InCUBE Project

Configuration of the PED for the neighborhood perspective

SUSTAINABLE PLACES 2023

Daniel Galera, CIRCE

Zaragoza Vivienda · circe Creating together · metro 7 · KOVER SIGLO XXI · abora Advanced Solar Technology · edp · InCUBE sustainable building innovations

InCUBE Project

Agenda

1. Introduction
2. At what point are we?
3. Prefabricated modular façade solution
4. Renowable Energy Sources
    - 4.1. Hybrid solar panels (Hot Water production)
    - 4.2. Energy community (electric self-consumption)

1

INTRODUCTION

InCUBE Project

24 partners of **7 European countries**

3 Demosites

- Italy
- Netherlands
- Spain (Balsas de Ebro viejo,Zgz)

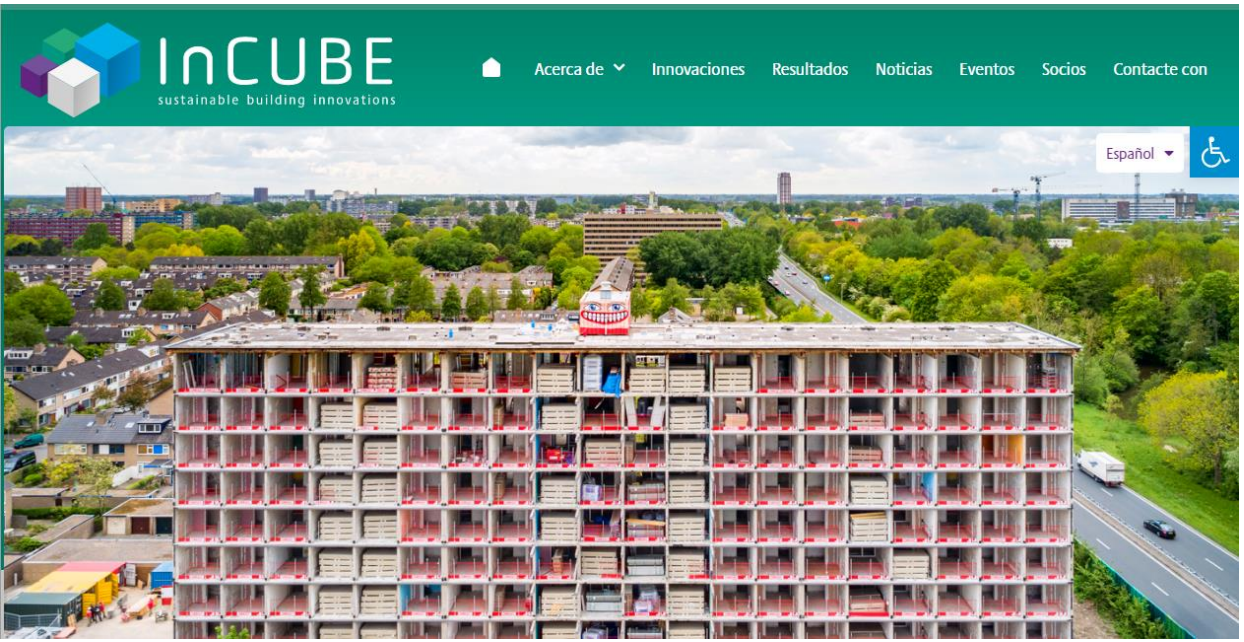
VIDEO INCUBE

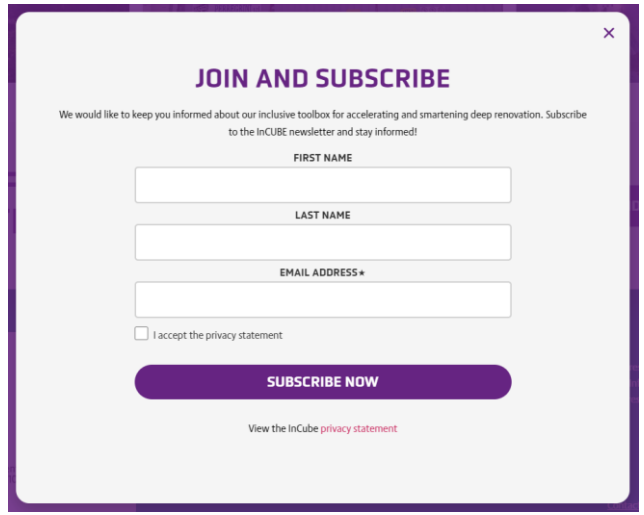
InCUBE Project

These are our social networks and web

WEB INCUBE

https://incubeproject.eu/es/





NEWSLETTER

FOLLOW US!

facebook

LinkedIn

InCUBE Project EU

Zaragoza Vivienda · circe Creating together · metro 7 · KOVER SIGLO XXI · abora Advanced Solar Technology · edp

2

AT WHAT POINT ARE WE?

InCUBE Project

At what point are we?

09/03/23
START-UP MEETING

1. ORDER OF THE TECHNICAL DOCUMENTATION
2. MAKE AGREEMENTS REGARDING THE ELEVATOR SOLUTION
3. TEAMWORK WITH THE FOLLOWING-UP COMMISSION
   - Sharing to advance the project
   - Compilation of documentation for diagnosis of current status and request for P5

Zaragoza Vivienda · circe Creating together · metro 7 · KOVER SIGLO XXI · abora Advanced Solar Technology · edp

Following-Up Commision

Making team

- Two **Following-Up Commisions** made to date

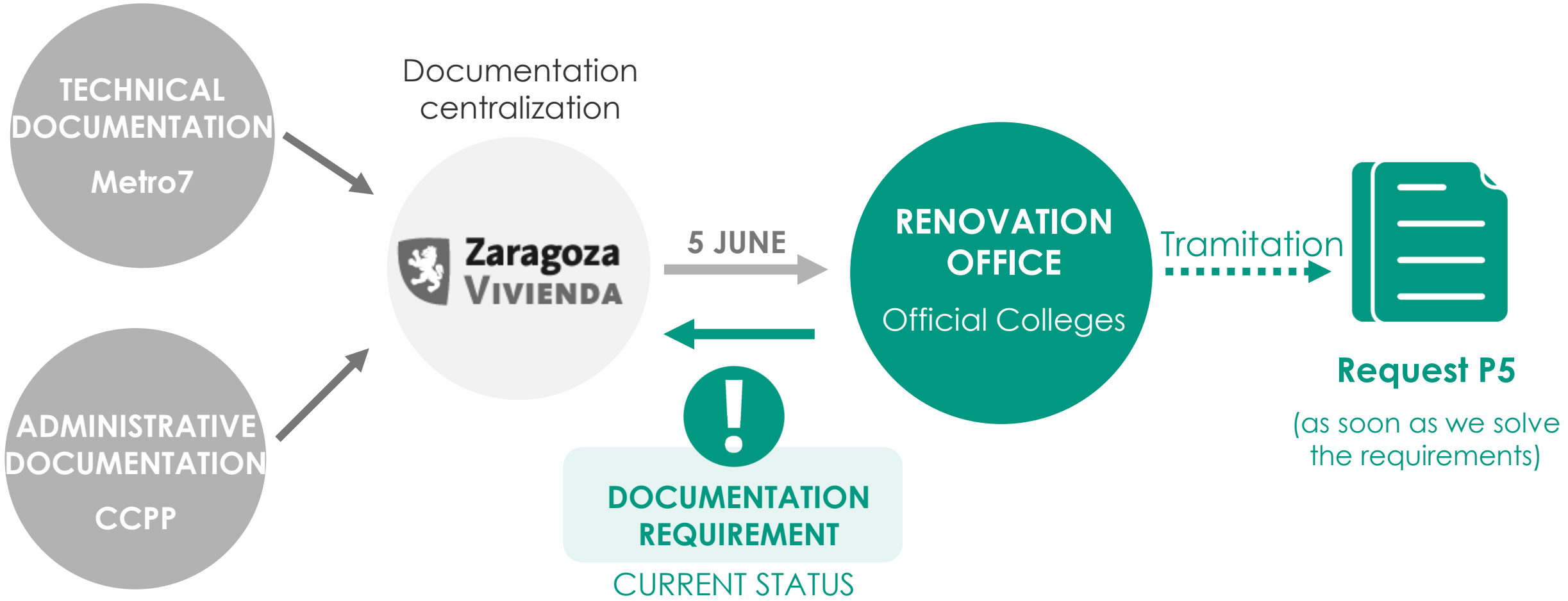
  - **COMISSION 1:** 22 March

  - **COMISSION 2:** 13 April

- **Direct contact** between technics and neighbor representatives (administrators and presidents)
- **Teamwork** for the compilation of documentation and progress in the project

Progress in the Next Generation funds application

Program 5 Application (Building Book and Project)



Progress in the project

Documentation and technical work

- 3D Model
- Energy certificate of the current state
- Reports justifying the **request for P5**
- Rehabilitation proposals: work phase by technical team

Progress in the project

Innovative methodologies

SCANNING

SCANNED VIDEO

DRON FLIGHT

DRON VIDEO

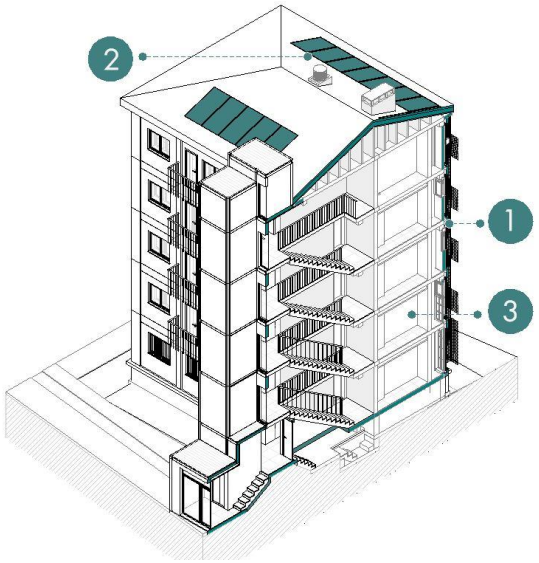
3D MODELLING

The geometry of the building is defined with great precision thanks to the data collected with the scanning and the flight of the drone

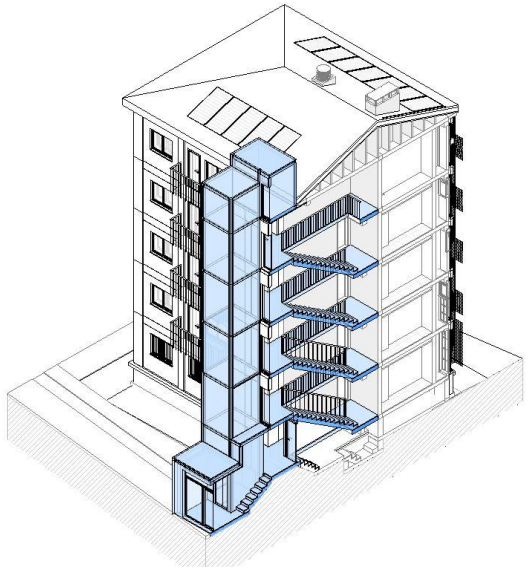
Progress in the project

Rehabilitation proposals on the analysis of the current state

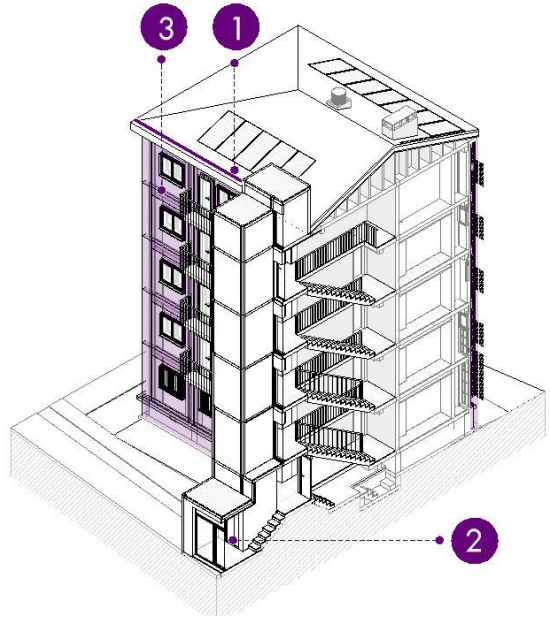
IMPROVEMENT OF ENERGY EFFICIENCY



IMPROVEMENT OF ACCESSIBILITY



CONSERVATION IMPROVEMENT

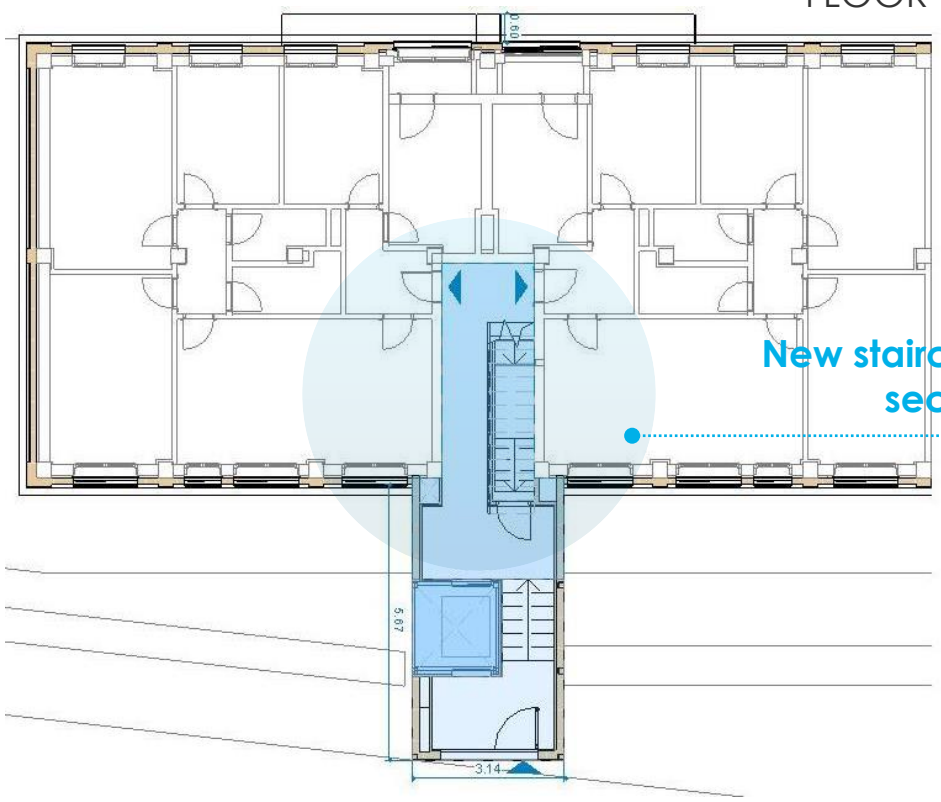


Zaragoza Vivienda · circe Creating together · metro 7 · Xover Siglo XXI · abora Advanced Solar Technology · edp

Progress in the project

Lift detail

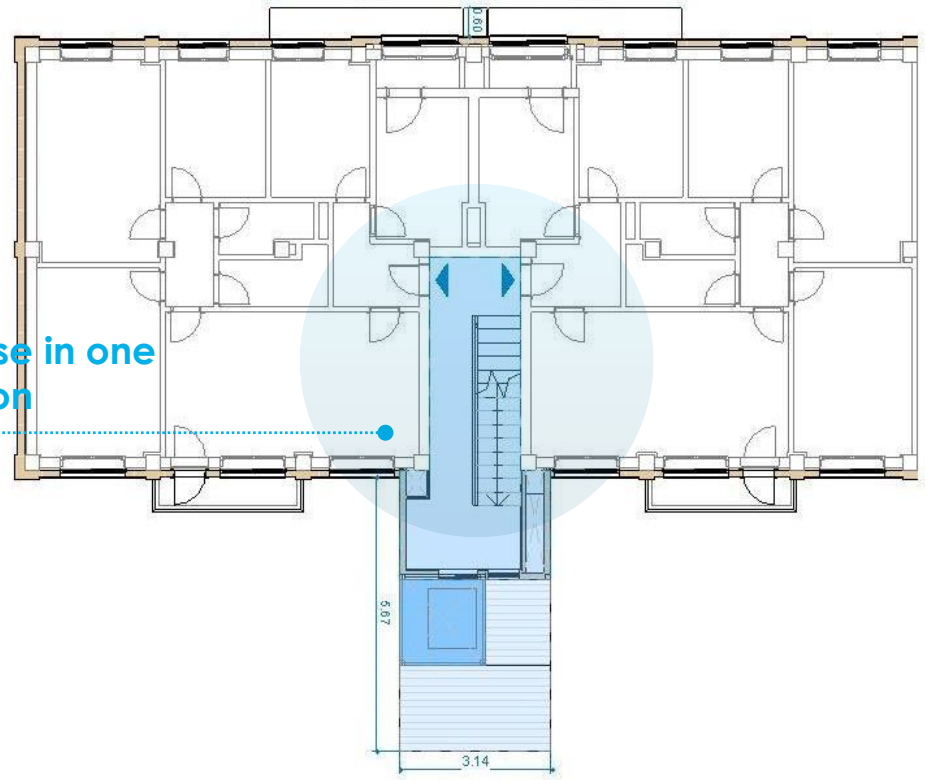
STREET FLOOR

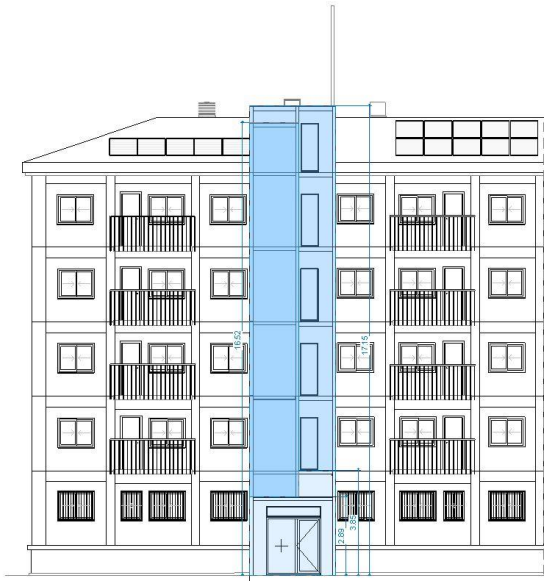


ACCESS FROM THE STREET

New staircase in one section

UPPER FLOORS





VALLE DE OZA FACADE

Progress in the project

Lift detail

Progress in the project

Architectural definition

Integration of community decisions in the project

OPTION A: Elevator

Progress in the project

Architectural definition

Front façade and panel integration

Back façade

Progress in the project

Next steps

JUN 23
Programme 5 Application

JUN 23 – JUL 23
Presentation of the Basic Project to the Zaragoza City Council
Review by the competent municipal areas of the City Council to confirm that everything complies with municipal regulations and that there will be no problems in order to obtain the license

DURING SUMMER
Monitoring
- JUN23. Reception of monitoring sensors
- DURING THE SUMMER. Programming of the sensors
- END OF SUMMER. Installation of sensors in homes (authorization)

END OF SUMMER
Execution project

3

SOLUTION OF MODULAR FACADE PREFABRICATED

Prefabricated modular facade

Specific municipal regulations on the facade

The buildings of Balsas de Ebro Viejo have a specific regulation since they are protected.
There are some aesthetic conditions on the façade that we must comply with:

- Materials
- Preserve the original compositional lines (pillars and slabs)

We are already in contact with the City Council (05/26/23)

Prefabricated modular facade

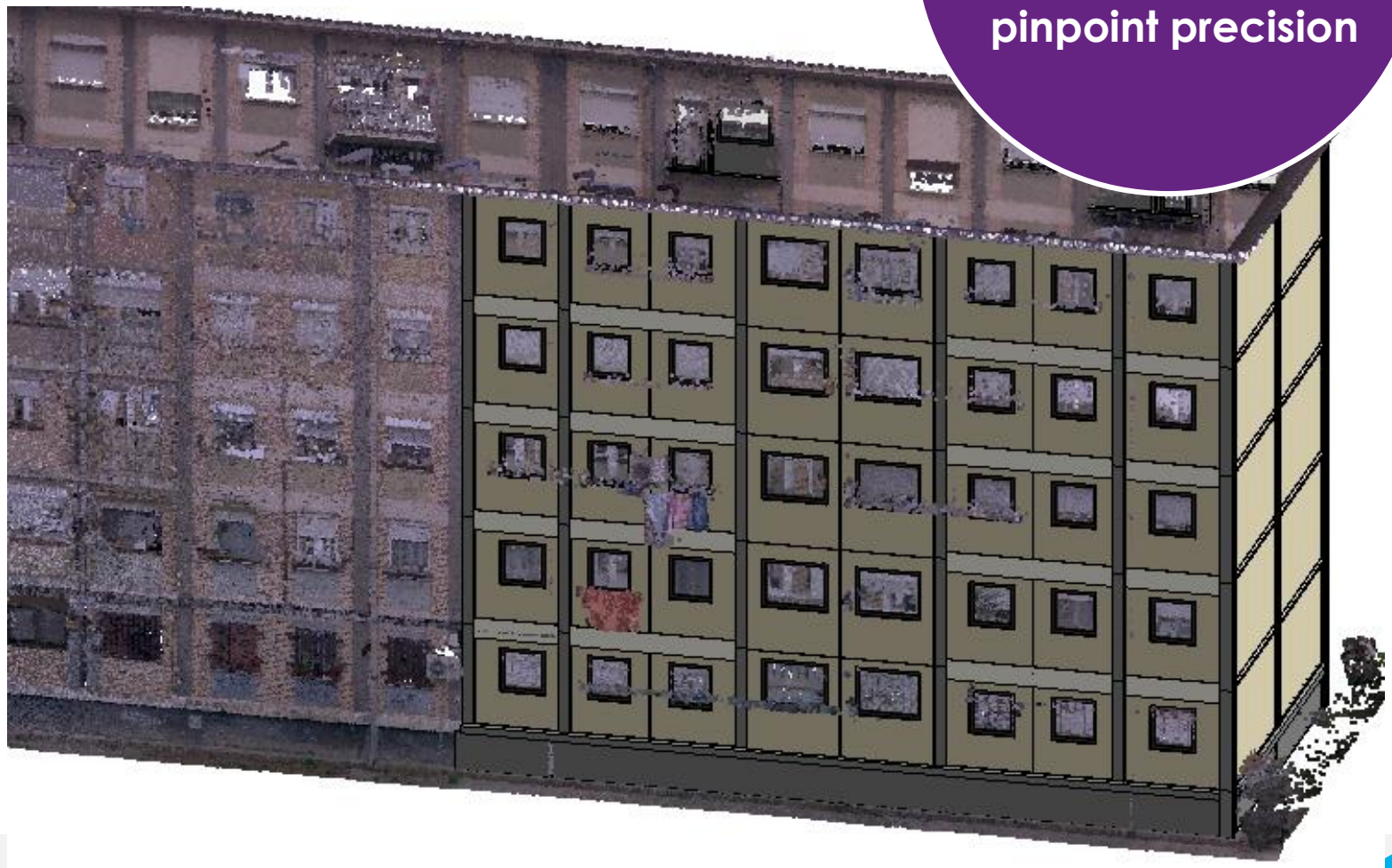
Definition and typification of the modules

23 types of modules
Engineered with pinpoint precision

Thanks to 3D scanning and modeling, we have a very precise knowledge of the current façade, which allows us to:

1. Divide the facade into modules

2. Classify them into "types" of modules that are the same in order to industrialize them



Zaragoza Vivienda · circe Creating together · metro 7 · KOVER Siglo XXI · abora Advanced Solar Technology · edp

Prefabricated modular facade

Module prototype design

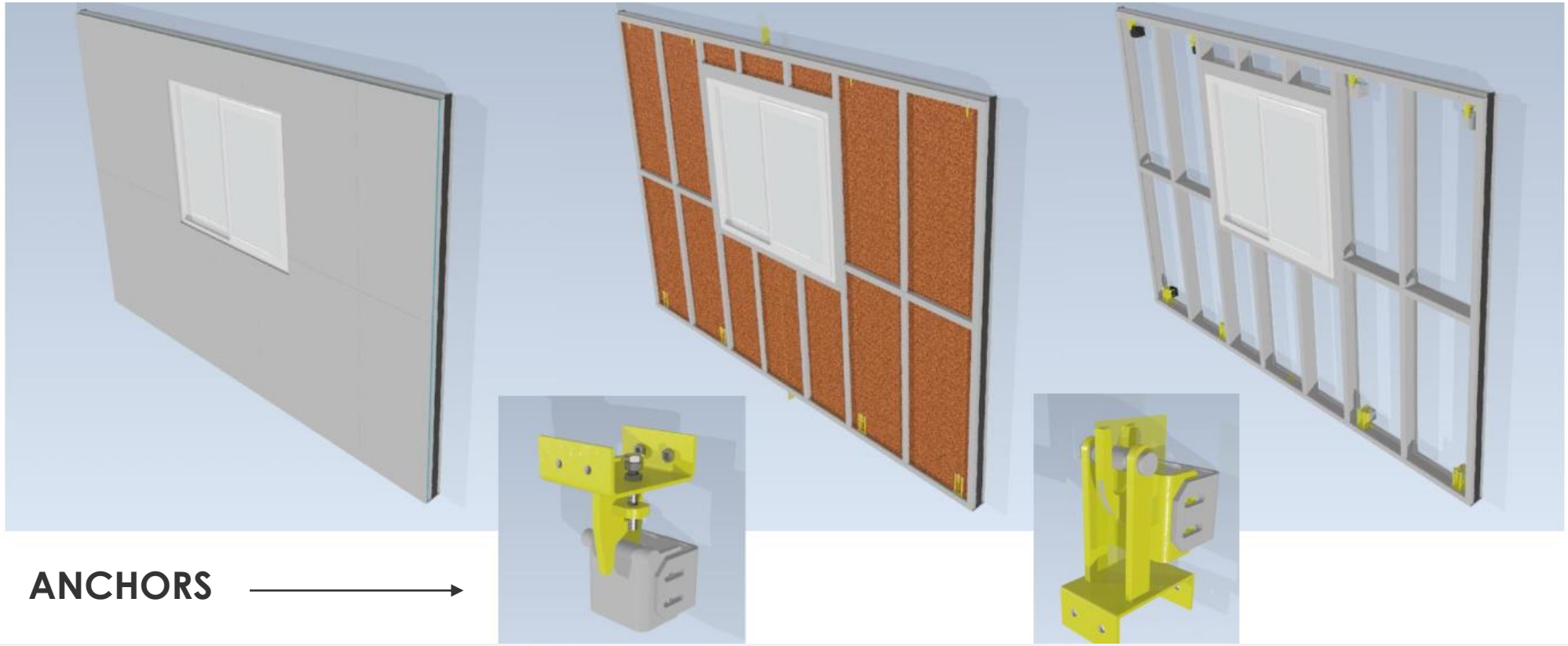
FINISHING
Municipal regulations

+

INSULATION
Best quality

+

SUPPORTING STRUCTURE
Metal frame



ANCHORS →

Prefabricated modular facade

Prototype development

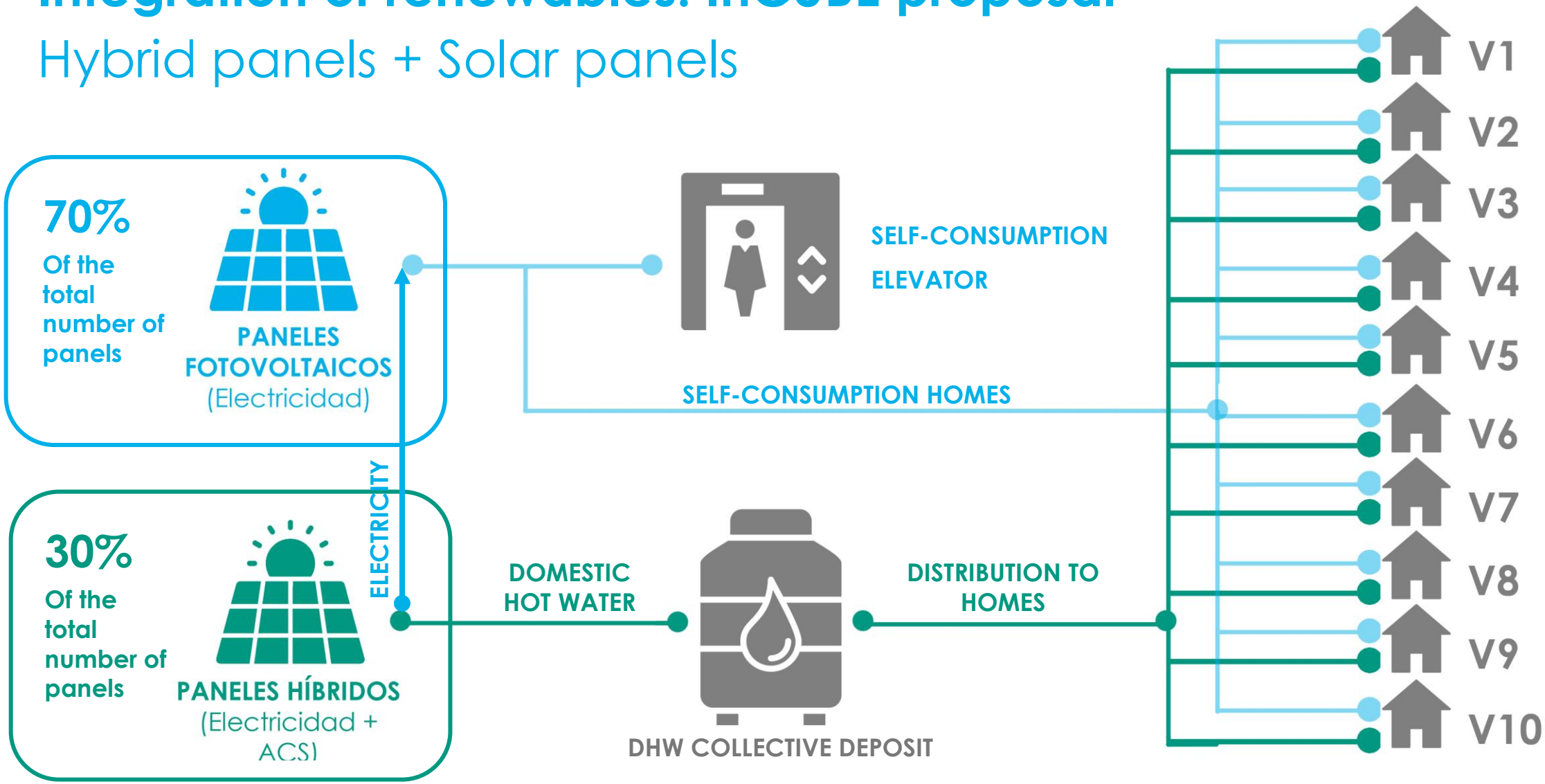
We are already working with the first prototype in the workshop

4

RENEWABLE ENERGY SOLUTIONS

Integration of renewables: InCUBE proposal

Hybrid panels + Solar panels



4.1.

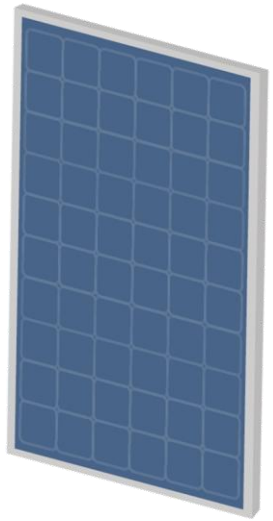
Hybrid solar panels

(electricity and hot water production)

Hybrid solar panels

Comparison between the different solar technologies

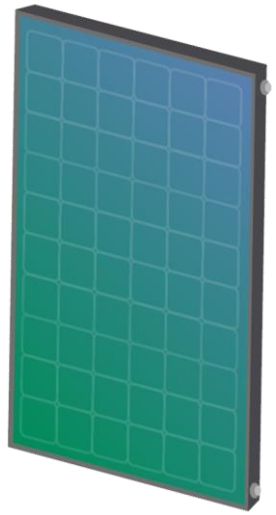
PHOTOVOLTAIC PANEL (PV)



Electricity only

Efficiency = 20%

HYBRID PANEL (PVT)

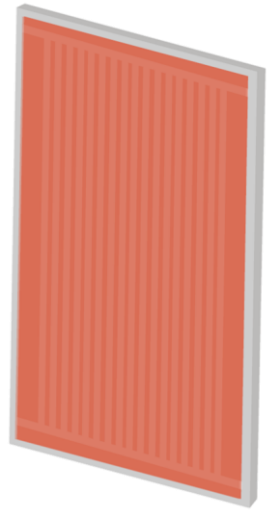


Electricity

Hot water

Efficiency = 89%

THERMAL PANEL (T)



Hot water only

Efficiency = 75%

Zaragoza Vivienda · circe Creating together · metro 7 · Xover Siglo XXI · abora Advanced Solar Technology · edp

Hybrid solar panels

Benefits and features

Double production

89%

Greater efficiency

EPD® THE INTERNATIONAL EPD® SYSTEM

The Solar Keymark CEN Keymark Scheme

Premium quality

MADE IN SPAIN

Made in Spain

Greater savings

CO2

Less CO2 emissions

Zaragoza Vivienda · circe Creating together · metro 7 · Xover Siglo XXI · abora Advanced Solar Technology · edp

Hybrid solar panels

Success stories in neighboring communities


Zaragoza


Zaragoza


Zaragoza


Oviedo


Teruel


Gijón


Gijón

Zaragoza Vivienda · circe Creating together · metro 7 · XOVER Siglo XXI · abora Advanced Solar Technology · edp

Hybrid solar panels

Success stories in Zaragoza

AVENIDA DE LA ALMOZARA – **ZARAGOZA**

Keys to the proper functioning of this technology

1. Good sizing (no surplus)
2. Combination PVT + FV
3. Dissipation system
4. Maintenance
5. **Monitoring (with notices)**
6. Validation

Hybrid solar panels

The importance of monitoring

For the technician who performs maintenance

Temperature and pressure monitoring with warnings

HOW DO WE DEAL WITH THE HIGH TEMPERATURES IN ZARAGOZA?

Temperature alert: If the panels reach 85°C, a warning appears. The maintainer will come to check and purge the installation

Reaction margin and installation safety: Several days of margin to go to review the installation since the warning appears

For the owner, who saves with the installation

Allows you to see and understand production and savings at all times

Zaragoza Vivienda · circe Creating together · metro 7 · KOVER SIGLO XXI · abora Advanced Solar Technology · edp

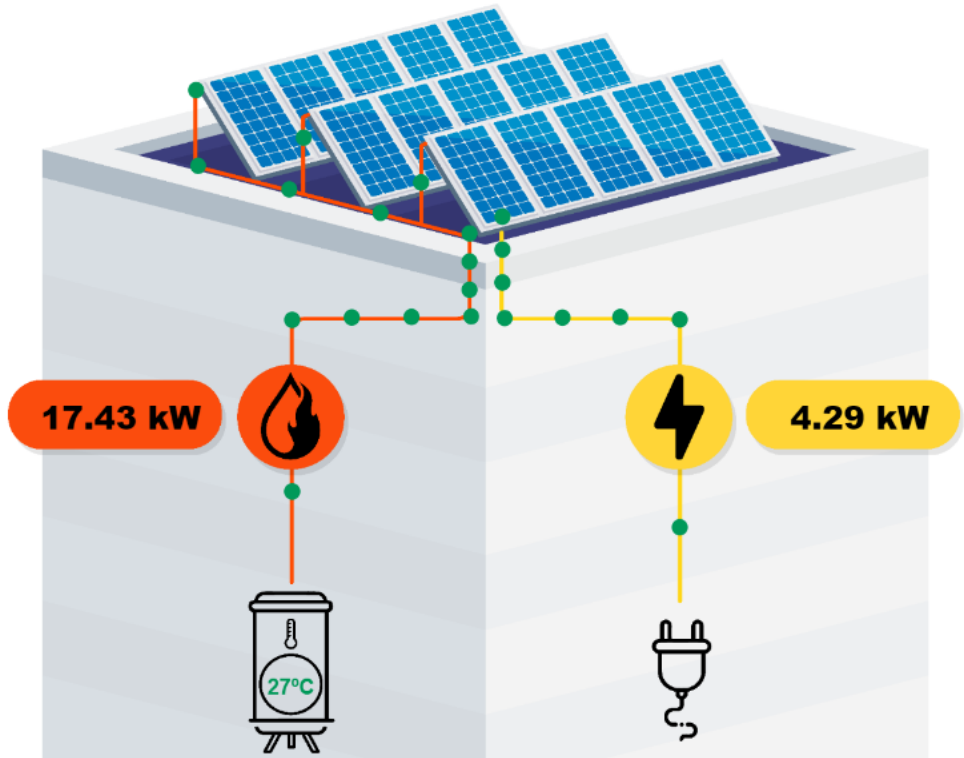
Hybrid solar panels

Monitoring of energy production

Status: Good

11:12

20 °C



aH TECH HYBRID

Avoided emissions
to the atmosphere
239.24 tCO2 / year

Total Production

331.37 MWh / year

196.08 MWh / year

Equivalent in
planted trees
6,295.66 trees / year

Equivalent in
km driven
12,591.33 km / year

Zaragoza Vivienda · circe Creating together · metro 7 · KOVER SIGLO XXI · abora Advanced Solar Technology · edp

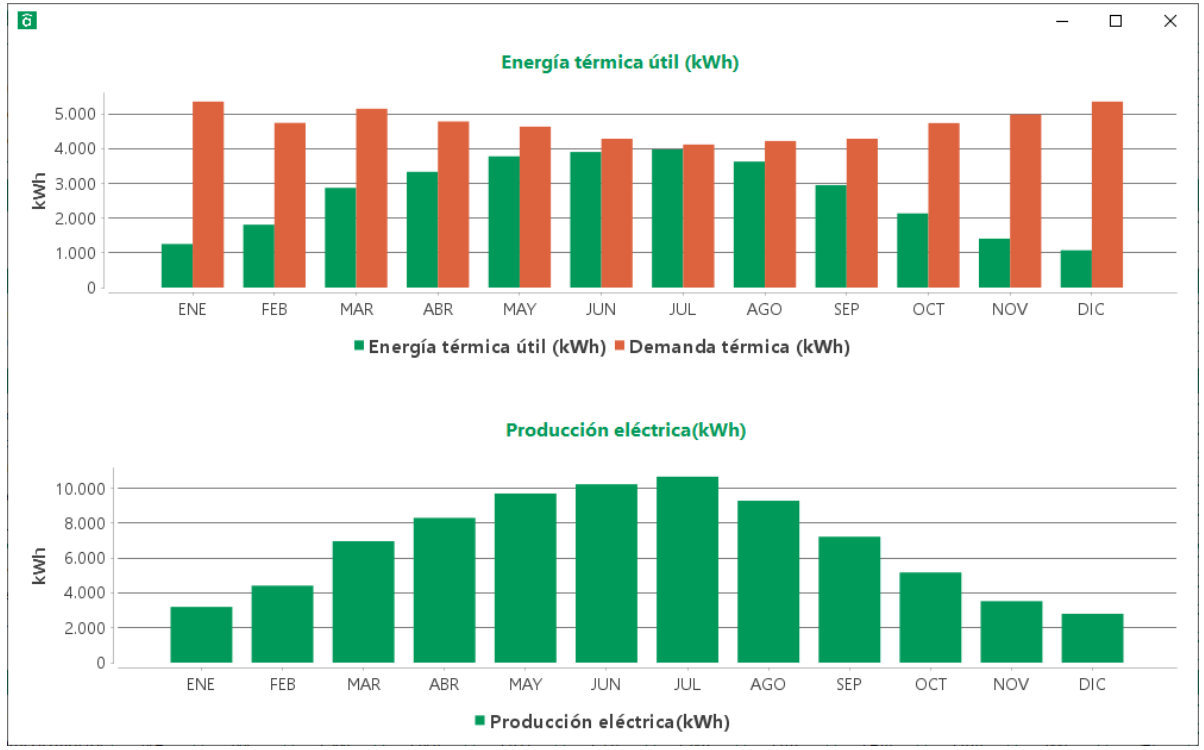
Hybrid solar panels

Monitoring of energy production

Installation of solar panels

Sizing of the Valle de Oza 1-3-5-7 neighborhood

Installation sizing: **40 HYBRID PANELS** + **108 PHOTOVOLTAIC PANELS**



Stimated savings:

Domestic Hot Water: **77%**

Electricity: **59%**

Hybrid solar panels

Maintenance

What maintenance do these panels require?

- **MANDATORY:** Measure temperature every day (by monitoring)

- **RECOMMENDABLE**: Periodically go up to the roof (approx. every 6 months) to carry out **visual inspections** and **cleaning** (pressurized water)

These are maintenance tasks typical of any solar installation, whether they are photovoltaic or hybrid panels.

How much does it cost approximately?

A maintenance cost of €50/home per year is estimated, which would be covered by the savings from the installation itself.

≈4€/home month

4.2.

Energy Community

(electric self-consumption)

Energy Community

The new way of generating and self-consuming energy collectively

An energy community has the objective that the neighboring communities can benefit jointly from a single solar energy generation installation located on their roof adapted to the needs of each one of the neighbors.

Energy Community
Installation elements

1 PHOTOVOLTAIC PANELS

Located on the roof, they collect solar radiation and convert it into energy.

2 INVERTER

Converts solar energy into valid energy for home consumption.

Energy Community

How does solar self-consumption work?

1 ENERGY CAPTURE

Solar panels produce renewable energy during sunny hours

2 SELF-CONSUMPTION OF SOLAR ENERGY

Both in the homes of the neighbors and in the common areas of the building

3 DISPOSAL OF SURPLUS TO THE NETWORK

The energy generated and not consumed will be poured into the network and will be compensated in the electricity bill

4 NETWORK ENERGY CONSUMPTION

During the hours in which the solar installation does not generate energy, if necessary, the electrical network is used

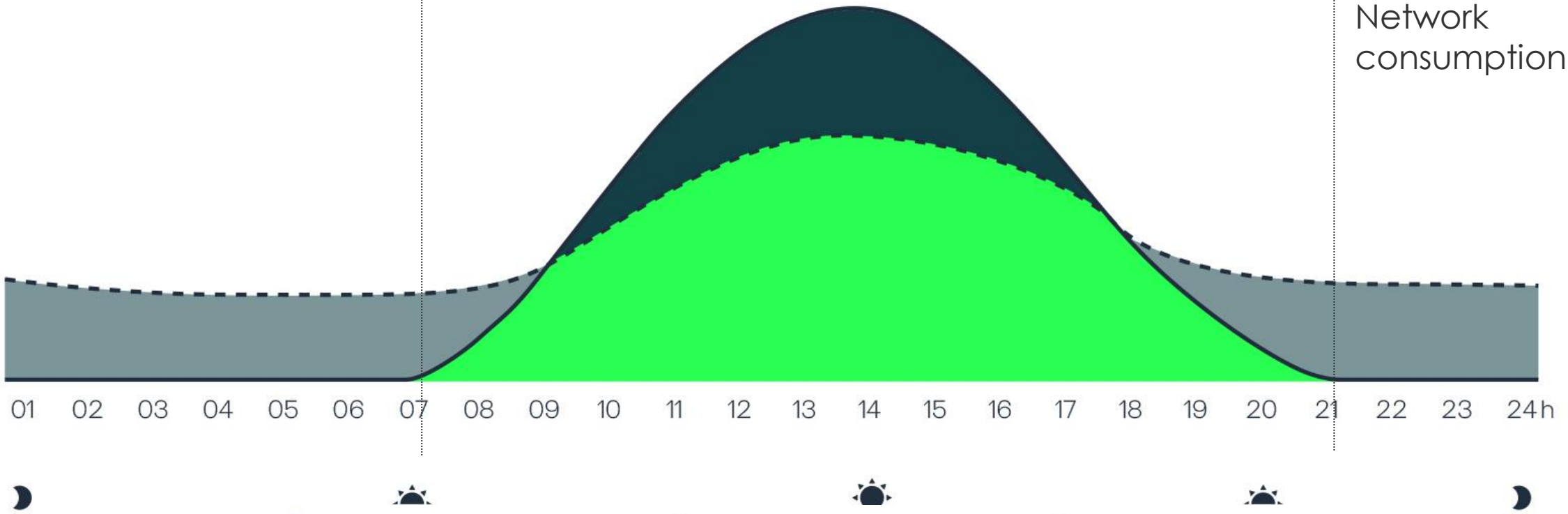
Energy Community

Self-consumption throughout the day

HOURS WITHOUT SUN
Network consumption

HOURS WITH SUN
Self-consumption

HOURS WITHOUT SUN
Network consumption



SELF-CONSUMPTION SOLAR ENERGY

SOLAR ENERGY SURPLUS

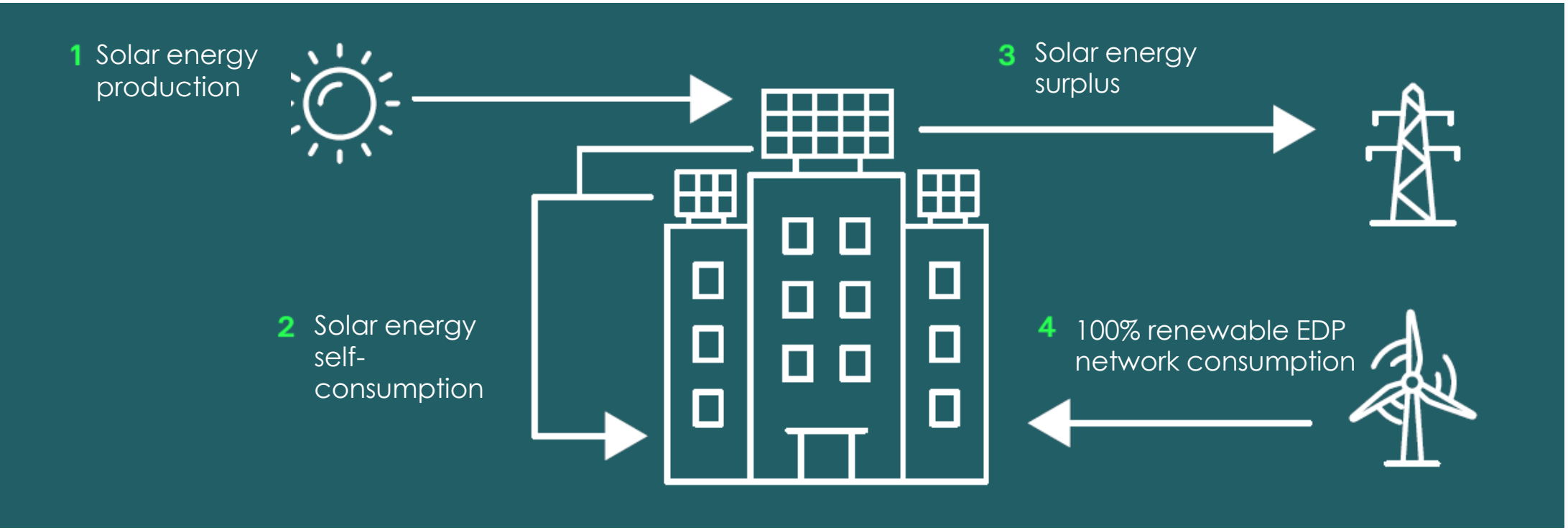
ELECTRICAL NETWORK CONSUMPTION

Zaragoza Vivienda · circe Creating together · metro 7 · KOVER SIGLO XXI · abora Advanced Solar Technology · edp

Energy Community

How does collective self-consumption work?

The energy produced by the solar panels is distributed among the different residents of the same building and its common areas.



Savings on your electricity bill

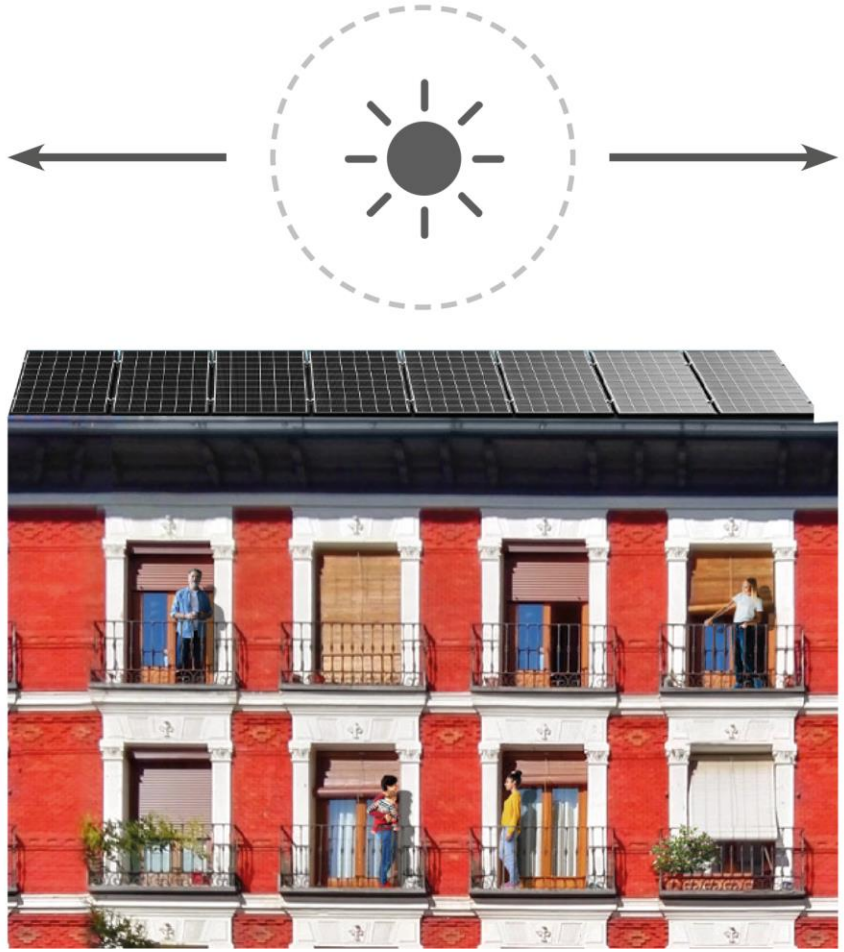
Zaragoza Vivienda · circe Creating together · metro 7 · Kover Siglo XXI · abora Advanced Solar Technology · edp

Energy Community

How is the distribution carried out in the building?

ELEVATOR

Priority will be given to covering the consumption of the new elevator

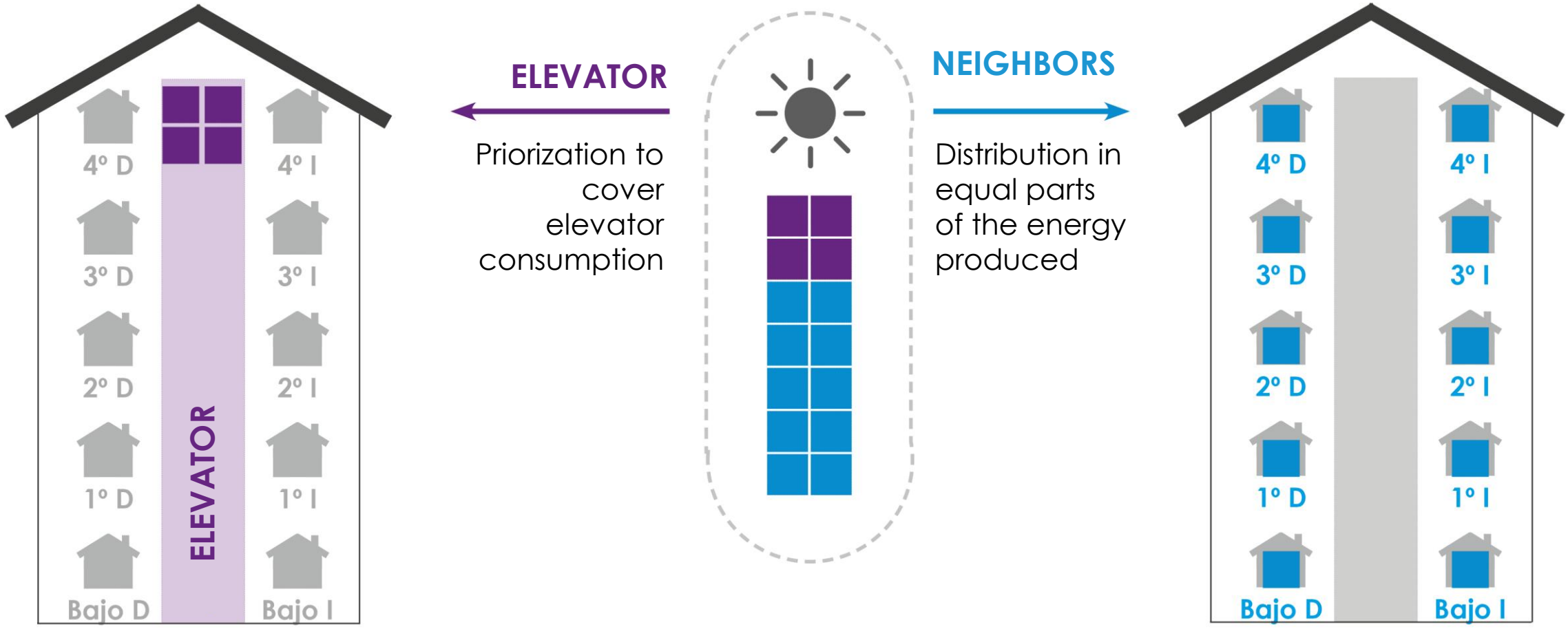


NEIGHBORS DISTRIBUTION

The rest of the energy will be distributed among the houses.

Energy Community

How is the distribution carried out in the building?

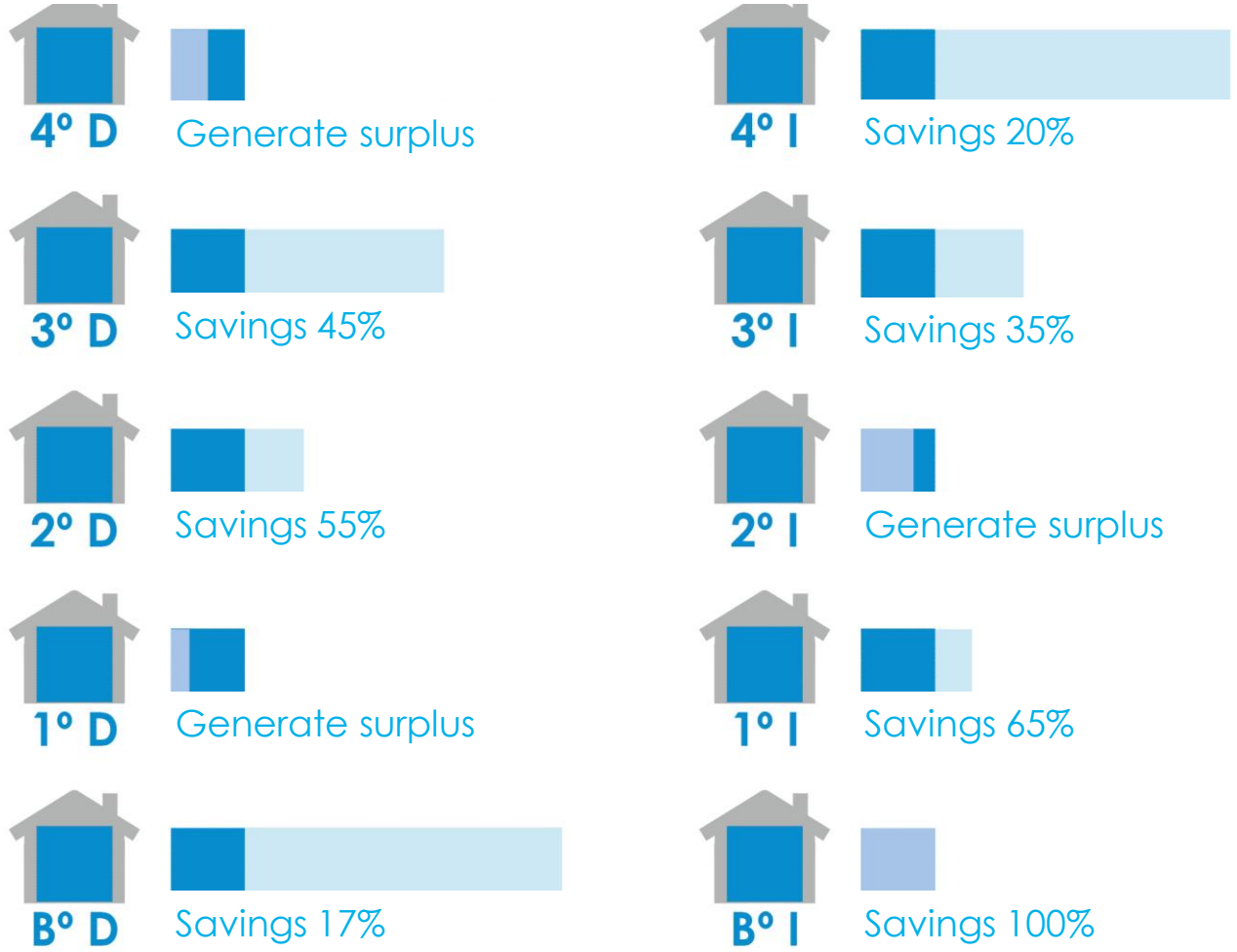


Energy Community

How much electrical energy does each house save?

The savings will be different for each House. It will depend on individual factors of each of them

1. The consumption of each dwelling
2. The individual heating and hot water systems of each home
3. The price at which each home pays for electricity based on its contract



Solar energy

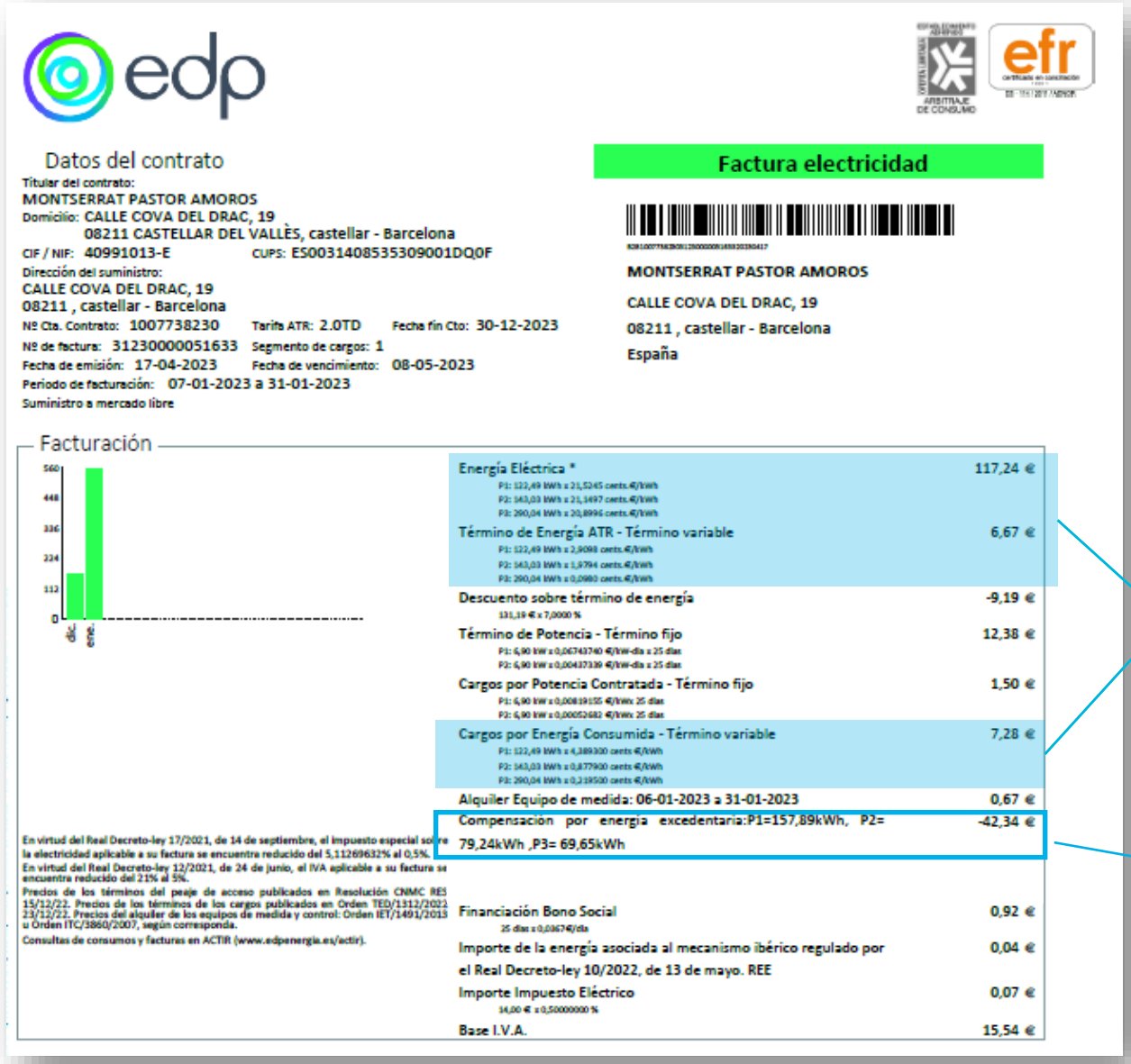
Consumption

Energy Community

Conclusions collective self-consumption

- All homes receive the same contribution of solar energy (equitable distribution among the neighbors)

- The savings will be different for each House. It will depend on individual factors of each of them



Datos del contrato

Titular del contrato:
MONTSERRAT PASTOR AMOROS
Domicilio: CALLE COVA DEL DRAC, 19
08211 CASTELLAR DEL VALLÈS, castellar - Barcelona
CIF / NIF: 40991013-E CUPS: ES0031408535309001DQ0F
Dirección del suministro:
CALLE COVA DEL DRAC, 19
08211 , castellar - Barcelona
Nº Cta. Contrato: 1007738230 Tarifa ATR: 2.0TD Fecha fin Cto: 30-12-2023
Nº de factura: 3123000051633 Segmento de cargos: 1
Fecha de emisión: 17-04-2023 Fecha de vencimiento: 08-05-2023
Periodo de facturación: 07-01-2023 a 31-01-2023
Suministro a mercado libre

Factura electricidad

MONTSERRAT PASTOR AMOROS
CALLE COVA DEL DRAC, 19
08211 , castellar - Barcelona
España

Facturación

Energía Eléctrica *	117,24 €
Término de Energía ATR - Término variable	6,67 €
Descuento sobre término de energía	-9,19 €
Término de Potencia - Término fijo	12,38 €
Cargos por Potencia Contratada - Término fijo	1,50 €
Cargos por Energía Consumida - Término variable	7,28 €
Alquiler Equipo de medida: 06-01-2023 a 31-01-2023	0,67 €
Compensación por energía excedentaria:P1=157,89kWh, P2= 79,24kWh ,P3= 69,65kWh	-42,34 €
Financiación Bono Social	0,92 €
Importe de la energía asociada al mecanismo ibérico regulado por el Real Decreto-ley 10/2022, de 13 de mayo. REE	0,04 €
Importe Impuesto Eléctrico	0,07 €
Base I.V.A.	15,54 €

En virtud del Real Decreto-ley 17/2021, de 14 de septiembre, el impuesto especial sobre la electricidad aplicable a su factura se encuentra reducido del 5,11269632% al 0,5%.
En virtud del Real Decreto-ley 12/2021, de 24 de junio, el IVA aplicable a su factura se encuentra reducido del 21% al 5%.
Precios de los términos del peaje de acceso publicados en Resolución CNMC RES 15/12/22. Precios de los términos de los cargos publicados en Orden TED/1312/2022 23/12/22. Precios del alquiler de los equipos de medida y control: Orden IET/1491/2013 u Orden ITC/3860/2007, según corresponda.
Consultas de consumos y facturas en ACTIR (www.edpenergia.es/actir).

Energy Community

How are the savings reflected on my electricity bill?

The savings from the community's self-consumption installation are reflected in two concepts:

1. **LESS ENERGY CONSUMPTION**
   Because we self-consume the energy we generate

2. **SURPLUS SAVINGS**
   It is financially compensated in the bill

Energy Community

What would the installation process be like?

- To carry out the installation it is necessary to have the necessary administrative permits, including the building license from the City Council.
- The installation of the panels will be carried out during the rehabilitation work

From start to finish: **the InCUBE technical team takes care of everything**

1. Approval by the neighborhood community
2. Signing of contracts
3. Administrative procedure
4. Installation of solar panels
5. Commissioning and legalization
6. You already consume your own energy!

Energy Community

FQA

What is the difference between an installation in a single-family home and a collective self-consumption?

The fundamental difference is that in a single-family home, a small work will have to be carried out, while the collective photovoltaic installation does not require any type of work inside the neighbors' homes. After a technical visit and personalized study of the building, the installation is carried out so that you can begin to enjoy your own renewable energy in the community of neighbors.

Do I need to carry out any administrative procedure to start the installation?

Yes, but you don't have to worry about anything, we take care of all the processing at EDP

Will all the neighbors have the same savings?

No, the savings will depend on how much energy each neighbor consumes and when they do so.

Neighbors who currently have a higher energy consumption will notice the savings more. In addition, those neighbors who concentrate their consumption in the central hours of the day (when the solar installation has the highest production) will have higher savings than their neighbors whose consumption habits are located at the first and last hour of the day.

Zaragoza Vivienda · circe Creating together · metro 7 · Xover Siglo XXI · abora Advanced Solar Technology · edp

Energy Community

FQA

Will you compensate me for the energy produced that is not self-consumed (surplus)?

Yes, if the solar installation produces more energy than you consume in your home, it will be fed into the network and you will receive compensation for it. This compensation will translate into savings on your bill.

Is it necessary to change the electricity bill to another supplier?

No, you can participate without having to change the company or the rate. By participating in the solar community, the solar energy that corresponds to you will be sent to your retailer so that it deducts it from your consumption of the network.

InCUBE

sustainable building innovations

Zaragoza Vivienda

circe Creating together

metro 7

Xover Siglo XXI

abora Advanced Solar Technology

edp