

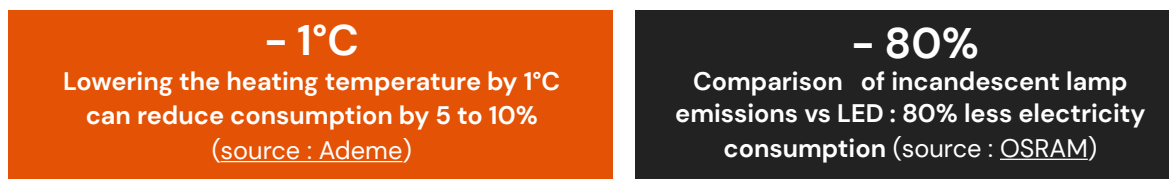
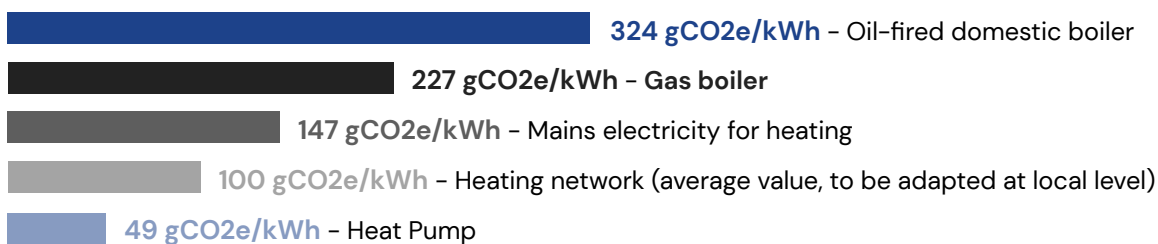
Emissions from buildings

I - Presentation of the source of emissions

Emissions associated with buildings are those linked to the purchase or rental of a building, as well as all emissions linked to its operation (lighting, heating, air conditioning, etc.).



Comparison of emissions associated with different heating methods, for 1kWh of heating in 2018 (ADEME carton base)



Not all ways of lighting, heating or air conditioning result in the same GHG emissions. For example:

- Heating with **gas or oil** emits more greenhouse gases than heating with **electricity**, because French electricity uses little carbon to produce;
- Not all light bulbs consume the same amount of **energy**;
- And not all companies use the same means of air **conditioning**, or use it at the same intensity.

By renovating buildings, we can accelerate the reduction in their emissions by acting on their lighting, heating and cooling needs (via insulation, the energy system or sunlight, for example). While each renovation is unique depending on the type of building concerned, there are generally 3 types of renovation depending on the extent of the work to be carried out and the potential energy savings :

- Simple renovations (changing lighting, changing windows, etc.), with efficiency gains of around 10% depending on the case;
- Medium-scale renovations (change of interior insulation, change of boiler or radiators, etc.), with efficiency gains of around 20% depending on the case;
- Major renovations (changing all the insulation, modifying the exposure to the sun, changing the entire heating system, etc.), which can result in efficiency gains of up to 90%, depending on the case.

Two new regulations in particular are tackling the issue of reducing GHG emissions from tertiary buildings:

- [The 2020 Environmental Regulations](#) (RE2020), which provide a framework and set environmental objectives for new builds, taking into account the entire life cycle of the building for the first time;
- The [Tertiary Eco-Energy Scheme](#) which sets targets for reducing the final energy consumption of tertiary buildings by 2030, 2040 and 2050 (-40%, -50% and -60% respectively).

However, not all companies have the same levers at their disposal: it is important to distinguish whether they own or lease their site.

II - Presentation of levers and best practices

Levers in **green** are easy to implement and offer significant gains in terms of GHG emissions, while the **orange** levers are more difficult to implement, but offer significant gains in GHG emissions, and finally the **blue** levers are easy to implement, but offer lower GHG emission gains.

1. Reduction of emissions linked to building operation

- 1.1 **Set up an energy management system**
- 1.2 **Fit low-energy lighting**
- 1.3 **Choose a site or premises with a good energy rating**

1.4 If the company is a lessee

- 1.4.1 **Encourage the owner to carry out energy renovation work**

1.5 Where the company is the owner

- 1.5.1 **Build a low-carbon building**
- 1.5.2 **Carry out energy renovation work**
- 1.5.3 **Connect the building to a district heating or cooling network**
- 1.5.4 **Install efficient heating and cooling equipment**
- 1.5.5 **Install infrastructure for self-consumption of renewable energy**

2. Reduce emissions linked to the use of buildings

- 2.1 **Have facilities and uses that are consistent with the company's activity**
- 2.2 **Sign a contract for the provision of energy generated from renewables**
- 2.3 **Raise awareness among users of the premises about saving energy and water**

1. Reduction of emissions linked to building operation

1.1 SET UP AN ENERGY MANAGEMENT SYSTEM

- Install an [energy management system](#) (regulated by the ISO 5001 standard) : provides an assessment and action plan for better management of energy consumption on your site.

1.2 FIT LOW-ENERGY LIGHTING

- Choosing **low-energy lighting** (compact fluorescent lamps or LEDs) can reduce energy consumption by [around 80%](#) compared with a conventional incandescent lamp.



1.3 CHOOSE A SITE OR PREMISES WITH A GOOD ENERGY RATING

- The [energy performance assessment](#) is the key to choosing an energy-efficient, low-GHG-emitting site or premises: the label displays both the **energy consumption** (in kWh/m2.year) and the **GHG class** (in CO2e/m2.year).

1.4 IF THE COMPANY IS A LESSEE

1.4.1 Encourage the owner to carry out energy renovation work

- The Tertiary Eco-Energy Scheme sets targets for reducing the final energy consumption of buildings: -40% by 2030, -50% by 2040 and -60% by 2050;

Contact the lessor about carrying out energy renovation work (especially if the Energy Performance Assessment is low, below D). The creation of an **environmental committee** provides a framework for these discussions.

1.5 WHERE THE COMPANY IS THE OWNER

1.5.1 Build a low-carbon building

- La [RE2020](#) provides a framework for the **energy and climate performance of new buildings**. It promotes low-carbon construction methods and encourages the use of **bio-sourced** materials;
- It takes into account GHG emissions linked to buildings over their **entire life cycle** : from construction materials to demolition and operation;

Give priority to the levers that have the greatest carbon impact: **building materials** (avoid excessive quantities of concrete and steel), the energy performance of the building, its service life and the **recyclability of the materials** used at the end of its life.

1.5.2 Carry out energy renovation work

- The Tertiary Eco-Energy Scheme sets targets for reducing final energy consumption (see above) which can be achieved through energy renovation work, such as the priority actions listed below;
 - Carry out an [energy audit](#) to identify ways of reducing energy consumption and greenhouse gas emissions;
 - **Insulate** (preferably outside as well) and change the glazing;
 - **Green** the roof and pavement;
 - Replace **heating equipment** with efficient solutions (see 1.5.3, 1.5.4 and 1.5.5);
 - Change the **lighting** and **light exposure** (light holes, LEDs);
 - Install **self-consumption** infrastructure (see below);
 - Change the **ventilation** and **air-conditioning** system (in particular, choose [coolants that emit low levels of greenhouse gases](#) and more efficient dual-flow systems);
 - Install a [Building Management System](#).

1.5.3 Connect the building to a district heating or cooling network

- Find out about [the possibility of connecting to a district heating/cooling network](#).

1.5.4 Install efficient heating and cooling equipment

- [The heat pump](#) is a method of heating that is both more energy efficient and reduces the emissions associated with heat production. A heat pump can be used to heat air (air-to-air heat pump) or to **heat air and domestic hot water** (air-to-water heat pump). However, could the work involved be significant and costly?
- Inertia radiators are more energy-efficient than most electric heaters.

*A heat pump reduces greenhouse gas emissions by 70-90% compared with heating with fossil fuels (gas or oil).
Source : ADEME*

1.5.5 Install infrastructure for self-consumption of renewable energy

- For electricity, install [photovoltaic panels](#) (roof, car park) or **wind turbines** if the site allows;
- To produce heat or domestic hot water, consider installing **thermal solar panels**;
- If the site allows, install a system using [geothermal energy](#).

2. Reduce emissions linked to the use of buildings

2.1 HAVE FACILITIES AND USES THAT ARE CONSISTENT WITH THE COMPANY'S ACTIVITY

- **Optimise the use of space** (e.g. sublet office or storage space) ;
- Adapt energy consumption to the **use of the premises** (don't heat a warehouse, don't light a shop window all night, install presence detectors, window opening detectors, start & stop systems);
- Have a **home automation** system or a [Building Management System](#) to monitor and adapt consumption to needs in real time (lighting, heating, air conditioning, electrical and electronic appliances).

2.2 SIGN A CONTRACT FOR THE PROVISION OF ENERGY GENERATED FROM RENEWABLES

- The French regulatory GHG emissions balance and the Bilan Carbone® methodology **do not allow the emissions factor linked to electricity consumption to be modified** if a renewable electricity contract is signed: this is therefore not a lever that can be used to reduce GHG emissions from a regulatory point of view;
- However, it can be beneficial to sign a renewable electricity contract via a [Power Purchase Agreement](#) or via a renewable electricity supplier that finances new sources of renewable electricity production in countries where electricity is highly carbon-intensive¹.

2.3 RAISE AWARENESS AMONG USERS OF THE PREMISES ABOUT SAVING ENERGY AND WATER

- **Employee training and awareness;**
- Put up **displays** to encourage energy and water saving.

OPERATIONAL KPI :

Energy consumption of buildings (monthly, to take account of seasonal variations) in absolute terms and per m2
Performance gap in relation to targets set by the Tertiary Eco-Energy Scheme
Renewable energy consumption rate by type
Rate of self-consumption of energy (if there are self-consumption facilities)
Space occupancy rate (offices, warehouse/storage)
Share of low-energy lighting
Monitoring the vegetated area of the site
Percentage of employees trained/educated in reducing building-related GHG emissions

¹On the appropriateness of green electricity contracts in companies' decarbonisation strategies, see this [study](#) by the consultancy Carbone 4.

III - Case study



A European leader in the transformation of polymers, composites and precision metal parts CLAYENS NP is **reducing and optimising its energy consumption** with the aim of reducing its carbon footprint by 4.2% per year (scope 1 and 2, by volume), in line with the objectives of the Paris Agreement

Electrification of machines (particularly presses), switch to green energy from controlled sources, ISO 50001 (energy management) certification, LED lighting: many good practices are already in place at most of the Group's French and international sites, which plan to roll them out across the board in their five-year plan up to 2025.



Self-consumption and purchase of renewable electricity

Founded 30 years ago in Alsace, the Hestiom Group is a key player in the ecological transition, designing, manufacturing, installing and maintaining ultra-efficient heating equipment and photovoltaic energy self-generation systems for both private individuals and businesses.

As part of its decarbonisation strategy, the Group has put this expertise into practice internally and has put in place a plan to improve the energy efficiency of its buildings and to move towards a 100% renewable electricity supply. Over 3 years (2019–22), this has resulted in a reduction in greenhouse gas emissions from scopes 1 and 2 of -19% in absolute terms (tco2eq.) and -26% in intensity (tco2eq./M€ of turnover)

Based on its rationale - "to give everyone the means to play a part in the energy transition" - the Group, via its B2B subsidiary PowerPark, has also set itself the task of supporting other small and medium-sized businesses in decarbonising their buildings by :

- The installation of self-generating electricity systems on shade canopies (car parks) and roofs, with or without battery storage, with the following benefits :
 - a. Economic: independent production of "free", low-carbon energy over more than 20 years
 - b. Climatic: 638 kgCO₂e avoided per kW of installed capacity (in France)
- Replacing inefficient heating systems with ultra-efficient, connected inertia radiator systems, with the following benefits :
 - a. Economic : Up to 40% reduction in electricity consumption, for greater thermal comfort
 - b. Climatic: 1,032 kgCO₂e avoided per kW of installed capacity (in France)

IV - Openness to other environmental issues

Economic activity is responsible for ¼ of [land artificialisation](#) in France, which poses problems in terms of loss of biodiversity, risk of flooding, reduction in agricultural land, etc.

[The coolants](#) in air conditioning systems and certain equipment (refrigerators, cold rooms, etc.,) can cause leaks that have a major impact on the destruction of the ozone layer (see a [Video](#) on this subject by the YouTube content creator Le Reveilleur) as well as being very powerful GHGs.


V - Further information


Here are a few libraries of resources for more in-depth study of building-related emissions :


- The Observatoire de l'Immobilier Durable resource library, [Taloen](#) ;
- The resources of [CEREMA](#) on buildings

VI - Appendice

Regulatory method version 5	Item	GHG Protocol	Category
Category		Scope	
1. Direct GHG emissions	1.1 Direct emissions from fixed sources of combustion	Scope 1 (directes)	Direct emissions from fixed sources of combustion
	1.4 Direct fugitive emissions		Direct fugitive emissions
	Other direct emissions		Other direct emissions
2. Indirect emissions associated with energy	2.1 Indirect emissions from electricity consumption	Scope 2 (indirect) Generation of energy consumed	Indirect emissions linked to electricity consumption
	Indirect emissions linked to the consumption of energy other than electricity		Indirect emissions linked to the consumption of steam, heat or refrigeration
3. Indirect emissions associated with transport	Goods transport, commuting, etc.	Scope 3 (indirect)	Transport and distribution, commuting, etc.
4. Indirect emissions associated with products purchased	4.2 Fixed assets		2. Fixed assets
	Purchasing goods and services, upstream leasing assets, waste management, etc.		Products and services purchased, upstream leasing assets, waste generated, etc
5. Indirect emissions associated with products sold	Use and end-of-life of products sold, etc.		Transformation, use and end-of-life treatment of products sold
6. Other indirect emissions	Other indirect emissions		

 Emissions item concerned by the sheet

 Emissions item not concerned by sheet

 Emissions item does not exist





23 rue de l'Arcade
75008 Paris
franceinvest.eu