

White paper

# Green ICT



Reduce your carbon footprint and environmental costs with clever ICT solutions

together  
with



belgacom

# Introduction

Green ICT allows both to reduce the carbon footprint and the costs of an organisation, in the short and in the long run. We want to indicate Belgacom's strategy, both as an enterprise and a provider of green solutions, without being too bullish about the possibilities. from the point of view of using green solutions as well as from the point of view of delivering green ICT solutions. This paper is an invitation to co-invest in long-term sustainability and to contribute to a long and healthy life in a clean environment for future generations. This paper provides several examples of what is currently possible and how we can move forward – together.

We first provide an overview of the main challenges the world is facing. We then look at how Belgacom is successfully tackling the environmental issues. Finally, we focus on ICT solutions which help lower both environmental impacts and costs. The solutions are manifold and not only help in building a sustainable society, but also help create new opportunities and reduce the overall costs.



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## Conclusion

## Executive summary

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In this white paper on 'green' we prove the importance of appropriate action. Our environment is suffering at an increasing pace. There are 200,000 more mouths to feed on our planet each day. The consumption of energy, water and food surpass what countries can cater for. Some countries have consumed what they can provide in 6 months and have to count on what other countries can provide. This surge in consumption rates, combined with a growing waste mountain, is clearly unsustainable in the long term.

Many different initiatives are being taken to reduce energy consumption (and hence reduce the CO<sub>2</sub> footprint), reduce waste generation and use the resources more efficiently. These initiatives are being regulated, frameworks are being designed, governments, organizations and individuals are being involved at all levels and stages. Saving the planet is the work of each and all inhabitants of our planet.

Belgacom actively participates in the 'save-our-planet' initiative by building a long-term sustainable business. Our first results are

presented here. Step by step we will reach our targets, as set forth in the mission statement.

As an active player in ICT, Belgacom is concerned by the effects of ICT on the environment. 2 to 3% of greenhouse gases originate from the world of ICT. Reducing the CO<sub>2</sub> footprint of ICT will help reduce its impact on climate change. Many examples will be given on how this can be achieved. Using ICT to reduce the impact of other activities is also investigated.

Our conclusion is that we actively participate in reducing our own environmental impact, as well as the impact of others by using 'green ICT' and 'ICT for green'.

We go resolutely for long-term sustainability and hope that we can help you in doing so as well. We would already be very glad if you're motivated to go for sustainability and green, just by reading this document.



*“The general expectation is that the ecological footprint of the world will increase by 2030 to double what the Earth can provide.”*

# 1. What is the emerging problem in our world?

## 1.1. Environmental issues

### Population growth

60 years ago we were only 2 billion; at current rates we are growing from 6.8 billion in 2010 to 9 billion in 2050. Every day we see an additional 209,000 people on the planet. The consequences of this trend are mounting demand for water, food, clean air, energy, goods and an increasing amount of waste.

### Resource depletion

At the current carbon footprint, we consume more than Earth can provide. According to the WWF, humanity consumed in 2007 1.5 times what the Earth can provide. In other words, we needed 1.5 planets to support our needs. The general expectation is that the carbon footprint will double by 2030. According to WWF's living Planet report - 2010, Belgium is 4<sup>th</sup> in the ranking and if everyone on the planet were to live like the Belgians, it would take 4.4 planets to provide for a year of food, water and energy!

### Greenhouse gases (CO<sub>2</sub>) and global warming

Greenhouse gases (GHG) make the temperature of the globe rise. The impact of global warming is the gradual meltdown of the ice caps at the North and South poles. An important side-effect is that the sea level would rise by at least 1 metre. This would flood part of west- and east-Flanders, as well as the city of Antwerp. Bruges would be in a difficult position as well. The goal set forth by the European Climate Foundation, is to reduce the emission of GHG in

the EU by 80% by 2050 (from the 2000 levels). This so as to limit the worldwide average temperature increase to 2 °C ([www.european-climate.org](http://www.european-climate.org)). Climate changes will happen more intensely if the global average temperature passes the threshold of 2 °C. To get there, the EU decided to cut GHG emissions by a minimum of 30% by 2020. And there is a real sense of urgency. For instance, the average temperature in Uccle has already risen by 2 °C over the last 100 years and, since the start of global temperature recording, the 10 hottest years have all been since 1990.

## 1.2. Increased regulation

There are many EU directives already defined or on their way to finalization. These EU directives must be turned into national or regional laws or decrees. There are, for example, directives for the utilities to improve the production and delivery of energy. There are directives on the eco-design of energy-consuming devices, as well as for the labelling of energy-consuming devices, such that the consumer can select the most eco-friendly equipment. There is the WEEE (Waste Electrical and Electronic Equipment) directive concerning the waste management of these devices. Another directive is enforcing energy performance for buildings. And yet others, talking about greener transport, like the CO<sub>2</sub> emission levels for cars, vans and trucks. Each European country is now studying how to turn all these directives into regulatory frameworks, each progressing at its own speed.

## 1.3. Rising cost of energy

### Energy prices

According to the IMF World Economic Outlook, we paid an average of 35\$ per barrel in 1980 and 79\$ per barrel in 2010. The price has thus doubled in 30 years. The general expectation is that the price will triple (compared to the 1980 level) in the next 3 to 5 years. The energy price has many side-effects on our living standards. For countries where heating (or cooling) is important, there is a direct link with our in-house temperatures (and thus comfort) and a rising cost of comfortable living. But nearly everything has to be transported to our homes or offices. As the price of oil is predicted to increase by 50%, we may expect an increase in the cost of daily living: food, clothes, newspapers, ... This underlines that we need to act now to reduce our energy-consumption and that we have to switch over as much as we can to renewable energy. Current reports also indicate that “if we were to consume as much energy as an average Singaporean inhabitant and the US president, the world's oil reserves would be depleted in 9 years' time”.

### Resource prices

It is not only about the price of energy. The price of iron has risen tenfold over those 30 years, while the price of zinc has tripled. This has an impact on the pricing of cars, ships, airplanes, construction, etc. The increase in population has a direct link with the demand, forcing prices to go up even more.

## 1.4. Public pressure

Companies are being put under pressure to become more 'green'. There is increasing pressure from politicians (on both EU and Belgian levels): sustainable criteria are cropping up, appearing in over 50% of public procurement tenders today. There is an upcoming CO<sub>2</sub> regulation/taxation, etc.

Increasing demand from customers: customers are concerned about environmental issues and will increasingly use 'green' as a selection criteria in both their private and professional lives. Public awareness and a sense of urgency to preserve the Earth and its climate are continually rising.

Increasing demand from investors: 'Socially responsible Investment' (SRI) is booming in Europe, as investors increasingly include environmental performance in their valuation of companies' long-term strategy.

Increasing demand from employees: employees, and in particular the younger generation, are very concerned about environmental issues and prefer to work for a sustainable company.

*“We want to reduce our CO<sub>2</sub> footprint by 70% by 2020, compared to our 2007 baseline. This will result in saving 126k tonnes CO<sub>2</sub>, equivalent to the CO<sub>2</sub> emissions of roughly 50,000 cars.”*

## 2. Belgacom colors green

### Clear actions/targets in all our operations to reach our -70% target (2007-2020)

#### Datacenters / IT

- cooling optimization
- virtualization of servers
- power Management
- EU code of conduct



#### Offices

- space consolidation
- energy audits & savings
- recycling
- employee involvement
- wake-on-LAN
- improved monitoring



#### 100% renewable electricity

- own solar energy production
- 100% electricity from renewable sources  
-> biggest buyer in Belgium (Alpenergie)



#### Target: -25% energy efficiency



#### Networks

- move to all-IP network
- replace mobile network equipment
- turn-off unnecessary equipment
- free air cooling



#### Transport

- ecodriving training program
- green fleet (120 gr CO<sub>2</sub>/km average for new orders by 2012, max 170 gr CO<sub>2</sub>/km)
- promote train & bike
- mobility budget & free public transport
- 1800 teleworkers
- push audio/web/video conferencing



#### Others

- supplier evaluation and follow up
- E-Supply
- green in vendor selection criteria
- EU code of conduct for modems and decoders

**-70% CO<sub>2</sub>**

Belgacom recognizes the need for a responsible and transparent way of managing our company, together with all stakeholders. Its employees realize that their future success will rely on making a positive impact on economic, technological and social progress through our activities. Corporate Social Responsibility (CSR) is therefore considered as a strategic management tool and as a key component of our corporate mission and strategy.

Our CSR strategy aims to take responsibility for our social and environmental impacts, by minimizing related risks and maximizing opportunities. We focus on enabling a greener society, enhancing access to communications for all layers of the society, encouraging a responsible use of our products, and supporting the communities we operate in.

(More info about Belgacom's mission and strategy can be found at [www.belgacom.com](http://www.belgacom.com).)

## 2. Belgacom colors green



Climate change poses potential risks to our operations but, at the same time, it throws up new business opportunities. As the leading provider of telecom services in Belgium, we are committed to playing a key role in conserving the environment and moving towards a low-carbon society, with our customers.

Belgacom has defined clear targets: We want to reduce our CO<sub>2</sub> footprint by 70% by 2020, compared to our 2007 baseline. This will result in saving 126k tonnes CO<sub>2</sub>, equivalent to the CO<sub>2</sub> emissions of

roughly 50,000 cars. We measure all emissions related to our transport, heating, electricity consumption, business travel, employee commuting and the transport of our subcontractors. We want to save energy and resources wherever we can: we have opted for a green transport fleet, we improve our waste management, we provide green ICT solutions, make our datacenters and network more eco-friendly, recycle our products,... This lofty ambition has already yielded a reported yearly energy saving of more than EUR 4m.

### Our key targets for energy and CO<sub>2</sub> reduction

	Targets (versus 2007)	Deadline
Reduce our CO <sub>2</sub> emissions	70%	2020
Certified renewable electricity	100%	2009
Mobile network	+ 20% energy efficiency + 25% energy efficiency	2012 2020
Datacenters	Average PUE of 1.75 + 25% energy efficiency	2012 2020
Fixed network	+ 25% energy efficiency	2020
Transport	Reach an average of 120 gr/km for CO <sub>2</sub> emissions in new company-car orders	2012
	Launch a major eco-driving training program	2010
	Encourage the use of low-carbon transport	2020
Office buildings	Monitoring en verbetering van de energie-efficiëntie	2020

Adding and improving sustainability criteria, like energy efficiency, in the sourcing and selection process of ICT is another target on our journey to a responsible organization. Belgacom is one of the few companies with decreasing carbon emissions while growing as a company. We're also included in the Ethibel Excellence Investment register, an eco-label for sustainability.

#### 2.1. 100% renewable electricity

Sourcing and switching to renewable energy was one of the first logical steps in our CO<sub>2</sub> emission reduction plan. Our electricity comes from renewable sources since 2009, either through own production (production of solar energy on some of our buildings) or through sourcing agreements. As a result, we reduced our CO<sub>2</sub> emissions by more than 90,000 tonnes.

#### 2.2. Datacenters

Belgacom improved the energy efficiency of their datacenters, by installing closed cold corridors, free chilling and heat exchangers in order to heat the building with the heat produced by the IT equipment in the data rooms. We keep reducing our average Power Usage Efficiency (PUE) and are on target to reach 1.75 in 2012.

To reduce the number of servers and improve their efficiency, we introduced virtualization. This technology has contributed significantly to our green ambition and cost savings target.

Construction of a new 2,250 m<sup>2</sup> datacenter has begun in Brussels. This high-density datacenter will be built according to the principles of separate air flows, powerful cooling installations and energy-saving solutions, and will therefore be able to accommodate server racks with a higher energy consumption. Given the average climatic conditions of Belgium, classical mechanical cooling will only have to be used 3% of the total time. It will be operational in early 2013. Belgacom also improved the energy efficiency of its existing datacenters with energy-efficient solutions. These investments allowed Belgacom to sign up to the EU code of conduct for energy efficiency in datacenters (the first company in Belgium to sign up) in September 2010. The new datacenter will comply with ISO 27001 classification Tier-III+, just like the other Belgacom datacenters. This means that the datacenters will guarantee an uptime of 99.99%, thanks to a fully redundant power supply supported by dynamic back-up generators and a cooling system with a buffer capacity.

#### 2.3. Networks

Belgacom began installing more energy-efficient equipment in its fix and mobile networks, yielding it a 20% energy efficiency saving in its mobile network in 2011. The fixed network will be gradually replaced by an all IP network. Our energy efficiency target for both the mobile and fixed network is 25% by 2020.

#### 2.4. Offices

We performed audits on our main buildings and implemented the energy-saving improvements, where needed.

## 2. Belgacom colors green

We keep reducing our energy consumption by implementing smarter technologies. For example, by optimizing our building management systems, tracking energy usage during non-working hours, installing LED lighting and auto detection lighting in the right places,...

We installed optimization systems for the elevators in our headquarters, thus ensuring fewer elevator movements and more efficient occupancy rates, to match the flux of people. Desktop PCs have an automatic power-off and power-on system ('wake on LAN'), which gives us an energy reduction of EUR 200K.

In 2012 our logistics operations will be centralized in a new 'green' central distribution centre. We are also going for a greener transport fleet. All new company cars are being bought with ever lower CO<sub>2</sub> emission levels, as are our vans and trucks. Our target for company cars is 120g CO<sub>2</sub>/km. We also launched a massive eco-driving training program for our drivers, which typically yields minimum 5% fuel savings and improves the safety of our drivers. We also promote internally the possibility for employees to work in remote offices, offer free public transport and offer a mobility budget to company car drivers, resulting in more than 30% of those drivers preferring voluntarily to commute by public transport instead of in their company cars.

We have introduced videoconferencing between the main locations and our international offices. This does away with many business trips, saving us time and energy. Our telepresence rooms are gaining in popularity, so much so that reservations have to be made weeks in advance.

### 2.5. Helping our customers reduce their carbon footprint

As to mobile phones, we push our suppliers to provide mobiles and smartphones that are more energy efficient, use a standardized charger and are delivered in less packaging. We have stopped rewrapping mobile phones in our own Belgacom branded boxes. We recycle mobile phones. We launched an initiative whereby we plant a tree for every mobile brought back by our customers, resulting in 30,000 trees planted in 2010-2011. In total we have recycled more than 100,000 mobile phones over the past few years.

We buy electronically. Orders are not sent on paper any more. 87% of our orders are purely electronic. We bill electronically and have launched campaigns to motivate our customers to opt-in for electronic bills.

We also provide decoders and Internet access devices that consume less power in active as well as in stand-by states.

*"Adding and improving sustainability criteria, like energy efficiency, in the sourcing and selection process of ICT, is another way to make our company greener. By pursuing this course, Belgacom is one of the few companies that successfully combines economic growth with decreasing carbon emissions."*





## 3. ICT as a response to sustainability challenges and climate change in particular

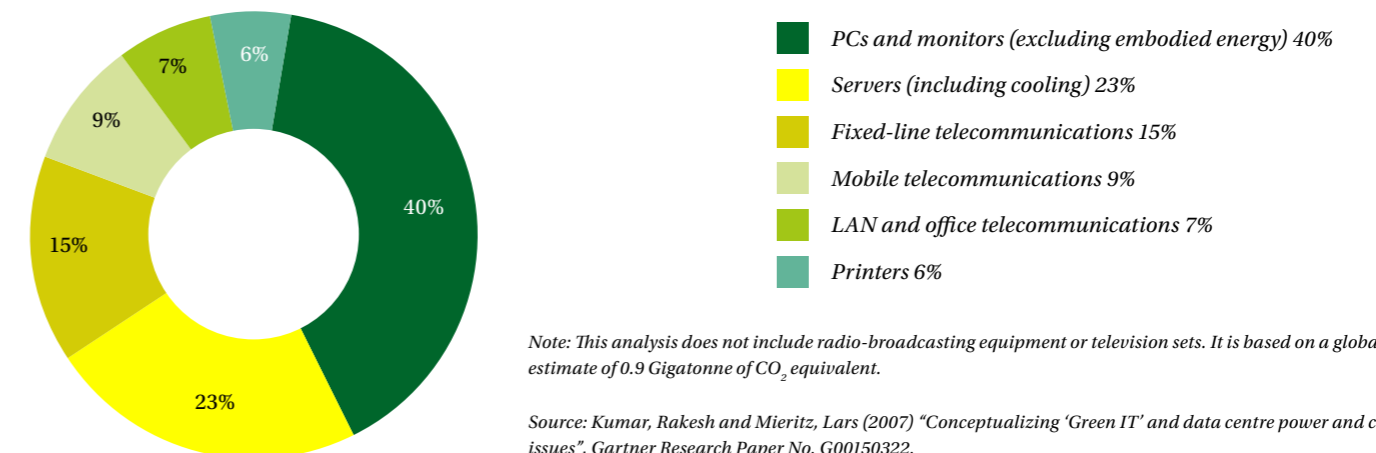
### 3.1. ICT as a problem...

Today, ICT generates 2 to 3% of the GHG emissions worldwide (source WWF guide and Smart2020 report). ICT is a big consumer of electricity. In fact, any processor we have today is based on moving electrons (bits), adding and subtracting them. There is no such thing as computers without electricity (at least with the technology of today and most probably tomorrow as well). This means that your computer consumes electricity (even in stand-by), as well your Internet connection (ADSL router), your LAN (switches), the mobile phone network (base stations), the websites (Internet servers) and disks (storage area networks). At the same

time the datacenters, where the servers and storage are located, need cooling to absorb the heat emissions of the computers. So it is not only the part that we all see and know, it is also the 'other side of the internet' and the 'Internet' as a whole. And it is not only energy for the computing, but also for the protecting the environment of these systems (access control, power back-up, fire extinguishing, lights, management systems, staff,...).

The various components of ICT, their CO<sub>2</sub> emissions in the ICT sector and their carbon footprints are shown below. Around 25% of the emissions are from the telecoms sector.

### Estimated distribution of worldwide CO<sub>2</sub> emissions of ICT devices





*“ICT forms the basis of smart solutions that can deliver carbon savings like smart grids, smart buildings, smart mobility, smart logistics,...”*

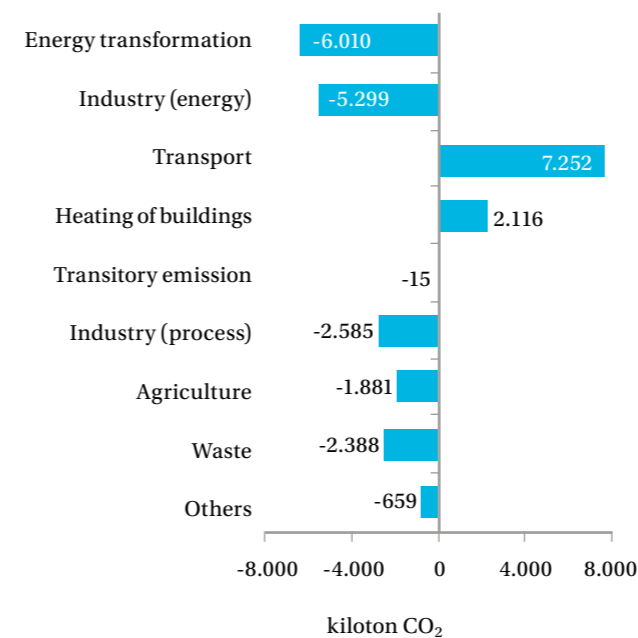
### 3. ICT as a response to sustainability challenges and climate change in particular

ICT is part of the problem and it is still increasing: we have more devices (laptops, tablets, smartphones) and more and more devices are becoming intelligent (e.g. cars, domotics, etc.). These devices generate more and more data, forcing us to build bigger and bigger datacenters. So ICT might become an even bigger generator of

GHG gases if we do not intervene. This is why Belgacom pledged to reduce the CO<sub>2</sub> of its operations by 70% over the period 2007-2020, with specific energy efficiency targets in all areas of operations (networks, datacenters, mobility, buildings).



**Evolution of the CO<sub>2</sub> emissions (2008 versus 1990\*, expressed in kilotons CO<sub>2</sub>)**



\* Note: level 0 represents the situation in 1990.  
Year of reference for fluorinated greenhouse gases: 1995

Source: Belgium's Fifth National Communication  
Climate Change  
Under the United Nations Framework Convention on Climate Change

#### 3.2. ... ICT as a solution

In Belgium the biggest challenge is to reduce CO<sub>2</sub> emissions in the transport and buildings, 2 domains accounting for the biggest increase in greenhouse gas emissions. These are 2 domains where ICT can play a significant role.

ICT is part of the solution. It can help reduce the global CO<sub>2</sub> footprint by 15% (Smart 2020, Mckinsey study). Firstly, by reducing its own energy consumption and, secondly, by providing solutions to reduce the general energy consumption of the industry, transportation, buildings,... . While the ICT sector plans to significantly step up the energy efficiency of its products and services, ICT's largest influence will be by enabling energy efficiencies in other sectors (smart grids, smart buildings, smart mobility, smart logistics,...), an opportunity that could deliver carbon savings five times larger than the total emissions from the entire ICT sector in 2020.

Any reduction in the heat generated at the datacenters has a big impact on the amount of cooling needed to reduce that heat. New cooling techniques further reduce the consumed energy of

### 3. ICT as a response to sustainability challenges and climate change in particular



*“ICT is part of the solution. Firstly, by reducing its own energy consumption and, secondly, by providing green solutions to promote energy efficiency and conservation in every walk of life.”*

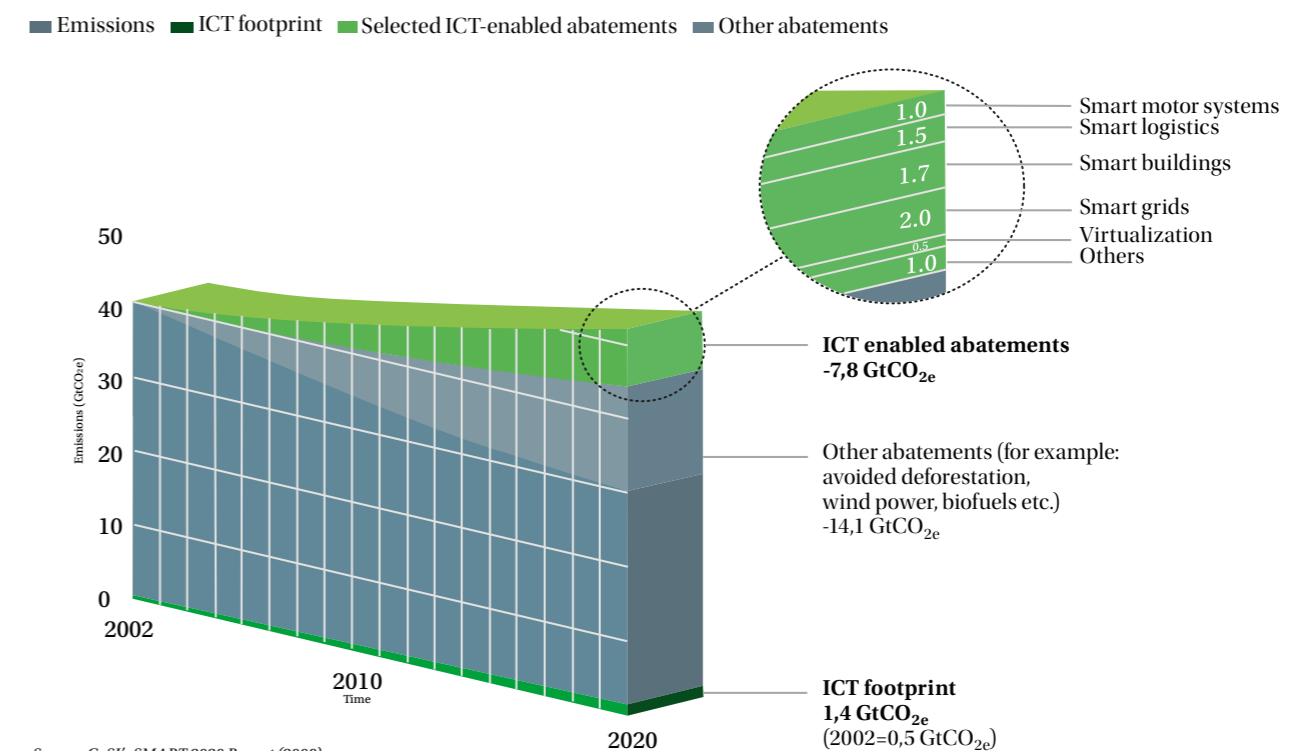
datacenters. For datacenters, we use a measure called PUE (Power Usage Efficiency). A PUE of 1 would indicate that all the energy consumed is used by the servers. Today, most of the datacenters have a PUE of 1.7 to 1.8, indicating that for every KW used by servers, we need 70% to 80% more to operate the datacenter. Efforts are being made to obtain PUEs of 1.3 or 1.2.

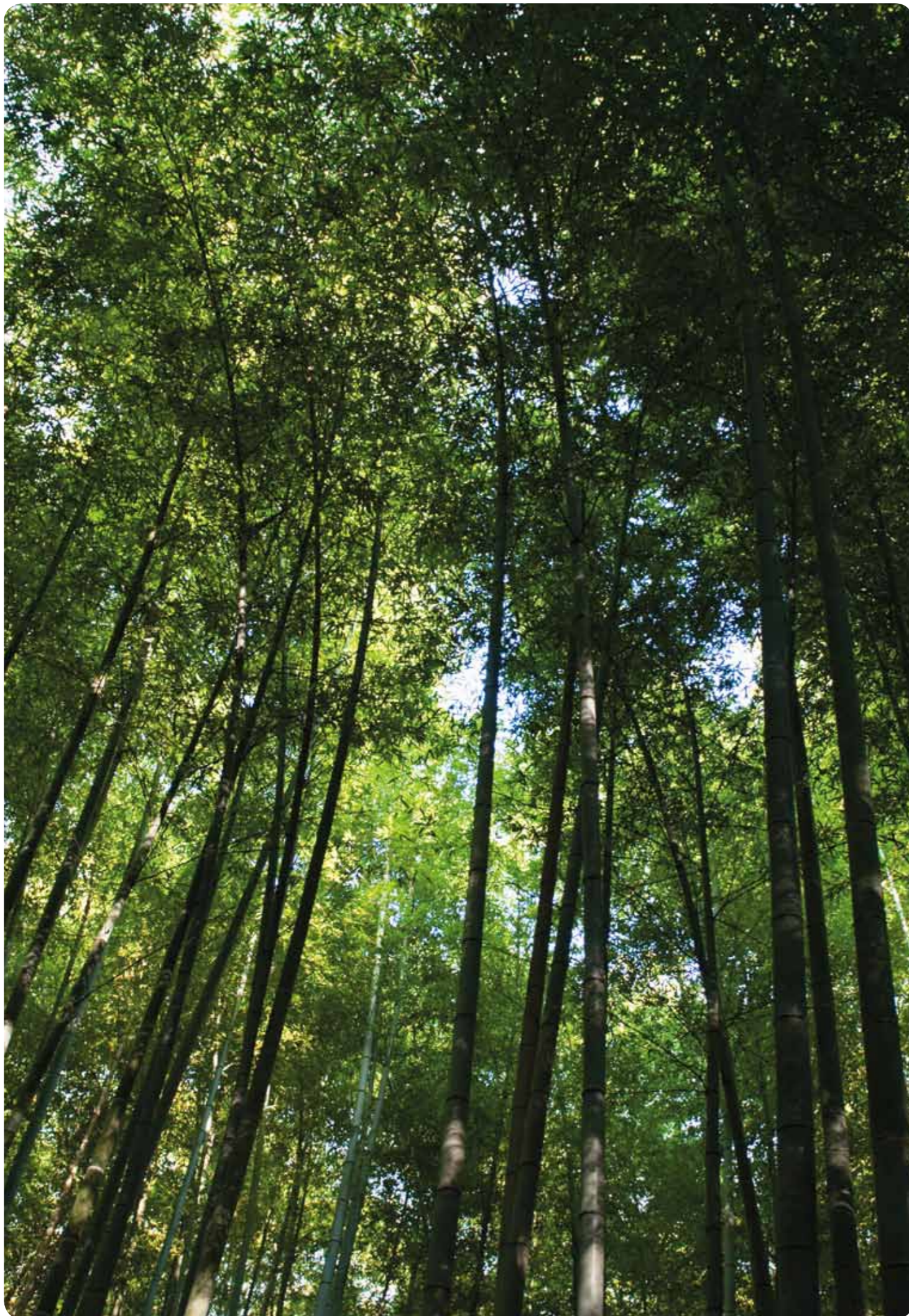
ICT can deliver a number of tools to solve a number of problems. For instance domotics, to make buildings more intelligent and turn off lights and HVAC when there is nobody present in a certain area. These systems can also be managed remotely, which would mean that a few people can manage hundreds of buildings and reduce the energy consumption. That’s interesting to companies with many distributed locations, like banks and retail. For instance,

ICT can provide intelligent road infrastructure, measuring the traffic and dynamically redirecting traffic whenever there’s a jam up ahead. Road infrastructure can be tuned to change traffic lights depending on the amount of traffic that’s queuing. Cars can be made intelligent, thus enabling an interaction between the traffic control system and the car. For example, by enforcing a certain speed limit, so that the car does not need to stop violently when approaching a traffic light.

Measuring your carbon emissions and having a good understanding of the sources and solutions is essential. Cutting your carbon emissions by using these innovative ICT solutions will impact favourably on the reputation, growth and costs of your company.

Expressed as gigatonnes of carbon dioxide equivalent (GtCO<sub>2e</sub>)





## 4. Belgacom's 'green' portfolio

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So, what does Belgacom provide as solutions for 'green ICT'? There are many different solutions, ranging from mobile technology, to datacenters, videoconferencing, etc.

### 4.1. Mobilizing activity

Teleworking (aka homeworking) may not be the ideal solution for everybody, but it certainly helps relieve the traffic jams and lower energy consumption during peak hours. People can start work at home, travelling to the office at a later moment (and vice-versa in the evening). But this requires an adequate infrastructure. We provide for Internet coverage over the 99.7% of Belgium with broadband Internet. We are constantly working on high-performance, wireless, 3G broadband coverage across the country and covering over 97% of the territory, combined with fair tariff plans. At the same time we provide Virtual Private Network infrastructure such that access to the corporate network can be made in a secure manner, thus protecting the valuable IT infrastructure of a company.

We offer our enterprise customers an 'Internet for Employee' programme, whereby an enterprise can offer an Internet connection as part of the employee benefits, and hence promote homeworking and reduce travel.

We implemented a payment system by SMS for travel tickets or parking for example. Many cities have already adopted this system

and more and more public transport tickets are being sold via SMS. No more machines to sell the tickets, no printing of tickets. Green and efficient.

We are a big believer in e-payment by mobile phone. We developed PingPing, a payment system via a tag on the mobile phone. Thanks to near-field communication, you just wave to the reader to pay amounts smaller than € 25. We use this for payments of refreshments on vending machines, in the cafeteria and in retail shops, for example. The system is being extended to handle vouchers and meal vouchers. Instead of sending the customers a voucher via the regular postal service, we can now deliver these via SMS to the phones of the customers. No cash collection, no printing, no risks.

### 4.2. Thin clients and devices

On fixed table top computers too, we can save energy. Everybody knows the EnergyStar logo on computer equipment. It means that the equipment goes into sleep mode when not in use. We now have 'wake on LAN', whereby PCs are turned off in the evening and powered up in the morning, automatically. The time of going to sleep and wake up are managed centrally.

Tablets are here to stay. They may be a perfect replacement of PCs for some profiles of workers. They consume less power, are more mobile and offer new possibilities of use. Tablets mobilize even

*Belgacom's green approach helps you make your ICT environment greener. It also helps by offering new and unexpected possibilities to evolve towards greener activities.*

## 4. Belgacom's 'green' portfolio

further the workforce and shed a new light on work flows, processes and the utilization of IT. Belgacom supports enterprises in implementing a tablet strategy, delivering product life cycle services, connectivity, security and remote management solutions.

Some of our customers are using 'thin clients' instead of desktop PCs. These are smaller tabletop computers having just enough computing power to interact with the user (display, keyboard, mouse) and exchanging the input/output over the network to the server. This brings a further energy consumption reduction, since the servers are running in an optimized datacenter and optimized configuration. The drawback is that the dimensioning of the server greatly influences the user experience, and that a company-wide policy on PCs and their utilization has to be set in place.

Tablets are 'thin clients'. They do not have the same power as laptops or tabletops. They cannot today handle the big applications like SAP or any other core business application. An effective solution is to use desktop virtualization, whereby the application runs on a server and the tablet interfaces via a lightweight client over the air with the application. It is the fastest way to bring standard core business applications to tablets without losing any functionality.

### 4.3. Collaborative working

To further lower the business barrier to homeworking or teleworking, Belgacom is offering a whole range of services centred around UC.

UC, the abbreviation for Unified Communications, is the integration of all communication devices into one platform: chat, presence, voice, click-to-dial, dual-ring + conferencing tools (video, application sharing, whiteboarding). UC delivers all the tools a worker may need for an internal discussion on electronic devices. We've noticed that our enterprise customers are beginning to use UC as a means to interact with their customers. A field worker can now go and visit a customer with his tablet or laptop and call a colleague (wherever this person may be at that time) and start an audio- or videoconference to enrich the discussion. This approach avoids another business trip (either by the colleague or the customer) and improves the customer experience.

UCaaS brings additional advantages in the sense that it comes at fixed prices per month, whilst the management is done by Belgacom, and where the servers are running in our green datacenters. Enterprises get the benefits of UC, while Belgacom takes care of all the hassle.

Videoconferencing is another service from Belgacom helping our customers to be more green. The issue with meetings is the travel



(time and energy) to get there. The bigger the distances (and/or the higher the number of participants), the bigger the CO<sub>2</sub> footprint. This problem is magnified by the number and the frequency of the meetings. In the past, videoconferencing went over ISDN with low bandwidth via dedicated equipment with poor results: bad image quality, freezing images, compression side-effects, time to set up a meeting with a different user interface,... Basically, videoconferencing was only successful at the C-level where wages are many times bigger than the communication cost, and where there was somebody to help. Nowadays there is a much lower barrier, since people are getting used to videochatting over the Internet. This has triggered a trend towards any-to-any communications (laptop, smartphone, meeting rooms, via the Internet or a private network). The systems have been vastly improved, broadband network capacity is available at low cost, resulting in a better user experience.

Belgacom has implemented Telepresence rooms in our principal international offices, resulting in fewer business trips and a higher percentage of efficient international meetings. Telepresence indeed yields an immersive videoconferencing experience with 3 incoming simultaneous HD videostreams, thus allowing the interconnection of 4 different locations or the set-up of meetings with large groups on 2 sides. A HD is used, the images are displayed on large screens, showing the people in 'real-life

*“Project partnering is now possible without having to make a single business trip. Thanks to ICT, digital meetings and collaboration are as simple as surfing on the Internet.”*

## 4. Belgacom’s ‘green’ portfolio

size’, which is a definite improvement compared to the wide angle cameras over an ISDN link.

As we’ve just said, videoconferencing helps reduce the amount of business travel. We developed a CO<sub>2</sub> savings calculator, allowing users to immediately estimate the benefits of using videoconferencing. Depending on the types of meetings, the CO<sub>2</sub> savings can be spectacular.

Both audio calling and audio conferencing are possible with UC. Everybody considers this mode of communication to be the most handy for a quick interaction with one another. Chatting can be used, but having a voice (or video) call vastly improves the interaction. Many researchers have made studies on communications. Apparently, 60 to 70% of all communication is non-verbal. It is difficult to put emotion in a written text, whereas emotions are audible in voice or visible in gestures, posture and eye movement. UC allows users to select the best way of communicating with the other party. This will depend on the caller’s situation, the presence (or not) of the called party or the intended result. It is now possible to see whether the correspondent is free or in a meeting, and then select chat, mail, voice or video call, just by one click. It improves the performance of the communications and gives remote employees a sense of integration into the company, without the need to be physically present at the office.

### 4.4. Belgacom Meeting Services

Conferencing may require an infrastructure. With Belgacom Meeting Services, it’s now possible to have a meeting where one person gives a presentation. All participants can follow the presentation and intervene via chat or voice via their own PC. So all the participants need is a computer. The advantage of this service is that you can organize the meeting, for example, just by sending an Outlook invitation to all the people involved. No infrastructure, efficient meetings, no travel, one click to book,...

This type of service avoids unnecessary travel for small learning sessions (1 to 3 hours) or meetings where one person informs all the attendees at the same time.

### 4.5. Streaming multimedia communications

Sometimes you may want to inform your colleagues via a multimedia video. Video is a kind of one-way communication, where the viewers cannot interact immediately with the players. This kind of communicating may be interesting for product presentations, learning, the speech of the CEO, etc.

It facilitates learning at any time, over any device: during your free time, home learning, in a hotel room or even on the train. It avoids having to travel to some location specially for that event. One drawback is that not everyone may have seen the message at the same instant.



*“A new way of building and using datacenters raises the capacity while energy consumption and costs decrease dramatically.”*



## 4. Belgacom's 'green' portfolio

Belgacom is offering video-on-demand services to several enterprises and, for example, supports the International Queen Elizabeth Music Competition for those who cannot make it to the Beaux Arts concert hall in Brussels.

### 4.6. Efficient IT infrastructure

Nowadays we are facing an increasing need, in servers, to handle the vast amount of information, new services and new ways of computing. Enterprise ICT infrastructure will continue to grow and therefore needs measures to keep the energy consumption as low as possible, or even consuming less energy and doing more.

Historically speaking, there has been a steady growth in servers (computers hosting server software), whereby one used to install one server software per machine. This to make sure that there would always be enough capacity to handle the demand, which was irregular and unpredictable by nature. In many large organizations, different departments used to source their own servers. The result was many server machines, scattered around the organization and over-dimensioned. Many of these were just waiting to do something for 90% of the time. Hence consuming and actually wasting energy.

Many organizations have used Belgacom's services to cope with this growing demand and over-investment in under-used servers. The steps taken so far (and still ongoing in many organizations) are:

standardization, consolidation and virtualization. Standardization means having the hardware servers everywhere, instead of different systems being bought by the different departments. The next step is then to consolidate: bring together on a smaller set of machines the different server functions, such that the machines are actually working ALL the time, instead of being in a powered state of waiting for some action. The last step is to virtualize, which means to bring together different applications, normally running on different operating systems. Typically one machine is running one operating system, with different applications on top. Virtualization allows any-to-any combination of one machine with different operating systems and different instances of different applications.

The advantages of these three steps are obvious: fewer machines, fewer applications, less management, less investment but, above all, less energy consumption. Combining these machines in one green datacenter further improves energy utilization. Every KW consumed by the servers will effectively be used to compute. Some of our customers reconfigure the systems twice a day to use different application sets during day and night, for optimal utilization.

So far we have only talked about the servers. Storage virtualization is the next step. In that case hard disks are shared amongst different servers, instead of assigning individual disks to

individual servers. Each server thinks it has its own disks whereas, in reality, it only has part of a large disk space. Further consolidation of disk hardware is then possible, as is further energy reduction.

### 4.7. The cloud as the green beacon

As previously stated, Belgacom has been greening its datacenters. Our services allow customers to utilize all these different virtualization techniques (servers, storage and desktops) to get really energy-efficient ICT infrastructures.

Customers can host their servers, i.e. bringing their own hardware into our datacenters or their own applications. We offer virtualized servers in our energy-efficient datacenters. With vContainers, customers can create, start and stop their virtual servers from a distance via our portal. This is called Infrastructure-as-a-Service (IaaS). Dynamic ICT infrastructure with remote management done by the customer himself.

In some cases, companies want to have datacenters of their own. Many companies have enough with just a few servers in limited scale datacenters. In the past, we have seen many a server installed in the most inadequate of locations, like the cloakroom, broom closet, kitchens, warehouses, corridors etc. Very often these locations had no access security, redundant power supplies, no

air-conditioning or protection against inappropriate utilization. Belgacom therefore offers customers the MatrixCube. A small datacenter-in-one with built-in air-conditioning, redundant power supplies, energy-efficient servers and disks in small racks. The main advantage is that these racks come with a PUE of 1.3, which is better than most of today's datacenters!

We fully understand that there is no single 'best' approach to datacenters. Placing everything 'in the cloud' (in the view of the service providers) or having everything local or using a combined approach. We therefore offer the different possibilities to our customers: our datacenters, the MatrixCube or a hybrid approach using cloud and local infrastructures

### 4.8. Greening processes

So far, we have talked about Belgacom's concrete solutions. But this is not all. Belgacom also works hard on becoming more efficient. Belgacom is merged with different historical entities, like Telindus and Proximus. They each had their own procedures, systems and organizations. Today operating procedures have been harmonized, systems have been integrated and people have been trained. This results in field engineers with a larger scope, so that fewer interventions need be made, hence less travel and lower energy consumption. Of course this is not always easy to realize: fibre optic splicing specialists cannot be used to install server software and

## 4. Belgacom's 'green' portfolio



vice-versa. Our goal remains 'right first time': sending the correct person to the intervention site with a clear target. Our NOCs have been combined, as have our helpdesks. This makes our first level of troubleshooting more correct, such that the field engineer gets the right information.

Which brings us to dematerialization. Instead of sending out paper bills, we send electronic bills. To customers (of our enterprise and consumer business units), to our employees, to our business partners. We increasingly use email as a communication channel to all the stakeholders of our ecosystem.

### 4.9. Innovative projects

Belgacom is working below the radar on long-term projects. For example, we are active in a consortium with the government and health insurers developing the 'e-prescription'. The doctor types in on his computer the prescription for some drugs, the patient, later on, goes to the pharmacist with his e-ID card or health insurance card, and the prescription is displayed on the pharmacist's PC. Less paper, no misreading anymore. Right first time. Road charging is long-term idea of the Belgian government, and the idea is maturing. The ultimate goal is to reduce structural traffic jams by having drivers pay for their journeys over the road network.

Smart grid is another long-term project we are working on with the energy providers. The electricity network is a one-way network, whereby electricity travels from the power plants to the consumers. With the advent of solar panels and new methods to create energy, consumers, in turn, start becoming energy suppliers. From that moment on, electricity is being generated at the consumer's house and is injected into the network from the opposite side. The network needs more intelligence to handle different sources of energy. Smart metering is required, while the public utilities need to know how much energy is being injected into the network by customers in order to create, by themselves, the complement of energy to fully meet the power demand, at all times.

We cooperate closely with providers of green energy generation infrastructure, like solar panel suppliers. We deliver the required connectivity such that owners can now watch the energy generated by their solar panels.

We cooperate with cities to roll out a city bike service. This service comprises city-wide scattered bike stands where members of the service can take a bicycle, cycle to another location and drop off the two-wheeler at another stand. It is a handy alternative to city rides, complementing public transportation. The provider of the service needs to know who

took a bicycle for how long (to work out the bill) and needs to know how many bicycles there are at any one point, in order to intervene and distribute the bicycles to all locations, such that there is always sufficient supply. We provide the required connectivity and communications infrastructure.

Electric vehicles are now the big hype in the world of cars, motorcycles and bicycles. These vehicles need stands where they can be plugged in for a recharge. We participate in these kinds of projects to enable fast identification of the user and payment of the recharge with our PingPing platform. Wave with your mobile phone at the stand, plug in your vehicle and that's it.

As we mentioned earlier, buildings have to become smarter. Heating, ventilation, air conditioning, access control, videosurveillance, lighting, etc. all need to be managed electronically for optimal energy consumption. We provide the requisite hard- and software to interconnect these systems in different buildings and centralize the management in one control room.

Digital signage is one of those niche projects that we have participated in for a long time now. For example, we use digital signage internally at our headquarters to record how much electricity we generate with the solar panels on the roof. Recently,

we implemented this in the elevators too, such that important (and sometimes urgent) messages can be conveyed to everybody in good time and efficiently. This, of course, using screens with a low energy consumption. Cities also require digital signage. One example is the use of digital signage to redirect drivers to a nearby car park with available spaces.

One of the most odd-looking approaches is the shared service concept. In this context, we investigate, together with other companies, if we can combine our services with theirs. Suppose that one of our technicians is going to a residential home to repair or install some equipment or a telecom line. Why couldn't this person deliver a service of our business partners at the same time? A small repair or change to the electricity installation, for example, or maybe a small repair to the plumbing or furniture.

## Conclusion

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We first investigated the needs and requirements to become greener. The cries to support our environment are growing every day. Doing nothing is not an option any more. Anybody and everybody is called to action, both in their private and professional lives.

What we have demonstrated here is that ICT can help in reducing an organization's carbon footprint. Our own results as a responsible enterprise show this. Our activities demonstrate that Green ICT is not only a matter for IT nerds, but involves the whole business and other companies even to build new ecosystems and new services helping to create a society that respects nature and our environment.

Business objectives can be aligned with IT's sustainability efforts. Growth can perfectly be combined with green efforts. It's just a matter of vision, will and empowerment. We have green on the radar from the top down to every member of the organization.

Investments make it worthwhile. Either on the side of the carbon footprint, or on the side of cost reduction, and many times even on both sides. The savings can be small to important, depending on the projects. Return on investment (ROI) can be reached within months or within years. This last point is key to the sustainability of your activities. Clever building management will yield results in the long term and these results will last for years.

We combine the short-term wins with the long-term strategies.  
We're going for it...  
... and we invite you to join us!  
Thanks for joining us to make our future greener!



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together  
with



belgacom