LIFE12 ENV/ES/000222

Good Environmental Practices Guidelines for ICT users

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It is recommended not to print this document. In case of doing so, please follow the good practices recommended in this guidelines

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INTRODUCTION

One of the results of the project LIFE 12 ENV/ES/000222 TIC expected is the elaboration of good practices guidelines that contribute to reduce energy and natural resources consumption in the use of Information and Communication Technologies and, therefore, help out with the reduction of its ecological footprint and especially the carbon footprint of this sector.

These guidelines set out different recommendations in order that Information and Communication Technologies (ICT) users make a "smart" and responsible use of different equipment and devices, reducing with the implementation of these recommendations ICT energy consumption, extending their useful life, and as a consequence, reducing their carbon footprint.

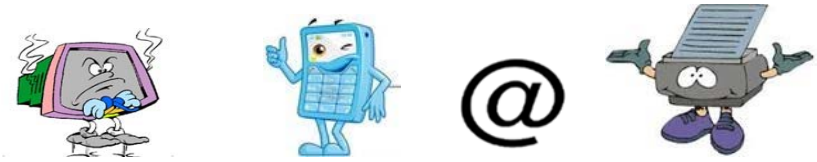
These good practices have been established after carrying out the following issues:

- *A questionnaire about the main habits and uses of ICT users.* This questionnaire has been subject to consultation in the different forums and conventions in which the consortium of LIFE GREEN TIC project has taken part by the end of 2014, mainly in the Spanish National Environmental Congress (CONAMA).

- *A comparative study concerning other initiatives,* guidelines, blogs, forums, ICT devices operating manual, etc., in which different good practices are recommended. This study has led to a specific document developed as a result of the project.

These good practices have been organized into the following sections:

- Good practices related to computers and monitors
- Good practices related to smartphones, tablets and so on
- Good practices for the management of information and e-mail
- Good practices for image printing equipment



After being submitted to public consultation in order to incorporate ICT users' recommendations the final document has been developed.

1. GOOD PRACTICES RELATED TO COMPUTERS AND MONITORS

Computers and monitors constitute one of the areas of highest energy consumption concerning equipment and devices in Information and Communication Technologies.

According to The Climate Group (Smart 2020) in 2002, computers and peripherals represented 49% of ICT sector CO_2 global emissions with 247 equivalent million tons (Mteq), being 2% to laptops, 7% to desktop computers (CPU) with liquid crystal display (LCD) monitors and 91% to desktop computers with cathode ray tube (CRT) monitors.

This situation has rapidly evolved because of the replacement of the majority of CRT monitors by LCD monitors. It will be more profitable for the environment with the emergence of LED monitors that not only consume less energy but also are less harmful to users' sight and do not contain dangerous substances like mercury.

Despite these technical improvements, CO_2 emissions of this group are expected to rise worldwide to 643 million equivalent tons, representing 42% of the ICT of global emissions of the sector, meaning 7% drop in it.

In addition, the main change in this ICT group will be the replacement of desktop computers by laptops (52% of CO_2 emissions) and the disappearance of Cathode ray tube (CRT) monitors.

For this reason, the implementation of good practices concerning these equipment is essential in order to reduce energy consumption and the carbon footprint of ICT.

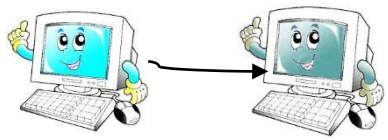
The scope of action concerning these equipment could be mentioned as desktop or workplace equipment, including the following equipment:

- Computer (CPU)
- Laptop computer
- Monitors (screens)

MONITORS

Recommended good practices:

To decrease the level of brightness of the screen. To decrease the level of brightness of the screen reduces energy consumption.



REASON: It is estimated that to adjust the level of brightness of the screen at an average level reduces between 15-20% of energy.

Laptop computers tend to reduce brightness when they work with the battery instead of connected to the grid, what can save up to 40%.

Another complementary option to screen brightness reduction is to choose dark desktop backgrounds. It is estimated that dark desktop backgrounds could use 25% less energy during the start up.

To switch off the monitor when you are not using it

REASON: It is recommended to switch off the screen when you take a short break, of more than 10/15 minutes. The average consumption of a LCD monitor may imply 35 watts in idle mode, 2 watts in sleep mode and 1 watt in off mode.

Your monitor can be set up in order to activate the sleep mode when it has been inactive between 5 and 15 minutes. The European Eco-label establishes a maximum of 10 minutes and Energy Star a maximum of 15 minutes. If the break is longer than an hour, it is recommended to switch off the computer completely.

New LED monitors use less energy than LCD monitors and much less than the old Cathode ray tube (CRT) monitors.

Screensavers

REASON: The use of moving screensavers was not a trend, but a recommendation for old cathode ray tube (CRT) monitors that could burn.

These monitors have fallen into disuse and they have been replaced firstly by liquid crystal displays (LCD) monitors and, more recently, by LED monitors. Nevertheless, moving screensavers have been inherited as a trend or in order to gain confidence, but there are no technical reasons as in CRT ones.

These screensavers consume energy. The best option is to use sleep mode and/or use a fixed or black screensaver.

COMPUTERS

Recommended good practices:

To programme properly the activation time of the sleep mode in the computer

REASON: Computers enable the user to set up the period of inactivity needed to activate the different saving energy modes like sleep, hibernate, or shut down.

It is estimated that the average consumption of a computer in idle mode is 50 watts, in sleep mode 2 watts and in off mode 1watt.

Energy Star recommends to establish a maximum of 30 minutes for its activation.

In some programs the hibernation mode should be activated if you want to set up a predetermined time in order that it starts operating. (Power options/properties/enable hibernation/apply/ok)

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Sleep mode operates by interrupting the energy supply in all components except for the RAM memory. It enables to continue downloading information and running programs. The system goes back to the same mode before going into the sleep one, in few seconds. It is recommended for short periods of time (10-30 minutes) when the computer is not being used.

Hibernation mode saves an image of the desktop with all the files and documents that are opened and disconnects the computer power supply. Files and documents are opened in the same location and condition in which they previously were.

Its use is recommended for long inactivity periods. This mode has the advantage that it is not necessary to close all the files, turn off, the computer, restart the system, and open all the files. In addition, in case of an electric cut, the work in progress is not lost.

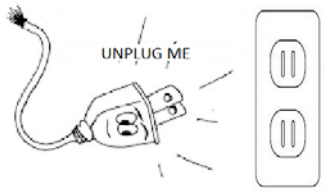
To turn off the computer when it is not going to be used for more than an hour

REASON: It is recommended to turn off the computer completely when you are having a break for more than an hour and at the end of its use or the working hours.

In the case of offices, even when the workers are informed and aware about the topic, several statistics show that 30% of the workers usually do not do it or if they initially do it, over time they forget about it.

Therefore, it is recommended to introduce active directory policies that are in charge of the shut down at a particular time.

To unplug the CPU or laptop after its shut down



REASON: The "phantom" energy consumption of computers may seem trivial when it implies approximately 1 or 2 watts per hour.

Nevertheless, if this figure is multiplied by an average of 16 hours per day and 365 days a year, the result is 6 kilowatt per year.

This consumption is produced when the computer is completely shut down and in the case of laptops may contribute to the discharge of the battery.

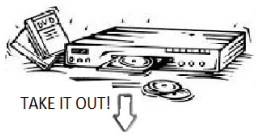
In order to avoid this consumption, the first option is to unplug the computer from the power supply.

To use power strips/"smart" sockets that cut off power supply and prevent phantom energy consumption.

REASON: In order to prevent not only computers but also all plugged peripheral (printers, scanners, etc.) phantom energy consumption, since all of them are usually plug in the same power strip, it is recommended to use "smart" plugs which cut off power supply if there is no consumption.

Where appropriate, it is also recommended to have power strips with a power switch to cut the power supply of all the equipment that are connected to the same power supply.

Do not leave DVDs inside the reader although they are not being played



REASON: The DVD drive uses a huge amount of energy. This fact is especially alarming in laptops when they are using the battery and they are not plug into the grid.

To leave a DVD in the reader, although it is not being used, contributes to energy consumption, because it starts reading its content while other functions are being used such as opening Windows explorer.

Not opening to many programs in multitask mode at the same time

However, to open and close them constantly it is also counter-productive because more energy is consumed when fields are opened and close.

REASON: When a lot of programs are opened, the functioning of the computer slows down and energy consumption increases. Therefore, programs or documents should be closed as you stop using them and when you finish the tasks.

To close programs as you stop to use them

REASON: You should close the programs as you finish using them, because if you leave them opened, the computer would not change into "idle or sleep modes" and it will continue consuming energy because it does not detect periods of inactivity.

For example, if you connect the radio through the Internet, listen to music or you have programmes that search for updates, the start-up of energy saving modes will be hindered when you stop working or using the computer for short periods.

To unplug computers external devices after its use

When they are plugged they consume energy unnecessarily.

REASON: External devices (memory cards, USB memories, external hard drives, etc.) should be disconnected once they have been used.

To place the laptop or the CPU away from heat and/or cold sources.

REASON: The batteries of computers, as the ones of other devices, are sensitive to extreme temperatures, both high and low, and may cause not only a poor performance but also security problems due to overheating.

Therefore, they should be placed away from heat sources or in the open air, at places where they are exposed to the sun or where it is very cold.

Moreover, air inlets and outlets of computers ventilation systems should not be blocked in order to avoid overheating and ventilators work overload that increase energy consumption.

Not to charge other devices connected into the computer through a USB

REASON: Some devices enable charging its batteries when they are connected to the computer through a USB.

This practice should be limited to devices that do not have its own external power supply (charger), as for example, MP3 or MP4 players.

In the remaining equipment (smartphones, etc.), if it is not strictly necessary, its external power supply should be used.

In case of charging the remaining equipment connected into the computer through USB, you should disconnect the USB from the computer as soon as the battery is complete.

2. GOOD PRACTICES RELATED TO SMARTPHONES, TABLETS.

The carbon footprint of mobile phones (nowadays mainly smartphones) represented worldwide in 2002 (The Climate Group) around 16 million of CO_2 equivalent tons (Mteq). Nevertheless, if not only direct emissions but also the incorporation of the telecommunications infrastructure required for its use are taken into account, the above figure would amount to 66 Mteq. The same source estimates that in 2020 direct emissions will increase up to 22 Mteq and total emissions, including devices and infrastructures, will increase up to the total amount of 179 Mteq.

In addition, new devices like Tablets with connection to Internet, Smart TVs, peer-to-peer devices, online games, etc. should be added to this consumption.

As a general rule, products belonging to the family of mobile devices, with connection to networks, usually have different functions and modes to save energy. These functions and modes should be set up by users according to their preferences, as well as the devices functions that according to the mode chosen, use more or less energy (brightness, Wi-Fi connection, GPS, Bluetooth, updates and notifications, etc.).

These options are usually included in the user manual that the manufacturer makes for each trademark or model. Normally, they are not provided in paper format, but they are included in the tutorial which is accessible in the device, or on the website of the manufacturer.

In these guidelines, recommendations that are good practices for energy saving, that contribute to extend batteries useful life and therefore, devices useful life as well, are set out.

The following recommendations are established on the base of instruction manuals provided by manufacturers, as well as in good practices documents identified at a previous benchmarking phase and on users experience.

Some of them may not adapt to certain models or may not be easily identified in certain models or trademarks because there are differences between them, but we have tried to make a simple and flexible explanation to facilitate its application in any device.

Good practices of this range of products are applicable to the followings:

- Smartphone
- Mobile phones
- Tablets

SMARTPHONES, MOBILE PHONES, TABLETS

Recommended good practices:

To read the instructions about battery saving capabilities of the device

REASON: Several devices incorporate very useful functionalities and tools in order to optimize the battery life, but in most cases they are underused because their different options and potential are unknown.

These instructions do not come together with the device, what contributes to paper saving. Therefore, in order to access to information you have to check the tutorial that it is included in many devices or to visit the trademark website.

To install an App for devices energy management

REASON: There are several free and paid applications in stores, both Android and Apple, to manage our devices energy, from the simplest to the most complex and professional ones.

These applications may be very useful if the functionalities that our device has do not meet our needs. Some of these Apps are, for example green power; battery doctor; go battery saver; DU battery saver; 2 battery; greenify; battery HD; one touch battery saver; etc.

To install applications that delete residual elements

REASON: Through the use of devices and especially with Internet surfing, several residual elements are generated. These several residual elements slow down devices functioning and produce “noise” and as a consequence they increase energy consumption.

Therefore, it is convenient to clear the cache, delete residual fields, clear call data, messages, emails, etc.

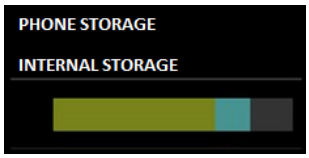
It is impossible and limited to do this task manually, but there are applications that do this task automatically like Clean Master; Icleaner; App cache cleaner; etc.

To clear periodically elements that had fall into disuse

REASON: Over time and through use, devices are filled with Apps, pictures, music, videos, documents, voice messages, etc.

It is convenient to clear periodically everything that you do not use or need anymore, especially all resources that contain images or audios.

To manage RAM



REASON: Devices provide us with information about the memory status and about the components that use more memory.

This information is useful to manage RAM and free up space.

It is also useful to have some application that shows the status of RAM such as Checker or free RAM.

To decrease the level of brightness of the screen

REASON: Decreasing the level of brightness of the screen saves battery energy consumption significantly. There are several options in the configuration of the screen that make easier to change the brightness when it is a need. It is recommended to increase the level of brightness of the screen when it is really necessary. Some Smartphones have the option "brightness level" that adjusts the brightness.

To disable resources and services that are not used

REASON: It is highly recommended to disable Wi-Fi, Bluetooth and GPS functions when they are not being used. Turn them on when you need them.

T*o deactivate automatic email updates*

REASON: When checking emails is not essential, it is recommended to deactivate the automatic check option, even more if you have several accounts in your Smartphone.

To deactivate social networks notifications

REASON: In order to save energy, it is necessary to deactivate social networks of new events, status, messages, etc.

To deactivate 3G/4G connection

REASON:

Smartphones try continuously to identify new networks. This is possible due to a resource of network automatic switching that consume the equipment energy.

To deactivate 3G or 4G connections you have to cancel automatic search keeping the equipment in EDGE or GPRS modes (older and slower). This is especially useful in places with poor or bad reception where there are no 3G or 4G services or the connection shuts off continuously, as in closed spaces or basements or rural and outdoor areas. It is not necessary to have mobile data connected, when you are not using them.

To turn airplane mode on

REASON: In places with poor or bad reception, a good alternative is to activate airplane mode. This resource disables the equipment connection to any kind of network, enabling the use of the remainder functions. This contributes considerably to energy saving because the Smartphone does not search constantly for signal in order to work.

To update the operating system

REASON: It is recommended and totally necessary to maintain the equipment operating system always updated because system updates usually have a better performances and they save energy consumption.

To avoid placing the device in warm or cold places

REASON: In order to maintain the Smartphone charge it is necessary to avoid placing them in very hot places. For this reason, it is not recommended to leave the equipment exposed to the sun or on high heat areas.

Similarly, to expose it to low temperatures could speed the battery discharge.

This is also important when charging the battery, because you have to look for a place away from heat or to avoid that the device is covered by other objects that impede its ventilation and could cause an overheating.

To enable hibernation mode

REASON: Another and one of the best ways to save energy is to establish a short period for the equipment to change into hibernation mode. This should be set up so that the systems switches into hibernation mode when it is clear that the Smartphone is not going to be used, for example while sleeping.

To charge the battery plugged into electrical power

REASON: When an equipment turns off because a lack of energy, it is important to connect it quickly and if it is possible with a charger connected to a wall socket instead to a USB because the last ones provides an electric current of 0.5 amps, while the charger provides more power. In addition, depending on the equipment running resources, the USB charge may not be carried out when the equipment is recognized by the computer as an external storage device. This would not happen when you plug the charger into the wall socket.

Watch the life of the battery charge

REASON: Devices should not be left plugged into the charger when this one is connected to a socket.

It is common to frequently forget our devices and they stay plugged into the charger for a long time, even when the charge is complete.

In addition to the possibility of causing a battery overheating, energy is being consumed unnecessarily.

Complete charges are not necessary with the new lithium-ion batteries, because the battery useful life is measured in charge cycles, regardless of whether they are charged one or more times.

Similarly, when you unplug your device from the charger, this one should also be unplugged because when it is unplugged to the device, stills consuming energy.

To update applications

REASON: The applications that are often used should be updated, because normally new versions are more efficient.

Updates should be carried out when you have Wi-Fi connection because the updates are carried out faster.

Use during the night

REASON: To turn off the mobile phone at night does not only mean energy saving, but also the serenity of not receiving calls or notifications nor electromagnetic radiation when you leave it at the bedside table.

Some Smartphones models could not be switch off if you want the alarm to work.

Some Smartphones models could not be switch off if you want the alarm to work. In these cases, the airplane mode may be activated.

Use of the flash of the camera

REASON: As a general rule, the camera flash should be deactivated and you should connect it when you want to take a photo that requires it.

Remember that the flash has a limited range and in many occasions, as when a photo is taken at a sport event or night musical, the flash is useless.

To synchronize accounts

REASON: The account synchronization (Google, Facebook, Twitter, etc.) should be carried out at intervals appropriate to reduce the number of connections needed for synchronizations

Location services

REASON: A lot of applications request or require the location service. You should think properly in which applications you need this services and they provide an added value. Disable it in the applications in which this service is unnecessary.

Hibernation/ sleep modes

REASON: You should think about the intervals in which you want to activate the hibernation mode automatically when you stop using the device.

This function should respond to a real lack of use for a more or less long period of time. Opening and closing sessions increases the battery consumption.

Depending on users' habits, a period between 30 seconds to 1 minute may result suitable.

Vibrate mode

REASON: This mode of call or notifications alert may be useful when you have your devices next to your body and in environments where there is a lot of noise so you could not hear the ringtone or where you must be in silence and do not want your phone to ring.

But in most cases, it is not necessary and its use implies an additional battery consumption.

3. GOOD PRACTICES FOR IMAGE PRINTING EQUIPMENT

Printers meant an 11% of CO_2 of ICT sector global emissions in 2002. In 2020 ICT global emissions are expected to mean 12%, despite the improvements experienced in energy efficiency of image printing equipment and the reduction of the printers ratio per employee at offices because centralized printers have become widespread with regard to individual printers.

Nowadays, there are multifunction equipment that enable the possibility of carrying out with just one equipment tasks that before were carried out by several ones (scanner, photocopier, fax, printer), that consumed energy and were connected 24 hours a day, 365 days a year.

The multifunction equipment consumption may reach between 1.200 and 1.500 watts when they are being used, while the newest could reach a consumption of 600 watts depending on its size and functions. Low energy consumption could also vary a lot, with values between 60 and 280 watts for computers of a larger size. Off mode consumption, in other words, when the printer is off but plugged into the power socket, could also be important, with values between 3 and 10 watts. These values are notably reduced in individual printers, with consumptions of 300/250 watts when they are working and 30/2 and 1/0 watts in off mode.

These new equipment usually also include functions in order to optimize energy, paper and toner/ink consumption, that in several occasions are not activated or are unknown for ICT infrastructures users and managers.

Some of these options are configurable both by individual users and by ICT infrastructures managers for networked printers, in offices and buildings with multiple equipment users.

However, a lot of the recommendations or good practices are also applicable to individual printers.

The following products are part of this range:

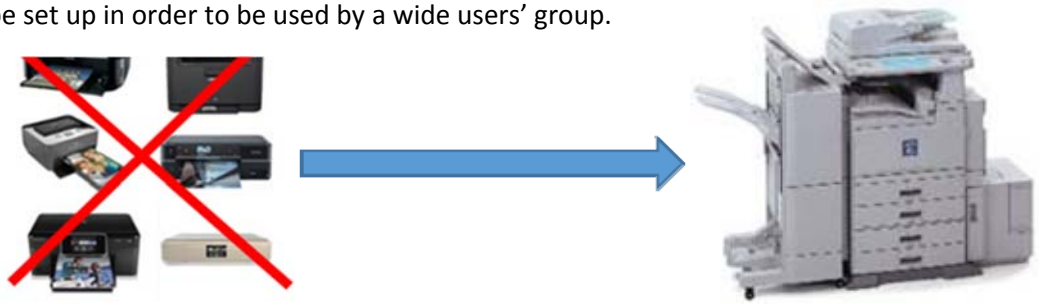
- Printers (ink and laser)
- Multifunction equipment
- Photocopiers
- Fax
- Scanner

PRINTING AND IMAGING EQUIPMENT

Recommended good practices:

To reduce to the strict minimum required the number of printers in offices

REASON: Printers at the individual workplace should be an exception. It may be justified by special reasons like confidentiality, workers' disabilities or technical requirements (plans, etc.). Decreasing the printers ratio per workplace must be an objective of every organization. Networked printers should be set up in order to be used by a wide users' group.



To purchase printing and imaging equipment with energy efficiency labelling like Energy Star and/or with programmable functions of energy saving in standby or sleep modes

REASON: The organization should incorporate energy efficiency criteria in the procurement of new imaging and printing equipment. There are different energy and ecology labelling whose function is to check objectively the compliance of energy efficiency standards (see green procurement of ICT guidelines document developed by LIFE GREEN TIC project).

At the same time, some printing and imaging equipment include programmable saving and efficiency functions that are very useful for equipment purchased in offices. In technical specifications requested for new equipment, the existence of these functionalities should be included.

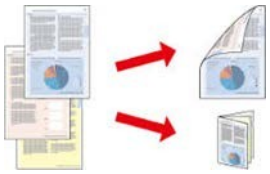
Subsequently, to verify whether these functionalities are activated would be necessary, or as the case may be, to adapt them to work or use patterns that will be taken into account in the office or at home.

In addition, if recycled paper is going to be used, printers technical specifications should guarantee full compatibility with different types of papers.

To prioritize the withdrawal of the oldest printers and the ones of higher consumption, as well as the ones at workplaces that are underused

REASON: In offices or houses where there are more than one printer, the withdrawal of the oldest printers and the ones of higher consumption should be prioritized, as well as to relocate the existing ones in places where they are going to be used.

To configure printers, photocopiers, fax and multifunctional equipment to print double- sided



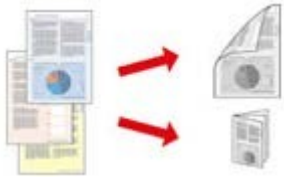
REASON: Double-sided printing could contribute to save between 30% and 50% paper, as well as direct or indirect energy saving.

The program for the renewal of equipment should prioritize the withdrawn of printers that do not make possible to print double-side.

It may be established a permanent or manual configuration to print. The permanent option is recommended for ICT managers or at single workplaces.

For manual configuration, go to “print” option; “enable properties”, “printer configuration”, “activate duplex”.

Configure printer in order to print in black and white by default and print in colour just under justified circumstances



REASON: Colour printing implies an additional waste of resources, essentially toner.

Therefore, printing in colour should be avoided unless it is absolutely necessary.

Printers should be configured by default to print in black/white.

The activation of the colour mode should be carried out manually by the user. So as they can establish roles that impede its use in certain departments or for a certain number of sheets to print.

To print first versions and drafts in low quality and in black/white

REASON: In general, drafts should always be printed in black or white. You should print the final version in colour, just if it is necessary.

A collaborative work among ICT administrators and departments in order to decide the best place for printers and users' role

REASON: Printers location should be in accordance to technical (installation of cables and electronics) and use, and workload criteria and/or users' roles. Consequently, it could be necessary that a management or accounting department disposes of printers to guarantee the confidentiality of the documents to print.

In other places, could be necessary to install printers next to workplaces of older persons and people with movement difficulties.

To establish users' roles

REASON: Not all users have the same needs when they print documents.

Setting different roles for each user has the advantage of establishing flexible and adapted frameworks for each workplace.

On the other hand, it requires an explanation about the justification of the different roles to the organization employees in order to avoid feelings of discrimination that imply counterproductive effects.

To preview documents on the screen before printing them.

REASON: Before printing, the user should preview the document.

This will enable to see if it is necessary to configure the page in order to reduce the number of sheets that have to be printed, to avoid areas outside the printing margin (specially in an Excel file) and other circumstances that could be made accurate before the printing version.

When you are sure that the document has the appearance that you want, then you can print it.

This will avoid to carry out printing tests and constant corrections and to use the printer just for the final version.

<u>To print, whenever it is possible, more than one page in each sheet of paper.</u>

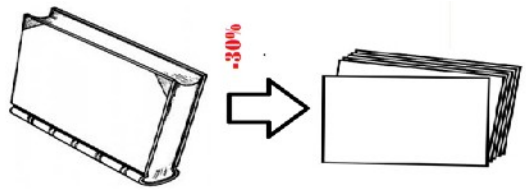
REASON: Lots of printers, photocopiers and imaging equipment enable to print in each sheet of paper several pages of a single document.

This is another technical standard to be taken into account when acquiring new equipment, always that this is possible, and in any event this technique should be used as much as possible.

This function is specially recommended when printing PowerPoint presentations, in which on the same side of a sheet of paper you can add two, four or even more slides of the presentation.

It can also be very useful when photocopying some pages of a book to highlight important information, etc., without damaging the book. In addition, you could photocopy more than a page of the book in the same sheet of paper.

Normally, books have a different size from sheet of papers (A4) and besides, they have larger margins. This makes possible to reduce 30% because the book sheet of paper is one half of a sheet of paper.



<u>*To install a software or programs of printing and imaging equipment management*</u>

REASON: In entities with several printing and imaging equipment or with a lot of employees, it may be recommended to have a management program or software in order to optimize its use and to reduce energy, paper and toner consumption, apart from extending the equipment useful life.

There are different programs in the market, for example:

- Papercut
- Xerox CentreWare
- Xerox Equitrac Express
- Lexmark
- InfoPrint® Manager (RICOH)
- ObjectPrint (Fitosoft)
- Printusagepro

Paperless policy (administration without paper, e-administration)

REASON: Digital society allows us to remove paper format of several documents in order to distribute, manage and store information and documents safely and without taking up physical space or consuming resources like paper or energy and toner necessary to print.

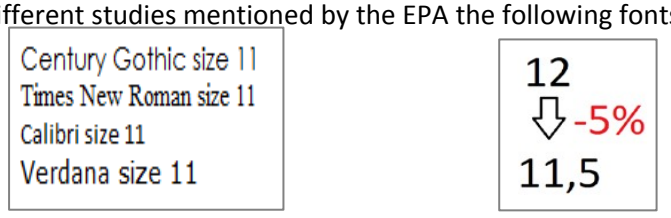
The following practices are recommended:

- To store documents and e-mails in pdf format, instead of printing them.
- To bookmark websites of our interest instead of printing the information.
- If you need to print some web information, you should configure it in order to optimize the printout, avoiding blanks, banners and advertisement, legal notices, etc. that normally occupy several pages.
- To introduce digital signature systems and electronic processing.
- To remove cover or separator pages.
- To work electronically in drafts and to share them digitally.
- To introduce reminders and messages encouraging not to print emails and attached files.

To configure documents font to reduce the printing volume and ink consumption

REASON: Among the different configuration actions that could be adopted to reduce the printing volume of documents in which it is unavoidable to use these actions you can carry out the following options:

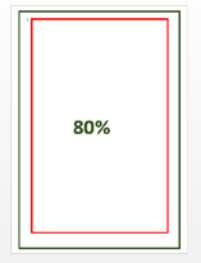
- To choose an appropriate font whose letter is smaller and takes up less space.
- According to different studies mentioned by the EPA the following fonts and sizes are recommended:



- To reduce the letter size using the one that is appropriate to the type of document and addressee. Normally, most common font by default is 12 points one. This could be reduced to 11.5 without changing significantly the quality but allowing to optimize in a 5% the use of the sheet of paper.

Font thickness and its size influence paper and ink consumption. To reduce ink consumption there are specific fonts that could be purchased in the market in addition to the ones provided by default by software suppliers in computers, tablets, etc., as for example *Ecofont*.

To reduce document margins

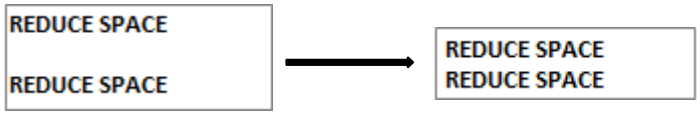


REASON: By default, the margin of documents in Microsoft Word are 2.5 cm at the top and lower margins and 3cm at the left and right margins. This reduces the printing area of a sheet of paper a 63%.

It is suggested to change the default settings. This can be made by the user in every document, according to the preferences or the destination of the document, Or to establish a more efficient new default setting and change in exceptional cases, case by case.

It is recommended to reduce the margins to 2cm, what increases the printing surface up to a 71%, or even 1.5 cm what increases the printing surface up to an 80% and entails a significant proper use of the paper.

To reduce the space between lines



REASON: The default setting for the space between lines of Word text process programs, are usually of 8 points of space, multiple line spacing 1.08.

- Changing it to 1.0 or to 0.95 enables to gain an extra line every 20 lines, increasing a 5% the capacity of the page.
- In contrast, changing the line spacing into 1.5 lines decreases noticeably the page capacity.

Likewise, the spacing between paragraphs, line spacing should be adjusted to optimize the pages, whenever it allows for fulfil its function to distinguish between them.

4. GOOD PRACTICES FOR THE MANAGEMENT OF INFORMATION AND E-MAIL

Energy saving is not only produced in ICT equipment, but also in the way that information is managed, because the management of data volume, unnecessary data storage and the ways in which the transmissions is carried out or data and files are shared may also have an impact in energy consumption, because of greater needs and working time when backing up, restarting sessions, etc.

MANAGEMENT OF INFORMATION AND E-MAIL

Recommended good practices:

To use programs that compress files

REASON: In order to send documents by email, a recommended option is to compress files through programs available at the market.

For Windows platforms, the usual ones are ZIP and RAR, in addition to ACE and ARJ. For Apple Mac, the program Stufft.

To optimize or reduce files

REASON: Regardless of whether the files are going to be sent by email or not, a lot of files that you save in your computer do not need images of high quality and may be optimized or reduced before saving them, for example in Word, PowerPoint or pdf presentations.

These programs enable to optimize images and documents.

For Word or PowerPoint documents, an option is to compress images. This option is set out by double clicking on the picture, so as that you can apply it to the image selected or to all the images on the document, and on different resolutions, both for printing and websites and projects or for email.

Once the images have been optimized, or without having done this, the file can be converted into pdf, what usually implies an important reduction of the file size.

Depending on the program release, when the conversion to pdf is being carried out you may choose between standard optimization or minimum size optimization (for online publication). For pdf documents, Adobe Acrobat also enables to optimize digitized documents through "tools"-"Actions" or through "Documents" (to reduce or optimize pdf), depending on the release.

To avoid sending large emails

REASON: Even when compression, optimization and reduction of files have been applied, you should think whether it is necessary or not to send them by email, especially when they are addressed to several addresses.

NO

In several occasions, emails are not read or files attached are not downloaded, producing an unnecessary data traffic in email servers.

An option is to share documents through a file management system like Wetransfer, sistemas FTP, Google Drive, Sharepoint, etc. In massive emails to distribution lists the best option is to add a website link to the document or information about the email.

Sending pictures and videos

REASON: It is increasingly common to share pictures image files (pictures and videos) by different ways, email, WhatsApp, etc. Some applications carry out an automatic file compression to low quality and size formats optimizing it in order to send them, or they ask the user about the format in which they want to send it in (original, big, small, etc.)

Before sending the file you should think about how the image is going to be used. If the picture is not going to be used in a format that needs high quality and they are just going to be shared, the option of less volume (small or very small) may be chosen.

In the event that high quality is required or several pictures are going to be sent, it is better to share those using galleries or image repositories.

Carrying out a cleaning of files or email periodically

REASON: Over time and use, documents, files, emails, etc. which are not necessary after a period of time. It is convenient to clear periodically everything that you do not use or need anymore, especially all resources that contain images or audio.

In order to optimize the clean-up, it is recommended to organize emails and files on account of its size, deleting the largest ones first and the smallest ones last.

Unless you need a documentary proof of the delivery or receipt of some email, as well as acknowledgements, as a general rule you should not save old files.

If you need an email address, it is recommended to save it in our list of contacts.

If you need attached files of an email, it is recommended to download it in the computer or in an external hard drive, USB memory, etc., but not saving them in the email.

Regarding to the files that you save in the computer, they are usually images (pictures and videos, etc.) that are not necessary. The best option is to save them in an external hard drive. It is usual to also save several versions of a document, what is confusing and decreases the free memory available.

To visualise the importance of carrying out a clean-up you can have a look at the free memory available in the email or the size of a folder of our computer before and after it.

To avoid printing emails

REASON: As a general rule, you should avoid printing emails. If printing emails is absolutely necessary, see printing advices in the corresponding file of these guidelines.

To avoid printing large documents, drafts, etc.

REASON: As a general rule, you should avoid printing drafts and large documents. If printing drafts and large documents is absolutely necessary, see printing advices in the corresponding file of these guidelines.

To search information online

REASON: When you use a search engine try to use the faceted search in order to reduce the number of options that may be selected.

In any event, whether it is possible, a reduce search number 5/10 should be selected, because when the number of results increases, the consumption of the search engine also increases exponentially