

ecômetro

Decarbonization through building renovation & whole life cycle vision "The Greenpeace Headquarters Case Study"

ENERGATE ENERGY EFFICIENCY MARKETPLACE

ULI Urban Land Institute

1st ENERGATE Regional Training Workshop in Madrid

Energy efficiency in Buildings, from financing to implementation

THE IMPACT OF BUILDINGS

S01

Problem



Climate Emergency.

Buildings produce **40% of the CO2 emissions**



Water Scarcity.

Buildings consume **13% of the fresh water**



Planet Degradation.

Buildings consume **40% of the raw materials**



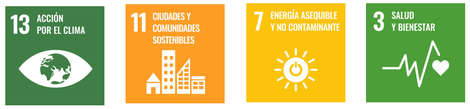
Health problems.

Buildings cause **30% of additional deaths in winter**



Social Impact.

80M people suffer energy poverty in Europe

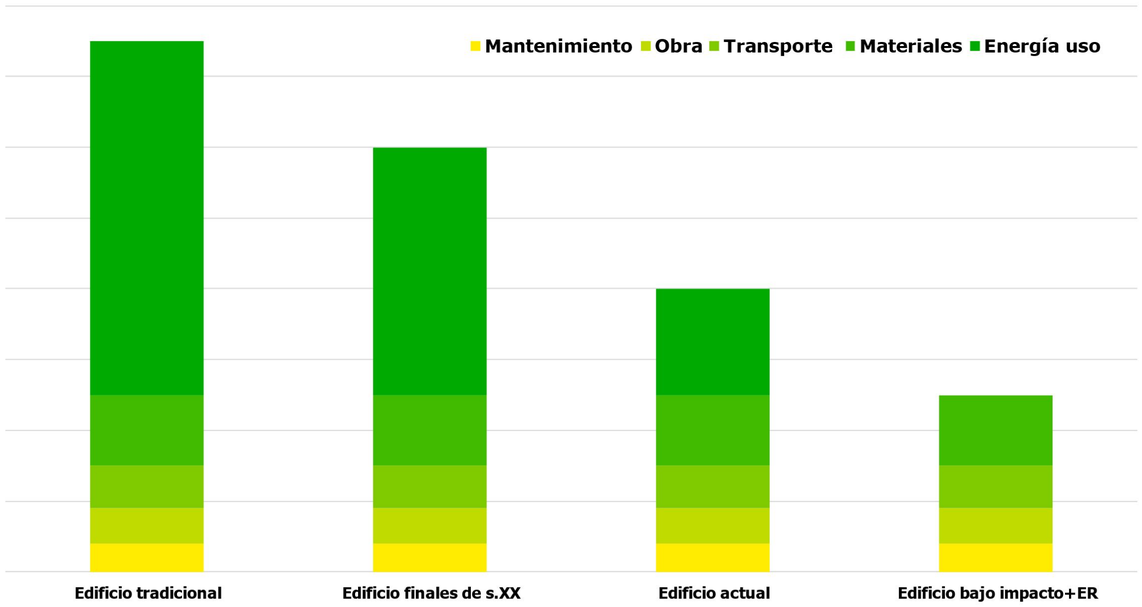












Distribution of impact by phases and impact categories for a standard construction building in Spain

The Impact of Construction.

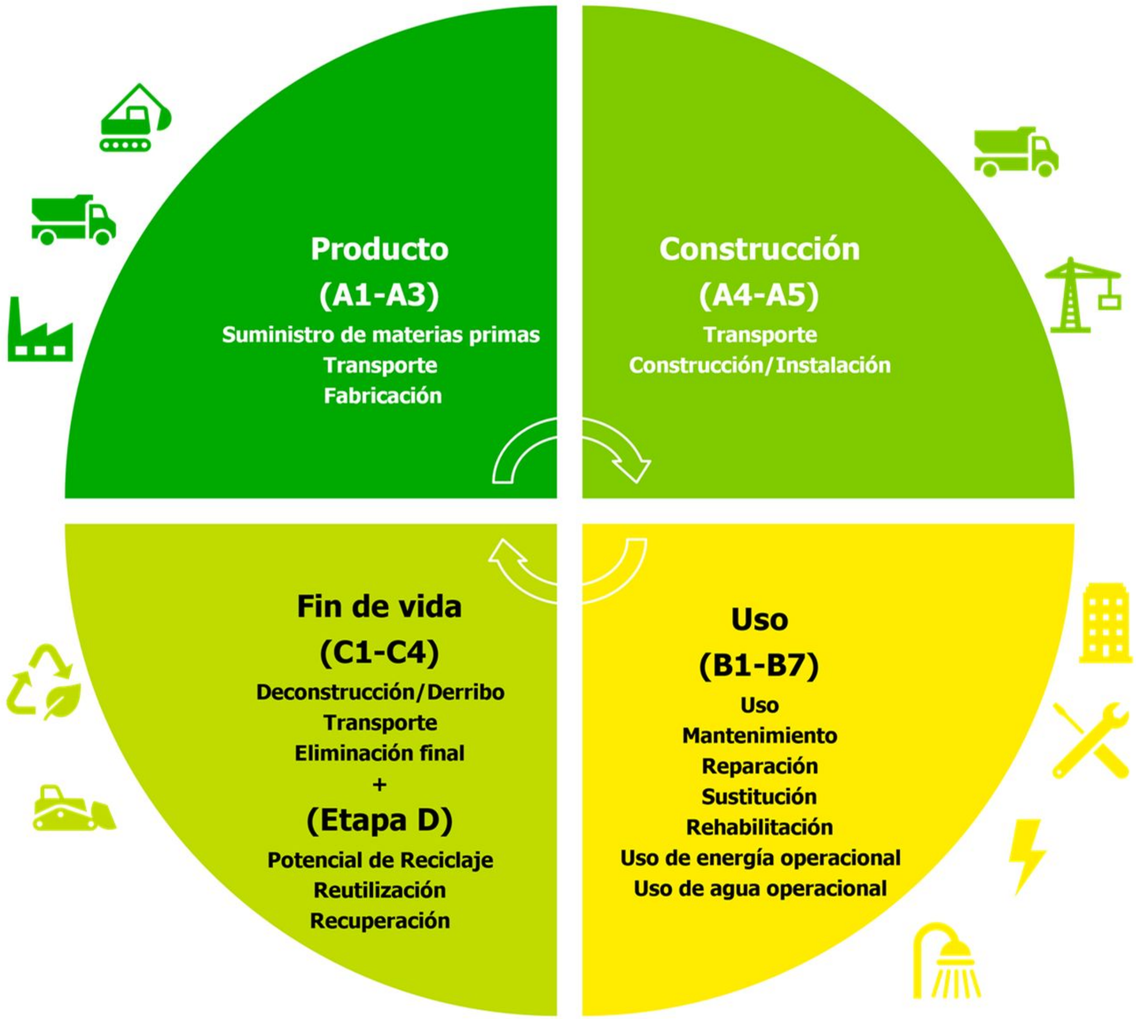
The less energy is consumed during the operational phase of a building, the more relevant the reduction of environmental impact during the construction phase becomes.

WHOLE LIFE CYCLE ASSESSMENT

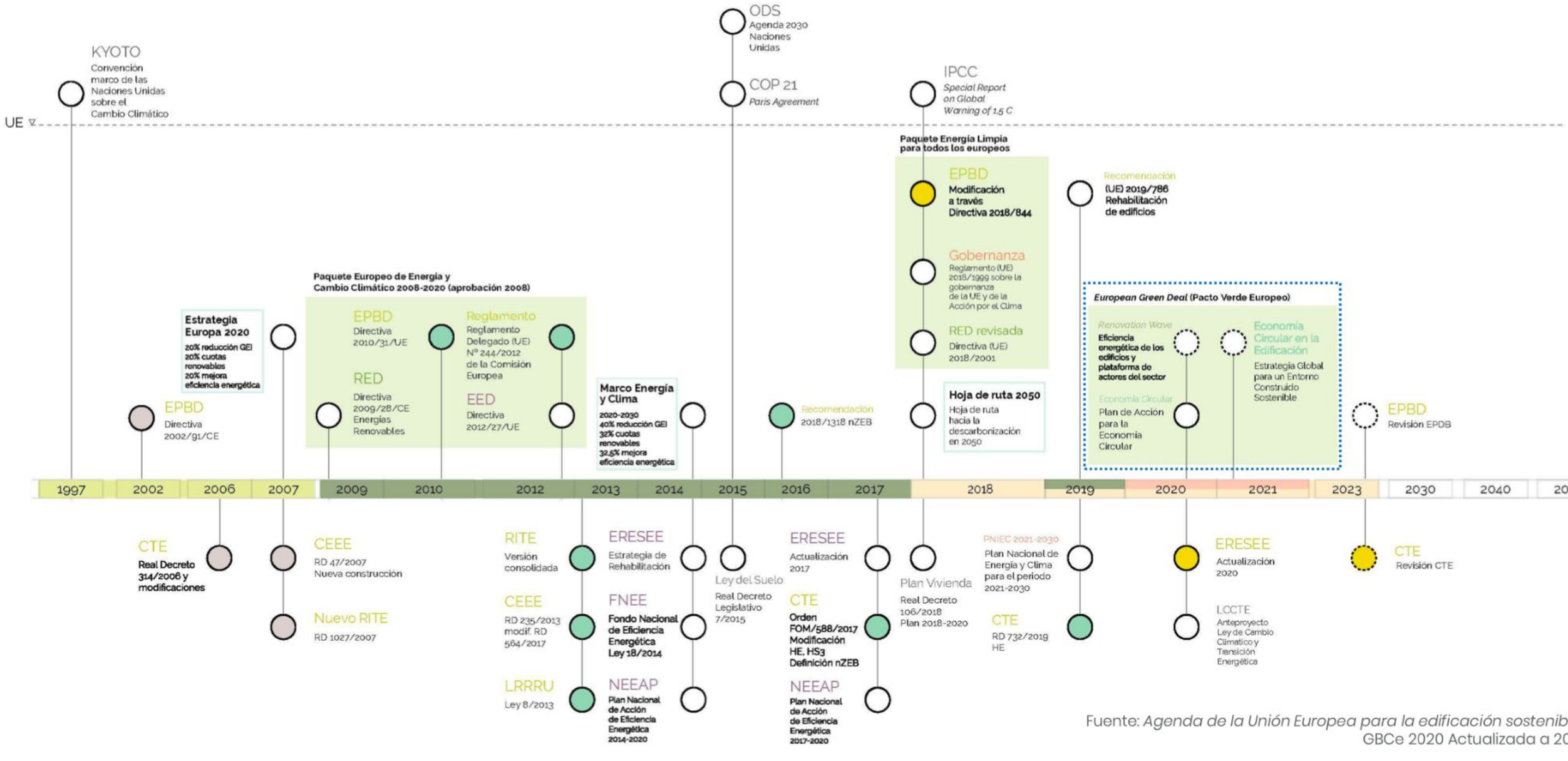
A holistic measurement of the **carbon footprint and 20 other environmental impacts**, throughout the life cycle of a building. From extraction of raw materials (stages A1-A3), transportation and construction of a building (stages A4-A5), use (stages B4, B6) to demolition, deconstruction, disposal (stages C1- C4), or recycling (stage D). Following standards 15804+A1/+A2 and UNE-EN 15978:2012.

Aligned with the EU Level(s) framework and European Taxonomy.

https://acv.ecometro.es/



Regulatory Framework



Fuente: *Agenda de la Unión Europea para la edificación sostenible*, GBCe 2020 Actualizada a 2021


GREENPEACE
"UNLOGIC"



Planta



Alzado principal

Superficie construida: 1084 m2
Superficie útil: 943 m2
Investment: 575.51 €/m2

Sustainability (6+1 measures)



Health

- sustainable materials
- geoenvironmental health
- Vegetation



Impact

- Energy Efficiency
- Renewable Energies
- Recycling



Decarbonization

- Whole Life Cycle carbon Assessment & Decarbonization Strategy



Queremos un sistema de climatización sin gases clorofluorados

Aislamientos ecológicos



¿And if we work with your banners?

Recycling

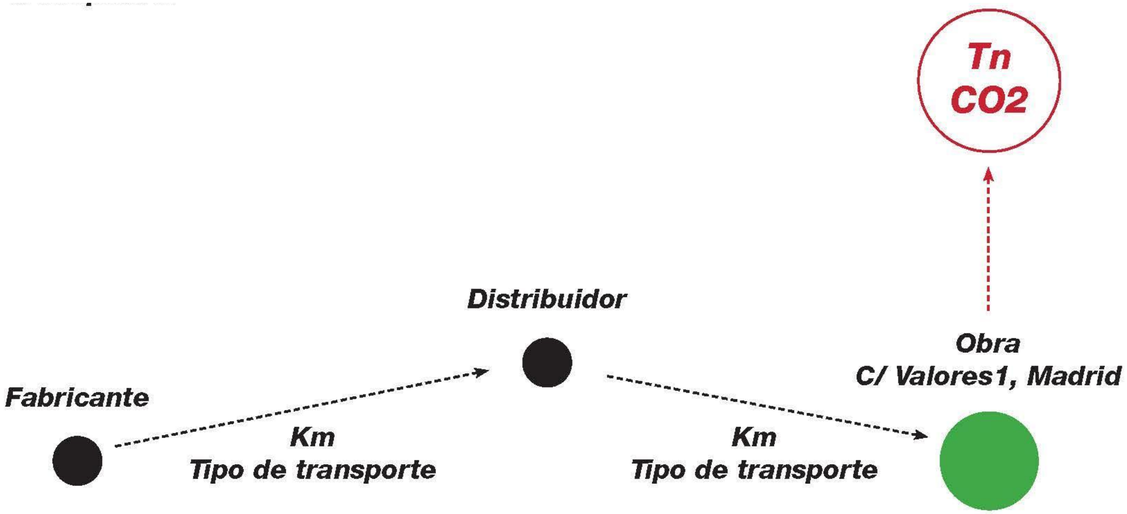
Greenpeace has banner material that once they have fulfilled their primary function does not have a second life. We propose to reuse all the available material to introduce it into the public area through a deconstruction of the banners themselves into different pieces. A collage that builds the social imagination we have about GREENPEACE.



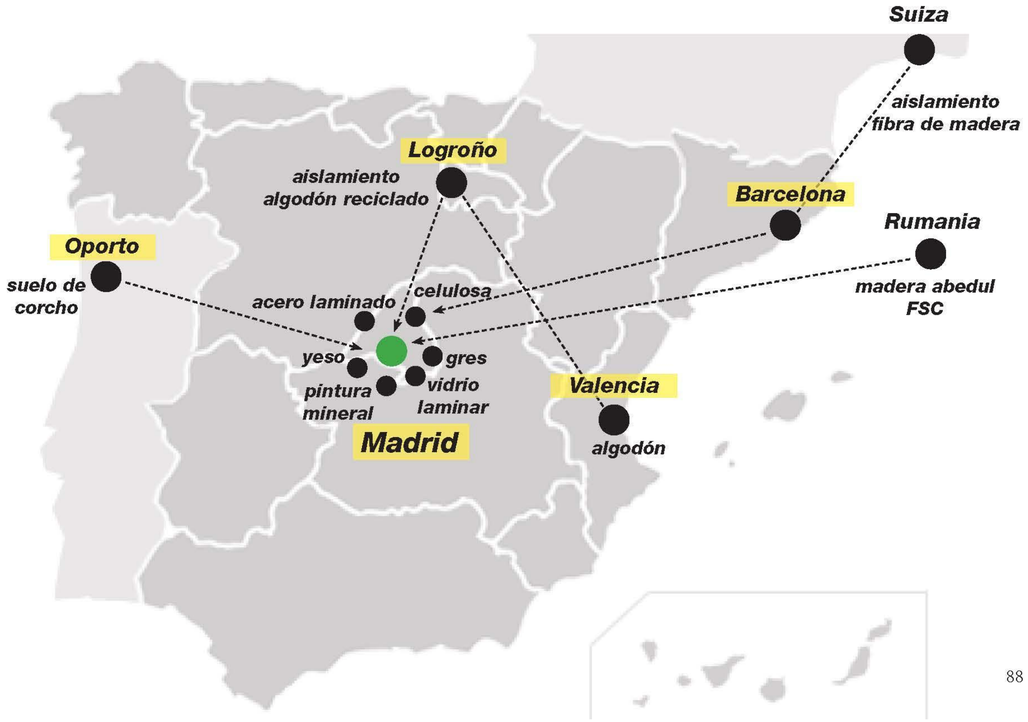


Life Cycle Assessment

Ecómetro´s Life Cycle Assessment tool was used in order to calculate the carbon footprint, during the whole life time span of the building.



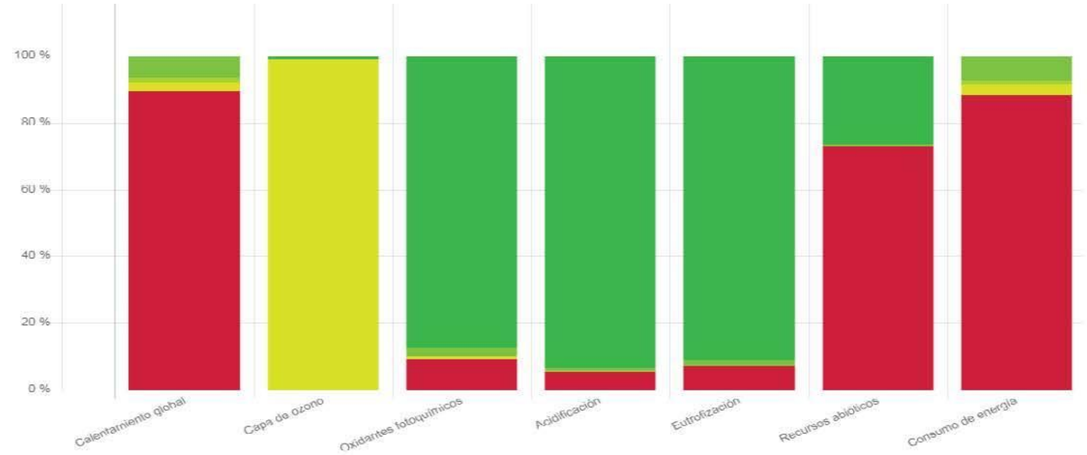
traceability Map



Life Cycle Assessment

Carbon footprint

124 Tn of CO_2 during the manufacturing, transport and construction (124 Kg/m² CO_2).



Oficina Greenpeace España Superficie: 1004 m2 Coste total (PEM): 457.000 EUR		Etapa Fabricación	Etapa Construcción		Etapa Uso		Total
		A1, A2, A3	Transporte A4	Construcción A5	Sustitución B4	Uso Energía B5	
Calentamiento global	$kgCO_2eq/m^2$	1.11e+5	3.30e+3	1.44e+3	8.17e+3	0.00e+0	1.24e+5
Agotamiento capa ozono	kg CFC-11 eq /m²	8.82e-3	1.20e+1	2.38e-4	9.49e-4	1.35e-1	1.22e+1
Oxidantes fotoquímicos	kg C_2H_4 eq /m²	2.37e+1	2.80e+0	3.24e-1	6.54e+0	2.29e+2	2.63e+2
Acidificación	kg SO_2 eq /m²	3.34e+2	5.65e-4	6.70e+0	5.60e+1	5.59e+3	5.99e+3
Eutrofización	kg PO_4^{-3} eq /m²	6.92e+1	6.18e-1	1.39e+0	1.64e+1	9.13e+2	1.00e+3
Agotamiento recursos abióticos	kg Sb eq /m²	3.74e+0	5.63e-3	1.03e-3	2.91e-2	1.36e+0	5.13e+0
Consumo de energía	MJ eq /m²	1.55e+6	5.33e+4	2.31e+4	1.29e+5	0.00e+0	1.76e+6

Energy Strategy

Insulation

We insulate the envelope on the inside: walls, floors, ceilings and windows with ecological materials to avoid energy losses. With this strategy we prioritize the passive strategy.

Windows insulation

climalit security 6/6 + 12 + 5/5



Floor insulation

4 cm of wood fiber
ECOESPAI / PAVATHERM

Wall insulation

12 cm recycled textile insulation
GEOPANEL
15 cm of celulose

Energías 100% renovables

La oficina utiliza energía 100% renovable de origen propio a través de un molino eólico instalado en Cataluña. De esta forma conseguimos la descarbonización del local en su uso e impulsamos el cambio de modelo energético.

Edificio Carbono **Nulo**

- ✔ Measure
- ✔ Minimize
- ✔ Offset
- ✔ Electrify
- ✔ Use 100% Renewables



Green Solutions AWARDS powered by Construction21.org

Construction21.eu ESPAÑA

GREENPEACE

FIRST PRIZE GREEN SOLUTIONS AWARDS
GREAT SUSTAINABLE REHABILITATION

LOW CARBON PRIZE

Edificio Carbono Nulo

Proyectos certificados



Casa Sophia, 2022

Vivienda sostenible en Guadalix de la Sierra. 600 kgCO2/m2

Energía: FV propia + Próxima energía

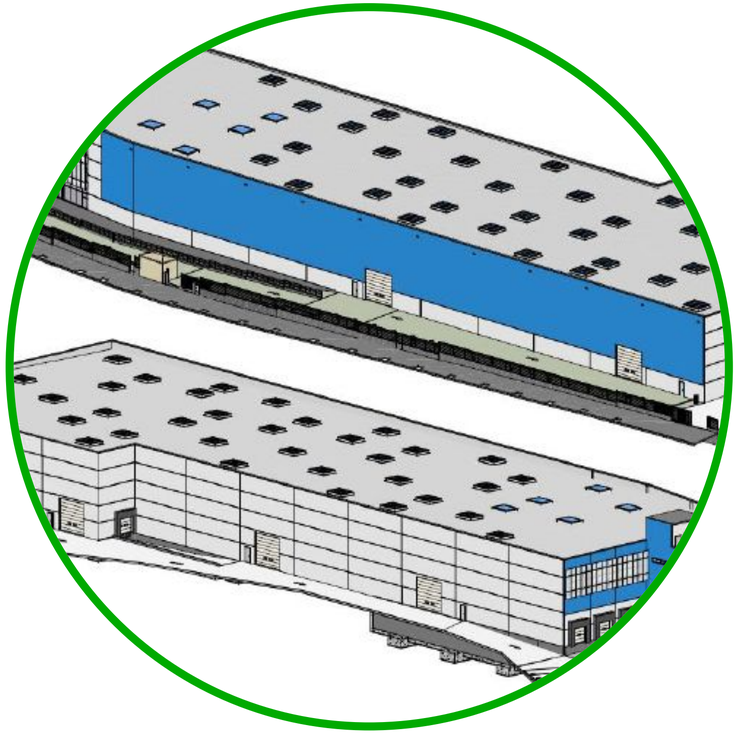
Compensación: Parque Eólico



Edificio Showpass, 2021

Rehabilitación sostenible en Barcelona.

348 kgCO2/m2.
Energía: comercializadora 100% renovable
Compensación: Restauración, reforestación y conservación.



Nave Logística, 2023

Nave de nueva construcción en Reus

880 kgCO2/m2.
Energía: FV propia
Compensación: Captura y almacenamiento

Edificio Carbono Nulo

Proyectos certificados



Oficina Triodos Bank, 2016

Rehabilitación sostenible en Málaga.

278 kgCO2/m2

Energía: Gesternova

Compensación: Reforestación



Cohousing Ecológico Entrepatios, 2019

Viviendas ecológicas de nueva construcción en Madrid. 385 kgCO2/m2.
Energía: 30 KW de energía solar in situ + comercializadora 100% renovable
Compensación: Conservación, reforestación y energías renovables.



Triple Coworking, 2020

Rehabilitación sostenible en Madrid.

364 kgCO2/m2

Energía: La corriente

Compensación: Reforestación

CLIMATE IMPACT

45.000m² measured with Ecômetro LCA tool

9.164 $tnCO_{2eq}$ **AVOIDED**

Through proposed **improvement measures**. Change of materials, construction systems, energy systems, etc.



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