LAMP

Worktitude for light

Lighting:
Energy efficiency and user well-being

Photos provided by: H.A.U.S Healthy Buildings

European energy transition

With the aim of implementing the 2030 Agenda for Sustainable Development of the United Nations, the European Union has set a series of actions realised in different regulations. One of the most important is the **Energy Efficiency Directive (EED)**, which advocates for member states to transition towards a system in which sustainability is key, without neglecting competitiveness and safety.

The EED issued in 2012 so that EU members implemented measures to improve energy efficiency in several areas was initially aimed at improving efficiency by **20% by 2020**. However, the EED was revised in 2018 (2018/2002) and this goal was set at a minimum of **32.5% by 2030**.

Nearly zero-energy buildings in the EU's sustainable development plan

According to EU data, buildings represent **40% of the total energy consumption** in Europe. Therefore, the EED includes a fundamental concept that has become a priority goal: the **nearly zero-energy buildings (nZEB)**.

This is a building model whose net energy consumption in a typical year is close to zero. To achieve this, measures have to be taken to help improve the efficiency or **energy performance of buildings**, which refers to the amount of energy needed to cover the demand for the use of the building, including components such as heating, air conditioning, ventilation, water heating and lighting. A nZEB's **consumption equals its demand and, in addition, uses mainly renewable power supplies**.

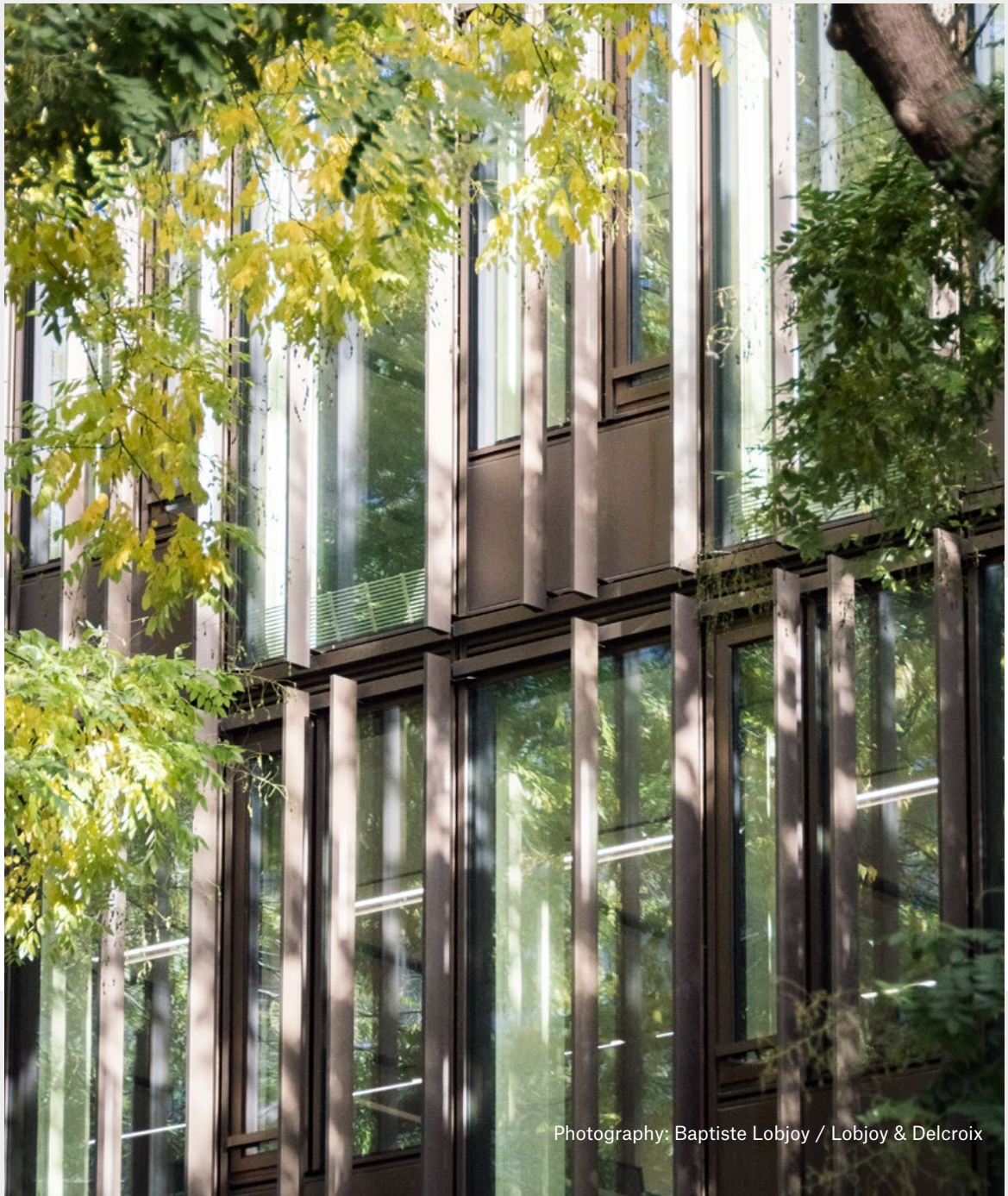
The EU intends to promote the renovation of all European buildings to comply with the EED and require new buildings to be nZEB as of 2020 (2018 for public buildings).

Sustainable design criteria

When talking about designing a building while trying to ensure efficient consumption, the aim is **to design and construct buildings that do not consume more than needed**, and this premise has to be taken into account from the inception and conceptualisation of any project.

Achieving a minimum energy demand must be one of the cornerstones of the project.

This energy savings are absolutely necessary to achieve the Sustainable Development Goals set by the UN and the EU, and also represent a significant economic saving for the end user.



Photography: Baptiste Lobjoy / Lobjoy & Delcroix

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The main pillars of a low energy demand building are:

- A climate study on the environment and location taking into account the different hygrothermal variables: temperature, moisture, solar radiation, wind speed and direction, among others;
- Setting out 'passive' strategies to reduce energy demand by incorporating them into the building's design;
- Correct thermal management and adequate ventilation through 'passive' strategies to reduce energy demand, and subsequently searching and proposing the most efficient active ventilation solutions and air conditioning systems;
- Analysis and proposal of local energy sources and resources so as to obtain as much of the necessary energy as possible from renewable sources, minimising the use of fossil energies with maximum efficiency criteria.

With regard to lighting, it is very important to **prioritise natural lighting and find the correct complements in artificial lighting.**

Artificial lighting and energy efficiency

Power consumption is defined as the relationship between the building's energy needs and the performance of the equipment and facilities. This is where **lighting** comes into play, becoming one of the key factors in the equation.

The Spanish Technical Building Code (CTE) dictates the limitation of energy consumption by establishing maximum values of VEEI (Energy Efficiency Value of the Installation) according to the properties of the building and the weather conditions, as well as the activity for which it is intended.

In this sense, the generalisation of the use of LED technology has been of great help, as this technology entailed a great reduction of energy consumption, achieving **energy savings of up to 80% compared to other technologies**, according to data from the US Department of Energy.

However, efficient light sources are not enough, it is also necessary to determine **energy consumption control and monitoring systems** to ensure greater efficiency. To this end, systems for the use of natural light and the control and regulation of artificial lighting are implemented, regulating the luminous flux of the luminaires through manual switching and control systems, timers or even the latest ones based on wireless technologies for remote control.

Photography: Max van den Oetelaar

Merging concepts of sustainability and well-being

However, it is 2021 and it is necessary to expand the conversation beyond the creation of efficient spaces to also **contextualise and humanise these solutions** under the paradigm of **sustainability linked to user well-being**.

From the point of view of the visual effects of lighting, the lighting solutions provided must guarantee:

- The illuminance level required for the task to be performed;
- Strategies of contrast and adequate uniformity to create comfortable spaces, where the data related to the finishes that make up the space are very important for an adequate calculation of the luminances;
- Low levels of glare, allowing users to carry out their work without discomfort;
- Suppression of the 'flicker' effect that can cause undesirable effects such as reduced visual comfort and task performance, even leading to physiological effects such as fatigue or headaches;
- Adequate chromatic reproduction for the task to be performed, among others.

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Photography: Baptiste Lobjoy / Lobjoy & Delcroix

Current contrasted studies show that, besides visual effects, lighting has **non-visual effects** on human beings, which must be taken into account when choosing a **suitable light** source. Therefore, it is important to determine the following parameters:

- The proper ratio of lighting level (illuminance, measured in lux) and correct colour temperature (measured in Kelvin degrees), taking into account the project's geographical and cultural context;
- Optimal spectral power distribution to improve circadian activation, while taking into account the optimisation to a 480 nm emission wavelength, which has been scientifically proven to have an impact on our circadian cycle;
- Design of light itineraries and scenes that allow users to have dynamic lighting solutions that adapt to their functional needs, but also from a biological and emotional point of view.

EU Lighting Ecodesign Regulation

The EU Ecodesign Directive was established in 2009, but the lighting regulations have been revised several times, most recently in 2019. Regulation (EU) 2019/2020, which establishes ecodesign requirements for lighting sources, comes into force on 1 September 2021.
Ecodesign requirements for lighting refer to several different aspects:

- Energy efficiency - limits are set on energy consumption.
- Functional requirements – these are applied to different aspects of the light sources, such as lumen maintenance factor, LED survival, flicker or colour consistency, colour rendering and others.
- Information requirements – this refers to the technical information that should be provided on the light source itself, on the packaging, or on the manufacturer's website, and also indicates the information and documentation required for product-independent control mechanisms.
- Several types of light sources will be phased out in the coming years: from 1 September 2023 halogen lamps with a G4, G9 or GY6.35 base and T8 linear fluorescent lamps. In addition to this, most halogen lamps and CFLi lamps will be phased out from 1 September 2021.

With the new directive coming into force, the labelling system will change as well. In addition to being a more demanding labelling system than the current one, it will be compulsory to include it only on products considered to be "light sources", with the labelling of luminaires disappearing. This classification is based on the recyclability criteria applied throughout the product's life, allowing it t be separated for repair, recycling, etc.

Sustainability and ecodesign

The concept of ecodesign refers to the entire product life cycle and focuses on two main aspects: the energy required both for its manufacture and during its use, and the resulting harmful emissions.

At **#WorktitudeForLife**, we prioritise all actions that will make us a more sustainable company, collaborating with the building of a lighting industry that is increasingly respectful of the environment, carrying out actions that help us to improve as a company in the management of our day to day lives, as well as in the solutions that we provide to our customers, incorporating recycled materials or researching the use of new, environmentally friendly materials.

Thanks to the commitment to responsible manufacturing and the work carried out by our "Sustainable Development" team, together with our collaborators, we can assure that, currently, more than 31% of the products manufactured by Lamp use **recycled aluminium extrusion at a rate of 80-85%**, reducing **the carbon footprint** of products and processes, as well as **the environmental impact** across the entire value chain.

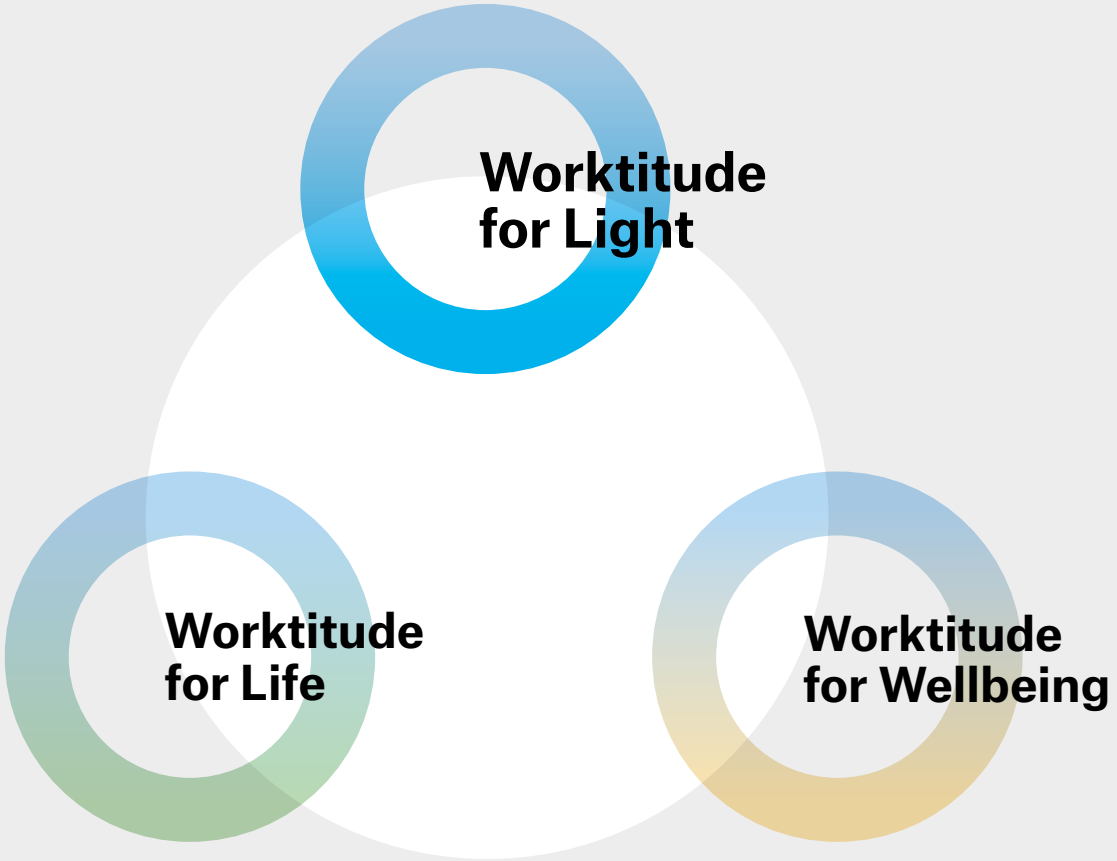
Currently, Lamp indoor families, including **Fil 35, Fil 45, Fil 50, Fil 70, Ocult, Lamptub**, and **Clinic**, as well as the outdoor options, including **Seti, Bazz, Lup, Iron**, and **B-Side**, are already being made of this material. All these families amount to a total of 2,258 references that represent 48% of our catalogue.

The use of recycled aluminium extrusion at Lamp has following benefits:

- **70% reduction in direct carbon emissions** during the manufacture, thanks to the manufacturing process, the optimisation of transport routes, and the collaboration with sustainable suppliers that produce a low carbon footprint.

- The use of only **5% of energy** in comparison with the amount used in the original process.

- The company has been awarded the **ASI Certification (Aluminium Stewardship Initiative)**, which is an independent certification whose regulations establish the environmental and social responsibility principles and criteria applicable to the aluminium value chain.



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