CREE Buildings as Enablers for EU Taxonomy Eligibility

The following case study illustrates how buildings built with the CREE approach meet the technical screening criteria of the EU Taxonomy for substantial contribution to climate change mitigation and the associated “Do No Significant Harm” criteria of the other five environmental taxonomy objectives.

LifeCycleTower ONE

SUBSTANTIAL CONTRIBUTION

MEETING AND SURPASSING THE CLIMATE CHANGE MITIGATION TECHNICAL SCREENING CRITERIA:

Despite being built in 2012, LCT ONE still fulfills the current climate change mitigation criteria. The total primary energy demand (PED) of the LCT ONE building is 117 kWh/m^{2}yr. The substantial contribution criteria require the PED of the new buildings to be at least 10% lower than the threshold value set for nearly zero-energy buildings (NZEB) requirements in that region, which for Austria is a maximum 170 kWh/m^{2}yr. Moreover, the energy performance of LCT ONE is rated A+ Energy Performance Certificate (EPC).

Upon completion, the airtightness and thermal integrity of the building underwent testing. The air exchange value obtained from the BlowerDoor test conducted on site was 0.56/h at 50Pa. For the u-value of the envelope, please refer to the Passive House Database.

The life cycle Global Warming Potential (GWP) of LCT ONE resulting from the construction has been calculated for each stage of the life cycle and is available upon demand.

CREE incorporates timber as structural building material to lower the initial carbon emissions caused by construction. Moreover, the total volume of concrete used in the building’s structure is decreased significantly by utilizing the structural advantages of timber, hence lowering the high carbon emissions related to clinker and concrete production.

All timber elements are sourced from sustainably managed forests, causing no indirect damage to forest ecosystems.
The building envelope and the services of a CREE building are designed to minimize operational energy demands throughout a building’s life cycle. Carbon emissions from materials and operation of the building is reduced by 47% compared to equivalent conventional buildings.

MEETING AND SURPASSING THE DO NO SIGNIFICANT HARM (DNSH) CRITERIA:

CLIMATE CHANGE ADAPTATION

A detailed climate risk and vulnerability assessment was conducted to identify the current and future risks associated with climate change. Even though the assessment showed that the building location was not susceptible to high risk of environmental influences and extreme weather events, necessary compensation measures were taken in considering climate change and adaptation strategies to create a resilient and sustainable building. In addition, installed building services have the capacity to adapt to extreme hot or cold conditions. In case of heavy rain fall, there are waterspouts installed as additional safety measures.

WATER AND MARINE RESOURCES

In LCT ONE, low-consumption faucets and flushes were installed throughout the building, complying with the technical specifications set for water appliances. The building is supplied with drinking water from the municipal supply network, with peak volume flow determined as 1.73 l/s.

Each sanitary unit was fitted with a flush-mounted shut-off valve. The toilet bowls and flushing cisterns are suitable for 4.5 liters flushing volume; EU Taxonomy criteria set the maximum water flush volume as 6 liters/bowl/hour.
The flush release was provided with flush/stop function and waterless urinals were installed throughout.

CREE GmbH, Färbergasse 17b
Rhomberg’s Fabrik, Haus L
A-6850 Dornbirn, Austria

T +43 5574 403 3190
E info@creebuildings.com

creebuildings.com

CIRCULAR ECONOMY, WASTE PREVENTION AND RECYCLING

Due to the assembly of highly prefabricated structural components, there was almost no waste on the construction site. Nevertheless, there were three containers separating plastic, wood, and mineral waste on the construction site and the „Kreislaufwirtschafts- und Abfallgesetz“ (Recycling and Waste Management Act) was fully complied with. Additionally, there was no presence of asbestos on the construction site. Industrial and commercial waste disposal and transportation processes were managed and recorded by the site management. The site was inspected and documented on a weekly basis.

Off-site production not only reduces waste generation on the construction site, but also paves the way for adopting a circular approach. In compliance with the DNSH circular economy criteria set by the EU Taxonomy, CREE building components can be disassembled to be reused, sent for recycling, or for energy recovery.

As required by the DGNB (German Sustainable Buildings Council) certification application process, a verifiable recycling and disposal concept had to be submitted with the application which provides information on the deconstruction and reuse of the construction materials. A disassembly manual was created based on a test dismantling, setting out guidelines for dismantling and the reuse of materials.

POLLUTION PREVENTION AND CONTROL

The indoor air quality in LCT ONE was tested according to DGNB criteria on two of the selected floors. The results were evaluated with regard to existing limits and guidelines. The formaldehyde accumulation per m^3 of material was measured as 0.025 mg and 0.027 mg; substantially lower than the 0.060 mg per m^3 of material maximum value set by EU Taxonomy criteria.

Measures were also taken to reduce noise, dust, and pollutant emissions during construction: The construction process was divided into two phases; site preparation and erection of the core and the assembly of CREE components. The first phase was similar to any other construction site, with additional measures taken due to the close proximity to a residential complex. Low-noise construction machinery was used, and the allowed time periods for construction were observed. During the assembly of CREE components, noise and dust emissions were substantially reduced as building with components with a high degree of prefabrication leads to much cleaner and reduced-impact construction sites.

PROTECTION OF HEALTHY ECOSYSTEMS

LCT ONE was developed on brownfield land originally used for a textile printing shop and then acquired for development as a business park, avoiding the use and development of a greenfield site. Independent site descriptions about the company site as well as the Dornbirn site and can be found on the homepage.

Based on the soil survey conducted prior to planning, the property was not contaminated and is in an urban area. At the time of the start of construction the site was used as a parking lot for the employees of the surrounding office buildings. There were efforts to enhance biodiversity with landscaping around the building, including placement of two nest boxes for birds, two beehives and additional raised beds for vegetation. Therefore, the site of the development complies with the technical criteria set for the protection and enhancement of biodiversity.