





# E CODESIGN

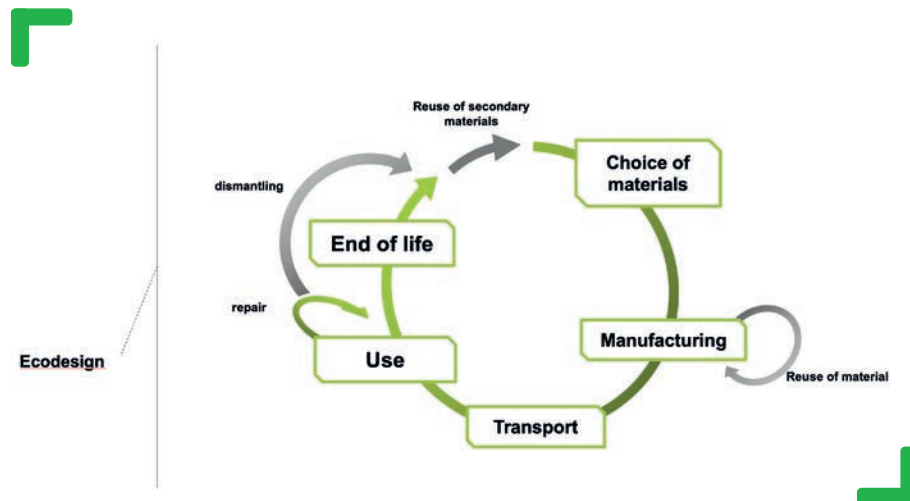


Ecodesign is a process in its own right that is included in Sagemcom's project management. Each phase of a project, from launch, to design, qualification and production start-up, is subject to a series of tests that apply to the ecodesign of the product.

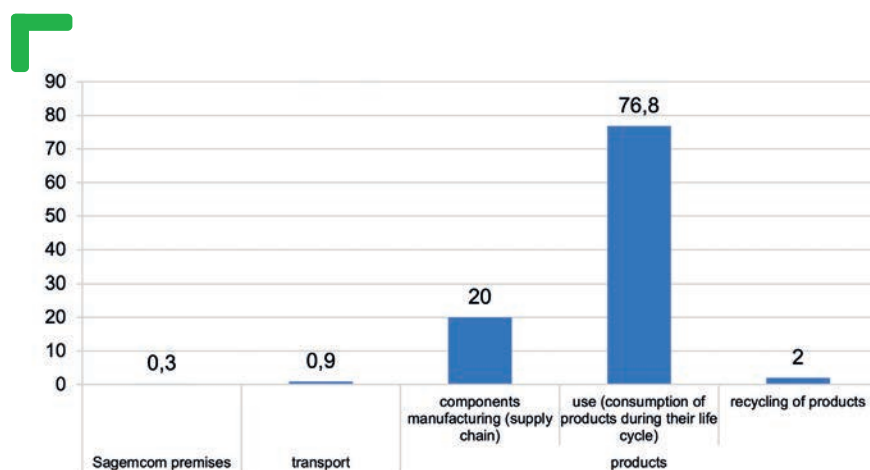


**F**or more than 10 years, Sagemcom has also been developing the capacity to conduct internal life-cycle analyses, in line with the protocols in ISO 14044 and the GHG protocol. Any analyses that have to be released outside the company are verified by an independent third party in order to guarantee that the results are accurate. These measurements allow us, and our customers, to direct our design options for our future product generations.

In these ways, throughout the product life-cycle, Sagemcom undertakes a number of measures:



These ecodesign measures are at the heart of our environmental initiative, because the impact of our products is far greater than the impact of our sites, if we consider their entire life-cycle. This gap is illustrated below. While the operation of our sites accounts for just 0.3% of our impact, the manufacturing of our products represents 20%, the use of our products represents more than 75% and their end of life about 2%.



*Breakdown of Sagemcom's annual carbon impact*

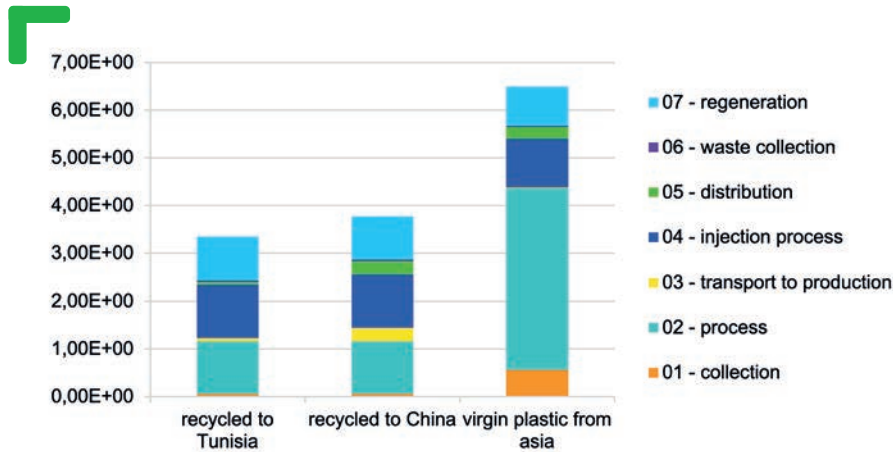
### Using alternative materials

The Sagemcom group considers the use of alternative materials as a permanent source of progress. In the same way that we strive to characterise the environmental impact of our materials, we make sure to qualify our products on the basis of plastics with high potential for recycling (end-of-life management).

The materials we use are evaluated according to two criteria: their environmental impact, but also their "technical" practicality. The Group cannot use materials that may have a lower environmental impact, but whose technical properties are insufficient to meet the quality requirements of our customers.

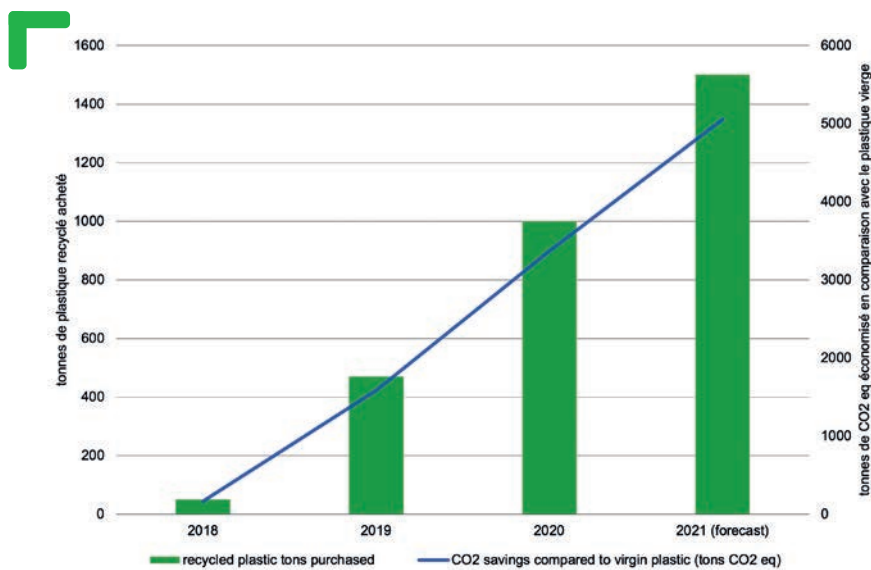
After several years of studies, in 2018 we introduced a recycled plastic into our plastic parts. The low impact of this secondary material, made in Europe from electronic waste produced on the old continent, also enables us to use it in our partner production plants in Asia. The global impact remains below that of the equivalent virgin plastic. Several hundred tonnes will be used in the years to come, as the initiative is gradually deployed.

*After several years of studies, in 2018 we introduced a recycled plastic into our plastic parts*



*Comparison of the impacts of virgin and recycled plastic, according to the location where the finished products are made (kg CO2 eq. / kg of plastic)*

Thanks to our industrial command of this type of plastic, we have been able to complete very large-scale series production runs using alternative materials. As a consequence, several hundred units have been produced in our own plants in Tunisia and in our partners' production plants all over the world. We intend to further increase the proportion of recycled materials in the plastics we purchase.



*Quantity of recycled plastic purchases*

The reuse cycle also makes clear sense in the management of our after-sales services and of the end of life of our products. The plastic waste produced by our after-sales activities in France is returned to our European supplier of recycled plastic, so that it can be fed back into our own supply chain.

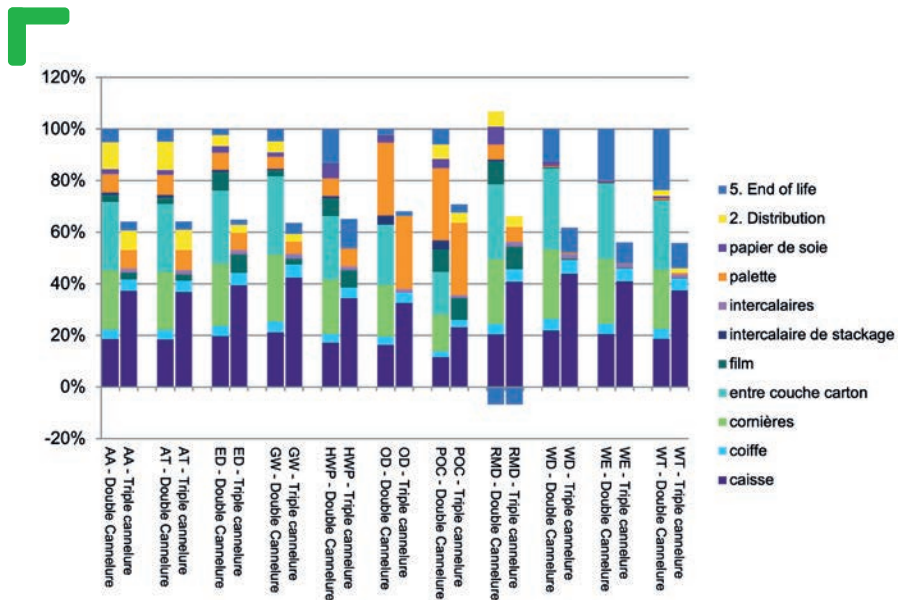
## Packaging

In addition to meeting these obligations, Sagemcom constantly strives to reduce quantities of packaging. Individual packaging is optimised to reduce transportation at equivalent quantities. We also prefer packaging made of recycled or FSC cardboard, printed with vegetable-based inks. We are also actively working on the use of packaging materials that do not contain any oil-based plastics, by resorting to alternative solutions, such as organic plastic bags made of renewable materials or paper fasteners to attach cables, etc.

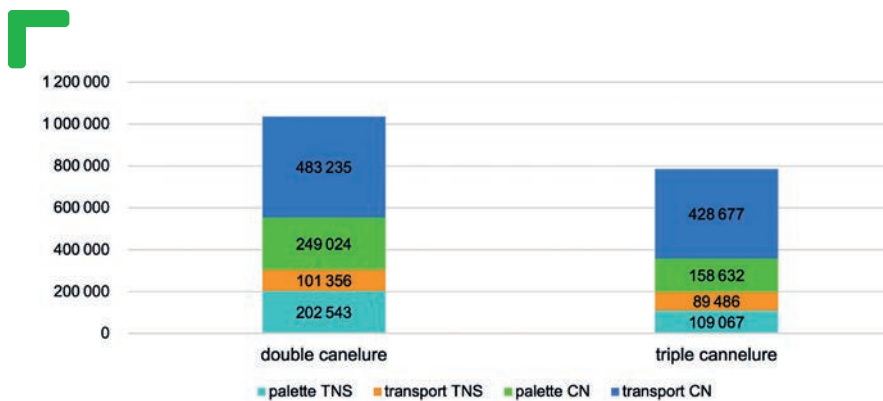
The replacement of our pallets with a lighter structure, guaranteeing the same performance during transportation, has reduced the environmental impact of every pallet by redistributing their mechanical strength to different parts. These measures have significantly reduced the weight of tertiary packaging (by up to 8 kg per pallet), while also increasing the number of products per pallet.

This dual optimisation of both materials and products per pallet has reduced the impact per shipped product by around 24%.

*We also favour packaging made of recycled or FSC cardboard, printed with vegetable-based inks*



*Reduction of impacts by replacing double flute pallet boxes with triple flute boxes (compared with a double-flute box as a 100% point of reference)*



*Reduction in transport impact thanks to the optimisation of our pallets (kg CO2 eq., for two million products, 50/50 manufacturing split between Tunisia and China)*



This performance was achieved as part of a manufacturing process, involving the sites in Tunisia and Asia, that transports the products by sea and then by truck to France.

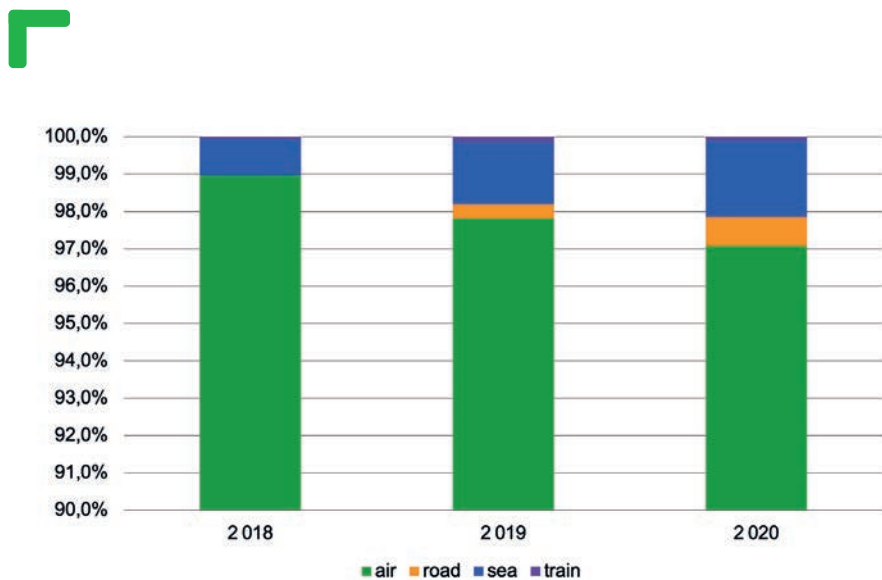
## Batteries

Batteries can represent a danger to the environment when they are disposed of, due to the hazardous substances they contain. We abide by the European Directive 2006/66/EC, which banned the most polluting batteries (limits on lead, mercury and cadmium).

Batteries are the only possible source of energy for some of our smart meters, and gas meters in particular, which are not connected to any external energy supply. Therefore, the capacity and the robustness of these batteries is vitally important to guaranteeing the lifespan of our products. But at the same time, we take care not to oversize them, in order to avoid any waste of resources.

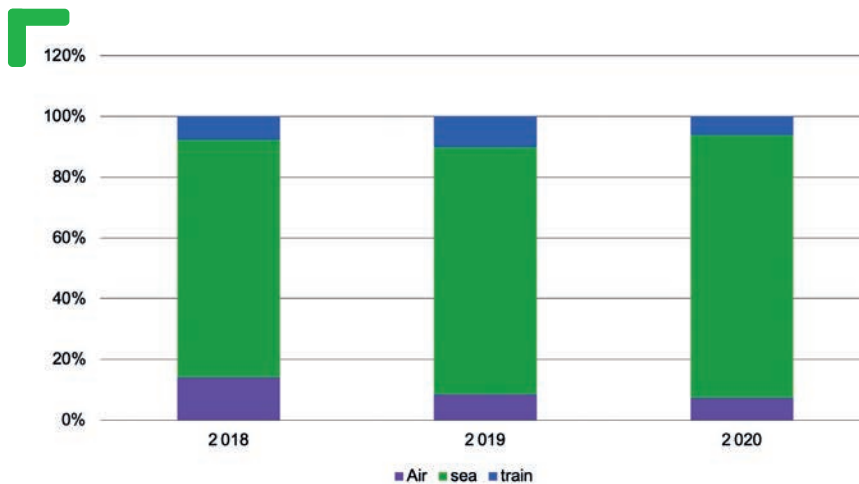
## Transport

Transport is a major source of greenhouse gas emissions. In particular, for urgent deliveries, shipping our components and finished products by air weighs heavily in the carbon balance. While only 7% of our incoming and outgoing goods were shipped by air over long distances, down 1% on 2019, air freight accounts for 97.8% of our logistics carbon impact! We try to avoid these situations by improving our forecasting processes and the corresponding manufacturing schedules. We pay close attention to local deliveries using reusable packaging materials. This avoids wasting pallets and cardboard boxes. We also try to optimise the packaging of components in partnership with our suppliers.



*The carbon impact by type of transport*

We can see this change in our transport mix by taking a closer look at the breakdown of the tonnages shipped over the corresponding distances. The decrease in the share of air freight is visible, despite the crisis we all went through due to COVID-19 in 2020. Consequently, the risk of increasing air transport in order to limit late deliveries was mitigated.



Breakdown of the means of transport in tonnes/kilometre

## Consumption of products

Energy consumption during use is the most significant environmental aspect of our products. Therefore, our strategy consists of making them more efficient in all their operating modes, and especially when in standby mode.

We pay particularly close attention to our broadband products. This equipment is at the heart of domestic networks, and, if we are not careful, they can consume energy needlessly and permanently. Therefore, we design them to operate as dynamically as possible, for example by switching off unused interfaces in order to cut energy consumption.

Our goal is to follow the European code of conduct for broadband products, which is representative of the most efficient products on the market. All our power supplies comply with the V5 European code of conduct, tier 2.

## Facilitating the recycling of our products right from the design phase

The first step affecting the recycling of our products is the choice of the materials used to build them. Combinations of different types of materials can impact the capacity of the product to be recycled. We take care to choose materials that are compatible in the recycling phases. Our products are then assembled in a way that facilitates their deconstruction and the separation of the various components.

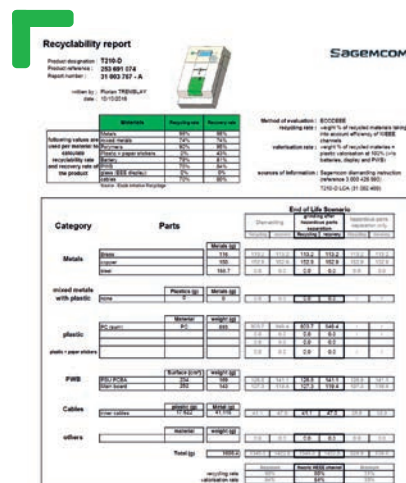
## Calculating product recyclability

We have built on our experience in design and our partnerships with recycling operators to introduce the measurement of the recyclability of our products in order to evaluate the benefits of our end-of-life oriented design methods.

This evaluation takes account of several parameters:

- The materials used
- The assembly techniques
- The known results of the WEEE processing channels

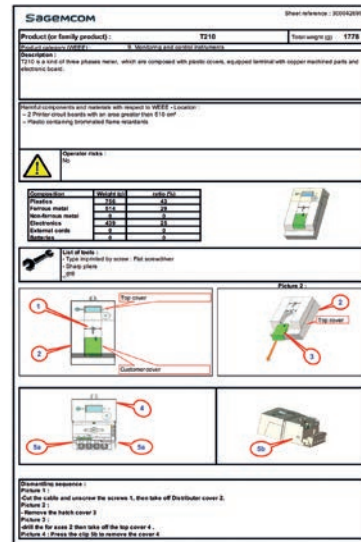
The evaluation attempts to be realistic, with three possible processing scenarios, ranging from refurbishing to direct destruction.



## Dismantling guides for easier recycling

On request, Sagemcom provides recycling operators with dismantling guides in a bid to encourage the recycling of its old products. These guides contain all the information required to optimally recycle and reuse the machines:

- a bill of materials (metals, plastics, electronic circuit boards, etc.)
- the location of the components to be separated (as per the WEEE directive)
- the dismantling steps
- the potential risks for recycling operators (sharp metal edges, etc.)



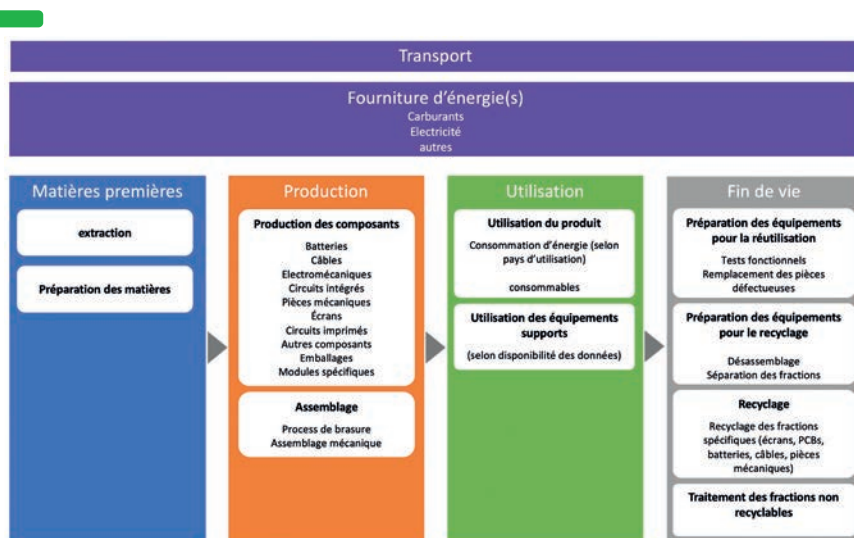
## Life-cycle analysis

To identify opportunities for improvement, we analyse our legacy products from both a qualitative (means of assembly, etc.) and a quantitative perspective, by modelling the product lines with a simplified life-cycle analysis tool: EIME software, developed by CODDE Bureau Veritas. These analyses guide our strategic development options in order to reduce energy consumption, because it is the phase when the product is in use that has the greatest impact on our products' life-cycles, no matter where they are used.

This expert knowledge also enables us to make preliminary life-cycle analyses in an advanced operation conducted during the call for tender phases. The goal is to estimate the environmental impact of a product, in order to help our customers to choose between several possible scenarios, particularly regarding the logistical phase and the choice of materials. It also enables us to decide on the communications mechanisms between products and networks in advance, in order to anticipate cases where one of them would prevent the other one from switching to standby mode.

Major projects are all analysed to assess their impact and the associated gains. Analyses can be customised when requested by customers as of the product design stage. Every product family has a specific approach to the reduction of its environmental impact.

Our internal life-cycle analyses are conducted in accordance with the ISO 14044 standard and within the following boundaries:

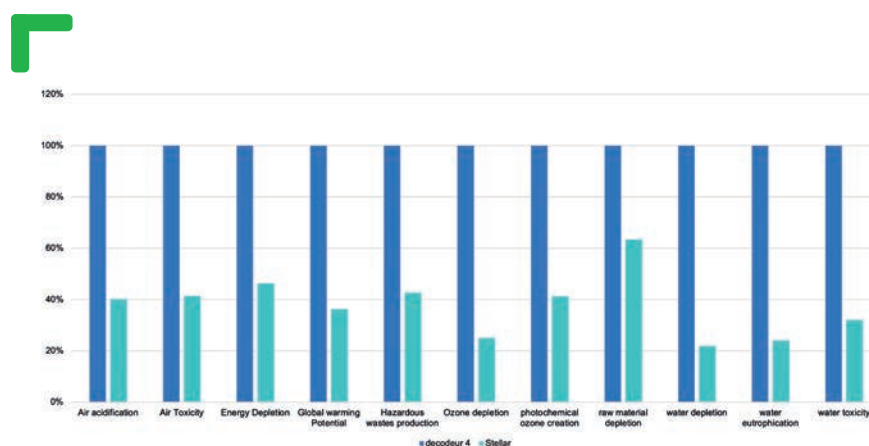




These analyses are described in detail in reports specific to each product model. The reports illustrate the main impacts during the different phases of the product's life-cycle using several indicators.

	Short Name	Indicator	Unit
<b>PEP eco-passport – PCR 3.0 - 2015</b>	AP	Acidification potential	kg SO <sub>2</sub> eq.
	ADPe for EN15804	Abiotic depletion (elements, ultimate reserves)	kg Sb eq.
	ADPf for EN15804	Abiotic depletion (fossil fuels)	MJ
	AP for DHUP	Air Pollution	m <sup>3</sup>
	EP for EN15804	Eutrophication (fate not included)	kg PO <sub>4</sub> eq.
	GWP for EN15804	Global Warming (GWP100)	kg CO <sub>2</sub> eq.
	ODP for EN15804	Ozone layer Depletion ODP Steady state	kg CFC-11 eq.
	POCP for EN15804	Photochemical oxidation (high NOx)	kg C <sub>2</sub> H <sub>4</sub> eq.
	WP for DHUP	Water Pollution	m <sup>3</sup>
	<b>PEP eco-passport® - PCR 2.1 - 2014</b>	AA	Air acidification
AT		Air Toxicity	m <sup>3</sup>
ED		Energy Depletion	MJ
GW		Global Warming Potential	kg CO <sub>2</sub> eq.
HWP		Hazardous Wastes Production	kg
OD		Ozone Depletion	kg CFC-11 eq.
POC		Photochemical Ozone Creation	kg C <sub>2</sub> H <sub>4</sub> eq.
RMD		Raw Material Depletion	Y-1
WD		Water Depletion	dm <sup>3</sup>
WE		Water Eutrophication	kg PO <sub>4</sub> eq.
WT		Water Toxicity	m <sup>3</sup>
<b>DHUP decree n°2013-1264 compliant declaration</b>		ADPe for EN15804	Abiotic depletion (elements, ultimate reserves)
	ADPf for EN15804	Abiotic depletion (fossil fuels)	MJ
	AP for DHUP	Air Pollution	m <sup>3</sup>
	AP for EN15804	Acidification (including fate, average Europe total, A&B)	kg SO <sub>2</sub> eq
	EP for EN15804	Eutrophication (fate not included)	kg PO <sub>4</sub> eq.
	GWP for EN15804	Global Warming (GWP100)	kg CO <sub>2</sub> eq.
	ODP for EN15804	Ozone layer Depletion ODP Steady state	kg CFC-11 eq.
	POCP for EN15804	Photochemical oxidation (high NOx)	kg C <sub>2</sub> H <sub>4</sub> eq.
	WP for DHUP	Water Pollution	m <sup>3</sup>

These analyses enable us to demonstrate the progress we make in terms of the environmental impact of our products, from one generation to the next. For example, the impact of our DCIW385 set-top-box platform is 64% lower than that of its predecessor on the market:

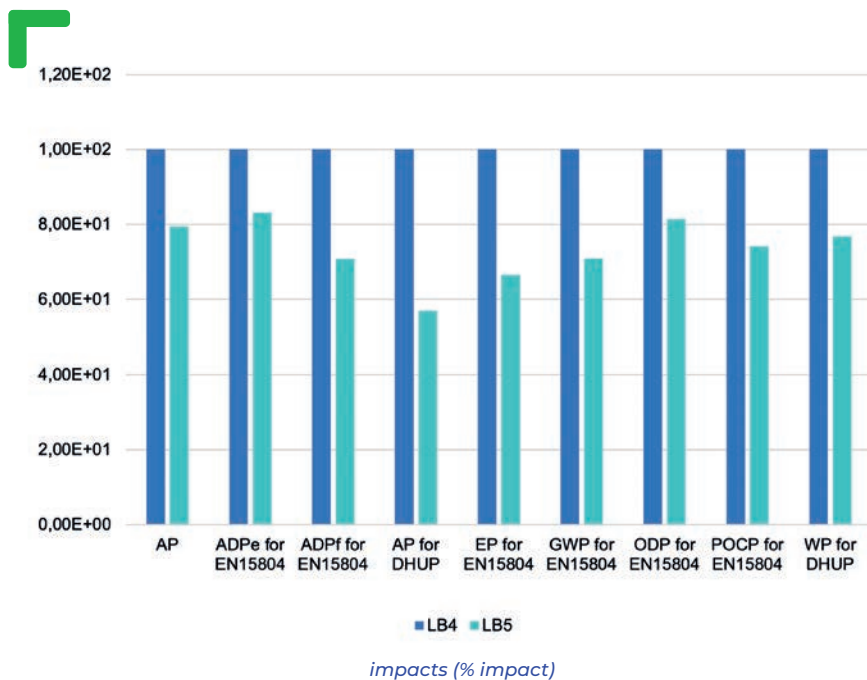


Comparison of the impact of the DCIW385 (in green) and the RTIW383 (in grey - reference impacts at 100%)

All its impact indicators have been reduced. It also shows that our innovations intended to reduce the carbon impact do not simply produce pollution elsewhere (the Global Warming Potential indicator).

We achieved this performance by miniaturising our products and reducing their energy consumption in standby mode. Unlike their predecessors, which switched to a connected standby mode, our new products feature a deep standby mode.

We did a lot of work on our residential gateways with our customer Orange in order to develop the most eco-designed box on the market. The Livebox 5 harnesses all of Sagemcom's know-how in ecodesign, with optimised electronics, reduced power consumption, that complies with version 7 of the European code of conduct, and housings made of recycled plastic sourced from European WEEE suppliers. As a consequence, its carbon impact has been slashed by 29% (information verified by an independent third party).



# A CLOSER LOOK AT: the Bureau Veritas Footprint progress® certification

The Bureau Veritas Footprint Progress® certification offers any organisation the possibility to publish information on improvements of the environmental performance of a product thanks to an ecodesign strategy.

Bureau Veritas Footprint Progress® is based on the best ecodesign practices. A description of the life-cycle and a quantification of the environmental impacts of the products / product families are required. Consequently, the certification system is based on the life-cycle analysis standards and the environmental management system standards, which include the design and development processes. In its capacity as a certification organisation, Bureau Veritas guarantees that the information provided by customers and stakeholders is true. The certification audit conducted by LCIE Bureau Veritas in 2020 highlighted the robustness of Sagemcom's ecodesign process.

"Sagemcom has a robust and efficient ecodesign process, which was initiated in 2007. The environmental footprint of the audited product is between 10% and 50% lower than that of the previous generation," explained the auditor, Damien Prunel.



With the launch of its new fibre box in Switzerland with the operator SALT, Sagemcom succeeded in reducing the environmental impacts according to the nine indicators that were analysed. The average reduction of the impact according to these nine indicators is 23%. By way of example, the product's carbon footprint has been reduced by 21%, which represents 22 kg CO<sub>2</sub> eq. of emissions per product.

## Grids and infrastructure

Sagemcom Energy & Telecom develops solutions to deploy electric power grids and telecommunications networks in African countries.

The WeLight partnership with Axian was founded to supply reliable, accessible and renewable energy to the populations in rural Madagascar and sub-Saharan Africa, by deploying innovative technologies and providing means of payment accessible to all.



Sagemcom Energy & Telecom has already deployed a total of 7.5 MWp of solar energy production in Africa, and expected to deploy a further 10 by the end of 2020.

GIS is actively participating in the development of Africa by reducing the digital divide through the provision of access to the network everywhere, the roll-out of the fibre network and the construction of telecommunications sites.

The activity of these telecommunications sites also supplies energy to villages off the grid, offering new possibilities to their inhabitants:

- Better health conditions
- The preservation of food
- Increased local agricultural output
- Business development
- Improved safety