discovered it was smoke, pollution, waste, caverns on the Earth's surface, exhausted soil...

Information

In 1395 in his Canterbury Tales Geoffrey Chaucer first used the word 'office' to mean a place where business is transacted. In 1957 the then Soviet Union sent Sputnik 1 into the Earth's orbit and broke the communication barrier. Our world entered the information age. White-collars replaced the blue ones and more and more people started working in offices than ever before. Today, knowledge is the fuel resource and not so much the oil. Even if we don't see that immediately it is only a matter of time to realize it. And even more, the infinite source of knowledge is nature. We need it not only for its clean air and water and for its energy that fills the reservoirs in our bodies.

We need to look at it as a teacher and to combine what we learned throughout our scientific and technological development with what is out there in the cycles in order to became knowledgeable enough to protect and cherish the environment, to reduce waste, to redesign our society and economy, to create a positive future for our children.

We invite you to the first step – to create office spaces that are closer to nature. This book will help you with some tips and directions on how to manage our offices so we develop them in a cozy and healthy environment, while feeling less detached from our greatest possession – the Earth.

Stoyan Faldjiyski

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MANAGEMENT

European Green Office (EGO) Principles

In order to become an European Green Office (EGO), certain principles have to be followed. The principles of EGO can be distinguished as being both management and performance related. Management-related principles are connected to managerial matters such as setting environmental objectives and raising the environmental awareness of the staff. Performance/operation related principles characterise the performance of significant environmental aspects such as energy and waste. EGO principles are listed below:

Management-related principles

MANAGEMENT

Environmental commitment and policy

The top manager(s) of the office are clearly committed to dealing with the environmental performance of the organisation and have stated that they support pro-environmental activities in the office. The office must have a documented environmental policy statement that has been approved by the top manager.

Environmental objectives and action plan

The office must identify the significant environmental topics (environmental aspects/impacts), taking into account the special features of the office and its situation. Based on this information the office must define their environmental objectives and develop a clear environmental action plan. The environmental objectives and action plan must show how environmental performance will be continuously improved and developed in the future.

The Green Office coordinator and team

The office must select a person (a green office coordinator) and team from the office personnel to coordinate the implementation of the green office activities.

Raising environmental awareness of staff

All staff in a Green Office must be aware of the Green Office objectives, management system and the practices which are being encouraged and supported in the office. The staff should be instructed, trained, and guided so that they know which practical measures are being implemented and which relate to their job profiles.

Monitoring and tracking progress

The office must monitor and check the fulfilment of its environmental objectives and action plan, as well as environmental performance, on a regular basis. The office must define key indicators for its activities that have significant environmental impacts and monitor/measure them on a regular basis.

Specific issues/Performance-related principles

PERFORMANCE

Green procurement

The office must have drawn up green purchasing criteria and procedures for selected office supplies and services.

Improving energy efficiency

The office must have established measures for energy saving and should demonstrate energy efficiency in the office.

Reducing the consumption of natural resources and office materials

The office must have established measures for reducing the consumption of natural resources and office materials that are related to the special features of the office and its situation (significant aspects).

Waste reduction and recycling

The office must have established measures for waste reduction and source separation that allow a high level of recovery and compliance with local requirements.

Sustainable transport and mobility

The office must have established measures for minimising transport impacts and promoting sustainable mobility.

Creating a healthy office environment

The office must have established measures for creating and promoting a healthy and socially responsible working environment/conditions (which includes regular risk assessments of work places).

Managing the European Green Office (EGO) Program

European Green Office program & Environmental Management System

EMS provides a systematic approach and continuous improvement

The European Green Office (hereinafter 'Green Office') program can be seen as a simple and 'light' environmental management system (EMS). In order to become a Green Office, a company has to develop an EMS, which provides a systematic approach to planning and implementing environmental performance measures and ensures continuously improving environmental performance. Implementing an EMS is central to every office which presents itself as being environmentally friendly. EMS works with the principle that "If a business fails to plan, it plans to fail".

An EMS monitors environmental performance in a similar way to how a financial management system monitors expenditure and income and enables regular checks of a company's financial performance. As such EMS integrates environmental management into a company's daily operations, long term planning and overall management systems.

An EMS follows a Plan-Do-Check-Act Cycle. This is the systematic approach of first identifying the environmental impacts of an organisation/activity, developing an environmental policy, setting objectives for improvements, having mechanisms for delivering improvements and also including elements of measuring progress and monitoring the environmental performance. For an effective EMS to be developed and implemented, the organisation needs to be committed at all stages of the cycle (see Figure 1 below).

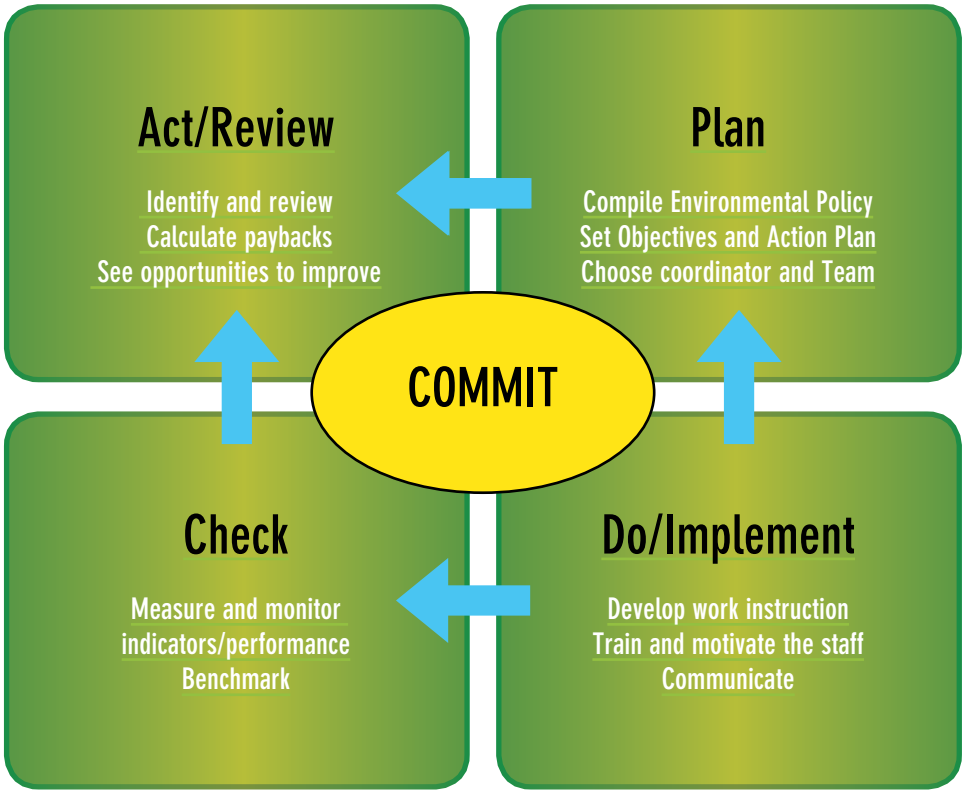


Figure 1. Implementing an environmental management system in a green office

Steps towards becoming an European Green Office using an EMS

The steps required to implement the principles of a Green Office using the elements of EMS are briefly described, as follows:

1 STEP

ENSURE TOP-LEVEL COMMITMENT

For an effective environmental management system to be developed and implemented, the organisation needs commitment from the very top of the organisation. This is the core and overarching principle of any management system. Top level management commitment sets the tone for implementation of the Green Office. Success depends on the ability of senior management to communicate support for the goals of the EMS, recognize and communicate its benefits and maintain the organisation's focus during the implementation process.

Therefore, top level management must ensure that sufficient resources for the initial stages of Green Office implementation are available. These resources include the personnel and support necessary to develop, implement and maintain Green Office program.

Fully implementing GO principles may take some time, and maintaining momentum can be a challenge. Sustained vision, leadership and top-level management commitment are critical to meeting this challenge. When senior managers maintain interest and commitment, employees also stay focused. There may be some frustration as implementation progresses and previously unforeseen issues arise. Accept these as opportunities and focus on continual improvement to address existing issues and prevent future problems. Don't allow the focus on the environmental work to be diverted by competing initiatives. Remember, organisational attitude reflects leadership!

2 STEP

APPOINT A GREEN OFFICE COORDINATOR AND TEAM

Effective development and implementation of the Green Office program is a challenging task that requires the involvement of all personnel in the office. Key personnel must provide the bulk of the effort because they are the ones who own, understand, and take responsibility for the environmental personality of the office. Top level management must appoint an effective leader for facilitating the task of creating a Green Office – the Green Office coordinator. The Green Office coordinator should be selected based on personal qualities (dedication to environmental issues and their motivational and organisational skills) rather than technical ones.

In addition, a Green Office team should be selected. The team should represent a broad cross-section of the organisation, not just "environmental" personnel and the number of the employees in the team should depend on the size of the office.

The quality of the individuals assigned to this effort directly reflects the manager's commitment to the Green Office program and determines its ultimate success. Those involved in Green Office program development and implementation must have a broad knowledge of their organisation's operations, a willingness to learn, and a commitment to continual improvement. Finally, they must be given the authority to pursue implementation of the Green Office and be able to propose ways to redistribute workloads and provide time for the Green Office team members and other important personnel to focus on the task.

3 STEP

IDENTIFY/REVIEW ENVIRONMENTAL ASPECTS

As one of the first steps, the office must identify and document the significant environmental impacts of the office, taking into account the special features of the office and its situation.

The first key task of the Green Office team is to undertake an environmental review, which helps to identify the current level of the environmental performance of the office.

Identifying the environmental issues (environmental aspects) and impacts of your office are the most important activities when implementing Green Office principles. A thorough environmental review of activities is critical to implementing a Green Office as your significant environmental issues become the primary focal points for your office EMS.

Identify the current level of the environmental performance of the office

The environmental review provides an opportunity for your organisation to stop and take a hard look at your behaviour, operations and activities in the office, and identify those that can negatively and positively affect the environment. The result will be a list of significant environmental aspects. Typical significant aspects for offices are usually: energy consumption, consumption of paper and other natural resources, waste generation, mobility and also provision of a healthy working environment. Therefore, all the areas, activities and documents of your organisation related to the above-mentioned significant aspects should be reviewed. In addition to typical office activities (e.g. related to the office building) all the associated activities (e.g. kitchens, use of seminar rooms) should also be reviewed. Moreover, procurement and transport/mobility-related environmental aspects should also be estimated and considered as being significant aspects of an office based organisation.

Understanding what your main environmental aspects are and how they are managed will assist you in identifying areas for improvement. The information generated during the review will then form the foundation for further development of your EMS - formulating environmental policy, objectives and an action plan.

Tools that support the activities in this part of the process:

WWW

- EGO Checklist: an easy-to-use tool to check Green Office performance against criteria for the Green Office

WWW

- Ecomapping: A simple, practical tool for scanning environmental impacts, problems and practices using several Ecomaps (a walk-around assessment of the office building). Helps facilitate and visualize environmental problems (energy, waste, air, etc.)

WWW

- Interviews with personnel: (e.g. survey of employee perceptions of environmental aspects)

WWW

- Ecological Footprint calculator: the environmental impact of the office quantified in hectares of land. To learn more about the Ecological Footprint, please visit the online EGO Footprint calculator which is tailored for offices

4 STEP

COMPILE AN ENVIRONMENTAL POLICY

The organisation's senior manager must sign the Green Office environmental policy statement. A robust, clear environmental policy statement is a documented reminder of what is expected by senior leadership. The policy is a critical document for a Green Office and is the ultimate guiding environmental principle for each individual within the organisation/office.

WWW See examples of environmental policies of Green Offices.

5 STEP

SET ENVIRONMENTAL OBJECTIVES AND PREPARE AN ACTION PLAN

Based on the information collected in Step 3 (identify/review environmental aspects) the office must define their environmental objectives and develop a clear environmental action plan.

The environmental objectives and action plan must show how environmental performance will be continuously improved and developed in the future. Environmental objectives derive both, from the environmental policy and environmental review.

To set objectives and targets, a 'SMART' approach can be used.

The acronym SMART has a number of slightly different variations which can be used to provide a more comprehensive method for goal setting:

- **S** - specific, significant, stretching
- **M** - measurable, meaningful, motivational
- **A** - agreed upon, attainable, achievable, acceptable, action-oriented
- **R** - realistic, relevant, reasonable, rewarding, results-oriented
- **T** - time-based, timely, tangible, trackable

While objectives define more general commitments such as "Reduce waste and the consumption of resources", an action plan specifies concrete activities which are designed to achieve objectives (such as "design a system for selective waste collection in the office"). The action plan must lead to changes in behaviour and better environmental performance and is the driver for continuous improvement.

6 STEP

AGREE ON HOW TO OPERATE THE EMS IN THE OFFICE

In order to accomplish its environmental objectives and actually implement the Green Office principles in the office, guidelines, practical measures and work instructions (e.g. manuals, procedures, or posted signs/instructions about how to carry out an activity) have to be developed.

It is recommended to make the environment-related work instructions simple and easy to follow (e.g. instead of many different instructions make one and clear instruction for all office workers that involves all the environmental issues in the office, incl. waste management, reducing paper use, etc.). These instructions should rather include slightly humorous reminders and language (e.g. "be bright about light") than boring sentences (e.g. "switch off the lights"). The specific need for documented instructions depends on the size and character of the office, the number of employees and their competence, etc.

Have a look at the examples of different guidelines, practical measures and work instructions in the chapters of this handbook below.

7 STEP

TRAIN AND MOTIVATE STAFF

To ensure that all employees know the importance of the environmental policy and objectives, their roles in achieving the policy objectives and maintaining the environmental activities in the office (and also health and safety and emergency preparedness) it is important to develop an awareness raising, communicating and training program.

Training

New staff members should be trained immediately when starting their work at the office. All staff should be instructed, guided and regularly trained so that they know which practical measures are being implemented and which are related to their job profiles. Environmental training for staff provides them with the necessary skills and motivation for the effective implementation of Green Office principles.

Employees who are required to use specialized procedures (e.g. health and safety, first aid, procurement, etc.) must receive additional training to ensure that they are fully familiar with, and understand the procedures.

Communicating

In most successful Green Office programs, consultations with staff are undertaken during all major steps of the process. This is necessary to ensure that all staff participate and all are committed (it adds the motivation to actually put into practice the Green Office principles). See the next chapter on 'Communication' for further guidance and tips about communicating about the Green Office internally and externally (remember also that environmental activity can improve the public image of the company).

Motivating staff

Most important is to ensure that staff are motivated to maintain and improve the EMS system at the office. This is not an easy task, because it often requires behaviour changes. This is something that one cannot change overnight (it is estimated that 80% of the behaviour and action of individuals comes from a subconscious level and only 20% is done consciously).

The amount of effort that you need to involve when motivating staff will vary depending on what form of environmental improvements you are making. For example, the amount of effort required for a waste-minimisation program that affects everyone in the business will be significantly more than buying energy-efficient equipment, which will affect very few people.

If you have an ongoing program of improvements, such as plans to improve staff commuting habits, make sure you encourage staff to contribute their ideas. Find out what staff want and need to help them in their efforts to make small environmental changes - for example, safe parking for bikes, or flexible hours to make travelling to work on public transport feasible. Small changes can be key to the success of the overall plan.

You could also consider using incentives or penalties to motivate staff to adopt your environmental improvements. However, you should be very careful that such methods are used fairly and do not lead to claims of favouritism or excessive punishment.

Have a look at the following chapters to find more ideas about training, communicating and motivating staff.

8 STEP

MEASURE AND MONITOR PROGRESS

You need to measure and monitor your performance and the key characteristics on a regular basis

Once you have set up your Green Office program and it is operating, you need to measure and monitor your performance and the key characteristics (environmental performance indicators) of your office operations on a regular basis.

Measuring and monitoring the performance of the office helps to identify where your environmental management processes are working well and where they need to be improved.

It is recommended that you establish a system of checks to ensure that the measures contained in your environmental policy, as well as agreed-on operational procedures and practices, are being implemented on a day-to-day basis. There are no specific rules one must follow, but it is recommended to have in place:

- mechanisms that track progress in meeting your environmental objectives
- clear definitions of reporting and management responsibilities
- regularly scheduled reviews of the procedures and practices that underpin your Green Office program

The monitoring and measuring of the Green Office performance is usually coordinated by the Green Office coordinator.

It is also sensible to incorporate your Green Office program into your other management processes, such as health and safety and quality control. This makes day-to-day management and checking easier and helps communicate your policies to staff.

It is also vital to set measurable targets by using performance indicators so that the environmental performance of your

Green Office program can be monitored and ongoing adjustments made. The main criteria used in selecting the appropriate environmental performance indicators are the relevance and the applicability of the information provided by the indicator. The environmental indicators should:

- provide a representative picture of specific environmental conditions and performance
- be simple and easy to interpret
- be adequately documented and of known quality
- updated at regular intervals

Usually, the Green Office performance-related indicators track significant environmental aspects such as energy consumption, waste recycling, etc.

Watch out for the following typical problems when starting a Green Office program!

NB! See the specific environmental topic related example indicators from the chapters below!

Tools that support the activities of this step:

- Ecological Footprint calculator: the environmental impact of the office quantified in hectares of land, using an online calculator
- EGO Checklist: to check improvements in your environmental performance (compared to the previous review)

WWW

- Setting goals that are too high. You may have the right aims but won't get the results you've been looking for.
- Your efforts can be met with resistance from colleagues.
- Significant investments can be made in resources with limited success; this can cause problems with top management.
- Activities may be introduced that are not supported with adequate infrastructure.
- There may be no infrastructure for fulfilling legal requirements (for example, selective waste collection is mandatory, but the infrastructure is not developed yet).

Communication of the Green Office Program

"Find the most loveable, motivating and cost effective tools for your GO programme!"

Communication has a high priority role in the European Green Office (EGO) program. All the existing internal and external informal and formal communication tools at the company can be effectively used in developing and managing the GO program. EGO could be also a good opportunity to develop new, specific communication tools. The aim is to inform and take into action the opinions of the stakeholders of the company such as owners, employers, leaders, managers, partners, customers and suppliers, etc. and to tell them how environmental-friendly their office is, and who is responsible for the different parts of greening process.

Going green is real team work; it works only if all stakeholders play their part in it. Common decisions are made by common assent, and the required results will be reached only if everybody follows the accepted rules. This process brings real value and communication benefits and could be part of team building activities if you utilize the opportunities emerging from it. There are several motivational tools that can make participants enthusiastic and able to achieve real changes in the office that affect external stakeholders.

Since communication is one of the key elements of the Green Office Program, it has to be an essential part of office management. For more information on "Green Office management" please go to the "Managing the European Green Office (EGO) Program" chapter.

ANY KIND OF COMMUNICATION ACTIVITIES HAVE TO START BY ANSWERING THE FOLLOWING BASIC QUESTIONS:

WHO IS YOUR TARGET GROUP?

From executives to doormen, from different groups of ages, interests, education and lifestyles.

WHAT ARE YOU COMMUNICATING?

The main messages of Green Office, the action plan, the results, etc.

WHY ARE YOU DOING THIS?

To inform, educate, involve, and motivate people, to share results, to improve the reputation of the company.

HOW ARE YOU MEASURING YOUR RESULTS AND WHAT IS THE TARGET?

You need to define indicators, and set realistic targets.

HOW WILL YOU SHARE THIS WITH THE PUBLIC?

Communicators, look around your desk!

In Corporate Communication, the PR or Communication team is usually responsible for composing brochures, newsletters and operating internal and external online tools, organising events, training, etc. It is advisable for them to show good examples and be open to green solutions. Inform your partners about the importance of green communication.

Be motivational and inventive, discover new methods, tools and incentives and don't overload people with too much information! And don't forget that non-verbal communication and absence of communication is also a form of communication.

It is important to raise your colleagues' level of environmental awareness:

- "leaving" your four walls and visiting some natural areas near to your office with your colleagues from time to time, such as a forest, a lake or a hill will help people to understand better the need to take care of nature.
- ask environmental activists from local NGOs for a brief presentation on local natural values, as well as human impacts and sources of pollution that threaten local areas.
- make a move – plant trees or help local farmers with bigger jobs in the form of group activity.

This information may motivate people to discover new ideas about how to reduce the environmental impacts of their office and actually act accordingly. Organising slide show presentations, holding film clubs, watching and discussing informative nature or documentary films about different environmental and social issues can have positive and "awakening" effects on employees (movies and video clips like: The Story of Stuff, Planet Earth, The Meatrix, Collaborative Consumption, A Farm for the Future, Young voices on climate change, Age of Stupid, Mathis Wackernagel, The Ecological Footprint, Think global, eat local, 20% renewable energy by 2020, HOME, The Corporation, the Whale Rider, Baraka, The 11th Hour, Plastic Planet, Earthlings, Meet your meat etc.). These events can also be part of HR programs as they contribute to employee welfare (for more information, see the "Social Issues" chapter).

Management-related activities, ideas and tips

Acknowledgement is a good tool for motivating colleagues

- Design and print materials with green messages such as stickers, posters, newsletters and electronic DM letters but don't forget to use environmental friendly and/or FSC paper, and print only as much as is needed, not more.
- Join Earth day and Earth hour (or other environmental days) programs, organise family events for employees such as excursions, cycling tours, tree-planting events, waste collecting/recycling afternoons, etc.
- Furnish a "green" corner in your office, buy recycled furniture, green magazines, organic/fair trade products and let your colleagues spend some time daily/weekly in that corner. Show it to your partners.
- Participate in green office competitions, participate in EGO programs.
- Hold training events, invite experts to talk about different GO issues.
- Results and milestones should be communicated to customers and partners via brochures, annual reports, posters, website or professional blogs and on social media sites. It is recommended to highlight your results and good practices from the greening process with dynamic, happy team photos and personal quotes about experiences, and advice written in a personal tone.
- The action plan should be hung on a board or presented as a poster in a visible and well-frequented location, such as a kitchen, lounge, meeting room, dining room, etc. so people can follow the process. It could be also as a table on the company intranet site.
- Share your achievements on your companies' website for other stakeholders to see.
- Organise a photo or drawing contest for staff or their children

Acknowledgement is a good tool for motivating colleagues. Small 'green' gifts as the prizes for winners of in-house competitions or quiz games will make employees more enthusiastic.

Performance-related activities, ideas and tips

Share good examples of best practices from succesful green offices

It is hard to separate management-related activities from performance-related activities when it comes to communication, but there are still some ideas which can be implemented for individual employees:

- Draw up the 10 most important rules of GO with your team, and share them with other colleagues
- Pay attention to green signs/messages!
- Download free tools for green offices (e.g.: EGO web-tools) and share the tips and your ideas with your colleagues using email in the form of 'daily green news' or via the existing companies' intranet site
- Share good examples of best practice from successful green offices
- Put your green message into your email signature (such as "please consider the environment before printing this e-mail")
- Create a green mailbox/common folder where all employees can send green ideas and tips
- Green Commandos can check (on a daily/weekly basis) all the office electronic equipment to see if it is switched off and windows are closed, taps turned off, etc. The 'good guys' get green points and the bad guys 'black points'. Don't forget to honour the champions!

- Small signs as stickers and warning labels can be used to remind your colleagues about the right behaviour (for example, next to switches, water taps or on monitors that remind users to save energy, water or paper). Humour is an important tool in Green Office communication, and it is very effective to communicate using simple, real-life illustrations (e.g.: to produce 1 tonne of paper it takes 3 tonnes of trees and 2000 m^3 of water);
- Organise film clubs and watch environmental films together, invite experts or celebrities and discuss the movies together

Focus your communication on the most understandable and meaningful indicators!

Environmental Performance Indicators

Here are some useful indicators for measuring communication. Whichever indicator you use it is really important not to focus just on your communication, but to focus on the effects (i.e. on environmental performance improvements)- you could use the EGO Ecological Footprint Calculator for this.

All GO indicators could be communicated, but keep the golden rule in mind: less is sometimes more - focus your communication on the most understandable and meaningful indicators; try to communicate your results in a visible way using illustrations and compare them with tangible, everyday things.

NEWSWORTHY

The first question of a PR manager is How can I generate news about this issue? Since 2008, the GO Programme of the KÖVET Association in Hungary has registered 78 printed articles, 79 radio interviews, 20 television interviews and 177 internet articles on the topic. In addition, several interviews have been made with the winners of GO competitions in regional or local media.

Results achieved in the EGO program give a good opportunity for you to communicate to the public. This will contribute to the positive image of the company. Some elements of the EGO program are good tools from a CSR, HR and PR point of view.

The reputation and the image of a company that saves energy, water, paper, uses environmental friendly equipment, etc. and takes care of the welfare of its employees may be externally higher, as well as internally.

Efforts by companies to join the EGO programme can be inspired by an environmentally-conscious employee or customer; an executive interested in conveying eco-consciousness can be part of the company brand. Whatever the original motivation is, the EGO program has several benefits and can inspire others to follow good examples. It is important to let people know how you did it!

INDICATORS OF COMMUNICATION ACTIVITIES:

number of participants and employees registered on targeted social media sites	piece
numbers of EGO teams at the company	piece
number of ideas and activities undertaken each week / month	piece
number of articles and interviews in internal media and local media	piece
number of intranet visitors and 'greenmails'	piece

It is also important to maintain the attention of employees continuously; for this purpose use communication tools on an ongoing basis.

It is also important to maintain the attention of employees continuously

Office Best Practice Examples

BUDAPEST WATERWORKS (2010)

The GO competition in Hungary: put together a green office communication plan targeting office workers and integrated the customer area into to the greening process.

For office workers: collected green ideas were evaluated monthly, relevant articles in the internal magazine were regularly issued, there was regular GO information on the intranet site, a unified 'environmental' email signature, the GO process was used for team-building purposes, an internal environmental award to reward Green Office champions was given and regular training events were held about related issues.

For customers: their green activities were communicated via social media sites, there was an organised tree-planting event in front of the office building, a corner in the customer area was furnished and filled with GO information, an Eco-corner for children with eco toys was built, colouring books were designed and green ideas were projected onto screens in the customer area.

DREHER BREWERIES LTD. (2010)

Their GO calendar with all related programmes was published in an E-newsletter. They issued a weekly Sustainable Development electronic newsletter with news and an eco quiz, created their own GO logo and printed T-shirts with it on. They organised a photo competition about home greening tips and ideas and collected green jokes. They installed a green corner in the free workers pub where employees could find green magazines and informational materials and organized a "green beer club" for discussion about environmental issues. They honoured GO champions with small eco friendly presents, joined the Earth Hour, Car free day, Earth Day events and organised clean-up activities.

Sustainable and Green Procurement

The way we consume resources in the EU is causing environmental damage at a rate that cannot be sustained

WHY SUSTAINABLE AND GREEN PROCUREMENT?

Public authorities and organizations are major consumers of goods and services. This makes them important market players and gives them the power to substantially influence market demand. By integrating proper environmental criteria into procurement procedures they are able to stimulate the eco-market and motivate the industry to innovate. Their purchasing behaviour may have immediate effects on the environmental performance of a whole range of sectors, such as construction works, energy, telecommunications and transport.

Greening the procurement process not only benefits the environment but also contributes to improving the image of the organization. Taking health, social and environmental aspects into account when spending money reflects the general expectations of people, and living up to these expectations proves the credibility of the organization. In addition to these 'soft' benefits, sustainable procurement may also bring more 'tangible', economic gains since environmentally friendly purchasing is linked to saving materials and energy as well as reducing waste and pollution and thus, when considering the whole life-cycle of a product, is cost-efficient.

What is needed is much more systematic, behavioural change - the staff who prepare tenders should be familiar with relevant sustainability concerns and be able to integrate them into the appropriate stages of the procurement procedure[1].

SUSTAINABLE PROCUREMENT

Sustainable Procurement is the process whereby organizations meet their needs for goods, services, works and utilities in a way which achieves value for money on a life-cycle basis. It results in benefits not only for the organization, but also to society and the economy, whilst minimizing damage to the environment.

This may mean with minimal harm to (or exploitation of) humans, animals and/or the natural environment.'Buying sustainable' is not something that only consumers can do. It can also be practised by organizations.

By incorporating sustainability into procurement processes, the organization can contribute to the achievement of key corporate objectives such as the creation of sustainable communities and economies. In this way, Fair Trade, the purchasing of local products and green procurement are the most important components of sustainable procurement.

UNEP – The United Nation Environment Programme published in 2011 some Guidance about SPP (Sustainable Public Procurement)[2].

GREEN PROCUREMENT

The way we consume resources in the EU is causing environmental damage at a rate that cannot be sustained. Many concerns have been raised about increasing consumption and production patterns, both internationally and a European level. If the world as a whole followed the EU's pattern of consumption, global resource use could quadruple within 20 years. Apart from the resulting environmental and health problems, this trend could threaten economic growth due to decreases in availability of natural resources and the costs of addressing these issues.

The criteria used for identifying "greener" goods are based on a life cycle approach

The definition and criteria used for identifying and promoting "greener" goods are based on a life cycle approach and cover elements which affect the whole supply chain, ranging from the use of raw materials and production methods to the types of packaging used and the existence of any take-back conditions. These criteria can equally inform private procurement practices. Member States and Community Institutions are encouraged to strengthen this link between Green public and private procurement.

By purchasing environmentally friendly products and services the buyer can directly affect the development of new products, technologies, innovation and the creation of a "green" market, in addition to increasing competitiveness.

Benefits to the environment can include:

- Reducing greenhouse gas emissions and air contaminants;
- Improving energy and water efficiency;
- Reducing ozone depleting substances;
- Reducing waste and supporting reuse and recycling;
- Reducing hazardous waste;
- Reducing toxic and hazardous chemicals and substances.

GREEN PUBLIC PROCUREMENT (GPP)

Green Public Procurement (GPP) is "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life-cycle when compared to goods, services and works with the same primary function that would otherwise be procured"[3].

Public authorities in Europe spend 2 trillion EUR (nearly 20% of EU GDP on average). From constructing energy efficient public buildings to buying low emission vehicles, from buying organic or Fairtrade food to installing water-saving toilets, public procurement can have a huge impact in driving the market towards sustainability.

The concept of GPP has been widely recognised in recent years as being a useful tool for driving the market for greener products and services and reducing the environmental impacts of public authorities' activities.

FAIRTRADE

Fairtrade is about better prices, decent working conditions, local sustainability, and fair terms of trade for farmers and workers in the developing world. By requiring companies to pay sustainable prices, Fairtrade addresses the injustices of conventional trade which traditionally discriminate against the poorest, weakest producers. It enables them to improve their positions and have more control over their lives.

EUROPEAN LEGISLATION AND OBJECTIVES

European Commission published in 2011 the "EU Handbook on green public procurement"- National Action Plans on GPP in all member States[4].

On 6 July, 2006 the European Parliament adopted a resolution on Fairtrade and Development (A6-0207/2006) indicating Parliament's full support for the concept of Fairtrade and defining a number of criteria which need to be fulfilled. It also urged the European Commission to issue a recommendation on Fairtrade.

LOCALLY MADE PRODUCTS

By incorporating locally made products into procurement processes, an organization can contribute to generating additional income for farms and producers, provide better quality food/products for local people, generate less negative environmental impacts and give better living and working conditions and health benefits to consumers.

Buying fresher produce means that it will also last longer after it is brought home

Fruits and vegetables harvested and consumed at the peak of ripeness provide the maximum amount of nutritional value. Many vitamins and other nutrients such as phytochemicals are unstable and will deteriorate with time after picking due to exposure to air, light and fluctuating temperatures. Produce sold by large grocery chains is often shipped long distances and may have spent days or weeks in transit, not to mention the time it spends in the store before it is purchased. The nutritional value of such produce is greatly reduced by the time it reaches the table.

Some fruits and vegetables are picked while still green and unripe to prevent crushing during transport, and will never properly ripen. Purchasing fresh fruits and vegetables from CSA – (Community Supported Agriculture) or local farmers' markets ensures that the produce was picked when ripe, is as fresh as possible, and contains the maximum nutritional value.

Buying fresher produce means that it will also last longer after it is brought home. Often, fruit such as strawberries purchased at the supermarket will become mouldy almost immediately and have to be discarded. Purchasing locally grown fruit reduces waste and saves money in the long run.

There are numerous environmental benefits to buying local at farmers markets

There are numerous environmental benefits to buying local at farmers markets. One obvious environmental benefit is the saving of fuel and the decreasing of carbon emissions by the food industry through eliminating the necessity of trucking produce long distances.

Industrial agriculture is a major source of water pollution. Run-off of chemical fertilizers, animal waste and pesticides contaminates lakes and streams. Excessive amounts of nitrogen and phosphorus in the water can cause algal blooms and result in ocean dead zones, such as the one in the Gulf of Mexico. In addition, industrial farms use huge amounts of water. Buying from local small farms that practice sustainable, responsible use of water and fertilizer helps to protect the environment.

Another environmental advantage of buying locally grown food is that it requires much less packaging. Commercial food that is shipped long distances often needs to be wrapped to protect it during transport. Some stores also use plastic wrap, Styrofoam, and other largely unrecyclable materials to package the food.

PRIORITIES IN SUSTAINABLE PURCHASING:

Purchase products that are grown locally. In sustainable sourcing the rule is to give preference to local products and Fair Trade products rather than to more „exotic" products.

Certification and labelling

Certification is conducted according to selected document(s): acknowledged international standard(s), legal and regulatory requirements or/and specific assessment criteria.

A certificate or label confirms to the outside world that an organisation has established its management system according to the standards in the selected document(s) and that the system is properly documented, implemented and maintained, and that its effectiveness is continually improved.

Environmental standards are a set of quality conditions that are adhered to or maintained for a particular environmental component and function. Different environmental activities have different concerns and therefore different standards.

Eco-labelling is a voluntary approach to environmental performance certification that is practiced around the world. An eco-label identifies a product that meets specified performance criteria or standards. In contrast to "green" symbols or claims made by manufacturers and service providers, an eco-label is awarded by a third-party organization for products or services that are designed to meet specific environmental criteria.

Eco Labels:

EU Ecolabel
Blue Angel
Nordic Ecolabel
International Energy Star Program
Fair Trade Mark

Locally made products

In purchasing local products, the Geographical indication (GI) can be employed.

The use of a GI may act to certify that the product possesses certain qualities, or enjoys a certain reputation due to its geographical origin.

"Geographical Indication" in relation to goods or services means a description or a presentation used to indicate the geographical origin, the territory of a country, or a region or locality in that territory, where a given quality, reputation or other characteristics of goods or services are exclusively or essentially attributable to geographical environment, including natural factors, human factors or both (for example, "Champagne", "Tequila" or "Roquefort cheese"[1]).

[1] The term "geographical indication" comes from the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). The TRIPS Agreement sets forth standards to regulate international intellectual property protection and enforcement and establishes international minimum standards for the protection of geographical indications.

Management-related activities, ideas and tips

Green procurement is a step-by-step process that requires top-management commitment and support. The following steps are recommended:

Green procurement is a step-by-step process that requires top-management commitment and support

- Consider which products, services or activities are the most suitable on the basis of both their environmental impact and on other factors such as the information you have, what is on the market, the technologies available, costs and visibility.
- Identify your needs and express them appropriately. Choose a green title to communicate your policy to the outside world, ensuring optimum transparency for potential suppliers or service providers, and for the citizens you are serving.
- Draw up clear and precise technical specifications, using environmental factors where possible (pass/fail conditions)
- Look for examples of environmental characteristics in databases/eco-labels;
- Build upon the 'best practices' of other contracting companies; use networking as a way of obtaining and disseminating information;
- Take a scientifically sound 'life-cycle costing approach'; do not shift environmental impacts from one stage of the life cycle to another;
- Use performance-based or functional specifications to encourage innovative green offers;
- Consider environmental performance, such as the use of raw materials, sustainable production methods (where relevant for the end product or service), energy efficiency, renewable energies, emissions, waste, 'recyclability', dangerous chemicals, etc.;
- If you are uncertain about the actual existence, price or quality of green products or services, ask suppliers about green alternatives.
- Establish selection criteria on the basis of the exhaustive list of criteria mentioned in the public procurement directives. Where appropriate, specify the environmental criteria that need to be met as a part of the contract.

Tell potential suppliers, service providers or contractors that they can use environmental management schemes and declarations to prove compliance with the criteria (ISO 14001, EMAS, and EU Eco Label)

- Use contract performance clauses as a way of setting relevant extra environmental conditions in addition to 'green contracts'. Where possible, insist on environment-friendly transportation methods.
- Always make sure that everything you ask of potential bidders and their offers relates to the subject matter of the contract.

Monitor results:

- How much procurement has been carried out according to green criteria?
- What were the tangible (reduced costs, improved performance) and intangible (improved motivation of employees, better image of organisation) benefits of specific green purchases?

Performance-related activities, ideas and tips

PRINCIPLES OF GREEN AND FAIR TRADE PURCHASING

Principle 1 – Consider whether a product is needed before purchasing it or not.

Principle 2 – Purchase a product after consideration of its various environmental impacts over the life cycle - from extraction of raw materials to disposal.

- Investigate buying products covered by certification schemes such as the EU Eco-Label Programme, Fair Trade, Energy star, EMAS, ISO 14001
- Select office equipment that has energy efficiency and other green benefits.
- Buy products in bulk where appropriate, including coffee, tea, sugar and other consumables.
- Buy from local suppliers wherever possible.

The above-mentioned principles and criteria can be taken into account when purchasing:

- Energy and water *(link - Chapter: Energy and water)*
- Office Buildings *(link – Chapter: Office Buildings: Design and Siting)*
- Office equipment *(link - Chapter: Green IT: Office Equipment)*
- Paper *(link - Chapter: Office Paper)*
- Furniture *(link - Chapter: Office Furniture)*
- Travelling *(link - Chapter: Transport and Mobility)*
- Cleaning services or chemicals *(link - Chapter: Cleaning)*
- Food *(link - Chapter: Food and Catering)*
- Events *(link - Chapter: Conferences and Events)*

Principle 3 – Select suppliers who make a conscious effort to care for the environment.

- Build environmental criteria into tender and contract documents.
- Ask suppliers for information about product options which offer improved environmental performance – and, where appropriate, specify them.
- Encourage suppliers to minimise – or take back and reuse – packaging.

Principle 4 – Collect environmental and fair trade information about products and suppliers.

Environmental Performance Indicators

What % of product / service is purchased in accordance with the principles of sustainable procurement	%
What % of the products / services is purchased are certified according to Fair Trade criteria	%
What% of products are purchased locally	%

Office best practice example

GREEN PUBLIC PROCUREMENT IN BARCELONA

Barcelona Citizens' Commitment towards sustainability[5]:

- "Include environmental criteria and social clauses in works and services public tenders. Stimulate public administration green purchasing"
- Lead by example, increasing the "environmental coherence" of the organization
- Generate demand for greener products and services (16% of European GNP is derived from public administration purchases).
- Use more efficient and environmentally-friendly products and services.
- Resource saving and reuse or recycling.

Internal Regulations and Decrees:

- Government Measure on Green Procurement (2001)
- Approval of Barcelona Local Agenda 21 (2001)
- Decree on the use of recycled paper (2002)
- Institutional Declaration for Fair Trade (2003)
- Decree on responsible timber procurement (2004)
- Instructions for the good use of air-conditioning (2005)
- Greening administrative contracts (2006)

Some results:

- 5 departments have implemented an Environment Management System (ISO 14001):
- All of these departments are introducing environmental criteria into their procurement procedures
- In the Environment Department, 10 of 11 big tenders have already specified environmental criteria.

PERFORMANCE

Improving energy efficiency

Energy Consumption

The energy challenge is one of the greatest challenges faced by the World. Rising energy prices and increasing dependence on energy risks both security and competitiveness.

Energy-related emissions account for almost 80% of the EU's total greenhouse gas emissions. It will take decades to steer our energy system onto a more secure and sustainable path. The European Council in 2007 adopted ambitious energy and climate change objectives for 2020 – to reduce greenhouse gas emissions by 20% (rising to 30% if conditions are right), to increase the share of renewable energy in the total energy mix to 20% and to make a 20% improvement in energy efficiency. We can no longer afford to waste energy.

Energy efficiency is one of the most cost-efficient ways to reduce emissions, improve energy security and to make energy more affordable to consumers. The public sector needs to lead by example. Ambitious objectives ought to be set for public sector consumption. Public procurement should support energy-efficient outcomes (for more information, see the "Sustainable and Green Procurement" chapter). Policies which promote resource efficiency, including energy efficiency investments, often have short-term, up-front costs before the medium- and longer-term benefits are felt. However, being energy efficient doesn't always mean making large investments; sometimes small, simple changes in habits (for example, using office equipment more efficiently, or introducing a good procurement policy) can significantly reduce the office energy bill.

Final energy use in commercial services grew by 68.4% from 1973 to 2000 and this trend is continuing. Growth in CO_2 emissions from the sector has been kept in check by fuel switching, both for heating and for electricity generation, but this situation is not expected to continue for many more years. The Energy Review (PIU 2002) highlighted the commercial sector as being an area where more action is required. Offices are a good starting place within the sector, as they account for a significant proportion of the sector's total energy use and emissions, and also seem to offer the greatest potential to achieve significant savings.[6]

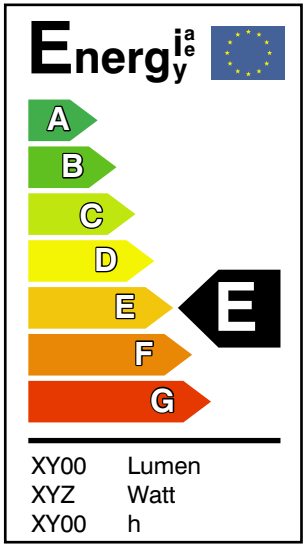
When we talk about energy, it is important to clarify for all energy consuming activities how much energy we use. During assessment of energy use we should not forget about the following areas and activities:

- functioning of computers, servers, office equipment and other electronic tools;
- lighting the workplace;
- HVAC systems;
- methods of travelling to the office and on business trips, and;
- the operations of kitchens and catering activities.

Reducing the temperature of the office by 1 C° can reduce energy consumption by 6%

Activities which can be undertaken to reduce consumption are numerous, but the goal is the same. By becoming more energy efficient, companies do not just help the environment and support the principles of sustainable development, but they reduce costs. With small changes in the office (in terms of behaviour or investment) companies can save huge amounts of money. Turning down the heating and reducing the temperature of the office by 1 C° can reduce energy consumption by 6%. 63% of office energy consumption goes into lighting, heating, and cooling; these areas are therefore the biggest potential sources of energy saving[7]. However, we still should not forget about other possible ways to reduce energy usage - computers, servers, office equipment and other electronic tools (for more information, see the "Green IT" chapter), catering activities (for more information, see the "Food and Catering" chapter) or business trips (see the "Transport and Mobility" chapter).

Certification and Labelling



Before changing an old device / product for a new, more energy efficient one, the first and most important question should be: does the new product have an eco-label or energy certification?

In 2010 a European Union directive (2010/30/EU) came into force establishing a new labelling scheme for energy efficiency of appliances. Into the replaced directive (92/75/EC)[8] labelling scheme (from A to G energy efficiency classes) new grades were introduced (A+, A++) for refrigerating appliances. This directive requires that most appliances (which are listed in the directive) which are placed on the market in the EU should display on their packaging their energy efficiency using the A-G scale. Apart from the clear colour-coded classification, other information is also provided; for example, the energy label for light bulb often shows 'lumens', an indication of the perceived power of the lighting, and 'Watts', the consumption of joules of energy per second.[9]

Within the European Union the other well known label is the European Energy Star (Regulation No 106/2008)[10].

Outside Europe the most well-known eco-label for energy efficiency is the ENERGY STAR. The Energy Star is a label for refrigerators, computers, and other electronic products which are more energy efficient than others. Energy Star qualified products can lead to relative savings of 10 to 70% for consumers compared to standard models. There are more than 40 000 product models from approximately 3000 manufacturers that have earned this label in more than 60 categories[11].

More ecolabels connected to energy:

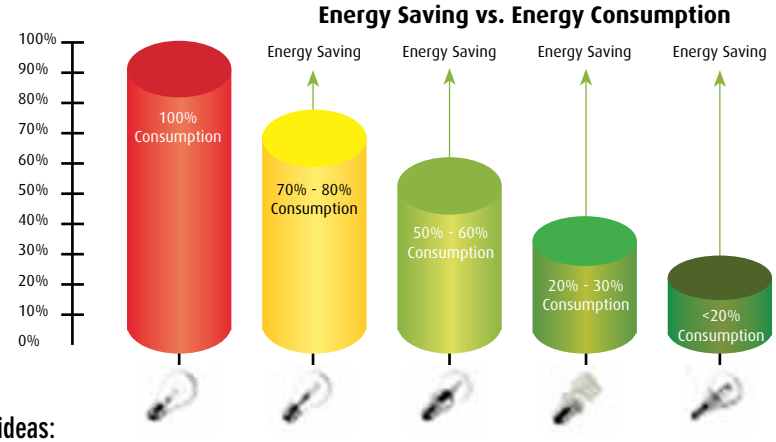
- EU Ecolabel;
- EKOenergy;
- Österreichisches Umweltzeichen (Austrian Ecolabel);
- SMaRT Consensus Sustainable Product Standards;
- TÜV SÜD Mark EE01/EE02;
- Carbon Trust Standard.

Management-related activities, ideas and tips

Before taking any action to reduce energy usage in the office it is recommended that an initial review or audit is conducted to measure the usage and the loss of energy of each energy consuming process in the office (as mentioned in the introduction to this chapter). For example, before making a decision about insulation it is recommended that an overview of the office is made which specifies how big the current heat loss is.

After obtaining a clear view of the office's energy usage, it is possible to make the right decision and take action to deal with specific issues. There are many energy efficiency solutions; the correct one to use depends on the energy consuming process.

Use of energy efficient equipment and the use of technical facilities in most cases require well-trained staff. Energy efficiency depends largely on the performance / behaviour of the staff. By training, active communication and exploiting information channels efficiently, a larger proportion of the office staff can be reached and be motivated to engage in energy saving strategies.



Some ideas:

- Organize competitions on thematic energy topics where employees can obtain extra points for environmentally conscious behaviour.
- Create funny captions / stickers to remind employees to turn off the lights when they are not needed.
- Another way to motivate staff is to keep track of energy used by regularly metering consumption. The financial savings can be returned in some form to the staff (such as in team-building events for the organization).
- Participate in movements like Earth Hour to improve employee awareness of energy and environmental topics.

Performance-related activities, ideas and tips

To increase office energy efficiency means to decrease the energy usage in the office and increase usage of natural energy sources.

LIGHTING:[12]

- The first thing to consider should be workplace and building design in order to ensure the maximum usage of daylight and save energy on lighting (more information on this topic can be found in the Office Buildings: Design and Sitting chapter).
- Changing of traditional (incandescent) bulbs to energy-saving type ones[13]. From September 2009[14], customers are obliged to change bulbs due to EU regulations. It is worthwhile identifying the advantages and disadvantages of different types of energy-saving bulbs. Advantages of energy saving light bulbs: include the fact that they have a longer life-span and use less energy to produce the same degree of luminosity (as less energy is transformed into heat[15]). Since 2009, inefficient lamps will be gradually phased out from the market. (100W in 2009, 75W in 2010, 60W in 2011, 40W and below in 2012)[16].

- Other options include special switches which are designed to allow the user to be able to regulate the intensity of lighting. In some premises is recommended that additional sensors are also used that take into account the intensity of external light (i.e. are daylight sensitive). With careful regulation of the intensity of lighting, energy use can be optimized so that comfort and quality of work will not decline.
- It is important to mention that office furniture (the 'physical workplace') has a big influence on the use of natural light. The orientation of the office and furniture determines the time period when work can be done using natural light.
- Significant energy savings can be made using motion sensors for less often frequented places (archives, toilets and entrances). In bigger premises it is recommended that sensors be placed on the ceiling and for smaller ones near to light switches.
- For outdoor illumination (office grounds, courtyards, etc.) so-called light barriers can be employed which regulate the periods when lighting is switched on. Also, in this case, changes in natural light can be accounted for. There is no need to only rely upon fixed timers.

HVAC SYSTEMS AND BOILERS:

Fix the temperature in the office (ideally 19-21 °C in winter and 23-26 °C in summer

- Replacing old windows and doors with new double-glazed types can save up to 40% of total energy consumption. If this is not possible, then external insulation could be an alternative. Other insulation options such as curtains and insulating wallpapers can increase the efficiency of the overall insulation system.
- Installation of a thermostat or intelligent building operation system. The cost of this equipment is relatively low and with these devices it is possible to avoid overheating and overcooling. Some of them are programmable and switch on heating/cooling systems only at the weekends and nights if it is necessary (n.b. switching off office heating/cooling for the weekend can save 30% of the total energy consumption of the office).
- Fix the temperature in the office (ideally 19-21 °C in winter and 23-26 °C in summer). At night it is enough to keep the temperature at 15°C (winter) and to switch off air-conditioning systems totally in summer. But these optimal temperatures will be different for different countries, depending on average temperatures of the climate. Check if you have any national legislation or directive concerning the temperature in the office.
- Spaces such as storage areas, entrances or corridors which the employees pass through need not be kept at the same temperature as permanently occupied rooms. It is recommended that heating is switched off in rooms which are never used. For hygienic reasons (to prevent mildew) it is necessary to keep rooms well ventilated.
- Invest in solar thermal collectors or in photovoltaic panels to reduce primary energy use.
- Nowadays, green roofs are commonly used for new office buildings. This involves planting different species of grasses and flowers on the roof. This can decrease the heat of the roof, increase evaporation and cool the building from the top.
- If it is possible, reduce the temperature of water coming from the hot tap. In some boilers the temperature is automatically set at 60-65 °C, while 25-35 °C is considered enough for comfort and health.

Open the windows early in the morning when the air outside is cooler

- If the building's orientation is west-south blinds can be open in winter time, which will contribute to heating the air in the office, which means less energy is needed to warm up the office. However blinds in summer should be closed to stop overheating of the office.
- On warm summer days it is better to open the windows early in the morning when the air outside is cooler, to cool the air inside the building. It is better to ventilate the office with fully open windows and leave them open for a shorter time (5-15 min) than to partially ventilate for a longer time.
- Plants in the office not only clean the air and make the workplace more cosy and produce oxygen, but also help to reduce the temperature through evaporation (for more information, see the "Air Quality" chapter).

Most of these recommendations can be taken up with very little investment in energy or money. Their effects may accrue over the long term but the final results are priceless. As almost all of these activities require the involvement of employees, it is very important to let people know about all of these procedures. Think about spin-off benefits; if only 10% of office employees undertake these actions at home, the results will be multiplied many times.

Environmental Performance Indicators

In a typical office 29% of the energy use comes from lighting. This fact underlines the need to monitor the energy we use in lighting. The most common way to track environmental performance is to observe energy use by checking the electric meter. The problem with this is one cannot identify the individual sources of use of electricity (lighting, IT or other electric equipment) from looking at the meter.[17]

In terms of the HVAC system, the following step-by-step activities may be considered:

- Learn about the current heating system – identify the heated area in square meters (m^2).
- Quantify fuel consumption and costs for heating – in most cases consumption is indicated on the utility invoice in kWh or m3 (app. 9,5 m3 = 1 kWh). But note that the heating value of natural gas depends on its quality which can vary according to its source. The exact heating value is given by the supplier ("X MJ") so it can be calculated using the following formula: X MJ / 3,6 = Y kWh.
- Identify losses and evaluate possibilities for improving efficiency – compare the consumption of an office building through benchmarking (see Table 1) to help identify how efficient it is.

Rating	Heat consumption kWh/m3/year	Comment
A	0-30	Best efficiency
B	30-51	Hight energy effeciency
C	51-70	Efficiency
D	71-120	Avarage
E	121-160	Unsutisfying
F	161-200	Wasteful
G	201-	Completely inefficient

Benchmarks for heat consumption in Central Europe

Office Best Practice Examples

The Hungarian University of Szeged made 250 MWh/year of energy savings by installing passive infrared sensors. Their installation cost €2500 but return savings of more than €38 000 per year (250 MWh/year, 40 tonnes/year CO_2).

Modernizing the heating system on three Hungarian Post sites led to a decrease in consumption of 64000 m^3 of gas. Furthermore, due to this saving in gas consumption there is also 32,5 kg less CO, 154,5 kg less NOx and 123 tons less CO_2 emissions per year. The investment cost €170 000 with a 7 year payback period.

Office Buildings: Design and Siting

If we are constructing a new building or renovating an old one, there is a range of environmental impacts related to the design, (re)construction, use and the disposal of the building to consider.

Include a systematic Life Cycle Approach

Here is a list of those impact:

- consumption of energy for heating, cooling, ventilation, hot water, and electricity, as well as the resulting CO_2 emissions;
- consumption of natural resources;
- consumption of fresh water resources both during construction and during the usage phase;
- emission of substances harmful to human health and the environment during the production or disposal of building materials leading to air and water pollution;
- negative health impacts on building users due to building materials containing dangerous substances;
- CO_2 emissions resulting from the transportation of construction materials and products; and
- waste production.

In order to address this challenge, the European Union proposed a voluntary instrument - Green Public Procurement (GPP) - offering several recommendations[18]:

- Maximise the energy performance of buildings.
- Ensure high energy efficiency standards for heating, cooling, ventilation, hot water systems and electronic devices.
- Use guaranteed performance contracts with energy service companies.
- Encourage the use of localised renewable energy sources (l-RES) and high efficiency cogeneration[19].
- Include a systematic Life Cycle Approach (LCA)[2] for building materials.
- Encourage the use of sustainably harvested and produced resources such as construction and insulation materials.
- Encourage the installation of high-end water conservation technologies, and reduce the use of freshwater during the construction process.

- Encourage the use of non-toxic building materials by also building upon the availability of renewable raw materials-based construction materials.
- Encourage the use of substitute substances/materials for dangerous building materials by also building upon the availability of renewable raw materials-based construction materials.
- Use energy efficient vehicles for transportation and on the building site.
- Use effective supply chain management systems. and
- Minimise waste production, and ensure proper waste management of demolition and construction waste.

*[2] "***Life Cycle Assessment (LCA)** *is a tool that can be used to assess the environmental impacts of a product, process or service from design to disposal i.e. across its entire lifecycle, a so called cradle to grave approach. The impacts on the environment may be beneficial or adverse. These impacts are sometimes referred to as the „environmental footprint" of a product or service." (RCS)*

EUROPEAN LEGISLATION AND OBJECTIVES

EPBD - Energy Performance of Buildings Directive[20]

As of 31 December 2020, new buildings in the EU must consume "nearly zero" energy

On 19 May 2010, a modification of the Energy Performance of Buildings Directive was adopted by the European Parliament and the Council of the European Union. A revision was necessary in order to strengthen the energy performance requirements and to clarify and streamline some of the provisions from the 2002 Directive (2002/91/EC) it replaces.

Some of the major highlights of the revised Directive include:

- As of 31 December 2020, new buildings in the EU must consume "nearly zero" energy (a building that has a very high energy performance, determined in accordance with Annex I). Moreover, the energy will be "to a very large extent" derived from renewable sources (the 'nearly zero' amount of energy required should to a very significant level be covered by energy from renewable sources, including renewable energy produced on-site or nearby).

- Public authorities that own or occupy a new building should set an example by building, buying or renting such "nearly zero energy" buildings as of 31 December 2018.
- There is no specific target set for the retrofitting of existing structures.
- Minimum requirements for components are introduced for all replacements and renovations.
- A harmonised calculation methodology to push-up EU member states' minimum energy performance requirements towards a cost-optimal level is presented (in a definition and an annex).
- A more detailed and rigorous procedure for issuing energy performance certificates will be required in member states. and
- Member states will be required to introduce penalties for non-compliance.

The 2002 Directive was designed to promote the energy efficient performance of buildings in Member States through the:

- Introduction of a framework for an integrated methodology measuring energy performance:
- Application of minimum energy performance standards in new buildings and certain renovated buildings, and regular updating of these standards:
- Energy certification and advice for new and existing buildings: and
- Inspection and assessment of boilers and heating/cooling systems:

Directive 2009/28/CE on the promotion of the use of energy from renewable sources[21]

By 31 December 2014, Member States shall, in their building regulations and codes or by other means with equivalent effect, where appropriate, require the use of minimum levels of energy from renewable sources in new buildings and in existing buildings that are subject to major renovation. Member States shall permit those minimum levels to be fulfilled, inter alia, through district heating and cooling produced using a significant proportion of renewable energy sources.

Proposal by European Commission of new Energy Efficiency Directive[22]

Public bodies will push for the market uptake of energy efficient products and services through a legal obligation to purchase energy efficient buildings, products and services. They will further have to progressively reduce the energy consumed on their own premises by carrying out every year the required renovation works covering at least 3% of their total floor area (from 1 January 2014). The clear aim is to save energy.

Construction Products Regulation (305/2011/EU - CPR)[23] is to ensure reliable information about construction products in relation to their performances. This is achieved by providing a "common technical language", offering uniform assessment methods of the performance of construction products.

Basic requirements for construction works are defined in Annex 1. Construction works as a whole and in their separate parts must be fit for their intended use, taking into account in particular the health and safety of persons involved throughout the life cycle of the works. Subject to normal maintenance,

construction works must satisfy the following basic requirements for construction works for an economically reasonable working life: mechanical resistance and stability; safety in case of fire; hygiene, health and the environment; safety and accessibility in use; protection against noise; energy economy and heat retention; sustainable use of natural resources.

The Construction Products Regulation (305/2011/EU - CPR) repeals the Construction Products Directive (89/106/EEC – CPD).[24]

Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products.[25] It repeals the Ecodesign Directive (2005/32/EC) that was establishing a framework for setting ecodesign requirements (such as energy efficiency obligations) for all energy using products in the residential, service and industrial sectors. Article 16 of the Ecodesign Directive required the European Commission to establish a Second Working Plan setting out an indicative list of products to be considered in priority for implementing measures in 2012-2014. The necessary background on environmental impacts, saving potential and market conditions in order to select the most appropriate energy related products can be found on the website.[26]

Directive on Energy End - Use Efficiency and Energy Services (2006/32/EC)[27] focuses on the introduction of measures for maximising energy performance and reducing end consumption. (Successive amendments and corrections to Directive 2006/32/EC have been incorporated in the basic text: Regulation No 1137/2008) The Directive also presents a unified calculation methodology and approaches for the evaluation of designated targets. For example, some energy conservation measures for reducing energy consumption by end consumers include the provision of energy services, insulation of buildings, building passive solar elements on the outsides of buildings, installation of solar thermal systems, and replacement of light bulbs with energy efficient bulbs.

Certification and Labelling

Building certification provides building owners and operators with a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. Furthermore, they enable environmentally responsible businesses to communicate their high standards of performance in protecting and conserving our environment.

There is a variety voluntary green building rating and certification systems, programmes and tools developed and applied around the world. Here, we focus on the most well-known in Europe:

HQE (France). This voluntary initiative was launched in France in the 1990s, and today it is the cornerstone of French green building design. Its objectives are to reduce the environmental impact of a building through ecodesign and eco-management engineering, and improve comfort and health in 14 targets areas[28].

BREEAM (UK) is a green assessment system whose goal is to assess the environmental impact of a building across a range of indicators, and to provide a single performance rating for that building. BREEAM codes for non-residential buildings can be applied to new buildings, design and post construction stages, and buildings undergoing major refurbishment[29].

DGNB (Germany). This certificate was initially developed in 2008 for office and public administration buildings, and covers all the relevant topics of sustainable construction. The certification evaluates the building's entire performance, and not individual criteria. Instead, certification is based on a list of key topics with 51 corresponding criteria for sustainable construction which are weighted differently, depending on the building type to be evaluated. These criteria are merged into 6 topics: ecological, economic, social-cultural and functional topics, techniques, processes, and siting[30].

ISO 21931-1:2010 (International Organization for Standardization) provides a general framework for improving the quality and comparability of methods for assessing the environmental performance of buildings and their related external facilities. It identifies and describes issues to be taken into account during the use and development of assessment methods for the environmental performance of new or existing buildings in their design, construction, operation, maintenance and refurbishment, as well as during demolition[31].

There are many other environmental assessment tools for buildings currently in use in Europe and around the world.

Management-related activities, ideas and tips

GREEN PUBLIC PROCUREMENT (GPP)[32]

For most public authorities, the construction of new, and renovation of existing buildings represents a major share of their annual expenditure – in some cases over 50%. "Environmental construction" means that one aims to minimise the environmental impact of construction works in all phases of a building's lifecycle, including planning/design, construction, renovation, use and demolition.

Environmental criteria relate to energy consumption:

- the use of renewable energy sources (RES);
- construction materials and products;
- waste and water management; as well as
- other aspects influencing the environmental impacts of construction such as the architect's experience, monitoring and user characteristics.

Aims to minimise the environmental impact of construction works in all phases of a building's lifecycle

GPP considers the overall environmental profile of the entire building. This implies the need to take into account many different issues ranging from types of building materials used to various approaches to achieve higher energy efficiency.

Siting (climatic zones) substantially impacts the energy demands of a building in terms of heating and cooling, the potential use of local renewable energy sources in the building, and material use.

Therefore, the energy performance of a building strongly depends on the architects' design. It is imperative to include the integration of environmental requirements into the architect's tender procedures. For example, some aspects that must be considered during the design phase are the net energy demand (for space heating, cooling, ventilation), selected materials (wood, glass, metal, etc), intelligent transport systems, waste generation, noise control, lighting services needed or potential for using localised renewable energy sources.

During the construction phase, other environmental aspects must be observed such as the percentage of sustainable building materials, recycling of materials, minimisation of dangerous substances and the energy demand for the construction strategy. Installation of building services is an additional phase where the final energy demand, the local RES, and wastewater generation must be taken into account.

Performance-related activities, ideas and tips

DESIGN OBJECTIVES FOR BUILDINGS

In order to achieve a truly successful building project, these design objectives must be considered in relation to each other[33]:

- Accessibility: with regards to public transport, which allows occupants to avoid the use of polluting cars; and building elements, such as heights and clearances implemented to address the specific needs of disabled people;
- Aesthetics: the physical appearance and image of building components and spaces, as well as the integrated design process;
- Cost Effective: selecting building elements on the basis of life-cycle analysis (weighing options during conceptualisation, design development and engineering) as well as basic cost estimation and budget control.
- Functional/Operational: functional programming - spatial needs and requirements, system performance, and durability and efficient maintenance of building characteristics;
- Historic Preservation: specific activities within an historic district or affecting an historic building, whereby building elements and strategies are classifiable into one of the four approaches: preservation, rehabilitation, restoration, or reconstruction;
- Productive: an occupants' well-being - physical and psychological comfort - including building components such as air distribution, lighting, workspaces, systems and technology;
- Secure/Safe: the physical protection of occupants and assets from man-made and natural hazards; and
- Sustainable: environmental performance of building components and strategies.

GOOD PRACTICES FOR SITING

The location of a building affects a wide range of environmental factors.

- Depending on the geographical position of the office, one must maximise what is offered by the territory. For example, only using solar energy would be a huge waste of energy and finances if the building stood in a place where hydroelectric energy was abundant.
- Buildings should be located in areas of existing development where infrastructure already exists, and consideration should be given to conserving resources by renovating existing buildings, including historic properties.
- In the case of new construction, one should expand the building's height, and not its width, in order to minimise the negative impact on the surrounding area (an example of this is the construction of a multi-storey car parks).
- Offices should be built in a place easily accessible by public transport or bicycles, and they should be provided with bike sheds in order to help promote cycling to work.
- The building should be conveniently located near restaurants or other eating establishments for employees' meals. This avoids the need to provide an on-site cafeteria that would not be cost-effective if there are only a limited number of employees.
- The building could be affected by noise pollution. Noise pollution may be avoided, or at least reduced, by adequate soundproofing of the premises. Avoid situating residential office buildings near industries, airports, etc.
- Facilities such as gardens should be provided for occupants, or other green areas where they may take a break. For new constructions in city centres, this could be substituted for by constructing in proximity to an existing garden. Alternatively, if the building is sited in the outskirts, a good solution could be a rooftop garden to save as much space as possible.
- A good location for an office building, as some case studies like the Atlantis Bridge and Access Buildings in Brussels demonstrate, could be a contaminated 'brown field' site (abandoned or underused industrial and commercial facilities available for re-use), with little or no existing ecological value. Of course, the area requires some land remediation and ecological regulation to ensure that the maximum benefit is gained in terms of ecological enhancement.

25% of energy loss is caused by the improper design and placement of windows

NATURE AND NEW TECHNOLOGIES

- Referring to heating systems, first of all it is recommended to do an overview of the heat insulation system (25% of energy loss is caused by the improper design and placement of windows). Double layered glass windows can save up to 40% of total energy consumption. If this is not possible, then external insulation could be an alternative. Other insulation options such as using curtains or insulation wallpapers could raise the efficiency of the insulation system.
- Poor operation of HVAC systems could be improved by installing a thermostat or intelligent building operation system (software and/or hardware to automatically control and manage the HVAC systems). The cost of this "development" is relatively low. These devices make it possible to avoid overheating and overcooling. Some of them are programmable so they switch off the heating/cooling at the weekends and nights if it's necessary (switching off the heating/cooling for the weekend can save 30% of total energy consumption). (for more information, see the "Energy Consumption" chapter)
- Because of the fact that the non-renewable energy sources are finite and, as with oil, depleting, scientists are looking for alternative sources. One of these alternatives is solar power. Solar collectors utilise the sun's heat to warm up or pre-heat water to support the main heating system.
- On windows, walls and roofs there are several "shadowing" options such as a light-reflecting roofs, window blinds, or planting cooling natural vegetation. If established on the western and southern sides of the building, shadowing techniques can decrease warming of buildings. It is recommended to use the opportunities nature provides. This helps save money and does not harm nature.

Environmental Performance Indicators

Sitting and Structural Design Efficiency	consideration of all life-cycle stages of the building project during the concept and design stages.
Energy Efficiency	the embodied and operational energy involved in the construction and the use of a building; the ratio of self-generated energy to total energy used by the building; investments made in improvements in the energy efficiency of the building and/or installation of RES.
Water Efficiency	ratio of water used through on-site collection and/or purification to total water consumption (water supplied from the natural aquifer).
Materials Efficiency	ratio of "green" materials, recycled industrial goods and/or locally extracted and manufactured materials used in the construction.
Indoor Environmental Quality Enhancement	indoor air quality, thermal quality and lighting quality.
Operations and Maintenance Optimisation (O&M)	involvement of the OM staff in all life-cycle stages of the project.
Waste and Toxics Reduction	provision of on-site equipment, such as compost bins, to reduce organic matter going to landfills; introduction of deconstruction practices (e.g. buildings are carefully dismantled to salvage components for reuse and recycling); conversion of waste and wastewater into fertiliser.

Office Best Practice Examples

GREEN BUILDING AWARDS 2011[34]

Dr.-Ing. W. Goetzelmann & Partner GmbH (Germany) - Reduction of energy consumption* by more than 90% and energy savings* of 22.6 MWh/year.

The new one-story office building provides 7-8 workplaces in a timber frame construction with very good insulation. Heating is supplied by a heat pump and heat recovery ventilation. A 19.32 kW photovoltaic system is installed on the roof.

Vasakronan, Sweden - Reduction of energy consumption* by 60% and energy savings* of 1886 MWh/year.

The new office and commerce building is situated in North Värtahamnen (Värta Harbour) in Stockholm. They use large air-handling units equipped with heat exchangers with heating and cooling capabilities. The pressure-controlled air handling units, together with active air diffusers in the ceiling save a lot of energy. Heat is generated in a nearby local facility.

MSF TUR.IM sgps SA, Natura Towers, Portugal - Reduction in energy consumption* by 54,5% and energy savings* of 579 MWh/year.

A double glass curtain facade, with high sun control glasses, will result in 65% energy absorption and allow night ventilation. Rain water will be utilised to supply all 1000 m2 of plantation, also for vertical walls. An efficient and intelligent lighting system is employed. Photovoltaic panels will produce the required energy to illuminate the outer green areas and operate the waterfall (21,9 MWh/year). A solar thermal plant will cover the building's total hot water requirements.

* Compared to building code

Green IT: Office Equipment

This chapter takes into account the following types of products: desktop computers, notebook and laptop computers, monitors, servers and imaging equipment (printers, copiers, etc).

There are some very good reasons for making your office an energy efficient, environmentally-friendly place. Here are some of the environmental impacts related to office equipment[35]:

- Energy consumption and resulting Carbon Dioxide (CO_2) emissions;
- Air, soil and water pollution, and ozone formation (smog). In addition, bioaccumulation or food chain exposure and its effects on aquatic organisms due to hazardous constituents like mercury content of LCD displays and some flame retardants;
- Negative impacts such as employee stress due to noise;
- Use of energy, finite resources and valuable materials suitable for reclamation (e.g. gold) and harmful emissions related to the production of IT products; and
- Generation of waste material including packaging, and final disposal.

In order to address this challenge, the European Union proposed a voluntary instrument - Green Public Procurement (GPP) – offering several remedies. (For more information, see the "Sustainable and Green Procurement" chapter)

EUROPEAN LEGISLATION AND OBJECTIVES

- Regulation on the EU Ecolabel ((EC) No 66/2010).[36] This may be awarded to products and services which have a lower environmental impact than other products in the same group. The label criteria were devised using scientific data based on a product's entire life cycle, from product development to disposal. The label may be awarded to all goods or services distributed, consumed or used on the Community market, whether in return for payment or free of charge. It does not apply to medicinal products for human or veterinary use, or to medical devices.
- Regulation on Community Energy Efficiency Labelling Programme for Office Equipment ((EC) No 106/2008)[37] replaces and repeals Regulation (EC) 2422/2001. It establishes the rules for the Community Energy Efficiency Labelling Programme for Office Equipment (Energy Star Programme) as defined in the Agreement of 20 December 2006 between the United States and the European Community on the coordination of energy efficiency labelling programmes for office equipment. The Regulation points out that office equipment accounts for a significant share of total electricity consumption. The various available models on the Community market have very different levels of energy consumption for similar functionalities, and there is significant potential for optimising their energy efficiency.
- Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products.[38] It repeals the Ecodesign Directive (2005/32/EC) that was establishing a framework for setting ecodesign requirements (such as energy efficiency obligations) for all energy using products in the residential, service and industrial sectors. Article 16 of the Ecodesign Directive required the European Commission to establish a Second Working Plan setting out an indicative list of products to be considered in priority for implementing measures in 2012-2014. The necessary background on environmental impacts, saving potential and market conditions in order to select the most appropriate energy related products can be found on the website[39].
- Directive on Electrical and Electronic Equipment Waste (WEEE)[40] In December 2008, the European Commission proposed to revise the directives on electrical and electronic equipment (2002/96/EC) in order to tackle the fast increasing waste stream of such products. The aim is to increase the amount of e-waste that is appropriately treated and to reduce the volume that goes to disposal. The proposals also aim to reduce administrative burdens and ensure coherency with newer policies and legislation covering, for example, chemicals and the new legislative framework for the marketing of products in the European Union. The Commission proposes to set mandatory collection targets equal to 65% of the average weight of electrical and electronic equipment placed on the market over the two previous years in each Member State. The recycling and recovery targets of such equipment would cover the re-use of whole appliances and weight-based targets would increase by 5%. Targets are proposed also for the recovery of medical devices.

- Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2011/65/EU).[41] This Directive is a recast of the well known RoHS Directive. It will continue to ban lead, mercury, cadmium, hexavalent chromium and the flame retardants Polybrominated biphenyls (PBB) and Polybrominated diphenyl ethers (PBDE). The previous RoHS Directive covered several categories of electrical and electronic equipment including household appliances, IT and consumer equipment, but it has now been extended to all electronic equipment, cables and spare parts. Exemptions can still be granted in cases where no satisfactory alternative is available. The list of banned substances will be reviewed on a regular basis.
- Directive on Batteries and Accumulators and Waste Batteries and Accumulators (2006/66/EC)[42] prohibits the placing on the market of certain batteries and accumulators with a proportional mercury or cadmium content above a fixed threshold. Batteries and accumulators, whether or not incorporated in appliances, containing more than 0.0005% by weight of mercury (except for button cells, which must have mercury content of less than 2% by weight). Portable batteries and accumulators, including those incorporated in appliances, with cadmium content by weight of more than 0.002% (except for portable batteries and accumulators for use in emergency and alarm systems, medical equipment or cordless power tools). In addition, it promotes a high rate of collection and recycling of waste batteries and accumulators, and improvement in the environmental performance of all steps in the life-cycle of batteries and accumulators (including their recycling and disposal). Member States have to make arrangements enabling end-users to discard spent batteries and accumulators at collection points in their vicinity and have them taken back at no charge by the producers. Collection rates of at least 25% and 45% have to be reached by 26 September 2012 and 26 September 2016 respectively.

The aim is to cut the amount of hazardous substances - in particular, mercury, cadmium and lead - dumped into the environment. This should be accomplished by reducing the use of these substances in batteries and accumulators, and by treating and re-using the amounts that are used.

Certification and Labelling

ENERGY STAR standards are the internationally recognised energy efficiency norm for IT products

ENERGY STAR standards are the internationally recognised energy efficiency norm for IT products. The standard aims to address the top 20-25% of products on the market. There is already a healthy supply of ENERGY STAR-labelled products on the market for all product groups. In the coming months and years it is likely that the major eco-labels in Europe will also adopt these energy efficiency standards. Blue Angel adopted them for computers in 2008. As such, ENERGY STAR standards are recommended as the basis for core and comprehensive energy efficiency criteria for PCs, laptops and monitors. For imaging devices, Blue Angel has adopted a different method and standards for energy consumption. Therefore, both the ENERGY STAR and Blue Angel criteria could be used.[43]

The most important Ecolabels:

- EU Ecolabel[44]
- EU ENERGY STAR[45]
- Blue Angel[46]
- TCO certification[47]
- Nordic Swan[48]

There are many other labels used in different European countries, such as: AENOR Medio Ambiente, BASF Eco-Efficiency, Carbon Reduction Label, Climatop, Cradle to Cradle Certification, DIN-Geprüft, EIZO Eco Products, EcoLogo, Environmentally Friendly Product: Czech Republic, Environmental Product Declaration, EPEAT, EU Energy Label, European Computer Manufacturers Association ECMA: TR/70, Good Shopping Guide Ethical Company, Group for Energy Efficient Appliances Label, SEE What You Are Buying Into, and TerraCycle.[49]

Management-related activities, ideas and tips

Green offices working to conserve energy not only save money, but also reduce carbon emissions. Over 2.8 million computers are purchased each year by public authorities in the European Union alone. Thus, the purchase of more energy-efficient models would reduce the energy bill and the emissions of greenhouse gases by over 830,000 tons of CO2 from this sector alone[50].

Over 2.8 million computers are purchased each year by public authorities in the European Union alone

Many easy energy conservation measures can be introduced. Any office equipment left plugged in consumes electricity. Computers, printers, monitors, modems and even cell phone chargers still consume electricity when switched off but plugged in. By unplugging chargers when they are not being used, powering down computers at the end of the day and switching off any equipment such as printers and monitors when they are not in use, the office's electricity use will be reduced.

Different good practice examples exist for bigger offices. The IT department can programme computers to shut down at a certain hour, pre-programme the stand-by modes of all IT equipment, or programme an automatic shut off for weekends.

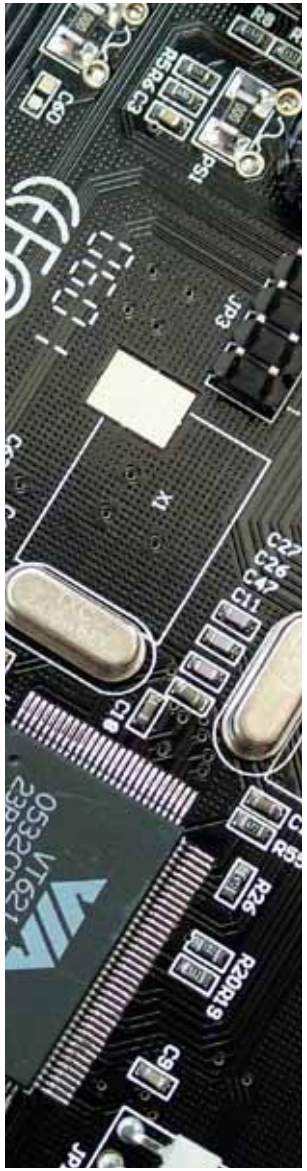
In order to increase efficiency and reduce the environmental impact of office printing, do the following[51]:

- Replace individual products with multifunctional printers (MFPs).
- Buy new, more energy-efficient products that meet eco-labelling qualifications.
- Consolidate to fewer printers, choosing those with energy-efficient features.
- Set double-sided printing as your default to save paper and money.
- Use tools to save paper and avoid costly reprints.
- Set and follow recycling guidelines for paper, print cartridges and old IT equipment.
- Print business and marketing materials in-house.

DEMATERIALISATION OF OFFICES

One example of the virtual dematerialisation of offices is cloud computing. This is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

- The virtual office is another example - a business location that exists only in cyberspace. A virtual office allows business owners and employees to work from any location by using technology such as laptop computers, cell phones and the Internet, provided the necessary and adequate telecommunications infrastructure is available.
- However, there is a significant concern related to cloud computing regarding the huge energy demand involved. For example, a major social media company's highly-efficient data centre in Oregon is substantially powered by coal-fired electricity. Therefore, efficiency by itself is not green if providers simply work to maximise output from the cheapest and dirtiest energy source available. All the same, other companies have made better decisions for siting some of their data centres. One of the largest websites in the United States for instance, chose to build a data centre outside Buffalo, New York that is powered by energy from a hydroelectric power plant. Hydroelectric power dramatically decreases the centre's carbon footprint[52].
- Cloud computing is the most energy-efficient method we have to address the ever-accelerating demand for computation and data storage. Although the architecture of cloud computing is an order of magnitude more efficient than traditional on-premises server solutions, the promise of truly green cloud computing lies with locating cloud data centres near clean, renewable sources of energy[53]. Given the current competitive market, IT managers must choose a greener cloud computing option.



Performance-related activities, ideas and tips

For any electrical device, purchasing energy efficient models is generally a win-win option – reducing running costs, and also reducing environmental impacts. Generally, the energy efficiency of the product has relatively little impact on the purchase price if you aim for a model that is within the top 25% of the most efficient products on the market. The EU Energy Star website[54] has a useful tool for calculating the possible financial savings of buying a more efficient product[55].

- When choosing IT equipment, also consider the presence or absence of hazardous substances in the products such as brominated flame retardants (BFRs). BFRs affect learning and memory functions in humans. Mercury may be harmful to the nervous system and toxic in high doses. Lead can be harmful to the nervous system and poisonous in high doses.
- Computers and imaging equipment can also be noisy and thus disturb those sensitive to such sounds. The main sources of noise in computers are motors and spinning components such as the hard drive, CPU fan, case cooling fans and power supply fan. There is a wide variety of imaging equipment available on the market, making it easier for consumers and procurement officers to make a smart choice[56].
- The picture is more complicated with regards to the replacement of PCs. In purely commercial terms, a report by the UK National Audit Office indicates that it may be financially more prudent to replace office IT equipment every 3 years rather than the 5 years typical within the public sector. This is because the equipment will have residual value and can still be resold or donated after 3 years, keeping operational costs low[57].
- A European Commission study on the Costs and Benefits of Green Public Procurement in 2007 examined the cost implications of purchasing green (eco-labelled) IT devices – computers, monitors and imaging equipment products[58]:

Energy Star qualified computer, for instance, will use between 30% and 65% less energy, depending on how it is used

COMPUTERS

For computers, green versions can be between 3%-7% more expensive than their non-green counterparts. At the same time, an Energy Star qualified computer, for instance, will use between 30% and 65% less energy, depending on how it is used. However, there are a number of uncertainties that might have significant influence on the results: usage behaviour, repair costs, influence of the on-site service on the overall product lifetime, and rapid changes in the market. For example, price and variability of components lead to rapidly changing product composition and product prices. Here are some ideas for computer power management[59]:

- "System standby" - Drops monitor and computer power use down to 1–3 watts each. Wakes up in seconds. Saves 20-60 Euro per PC annually.
- "System hibernates" - Drops monitor and computer power use down to 1–3 watts each. Wakes up in 20+ seconds. Saves work in the event of power loss. Saves 20-60 Euro per PC annually.
- „Turn off monitor" - Drops monitor power use down to 1–3 watts. Wakes in seconds or less. Saves half as much as system standby or hibernate: about 10-30 Euro.
- "Turn off hard disks" - Saves very little energy.

NOTEBOOKS

For notebooks, green versions can be between 6%-24% more expensive than their non-green versions. Energy savings from greener notebooks have no major influence on overall costs, with a typical savings of 8 over 4 years.

In general, notebooks are much more efficient than desktop computers. Comparing the 30W needed for a powerful notebook (including LCD screen) with a 120W desktop PC plus the 80 W CRT screen, energy savings could amount to 80%. And even with notebooks intended as 'desktop replacements', with larger screens (up to 16-17") and less aggressive power management settings, the savings are still well over 50%[60].

SERVERS

Servers could account for approximately 1/3 of the total energy consumption of office IT equipment

Servers could account for approximately 1/3 of the total energy consumption of office IT equipment. The US Environmental Protection Agency (US EPA) says that servers that earn the Energy Star rating should be 30% more energy efficient than older servers – and sometimes more. A recent set of tests conducted jointly by the EPA, HP and Microsoft demonstrate that replacing an older server with a new Energy Star certified model will save energy and deliver more processing power. In some of the tests, the new Energy Star server consumed 54% less power than older models. The findings imply that the energy savings from a single Energy Star-qualified server could range from 600kWh (at 50% utilisation) to 1200 kWh (at idle) annually, or 2400 kWh to 4800 kWh over the useful life of a server (4 years). In addition to using less energy themselves, Energy Star-qualified servers substantially reduce cooling loads in data centres. A general rule of thumb suggests that one watt saved by a server has the added benefit of saving one to two watts of cooling power. It is important to note that these power savings come with a substantial increase in performance—at 50% utilisation, for example, the newer, more energy-efficient server handles over three times the workload, thereby reducing the number of systems needed to support the same load.[61]

IMAGING EQUIPMENT

The green version of single-function inkjet printers as specified in the Costs and Benefits Study (i.e. automatic duplex unit and meeting energy star requirements) are more expensive than the conventional ("non-green") version. This is mainly due to the relatively high price of the automatic duplex unit (between 38-45% higher than the non-green version). As the printing volume is quite low, these higher costs cannot be compensated for by lower paper consumption.

In contrast, the life cycle cost (LCC) of the green version of the single-function electro-photography (EP) laser printers as specified in the Costs and Benefits Study (i.e. automatic duplex unit and meeting energy star requirements) are 7-11% lower than the LCC of the non-green version. Even though the purchase price of the printers with an automatic duplex unit is 20-25% higher than the price of the non-green version, the lower costs during the use phase overcompensate for this difference due to much lower paper consumption.

With about 38% lower LCC for green multifunctional EP devices, the most important cost saver is the use of the duplex function. Large multifunctional EP devices come with a duplex unit, so no extra costs have to be assigned to this function. It is more critical whether users actually use the duplex function or not. Cost savings due to better energy efficiency are negligible.

In all cases, it can be seen that the use of recycled paper leads to cost reductions as the price for recycled paper in Germany for example is lower compared to the price of conventional paper. Combining the use of greener printers with the use of recycled paper leads to lower additional costs for inkjet printers and to higher savings for EP printers.

Whatever your equipment choice, before buying new, apply the green basics of reusing, repairing, and recycling.

Follow these suggestions, keeping in mind that most of them not only make the company greener but also save it money:[62]

- Check whether the business already has something that can do the job for which the new item is being considered.
- Rent instead of buying new.
- Look for a version that has nontoxic components, and as much recycled material as possible;
- Choose the option with as little packaging as possible.
- Opt for rechargeable batteries whenever possible.
- Buy the most energy-efficient product that will last as long as possible. When purchasing office equipment, look for Energy Star ratings.
- Make sure that equipment can be serviced and repaired so that it lasts as long as possible.
- If possible, avoid sending used items to the landfill by donating them to an organisation that can use them, or by recycling their components as appropriate. and
- Buy from local companies to reduce the distance that items have to be transported, thereby reducing the amount of fuel needed to get them to your workplace.

At EPEAT Global Registry for Greener Electronics provides an easy-to-use resource for finding and promoting environmentally preferable products.[63]

Environmental Performance Indicators

Annual green purchases/all purchases	%
Annual energy consumption/employee or /turnover	%

Office Best Practice Example

VERDIEM SURVEYOR - PC ENERGY MANAGEMENT[64]

SURVEYOR is one example of a software product that allows companies to measure, manage, and reduce their network's energy consumption, saving money and reducing carbon footprint. It is a product that is flexible enough to tailor to individual requirements balancing user productivity and energy efficiency.

Here are some of the benefits offered from such product:

- Quantifies PC energy consumption and savings;
- Provides remote, network-level control over PC power settings;
- Safely puts PCs and monitors in low-power states when not in use;
- Reduces IT operating costs up to 30 Euro per PC annually;
- Simple installation, with minimal support and maintenance;
- Reduces greenhouse gas emissions by eliminating PC energy waste;
- Reduce air conditioning cooling requirements, as less heat is generated by switched on PC's;
- Provides verifiable return on investment through integrated measurement and reporting

The product was used by Freshfields Bruckhaus Deringer LLP. The solution resulted in yearly cuts in the power consumption of the 5,566 desktop PC's by 34% which equated to a yearly saving of 922,268 kWh of energy and 396,575 kg CO_2. With a return on investment period of roughly 11 months, the technology has proven itself to be an extremely cost effective solution.

Reducing the consumption of natural resources

Office Paper

Paper is a versatile material with many uses. Whilst the most common use for paper is for writing and printing, it is also widely used for packaging and other materials. Paper is an office necessity for several essential tasks, but it is also one of the biggest sources of environmental impact caused by offices.

Offices normally use 4 types of paper:

- office paper;
- newsprint;
- cardboard packaging and wrapping paper; and
- soft or hygiene paper (paper towels, paper tissues, napkins)

According to different sources, it can be concluded that paper consumption in an ordinary office is approximately 1000 A4 sheets per employee per month (ca 50 A4 sheets per day/ employee). That is equal to about 5 kg of paper and 3,5 kg of CO_2 emissions.[3] Equivalent CO_2 emissions would be produced by travelling 16,6 km in a mid-sized petrol car.[65]

Approximately 45% of annual office waste produced (mass %) in a typical office is office paper. Also see the "Waste Management" chapter in this handbook.

WWW

Approximately 45% of annual office waste produced (mass %) in a typical office is office paper

Despite the efforts made in order to create a "paperless office" using modern electronic solutions, paper usage has not significantly decreased. As digital technology made printing cheaper and easier, global consumption of office paper has actually more than doubled in the last two decades. Therefore, paper use and its minimisation is one of the most significant environmental aspects that should be addressed when implementing the principles of a green office. Furthermore, unlike many other issues such as public transportation, where the local and national governments are responsible for changes, it is an area where much can be done through improved office management and behaviour.

Office paper reduction provides environmental, economic and efficiency benefits:

Saving paper reduces environmental impact

- Fewer natural resources will be used for the production of paper.
- Reduced air and water emissions will be generated from the manufacture of paper.
- Reduced paper use (cutting down fewer trees) reduces greenhouse gases (forests absorb carbon dioxide).

[3] Greenhouse Gas Protocol, June 2006, World Resource Institute: (1 kg of paper (80g/m²) equals with 0,7 kg of CO_2e emission)).

Saving paper saves money

- Less money will be spent on buying paper.
- Less space will be needed for the management and storage of paper documents.
- Savings on supplies and maintenance of printers and copiers will be made.
- Less paper waste means lower costs for waste management.

Saving paper increases efficiency

Businesses that have converted to electronic forms and filing systems have found that it takes less time to both find and process information. Although in some instances paper is, and will be the best tool, most businesses find that reducing their paper use increases their efficiency. Whenever one has fewer sheets of paper in the office, less time is spent looking for those that are misplaced or lost.

A great deal of guidance in choosing the most environmentally-friendly type of paper is provided by different certification/labelling schemes

Certification and Labelling

In addition to reducing paper use, it is important to make an environmentally aware choice when buying paper in the first place. A great deal of guidance in choosing the most environmentally-friendly type of paper is provided by different certification/labelling schemes.

Although there is no legal definition of "sustainable" or "green paper," many labelling schemes are widely known and used, such as:

- the EU "Flower,"
- the Nordic Swan in Scandinavia,
- the Blue Angel in Germany,
- the Forestry Stewardship Council's FSC standard.

FSC

The Forest Stewardship Council (FSC) is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests. FSC certification provides a credible link between responsible production and consumption of forest products (including paper products).The FSC enables consumers and businesses to make purchasing decisions that benefit people and the environment, as well as providing ongoing business value. The intent of the FSC system is to shift the market to eliminate habitat destruction, water pollution, displacement of indigenous peoples and the violence against wildlife that often accompanies logging. The FSC label on a paper product shows that it was manufactured using resources from sustainably managed forests.

FSC is nationally represented in more than 50 countries around the world.[66]

TCF AND PCF

Processes or products that are manufactured without chlorine are identified with the TCF (Totally Chlorine-Free) or PCF (Processed Chlorine-Free) labels. TCF is a technique that uses no chlorine compounds for the bleaching of wood pulp for paper production. This prevents the formation of dioxins and highly carcinogenic pollutants. The Chlorine Free Products Association (CFPA) is an independent not-for-profit accreditation and standard setting organization that promotes chlorine-free policies, programmes, and technologies throughout the world. The mission of the CFPA is to raise market awareness by providing facts, drawing direct comparisons, and highlighting the process advantages for TCF and PCF products.

ECF

Elemental Chlorine Free (ECF) papers are made from pulp that has been bleached using oxygen, chlorine dioxide or other chemicals rather than pure chlorine, which, from all bleaching methods, is considered to be the worst for the environment.

Management-related activities, ideas and tips

There are several management/organisation related measures to undertake before applying concrete practical actions to reduce paper use in the office. One of the measures is to develop organisational procedures for paper-saving. These procedures should be created as a first step when moving towards a paper saving office (see also chapter "Management" in the current handbook). Have a look at the managerial actions and tips listed below.

Procedures

The following procedures are recommended:

- Develop a procedure (guidance/internal rules) for reducing paper use (incl. setting rules and measures for reducing, reusing and recycling paper). It can either be a part of the general environmental rules of the office or a separate procedure for paper products.
- Develop a procedure (guidance/internal rules) for purchasing environmental friendly paper products (e.g. eco-labelled paper). It can either be a part of the general procurement policy of the office or a separate procurement procedure for paper products.

Organise paper saving campaigns within the office

Communication and Training

- Inform and remind staff about the approved paper saving rules and measures in the office regularly, e.g. at staff meetings. See the actions, ideas and tips for increasing performance below.
- Put up good and eye-catching examples of paper use (e.g. on walls or next to computers, printers and copiers)[67].
- Check from time to time the performance of staff: whether all employees have the opportunity to reuse and recycle paper easily (e.g. have access to separate places for collected paper) and if they are following paper saving rules and measures.

Monitoring

- Monitor paper usage according to the defined indicators (see below). Keep track and measure how much paper is used and how much is wasted. Also, follow what the share (%) of environmental friendly paper used in the office is.

Feedback

- Give feedback to all staff about decrease /increases in paper use.

Engaging and Motivating

- Organise paper saving campaigns within the office (a good way to promote "think before you print/copy" attitudes).
- Create competitions between employees – for example, in order to motivate staff and reward those who use paper most efficiently.

Performance-related activities, ideas and tips

In addition to the managerial measures which are undertaken, reducing paper use in the office depends largely on the actual performance / behaviour of the staff. This includes topics such as avoiding printing (e.g. printouts vs. electronic documents) and so-called green printing principles (e.g. one-side vs. double-side printouts). See the relevant activities, ideas and tips below.

ACTIVITIES/TIPS TO REDUCE OFFICE PAPER USE

Avoid printing when possible – "think before you print" attitude:

- Do not unnecessarily print out documents.
- View documents on your computer instead of printing them out.
- Edit documents on-screen rather than printing drafts.
- Make reports and other documents available on the Internet or Intranet (instead of on paper).
- Share already printed documents/reports of common interest with colleagues.
- Send information electronically. Use e-mail instead of faxes or letters when possible (this is also faster).

Make sure printers and copiers are set to print on both sides of paper as default

When printing then keep in mind the "green printing principles":

- Practice using a paper conserving format for documents: ensure that document formatting reduces "white" space as much as possible – in order to make the most from a sheet of paper, print more words on each page (e.g. minimal spacing, narrower margins, smaller characters, use efficient fonts like Times New Roman, etc.);
- Preview documents before printing. Use the print preview function to spot formatting errors and blank pages before you print. Proofread first, and use the spelling/grammar tools to help avoid errors that may result in documents having to be reprinted;
- Make sure printers and copiers are set to print on both sides of paper as default (also when buying a new printer/copier then make sure that it has "print on both side" and "2 pages per sheet" options);

- Make double-sided copies in A5 format where possible.
- Avoid colour printing when possible, setting black/white print as default.
- Print only the pages of a document you need (e.g. instead of the whole report).
- If it is necessary to print out presentations, use the "handout" option to print more slides per page.

NB! Have a look at new sustainable printing software on the market. Alternatively, MS Office has an EconoMode function which is free.[68]

Reuse and recycling:

- Give paper a second chance within the office: reuse paper that has only been printed on one side for faxes, draft copies, internal documents or as scratch paper. Collect this kind of paper separately, and if possible, designate a common printer for printing on reused paper (so that the one-side used paper will not be mixed up with the "clean"). and
- Recycle paper: collect the "useless" (used on both sides) paper separately.

Be nice to your copier and your copier will be nice to you

In addition, "be nice to your copier and your copier will be nice to you". Keep copiers and printers in good repair and make it policy to only buy copiers and printers that make reliable double-sided copies. Let the copier maintenance person know when a copier is performing poorly (toner is low, jams frequently, etc.). Regular copier maintenance is important, especially if the toner is low. Copiers are often used until all the toner is gone, and that wears down machines. A copier that works well is less likely to jam, and this helps save paper.

Also, it is recommended to track individual printing footprints in the office. Create systems that allow staff to measure how many copies they are personally responsible for each month. Most people are shocked to find out how much paper they are using. This knowledge will motivate people to reduce their personal paper usage.

ACTIONS/TIPS IN TERMS OF PURCHASING PAPER

- Buy recycled paper made from a high percentage of post-consumer recycled content and/or eco-labelled paper.
- Look for paper that is chlorine-free processed (PCF).
- Prefer FSC labelled paper (originating from sustainably managed forests).
- Use unbleached and uncoloured paper. If you need to use coloured paper, use pastel colours;
- Do not use glossy paper.
- Buy the lightest-possible-weight paper.
- Buy products in bulk to minimise packaging.

Environmental Performance Indicators

Possible indicators for office paper are:

Total amount of office paper used	total kg/tons in a year
Amount/number of packages/ A4 sheets used per employee	kg/packages/sheets per employee in a year
Share of eco-labelled office paper	% out of all office paper used
Share of eco-labelled other paper, e.g. toilet paper and paper towels	% out of all paper (e.g. toilet paper and paper towels) used in the office
Share of eco-labelled procured printed paper materials, e.g. leaflets, brochures, reports etc.	%of all procured printed paper materials (e.g. leaflets, brochures, reports etc.)
Amount of paper waste generated	kg/tons per year
CO2 emissions from paper use	kg/tons per year (per employee[1]

NB! The best way to collect data concerning the amount of office paper used is to look at the annual purchases of office paper.

Office Best Practice Examples

SEI TALLINN OFFICE

SEI only purchases eco-labelled paper (with the Flower or Swan labels), monitors in-house paper usage, and undertakes many activities that help to reduce paper use. The organisation also carries out traditional tree-planting events to lessen its carbon footprint[4]. The tree-planting events are also good in terms of awareness-raising (e.g. for employees` children). SEI Tallinn, like most Estonian organisations these days, uses digital signing for most contracts and documents, thus significantly decreasing printing needs.

WWF FINLAND`S GREEN OFFICE PROGRAMME

By cutting consumption, Finnish Green Offices saved a total of 2230 tons of greenhouse gas emissions compared to the previous year in 2009. The amount corresponds to over 260 passenger car trips around the world. WWF Green Office is an environmental service for offices aimed at reducing the ecological footprint of offices and decreasing greenhouse gas emissions. The Green Office Network includes 180 organisations. The reduction was achieved by avoiding printing, switching to electronic documents and double-sided printing.[69]

Finnish Green Offices saved a total of 2230 tons of greenhouse gas emissions compared to the previous year in 2009

[4] Carbon footprint: measure the total greenhouse gas emission caused directly and indirectly by a person, organisation, event or product. The footprint considers all six of the Kyoto Protocol greenhouse gas and measured in tonnes of carbon dioxid equivalent (tCO_2e). CO_2e is calculated by multiplying the emissions of each of the six greenhouse gases by its 100 year global warming potential (GWP)

THE DIGITAL SOCIETY – E-ESTONIA

All the e-services contribute towards a paperless society

e-Estonia means the ability to vote in elections from the comfort of your own home, filing your income tax return in just five minutes, and signing a legally-binding contract over the Internet, from anywhere in the world via your mobile phone. These are just a few of the services that Estonians take advantage of on a regular basis. The main components of the digital society are an electronic ID card (acts as a proof of ID in secure electronic environments), i-voting (allows voting over the Internet from anywhere in the world), mobile-ID (allows the use of mobile phones as a form of secure electronic ID) and X-road (allows databases to interact, making integrated e-services possible). All these e-services contribute towards a paperless society. For instance, signing documents with a digital signature (with the help of ID cards) is already an every-day practice by the local and state authorities in Estonia (e-government system). Moreover, all levels of administration in Estonia are working more cheaply and more efficiently thanks to the country's e-solutions. They have also become more open to the public than ever before, building bridges between the state and the people it serves.[70]

Water Consumption

"Water is always in the headlines – whether too much of it or too little".

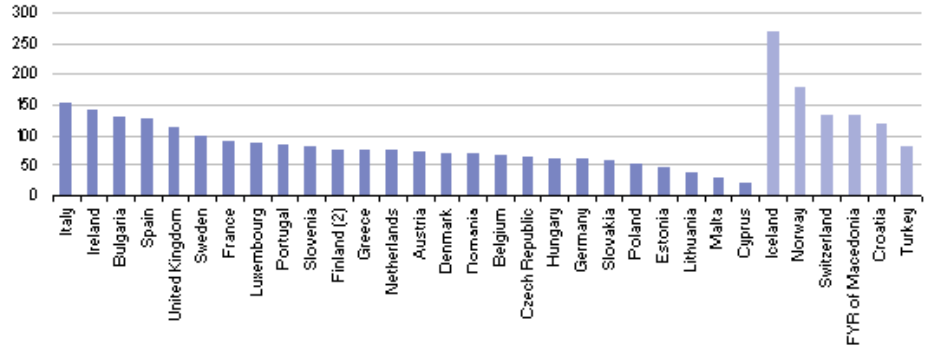
Annual water consumption in most EU Member States is between 50 m³ and 100 m³, per person

Water is one of the most important elements of the biosphere. 70% of the Earth's surface is covered with water but just 2.5% of it is drinkable freshwater[71].

Supplies of our most precious resource are decreasing due to growing demands from agriculture, industry and an ever-growing world population. Effective management is key to saving our drinking water which is essential for humans and other living creatures. However, most humans are not concerned about their water consumption.

Annual water consumption in most EU Member States is between 50 m³ and 100 m³, per person although variations reflect specific national conditions. For example[72]:

- In Ireland, annual water consumption is 141 m³ per capita, because the use of water from the public supply is free.
- In Bulgaria this figure is 129 m³ due to large losses from the public network.



(1) Spain, Italy, the Netherlands, Austria, Portugal, United Kingdom and Turkey, 2008; Germany, Ireland, Greece, France, Slovakia, Sweden and Norway, 2007; Switzerland, 2006; Finland and Iceland, 2005; Latvia not available.
(2) Estimate.
Source: Eurostat (online data code: env_watq2)

- In Norway, Iceland and Switzerland water consumption is extremely high because water is abundant and the supply is largely unrestricted.
- Estonia and Lithuania consume low amounts of water due to the low national average connection rate to the public supply, while...
- in Malta and Cyprus annual water consumption is also very low, because they have partially replaced groundwater with desalinated seawater.

It is not just high water abstraction rates and decreasing resources that should make us think about water management, but the fact that in many countries municipal wastewater treatment rates are low - in countries like Hungary, Bulgaria, Romania and Cyprus just one in two households are connected to the urban wastewater treatment network.

It is really important to think through the water consumption chain and find ways to reduce water consumption without reducing comfort levels in daily life, no matter whether in the office or at home.

In the EU, the Water Framework Directive (Directive 2000/60/EC) (WFD) states that "water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such". This directive is designed to prevent further deterioration of water resources and "protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems"[73].

A study[74] conducted for the European Commission showed that water efficiency could be increased by 40% just through technological improvements - changes in human behaviour could lead to further savings. By 2030 water usage (public, industry and agriculture) will increase by 16% if there are no changes. This study also showed that water efficiency measures could decrease water wastage by up to a third[75].

Certification and Labelling

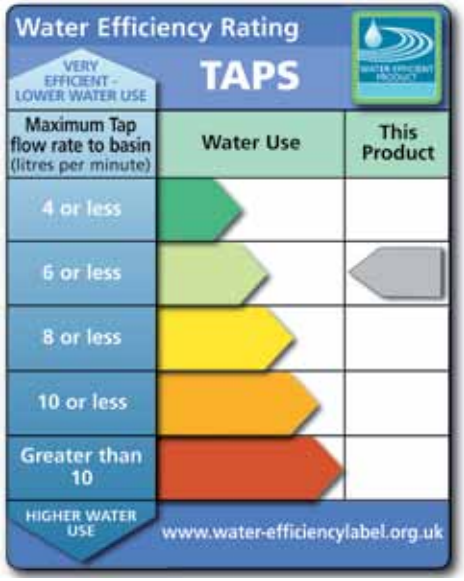
"Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such "

At the EU level, very few pieces of legislation or policy measures relate to water efficiency requirements, although it seems that this might change in the near future with the extension of the Ecodesign Directive to cover energy-related products, which includes water-using devices. However, several labelling schemes (e.g. the EU Ecolabel for accommodation services) contain details about the sustainable use of water.

There are several water-related initiatives which have been introduced within the EU and from external countries:

- The Product Labelling Directive (2010/30/EU) indicates energy (and other resource) consumption by household appliances through labelling and standard product information. Its aim is to promote the use of more resource efficient appliances. This Directive applies to many water consuming appliances.
- The EU-Ecolabel - in terms of water consumption this only covers some product groups (namely, dishwashers and washing machines).
- The Ecodesign Directive (2009/125/EC). The primary aim of this directive is to reduce energy use, but it also promotes other environmental considerations - including use of water[76].

- The Australia and New Zealand Water Efficiency Labelling Scheme (WELS) provides information to consumers about the water efficiency and water usage of products. This scheme employs six different product classes: taps, clothes washing machines, dishwashers, lavatories, showers and urinals. Washing machines and dishwashers display a combined energy/WELS label because they use both energy and water. The WELS label displays two different pieces of information:



a) the rating system, which consists of a maximum of six stars and indicates relative water efficiency;

b) the water consumption or water flow figure. This part of the label can show the litres per minute (for showers and taps), litres per wash (for clothes washing machines and dishwashers) or litres per flush (for lavatories and urinals)[77].

- 25 bathroom manufacturers around the world decided to create The Water Efficient Product Labelling Scheme which provides access to a database of new, exciting, innovative and technologically advanced products which use less water and energy[78];

Global Water Footprint Standard demonstrates how we can quantify product, company, individual or national water usage. It has strong international support from major companies, policymakers, NGOs and scientists.[79]

Management-related activities, ideas and tips

Human behaviour regarding energy and water efficiency is a significant factor in meeting the goals set

A piece of research from 2009 showed that the water consumption of office buildings heavily relies on cooling towers, but restrooms are responsible for an even greater proportion of the water consumption of this kind of building. Responsible for the highest percentages of water consumption are:

- bathrooms (excluding showers);
- kitchens (e.g. dishwashers, ice machines, etc.)(For more information, see the "Food and Catering" chapter);
- cooling towers.

When you make a decision to reduce water consumption, it is recommended that you get an overall picture of the water usage in your office. Continuous monitoring of water meters in different areas will give a clear picture of the "leakage" points.

One of the best ways to monitor water use is to print out a map of the office and mark on it all the consumption points ('environmental mapping') to find the leakage or critical use points. If critical points are found, the first action you should take is to find the reason for the extremely high level of consumption. In many cases, broken pipes or a leakage in the water supply network may be responsible.

The next step is to define environmental objectives and an action plan for fixing each leakage or critical use point.

Here are some managerial ideas:

- Fixing leaks is the most efficient way to reduce the water bill. If warm water is leaking, the office wastes not only water but also energy. This is why it is essential to check the building's water system regularly.
- Regularly maintain HVAC systems. Poorly regulated systems can use more water and consume more energy (For more information, see the "Energy Consumption" and "Indoor Air Quality" chapters).

Many studies have shown that human behaviour regarding energy and water efficiency is a significant factor in meeting the goals set. Changing the behaviour and habits of employees is as important as making water saving investments. It is recommended that employees are trained and motivated to be more conscious of their everyday activities.

- Ensure that everyone at the organisation is aware of the need to be water efficient. Communication of the chosen measures and results is an important step in awareness raising. The simplest measures are the easiest to adopt.
- Monitor paper usage according to the defined indicators (see below). Keep track and measure how much paper is used and how much is wasted.

Performance-related activities, ideas and tips

Here are some tips which can contribute to reducing office water consumption:

- Use tap water instead of bottled water - the cost of tap water can be 100-300 times lower than bottled water. Water filters can be used if desired.
- The dishwasher should be used when it is full otherwise energy and water will be lost.
- With the use of recycled paper a reduction in indirect water usage will be made.[80]
- Fill kettles with enough water for your needs but not to the brim. This will reduce energy bills too.

An old toilet tank can use 10-12 litres of water, while a new one typically uses 3-9 litres

The cost of tap water can be 100-300 times lower than bottled water

- To efficiently reduce the water consumption (litre/min) of a faucet/tap use a faucet aerator (perlator). This little gadget causes water to be mixed with air and thus reduces the amount of water used, increases the feeling of water pressure and makes the water softer. One faucet aerator (perlator) can reduce water consumption to 6-7 litres/min. There are also new EU Ecolabel and GPP criteria for taps and showerheads.[81]
- Middle stand cold water faucet. The idea of this faucet is that most people do not wait until water from faucets warms up; they wash their hands under cold water. The single handle faucet can be set to provide warm water in the middle stand. In this way not just water, but energy is saved.
- Invest into water efficient toilets. An old toilet tank can use 10-12 litres of water, while a new one typically uses 3-9 litres. An alternative solution is to use toilets without water tanks (replaced with a high pressure flushing system) - or the most water efficient solution of all is a dual flush system, which can use 70% less water per flush.
- If your office has a shower, the above-mentioned aerators can be used in the shower heads which lead to water savings of nearly 60% (a normal shower head emits about 20 litres/min. of water while a water efficient one can reduce this to 5 litres/min.)
- Changing kitchen equipment for more energy and water efficient units can help offices to make huge water savings (For more information, see “Food and Catering” chapter).
- Harvesting rainwater is also a good practice for saving drinking water. Furthermore, it is better to water office flowers with softer rainwater.
- Many commercial premises have a great roof area where rainwater capture can offer good opportunities for reducing water usage.

Environmental Performance Indicators

water consumption / month	(m^3/month)
water consumption / year	(m^3/year)
water consumption / employee	m^3/employee/month
water consumption / employee / year	m^3/employee/year

The Water Footprint is a useful indicator which shows freshwater consumption (and covers direct and indirect water use). The Footprint indicates the water use of a business through showing the volume of freshwater used to run and support the business (e.g.: to produce a certain product) taking into account the whole supply chain. It is a multidimensional indicator because all of its components are specified geographically. For example, one of the key environmental indicators is freshwater (freshwater quality and resources).

FRESHWATER USE CAN BE DIVIDED INTO THREE DIFFERENT PARTS:

- the "green" component: the volume of rainwater which evaporates during the considered process (relevant mainly for agricultural products);
- the "blue" component: the volume of surface and groundwater which evaporates during the considered process;
- the "grey" component: the volume of polluted water originating from the considered process.

Office Best Practice Examples

The Hungarian University of Szeged saved 160 m^3/year of water by installing about 50 aerators. This measure was a low-cost investment with a short (4 month) payback period and resulted in savings of more than €400 per year.

Toyota Motor Hungary Ltd. made a remarkable environmental-economic investment whose goal was to stop the use of drinking water for irrigation and to reduce water and sewerage charges. This investment took priority for both environmental and economic reasons. In the frame of this project, 6 groundwater pumps were built. The investment cost approximately €30 300 but the payback time was only 11 months and saves them €34 000 yearly.

The Arenson group, which is involved in office furniture manufacturing, implemented a number of simple water saving measures in the non-manufacturing process (installing passive infrared detectors in urinals, for example, to prevent unnecessary flushing, conducting on-going maintenance to maintain spring-loaded taps, checking water meters to ensure no water was wasted from leaks, etc.). As a result, water use in factory/office washrooms was reduced by 45% from 3800 m^3/year to 2100 m^3/year - equivalent to cost savings of €3500 /year[82].

Saved 160 m^3/year of water by installing about 50 aerators

Office Furniture

Furniture is a broad product group that covers very different types of furniture such as cupboards, chairs, tables, shelves, etc. each with very different uses - for example: for schools, outdoors, offices, kitchens[83].

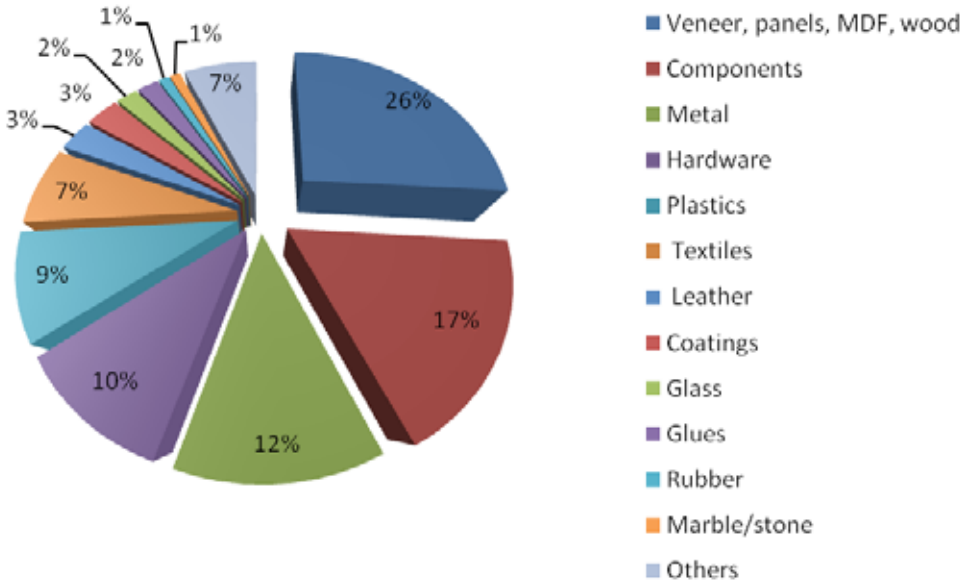
- Indoor furniture includes furniture for business purposes (e.g. offices and schools) as well as for domestic purposes. It can be used for storing, hanging, lying, sitting, working and eating and can be free-standing or built-in furniture. The group does not include, however, building products (for example, steps, walls, mouldings, and panels), sanitary equipment, carpets, fabrics, office supplies, and other products, whose primary purpose is not to function as furniture.

- Outdoor furniture mainly refers to benches, tables, chairs, and excludes other products whose primary purpose is not to function as furniture (e.g. streetlights, bike-parks, playgrounds, etc.).

To identify the environmental impacts of furniture it is necessary to consider the life-cycle impact of the materials the furniture is made of and the impacts of the final product during its life span and disposal.

According to the European Furniture Manufacturers Federation, the share of materials used in furniture production (by value) is[84]:

Share of materials used in furniture production (by value)



Use products made partly or totally from recycled materials and/or renewable materials (such as wood)

A piece of furniture can be made out of a large variety of materials and therefore it may be difficult for manufacturers to follow all environmental requirements for all materials used.

In general, a large proportion the environmental impacts of furniture depend on the production and treatment of the raw materials rather than on the production of the furniture itself. The second major part of environmental impact comes at the end of the product lifecycle (recycling, reuse or just disposal).

The focus is therefore on the environmental aspects of the raw materials that are used in furniture, their finishing treatment (such as lacquering or gluing) and it is also necessary to take into account the impacts of furniture once disposed of.

Key environmental impacts (GPP – Furniture Background Product Report)[85]:

- Loss of biodiversity, soil erosion and degradation as a result of unsustainable forest management and illegal logging.
- Landscape impact from mining activities.
- Use of non-renewable resources such as metals and oil/ natural gas for plastics.
- High water and energy consumption in the production of several materials.
- Use of hazardous substances that can be released during production, use or disposal.
- Use of organic solvents and generation of VOC emissions;
- High amount of packaging.
- Early replacement of furniture due to a lack of reparability options, low durability, ergonomics or furniture not fit for purpose.

EUROPEAN LEGISLATION AND OBJECTIVES:

- For wood and wood-based products, reference should be made to the FLEGT (Forest Law Enforcement Governance and Trade) action plan adopted by the EU in 2003.
- Wood treatment shall comply with the relevant provisions (in Directive 79/117/EEC and amendments) that prohibit the placing on the market and the use of plant protection products containing certain active substances which, even if applied in an approved manner, could give rise to harmful effects on human health or the environment.
- Directive for dangerous substances 76/548/EEC or Directive for dangerous preparations (1999/45/EC).
- In relation to volatile organic compound (VOC) emissions, even though no standard regulation exists for furniture, there is a Directive for the reduction of industrial emissions of VOCs (Directive 1999/13/EC amended by Directive 2004/42/EC).
- For all pieces of furniture, reference should be made to Directive 1999/44/EC on certain aspects of the sale of consumer goods and associated guarantees.

In relation to packaging, reference needs to be made to Directive 94/62/EC on packaging and packaging waste.

Certification and Labelling

In the European Union there are many eco-labels for furniture; however none of them cover all relevant market sections. Either they apply to a particular type of furniture (e.g. chairs), on one major input material (wood) and only a few cover several furniture types using criteria for addressing all relevant environmental aspects.

Apart from ecolabels for furniture as a product group, there are other ecolabels or industry standards for certain materials used in furniture.

The main ones are:

- For textiles and leather the European Ecolabel, Nordic Swan and Ökotex standard 100.
- For mattresses and foams the main ecolabels and standards are the European Ecolabel and the PU-foam SHE-standard (CertiPUR) from the European Association of flexible Polyurethane foam block manufacturers (EuroPUR). The Blue Angel also contains extensive criteria for padding materials.

Apart from ecolabels for furniture as a product group, there are other ecolabels or industry standards for certain materials used in furniture

RECYCLED CONTENT CERTIFICATIONS

- Forest Stewardship Council™ FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests.[86]
- Formaldehyde Emission Testing VOC Testing Reinforces Confidence in Safety. Furniture and building materials may emit various kinds of Volatile Organic Compounds (VOCs) that have an impact on indoor air quality and may, as a result, affect human health. Examples of common health disorders related to VOCs include headaches, abnormal tiredness, malaise, irritation of the mucous membranes in the nose and throat, eye irritation, and skin problems. As a consequence of such health risks, many countries have established mandatory or voluntary rating systems to control the emission of VOCs, formaldehyde and other hazardous substances in construction and furnishing materials[87].

As was mentioned, none of the ecolabels covers fully the product's entire environmental impact and there are some controversial issues where technical standards are under debate:

- Certified wood: Advocate the use of at least 70 per cent wood from certified forest sources.
- Finishes and adhesives: Limits the permissible emissions of volatile organic compounds.
- Formaldehyde: Limits formaldehyde emissions to a maximum of 50 per cent of the E1 standard.
- Greenhouse gas: Establishes criteria for calculating GHG emissions, including transportation.
- Preservatives: Limits use of toxic chemicals to preserve wood for outdoor furniture.
- PVC: The plastics industry supports the use of PVC for foils or edging, while Greenpeace and other environmentalists oppose it.

EUROPEAN ECOLABELS

- GPP – Furniture Background Product Report + Criteria[88].
- European Ecolabel for textiles, mattresses and furniture [draft].
- European Ecolabel for wooden furniture[89].
- Milieukeur (The Netherlands) for textiles and furniture.
- Marque NF Environnement (France) for furniture.
- ÖkoControl (Germany) for furniture.
- RAL-RG 430, Deutsche Güte Gemeinschaft Möbel (Germany) for furniture.
- Nordic Swan (Nordic countries) for textiles, outdoors furniture and furniture and fittings.
- Blaue Engel (Germany) for wooden and upholstered furniture.
- Österreichische Umweltzeichen (Austria) for wooden furniture and office chairs.
- Öko-tex (Germany) for textiles.
- Certi-PUR (EuroPUR association) for PUR-foams.
- TCO Development (Nordic Countries) for chairs and tables.

Management-related activities, ideas and tips

ACTIVITIES FOR REDUCING KEY IMPACTS:

- procure products with timber from sustainably managed forests;
- use products made partly or totally from recycled materials and/or renewable materials (such as wood);
- ensure that the furniture is reparable;
- ensure that furniture has limited organic solvent content and VOC emissions (in products such as adhesives and surface treatment substances);
- furniture components must be easily separable for recycling at the end of the product lifetime;
- ensure recyclability and separability of packaging materials and furniture parts;
- procure durable, fit for use, ergonomic, easy to disassemble, repairable and recyclable furniture;
- look at long-term, not just up-front costs;
- consider buying reused furniture;
- purchase from local producers;
- consider using Life Cycle Assessment for office furniture.

The employer must examine and assess the health and psychological aspects of working in front of computers

RECYCLABILITY:

- A large (90%) proportion of the product should be dissassemblable into recyclable components without the use of complex tools.
- Plastic parts greater than 50g in weight should be clearly marked as recyclable.

The employer must examine and assess the health and psychological aspects of working in front of computers to ensure an appropriate, pleasant, ergonomic, healthy and creative environment which ensures comfortable and efficient work. (see the Health and Safety chapter)

Performance-related activities, ideas and tips

A few general ideas:

- refurbish old furniture (by moving or redecorating it);
- choose items that can be modified;
- choose smart materials (products made with sustainable materials);
- choose items that can be disassembled;
- give away used furniture. What you don't need may be useful for somebody else.
- Conduct training, use checklists and provide working instructions.

Environmental Performance Indicators

What % of purchased furniture has an EU Ecolabel?	%
What % of office furniture is made with FCS wood or recycled materials?	%

Office Best Practice Examples

Tutto Mobili SRL, (Romania) (custom-built furniture manufacturing): all of their products are made in accordance of the client's requirements, taking into consideration waste minimization rules, cost reduction and energy efficiency.

A lot of companies and organisations from Romania are convinced that the key to controlling their office furniture costs and their negative environmental impacts is to only purchase the office furniture they really need and to try to cut costs by purchasing used and refurbished office furniture where possible.

Because of the persistent and a steady demand, almost in every little settlement and township there is a second-hand furniture store.

"Second hand furniture has a plenty of life left in it!"

As part of the London Re-use Network, GreenWorks[90] collects furniture (from very large office blocks to small office suites) and then provides this `re-use` furniture to small business, charities, community and educational groups via the Re-use Network partners.

"Second hand furniture has a plenty of life left in it!"

"Our priority is to maximise the use of the furniture we get, not to maximise our profits."

"A complete chain of responsibility, not a one-off effort" Kinnarps[91] is a family-driven Swedish company offering workspace interior solutions, with some 200 showrooms all over Europe. The company has full control over the complete chain from sourcing of raw materials, production, logistics, delivery to installation and after-service.

Waste reduction and recycling

Waste Management

Average municipal waste generation in the EU is more than 500 kg per person annually

Waste has become an increasingly difficult environmental and economic problem, one which affects us all and to which everyone contributes. Individuals, at home or at work, have a vital role to play in schemes to minimising and reducing waste. Today's complex, technology-based society, combined with population growth, has led to the generation of enormous quantities of solid waste. Average municipal waste generation in the EU is more than 500 kg per person annually.[92] Approximately one-third of municipal waste is generated by businesses such as offices, restaurants and retail stores.

It has been estimated that waste typically costs companies 4-5% of their turnover

As more businesses and organisations consider the effects of their activities on the environment, waste generation at work is receiving increasingly attention. More and more, the production of waste is seen as a form of inefficiency and misuse of resources, which has both economic and environmental implications for individual companies and the country as a whole. It has been estimated that waste typically costs companies 4-5% of their turnover.[93] All businesses have a legal duty to provide appropriate arrangements for the management of their waste. There is usually a fee for municipal waste collection. By reducing the quantity of waste for collection, companies can reduce the cost of waste disposal. Furthermore, this puts more pressure on offices to look at the areas where they generate the most waste and how to reduce it.

All the waste that an office produces has both an associated financial and environmental cost, and these costs are often underestimated. However, the bigger issue is about understanding where this waste is generated, and whether it is possible to eliminate this waste at source, reduce, re-use or recycle it. This is where an understanding and use of the waste hierarchy is important.

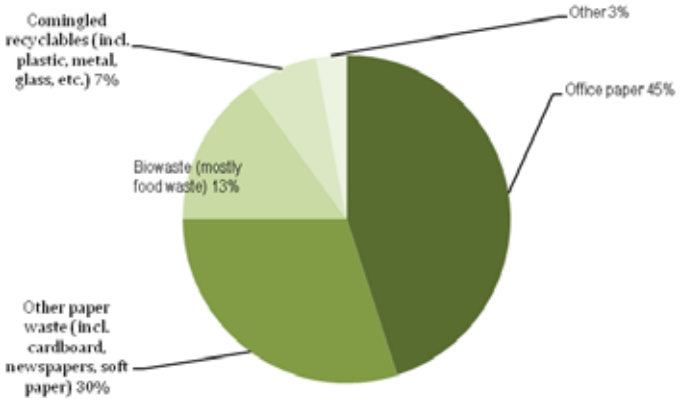
European waste management practices should follow the waste hierarchy which aims to encourage the management of waste materials in order to reduce the amount of waste materials produced, and to recover the maximum value from the waste streams that are produced.

The priorities in terms of waste management[94], in descending order (beginning from prevention), are as seen in the following table[95]:

1. Eliminate: Avoid producing waste in the first place	**2. Reduce:** Minimise the amount of waste you produce	**3. Re-Use:** Use items as many times as possible	**4. Recycle:** Recycle what you can only after you have re-used it	**5. Dispose:** Dispose of what's left in a responsible way

According to different studies, 75% of the waste produced in typical offices is paper waste. Office paper comprises 45% of this waste stream, while the remaining 30% of paper waste consists of cardboard, newspapers, soft paper, etc. See the graph below[96].

Office waste composition



Graph 2: Office waste consumption (SEI Tallin Study)

Due to the fact that the majority of office waste is paper, this topic is addressed in a separate chapter in this handbook ("Office Paper") which describes how to reduce paper use and paper waste.

EUROPEAN LEGISLATION AND OBJECTIVES

The waste management regulation of all EU member states is based on EU waste policy and respective directives. The five-stage waste hierarchy set out in the Waste Framework Directive lays the foundation for a European recycling society.

Waste Management-related directives can be found in the legislative database of the EU and on the web pages of the member states' ministries[97]:

- The Waste Framework Directive (2008/98/EC) defines the basic concepts and definitions related to waste management and defines and establishes waste management principles such as the "polluter pays principle" and the "waste hierarchy."[98]
- The Directive on Packaging Waste 94/62/EC aims to harmonise national measures in order to prevent or reduce the impact of packaging and packaging waste on the environment. In 2004, the Directive was reviewed to provide criteria clarifying the definition of the term "packaging" and increase recovery targets for and recycling of packaging waste. In 2005, the Directive was revised again to allow new Member States transitional periods for attaining the recovery and recycling targets.[99]

Certification and Labelling

Standardised environmental management systems at the organisational level such as ISO 14001 or the EU EMAS scheme may be viewed as both targets and rewards.

ISO

EMAS

Management-related activities, ideas and tips

Identify the what, where and how of waste generation

An important step when starting an office waste minimisation and recycling programme is to conduct an initial review or audit to measure the usage of consumables, and the types and amounts of waste produced. An audit provides a baseline from which to measure the effectiveness of the waste management system and the results once the new system is in place. An evaluation can be very significant in terms of motivation, as many waste minimisation measures seem, on the face of it, to be quite trivial. The basic role of this first review is to identify the what, where and how of waste generation. It should include the nature and amount of waste, as well as its cost to the organisation. The audit should also provide a benchmark by which to measure the success of waste minimisation and recycling procedures by identifying opportunities for implementing such procedures.

Therefore, it is recommended that the review should cover the following aspects:

- Identify all points at which waste is generated.
- Identify the origin of each type of waste.
- Identify any waste which is hazardous and consider how it can be separated from the main waste stream, or replaced with a non-hazardous substitute.
- Establish methods of measuring the waste for monitoring purposes.
- Identify the costs of the current waste management practices.
- Look at opportunities to reduce, re-use or recycle the waste.
- Set targets for reducing waste.

The appropriate waste management system in the office is important not only because of the environmental impact on company operations, but also because of the effect it has on raising employees' environmental awareness. Staff may bring home the good practices from the office. Increasing staff awareness is essential to the success of any office waste management system. All management and staff must understand how the system works and should know what part they play in the process.

Here are some primary hints to remember when moving towards waste reduction and employee engagement:

- An office waste minimisation and recycling scheme is one of easiest environmental activities to involve everyone in.
- Do not start everything at once. It is best to have a gradual approach, starting small and working up to a more high-level waste management programme.
- Start with what you think will work best. The most obvious place to start is with paper.

In order to change the behaviour of staff when reducing and sorting waste in the office, the following thematic activities could be taken into consideration by the organisation (see a more thorough list below):

Procedures

Define how the waste management system functions at the office.

The office has to have an approved waste management procedure (guidance/internal rules) for reducing, reusing and separately collecting (recycling) waste. It can either be a part of the general environmental rules of the office or a separate procedure for waste management.

Communication and training

- Inform and train staff about waste separation for recycling.
- Remind staff about the waste sorting measures regularly (e.g. at staff meetings) concerning all the waste reduction methods that are described above (actions, ideas and tips in terms of investments).
- Display good, eye-catching examples of selective waste collection (e.g. showing the containers).
- Check occasionally if sorting bins for waste exist, incl. those designated for selective collection for paper at individual desks.

Put environmental issues onto the agenda of managerial staff meetings

Monitoring

- Monitor waste generation. Keep track and measure the amount and composition of generated waste;

Feedback

- Give feedback to all staff about reduction efforts (e.g. decreases/increases in waste generated).

Engaging and motivating

- Organise waste-related campaigns within the office (a good way to promote “reduce-reuse-recycle” attitudes).
- Create waste-related competitions for employees.

The following text gives a more thorough overview of possible activities, ideas and tips in terms of changing behaviour related to waste management in the office.

Awareness and Commitment

The key to success is people. In particular, senior management should be committed to educating and encouraging staff to support green practices, including waste separation and collection in the workplace. Here are some tips for involving staff:

- Hold meetings to discuss the importance of waste management practices in the workplace and the correct use of bins and office equipment;
- During the initial stage, it is useful to form an organising committee involving active employees who will be responsible for waste Management-related activities;
- Hold a training session for staff on the committee to ensure they understand the new processes and policies. Make new staff aware of waste management practices;
- Most importantly, put environmental issues onto the agenda of managerial staff meetings; and
- Encourage staff to participate and provide feedback.

Education and Promotion

Hold education sessions and encourage all staff to attend a brief information session about the programme

Promotion is essential to all successful waste minimisation and recycling programmes. Employees will participate if they are well-informed about programmes and their benefits. Possible activities could include:

- Launch the programme. A launch is a positive way to announce the scheme to all staff and provide an opportunity for senior management to show their support;
- Arrange for your chief executive to launch the scheme. Put green office posters up in prominent places. These could highlight good and bad practices or carry a slogan for your office. Circulate a flyer to all staff to publicise the scheme and outline how it is being set up. The flyer should be circulated prior to or at the time of the launch;
- Distribute a memo announcing the start of the programme, signed by the chief executive or a senior manager. Highlight the benefits and explain the co-operative nature of the programme, the separation and collection procedures, and how the materials will be disposed of;
- Descriptions of how the scheme will work should emphasise the simplicity of the scheme and indicate that a small amount of effort, or the re-direction of effort by each staff member can make the scheme a success;
- Hold education sessions. Encourage all staff to attend a brief information session about the programme. These sessions have proved to be far more effective than memos for achieving both higher levels of participation and less confusion over what is and is not recyclable or acceptable. The sessions can be incorporated into a regular staff meeting, and the "do's and don'ts," as well as the benefits of the programme can be explained in detail;
- It is important to maintain follow-up publicity and reinforce the new recycling habit. Quantities recycled, revenue earned, savings in disposal costs, and any problems such as low participation rates can all be highlighted in follow-up memos. Continual reminders and encouragement will help maintain a successful programme;
- Place advertisements about your scheme in your in-house newsletter or staff bulletins (preferably electronic), put up information sheets on notice boards and in other public areas, or send out your own green office newsletter; and

Survey staff on their present attitudes, knowledge and practices regarding recycling and waste minimisation

- A good education programme is essential if your office recycling scheme is to work. A formal education programme is most important in large offices and can be less formal in smaller offices where communication is easier. Education media can include posters, memos, videos, briefings and newsletter articles.

Monitoring and Feedback

Information on how the scheme is progressing can be used to show the rate of progress, suggest better approaches and, most importantly, provide feedback to management and staff. This could be achieved by following the steps below:

- Collect and record the quantities of material being recycled and of recycled products (such as paper) being purchased;
- Produce regular reports for staff highlighting these amounts;
- Note and reward high performance. Also note any differences between sections or groups, but don't "point the finger" or lay blame;
- Survey staff on their present attitudes, knowledge and practices regarding recycling and waste minimisation through interviews and questionnaires;
- Encourage staff to suggest to management further ways to make the office greener;
- Evaluating progress allows success to be measured. An evaluation can be undertaken by providing regular reports to senior management for their information, incorporating recycling and waste minimisation activities and targets into organisational corporate plans, and recording your results in annual reports;
- By getting your green office infrastructure established, then ensuring staff participation and commitment by following the steps in this section, you will have every chance of succeeding with your green office plan.

Performance-related activities, ideas and tips

The first objective of green office waste management is to minimise waste generation, and then to maximize reuse and recycling of generated waste.

REDUCING WASTE – MINIMIZING WASTE GENERATION (THE FIRST OPTION!)

Encourage suppliers to ship material in reusable containers

It makes sense both environmentally and economically not to buy and use items which are unnecessary and which rapidly become waste. There are many products that are designed for single or short life usage which are commonly found in the office or workplace. Examples include non-refillable ball-point pens and marker pens, plastic cups and cutlery, plastic containers for single portions of milk, disposable wiping cloths, paper towels and staples. All these products require raw materials and energy for their production and resources to deal with their disposal. Furthermore, each process produces environmental impacts. In many instances, longer life products can be substituted, sometimes through rediscovered old technologies such as the fountain pen. Sometimes office supplies may be replaced through new products, such as refillable marker pens, or energy efficient light bulbs which last up to 10-times longer than standard bulbs.

Reducing the amount of waste can be achieved in a number of ways. The following activities can be taken:

- Reduce paper use (see "Office Paper" chapter);
- Buy or lease durable and repairable equipment, such as photocopiers, computers, coffeemakers, etc. (extending product life);
- Consider the length and coverage of warranties and service contracts when selecting products;
- Buy products and materials (e.g. coffee, tea, sugar) in bulk to reduce packaging;
- Select products and materials (e.g. cleaning agents, paints, ink) with non-toxic content in large reusable containers to avoid the generation of hazardous waste; and
- Purchase equipment that does not require batteries, such as solar-powered calculators, manual can openers and mechanical pencil sharpeners.

In addition, several organisational changes may enable longer life for products, such as using real ceramic mugs instead of disposable cups.

Although much can be done to minimise waste and encourage reuse at an individual or departmental level, there are instances where the purchasing strategy of the whole organisation needs to be considered. Procurement policy will most probably form a part of a broader environmental management system (including the purchasing policy) of the organisation. Read more about purchasing policies in the "Sustainable and Green Procurement" chapter.

REUSING WASTE - SWITCHING FROM DISPOSABLES TO REUSABLES

Many products that we use in an office can be re-used. The following activities could be undertaken:

- The simplest example would be reusing paper. Set up an office paper reuse and recycling scheme (re-use paper from misprints and drafts as scrap paper in the office). Read more about paper reuse in the "Office Paper" chapter;
- Packaging boxes can be re-used many times. We can minimise the waste coming from wrapping materials (avoiding foil and cellophane) and reuse old boxes for postal packets;
- Ship your office's materials in reusable/reused packaging;
- Encourage suppliers to ship material in reusable containers;
- Use reusable envelopes for inter-office mail;
- Refill printer and toner cartridges;
- Buy mechanical pencils and refillable pens;
- Use reusable tableware (mugs, silverware, plates) instead of disposable;
- Buy reusable filters for coffee machines;
- Use cloth towels for kitchens and bathrooms;
- Buy used or refurbished materials (e.g. furniture and textiles) where possible; and
- Donate food, furniture and other materials to local organisations, such as homeless shelters, charities and reuse centres.

RECYCLING WASTE - SETTING UP A SUCCESSFUL OFFICE RECYCLING SCHEME

It is useful to develop a standardised waste collection scheme (including the design and number of collection containers) for the whole organisation

The essence of a successful office recycling scheme is simple - source, separate and collect together a sufficient quantity of a particular type of waste material and find a merchant to take it away for reuse or recycling.

According to legislations, it is mandatory to collect hazardous waste and WEEE separately. Therefore, hazardous waste (incl. batteries, paper waste, chemical waste, Hg-lamps etc.) should be collected separately in all offices. The waste streams that should also be selectively collected in offices are as follows:

- Paper waste (e.g. office paper, newspaper, paper and cardboard packaging)
- Packaging waste (incl. deposit packaging if such a system exists)
  - plastic (e.g. plastic bottles, containers)
  - glass (mainly glass packaging)
  - metal (e.g. aluminium cans, foil, tin cans, and bottle caps)
- Biowaste (mostly food waste) – if possible (if the area has a separate biowaste collecting system).

It is best to use a gradual approach when initiating an office waste recycling scheme. The easiest way to begin is to establish an office paper-recycling scheme first.

However, there are often problems to be overcome in practice. For example, the organisation renting the office space may have no voice in the design of the office building waste collection system. In some areas there are only limited opportunities for recycling certain waste types. Therefore, it is essential to carefully evaluate (do an initial review of) the possibilities for collecting and recycling certain waste streams.

It is useful to develop a standardised waste collection scheme (including the design and number of collection containers) for the whole organisation.

In order to show a good example of recycling, purchase office supplies manufactured from recycled materials.

Environmental Performance Indicators

- Generated total waste or specific waste stream or hazardous waste (kg/year).
- Generated total waste or specific waste fraction (e.g. paper) per employee (kg/year).
- The share of recycled waste or a specific waste fraction (% per year or share of recycled waste to total waste generation).

Generated total waste or specific waste stream or hazardous waste	kg/year
Generated total waste or specific waste fraction	kg/year
The share of recycled waste or a specific waste fraction to total waste generation	% / year

Sustainable transport and mobility

Transport and Mobility

Perhaps 20% of Europe's citizens suffer from health-impairing levels of noise

There is common agreement that the environmental impacts of transport should be reduced. Greenhouse gas emissions from traffic are set to increase if current trends continue. Air quality hotspots remain an issue, despite substantial reductions in vehicle tailpipe emissions. Perhaps 20% of Europe's citizens suffer from health-impairing levels of noise.

The aim of this section is to encourage an increase in company awareness of the need to act to reduce environmental impacts caused by increases in motorised traffic in the urban environment. Business has an important role to play in promoting sustainable transport. In the following section we provide you with guidance on how to support sustainable transport in many areas of your business to improve your environmental performance. Being aware of the current environmental impacts of transportation will help to prioritise where improvements can be made.

The transport sector (particularly cars) is one of the major emitters of greenhouse gases. There are a number of other environmental problems associated with transport, including:

- Pollution from engine exhaust gases (nitrous oxide, carbon monoxide and fine particles) which reduces air quality and affects human health, plants, animals and habitats
- Loss of land and habitats from the construction of transport infrastructure - such as new roads, railways and runways
- New roads and other structures can interrupt natural water courses and cause flooding
- Run-off from roads may include pollutants such as fuel oils and seasonal road treatments that pollute nearby local water courses
- Noise from aircraft, rail, traffic and industry can be a nuisance. For example, one person taking a return flight between Europe and New York is responsible for the generation of between 1.5 and 2 tons of CO^2. This is approximately the same amount of Carbon that an average European emits at home for heating and electricity in the course of one year.

Certification and Labelling

UK Fuel Economy Label

The Low Carbon Vehicle Partnership's voluntary label shows how much carbon dioxide a vehicle emits and relates that figure to the vehicle tax that must be paid.[100]

Management-related activities, ideas and tips

MULTIMODAL ACCESS MAP

A Multimodal Access Plan is a detailed, integrated plan for public transportation, vehicular, bicycle and pedestrian access throughout the company.

THE GLOBAL FUEL ECONOMY INITIATIVE AND 50BY50

"The Global Fuel Economy Initiative (GFEI) is a partnership of four organizations – IEA, ITF, UNEP and FIA Foundation – which seeks to promote the potential of a substantial but attainable improvement in vehicle fuel economy as a contribution to the debates on how we might climate change, energy security and more sustainable mobility on a global basis.

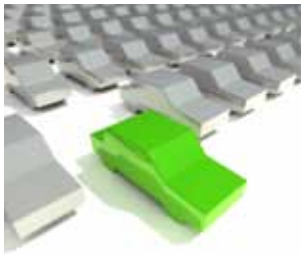
The GFEI works with countries to develop an appropriate national approach and supporting target for improved car fleet fuel economy, while working toward a global stabilization of emissions from the road transport sector by 2050."[101]

FISCAL TAX

Many European countries have implemented measures about the reimbursement of public transportation fees. Your company should check the local and national legislation.

A company can allocate preferential parking bays for the following users of transportation:

- Cyclists
- Car-sharers
- Clients and visitors



In order to encourage employees to use other transportation alternatives than cars, the company can charge employees for the use of parking bays. Exceptions can be made for the following employees:

- Those who car-share
- Those who use their cars for professional trips
- Those who have physical disabilities
- Those who are in difficult social circumstances

Teleworking, allows employees to work at home one or more days per week

TELEWORK

Telework, also known as Teleworking, allows employees to work at home one or more days per week using communication tools such as phone, Internet, fax or teleconferencing and to undertake work from a remote location.

Telework contributes to a greener environment by decreasing vehicle carbon emissions as a result of avoiding employee commuting.

Telework increases personal freedom and flexibility, thereby improving morale and decreasing stress.

Telework accommodates persons with disabilities.

TELECENTRE

A telecentre is a place where people can access computers, the Internet and other digital technologies.

A company can consider using a telecentre in the cases where the company is not accessible by public transportation or when employees live far from the company.

Purchasing criteria

If the use of cars is unavoidable, the company may consider purchasing greener cars for employees. The following elements should be taken into consideration when selecting and purchasing vehicles:

- The vehicles should be in compliance with EURO norms; preferably those regulations issued after 2005;
- The cars should consume less fuel and thus emit less CO;
- The company should verify the energy consumption of motorcycles;
- Buy LPG hybrid cars and electric cars (even if they are more expensive). Financial support schemes for purchasing eco cars exist in most European countries.

CARBON OFFSET

Carbon offsets are measured in metric tons of carbon dioxide-equivalent (CO2e) and may represent six primary categories of greenhouse gases. The categories include: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), perfluorocarbons (PFCs), hydroflourocarbons (HFCs), and sulfur hexaflouride (SF6). One carbon offset represents the reduction of one metric ton of carbon dioxide or its equivalent in other greenhouse gases.

Offsets are typically achieved through financial support for projects that reduce emissions of greenhouse gases in the short- or long-term. The most common project type involves the use of renewable energy (such as wind farms, biomass energy, or hydroelectric dams). Others include energy efficiency projects, the destruction of industrial pollutants or agricultural by-products, reduction/use of landfill methane and forestry projects. Some of the most popular carbon offset projects from a corporate perspective are energy efficiency and wind turbine projects.

Performance-related activities, ideas and tips

LOCAL TRIPS: FROM HOME TO WORK

A company can develop an employee mobility programme to promote the use of alternatives to the car. Long-term measures can be introduced to encourage additional use of public transport, bicycles, car-sharing and eco-friendly vehicles.

- Financial incentives as alternatives to providing cars

Through financial incentives the company can influence the mobility behaviour of employees. Here are some suggestions for financial incentives:

- Partially or totally reimbursing public transportation expenses.
- Providing a bonus for cyclists and walkers.
- Using park and ride schemes.
- Implementing a "parking-cash-out" scheme (a method of paying employees who don't drive to work the amount paid to drivers as a parking subsidy).

ECO-DRIVING

Different tips and examples of good practice exist that can help drivers to reduce car energy consumption by 20 to 40%.

Your company can organize Eco-driving training courses for employees.

Here are some fuel-efficiency driving tips to save money on fuel use and reduce the greenhouse gas emissions of cars.

Eco-driving reduce car energy consumption by 20 to 40%

- Change gears appropriately. The driver is advised to shift up as soon as possible to a higher gear when reaching 1800-2500 revolutions per minute (RPM) for petrol-fuelled cars or 1500-2000 for diesel fuelled cars.
- Drive smoothly. Braking, and accelerating back up to full speed uses more petrol than driving at a consistent speed.
- Switch off the engine during short stops. Minimise fuel wasted during idling by turning off the engine whenever the car is stopped or held up for an extended period of time (even as little as 30 seconds). Having the engine switched off even for a short period will save more fuel than is lost from the burst of fuel used in restarting the engine.
- Service vehicles regularly. Keeping the vehicle well tuned will mean it is operating at its most efficient, which means it will use less petrol.

LONG DISTANCE TRAVEL

Avoid unnecessary business travel in favour of tele- and videoconferences.

If travel cannot be avoided, modes of travel with lower GHG emissions (CO_2 equivalents per kilometre) should be encouraged.

- Train: encourage employees to use trains for shorter trips since, for the same distance travelled, one third of the GHG emissions are emitted compared to flying.
- Car: encourage car-sharing. The type of car also has an influence.
- Plane: If flying remains the only option, the company can have a lower environmental impact by making specific choices. The class you choose to fly has an impact on emissions. First class and business travel generate three and two times respectively as many GHG emissions as flying in economy class due to space allowances in the aircraft. Direct flights should be preferred as a higher number of take-offs and landings increase emissions.

Environmental Performance Indicators

Home to work travelling	
Car	km
Public transport	km
Bike/foot	km

Company cars	
Car	km
Fuel	l/km

Office Best Practice Examples

ZURICH INSURANCE GROUP[102]

Zurich is an insurance-based financial services company providing investment, protection, pensions and insurance for employers, business and personal customers and brokers.

Zurich seeks to reduce the impact of commuter and business travel as well as car parking pressures at its sites. To start the process, staff travel surveys were conducted. The survey revealed that many employees had difficulties in travelling to work due to congestion, parking and public transport reliability, so there was significant scope for improvement. A mix of company-wide and local measures was needed to create successful travel plans.

The company took several measures to improve its accessibility. A free bus provides a direct transport link between different company sites. For those travelling to the office from locations further away, taking the bus is not a feasible alternative and car sharing therefore played a central role and was promoted through the company's intranet and notice boards. Additionally, staff can access software which allows them to find suitable car sharing partners. Car sharers are rewarded with preferential parking spaces and are supported by guaranteed rides home (the company pays the cost of a taxi if the employee has no other way to get home).

A new car parking management system was introduced at some sites to prioritise access for those in need of a car parking space.

The company runs free shuttles and buses between many of its sites and local railway stations. As an incentive for staff to use buses, Zurich has offered a discounted Travel Pass Scheme which enables employees to get an interest-free Season Ticket Loan which enables travel on local public buses in the evenings and weekends, as well as for work.

Video conferencing has been particularly popular between Zurich's sites and has helped to significantly reduce regular trips between corporate centres.

- The use of audio and video conferencing has reduced annual business mileage by over a million miles, with fuel cost savings of £122,000 and creation of an extra 17,000 working hours.

A carbon offset is a reduction in emissions of carbon dioxide or greenhouse gases made in order to compensate for or to offset an emission made elsewhere.

Creating healthy office environment

Indoor Air Quality

The air in our homes, schools and offices can be 2 to 5 times more polluted than outdoor air

The goal for indoor climate control is to provide comfort and well-being, and prevent illness and negative health effects. In Europe, we spend an average of over 80% of our time indoors, be it at home, school, work or on public transport. Indoor air quality [IAQ] has a significant impact on our health, the extent of which depends on both indoor and outdoor air pollution. Outdoor air pollution is important mainly because indoor air is linked to outdoor air via ventilation[103].

Health and environmental organisations view indoor air pollution as one of the greatest risks to human health. These pollutants come from activities, products and materials we use every day. The air in our homes, schools and offices can be 2 to 5 times more polluted, and in some cases 100 times more polluted than outdoor air. Therefore, it is essential to reduce noxious emissions present in building materials as well as in all cleaning products, soft furnishings and floor coverings[104].

The potential economic impact of indoor air pollution is high, and is estimated in the tens of billions of Euro per year for Europe alone

Poor IAQ is the result of mounting air pollution, both inside and out, from either biological or chemical substances. Chemical emissions are the most harmful, since they can contribute to a wide range of health problems. For example, asbestos is still found in many old buildings, and if inhaled, can harm lung tissues and cause tumours (asbestosis). Moisture and mould problems increase the risk of respiratory disease in children and adults by 50% by releasing biological agents indoors such as viruses, germs, fungus and their spores. Dust is also an important component, since it can be either organic or inorganic and help bind chemical elements to surfaces. Finally, poor IAQ is also the result of poor circulation caused by buildings too tightly sealed and insulated and inadequate ventilation.

Some symptoms that have been observed in people working in unhealthy offices include irritability, drowsiness, increased sensitivity to chemicals, eye and nasal irritation, dry skin and difficulty concentrating. Often referred to as Sick Building Syndrome (SBS), none of these symptoms contribute to make a productive workplace, especially in non-industrial buildings like offices and educational buildings. SBS can lead to increased sickness and chronic illnesses.

The potential economic impact of indoor air pollution is high, and is estimated in the tens of billions of Euro per year for Europe alone. Such impacts include direct medical costs and lost earnings due to major illness, as well as increased employee sick days and lost productivity. Remember that labour costs alone are estimated to be 10 to 100 times higher per square meter of office space than energy and other building-related maintenance costs. (SINTEF Energy Research)[105].

As we see IQA has a significant connection with health at workplace. For more information please read the "Health and Safety" chapter as well.

EUROPEAN LEGISLATION AND OBJECTIVES

- EC Directive on Dangerous Substances (EC REACH regulation 2006/121/EEC; 76/769/EEC).
- EC Building Directive on Construction Products (Regulation (EU) No 305/2011).
- EC Directive on Gas Appliances (2009/142/EC), EC Directive on Heating Appliances (92/42/CEE), EC Eco-Design Directive (2005/32/EC).
- EC Directive on Energy Performance of Buildings.

The new EC Directive on the Energy Performance of Buildings requires the characteristics of the indoor environment to be taken into account. Therefore, decreasing indoor environmental quality may not fulfil energy performance requirements.

Certification and Labelling

Establishing legally-binding concentration-based standards for indoor air quality explicitly requires specific enforcement methods, including compliance testing. However, this poses difficulties for the use of indoor exposure standards as a means of reducing air pollutant effects on health. Furthermore, routine workplace monitoring is unlikely to be widespread, and the application of measures to enforce standards is often not feasible or at least difficult.

The IAC certification approach by Euro fins (Indoor Air Comfort) labelling and classification of a product based on the results of emission testing) grants a certificate only on the basis of an emission testing and auditing programme. Any IAC labelled product meets legal standards within the EU. Specifications for building materials and furniture with respect to certification and labelling with Indoor Air Comfort or Indoor Air Comfort Gold are covered by the following:

- Textile floor coverings (according to EN 14041);
- Resilient floor coverings (according to EN 14041);
- Wooden floorings;
- Insulation materials (EN 13162 to EN 13171);
- Gypsum boards (EoNh 520);
- Adhesives, levelling compounds, primers, sealants, sealing
- Other building materials; and
- Furniture

Regularly service the HVAC in order to optimise the performance

Management-related activities, ideas and tips

It is important to encourage communication between employees and building managers and operators, and raise their awareness about indoor pollutants through leaflets and Internet sites. It is also the best way to keep indoor environments safe, because even with frequent inspections, complaints from staff are often the first indication of a problem concerning IAQ or thermal comfort. Complaints should be addressed before they become serious. Odours are often an excellent indicator of potential problems.

MINIMISE CHEMICAL POLLUTANTS

- Ban smoking in all enclosed workplaces to limit the thousands of indoor pollutants at high concentrations contained in tobacco smoke.
- Choose low-emitting VOC products that have been certified and labelled by reputable organisations such as IAC certification through Eurofins. Be wary of manufacturer claims of “no VOC”, “natural” or “alternative.”
- Minimise the use of harsh or solvent-based cleaners, and cleaners with strong fragrances.
- Certain activities, such as paint stripping, hobby soldering or gluing, painting, sanding and rock polishing may create high levels of pollution and should be performed outside.
- Control car and appliance emissions. Do not idle cars or other engines in garages, especially in garages that are attached to the building. Restrict the construction of attached garages, or isolate them from living and working spaces.

KEEP IT CLEAN

- Install door mats at doorways to minimise dust and dirt tracked in from outdoors, and regularly change air filters.
- Use high efficiency particulate air (HEPA) vacuum cleaners and microfiber cloths for surface dust removal.
- Clean frequently to reduce indoor contaminant build-up, especially from dust accumulation.
- Regularly service the HVAC in order to optimise the performance.

CONTROL MOISTURE

- Limit condensation and the development of moulds and dispose of or avoid materials that quickly absorb large quantities of steam (clay coated with lime, plaster panels, etc.) if they are in contact with a damp atmosphere. Once they dry, these materials reintroduce pollutants into the environment.
- Control relative humidity levels to less than 60 percent, using dehumidifiers if necessary. Frequently clean humidifiers.
- Since it is impossible to eliminate mould spores, the best way to reduce the impact of mould on indoor air quality is to prevent or promptly repair the moisture problems that enable mould growth.
- Promptly repair all leaks.
- If there has been a flood or water damage, take immediate action and remove the water and wet materials. Dry all porous materials and furnishings within 48 hours. If mould grows on any porous materials, such as drywall, ceiling tiles or wood, then remove and replace.
- Plants can improve indoor air quality by filtering carbon dioxide; however, if they are over-watered, this may also encourage mould growth.

Open doors and windows when temperature and humidity levels permit it

ENSURE PROPER VENTILATION

- Open doors and windows when temperature and humidity levels permit it, and be aware of outdoor allergens during spring and fall. However efficient, natural ventilation relies on employees for manual opening and closing. The efficiency of this system may diminish over time as employees' attention wavers, resulting in poor indoor ventilation.
- In normal comfort ventilation systems, filters and the ducts seem to be the most common sources of pollution, especially odours. Residual oils are the dominating source of pollution in new ducts, while growth of microorganisms, dust and debris accumulated in the ducts during construction (mostly inorganic substances), and organic dust accumulated during the operation period can also be sources of pollution.
- Make sure that mechanical filters are in place, that they fit well, and that they are periodically changed according to the manufacturer's instructions.

ENSURE PROPER MAINTENANCE OF THE HVAC

HVAC systems must be designed, operated and maintained to meet required standards and avoid air pollution as a result of poor maintenance. It is a requirement in all European countries to take all reasonable steps to prevent leakage of refrigerants by installing fixed gas detectors in new and existing installations.

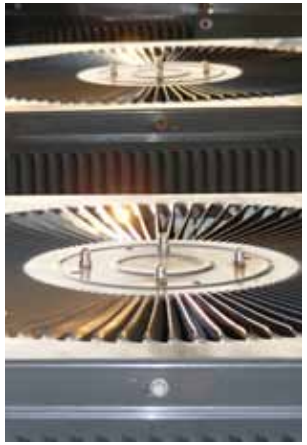
Refer to:

- European Community Regulation (No 2037/2000) on Ozone Depleting Substances
- European Standard (EN378) - Refrigerating Systems & Heat Pumps-Safety & Environmental Requirements
- F-Gas Regulation (EC No.842/2006 - EC Global Warming Response USA: ASHRAE 15 and Unified Mechanical Code 1994)

MANDATORY MAINTENANCE AND INSPECTIONS

Help avoid gradual deterioration of the equipment, the accumulation of its risks, and ensure that safe operation requirements are met through their lifetime by maintaining a regular maintenance and inspection schedule.

Performance-related activities, ideas and tips



Provide natural ventilation through a combination of automatically opening windows and high level shutters or blinds

It is important to seek proper professional evaluations and advice to ensure a healthy environment, a rational operation and adequate automation. Solutions should meet user demands and requirements, and include adaptive solutions that will provide a satisfactory indoor environment with minimum energy consumption.

The system should:

- Be easy to operate;
- Be easy to understand;
- Correspond to users' needs;
- Make it possible for each user to satisfy his/her personal preferences;
- Give an immediate response;
- Return to a default setting after a certain period, after having been adjusted by users;
- Not only be based on user participation. Natural ventilation systems, based on users' participation and intervention have proven that even engaged people cannot be depended upon to regularly contribute as time goes on;
- The automation itself should not cause problems; and
- Ensure interaction between ventilation, heating and cooling systems.

MAXIMISE NATURAL VENTILATION

- Install windows that open so one can naturally ventilate all occupied areas in the office.
- Provide natural ventilation through a combination of automatically opening windows and high level shutters or blinds (such as in an atrium) to provide cross flow and stack ventilation, thus encouraging natural air flow through the building. Working in conjunction with an external weather station, windows and louvers can be controlled by temperature and CO_2 sensors.
- Where there are air intakes serving an occupied area, avoid major sources of external pollution and recirculation of exhaust air.
- Investigate the possibility of installing exterior protection from the sun, such as louvers and awnings.

VENTILATION SYSTEMS

Different ventilation strategies, natural, mechanical and hybrid systems might have a significant influence on energy use. Nevertheless, it is important to realistically evaluate the entire system and the indirect effects on building design. Natural and hybrid systems are often claimed to use less energy than mechanical solutions, but they demand larger rooms and more building materials. Such systems may even cause greater heat loss than other systems. In order to ensure a healthy indoor environment, without unnecessary strain on the environment, the entire system should be analysed.

It is a challenge for the different professions to create a healthy environment when a building is refurbished or rebuilt. When buildings are refurbished or rebuilt, both the environment and a healthy indoor environment must be taken into consideration.

PROVIDE HVAC (HEATING, VENTILATION AND AIR-CONDITIONING) SYSTEMS

In the case of mechanically ventilated and air conditioned building, fresh air should be provided at 12 l/s/person

- In the case of mechanically ventilated and air conditioned building, fresh air should be provided at 12 l/s/person[5].
- Apply computational fluid dynamics and thermal modelling to ensure (prior to construction or renovation) that proposed natural ventilation and cooling strategies would perform acceptably.
- An outside air economiser, which brings outside air in for cooling when it is cooler than the air inside, can be integrated with existing HVAC systems. Alternatively, operable windows are even better because they save energy and bring fresh air inside. Windows will perform better in an ideal climate, meaning the climate is cool enough outside so that it can be used frequently and in the evening for pre-cooling. Even including the extra equipment and control systems, the potential savings from this "free cooling" can be significant. One can obtain a return on their investment in 2 to 5 years.
- Mechanical ventilation systems with good filtration can control dust levels. Some additional air filters, such as electrostatic systems or ion generators, may be used as standalone or integrated elements of the system. If these additional air cleaners are used, make sure they are certified according to European legislation and current minimal ozone release standards.
- The positive effects of HVAC systems are mostly gained through the filters, reducing indoor ozone concentration and levels of potentially harmful oxidation products.

NB! Please see additional information in the "Energy Consumption" chapter.

[5] **Per occupant air flow rate:** *the volumetric flow rate is divided by the number of occupants in a space to give a flow rate for each occupant. This is commonly expressed in terms of litres/second for each occupant, i.e. l/s.p.*

ELIMINATION OF INDOOR CONTAMINANTS

Using green furniture can reduce this indoor pollution

- Prevent outdoor contaminants from entering the building. Ensure sufficient air exchange through good ventilation. No matter how hard one tries, there will always be indoor air pollutants. It is important that they can escape from the building.
- Choose low-emission materials, furnishings, and equipment to reduce Volatile Organic Compounds (VOCs) and other contaminants. Buy products that contain low or no formaldehyde, trichloroethylene or benzene.
- Using green furniture can reduce this indoor pollution.
- Avoid using difficult-to-maintain materials with the usual high risk of dust accumulation, such as carpets.

NB! Please see additional information in the "Office Furniture" chapter.

DISPOSE OF CONTAMINATED FURNISHINGS AND PREVENT SORPTION

Some furnishings, especially upholstered furnishings like chairs and partitions, can absorb air contaminants and re-emit them later (processes known as sorption and desorption). Overly contaminated materials, such as mouldy insulation or fabrics that have absorbed smoke or cleaning solvents should be removed from the environment. New furnishings should be well wrapped during transportation to prevent sorption.

INTEGRATE PLANTS

Plants can be integrated into the office to reduce airborne pollutants and improve the quality of the indoor environment. Put air cleaning plants in your office, such as these varieties: Peace Lily, Dracena, Mother-in-Law's Tongue, English Ivy, Chinese Fern and parlour palms. If you have more light, then choose spider plants or flowering plants (e.g. chrysanthemums or azaleas)

Environmental Performance Indicators

IAQ Standards and Guidelines

The privacy of most indoor spaces makes enforcing indoor air quality standards very difficult. Ensure that ventilation dilutes predictable indoor emissions below the guideline levels.

Indoor Pollutant Guidelines

For the high priority pollutants such as "ETS, formaldehyde, CO, particulates (PM2.5 and PM10), NO2, benzene, naphthalene, moulds and mites, dampness/moisture, CO2 (measure for ventilation) and radon" monitor every 3 or 5 years. [106]

Consult the guidelines for selected indoor chemicals and establish targets at which health risks are significantly reduced. Refer to standards set by the World Health Organisation (WHO)[107].

In conclusion, standard sampling and analysis methods are available for most indoor air pollutants, and ensure that there are no major sampling and analytical constraints hampering assessment by indoor air sensors. The use of the existing ISO 16000-series (CEN-ISO, 2001, 2004, 2006a-c) certification should be encouraged[108].

Plants can be integrated into the office to reduce airborne pollutants and improve the quality of the indoor environment

IAQ Human Criteria Evaluation

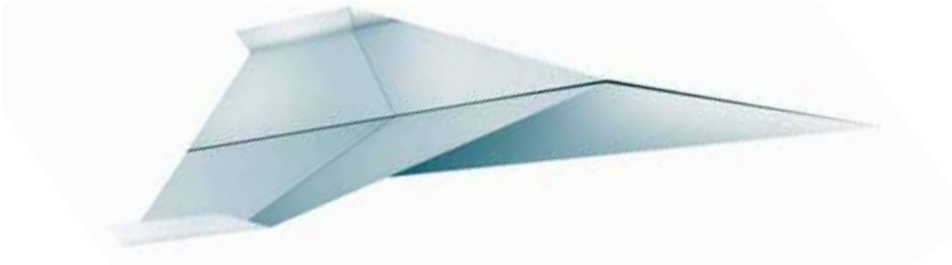
The evaluation of human criteria for IAQ can be established at three different levels of response:

- Behavioural (task performance, self-estimated performance and observed spontaneous behaviour)
- Subjective perception (acceptability, satisfaction, whether air quality has positive or negative effects, and description of odour type and character)
- Physiological (self-evaluated intensity of health symptoms, and objective measurements such as blinking rate, breathing pattern, measurements of metabolic rate and level of activation (amount of activation)
- A multi-disciplinary approach includes the evaluation and planned management of future risks to IAQ, such as the possible implications of climate change

Humidity Guidelines

Indicators of dampness and microbial growth include the presence of condensation on surfaces or in structures, visible mould, perceived mould odour, and a history of water damage, leakage or penetration. The following can indicate indoor environmental problems:

- During winter, is there condensation on the middle of the inside of double-glazed windows?
- Is there discolouration or dark spots on external walls (e.g. behind bookshelves) and cabinets (which are placed close to the external wall)?
- Do staff and visitors smell mould in the office?
- Do staff experience constant respiratory symptoms or dry mucous membranes?



Thorough inspection and, if necessary, appropriate measurements of excessive spore levels, cell fragments, allergens, mycotoxins, endotoxins, β-glucans and volatile organic compounds can be used to confirm indoor moisture and microbial growth and indicate any potential health hazard.

As the relationships between dampness, microbial exposure and health effects cannot be precisely quantified, no quantitative, health-based guideline values or thresholds can be recommended for acceptable levels of contamination by microorganisms. Instead, it is recommended that dampness and mould-related problems be prevented[109].

Office Best Practice Examples

AIR QUALITY AT AUDUBON HOUSE

Audubon House in New York undertook a total retrofit of its offices a few years ago, using only green products. Employees are now so comfortable that they arrive at work earlier, and often stay late. They are also keeping their desks neater.

Employees will find that they are not only more comfortable without the emissions from traditional office furnishings, but can take some pride in working for a company that is environmentally-conscious - a good corporate citizen. Because consumers are becoming more aware of the steps we can all take to conserve and protect the planet's resources, it is encouraging to know that one's employer is also taking steps to go green.

Life-Cycle Cost (LCC) Evaluation by Upgrading Indoor Air Quality in an Office Building, performed by P. Wargockia and R. Djukanovica[6]

The objective of the evaluation was to compare life-cycle costs (LCC) of upgrading IAQ in an office building with the resulting revenues from increased office productivity. The LCC demonstrated that improving air quality is highly efficient. Office productivity benefits much higher than investment can generally be recovered in no more than 2 years

Office productivity benefits up to 60 times higher than investment can generally be recovered in no more than 2 years

Based on the above calculations, improving air quality from the "mediocre" level (50% dissatisfied) to the "excellent" level (10% dissatisfied) will for example, in a small-sized office building with 100 employees, result in an annual increased revenue of approximately $100 000 over a period of 25 years. The results also showed that similar economic benefits can be obtained in different climatic zones.

[6] **Consult:** *"Estimate of an Economic Benefit from an Investment in Improved Indoor Air Quality in an Office Building"*

Health and Safety

Any kind of investment into health and safety at a workplace pays off with the better health and wellbeing of staff

Although working in an office has always been considered relatively safe, office workers face occupational hazards such as eye strain, overuse syndrome, headaches, trips and falls, manual handling injuries and work-related stress. These potential hazards and risks can be avoided by taking simple precautions.

This chapter describes the basic principles for organising healthy and safe work conditions (office environment, work organisation and basic occupational health and safety issues) in offices.

The office environment is a combination of lighting, temperature, humidity and air quality. In addition, design of work place, work organisation (work practices/work load, rest breaks), worker awareness and information, as well as safety preparedness play important roles. The office can be a healthy and comfortable place to work if the correct combination of these elements is maintained.

Any kind of investment into health and safety at a workplace pays off with the better health and wellbeing of staff, and therefore, also higher work productivity. More specifically, there is growing evidence that occupational health care, while primarily targeting the prevention of harmful effects from work, also has a positive economic impact at both the national and company level. Thus, occupational safety may be regarded as a productive factor rather than an economic burden.

EUROPEAN LEGISLATION AND OBJECTIVES

In Europe, the framework for occupational health and safety is now largely based on legislation. The 1989 European Framework Directive on Safety and Health at Work (Directive 89/391 EEC) was a substantial milestone in improving safety and health at work. This directive establishes minimum safety and health requirements (tasks, methods and structures) throughout Europe. However, Member States are allowed to maintain or establish more stringent measures. In spite of harmonisation efforts, there may still be variations between national laws and practices. While some countries require comprehensive health and safety provisions for all employees, some others require coverage for only those "in need."

Among other possible risks, the electrical and fire safety of office buildings is strictly regulated in the EU. The EU has harmonised standards for electrical equipment and installations as well as for building fire safety. The technical level is regulated by EU regulations and standards; however, the organisational level is usually governed by national legislation.

Information about current European legislation concerning occupational health and safety at work can be found here:

- European Directives[110]
- National laws implementing the Framework Directive[111]

Certification and Labelling

The most utilised document concerning health and safety standards is OHSAS 18001.

OHSAS 18001 is an international occupational health and safety management system specification that has been developed to be compatible with ISO 9001 (quality) and ISO 14001 (environmental) management system standards. Should organisations desire, ISO 9001 and 14001 facilitate the integration of quality, environmental and occupational health and safety management. These standards specify requirements for an occupational health and safety management system enabling an organisation to control its occupational health and safety risks and improve its performance.

International Labour Organisation (ILO) Guidelines - ILO-OSH 2001 provides a unique international model compatible with other management system standards and guidelines. However, it is not legally binding, and not intended to replace national laws, regulations and accepted standards. It reflects the ILO's values such as tripartism and relevant international standards including the 1981 Occupational Safety and Health Convention (No. 155) and the 1985 Occupational Health Services Convention (No. 161). Its application does not require certification, but it does not exclude certification as a means of recognition for good practice if this is the desire of the country implementing the Guidelines.

There are many standards for the classification and testing of the electrical and fire safety of products and building materials. The classification system for building materials is known as EUROCLASSES. EUROCLASSES is a rather complicated system of ratings for characteristics and properties of materials and components applied to give architects and builders accurate information about the materials they intend to incorporate into the design and construction of a particular project or building.

Management-related activities, ideas and tips

There are several management/organisation related measures to consider before undertaking concrete practical activities in terms of health and safety in the office. One of the measures is to develop a corresponding procedure. The office should have an approved occupational health and safety procedure (guidance/internal rules) for creating a healthy and socially balanced working environment.

In addition to technical solutions, "soft" activities are also essential in order to guarantee workplace health and safety

In addition to the approved procedure, the office must assign a few responsible persons from the staff:

- a working environment specialist for coordinating all the H&S related work
- a working environment deputy to represent staff and their complaints

Besides supplying the office with ergonomic, safe and well-maintained technical facilities, the so-called human factor is also very important (e.g. poor handling of office equipment might cause major health problems). Therefore, in addition to technical solutions, "soft" activities are also essential in order to guarantee workplace health and safety. Soft activities include everything concerning communicating and training the staff (e.g. employees should be regularly informed about their health risks at workplace, incl. fire and emergency situations, the need to take a 10 minute pause every hour to stretch the body and relax the eyes, etc.). Also, the actual performance of the 'human factors' of staff should be checked time to time.

Some of examples of soft activities include:

- New staff should immediately be informed about the health risks at the workplace;
- All employees should regularly be reminded about work-related risks and given suggestions and good tips for improving their health and safety (e.g. tips for using equipment safely and ergonomically);
- Giving an opportunity for all staff and promote to make suggestions concerning improving health and safety in the office.

Health and safety in the office is tightly connected to the systematic risk assessment process consisting of well-defined steps that can be linked to the problem-solving process. To summarise, the health, well-being and safety of people at work can be achieved through a combination of:

- Creating an action plan for promoting health and safety in the office with the direct involvement of employees;
- Assigning responsible persons from staff whose duty it is to organise and implement the activities described in the above-mentioned plan;
- Improving the organisation of work and the working environment;
- Promoting active participation of employees in health activities. Compensation for the cost of health activities – at least partly – should be considered by an employer (e.g. costs for yoga classes, gym etc.);
- Encouraging personal development;
- Organising regular external health inspections for all staff, e.g., every 2 years these should be carried out at the employer's cost (minimum of every 3 years). In addition to the results of analyses, this shows commitment and care from the organisation towards its staff.

The office should define several indicators to monitor and evaluate health and safety performance periodically. For instance, indicators could be: number of accident / injuries reported by cause, number of illness days per year, number of staff complaints related to health and safety issues per year, etc. Also, feedback should be being given to all staff about the efforts concerning /situation of health and safety-related issues in the office (e.g. once a year).

The office should have measures to engage and motivate staff to actively participate in health-related issues (e.g. organising specific health and safety-related campaigns and competitions for employees).

Rest breaks and exercises – could be promoted daily by a selected staff member

Break repetitive work with non-repetitive tasks or exercises and/or rest break

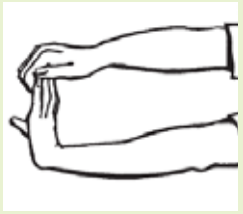
The key to preventing overuse injuries is to break repetitive work with non-repetitive tasks or exercises and/or rest breaks. Workers need to move around and reduce the effects of fatigue by doing different tasks. Frequent short breaks are most effective at relieving the strain associated with keyboard work. During those breaks, employees should walk around and perform whatever movement relieves the feeling of muscle fatigue. Movements that are a natural response to fatigued muscles such as shrugging the shoulders are generally the most effective.

A particularly useful method of relieving muscle fatigue is to occasionally alter posture. Change from the recommended posture for short durations. Some chairs have a forward tilt control that allows the worker to sit forward and can sometimes help reduce fatigue to the muscles of the forearm, neck and shoulders. Monitors can cause tired and sore eyes and eyestrain. Reduce strain by taking short rests by looking into the middle distance, or if necessary, close the eyes and cover them with one's hands without pressing and breathe deeply.

SOME SIMPLE EXERCISES:

The following exercises should be done before commencing work and after (lunch) breaks. The benefit of these exercises is best achieved by a gentle stretching action over periods of at least 30 seconds.

Bend your wrist and fingers with your other hand, bending your elbow slightly at the same time, until you feel the stretch over the back of your forearm. Hold the position for 30 seconds.



Stretch your arm out in front of you with your elbow straight, palm facing away from you (fingers pointing up or down). Then with your other hand, pull your fingers backwards until you feel the stretch over the front of your forearm. Hold the position for 30 seconds.

Tuck your chin down onto your chest and gently turn your head from side to side, keeping your chin on your chest. Do this ten times.

Turn your head slowly from side to side ten times.

Tall stretch:

Interlock fingers, palms up. Stretch arms above the head until they are straight. Do not arch the back.

Toe-in, toe out:

Place feet shoulder-width apart, heels on the floor. Swing toes in, then out.

Shoulder roll:

Roll the shoulders – raise them, pull them back, then drop them and relax. Repeat in the opposite direction.

Side stretch:

Drop left shoulder, reaching left hand towards the floor. Return to starting position. Repeat on right side.

Back curl:

Grasp shin, lift leg off the floor. Bend forward curling the back with nose towards the knee. Note: This exercise should be avoided in pre- or post-natal conditions.

Ankle flex:

Hold one foot off the floor, leg straight. Flex ankle (pointing toes up) and extend (pointing toes toward the floor). Repeat with other leg.

Leg lift:

Sit forward on the chair and place feet on the floor. With a straight leg, lift one foot a few centimetres off the floor. Hold for a second and then return it to the floor. Repeat with the other leg.

Walking/cycling to work

Besides the above-mentioned exercises and other workplace health and safety issues, it is recommended to include a daily commuting routine. It is free of charge to walk to work (over a reasonable distance) and it would only need a little investment from an employer to supply employees with bicycles (which can also be reused and only loaned to employees).[112]

Performance-related activities, ideas and tips

Setting up a green office does not necessarily mean buying high tech ergonomic equipment or designing a modern office building. Often, low cost measures and well-organised work practices provide good results. All the available options should be used efficiently, and planned solutions should be well considered. Where possible, low cost investments should be given preference. For example, natural ventilation should be utilised instead of artificial ventilation whenever possible. This not only saves money but also protects the environment and human health. After all, who would not be motivated to work in a healthy, safe and green office?[113]

Temperature and Air Conditioning

Most people work comfortably at temperatures between 20°–24° Celsius

Most people work comfortably at temperatures between 20°–24° Celsius. Therefore, it is important to ensure a stable indoor temperature irrespective of the outdoor temperature (for more information, see the "Air Quality" chapter)[114].

- It is important to pay attention to the design of an office building and workplace. A well-designed natural ventilation system often helps to ensure a stable temperature and avoid artificial air conditioning. This also saves energy (environment) and money.
- If there are continual complaints that the office is either too cold or too warm despite the thermostat showing the temperature to be within the acceptable range, check that the thermostat has not been situated directly in the path of the airflow from an air conditioning vent.

Humidity

The optimum comfort range for relative humidity is 40–60%

Humidity refers to the amount of water vapour in the air. The optimum comfort range for relative humidity is 40–60%. Low humidity can cause dryness of the eyes, nose and throat and may also increase the frequency of static electricity shocks. Relative humidity above 80% can be associated with fatigue and reports of "stuffiness." In order to maintain the optimum comfort range for relative humidity, other indoor climate quality factors such as room temperature and ventilation must also be at the optimum level. Plants are also useful for improving indoor air quality. If relative humidity is still consistently too high or too low, contact an air conditioning expert to conduct a review and suggest possible solutions. (for more information, see the "Air Quality" chapter)

Ventilation

If possible, it is highly recommended that a green office integrates a natural ventilation system

Ventilation refers to the movement of air and rate of fresh air input. The recommended ventilation rate should be 12 litre per second per person for general office space (for more information, see the "Air Quality" chapter).

Proper ventilation also helps to avoid air contaminants in the office that can include bacteria, viruses, mould spores and dust, solvent vapours or chemicals generated or used in the building.

Modern office buildings often have built-in artificial ventilation systems. Unfortunately, in many cases the low-cost solutions do not take into account the real situation (including the amount of lighting, office appliances and people in the room), and the ventilation is either set too low or too high. This may cause many health issues or general discomfort.

Ventilation units that do not provide adequate amounts of fresh air can result in high levels of carbon dioxide. Stale air due to poor ventilation and excessive heat build-up or humidity can also contribute to air contamination. Appropriate control measures for the reduction of air contamination include:

- Effective air filtration;
- Ensuring that adequate amounts of fresh air enter the building;
- Maintenance of air conditioning units, including regular cleaning;
- Preventing the obstruction of vents;
- Locating equipment that uses solvents in areas with substantial air movement and/or installing local exhaust ventilation.

If possible, it is highly recommended that a green office integrates a natural ventilation system. Firstly, it is better for the environment and also saves money. Secondly, it has been proven that correctly designed natural ventilation is better for indoor climate and employee health.

Ozone

The operation of photocopiers and laser printers produces ozone. It is possible to smell ozone at a concentration of between 0.01 and 0.02 parts per million (ppm). High concentrations of ozone can cause eye and upper respiratory tract irritation, headaches and temporary loss of the ability to smell.

To keep ozone levels well below acceptable limits:

- Have photocopiers regularly serviced;
- Ensure that an ozone filter is fitted to photocopiers and laser printers;
- Make certain that there is adequate ventilation.

Provided they are properly maintained, modern photocopiers fitted with an ozone filter do not usually present a health hazard. Preliminary investigations into laser printers indicate the same result.

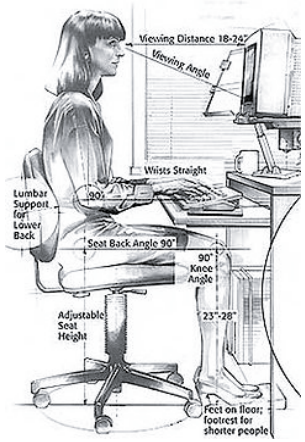
Lighting

Workplaces should receive sufficient natural light (daylight)

Workplaces should receive sufficient natural light (daylight) and be equipped with artificial lighting adequate for the protection of workers' health and safety. Workplaces in which workers are especially exposed to risks in the event of failure of artificial lighting must be provided with adequate emergency lighting.

It is important to design a workplace so that natural light may be exploited as much as possible – this is also good for the general health and well-being of the worker. Therefore, skylights and sun tunnels in rooms without windows should be considered. And also, utilisation of natural lighting results in lower energy use and economic benefits. (For more information, see the "Energy Consumption" chapter)

Ergonomics



Office workers should hourly take a 10 minute break to relax the body and eyes

Ergonomics is employed to fulfil the two goals of health and productivity. Ergonomics is relevant to the design of such things as safe furniture and easy-to-use machine interfaces. Proper ergonomic design is necessary to prevent repetitive strain injuries which can develop over time and can lead to long-term disability.

Many offices are run under the delusion that by purchasing new "ergonomic" office equipment they can provide an easy solution to diverse workplace related complaints. Actually, besides the use of the ergonomic technical facilities, which is also an essential aspect, the human factor is also very important. If for example the height is not correctly adjusted, a very ergonomic chair could be used totally inappropriately. There are several requirements for placement and use of keyboard equipment, including work surface height, chair, keyboard placement, screen placement, posture and movement and mouse usage. An ergonomic instructor should be contracted to train all personnel. Moreover, office workers should hourly take a 10 minute break to relax the body and eyes. In addition to the recommended adjustments and breaks, staff should do regular exercises to prevent injury (see exercise examples above).

Sick Building Syndrome

The incidence of illness is significantly higher in some buildings than in others. The symptoms that characterise "sick building syndrome" are sore eyes, running nose, headaches, mucous membrane irritation, dry skin, dizziness and nausea. No single, specific cause has been found. It is believed that the syndrome is caused by a combination of poorly adjusted ventilation, air conditioning, temperature, humidity, toxic building materials, lighting and psychological factors such as stress, management style and work schedules. Individual solutions offered in this handbook may help reduce the symptoms. (for more information, see the "Air Quality" chapter)

Plants in the Office

Many studies have shown that plants reduce the levels of toxic substances such as formaldehyde, benzol and carbon monoxide in the air. Some useful plants for the office are: Chinese Evergreen, Madonna Lily, Mother-in-Law's Tongue, and Heart Leaf and English Ivy.[115]

A Break Room

And last, but not least, a sustainable office should provide a special place / room for staff to spend rest breaks in. It could be called a "zen" room, because of the good, peaceful atmosphere in it (possible elements that could be used: plants, natural light, fresh air, natural incenses, comfortable armchairs, a bed, exercise equipment such as yoga mats and fit-ball, musical instruments, etc.). This will all help to avoid stress and help the mental balance of staff. Furthermore, sometimes the costs of private sports / health care activities of staff are covered by employers – this can be seen as an example of CSR being implemented in an organisation. Healthy and rested employees are generally more satisfied and their work is more efficient and of good quality.

ACTIVITIES AND TIPS CONCERNING OFFICE SAFETY:

Office accidents mainly result from slips, trips and falls, electrical accidents and emergency situations such as fire.

Many of these accidents can be avoided by simple planning and good housekeeping:

- Corridors should be well lit and be kept clear of materials, equipment, rubbish and electrical cords;
- Floors should be level. Spilled liquids and anything else dropped on the floor should be immediately picked up or cleaned away;
- Free standing fittings should be completely stable or secured to the wall or floor. Filing cabinets should be placed so that they do not open into aisles, and should never be left with cabinet drawers open. For stability, load cabinets starting from the bottom and do not open more than one drawer at a time;
- Office machines and equipment should be kept in good working order. Equipment using hand-fed processes such as electric staplers and paper guillotines should be guarded and staff trained in their proper use;
- Many pieces of electrical equipment can mean trailing cables, overloaded circuits, and broken plugs and sockets. Ensure that these dangers are alleviated by a competent person and the risks are managed.

Office accidents mainly result from slips, trips and falls, electrical accidents and emergency situations such as fire

FIRE SAFETY IN OFFICE BUILDINGS

For managers and building supervisors, it is very important that they are aware of and implement all local and national building fire codes and legislation.

There are easy ways to ensure fire safety in office buildings:

Conduct a fire risk assessment

First conduct a thorough fire risk assessment. One could also involve experts to help identify possible risk areas. Examples include faulty wiring, lack of fire-proofing, non-regulated equipment and sub-standard design.

Draw up a fire safety plan

Once the risks and problems have been identified and the possible solutions suggested, it is time to draw up a comprehensive fire safety plan that will address all problem areas. This plan should also include the allocation of fire safety equipment throughout the premises, complete escape plans with properly marked routes and exit doors, and dissemination of information related to fire-related accidents. Remember that drawing up an office safety plan is mandatory throughout the EU.

Undergo proper safety training

Apart from drawing up a comprehensive plan, all employees should undergo proper training so that the important points of fire safety in office buildings be communicated to the building occupants. Ensure that everyone is aware of escape plans, that they possess the skills needed to prevent a fire from occurring, and can react appropriately to an unmanageable fire. For example, fire safety training will teach employees how to properly use a fire extinguisher (which type for what kind of fire) and identify symbols. The training will also teach employees about fire risks and other crucial information related to building fires. Proper fire fighting equipment and signs should be installed throughout the premises. These pieces of equipment will provide active fire protection when and where they are required, and include fire extinguishers and fire blankets. On the other hand, passive fire fighting equipment includes alarms and sprinklers.

Environmental Performance Indicators

Monitoring and evaluation of health and safety performance should be an integral part of office management: target setting, management by objectives and the development of workplace occupational safety and health programmes. An occupational health indicator is a specific measure of a work-related disease or injury, or a factor associated with occupational health, such as workplace exposures, hazards or interventions. These indicators help to identify trends and patterns of work-related injury and illness, as well as anticipate early problem areas that deserve attention.

Example indicators:

Number of accidents/injuries and illnesses reported by cause/age/gender	per year
Number of illness days	per year / per person
Number of workers complaints related to health and safety issues	per year
Number of implemented programmes/initiatives that improve the working environment	per year
Employee satisfaction rate with the working environment	questionnaire

PS, See also the next chapter "Social Issues"!

Office Best Practice Examples

REGULAR PHYSICAL EXERCISE PROGRAMME AT SEI TALLINN OFFICE

In addition to rest breaks (10 minutes every working hour), some staff volunteers carry out a daily exercise programme (easy movements, stretching etc.) at 11:05 (following the example of a daily radio programme) and 15:00. Both sessions last about 5-10 minutes. This keeps staff healthy and full of energy.

Social Issues

Corporate Social Responsibility (CSR) is one of the pillars of a sustainable operation and includes caring for employees

Corporate Social Responsibility (CSR) is one of the pillars of a sustainable operation and includes caring for employees. Organisations are aware of the fact that employees are their greatest capital, so winning their trust is a highly important mission. Employee satisfaction and loyalty are of key importance for the successful development and growth of organisations.

Challenges Facing European Companies:

Active ageing: The European population is simultaneously shrinking and ageing. The number of those 55 years and older is steadily growing, while all younger age groups are shrinking. From 2012 onwards, the European working-age population will start to shrink, while the 60+ age group will increase by about two million people a year. Eurostat predicts a possible decrease of about 20.8 million (6.8%) people of working age by 2030.

Diversity issues: The European employment rate is particularly low for women (63% versus 76% for men aged 20-64) and older workers aged 55-64 (46% against 62% in the US and Japan).

Equal opportunities: The economic crisis has resulted in high youth unemployment– over 21% – and made it harder for unemployed people (including disabled people) to find jobs.

Good work/life balance: Under conditions of global competition and persistent assumptions about ideal workers being fully devoted to their work and having no family or other caring responsibilities, achieving a satisfactory balance between employment and parenthood has become a problem across Europe.

EU TARGETS FOR INCLUSIVE GROWTH INCLUDE (EUROPE 2020 STRATEGY)[116]:

- Seventy-five percent employment rate for women and men aged 20-64 by 2020 – achieved by getting more people into work, especially women, youth, older and less-skilled people, and legal migrants;
- Better education– in particular:
  –reducing school drop-out rates to below 10%;
  – increasing the number of 30-34 year-olds completing third level education (or equivalent) to at least 40%; and
- Reducing the number of people in or at risk of poverty and social exclusion by at least 20 million.

In order to become responsible while remaining sustainably competitive, European companies will have to successfully gear their employment and HR policies to a changing and ageing potential workforce.

In the UK, maintaining a work-life balance is not just an issue for women. Work-life balance also has a strong cultural dimension, and how individuals define and rate these issues varies in different parts of Europe and around the world. "In the long run, having a rewarding life at home is good for work life, and having a rewarding life at work is good for home life."

Many companies are discovering that they can save money on rent and other costs if employees do not come to the office every day. Even the US federal government acknowledges that the old ways of doing business do not work anymore. In March 2011, the President's Council of Economic Advisers issued a report praising telecommuting, job sharing and flexible hours.

During difficult economic times, employers that cannot give raises might be willing to offer other benefits. They will want to treat their best employees well, so that when the economy turns around those employees do not flee to other companies.

Certification and Labelling

The Investors in People Standard[117] (UK Commission for Employment and Skills). Launched in 1991, Investors in People is a business improvement tool with a strong focus on employee involvement and development. In 2008, there were almost 40,000 organisations working with Investors in People, involving approximately 7.5 million of the UK workforce. The Investors in People framework (consisting of the Standard and the wider Framework)[118] has three fundamental principles: Plan – Do – Review, broken down into 10 indicators. Each indicator is subdivided into a number of requirements.

Family Friendly Enterprise Certificate[119] (FFE, Slovenia, by Ekvilib).

The FFE Certificate represents a consulting-audit process. FFE has been developed as one of the tools for effective and more quality human resources management within enterprises and organisations in the context of balancing the professional and private lives of employees. The FFE Certificate represents one of the various possibilities of socially-responsible behaviour by a particular enterprise or organisation. Besides Slovenia, it is currently used in Germany, Austria, Hungary and Italy.

The 9700-820 Work-Family Balance Standard[120]

The Work-Life Standard (BNQ 9700-820) is a reference document that specifies the requirements for good practices to attain a good work-family balance. It applies to any organisation (public, private, other), regardless of its size, products or services. It is also accompanied by a certification programme offered by the Bureau de Normalisation du Québec (BNQ).

In the Official Communication of the European Commission on Corporate Social Responsibility (October 2011), there are guidelines related to internal corporate social issues:

- OECD Guidelines for Multinational Enterprises[121];
- Ten principles of the UN Global Compact[122]; and
- ISO 26000 Guidance Standards on Social Responsibility[123].

Management-related activities, ideas and tips

A flexible work schedule is ranked third among strategies for retaining employees. There are substantive workplace benefits to providing flexible alternatives for working parents.

Alternative working arrangements:

- Flexible working hours, compressed working hours, flexible work breaks and part-time jobs;
- Work with time accounts, which allow workers to build up time credits during periods in their lives when they have fewer responsibilities. These credits can later be cashed in by, for example, separated spouses who share custody of their children or to allow people to respond to family emergencies;
- Allow telecommuting and off-site work from home a few days a week and communicating by computer or phone;
- Voluntary reduction of normal work week;
- Voluntary sharing of position (may be combined with phased retirement);
- Exchange of the work shift;
- Reduction of the meeting frequency during working hours; and
- Baby bonus time.

Special attention to endangered working groups (youth and older (55+))

Workplace:

- Working meetings (formal and informal);
- Implementation of employee satisfaction surveys;
- Possibility of participation and to make proposals about important decisions;
- Code of Ethics and Code of Conduct with effective measures; and
- Health protection measures.

See some more ideas in the "Health and Safety" chapter!

Management Skills and Style:

- Equal treatment of all employees, even at the hiring phase;
- Openness to criticism and suggestions;
- Early information about major changes;
- Effective internal communication about policies and benefits; and
- Special attention to endangered working groups (youth and older (55+)).

Human Resources Development:

- Planned education and training of staff;
- Annual interviews;
- Individual career plans;
- Promotion of women in education;
- Promotion of paternity leave;
- Encouraging contact with the employee in their absence; and
- Pilot projects (e.g. for better engagement of fathers in family duties or special initiatives which allow part-time employment in leadership positions).

!

Four Things That the Employer Should Not Do:

DO NOT try to "impose" a work-life balance, or introduce it without consultation and co-operation!

DO NOT assume that you only need to target women with children or older employees!

DO NOT think that flexibility is only appropriate in certain work settings!

DO NOT discriminate!

DO NOT

Performance-related activities, ideas and tips

Structure of Payment and Remuneration:

- Work Life Programme – offer free, confidential counselling services and a professional referral service to help employees faced with challenges;
- Financial assistance and counselling;
- Scholarships for children of employees; and
- Promotion of study opportunities for employees as a benefit.

Workplace:

- Additional company leisure facilities (e.g.: gym usage);
- Break room; and
- Regular massage in the office.

Services for Families

- On-site kindergarten/day-care facilities;
- Childcare during school holidays;
- Room for short-term child care;
- Business cooperation with local institutions in the search for nannies;
- Christmas gifts to employees' children;
- Room for breastfeeding and changing; and
- Dry-cleaning services.

Environmental Performance Indicators

The balance between work and family has an impact on the following indicators which are important for any business leader:

Reputation level
Work-family balance certification.
Retaining Workers' level
Level of employee' seniority
Turnover of employees
Performance level
Number of sick leave days per employee per year
Number of days off due to diseases and poor health
Number of mistakes made during work performance
Cost Saving for
Office waste treatment
Office space rental, office furniture, heating and electricity, etc
Travel expenses
Employment and training of new workers
Employee performance indicators (based on regular satisfaction surveys)
Level of satisfaction with work
Level of satisfaction with family and effective relationships
Level of stress and anxiety

Office Best Practice Examples

SI.MOBIL

A sense of inclusion helps employees develop their potential and gives them additional motivation

Si.Mobil puts great emphasis on employee inclusion and participation in different projects, even outside their fields of work. A sense of inclusion helps employees develop their potential and gives them additional motivation. In addition to salary and bonuses for regular work, Si.Mobil makes it possible for employees to gain personal recognition and personally develop.

Si.Mobil responds to employee needs with different measures and creates a stimulating and friendly work environment. The organisation was awarded the Family Friendly Enterprise Certificate. With the help of their employees, the company created a ranking system of desired and undesired skills that reflect the company's values within this framework.

At the end of each year, multi-directional evaluations of the skills of co-workers and managers are carried out. Through this multi-directional skill analysis, each employee gets an image of his opportunities and challenges that they can use for their personal development. Si.Mobil has been measuring its organisational climate since 2005.

Education and Training

All the training at Si.Mobil is gathered under the umbrella of People Development Programme, which is responsible for suitable and focused career development. Employees also have the opportunity to improve their expertise in an international environment.

On the basis of annual interviews and established development plans, employees have the prospect to choose training programmes from the training catalogue that are designed for:

- all employees;
- managers; and
- employees with management/upper level potential.

Care for Employees

Si.Mobil realises its mission of being a caring and responsible employer in many ways:

- Annual interviews with employees;
- Promotions;
- Bonuses for successful work (employees can receive a yearly bonus of up to 12% of their gross annual salary. Goals are set annually by employees and their superiors);
- Additional education (internal and external training, effective knowledge management);
- Care for a safe old age (Si.Mobil pays a monthly contribution of 1.8% of an employee's gross wage to a pension fund for each employee who has entered the complementary collective pension insurance scheme);
- Accident insurance;
- Special attention (mobile phones – all day free use; vouchers when they become parents; New Year's presents; free coffee and fresh fruit; use of company cars; bicycles and scooters for business trips around Ljubljana; picnics and a New Year's Eve party); and
- Participation in different groups within the company.

Employees can share their knowledge and express their interests with active participation in the Family-Friendly Enterprise Group or the internal Eco Team. They can also find opportunities for a more active life with the help of benefits offered by the internal Sports Group.

Family Friendly Enterprise

Si.Mobil introduced the following benefits:

- Child-time bonus;
- Flexible work breaks;
- Reintegration into the work process after maternity or paternity leave;
- Training on family-friendly employment policy for management workers;
- Establishment of an expert group tasked with balancing the interests of employees with the interests of the company; and
- Public relations –presenting measures for easier balancing of professional and family life as part of the organisational culture.

Communication with Employees

- Internal communication strives to strengthen the culture and values that are being developed among employees, as well as to help employees understand the company's vision, strategy and goals. Efficient internal communication contributes to greater employee satisfaction at the workplace, as well as feelings of security, motivation and membership in the company;
- Intranet and internal magazine designed for and accessible to all employees;
- E-notices on activities of the Sports Group, different benefits for employees, internal changes and new employees, job openings, corporate info, HR info, and Re.think info on issues related to social and environmental responsibility;
- Vertical meetings. Si.Mobil organises three meetings yearly for all employees. (Start up meeting at the beginning of the year, a picnic in the summer, and a New Year's party in December);
- The chairman and the members of the Management Board visit all the company's departments at least once a week and go on a so-called "road show" that takes them to the sales centres at least once a year;
- Meetings with employees' families: Santa visits Si.Mobil's employees' children at the end of the year, and in the spring, they invite employees' families to an Open Door Day.

CCEFC

Cleaning

Office cleaning is the act of cleaning a business' headquarters after the employees have left for the day. If an organisation is big enough, then they might choose to hire full-time janitorial staff to keep their premises in top shape. However, most companies hire an external company to take care of their commercial cleaning needs.

The usage of non-environmentally-friendly detergents has several negative impacts on the environment and human health

Although not often considered, businesses are in constant need of cleaning support. Offices are highly trafficked areas. Dust is spread by foot traffic and using computers and other equipment. In addition, employees and visitors regularly use the washrooms and common eating areas; basically living in a contained environment for up to 12 hours a day. Such close proximity on a continual basis is a breeding ground for germs. Unless the office is cleaned frequently, a company might suddenly find itself facing high employee absenteeism due to illness. In order to avoid such scenarios and to provide employees with a safe and healthy working environment, businesses are forced to hire commercial cleaners. Whether the office is cleaned by in-house staff or by an external cleaning company, it is best to use environmentally-friendly cleaning products.

The usage of non-environmentally-friendly detergents has several negative impacts on the environment and human health. The production of hazardous agents containing petroleum contributes to the depletion of non-renewable energy sources. These products then contaminate fresh water resources through the sewage system. Furthermore, the usage of non-environmentally-friendly detergents pollutes indoor air, which can lead to health risks such as an increased chance of developing asthma.

"Although manufacture and use of certain chemicals has been tightly regulated, global sales of chemicals have increased nine fold since 1970." (Lewis Akenji: Latte Chemoccino)

The selection of the appropriate cleaning product is extremely important because of the potential health and environmental risks associated with the chemicals contained in these products.

Small offices with few employees may use simple and "home-made" cleaning supplies: by adding vinegar or baking soda to warm water one can create a universal detergent. In larger offices where these kinds of detergents cannot be readily used, green procurement is highly important.

Eco-labels help us by choosing truly environmentally-friendly products. It is important to know that many products are available which falsely advertise themselves as being "green products." Research your purchases and do not be fooled by false advertising. Often these "fake-products" are no better than their conventional competitors.

NEGATIVE ENVIRONMENTAL IMPACTS (HISTORICAL, ACTUAL AND FUTURE)

Cleaning products and processes affect the environment in many ways. The biggest impact of cleaning products comes from the chemicals they contain; however, their packaging is also an issue.

Chemicals:

There are thousands of chemicals in common use. Although the effects of many chemicals are known, many have not been tested for safety. They may pollute streams and rivers, and may take a long time to degrade into harmless products. Some may not decompose at all and may persist in the environment. Toxic chemicals may enter the food chain and eventually be consumed by humans, flora and fauna.

The biggest impact of cleaning products comes from the chemicals they contain; however, their packaging is also an issue

Packaging:

Many products used to come in aerosol cans which contained a propellant gas, often chlorofluorocarbons (CFCs). CFCs, although non-hazardous and chemically inert, damage the ozone layer. The Montreal Protocol set targets for reductions in CFC use and most aerosols now use "ozone-friendly" propellants. But aerosol cans still contain a high proportion of packaging to contents and are not easy to recycle. Many products come in plastic containers which are light and durable and can be recycled in some areas, but otherwise are very slow to biodegrade. Components of plastic bottles are made from petroleum and ingredients such as phthalates used to keep the bottles from becoming brittle and breaking or leaking. Packaging also includes cardboard shipping cartons made from tree fibres. Finally, chemical products are disposed down the drain or evaporate into the air where they cause further environmental impacts. [124]

Refillable bottles and buying concentrated products also reduces the amount of packaging.

One final environmental impact is the disposal of approximately 1 billion pounds annually of janitorial equipment and supplies, including vacuum cleaners, floor machines, mop buckets, doormats and more. Not only does the disposal of these items equate to approximately 40,000 garbage truck loads clogging landfills, but replacement materials require additional raw materials to make the plastic, metal and other components; not to mention energy and water during manufacturing.

According to the US Environmental Protection Agency (EPA), indoor air pollution can be up to ten times worse than the air outside the home. Indoor pollution comes from volatile organic compounds (VOCs) which are usually found in paints, stains, photographic or printing fluids, furniture, upholstery, cleaners, disinfectants, air fresheners, wood panelling, insecticides, fuels, detergents, lotions, creams, and dry cleaned clothing.

EUROPEAN LEGISLATION AND OBJECTIVES

- Commission Decision (2005/344/EC) - establishes ecological criteria for the award of the EU Eco-Label for all-purpose cleaners and cleaners for sanitary facilities;
- Directive (98/8/EC) - concerning the placing of biocide products on the market;
- Commission Decision - establishes revised ecological criteria for the award of the EU Eco-Label to laundry detergents (2003/200/EC);
- Commission Decision - establishes revised ecological criteria for the award of the EU Eco-Label to hand dishwashing detergents (2005/342/EC);
- Commission Decision - prolongs the validity of the ecological criteria for the award of the EU Eco-Label to certain products (2003/31/EC);
- Dangerous Substances Directive (67/548/EEC and 1999/45/EC);
- Directive on the marketing and use of certain dangerous substances and preparations (76/769/EEC);
- Regulation on the use of phosphates and other phosphorous compounds in household laundry detergents ((EC) No 648/2004);
- REACH Regulation (1907/2006) - on the registration, evaluation, authorisation and restrictions of chemicals, was adopted in December 2006, and entered into force on 1 June 2007. It provides a new regulatory framework for the collection of information on the properties of chemicals on the European market, and also for future restrictions on their use[125].

Certification and Labelling

- EU Eco-Label[126];
- Blue Angel (Blauer Angel);
- National Eco-Label of Hungary (sessile oak logo);
- Nordic Swan;
- NF Environment (the French eco-label);
- Das Österreichische Umweltzeichen (Austrian eco-label); and
- Design for the Environment (DfE) label.

Management-related activities, ideas and tips

Some practical ideas for environmentally and human-friendly cleaning:

- Minimise the variety and amount of products used in the office;
- Minimise the usage of hazardous agents or replace them with environmentally-friendly detergents;
- Ensure the isolated usage of acids, alkalis, different bleaches, solvents and phosphates, thereby avoiding undesirable reactions;
- Ensure the adequate education of the cleaning staff about the methods of cleaning, potential risks and environmental aspects;
- Ensure the right treatment and disposal of detergents and their containers;
- Purchase in bulk – e.g. detergents in concentrated form with refillable containers to decrease generated waste;
- Open the windows for some minutes after cleaning; and
- Monitor cleaning product usage where possible.

When choosing an eco-friendly detergent, you can identify if products have the following characteristics (more information in the European Commission Green Public Procurement (GPP) Training Toolkit-Cleaning Products and Services):

- Non-hazardous;
- Biodegradable;
- Ingredients derived from renewable sources instead of petroleum;
- Packaging is recyclable and contains minimal material; and
- Usage is not harmful to human health.

The signal words found on product labels are placed there on the order of authorities and are primarily for your protection

Choose non-hazardous, biodegradable substitutes

Choose non-hazardous, biodegradable substitutes helps reduce the hazardous burden of manufacturing and greens your office.

Read "signal words" on labels. The signal words poison, danger, warning, or caution, found on product labels are placed there on the order of authorities and are primarily for your protection. In some cases, these words are on the label because of the potential impact that the product can have on the environment.

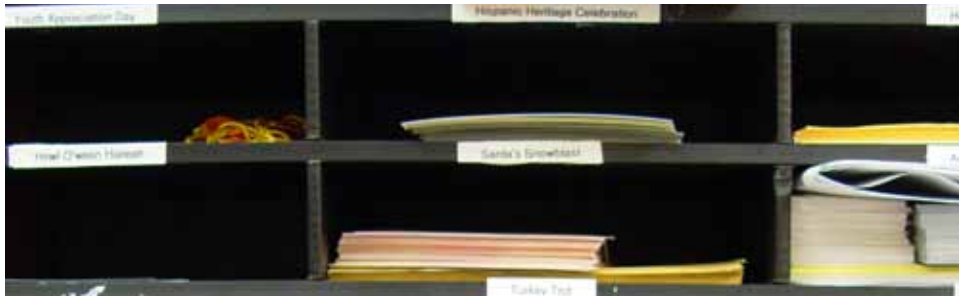
Non-hazardous cleaning materials and methods save money, protect your health and reduce the use of valuable resources

- Poison/danger denotes a product of most concern; one that is highly hazardous, and ingesting small amounts - in some cases only a few drops - can be fatal.
- Warning means moderately hazardous; as little as a teaspoonful can be fatal.
- Caution denotes a product that is less hazardous; one in which it would be necessary to ingest between two tablespoons and two cups to be fatal.
- Corrosive products can damage skin and mucous membranes.
- A strong sensitizer is a chemical that can increase allergies.

Learn non-hazardous cleaning basics: how to use kitchen cupboard ingredients

Non-hazardous cleaning materials and methods save money, protect your health and reduce the use of valuable resources.

- Learn how to clean from scratch.
- Using homemade recipes can truly work if time is taken to understand a bit about the chemistry behind how the formulas work.
- Effective natural cleaning products can be made from (a combination of) common household ingredients, such as: lemon juice, conventional and electrolysed water, borax, vinegar, salt, mineral oil, baking soda, washing soda, vegetable based soap, and plants with high saponin levels.
- Avoid using petroleum products and other non-renewable resources.



Performance-related activities, ideas and tips

By using water efficient machines, it is possible to reduce water usage by 70%

An increasing number of companies and organisations are looking for ways to be good environmental stewards by adopting sustainable business practices. The most publicised practices often involve design and/or construction modifications that require significant capital outlays. The environmental and human health impact of facility cleaning and cleaning products is often overlooked. Incorporating sustainability into office operations does not require huge capital outlays and actually provides one of the best available returns on investment. There are a number of accessible options regarding cleaning operations.

There are two types of office cleaning methods: "self-cleaning" and subcontracted cleaning.

'Self'-cleaning

There are many factors to take into account when "greening" an office's cleaning regime. Nowadays, there is a broad range of environmentally-friendly cleaning machines. Offices can purchase automatic cleaning machines, which help reduce spillages and over-consumption of cleaning agents. For example, floor cleaning machines which employ the FaST and

ECH20 technologies use electrically charged water for excellent cleaning results without chemicals, leaving no chemical residue or chemical waste to dispose of. By using cleaning machines like these, it is possible to reduce water usage by 70%. A single tank of water lasts 3 times as long, whilst the technology also eliminates potential health issues associated with the use of harsh chemicals.

Subcontracting:

When outsourcing cleaning services, ensure that subcontractors utilise environmentally- friendly products and follow good practices (such as having an Environmental Management System).

As demonstrated in the "Sustainable and Green Procurement" chapter, how one purchases products has a significant environmental impact. One should take into account the transport distance from manufacturer to end user, as well as the packaging.

There are three important questions regarding packaging:

- Quantity of the material used for packaging (buying products in bulk will reduce the packaging used per item);
- Type of packaging used (before ordering, be certain if the packaging material is recycled or recyclable); and
- Refillable or not.

Environmental Performance Indicators

Number of non-environmentally-friendly detergents which were replaced with environmentally-friendly alternatives	
Number of detergent containers used per year (look for decreases)	
Amount of green detergent in annual procurement	
Safety Data Sheet for each detergent	
Eco-labels on detergents	

Office Best Practice Examples

REYKJAVIK

The City of Reykjavik (population 120,000) has been incorporating environmental criteria into all its tenders for cleaning services since 2008. Today, the city's major buildings (including all kindergartens) are cleaned by contractors certified by the Nordic Swan Eco-Label. The city's demand for environmentally-sound services has caused a boom in the demand for Nordic Swan Label applications and certifications in Iceland, including environmental management systems such as ISO 14001.

Conferences and Events

A green event is one which is designed, organised and implemented in a way that minimises negative environmental impacts by conserving and restoring resources

Private corporations and public authorities often have to organise conferences and events either for their own staff or for the public. In the context of business events, the word 'event' can refer to conferences, seminars or business meetings. Related events such as concerts and festivals are not considered in this guide.

Throughout its duration, an event will usually require transport and accommodation for participants, the use of different material such as paper, equipment, food and catering services, the use of paper, energy and water. It will also generate waste.

A green event is not necessary all about "carbon neutrality". A green event is one which is designed, organised and implemented in a way that minimises negative environmental impacts by conserving and restoring resources.

Indeed, organising an event or a conference inevitably has an environmental cost since it requires great amounts of water, energy, and materials that result in waste and greenhouse gas emissions.

Different initiatives exist across Europe that are designed to promote sustainable event management. However, there is no harmonised European standard.

Certification and Labelling

BS 8901 Sustainability Management Systems for Events

BS 8901 is the British Standard which has been developed specifically for the events industry with a purpose of helping the industry to operate in a more sustainable manner. The standard defines the requirements for a sustainability event management system to ensure an enduring and balanced approach to economic activity, environmental responsibility and social progress relating to events.

ISO 20121

ISO 20121 will take a management systems approach, requiring identification of key sustainability issues like venue selection, operating procedures, supply chain management, procurement, communications, transport and others. The standard is expected to be finalized in 2012.

Guidelines issued by international organisations and institutions

EU Presidency good practice guidance: Austria, France and Belgium have issued guidance on sustainable meetings for their presidency.

UNEP: Green meeting: The guide is designed to assist organisers and hosts of small- to medium-sized meetings of up to 500 participants in greening their meetings - from partner meetings to small conferences. It is applicable to all organisations, not just those within the UN system.

Management-related activities, ideas and tips

The venue has to be easily accessible by walking, public transport or bicycle

If the event is organised outside the hosting organisation, the type of venue selected will clearly depend on the size of the meeting. Too big a venue or too small a venue causes unnecessary costs in terms of heating and cooling. Indeed, the consumption of energy at the venue is one of the largest environmental impacts.

The following elements should be taking into consideration when selecting the venue.

Location and accessibility:

The venue has to be easily accessible by walking, public transport or bicycle. The event has to be accessible to everyone. If disabled persons plan to participate, the organizer shall make every effort to meet specific needs such as providing a sign language interpreter, allowing guide dogs and facilitating access for wheelchairs.

Energy consumption:

Since meetings are usually highly energy consuming, the organiser has to make sure that the venue has taken steps to measure and reduce energy consumption by installing energy-efficient lighting and implementing energy-saving strategies.

Waste management:

The organiser has to implement a waste reduction policy that addresses:

- Reduction of waste;
- Reuse of materials, equipment etc. where possible; and
- Recycling of waste where it cannot be reduced or reused.

Since large amounts of waste are generated during meetings, preference should be given to venues with appropriate systems for the collection, reusing and recycling of this waste.

The venue should also offer onsite recycling of paper, cardboard, plastic, glass and metal. An added incentive in choosing a specific venue is the existence of a food/compost collection program.

Procurement policy:

The organizer has to make sure the venue manager employs a sustainable procurement policy. Purchasing biodegradable or recyclable products, refillable ink cartridges and non-toxic cleaning are significant measures which can reduce environmental impacts.

Restrooms: The organiser should check if the venue employs water conservation practices in restrooms.

Management:

The venue will preferably employ sustainable or environmental policies and management systems such as ISO 14001 or EMAS.

If you have difficulties finding a venue which uses an environmental management system, here are the key questions you can ask to find out if a venue is sustainable:

Key questions you can ask to find out if a venue is sustainable:

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- Do you have members of staff with responsibility for environmental management and Corporate Social Responsibility?
- Do you buy products with reduced environmental impact (e.g. energy-saving light bulbs, energy efficient electrical equipment, recycled paper, low VOC paints, natural cleaning products, etc)?
- Do you practice waste minimisation and do you have recycling facilities?
- Have you installed water-efficient devices for taps and toilets and water saving devices for showerheads?
- Have you implemented water conservation measures such as rainwater harvesting or grey-water reuse?
- Do you buy green electricity or generate your own renewable energy?
- Have you installed motion sensors for corridor and toilet lighting and reminders to turn lights off when leaving rooms[127]?

Performance-related activities, ideas and tips

COMMUNICATION

Minimize the use of promotional material and delegate bags

Paper

- Prefer online registration to faxing/posting registration.
- Avoid excessive paper usage.
- Prepare electronic event support material to disseminate via your website.
- If printing paper remains necessary, sustainable/ environmentally sound paper should be used (this can be recognized thanks to labels such as the EU eco-label, Blue Angel, Nordic Swan, FSC, etc.).
- Use double-sided printing.

Gadgets

- Minimize the use of promotional material and delegate bags.
- Gadgets and gifts should be produced with sustainable materials.
- Consider using and giving local products.

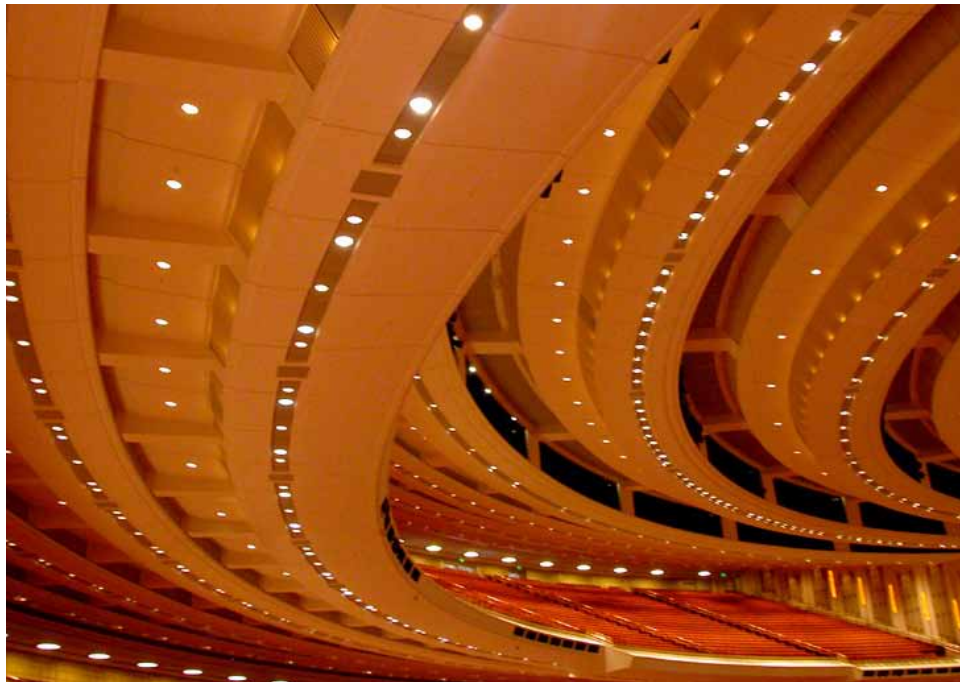
ACCOMMODATION

Location:
The accommodation should be close to the venue or easily accessible by public transport and well connected to the venue.

Energy and water:
The hotel should have an efficient energy and water consumption policy.

Cleaning:
The hotel should use eco-friendly cleaning products.

Management:
The organiser should suggest hotels that have sustainable or environmental policies such as EMAS, EU EcoLabel and Green Key.



MOBILITY

Long distance travel

Avoid unnecessary trips, in favour of tele- and video-conferences.

If travel cannot be avoided, modes of travel with lower GHG emissions (CO_2 equivalents per kilometre) should be encouraged, such as the use of public transport and car sharing:

Train: The organizer should encourage participants to use trains for shorter trips since for the same distance, on average, train travel generates one third of the GHG emissions of air travel.

Car: For those travelling by car, encourage car-sharing by distributing information about local car-sharing possibilities. The type of car also has an influence.

Plane: If flying remains the only option, the organizer can reduce environmental impact by taking specific measures. The class chosen has an impact on emissions. First class and business travel generate respectively three and two times as many GHG emissions as economy class due to the spacing specification of the different types of seating. Direct flights should be preferred as the number of take-offs and landings increases emissions.

Local transport

The organizer should provide access maps

- The proximity and accessibility of the principle meeting locations (venue, accommodation, town centre and transport modes) should be a priority in reducing the need for lengthy trips.
- The organizer should provide access maps.
- If the venue is not within walking distance of public transport, a shuttle service should be provided and taxi-sharing should be encouraged.
- The organizer should promote and/or provide cycling facilities, such as local cycle lanes & routes and bike racks.
- The organiser can limit the number of car parking spaces available, and provide them only to those who are unable to travel by public transport.

CATERING (MORE INFORMATION IS PROVIDED IN THE FOOD AND CATERING CHAPTER)

Food and drink constitute the most significant sources of waste and environmental impact at most events.

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Food & drink

Attention should be given to the following areas when considering catering:

- The caterer should provide local and/or organic food options.
- Fish should come from sustainably managed sources that are harvested in a manner that does not lead to over-fishing or depletion of exploited populations.
- Fairly traded products, such as coffee, tea, bananas and chocolate should be offered.
- There should be a good range of vegetarian choices and options suited to specific dietary requirements, including choices for ethnic minorities.
- Provide fresh fruit as an alternative to prepared desserts.
- If possible, use tap water for drinking; prefer bulk dispensers to individual containers.

Food Donations

- If there is good-quality leftover food, it's easy to donate this to charity. Food safety and legal considerations should be observed.

Environmental Performance Indicators

The organiser should keep track of the following indicators which will help them to calculate the carbon- and ecological-footprint of the event:

Energy	
Electricity	kWh
Gas	kWh

The organizer can ask the venue manager about the total energy consumed during the event.

Material efficiency	
Detergents and cleaning agents	kg
A4 paper consumption	Sheets or kg
Percentage of recycled paper	%

The organizer should keep track of material consumption.

Water	
Water consumption	m3

The organizer can ask the venue manager and hotel manager about water consumed during the event.

Waste	
Organic waste	m3 or kg
Paper and cardboard waste	t
PMC/PMD-type waste	t
Glass waste	t
Waste which cannot be recycled	t

The waste service contractor can provide specific information such as: quantities of materials and recyclables in the waste bins and the amount of recyclable material which is sent to recycling facilities.

Mobility	
Air	km
Ship	
Train	km
Bus	
Car	km
Public transport	km
Bike/foot	km

The organiser should collect information from participants to get an overview of the distance travelled and method used (air, rail, road) by participants[103].

Catering	
Percentage of regional foods	%
Percentage of organic food	%
Percentage of food from fair trade	%
Percentage of community supported suppliers	%

The caterer should provide proof of the origin of the food/drinks served.

103 This can easily be done via websites like www.myclimate.org or www.ecopassenger.org

Office Best Practice Examples

ENWORKS[128]

On 25 March 2010 ENWORKS hosted a one-day conference, "Obvious in Hindsight: A strategic insight into successful environmental business support" at Manchester Central Convention Centre. Organise This Ltd. was commissioned by ENWORKS to manage the event.

The event included four morning and afternoon workshops.

Organize This Ltd. organized the conference and supported ENWORKS to implement sustainable measures throughout the event, which included:

Using onsite caterers who can offer a locally sourced, healthy menu with equal amounts of vegetarian and meat options

Venue / Accessibility

- Choosing a venue that geographically suited the demographics of the delegate
- Ensuring public transport access routes to minimise the need to travel by car
- Measuring delegate and staff mileage to produce a CO2 emissions calculation for the event, using the online tool[129],

Catering

- Using onsite caterers who can offer a locally sourced, healthy menu with equal amounts of vegetarian and meat options, along with special options such as gluten free meals
- Ordering the correct quantity of food for the delegates
- Clear labelling of food with the source of ingredients so delegates were able to make informed choices
- Using tap water rather than bottled water
- Ordering refreshment items in bulk, such as sugar and milk to accompany teas and coffees

Using an online registration system for delegates instead of printed invites

Audio / Visual

- Using onsite audio/visual suppliers to minimize any transportation of equipment
- Using a British Safety Council Award winning supplier
- Using energy efficient LED lighting on stage

Marketing Materials

- Using an online registration system for delegates instead of printed invites
- Designing generic, reusable signage, pop-up stands and banner stands
- Avoiding printing event documents such as delegate packs or agendas wherever possible
- Recycling delegate badges for future use
- Distributing online feedback surveys rather than printed forms
- Providing existing marketing materials instead of creating new printed materials, reusable USB sticks given to delegates rather than goodie bags
- Showing case studies via DVD rather than printed format

ACHIEVEMENTS

Venue / Accessibility

- Contracting of local suppliers and reduction in CO_2 travel emissions
- Accessibility for delegates and reduction in CO_2 travel emissions
- Monitoring and measuring the impact of the event

Catering

- Contracting of local supply chain. Accessible and inclusive menu for social wellbeing of delegates. Reduction of CO_2 through using locally sourced food
- Minimisation of food waste
- Accessible and inclusive menu
- Reducing water usage, energy and packaging waste
- Reducing packaging waste

Audio / Visual

- Contracting of local supply chain. Reduction in CO_2 travel emissions
- Social wellbeing of delegates
- Energy saving costs

Marketing Materials

- Estimated cost saving by using in-house marketing: £1,300 which includes design and print of stands
- Reduction in plastic and paper waste
- Reduction in waste and estimated cost reduction of around £75 in printing
- Estimated saving of £210 in production costs for the bag only

EIBTM 2008 - THE GLOBAL MEETINGS AND INCENTIVES EXHIBITION

EIBTM is an exhibition for the global meetings and incentives industry held annually in Barcelona, Spain.

The objectives of EIBTM are to:

- Benchmark the waste generated from the event
- Educate and encourage suppliers to increase their level of sustainability
- Benchmark the economic, environmental and social impact of an event

For each of these objectives EIBTM identified numerous Key Performance Indicators (KPIs), and for each of these KPIs a quantifiable target was established. For example, the target of reaching 100% of the supply chain with information about sustainability was established as a way to achieve the objective of educating contractors and suppliers.

Food and Catering

Food represents 1/3 of our impact on the environment, or 20% of our CO_2 emissions

Food represents 1/3 of our impact on the environment, or 20% of our CO_2 emissions because of products which come from the other side of the planet or which are grown in heated greenhouses and require synthetic fertilizer and a considerable amount of energy. From the food we consume, meat represents almost 50% of the environmental impact with production that involves the consumption of numerous natural resources.

The production of one kilogram of meat requires the same amount of time and the same surface area of Earth as would produce of 160 kg of potatoes. With the amount of water needed to produce 1 kg of beef a person could shower daily for six months. Putting 1 kg of beef on your plate requires 7 litres of gasoline. In terms of global warming, the production of a kilo of beef generates nearly 80 times more greenhouse gas that a kilo of wheat, and represents the equivalent of 60 km travelled by car.

Beyond these environmental issues there are also impacts on our health and the question of food safety and nutrition. Thus companies and firms can play an important role in the management of the catering services they provide to their staff and visitors.

An office can provide cooked meals from its own premises or through subcontracting a caterer; either option ideally requires the promotion of numerous guidelines regarding organic versus conventional foods and the implementation of fair trade policies. Whether very small or medium size, a firm has the ability to encourage numerous behavioural changes (such as the choice of products, changes in menus and changes in cooking practices) and the possibility to invest in more sustainable immediate or long-term activities and infrastructure, depending on its catering needs.

In addressing its catering activities, an office can have an impact on its ecological-footprint. Promoting healthier eating can heighten self-esteem amongst staff which in the long run can play a role in overall efficiency of staff and may help to encourage positive lifestyle changes outside the office, leading to a positive impact on health and well-being, as well as on our environment.

A new report published in May 2011 by the UN Food and Agriculture Organization indicates that 1.3 billion tons, or nearly one-third of all food produced in the world, is lost or wasted.

EUROPEAN LEGISLATION AND OBJECTIVES

Organic food

In Europe, food products can only legally be called "organic" if they are produced in accordance with European Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and food stuffs. This regulation details how food must be produced, processed and packaged in order to be identified as organic and makes the procurer's job far easier in determining whether food products were produced organically or not.

Also relevant is the European Council Regulation (No 1804/1999) on the organic production of agricultural products and indications referring to agricultural products and foodstuffs to include livestock. This regulation defines rules on production, labelling and inspection of the most relevant animal species, covering, for example, animal welfare, disease prevention and the exclusion of GMOs from organic production methods.

FairTrade

On 6 July, 2006 the European Parliament adopted a resolution on Fair Trade and Development[130] (A6- 0207/2006) indicating Parliament's full support for the concept of Fair Trade and defining a number of criteria which need to be fulfilled.

Certification and labelling

Although there is no legal definition of 'sustainable food', some features of this such as 'organic' or 'Fairtrade' are clearly defined. Organic accreditation is clearly marked on food packaging and/or on signs at farms, and an accredited producer will be able to provide a copy of a valid certificate.

ORGANIC CERTIFICATION

The word 'organic' refers to the way farmers grow and process agricultural products, such as fruits, vegetables, grains, dairy products and meat. Farmers who grow organic products and meat don't use conventional chemical methods to fertilize, control weeds or prevent livestock disease.

The following "organic" labels are recognized and used in the European Union public sector:

- European organic product label (EU)
- Bio-Siegel (Germany)
- Skal Eko Symbol (EU and Netherlands)
- AB (Agriculture Biologique) (France)
- Demeter (Germany)

FAIRTRADE CERTIFICATION

When a product carries the Fairtrade mark it means the producers and traders have met Fair trade standards. The standards are designed to address imbalance in the power of trading relationships, unstable markets, and the injustices of conventional trade.

The following "Fairtrade" labels are recognized and used in the European Union public sector:

World Fair Trade Organization (WFTO)
(The International Fair Trade Association (IFAT))[131]

Fairtrade Labelling Organization International (FLO)[132]

Buy Fair – A Guide to the public purchasing of Fair Trade production[133]

CO_2 LABELLING

The concept of CO2 labelling has resulted in numerous studies and propositions for labelling throughout north-western Europe but there is no labelling system as yet which has been shown to produce satisfactory results due to the complexity of the calculations involved and the feasibility of implementation. However several references to schemes are here mentioned which may assist in making sustainable choices, such as:

- Mangez moins de CO_2 (Eat less CO_2) (France)[134]
- Milieukeur (the Dutch eco-label scheme)
- Carbon Trust (UK)
- Foodwatch (Germany)[135]
- Air freighted (UK)
- Spillage and Indirect Energy of Food, 2007 (Netherlands)

SEAFOOD LABELLING

The Marine Stewardship Council (MSC) labels fish and fish products which are derived from sustainable fisheries, ensuring the avoidance of fish stock depletion, an active approach to the recovery of already depleted stocks, minimal ecosystem impact, and an effective management system.[136]

Management-related activities, ideas and tips

Whether a firm can provide cooked meals from its premises or subcontracts the services of a caterer, the following activities can be undertaken:

- Adoption of a sustainable catering policy: Sustainable Catering strives to minimize the environmental impact at all stages of the production process and when purchasing basic ingredients opts resolutely for environmentally responsible products. It focuses on locally produced, high quality goods and for products that cannot be produced locally (e.g. coffee, tea, wine, chocolate, rice or cotton); it promotes fair trade.
- Adoption of a sustainable procurement policy: More information on this is provided in the "Sustainable and Green Procurement" chapter (or in the "Sustainable Procurement Guidelines for UN cafeterias, food and kitchen equipment" or Procura+)
- Suppliers should have an environmental management system (EMS) for catering services (such as EMAS, ISO 14001), or equivalent.

Training and communication

In the case of a firm with a small kitchen for the use of its employees, sustainable eating can be promoted by consulting with nutritionists and offering cooking classes with the following topics:

- Training on how high quality fresh food can be prepared, served (and ultimately disposed of) to maximize health and sustainability benefits.
- Information about nutritional principles, waste and energy management.

Performance-related activities, ideas and tips

By buying less but more often, you can buy more for your needs and avoid wastage. To ensure good conservation of food, a refrigerator should not exceed 6° Celsius, with a temperature of 4°C being ideal.

A more sustainable menu means replacing items – e.g.:

- Individual cans of soda (1-2€ / person) with local fruit juice (apple) (4€ / litre);
- Individual water bottles (1-2€ per bottle) with a refillable pitcher (one-time price of 5€);
- Boxed lunches (8-12€ / lunch) with vegetarian platters (5-10€ / person);
- Dessert trays (2-3€ per person) with local, seasonal fruit (0.50-2€ per person);
- Beef with chicken, sustainably-harvested fish, or vegetarian meals. The production of beef is ten times as carbon-intensive as chicken, and vegetarian food has an even smaller carbon footprint;
- Exclude fish species identified as most at risk by the Marine Conservation Society.

By buying less but more often, you can buy more for your needs and avoid wastage

Food choices:

Develop menus which contain seasonal products to reduce food air miles;

Re-formulate meals based on daily or weekly regional availability and if possible commit to a target of offering 75% fresh food on site;

Offer more fruits, vegetables – preferable regional, national – with stable importers (building up long term relationships with food providers);

Offer local, organic and fair trade products if possible;

Provide a basket of fruit (apples, pears) in the office;

Take account of whole life cycle costs where applicable to ensure sustainability and minimize impact on the environment;

Demand GMO (genetically modified organism) free foods;

Participate in campaigns such as “a day without meat”, “meat-free Monday”, “veggie Thursday”, etc.).

Food Supply:

- Request that products be delivered in returnable crates to reduce packaging;
- Buy products with less packaging or with renewable packaging;
- Purchase groceries wholesale in large amounts and from regional producers (less travel, less generated waste, lower emissions);
- Evaluate, with as much precision as possible, how much food should be bought;
- Avoid prepared products or single unit packaging (milk, sugar, butter, etc.);
- Collect/preserve reusable containers for the office, so employees can take home leftovers;
- Donate surplus to local charity organizations.

Table service:

- Provide salad garnish, butter portions, etc. on request to minimize waste;
- Use reusable coffee filters;
- Encourage participants to bring their own cups in exchange for free coffee;
- Propose that tap water should be provided in a carafe;
- Limit as much as possible drinks from single bottles;
- If you cannot use linen napkins, favour paper towels made from 100% post-consumer recycled fibre and give one to each person (soiled paper towels are not recyclable!);
- Print menus on recyclable material or use blackboards to reduce the need for printing daily menus;
- Value used oils (a growing number of companies offer commercial collection services you can use).

Tableware:

- If you want to use plastic glasses, choose recyclable ones;
- An interesting alternative to plastic and reusable dishware is biodegradable or compostable dishware – but this requires the use of specific sorting bins and precise sorting because the presence of heavy metals in bleached paper can affect the composting process.

Waste:

- Using reusable tableware necessitates a more elaborate collection process - but allows for efficient disposal of the various wastes by customers prior to returning the dirty tableware;
- Organize waste sorting and recycling;
- Put in place an organic waste recovery system.

Environmental performance indicators

Food Products	**%**	
Organic Fair Trade Labelling (recognized) Seasonal		
Sustainability	**%**	
Procurement: Environmental Management System EMAS ISO 14001 Other		Indicate % of suppliers
Packaging: Renewable Non-renewable No packaging Waste		Indicate overall %
Origin: Local Regional National International		Indicate overall %
Overall performance		**kgCO_2 eq.**
Meal types: #1 Vegetarian #2 Seafood #3 Chicken #4 Beef #5 Other		

Office Best Practice Examples

In 2001 the catering service of Ethias Insurance Corporation from Liège, Belgium undertook a gradual and important change towards more sustainable management. After eight years it now has an impressive record, with:

- 85% of its food purchases being organic or fair trade;
- Double the number of customers;
- A new network of suppliers which includes several regional producers;
- A charter for suppliers to certify compliance concerning quality of products and also social elements (e.g. proper working conditions).

Integrating strict compliance requirements for use of seasonable fruits and vegetables

The objective of the new manager was to:

- Eliminate chemical sauces from the shelves, and use only natural ingredients;
- Find suppliers of goods that are "good, clean and fair";
- Stimulate the cooking staff to rediscover the profession and pleasure of cooking.

Without changing the final cost of the food the manager gradually changed supplies, menus and preparation methods and - despite some opposition at the beginning -succeeded in:

- Reducing the quantity of meat used;
- Integrating strict compliance requirements for use of seasonable fruits and vegetables;
- Abandoning the purchase of expensive industrial convenience products.

Also really good example is the Royal Navy's sustainable, energy efficient dining and kitchen facility.

Bibliography

1. Cs. Bodroghelyi – P. Havasi – I. Pap: Money Through the Window, Vol. VII, KÖVET, 2008

2. Directorate General for the Environment of the Belgian Federal Public Service of Health (Belgian Presidency of the Council of the European Union): Product Policy and Indoor Air Quality, 2010

3. D. Saltzman – S. Anderson – C. Nichols: Green Office Guide - A Guide to Greening Your Bottom Line Through a Resource-Efficient Office Environment, City of Portland Office of Sustainable Development, 2001

4. European Communities: The European Eco-Management and Audit Scheme, 2004

5. P. Calanter – M. Patricia Ardeleanu: Implementing Environmental Policies in EU – Action Plans and Programs, Scientific Papers, Issue 4, August 2011

6. P. Havasi – R. Halmavánszki: Money Through the Window, Vol. VIII, KÖVET, 2009

7. P.W. Gerbens-Leenes – A.Y. Hoekstra: Business Water Footprint Accounting, 2008

8. P. Wargocki: Estimate of an economic benefit from investment in improved indoor air quality in an office building, in Proceedings of Healthy Buildings 2003, Vol. 3, University of Singapore, Singapore, 2003

9. Procuring the Future- the Report of the UK Sustainable Procurement Task Force, 2006

10. RICS MODUS: The Water Issue January, 2011

11. World Health Organization: WHO Guidelines for Indoor Air Quality: dampness and mould, 2009

Internet references

(Footnotes)

1 *Greenhouse Gas Protocol, June 2006, World Resource Institute: (1 kg of paper (80g/m²) equals with 0,7 kg of CO2e emission))*

(Endnotes)

1 *http://www.emasnetwork.org/FCKeditor/data/File/factsheets/Green%20Public%20Procurement.pdf*
2 *http://www.unep.fr/scp/procurement/docsres/ProjectInfo/MTF_Flyer_A4_Ansicht.pdf*
3 *http://ec.europa.eu/environment/gpp/what_en.htm*
4 *http://ec.europa.eu/environment/gpp/index_en.htm*
5 *http://www.bcn.es/agenda21/ajuntamentsostenible/english/index.htm*
6 *http://www.ukace.org/publications/ACE%20Research%20(2003-05)%20-%20Energy%20Efficiency%20in%20offices%20%5BMotivating%20Action%20report%5D*
7 *http://www.earthtoys.com/emagazine.php?issue_number=08.06.01&article=reducingcarbon*
8 *http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0075:HU:NOT*
9 *http://www.energy.eu/focus/energy-label.php*
10 *http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008R0106:EN:NOT*
11 *http://www.energystar.gov/index.cfm?c=about.ab_index*
12 *http://www.dmme.virginia.gov/de/consumerinfo/HandbookLighting.pdf*
13 *http://www.energy.eu/focus/energy-label.php*
14 *http://ec.europa.eu/energy/lumen/professional/legislation/index_en.htm*
15 *http://www.dmme.virginia.gov/de/consumerinfo/HandbookLighting.pdf*
16 *http://ec.europa.eu/energy/lumen/overview/whatchanges/index_en.htm*
17 *http://www.green-energy-efficient-homes.com/index.html*
18 *http://ec.europa.eu/environment/gpp/pdf/toolkit/construction_GPP_product_sheet.pdf*
19 *http://ec.europa.eu/environment/gpp/pdf/toolkit/construction_GPP_product_sheet.pdf*
20 *http://ec.europa.eu/energy/efficiency/buildings/buildings_en.htm*
21 *http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:01:EN:HTML*
22 *http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/11/440&format=HTML*
23 *http://ec.europa.eu/enterprise/sectors/construction/legislation/index_en.htm*
24 *http://ec.europa.eu/enterprise/sectors/construction/legislation/index_en.htm*
25 *http://europa.eu/legislation_summaries/enterprise/interaction_with_other_policies/en0018_en.htm*
26 *http://www.ecodesign-wp2.eu/*
27 *http://europa.eu/legislation_summaries/energy/energy_efficiency/l27057_en.htm*
28 *http://assohqe.org/hqe/*
29 *http://www.breeam.org/page.jsp?id=66*
30 *http://www.dgnb.de/*
31 *http://www.iso.org/iso/home.html*
32 *http://susproc.jrc.ec.europa.eu/buildings*
33 *http://www.wbdg.org/design/designobjectives.php*
34 *http://re.jrc.ec.europa.eu/energyefficiency/greenbuilding/index.htm*
35 *http://ec.europa.eu/environment/gpp/pdf/toolkit/office_IT_equipment_GPP_product_sheet.pdf*
36 *http://europa.eu/legislation_summaries/consumers/product_labelling_and_packaging/co0012_en.htm*
37 *http://www.europarl.europa.eu/oeil/file.jsp?id=5393632*
38 *http://europa.eu/legislation_summaries/enterprise/interaction_with_other_policies/en0018_en.htm*

39 *http://www.ecodesign-wp2.eu/*
40 *http://ec.europa.eu/environment/waste/weee/index_en.htm*
41 *http://ec.europa.eu/environment/waste/rohs_eee/*
42 *http://europa.eu/legislation_summaries/environment/waste_management/l21202_en.htm*
43 *http://ec.europa.eu/environment/gpp/pdf/toolkit/office_IT_equipment_GPP_background_report.pdf*
44 *http://ec.europa.eu/environment/ecolabel/ecolabelled_products/product_categories_en*
45 *http://www.eu-energystar.org/en/index.html*
46 *http://www.blauer-engel.de/*
47 *http://www.tcodevelopment.com/*
48 *http://www.nordic-ecolabel.org*
49 *http://www.ecolabelindex.com/*
50 *www.scientificpapers.org*
51 *www.hp.com/ecosolutions*
52 *http://www.greenpeace.org/international/Global/international/planet-2/report/2010/3/make-it-green-cloud-computing.pdf*
53 *http://www.americanbar.org/newsletter/publications/gp_solo_magazine_home/gp_solo_magazine_index/solo_lawyer_cloud_energy_pollution_environment.html*
54 *http://www.eu-energystar.org/en/index.html*
55 *http://ec.europa.eu/environment/gpp/pdf/toolkit/office_IT_equipment_GPP_product_sheet.pdf*
56 *http://ec.europa.eu/environment/gpp/pdf/toolkit/office_IT_equipment_GPP_background_report.pdf*
57 *http://ec.europa.eu/environment/gpp/pdf/toolkit/office_IT_equipment_GPP_product_sheet.pdf*
58 *http://ec.europa.eu/environment/gpp/index_en.htm*
59 *http://www.energystar.gov/index.cfm?c=power_mgt.pr_power_mgt_faq*
60 *http://www.eu-energystar.org/en/en_022.shtml*
61 *http://www.energystar.gov/ia/products/downloads/ES_server_case_study.pdf*
62 *http://www.dummies.com/how-to/content/buying-green-office-equipment-and-supplies.html*
63 *http://www.epeat.net/*
64 *http://www.it-energy.co.uk/homepage/case-studies/*
65 *http://archive.defra.gov.uk/environment/business/reporting/pdf/101006-guidelines-ghg-conversion-factors-method-paper.pdf*
66 *http://www.fsc.org/*
67 *www.panda.org/savepaper*
68 *www.ecofont.com*
69 *http://www.wwf.fi/wwf/www/uploads/pdf/go_tiedote_tulokset_englanti_08062010.pdf*
70 *http://e-estonia.com/e-estonia*
71 *http://www.unwater.org/statistics_res.html*
72 *http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Water_statistics*
73 *http://www.unwater.org/statistics_san.html*
74 *http://ec.europa.eu/environment/water/quantity/pdf/water_saving_1.pdf*
75 *http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Water_statistics*
76 *http://ec.europa.eu/enterprise/policies/sustainable-business/documents/eco-design/legislation/framework-directive/index_en.htm#h2-1*
77 *http://www.mfe.govt.nz/issues/water/wels-scheme/index.html*
78 *http://www.water-efficiencylabel.org.uk/members.asp*
79 *http://www.waterfootprint.org/?page=files/home*

80 http://www.waterfootprint.org/Reports/Report46-WaterFootprintPaper
81 http://ec.europa.eu/environment/gpp/gpp_criteria_sp.htm
82 http://ec.europa.eu/environment/water/quantity/pdf/Water%20efficiency%20standards_Study2009.pdf
83 http://ec.europa.eu/environment/gpp/pdf/toolkit/furniture_GPP_background_report.pdf
84 www.ueanet.com
85 http://ec.europa.eu/environment/gpp/pdf/toolkit/furniture_GPP_background_report.pdf
86 http://www.fsc.org/about-fsc.html
87 www.tuv.com
88 http://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm
89 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009D0894:EN:NOT
90 http://www.green-works.co.uk/index.php
91 http://www.kinnarps.com/
92 http://epp.eurostat.ec.europa.eu/portal/page/portal/waste/data/sectors/municipal_waste
93 http://envirowise.wrap.org.uk
94 http://envirowise.wrap.org.uk/uk/Our-Services/Resource-efficiency.html
95 http://envirowise.wrap.org.uk/uk/Sectors/Commerce/Key-Issues/Office-Waste.html
96 http://www.green-office.org.uk/
97 http://eur-lex.europa.eu/
98 http://ec.europa.eu/environment/waste/framework/index.htm
99 http://ec.europa.eu/environment/waste/packaging_index.htm
100 http://www.lowcvp.org.uk/
101 http://www.globalfueleconomy.org/FAQ/Pages/FAQHome.aspx
102 http://www.iema.net/download/readingroom/casestudy/Zurich%20-%20Sustainable%20Transport%20Planning/Zurich%20-%20Sustainable%20Transport%20Planning.pdf
103 http://ec.europa.eu/health/ph_projects/2002/pollution/fp_pollution_2002_frep_02.pdf
104 http://www.euro.who.int/en/what-we-do/health-topics/environmentalhealth/ look for air-quality
105 http://www.energy.sintef.no/Prosjekt/Annex29/Publikasjoner/GSHPs_ThermalStorageNO.pdf
106 http://www.euro.who.int/__data/assets/pdf_file/0009/128169/e94535.pdf
107 http://www.euro.who.int/__data/assets/pdf_file/0004/128605/Factsheet_indoor_chem_15_Dec_10.pdf
108 http://www.eutrio.be/
109 http://www.euro.who.int/__data/assets/pdf_file/0017/43325/E92645.pdf
110 http://osha.europa.eu/en/legislation/directives
111 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:71989L0391:EN:NOT
112 http://www.biketowork.be/index.php?option=com_content&view=article&id=22&Itemid=49&lang=en-GB
113 http://www.workcover.nsw.gov.au/formspublications/publications/Documents/health_and_safety_in_the_office_guide_1319.pdf
114 http://www.euro.who.int/__data/assets/pdf_file/0007/115486/E77650.pdf
115 http://www.colormegreenco.com/NASA/nasa2.htm
116 http://ec.europa.eu/europe2020/priorities/inclusive-growth/index_en.htm
117 www.investorsinpeople.co.uk/Needs/3minutes/Pages/Standardbeyond.aspx
118 http://www.investorsinpeople.co.uk/Documents/Branding2009/IIP_framework_summary09.pdf
119 www.certifikatdpp.si
120 http://www.bnq.qc.ca/en/es/service.html
121 http://www.oecd.org/department/0,3355,en_2649_34889_1_1_1_1_1,00.html
122 http://www.unglobalcompact.org/AboutTheGC/TheTenPrinciples/index.html

123 http://www.iso.org/iso/social_responsibility
124 http://www.helium.com/items/334584-the-environmental-effect-of-todays-household-cleaning-products
125 http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm
126 http://ec.europa.eu/environment/ecolabel/
127 http://www.eventsustainability.co.uk/pages/uploadedfiles/www/SustainableEventsGuide_defra.pdf
128 http://www.organisethis.co.uk/assets/uploads/page_content/image/E078BB1A-122C-10D6-947C12FBA-5C3A8FB.pdf
129 www.eventsustainability.co.uk
130 http://trade.ec.europa.eu/doclib/docs/2009/may/tradoc_143089.pdf
131 http://www.ifat.de/en
132 www.fairtrade.net
133 www.buyfair.org
134 www.saveurspaysannes.be
135 http://www.foodwatch.de/kampagnen__themen/klima/klimastudie_2008/index_ger.html
136 www.msc.org

International labels for products	Air + Indoor Pollution	Furniture	Paper	Office equipment	Energy and water	Cleaning	Traveling, usage of cars	Meal, catering	IT equipment	Waste management	Design and location of the building
The European Ecolabel (EU Ecolabel) *http://ec.europa.eu/environment/ecolabel/*		x	x	x		x		x			
The FAIR TRADE Mark *http://www.fairtrade.net/*				x				x			
Organic label *http://ec.europa.eu/agriculture/organic/consumer-confidence/logo-labelling_en*						x		x			
International Energy Star Program www.eu-energystar.org				x					x		
The European Energy Label *http://www.energylabels.org*				x							
PEFC - programme for the endorsement of forest certification *http://www.pefc.org*		x	x								
FSC -forest stewardship council *http://www.fsc.or*		x	x								
EMAS *http://ec.europa.eu/environment/emas/index_en.htm*										x	

Important national and regional labels for products	Air + Indoor Pollution	Furniture	Paper	Office equipment	Energy and water	Cleaning	Traveling, usage of cars	Meal, catering	IT equipment	Waste management	Design and location of the building
The Nordic Ecolabel *http://www.nordic-ecolabel.org/*		x	x	x		x		x			
The Blue Angel (Blauer Engel) *http://www.blauer-engel.de/en*		x	x	x		x		x			
Soil Association *http://www.soilassociation.org*								x			
HQE (France). *http://assohqe.org/hqe/*											x
BREEAM (UK) ***http://www.breeam.org***											x
DGNB- The German Sustainable Building Council *http://www.dgnb.de/_en/*											x
Design for Environment (DfE) *http://www.epa.gov/dfe*				x	x	x					x
Green Key *http://www.green-key.org/*								x			

EGO CHECKLIST

EGO LEVELS: **1** = Basic level of EGO - COMPULSORY! **2** = Advanced level - optional **3** = Experts level - optional

No	Topic	Criteria / Question	Level
1	**Management**	Does your organisation have a top-level commitment regarding developing and implementing a green office (GO) in some sort of written statement (e.g. a signed environmenatl policy)?	1
2	**Management**	Have a GO coordinator and a GO team been appointed/selected?	1
3	**Management**	Have the most significant environmental impacts of the office been identified/ reviewed?	1
4	**Management**	Have GO environmental objectives been defined and corresponding action plan been developed (with goals, actions, responsibilities and a timeline)?	1
5	**Management**	Do you regularly inform and train the staff about the the GO program (incl. why are we doing it and what can each of us do in order to minimize our environmental impact) ?	1
6	**Management**	Do you revise your action plan regularly?	1
7	**Management**	Have you defined indicators to monitor your environmental performance?	1
8	**Management**	Do you regularly monitor the progress of your GO activities of your office?	1
9	**Management**	Have you calculated the ecological and/or carbon footprint of your office?	2
10	**Communication / management**	Do you conduct awereness raising of your staff by using external experts who educate your employees about global problems?	2
11	**Communication / management**	Do you work with the property manager of your building to introduce and communicate green office behaviour?	2
12	**Communication / management**	Do you have a "Green corner" where you display and promote the use of green office equipment?	3
13	**Communication / management**	Do you communicate and involve / inform all your partners and subcontractors about the environmental aspects and greening efforts of the office?	3
14	**Communication / management**	Have you created a Corporate Citizenship / CSR / Sustainability Report and included a section about your Green Office program?	3
15	**Communication / performance**	Have you shared the ten most important Green Office rules with your colleagues?	1
16	**Communication / performance**	Have you created an external communication plan to promote your GO (e.g. regular press releases / short videos / case studies presenting your Green Office program)?	3
17	**Sustainable Procurement**	Does your office have a written and implemented green and/or sustainable procurement policy/principles/procedure?	1
18	**Sustainable Procurement**	Is the GO coordinator involved in the process of (green) procurement?	1
19	**Sustainable Procurement**	Are your company's procurement staff aware of the principles/procedures of green procurement and eco and Fair Trade labels?	1
20	**Energy consumption / management**	Are you tracking and measuring your energy consumption?	1
21	**Energy consumption / management**	Have energy consumption and savings been quantitatively tracked? (e.g. checklist for maintenance)	1
22	**Energy consumption / management**	Do you have action plan for reducing energy consumption?	1
23	**Energy consumption / management**	Do you encourage employees to turn off lights, computers, heating, air-conditions and electronic equipment when they leave their offices (especially at the weekends and on holidays)? Or use stairs instead of elevators?	1
24	**Energy consumption / management**	Has an energy audit been undertaken by an external consultant?	2
25	**Energy consumption / management**	Are workers rewarded for resource-saving activities?	3
26	**Energy consumption / performance**	Do you use energy efficient equipment (equipment with eco-labels, etc.)?	1
27	**Energy consumption / performance**	Do you regularly maintain HVAC systems?	1
28	**Energy consumption / performance**	Do you take advantage of natural light?	1
29	**Energy consumption / performance**	Have you installed local lights that allow staff to control their own lighting areas?	2
30	**Energy consumption / performance**	Do you use renewable energy (e.g. have a green electricity provider)?	2
31	**Energy consumption / performance**	Have you installed motion detectors that automatically turn lights on and off in rooms and areas that receive infrequent traffic?	3
32	**Energy consumption / performance**	Have you installed software that centrally shuts-down office lighting and equipment on a pre-determined schedule?	3
33	**Energy consumption / performance**	Do you have any technology for producing renewable energy (solar panels, etc.)?	3
34	**Office buildings design and location / management**	Has the creation of proper waste management system (sorting) been taken under consideration already when building/designing?	1
35	**Office buildings design and location / management**	During the planning / design phase at least two of the following four have been considered: net energy demand (for space heating, cooling and ventilation); waste generation; the potential for using local renewable energy sources; the use of sustainable building materials and/or reducing dangerous substances.	2
36	**Office buildings design and location / management**	Does the building have at least two of the following four elements: external (facade) insulation, double/triple glazed windows, roof insulation, an insulated heating system?	2
37	**Office buildings design and location / performance**	Does the building's indoor environmental quality (e.g. air, temperature, light) comply with applicable norms and regulations?	1
38	**Office buildings design and location / performance**	Has the office building been environmentally certified?	3
39	**Office buildings design and location / performance**	Does the building itself generate up to 50% of its energy needs?	3
40	**Green IT office equipment /management**	Is there a Green IT Procurement strategy in place?	1
41	**Green IT office equipment /management**	Is a greener IT equipment registry (e.g. EPEAT) consulted when buying new equipment?	1
42	**Green IT office equipment /performance**	Do about 85% of the computers, notebooks, monitors, imaging equipment and internal servers have officially-recognized environmental certification (related to energy saving, toxic free materials, healthy noise levels, etc.) (e.g. Ecolabel, Energy star)?	1
43	**Green IT office equipment /management**	Is there a management system in place for dealing with e-waste (end-of-life servers, computers, notebooks, monitors, imaging equipment and cartridges and accessories such as headphones, mics, computer mice, etc.)?	1
44	**Green IT office equipment /performance**	Are employees trained to use the environmental features of IT equipment (if a central green management plan has not been introduced by the ITC department)?	1
45	**Green IT office equipment /management**	Does the supplier of IT equipment for the office offer maintenance and repair as a part of the contract?	2
46	**Green IT office equipment /management**	Has the ICT department introduced an energy management plan for IT equipment (e.g. programmed the relevant IT equipment to shut down automatically at a certain hour or after a certain period when the equipment has not been in use (e.g. lunch breaks, during weekends, public holidays)?	2
47	**Green IT office equipment /performance**	Are your external servers (e.g. cloud computing) powered using green energy?	3

48	**Office Paper/management**	Does your office have an approved procedure (guidance/internal rules) for reducing paper use (incl. setting rules and measures for reducing, reusing and recycling paper)? (This can either be a part of the general environmental rules of the office or a separate procedure for paper products).	1
49	**Office Paper/management**	Does your office have an approved procedure (guidance/internal rules) for purchasing environmentally friendly paper products (e.g. eco-labelled paper)? (This can either be a part of the general procurement policy of the office or a separate procurement procedure for paper products).	1
50	**Office Paper/management**	Do you regularly communicate to and train your employees about how to use paper sustainably in the office?	1
51	**Office Paper/management**	Have you defined indicators to monitor office paper usage periodically (e.g. monthly or quarterly or yearly)?	1
52	**Office Paper/management**	Do you periodically give feedback to all staff about decreases/increases in paper use in the office (e.g. once a year)?	1
53	**Office Paper/management**	Do you have measures designed to engage and motivate staff to save paper (e.g. organising paper-saving campaigns and competitions for employees)? (Has the office carried out any specific activity like this in the last 1 year)?	2
54	**Office Paper/performance**	Concerning communication and training, do all staff know and follow the commonly-agreed-on paper saving rules and measures?	1
55	**Office Paper/performance**	To avoid paper print-outs, are electronic document handling options widely used in the office (e.g. documents are read and edited on-screen rather than printed; presentations and other documents are made available on the Internet instead of on paper; information is sent electronically rather than in printed format, etc.)?	1
56	**Office Paper/performance**	Has the duplex printing ("print on both sides") function been selected as default for all printers and copiers that have this function?	1
57	**Office Paper/performance**	Do you have a system to collect office paper for later reuse in the office? (e.g. workplaces may have trays for collecting paper that has been only used on one side for internal needs such as draft papers).	1
58	**Office Paper/performance**	Do you have a paper waste collection system at workplaces where paper waste is generated (e.g. clearly labelled small bins are placed near desks and bigger ones near printers and copiers)?	1
59	**Office Paper/performance**	Is a minimum of 80% of all the office paper used in the office environmentally friendly (i.e. has been awarded the EU eco-label or another national or regional ISO Type I eco-label)?	1
60	**Office Paper/performance**	Are a minimum of 80% of all other paper products (at least toilet paper and paper towels) used in the office environmentally friendly (i.e. have been awarded the EU eco-label or another national or regional ISO Type I eco-label)?	2
61	**Office Paper/performance**	Are all your printed paper materials (leaflets, brochures, reports, etc.) printed on environmentally friendly paper (i.e. which has been awarded the EU eco-label or another national or regional ISO Type I eco-label)?	3
62	**Office Paper/performance**	Is the so-called 'personal printing footprint' being tracked in the office (e.g. a system that allows measurement and reporting of how many sheets of paper each staff member is personally responsible for, e.g. each month)?	3
63	**Water Consumption / management**	Are you regularly tracking and measuring water consumption?	1
64	**Water Consumption / management**	Do you have an action plan for reducing water consumption?	1
65	**Water Consumption / management**	Do you have water-saving guidelines and procedures for using kitchen equipment? (e.g. using the dishwasher only when it is full, etc.).	1
66	**Water Consumption / management**	Do you train your employees about water-saving activities?	2
67	**Water Consumption / management**	Do you harvest rainwater?	3
68	**Water Consumption / management**	Are workers rewarded for water-saving activities?	3

69	**Water Consumption / performance**	Do you promote the drinking of tap water instead of bottled water to your employees?	1
70	**Water Consumption / performance**	Do you use water saving equipment (perlators, efficient shower heads, etc.)?	2
71	**Office furniture**	Is the office furniture made of environmentally-friendly substances? Does it conform to ecolabel criteria?	3
72	**Office furniture**	Do you have a procedure/guidance on how to provide an ergonomic working place?	3
73	**Office furniture**	Is there a written policy about methods for dealing with furniture at the end of its life (official recycling policy, distribution for second hand use, etc.)?	2
74	**Office furniture**	Are the textiles of the furniture you use washable and made from natural materials? reusing / recycling	2
75	**Office furniture**	Is your furniture supplied by a local producer?	2
76	**Waste/management**	Does your office have an approved waste management procedure (guidance/internal rules) for reducing, reusing and separately collecting waste? This can either be a part of the general environmental rules of the office or a separate procedure for waste management.	1
77	**Waste/management**	Are you regularly communicating and training employees about how to reduce, reuse and separately collect (recycling-type) waste in the office (e.g. through providing instructions on how to handle waste to all staff)?	1
78	**Waste/management**	Is feedback regularly given to all staff about efforts related to waste management (e.g. about decreasing waste) in the office?	1
79	**Waste/management**	Do you monitor waste generation periodically (e.g. monthly or quarterly or yearly)? Is the share of recycled waste to total waste measured?	2
80	**Waste/management**	Does the office motivate staff to reduce the generation of waste (e.g. organise specific waste-related campaigns and competitions for employees)? Furthermore, has the office carried out any specific activities of this type in the last 1 year?	3
81	**Waste/performance**	Concerning communication and training, do all staff know and follow commonly-agreed-on rules and measures about waste prevention and waste management?	1
82	**Waste/performance**	To reduce/minimize waste generation, are specific measures being widely employed in the office (e.g. paper use is reduced, only durable and repairable equipment is purchased, products are purchased in bulk to reduce packaging, products with nontoxic content are selected, equipment that do not need batteries is purchased, etc.)?	1
83	**Waste/performance**	When reusing office waste, are several activities being undertaken (e.g. re-using office paper, re-using packaging-boxes, using re-usable tableware rather than disposable, purchasing used furniture, etc.)?	1
84	**Waste/performance**	Do you collect hazardous waste (e.g. batteries, paper waste, chemical waste, Hg-lamps, etc.) separately? Also, do all staff have access to centralized collection bin(s) for hazardous items?	1
85	**Waste/performance**	In addition to the separate collection of hazardous waste, are there other types of waste which are collected separately (incl. WEEE, paper waste, packaging waste (glass, plastic, metal) and, if possible bio waste (if the area has a separate bio waste collecting system))?	1
86	**Transport and Mobility / management**	Has your office been able to reduce conventional commuting trips by providing employees with support for using public transport?	1
87	**Transport and Mobility / management**	Do you monitor the mobility of your employees (number of kms travelled, number of litres of gasoline used, etc.)?	2
88	**Transport and Mobility / management**	Have you implemented a mobility plan?	2
89	**Transport and Mobility / management**	Do you promote Carpooling and Car-Sharing and make it easy for staff to find car-pool options?	2

90	**Transport and Mobility / management**	Do you have a policy about purchasing clean vehicles or do you provide eco-driving courses?	2
91	**Transport and Mobility / management**	Do you measure carbon emissions from transport?	2
92	**Transport and Mobility / management**	Do you purchase carbon offsets for the transport emissions?	3
93	**Transport and Mobility / performance**	Do you implement and encourage the use of desktop webcams / videoconferencing to reduce travel?	1
94	**Transport and Mobility / performance**	Do you provide access to showers, lockers and secure bike storage facilities?	2
95	**Transport and Mobility / performance**	Have you purchased bicycles for your employees?	2
96	**Indoor Air Quality**	Can your air conditioner be regulated at all?	1
97	**Indoor Air Quality**	Do you have a smoking policy?	1
98	**Indoor Air Quality**	If you have air conditioning, do you set it to an eco-friendly usage setting?	2
99	**Indoor Air Quality**	Do you have green plants in the office (selected according to environmental criteria)?	2
100	**Indoor Air Quality**	Do you check on humidity issues (ideal humidity rate between 40-60%, no damp marks on walls, no smell of mould)?	2
101	**Indoor Air Quality**	When renovating interiors, do you favour the use of ecological paint? (optional question)?	2
102	**Indoor Air Quality**	Do you measure maximum noise levels? Do you have a noise reduction plan in place? (optional)	3
103	**H&S/management**	Does your office have approved occupational Health & Safety procedures (guidance/internal rules) for creating a healthy and socially balanced working environment?	1
104	**H&S/management**	In addition to the approved procedures, has the office assigned a few responsible persons among the staff: 1) a working environment specialist for coordinating all H&S related work; and, 2) a working environmental deputy to represent staff and their complaints?	1
105	**H&S/management**	Do you regularly communicate and train your employees about issues related to Health & Safety in the office (e.g. do you promote and remind staff about obligatory rest breaks and exercise)? Do you immediately inform new staff about health risks at the workplace?	1
106	**H&S/management**	Does your office give opportunities (and promote) for staff to make suggestions about improving Health & Safety in the office?	1
107	**H&S/management**	Do you undertake regular internal risk assessments of work places (and is this documented)?	1
108	**H&S/management**	Do you have regular external health inspections for all staff (e.g. every 2 years, but a minimum of every 3 years) which are payed for by the employer ?	1
109	**H&S/management**	Do you monitor and evaluate Health & Safety performance periodically? For instance, indicators could be: the number of accidents / injuries reported by cause, number of days of illness per year or number of staff complaints related to Health & Safety issues per year, etc.	1
110	**H&S/management**	Is feedback being given to all staff about Health & Safety related issues (current status and efforts being made) in the office (e.g. once a year)?	1
111	**H&S/management**	Does your office compensate (at least to some extent) the cost of health-related activities for staff (e.g. costs for yoga classes, gym membership, etc.)?	2
112	**H&S/management**	Has the office implemented measures that engage and motivate staff to be actively involved in health-related issues (e.g. organising specific Health & Safety campaigns and competitions for employees)? Furthermore, has the office carried out any specific activity related to this in the last 1 year?	3
113	**H&S/performance**	Concerning communication and training, do all staff know and follow the commonly-agreed-upon occupational Health & Safety procedures and related recommendations as well as understand all the risks related to the workplace?	1

114	**H&S/performance**	Are all workplaces provided with ergonomic, safe and well maintained office equipment? All equipment must be correctly adjusted and sited (according to best ergonomic practices on a case by case basis).	1
115	**H&S/performance**	Do your staff use obligatory rest breaks for taking walks, doing exercise or relaxing in a designated rest room?	1
116	**H&S/performance**	Are there enough plants in offices to reduce the levels of possible toxic substances in the air?	1
117	**H&S/performance**	Does your office have a separate rest room (a special place for staff to spend their rest breaks)? This should at least include some comfortable chairs, a yoga-mat and a bed.	3
118	**H&S/performance**	In addition to a separate rest room and related equipment, do you have other relaxing elements at the workplace such as music instruments, natural incense, massage chairs or other exercise equipment, etc.?	3
119	**Social Issues**	Does your office have a clearly-defined work-family balance strategy in place?	3
120	**Social Issues**	Does your office promote distance-work?	3
121	**Social Issues**	Does your office monitor employee satisfaction and integrate findings into its HR policy?	1
122	**Cleaning**	Are all the environmental aspects of cleaning identified and considered during the cleaning process (amount and type of detergents used, use of microfiber textiles, etc.)? Or do you have an agreement for subcontractors to provide a green cleaning service?	1
123	**Cleaning**	Are you using "homemade" products for cleaning which are made from simple household ingredients, such as: lemon juice, conventional and electrolysed water, borax, vinegar, salt, mineral oil, baking soda, etc.?	3
124	**Cleaning**	Are you monitoring the quantity of cleaning products used?	1
125	**Cleaning**	Are your cleaning staff informed and trained about the environmental aspects of their work and the most appropriate ways of cleaning?	1
126	**Conferences and events**	Do you have a written green checklist for events (which includes all potential environmental aspects and solutions)?	2
127	**Conferences and events**	Do you have strategy for reducing the environmental impact of your events?	2
128	**Conferences and events**	Are you communicating with all participants about how to be a part of efforts to organize green events?	2
129	**Conferences and events**	Are you making an effort to minimize paper-based handouts (through using e-registration, digital posters, etc.)?	2
130	**Food and Catering**	Do you support the purchase of fresh and seasonal food & beverages at your company buffet/restaurant/events?	2
131	**Food and Catering**	Do you support the purchase of organic food & beverages at your company buffet/restaurant/events?	2
132	**Food and Catering**	Do you support the purchase of local food & beverages at your company buffet/restaurant/events?	2
133	**Food and Catering**	Do you have a policy about reducing waste related to your food consumption practices?	2

DATA FOR OFFICE ECOLOGICAL FOOTPRINT CALCULATOR	
BUILDING	
What is the surface occupied by your building?	m2
What is the surface of floors currently in use?	m2
What is the surface occupied by parkings and gardens?	m2
ENERGY	
What is your total electricity consumption?	Kwh
What is the share of green electricity in your electricity consumption?	%
What is your district heating consumption?	Kwh
What is your biomass consumption (wood ships/pellets)?	Kwh
What is your oil consumption?	Litres
What is your natural gas consumption?	M3
WATER	
What is your water consumption?	m3
What is your use of rain water?	m3
MOBILITY	
How many km were driven by petrol car (for your business travels)?	km
How many km were driven by diesel car (for your business travels)?	km
How many km were km were driven by electric car (for your business travels)?	km
How many km were driven by hybrid car (for your business travels)?	km
How many km were driven by bus (for your business travels)?	km
How many km were driven by bicycle (for your business travels)?	km
How many km were driven by train (for your business travels)?	km
How many km were driven by local transportation -metro/tram (for your business travels)?	km
How many km were driven by plane in economic class (for your business travels)?	km
How many km were driven by plane in business class (for your business travels)?	km
COMMUTE	
How many km were driven by petrol car (home workplace)?	km
How many km were driven by diesel car (home workplace)?	km
How many km were driven by electric car (home workplace)?	km
How many km weredriven by hybrid car (home workplace)?	km
How many km were driven by bus/tram (home workplace)?	km
How many km were driven by bicycle(home workplace)?	km
How many km were driven by train(home workplace)?	km

PURCHASING	
What is the amount of copy paper used?	reams
% recycled copy paper	%
Publications (annual report)	Kgs
What is the number of PCs (+CRT screen) purchased?	units
What is the number of PCs(+LCD screen) purchased?	units
What is the number of servers purchased?	units
What is the number of laptops purchased?	units
What is the number of beamer/projectors purchased?	units
What is the number of printers purchased?	units
What is the number of copiers purchased?	units
What is the number of Faxes purchased?	units
What is the number of desks purchased?	units
What is the number of chairs purchased?	units
What is the number of storage furniture purchased?	units
How many litres of detergents were purchased?	Litres
How many kgs of toilet paper were purchased?	Kgs
FOOD	
How many meals with meat/fish were served during office events?	units
How many vegeterian meals were served during office events?	units
how many kgs of tea were purchased?	kgs
How many litres of soft drinks were purchased?	Litres
How many litres of bottled water were purchased?	Litres
How many kilos of sugar were purchased?	kgs
How many litres of milk were purchased?	Litres
How many kgs of coffee were purchased?	kgs
WASTE	
What is the amount of organic waste generated by your activities?	kgs
What is the amount of cardboard/carton waste generated by your activities?	kgs
What is the amount of paper waste generated by your activities?	kgs
How much plastic/metal/can waste was generated by your activities?	kgs
What is the amount of unsorted waste generated by your activities?	kgs
What is the amount of hazardous waste generated by your activities?	kgs
What is the amount of glass waste generated by your activities?	kgs

THIS PROJECT HAS BEEN FUNDED WITH SUPPORT FROM THE EUROPEAN COMMISSION.

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