ACE Policy Seminar – EUSEW 2026
Thursday 11 June 2026

Architecture for Europe's Housing Future

ace-cae.eu

Welcome

Daniel FÜGENSCHUH

ACE President

With the support of

Co-funded by
the European Union

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SUSTAINABLE
ENERGY WEEK

Introduction

Greta TRESSERRA

Co-Chair of the ACE Sustainable Architecture Work Group

Case studies presentations

01

Case studies presentations

Luca VOLPI
Societat Organica, presentation of the WikiHousing Barcelona project

Mellis HAWARD
Director at Archio Ltd

Niki GAITANI
Associate Professor at the Dept. of Architecture and Technology, Norwegian University of Science and Technology (NTNU)

Lorenzo PAGLIANO
Professor at Politecnico di Milano, representative of the UN Environment Programme (UNEP)

societat orgànica

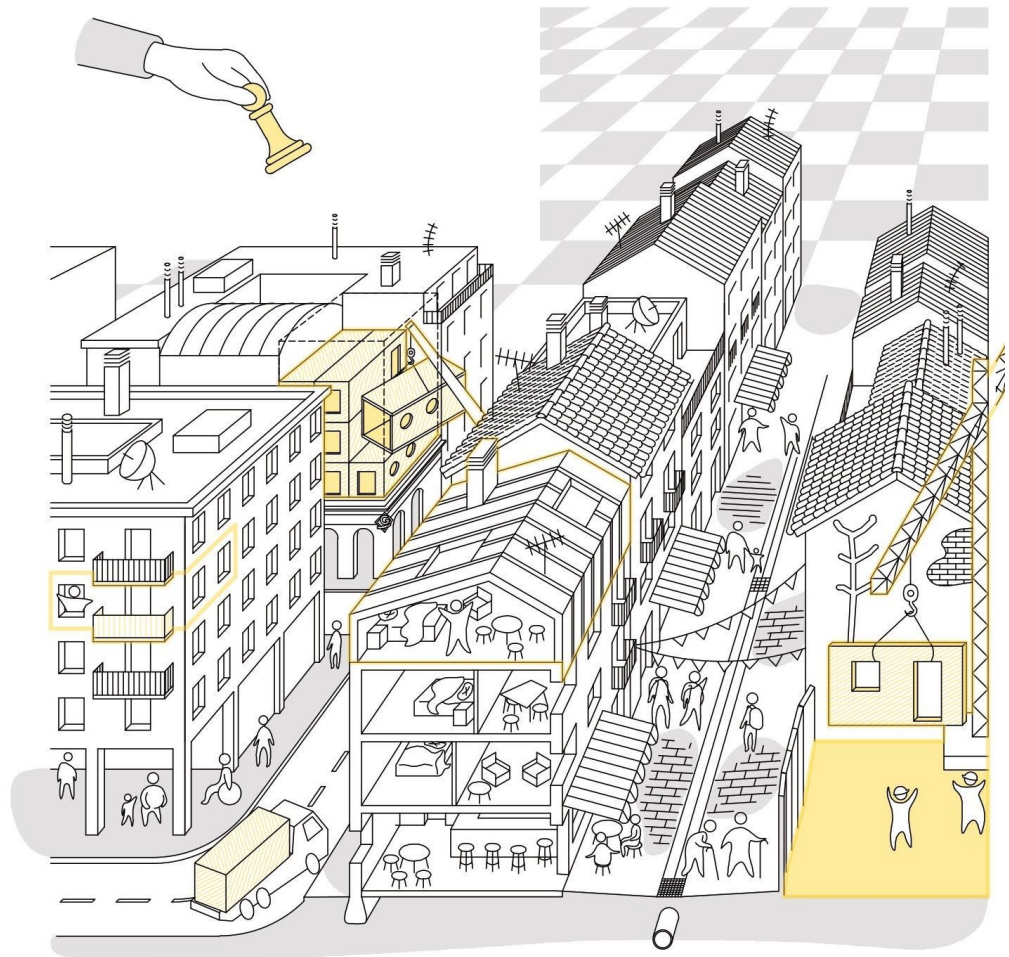
WikiHousing Barcelona

Achieving

fast, sustainable, and

inclusive

affordable housing

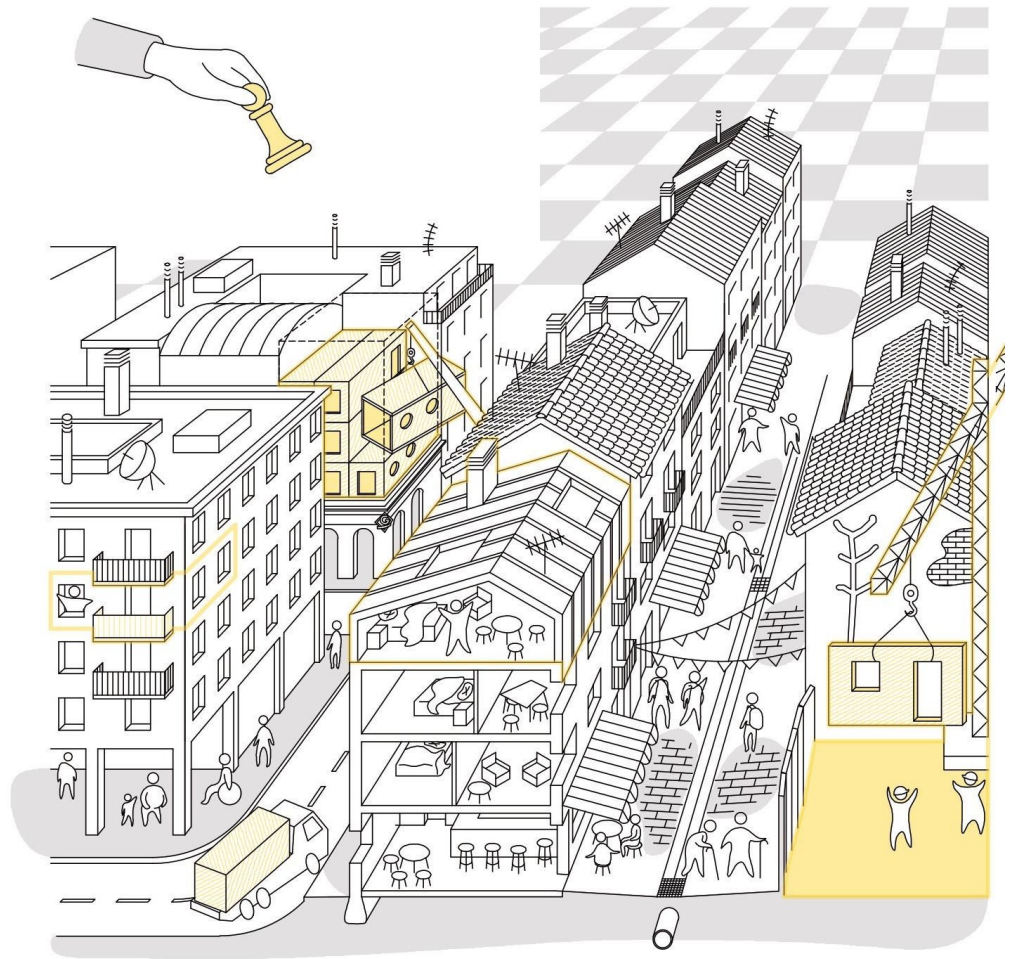


societat orgànica

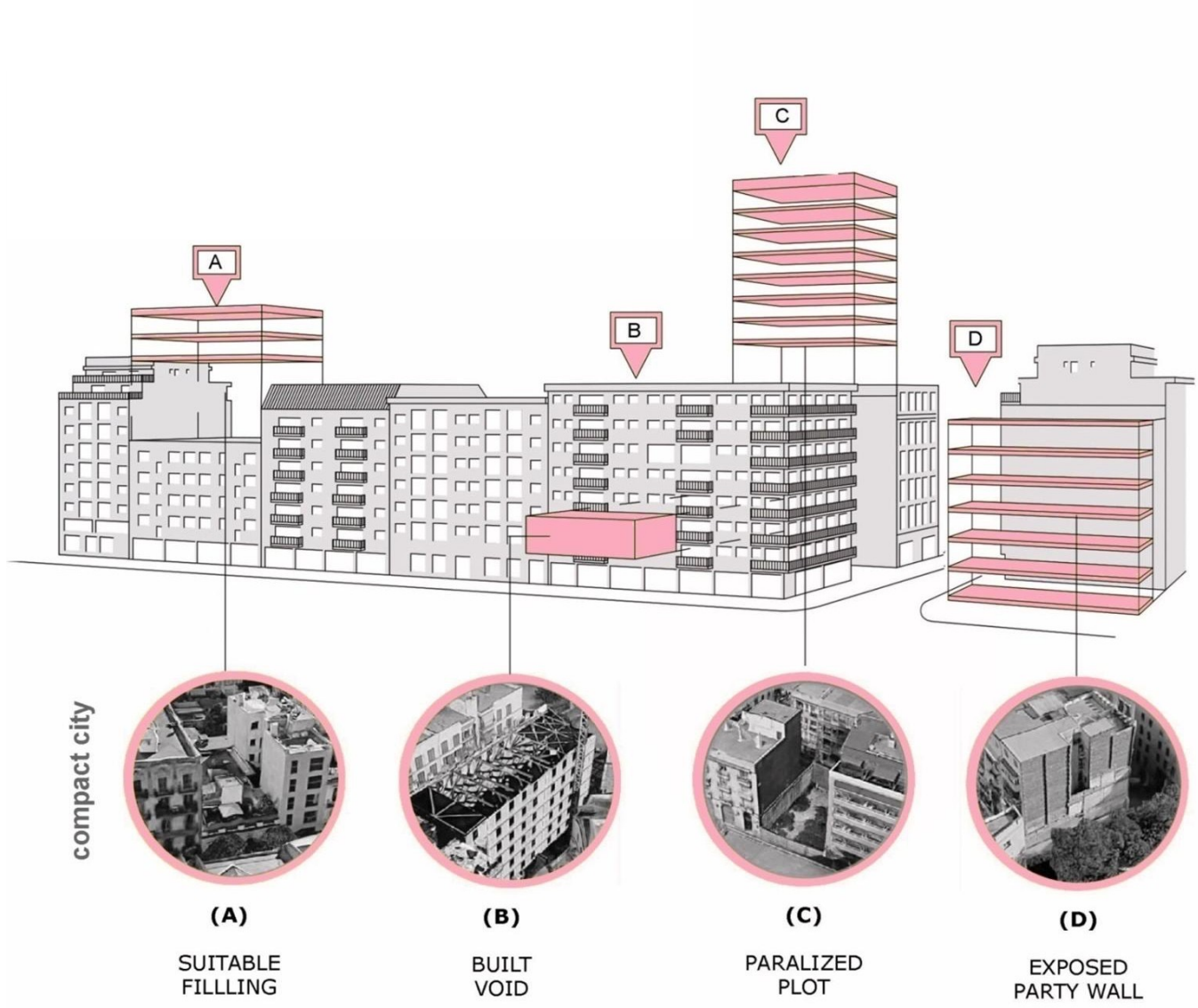
Participation
Upskilling
Re-industrialisation

WikiHousing Barcelona

Achieving
fast, sustainable, and
inclusive
affordable housing



Urban dimension


A
B
C
D
compact city
(A)
SUITABLE
FILLLING
(B)
BUILT
VOID
(C)
PARALIZED
PLOT
(D)
EXPOSED
PARTY WALL

Aquest primer escombratge es fa amb una mirada amplia i imaginativa per tal de no menysprear cap de les possibilitats que puguin haver-hi al districte, que com ja sabem és un teixit molt compacte i amb pocs racons urbans sense edificar.

CASOS ESTUDIATS EN NIVELL PRELIMINAR

GÒTIC SUD
01-Passatge de la Pau 5. Pàrquing.
02-Passatge de la Pau 12. Pàrquing.
03-Carrer Josep Pijoan 7b.
04-Passatge de la Banca 6. Pàrquing.

RAVAL SUD
05-Carrer Marquès de Barberà 16. Pàrquing.
06-Carrer Riereta 24b. Antiga fàbrica de guatas.
07-Carrer Riereta 34.
08-Carrer Carretes 45. Pàrquing.
09-Carrer Aurora 18. Pàrquing.
10-Av. Drassanes 14. Escola oficial d'idiomes.
11-Carrer Santa Mònica 3

CASOS ESTUDIATS EN NIVELL INTERMEDI

GÒTIC SUD
12-Carrer d'en Carabassa 8bis.

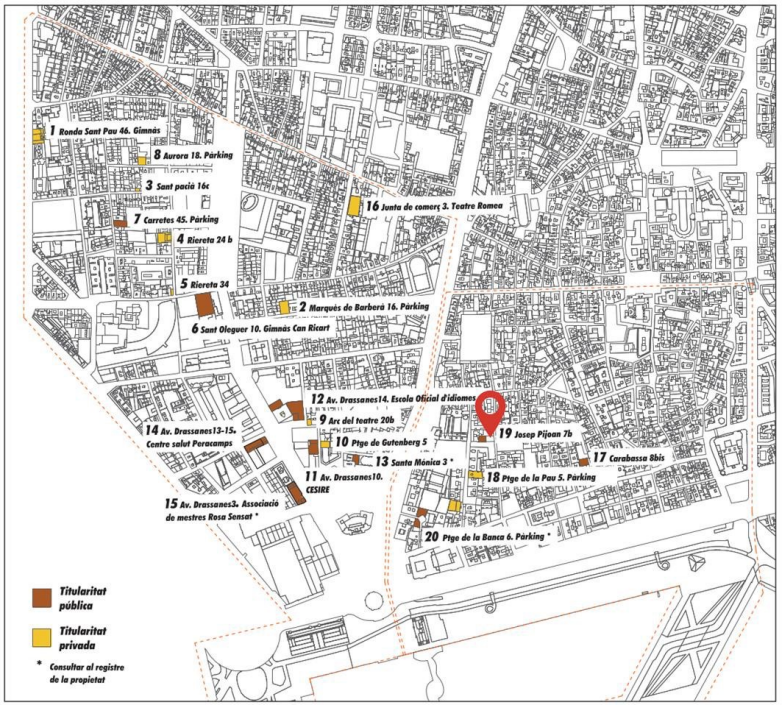
RAVAL SUD
13-Passatge de Guttenberg 5.
14-Av. Drassanes 13-15. Centre Salut Peracamps.
15-Av. de les Drassanes 3. Associació de Mestre Rosa Sensat.
16-Ronda Sant Pau 46. Gimnàs Sant Pau.

CASOS ESTUDIATS EN NIVELL AVANÇAT

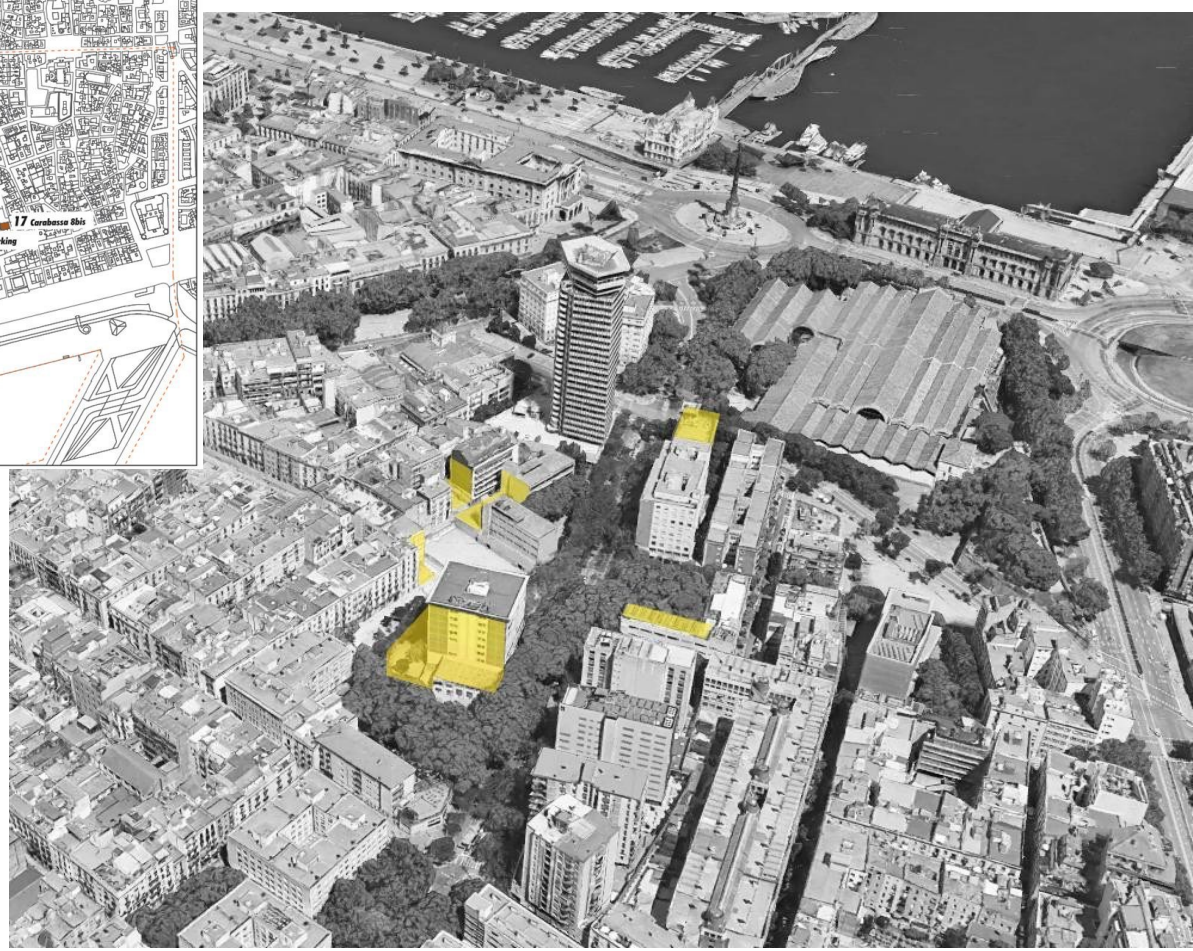
RAVAL SUD
17-Carrer Sant Pacià 16c.
18-Carrer Arc del Teatre 20b.
19-Av. Drassanes 10. Escola d'adults CESIRE.

CASOS DESESTIMATS

20-Solar al carrer de la Junta de Comerç 3. Teatre Romea.
21-Gimnàs Can Ricart

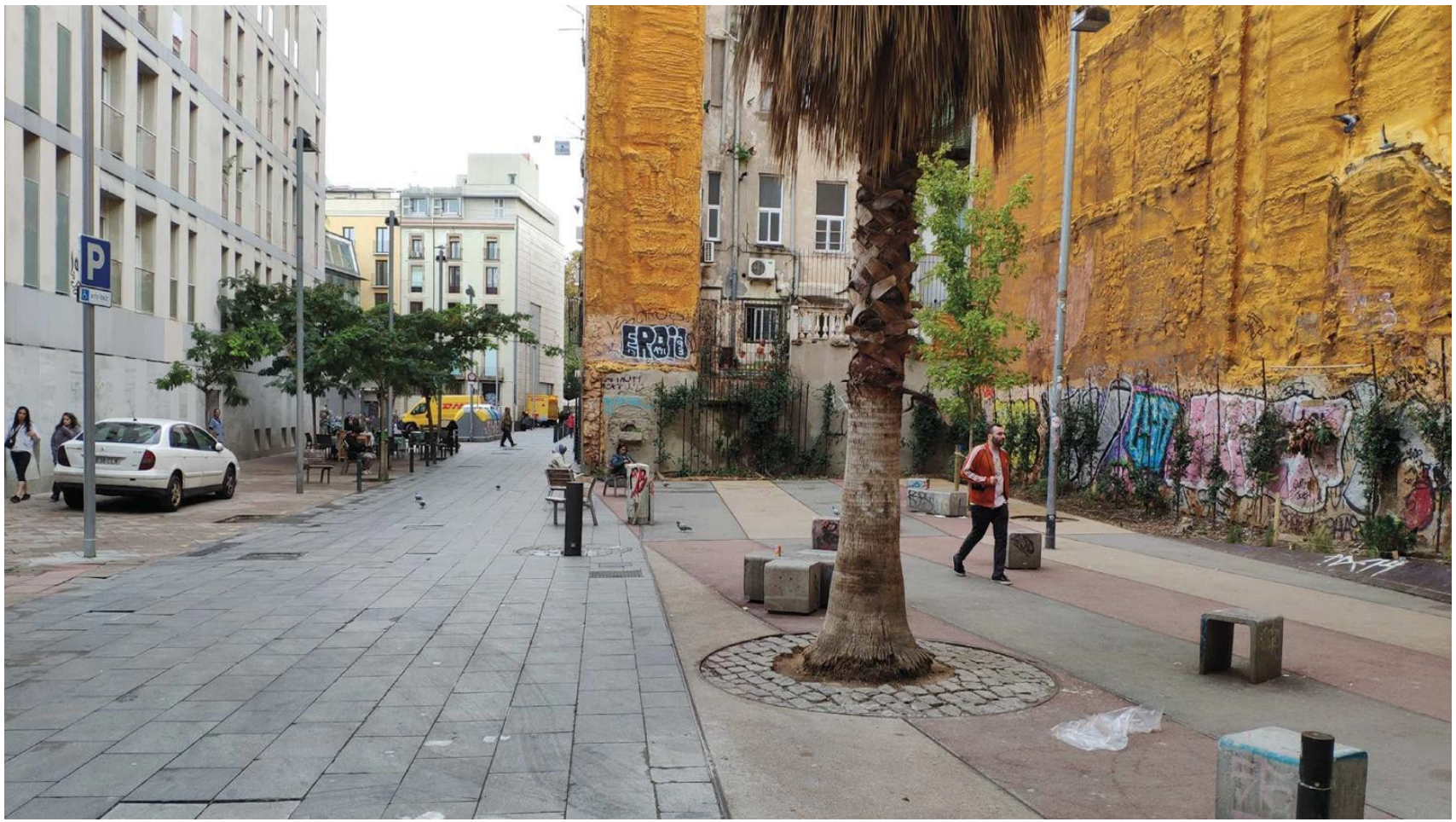


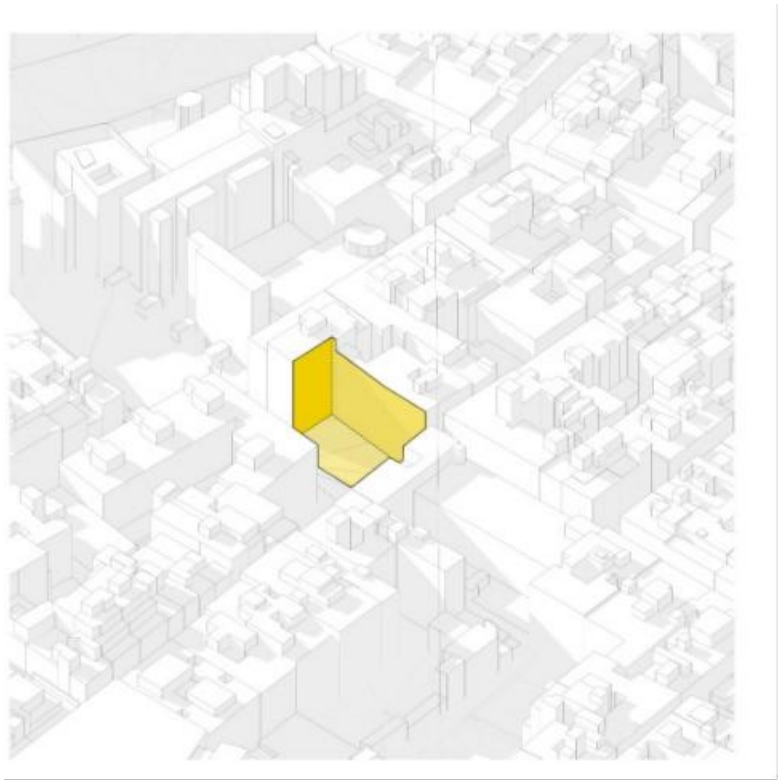
Espais d'oportunitat en Avinguda Drassanes (BCN)

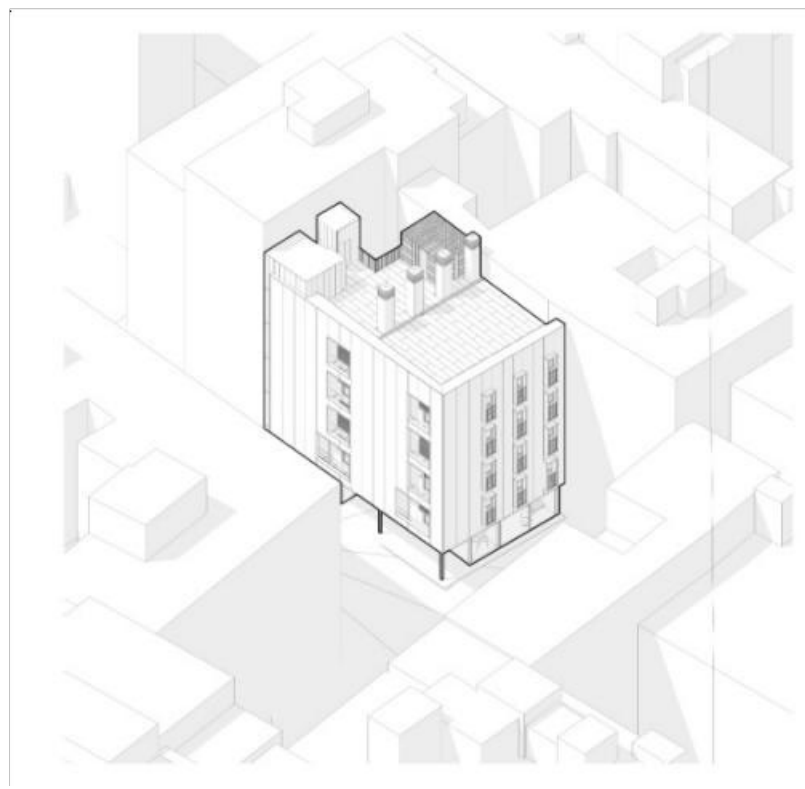


Precedent:
emergency
housing

aprop ciutat vella





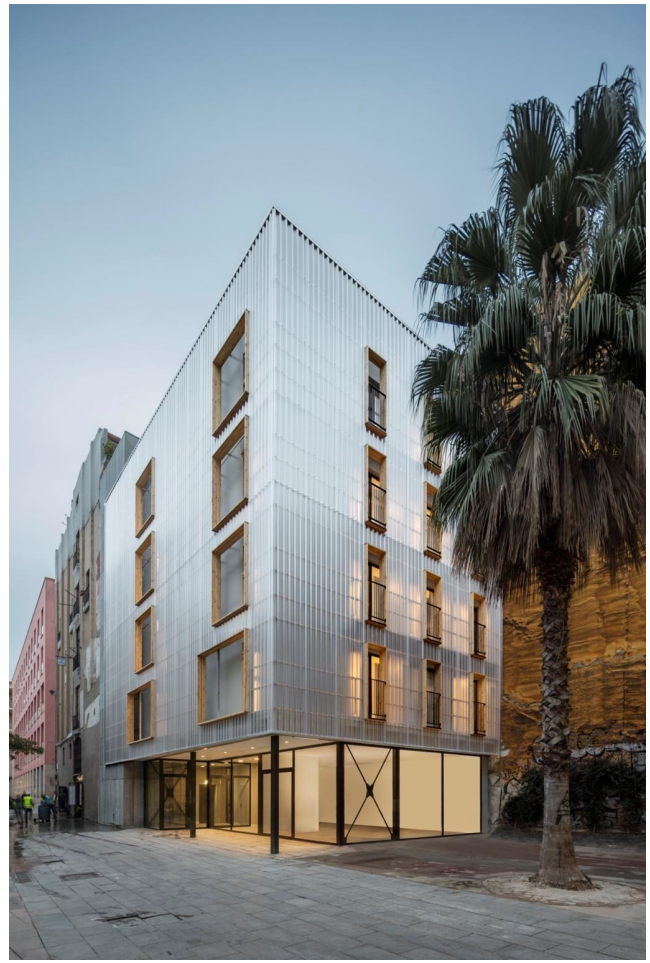


▲ People walk by the construction site of the first building built with shipping containers in Barcelona. Photograph: Pau Barrena/AFP/Getty Images

Just a stone's throw from La Rambla, the Spanish city is building 12 shipping container flats to help tackle its social housing crisis

Barcelona has begun installing its first shipping container homes just a

Most viewed




un reportatge de: Francis Manzano i André Roseira


La raça de la gossa era un impediment per accedir al pis, però finalment li van permetre entrar-hi amb ella


Fa un any de l'entrada dels primers inquilins als pisos fets en contenidors

laSexta

EN DIRECTO PROGRAMACIÓN atresplayer

ESPAÑA DEPORTES INTERNACIONAL CIENCIA Y TECNOLOGÍA CULTURA SERIES SOCIEDAD ECONOMÍA BIENESTAR TIEMPO CÓMO PROGRAMAS MENÚ

ECONOMÍA Declaración de la renta Salarios Pensiones Precio de la luz OCU Bolsa Ibex 35

Drama juvenil

En casa hasta después de los 30: España registra la edad de emancipación más alta de los últimos 20 años

Cada vez se retrasa más la edad con la que salen de casa de sus padres. Ahora de media lo hacen al superar los 30 años y es la primera vez que se pasa esa edad.

Seleccione: ESPAÑA

SUSCRÍBETE INICIAR SESIÓN

EL PAÍS

Sociedad

EDUCACIÓN · MEDIO AMBIENTE · IGUALDAD · SANIDAD · CONSUMO · LAICISMO · COMUNICACIÓN · ÚLTIMAS NOTICIAS

URGENTE La activista iraní Narges Mohammadi, Premio Nobel de la Paz 2023

JÓVENES >

E Los jóvenes no pueden irse de casa: la edad media de emancipación supera por primera vez los 30 años

La pérdida de poder adquisitivo y la subida ininterrumpida de los precios de la vivienda dificultan la independencia, a la que solo accede el 15,9%, la mitad que en la media de la UE

12 Nov 2021

WikiHousing Barcelona guanya la convocatòria de La ciutat proactiva 2021

Ajuntament de Barcelona bithabitat

An initiative by

straddle3 · societat orgànica · IDRA

Plot and funding

Barcelona

Additional funding

holaluz

With the support of

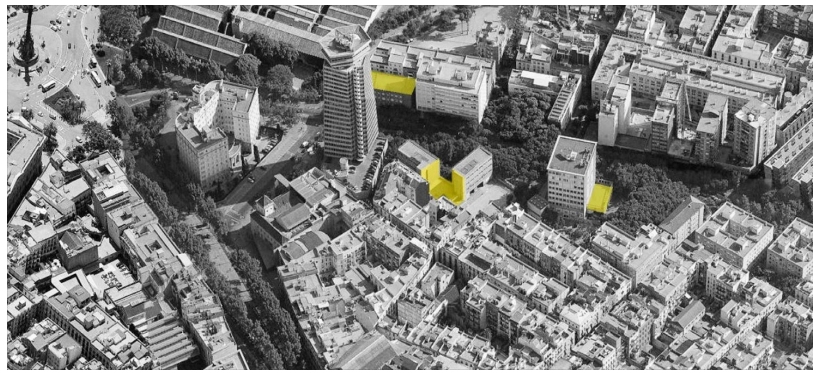
Amb el suport de:

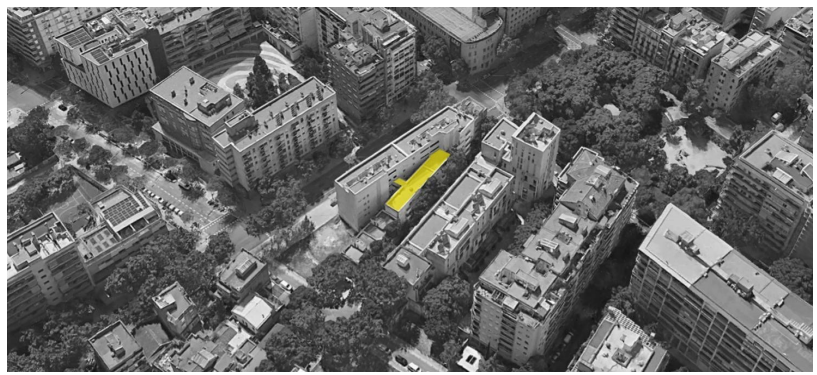
TECHNAL By Hydro · tallfusta s.l. · ARISTON Hogar del confort sostenible · treehood · Roca · ACO · REMOSA

TANCAMENTS · RIOU. VIDRESIF · ROSA GRES · CATALONIA CERAMIC · fermacell · MAUSA

En col·laboració amb:

ANTONOMASIA > COMMUNICATION FOR SUSTAINABLE ARCHITECTURE · COAC · impulsem · LA PAPIRO · bithabitat Centre d'Innovació Urbana de Barcelona



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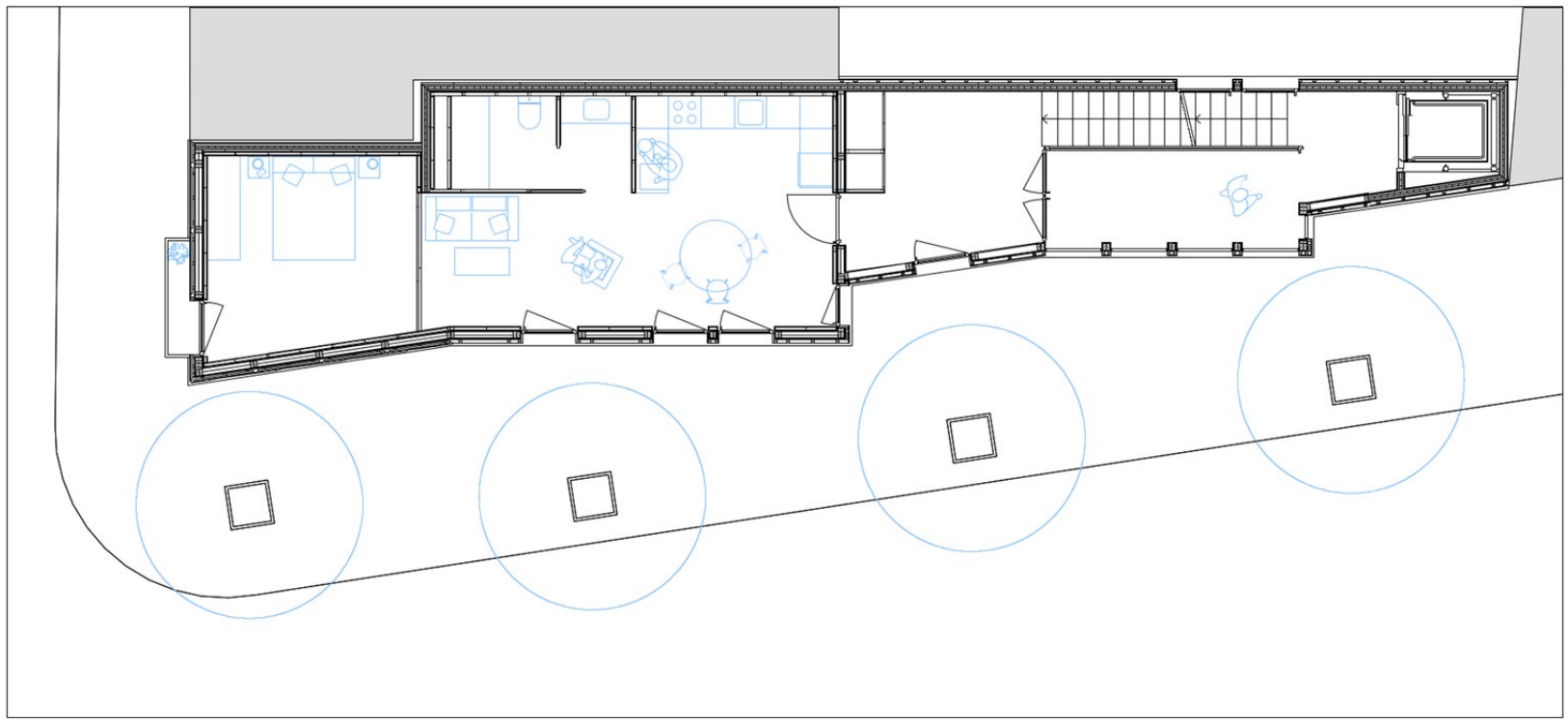
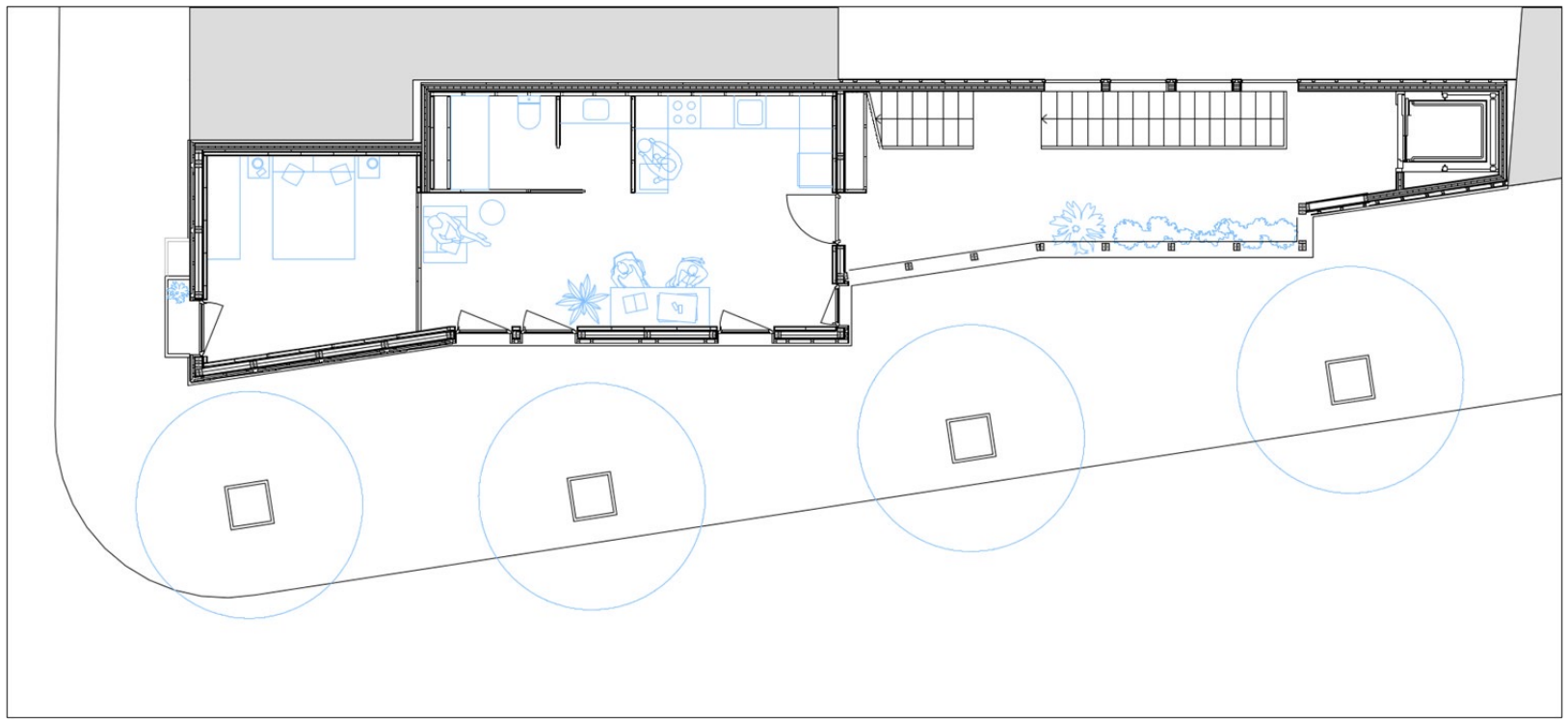
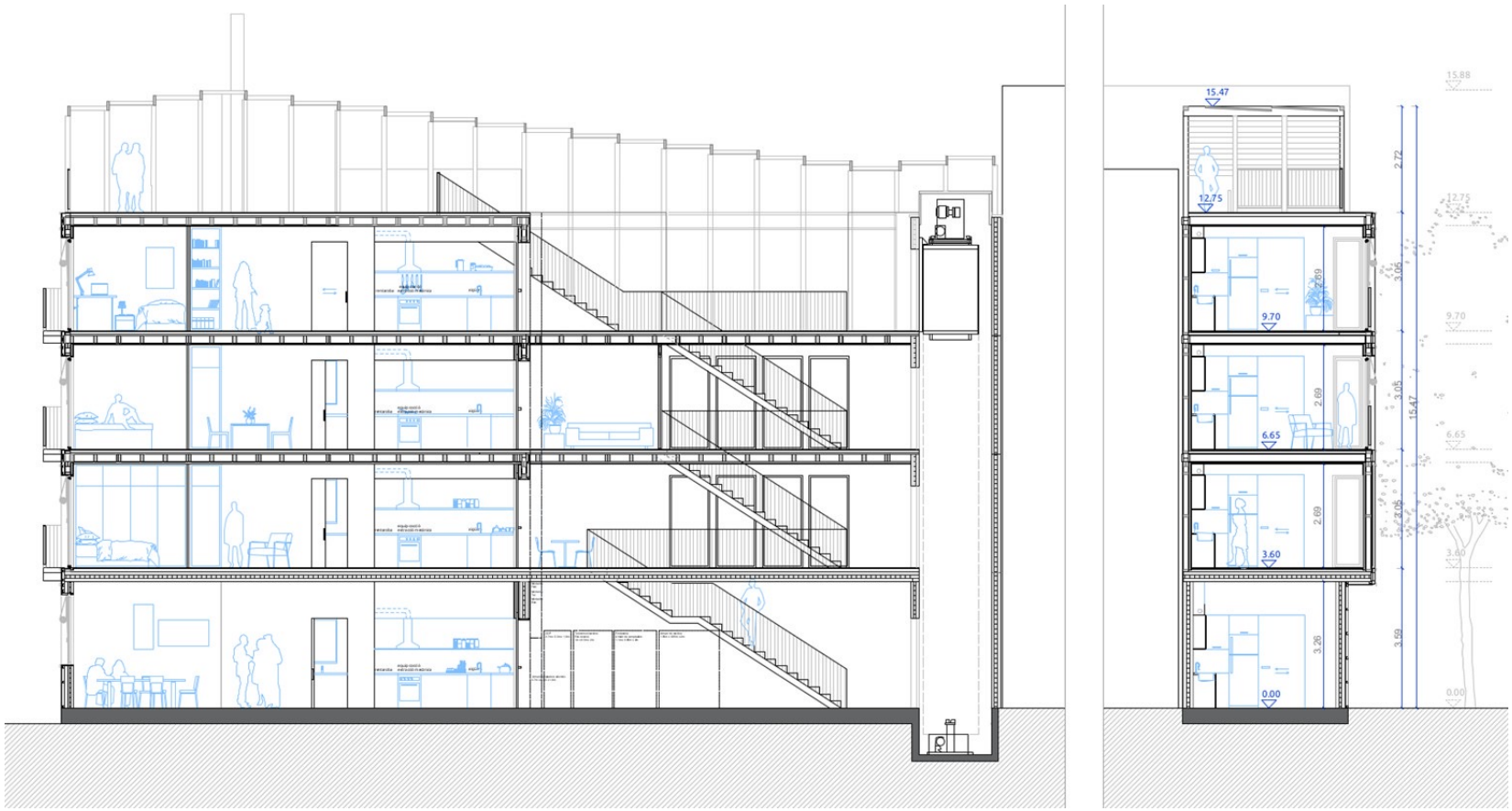


second floor



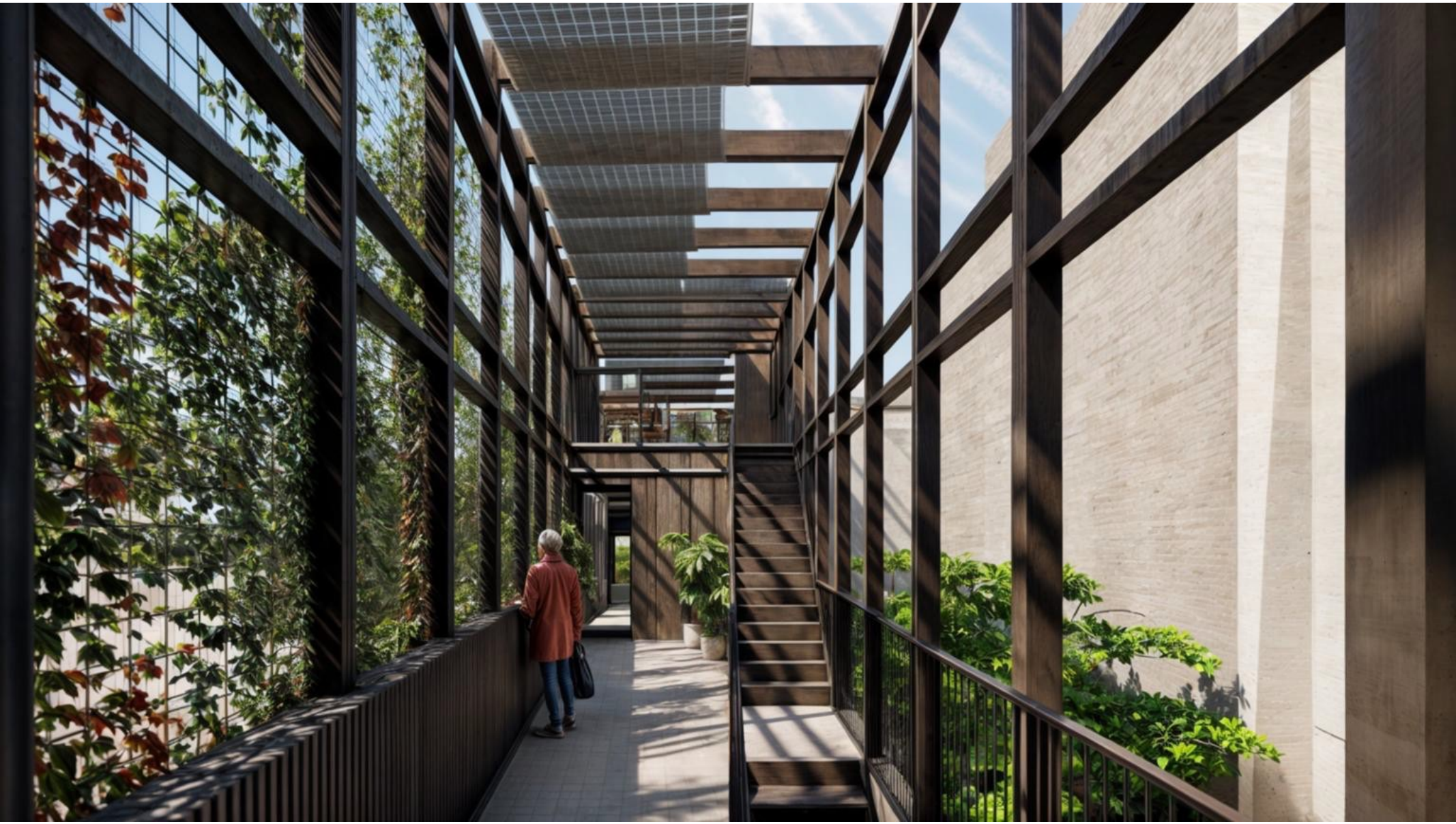
third floor



sections

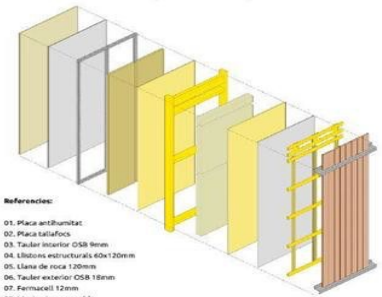

LA VIURE
Prioritzem
l'habitatge
VERDA


rothoblaas



Technical dimension

Mòdul 1:
Panell de revestiment interior + panell estructural + panell d'exterior de CBPB



Referencies:

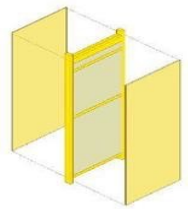
01. Placa antihumitat
02. Placa tallafocs
03. Tauler interior OSB 9mm
04. Llistons estructurals 60x120mm
05. Llana de roca 120mm
06. Tauler exterior OSB 18mm
07. Fermacell 12mm
08. Làmina impermeable
09. Llistons d'escorriment 30x50mm
10. Muntants 60x50mm
11. Placa de CBPB 12mm

Pas 1:
Conformació del panell estructural

Referencies:

04. Llistons estructurals 60x120mm
05. Llana de roca 120mm

Pas 2:
Tancament del panell estructural



Referencies:

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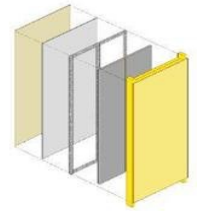
Pas 3:
Conformació del panell de revestiment interior



Referencies:

01. Placa antihumitat
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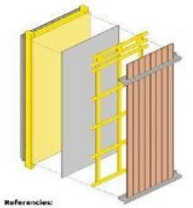
Pas 4:
Conformació del panell de revestiment interior

Referencies:

01. Placa antihumitat
02. Placa tallafocs

Pas 5:
Conformació del panell de tancament exterior



Referencies:

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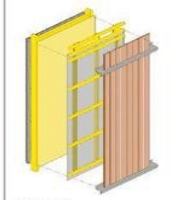
Pas 6:
Conformació del panell de tancament exterior



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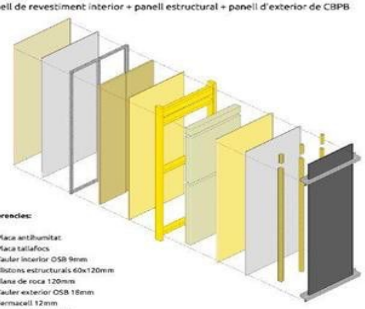
Pas 7:
Conformació final

Mòdul 1:
Panell de revestiment interior + panell estructural + panell d'exterior de CBPB



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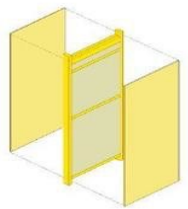

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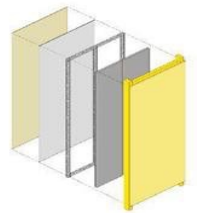


Referencies:

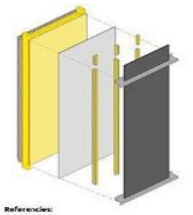
01. Placa antihumitat
02. Placa tallafocs

Pas 4:
Conformació del panell de revestiment interior

Referencies:

01. Placa antihumitat
02. Placa tallafocs

Pas 5:
Conformació del panell de tancament exterior



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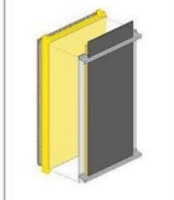
Pas 6:
Conformació del panell de tancament exterior



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Conformació final

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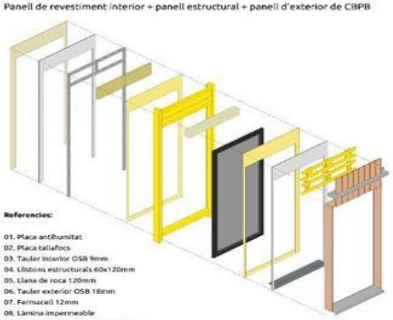

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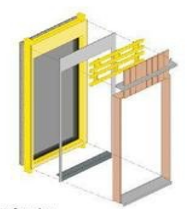
Pas 4:
Conformació del panell de revestiment interior

Referencies:

01. Placa antihumitat
02. Placa tallafocs

Pas 5:
Conformació del panell de tancament exterior



Referencies:

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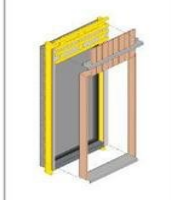
09. Llistons d'escorriment 30x50mm
10. Muntants 60x50mm
11. Placa de CBPB 12mm

Pas 6:
Conformació del panell de tancament exterior



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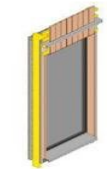
Pas 7:
Conformació final



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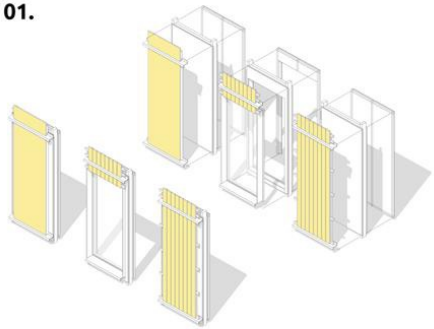

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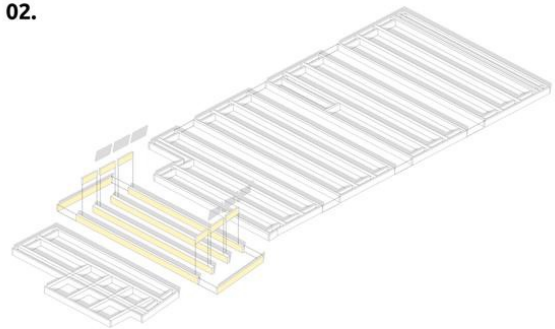

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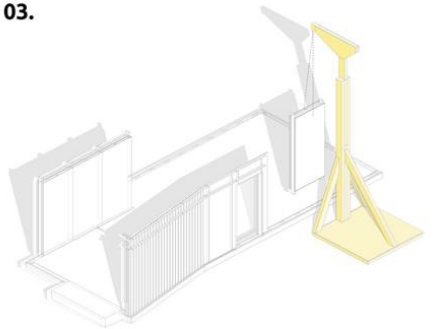

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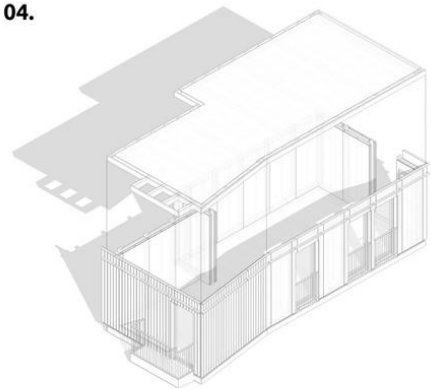

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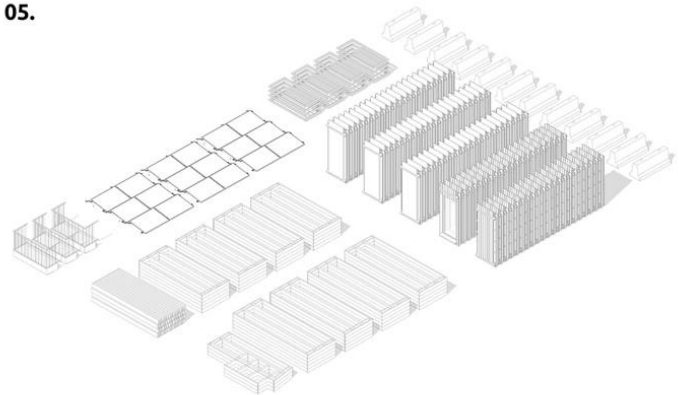

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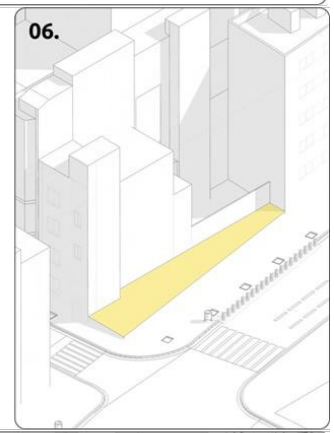

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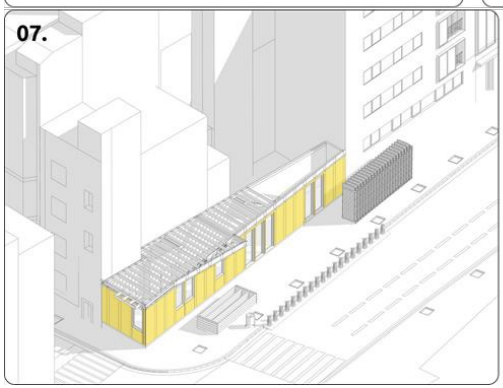
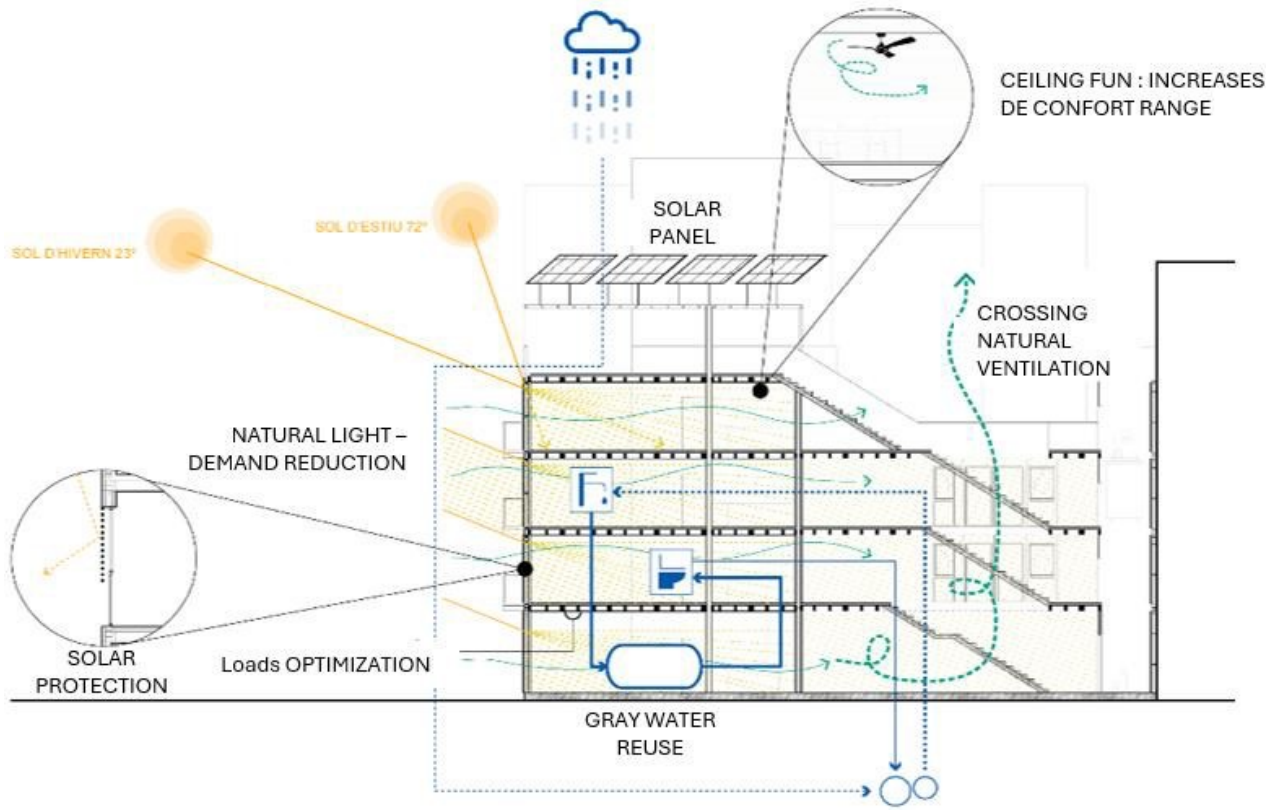
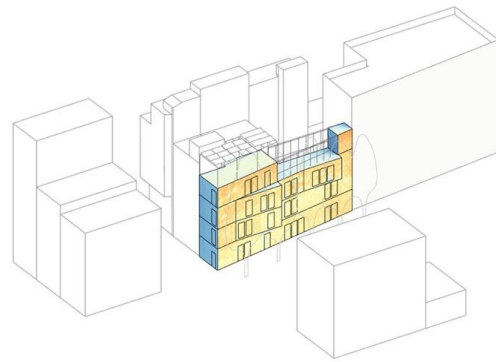


08.

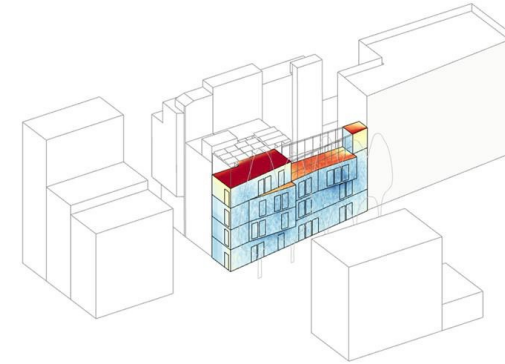
09.


CEILING FUN : INCREASES
DE CONFORT RANGE
SOL D'HIVERN 23°
SOL D'ESTIU 72°
SOLAR
PANEL
CROSSING
NATURAL
VENTILATION
NATURAL LIGHT –
DEMAND REDUCTION
SOLAR
PROTECTION
Loads OPTIMIZATION
GRAY WATER
REUSE



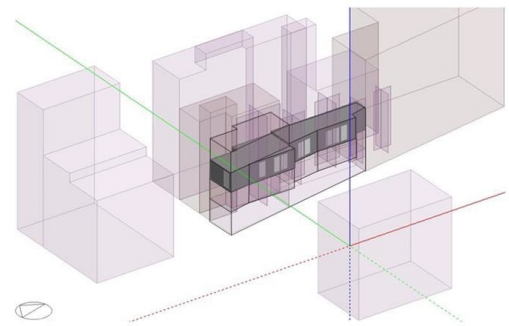
CAPTACIÓ PERÍODE D'HIVERN
21 desembre - 21 març

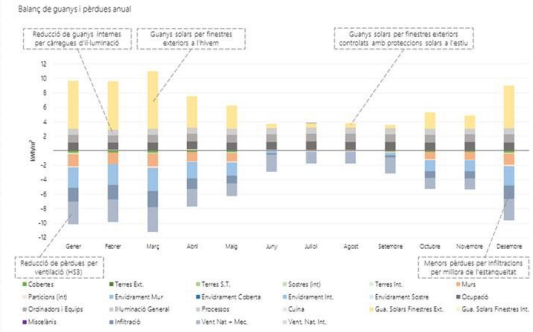
Dia mitjà del període:	**1440** Wh/m²·día
MÀXIM (Dia mitjà del període):	3835 Wh/m²·día
Total període:	**131** kWh/m²
MÀXIM (Total període):	349 kWh/m²

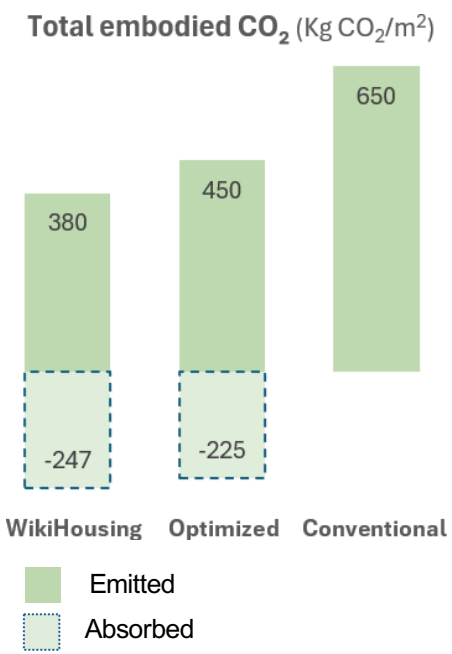


CAPTACIÓ PERÍODE D'ESTIU
21 juny - 21 setembre

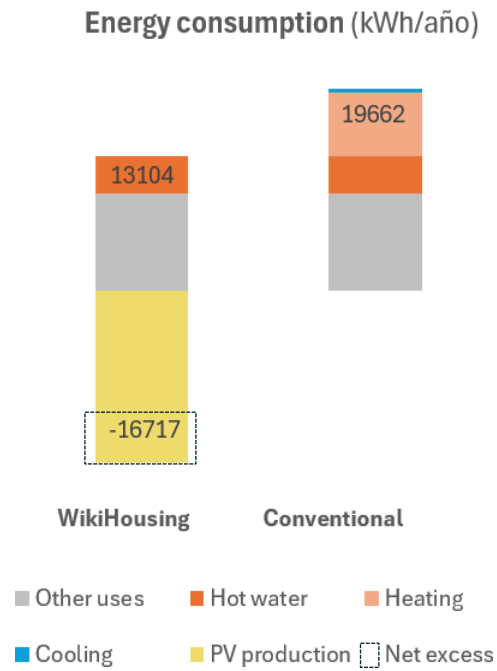
Dia mitjà del període:	**1409** Wh/m²·día
MÀXIM (Dia mitjà del període):	5710 Wh/m²·día
Total període:	**131** kWh/m²
MÀXIM (Total període):	531 kWh/m²

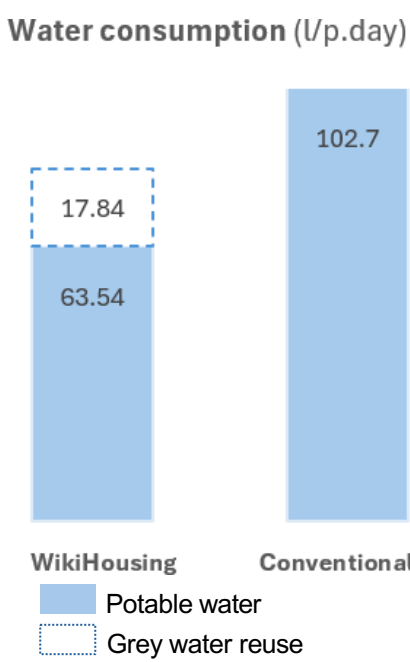





Total embodied CO_2 (Kg CO_2/m^2)
380
450
650
-247
-225
WikiHousing
Optimized
Conventional
Emitted
Absorbed

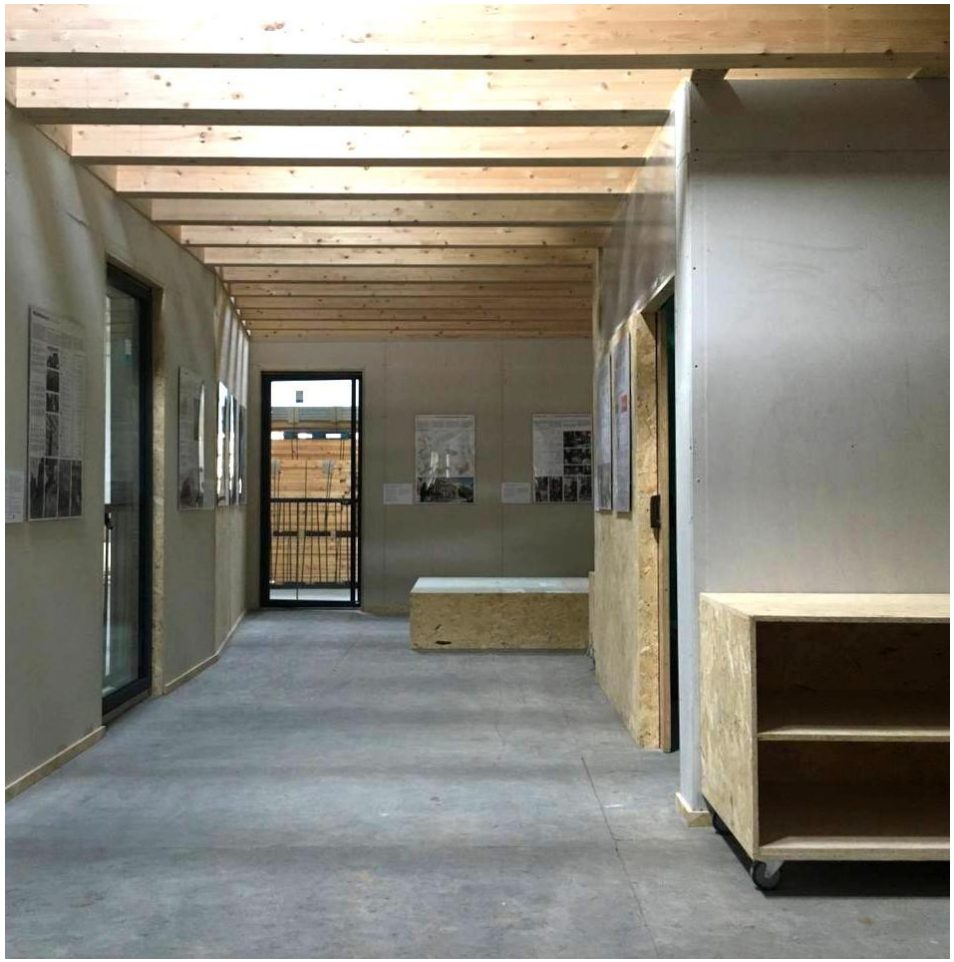

Weight and circularity (kg/m2)
820
80%
2200
2%
WikiHousing
Conventional
Weight
Circularity


Energy consumption (kWh/año)
13104
19662
-16717
WikiHousing
Conventional
Other uses
Hot water
Heating
Cooling
PV production
Net excess


Water consumption (l/p.day)
17.84
63.54
102.7
WikiHousing
Conventional
Potable water
Grey water reuse

Social dimension


making balloon frame,
which is what we are doing
SPAX




TW-Flip
TW-Flow X


Ecotec
Pivotroll


2820

societat orgànica

Thank you

Link to video

Link to web

ARCHIO X ACE

Delivering Affordable and Climate-Resilient Housing for All

ARCHIO X FESTIVAL OF PLACE

CITIZENS HOUSE, LONDON CLT:

London’s first purpose built Community Land Trust

CROWN ESTATE + TOWN INNOVATION PROJECT:

Lessons learnt from pushing design boundaries at the Westwick Row, Hemel site.

CLIENTS AND REACH

DEVELOPER REGENERATION

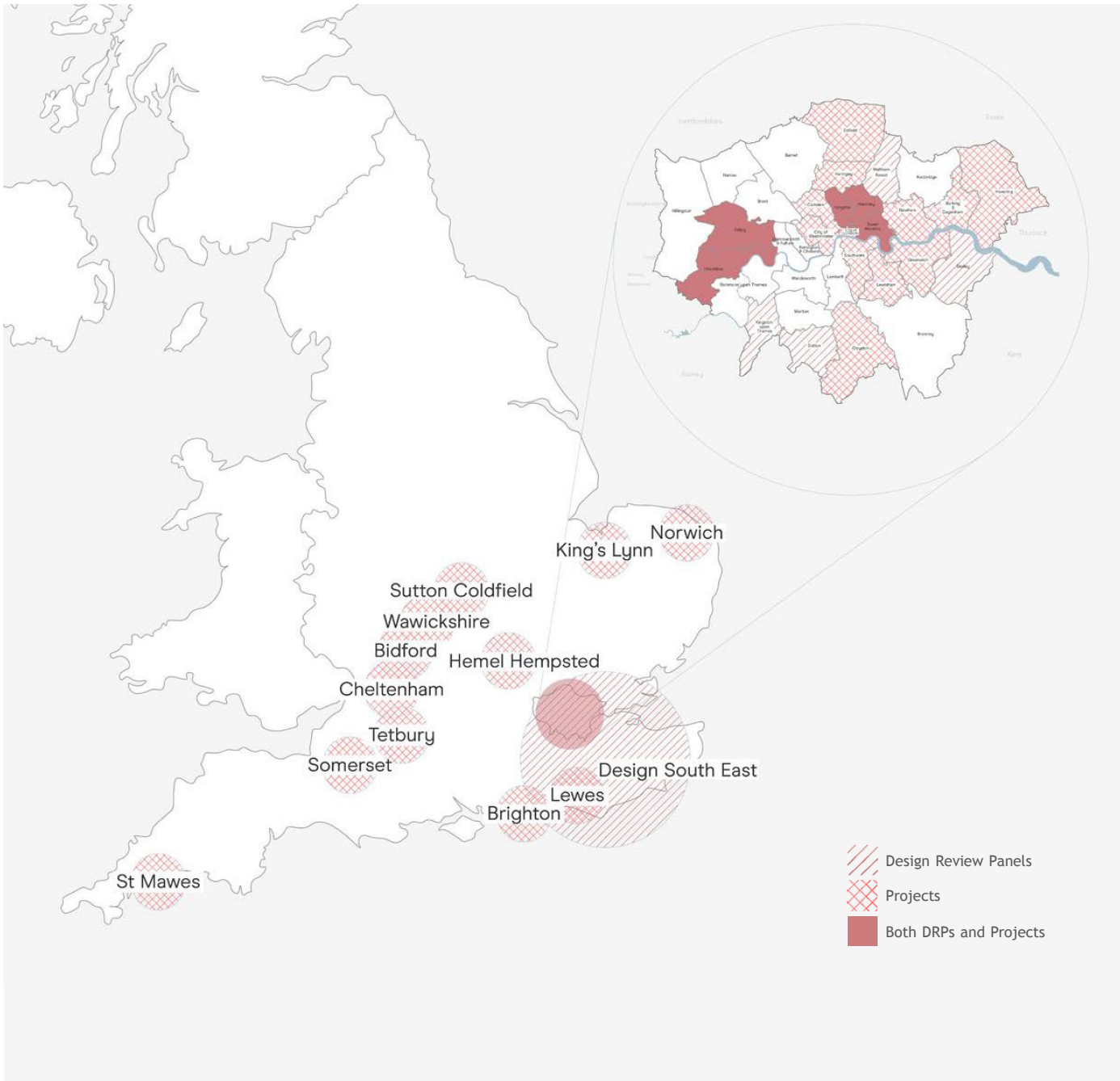
ballymore.
LCR
London CLT
Places for London
Human Nature
Transport for London
Landsec
U+I
TOWN.

LOCAL AUTHORITES

Working in partnership
BeFirst
Barking & Dagenham
Camden
City of Westminster
Hackney
Ealing
Havering
London Borough of Hounslow
ISLINGTON
For a more equal future
LONDON LEGACY DEVELOPMENT CORPORATION
Southwark Council
TOWER HAMLETS

HOUSING ASSOCIATIONS

CLARION HOUSING
Habinteg
Accessible homes. Independent lives.
hornsey housing trust
Metropolitan Thames Valley
Notting Hill Genesis
Peabody
Phoenix
Our community in our hands



HOUSING EXPERTS

MIXED-USE, BtR

114 build to rent homes for LandsecU+I in Lewisham

SOCIAL HOUSING

19 homes and community space for BeFirst in Becontree

COMMUNITY LED

11 community-led homes for London CLT in Lewisham

MASTERPLAN

A 50 home co-housing plot for Human Nature in Lewes

ESTATE REGENERATION

20 homes and estate regeneration for Southwark Council

SPECIALIST

22 specialist homes for Habinteg in Dagenham

TOWN EXTENSIONS

100 homes for the Crown Estate in Hemel Hempstead

CO-HOUSING

34 homes and Common House, for TOWN in Norwich

RETROFIT

Retrofit strategy for 1,800 homes in Westminster

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GENUINELY AFFORDABLE & COMMUNITY LED: CITIZENS HOUSE

The first designed and delivered community led housing in London

CLT
land gifted by council

£3,800
per sq.m

65%
of market price for homes sold

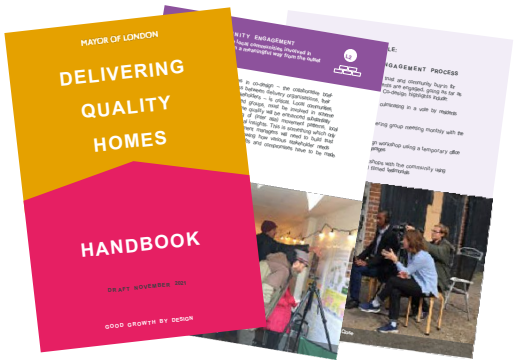
homes held in trust so affordable in perpituity

RESIDENTS HAND-DELIVERING THE PLANNING APPLICATION TO THE MAYOR OF LEWISHAM

IMPACT THROUGH ENGAGEMENT

WHAT RISKS WHERE THERE:

- Legal process behind planning permission (CLT model).
- Scale of development on a small site needed intense engagement,
- Range of expertise across client group (first direct delivery for
- London CLT).



Citizens House was an exemplar project for engagement in Mayor of London's guide to Delivering Quality Homes.

"There's this real sense of safety and security that you have when you move into a development like this."

LYNETTE, RESIDENT

107 letters of support with application

TEMPORARY SITE OFFICE IN ONE OF THE GARAGE SITES

CO-DESIGN TOOLKIT

WE ARE PASSIONATE ABOUT DELIVERING MEANINGFUL BENEFITS

We use co-design processes to combine our expert knowledge with the lived experience of residents, so that our designs tackle the everyday issues people face in their neighbourhoods.

Our Toolkit consolidates our extensive experience into a series of ‘tools’ in order to demystify co-design, and to enable clients and community groups to benefit from the process.

RADICAL AFFORDABILITY

WHAT MADE THE DESIGN AFFORDABLE:

- Understanding constraints from outset (e.g. gas main 0,)
- Simple robust materials,
- Every design move has maximum benefit,
- Co-designed landscape to meet resident needs,
- No lift, 1 and 2 bedroom homes aligned with GLA funding per home.

£50k
saving by avoiding gas main in design

SHARED SPACE IN FRONT OF CITIZENS HOUSE

BALANCING SUSTAINABILITY + AFFORDABILITY

Balancing energy and affordability at Citizens House under the Community Land Trust scheme meant aiming for basic building regulations compliance rather than deeper sustainability, consciously prioritising lower upfront costs and cheaper energy systems over more ambitious low-carbon measures, to keep homes genuinely affordable.

AERIAL VIEW

PROJECT IMPACT

London CLT and Impact on Urban Health
CLTs and Urban Health:
A case study of London CLT's Citizens House, Sydenham

CATEGORY	STATISTIC	QUOTE
Health (Physical)	78% of residents satisfied with physical health after moving in, compared to 17% before.	*"Some residents gave stark examples of health improvements: no longer having migraines or having to use an asthma inhaler."*
Health (Mental)	56% of residents satisfied with mental health after moving in, compared to 8% before.	*"The most common health benefit was relief from the constant anxiety of precarious housing circumstances and unknown futures."*
Safety & Security	100% of people felt safe in their homes after moving to citizens house, with 68% saying they felt "very safe", an increase from 15% prior.	*"There's this real sense of safety and security that you have when you move into a development like this, where you know the people..." - Lynette*
Overall Accommodation Satisfaction	Residents reporting being "Very Satisfied" with their accommodation went from approximately 8% (before moving) to 60% (after moving).	*"It's like a little sort of Oasis away from all the busy stuff" - Olivia*
Loneliness	Average scores for frequent loneliness were higher than in England before moving in but show significant improvements twelve months later, with stats of people feeling lonely some of the time dropping from 46% down to just 14%.	*"We all had seen each other and sort of knew each other a bit before we even moved in. So there was no sort of awkwardness at the beginning. It's just you instantly are saying hi to people that you've, you already know and you're already really familiar with." - Olivia*

DELIVERING SOCIAL VALUE





RIBA STAGES

STAGE 0	STAGE 1	STAGE 2	STAGE 3	STAGES 4-6	Stage 7
Making introductions	Listening + Learning	Co-designing	Refining the design + co-designing the allocations process	Communication with local residents, and forming the new residents group	Advocacy + ongoing stewardship

CLIENT + CAMPAIGNERS

- "pick an architect" workshop for the public to choose the architect
- campaign for the land from the council for community land trust housing
- support the engagement events
- work with the resident's steering group to design the allocation process for the homes
- residents choosing interior finishes
- residents meeting for the first time - starting a support network
- opening launch and wide-spread CLT advocacy

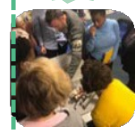
STRATEGIC ENGAGEMENT PROCESS / PLANNING APPLICATION

- co-design workshop — An initial three-day co-design workshop using a temporary office in one of the site's empty garages
- community design workshops — Further on-site design workshops with the community using questionnaires written and filmed testimonials
- 'Landscape walkaround' — 'Landscape walkaround' to talk about how the new public space could best serve community needs
- landscape workshops — further co-design workshops focussing on landscape
- planning application — community and campaigners hand-delivered plans to the Mayor of Lewisham. The planning application received an unprecedented 107 letters of support.

> "There is something about giving space on each project to creatively come up with design quality ideas that people can own and be proud of because they created it on that project. So we set social impact objectives at the beginning of each project with each community group; for example one group specifically set an objective that there should be a plan for how community spirit will be generated and how design will affect community spirit."
> LONDON CLT

"ADDED VALUE" SOCIAL VALUE DELIVERY

- joining the campaign for the site to be released to London CLT
- employ local film maker to make story of the project, including young person's media training
- workshops with school children
- residents form steering group to refine the process iteratively
- mayor's handbook - best practice
- mural painting with local sixth form students
- Site visits with other CLT groups
- stewardship and handover to new residents
- gardening group forms for long-term resident-led maintenance






STEWARDSHIP
+ LONG TERM
OWNERSHIP

PROJECT IMPACT

- Community stewardship
- Affordability in perpituity
- Social value all the way through
- Post occupancy results aligned with GLA funding per home

PROJECT IMPACT

ARCHIO X FESTIVAL OF PLACE

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CROWN ESTATE + TOWN INNOVATION PROJECT:

Lessons learnt from pushing design boundaries at the Westwick Row, Hemel site.

CROWN ESTATE + TOWN INNOVATION PROJECT

CLIENT

THE CROWN ESTATE | TOWN.

TEAM

periscope

Archio

Mole

DAVID LOCK ASSOCIATES

expedition

urban movement

RIDGE

Introba

apex

APPLIED ECOLOGY

CONTEXT

The Crown Estate's land at West Row (red) neighbours the East Hemel site (white)

Westwick Row seeks to demonstrate best practice in sustainability and will explore the necessary changes in housing delivery to enable this. The Crown Estate intend to incorporate learnings from this project into future activity at East Hemel and in other communities.

The project is participating as a pilot project in the UK Net Zero Carbon Building Standard (UK NZCBS).

SUSTAINABILITY OBJECTIVES

RESOURCES & CIRCULARITY

Low upfront carbon for residential buildings and infrastructure, aspiring for less than 300 kgCO2e/m² GIA (A1-A5) and 100 kgCO2e/m² GIA (A1-A5).

OPERATIONAL ENERGY

Low operational carbon homes, aspiring to energy use intensity of less than 35 kWh/m2 GIA per year. Homes with EPC rating of B or better.

SOCIAL IMPACT

Min. 30% tenure-blind affordable homes.

SUSTAINABLE LIFESTYLE

Designing in sustainable transport measures that could contribute to wider HGC target of 60% modal shift by 2050.

CLIMATE & NATURE

Exceed biodiversity net gain of 15% via on-site measures.

LANDSCAPE & LAYOUT

CONSTRAINTS:

- High BNG target +15%,
- Retained protected hedgerow,
- Steep slope,

DESIGN OUTCOME:

- 30% greenspace,
- One point of entry,
- Reduced road width to maximise public open space
- Car parking in four clusters, at the edge (unallocated, fewer)
- Terraced housing aligned with topography,
- 40 DPH, using some flats, terraces and ‘tyneside’ flats
- SUDs to the north (bottom of slope).

Image by periscope

ENERGY AND CARBON

SUSTAINABILITY TARGETS:

- Energy use intensity of 35 kWh/ m^2 GIA per year, well below the UK Net Zero Carbon Building, matching LETI's benchmark for medium housing,
- Embodied carbon target of <300 kg CO2/m^2 significantly exceeds LETI's 500 kg CO2/M^2,
- Minimum 15% BNG,
- On-site renewable energy,

ACHIEVED THROUGH:

- Reduced cut and fill,
- Structural stacking,
- Timber cassette systems,
- Lime render / clay tiles,
- External shading,
- Individual ASHP, maximum PV on roof incl E/W orientation

ENGAGEMENT

Layered engagement, has led to so few objections the scheme is heading to delegated decision.

- An Ideas Exchange panel (demographically representative of Leverstock Green).
- A Renters Panel which consists of local private renters and focuses on spatial design and future management structures for the rental homes.
- A co-design process with potential future residents.

CLIMATE RESILIENCE

- Shading
- Biodiversity
- Sustainable travel
- Managing flood risk
- Solar panels and battery storage for energy resilience.

ARCHIO X FESTIVAL OF PLACE

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Lessons learnt from pushing design boundaries at the Westwick Row, Hemel site.

Design and implementation of Climate Positive Circular Communities – Lessons Learned

Niki Gaitani

Head of Research, Assoc. Professor

Dept. Architecture and Technology, NTNU

NTNU | Norwegian University of Science and Technology

THE ARV PROJECT AT A GLANCE

EU Green Deal Innovation Action

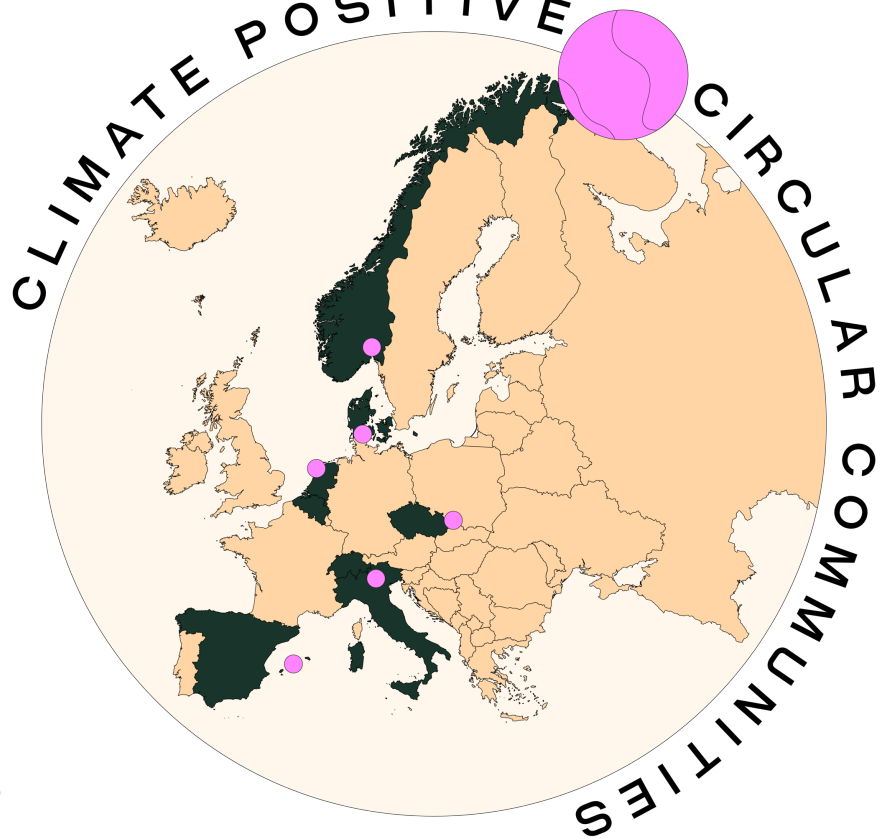
A 5-year initiative (2022–2026) accelerating building renovation and climate-positive circular communities across Europe

Coordinator: Norwegian University of Science and Technology NTNU
Budget: €21.3M
Consortium: 35 partners across the whole value chain
Countries: 8

Three Pillars

- **Circularity:** LCA, local materials, digital logbooks, material banks
- **Integration:** People–building–energy system links via integrated energy design, co-creation and digital tools
- **Simplicity:** User-friendly sustainable solutions

6 Demonstration Cases – Climate Positive Circular Communities CPCCs Testing **50+ innovations** across **250,000 m²** in **Norway, Spain, Denmark, the Netherlands, Italy, and Czechia.**

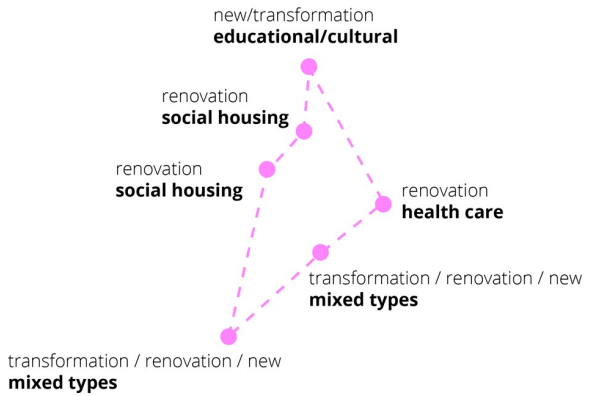


Source: https://greendeal-arv.eu/

6 URBAN TRANSFORMATION & REGENERATION PROJECTS

ARV

6 climate positive
circular communities



ENERGY EFFICIENCY

JOINT SOLUTIONS FOR RENEWABLE ENERGY

ENERGY SHARING / SMART MANAGEMENT

ENERGY FORECASTING / ENERGY FLEXIBILITY

CIRCULAR SOLUTIONS / MATERIAL USE

TRANSFORMATION/RENOVATION

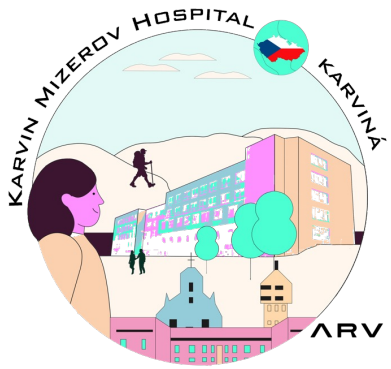
Diversity of Contexts & Target Groups

Source: https://greendeal-arv.eu/

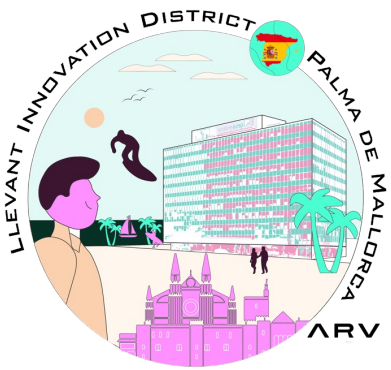
Plus energy school, Retrofitted heritage building, Sports hall, Norway

Social renovation of high/mid-rise social housing flat, Netherlands

One-stop shop for timber-based retrofitting on district scale, Italy

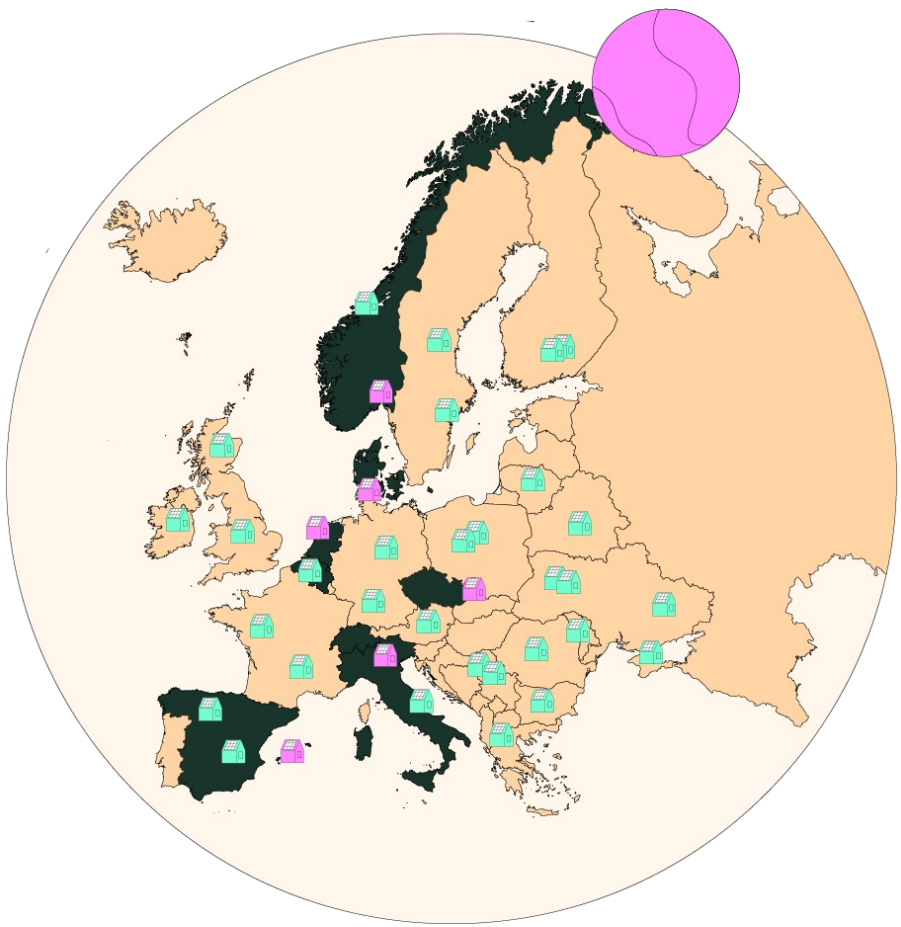


Transformation of health care building Czechia



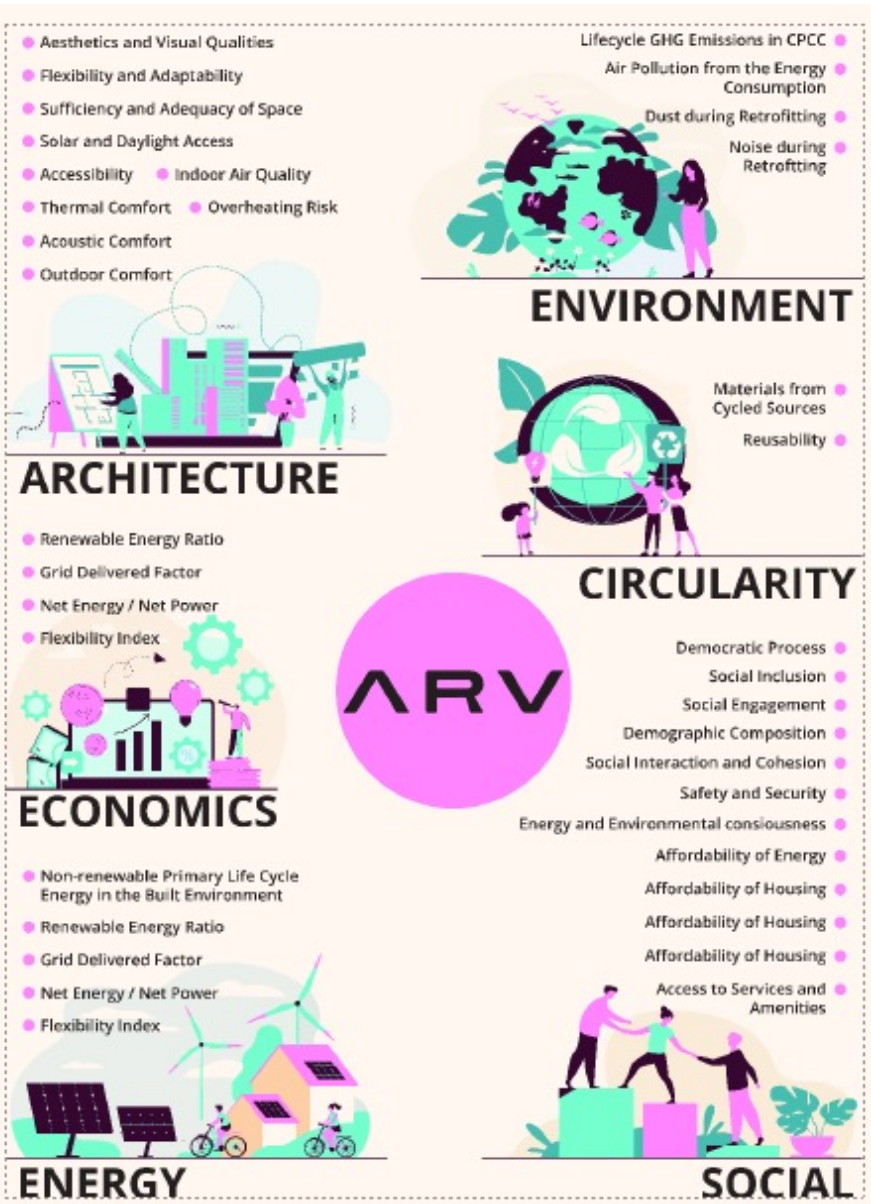
Large-scale urban retrofitting and regeneration, Spain

AIM: TO BOOST THE BUILDING RENOVATION RATE ACROSS EUROPE



Specific performance goals

	ENERGY	IEQ	NOISE & DUST	EMBODIED EMISSIONS	TIME	LIFE CYCLE COSTS	CONSTRUCTION COSTS
NEW BUILDINGS	**At least 50%** reduction in energy needs compared to current country building code. Positive energy level based on primary energy	High levels of indoor environment quality according to EU norms	According to the EU health, safety and environment standards	**At least 50% reduction** compared to local practice	**At least 30% reduction** compared to local practice	**At least 20% reduction** compared to local practice	**At least 30% reduction** compared to local practice
RENOVATION	**At least 50% reduction in energy needs** compared to pre-renovation levels. At least nZEB standard	**At least 30% improvement** compared to pre-retrofitting levels according to EN 16798-12019	**At least 30% reduction** in occupant disruption during retrofitting compared to current practice	**At least 50% reduction** compared to local practice	**At least 30% reduction** compared to local practice	**At least 20% reduction** compared to local practice	**At least 30% reduction** compared to local practice



MAIN KPI FRAMEWORK IN ARV

A **multi-dimensional system** aligned with Climate Positive Circular Communities (CPCCs). The KPIs go beyond typical building metrics and cover both **building and neighbourhood scales**

1. Energy: **Net-zero / climate-positive energy balance**
2. Environmental/Climate: Strong alignment with **EU climate-neutrality goals**
3. Circularity: a **core pillar** of ARV alongside integration and simplicity
4. Architecture: how **design quality** supports climate-positive, circular, and socially inclusive buildings and neighbourhoods
5. Economic: **scalable, financially viable deep renovation models**
6. Social: ARV's emphasis on **citizen engagement and quality of life**

OSLO'S FIRST PLUS-ENERGY SCHOOL AND CULTURAL CENTRE

Combines a **new secondary school** for 810 students with the renovation of a **1922 heritage building,** including cultural facilities such as a culture hall, dance hall, and rehearsal spaces

Features **1,556 m² of integrated solar panels** producing ~192 MWh/year.

Not only operational energy → **whole life carbon**

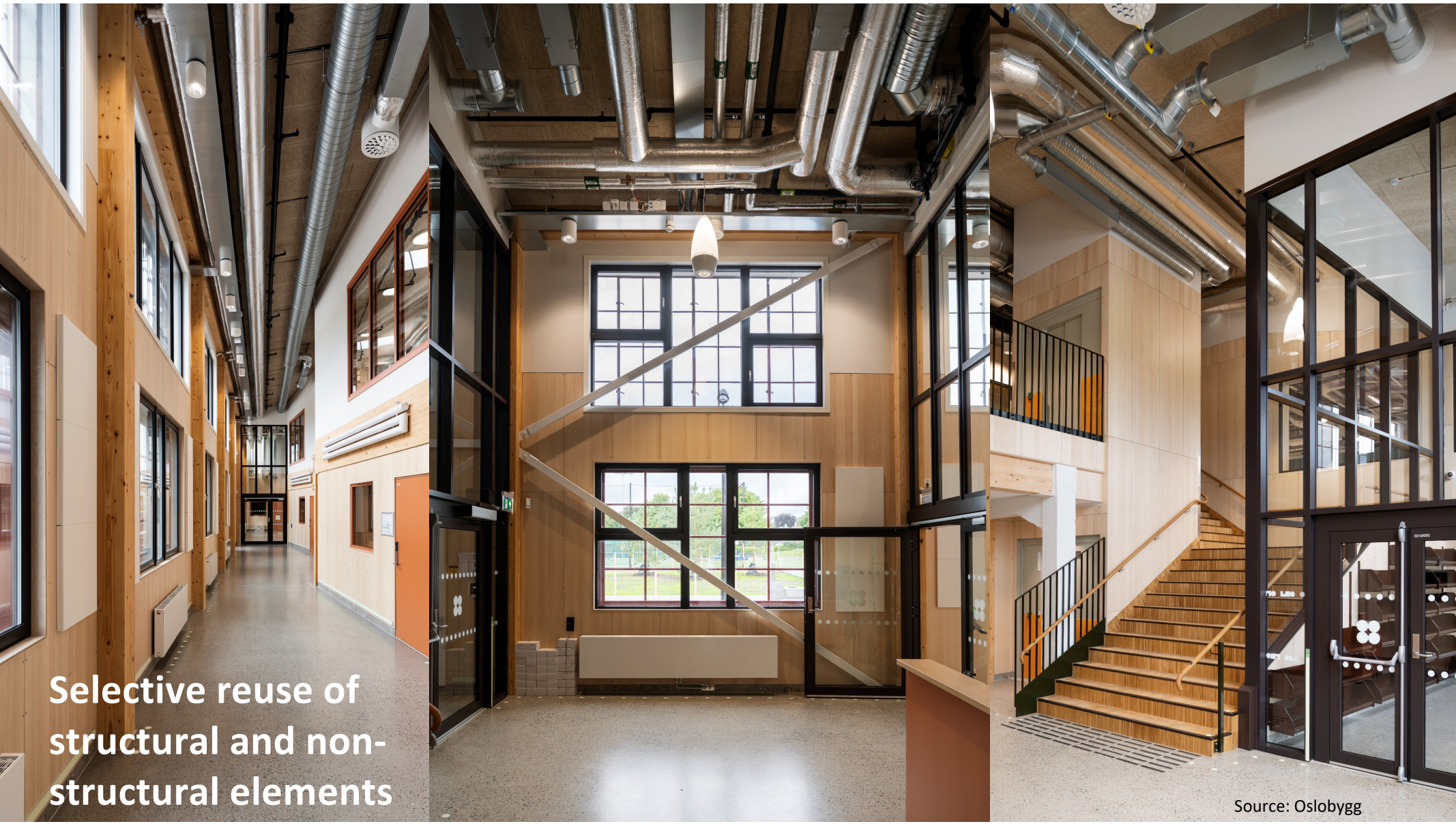
PLUS-ENERGY BUILDING PRODUCING MORE ENERGY THAN IT CONSUMES OVER ITS LIFECYCLE

Key Innovations
On-site renewable energy generation (solar PV integrated in roof and façades)
High-performance building envelope minimizing energy demand
Advanced **energy management systems and smart controls**
Use of **low-carbon and circular materials**

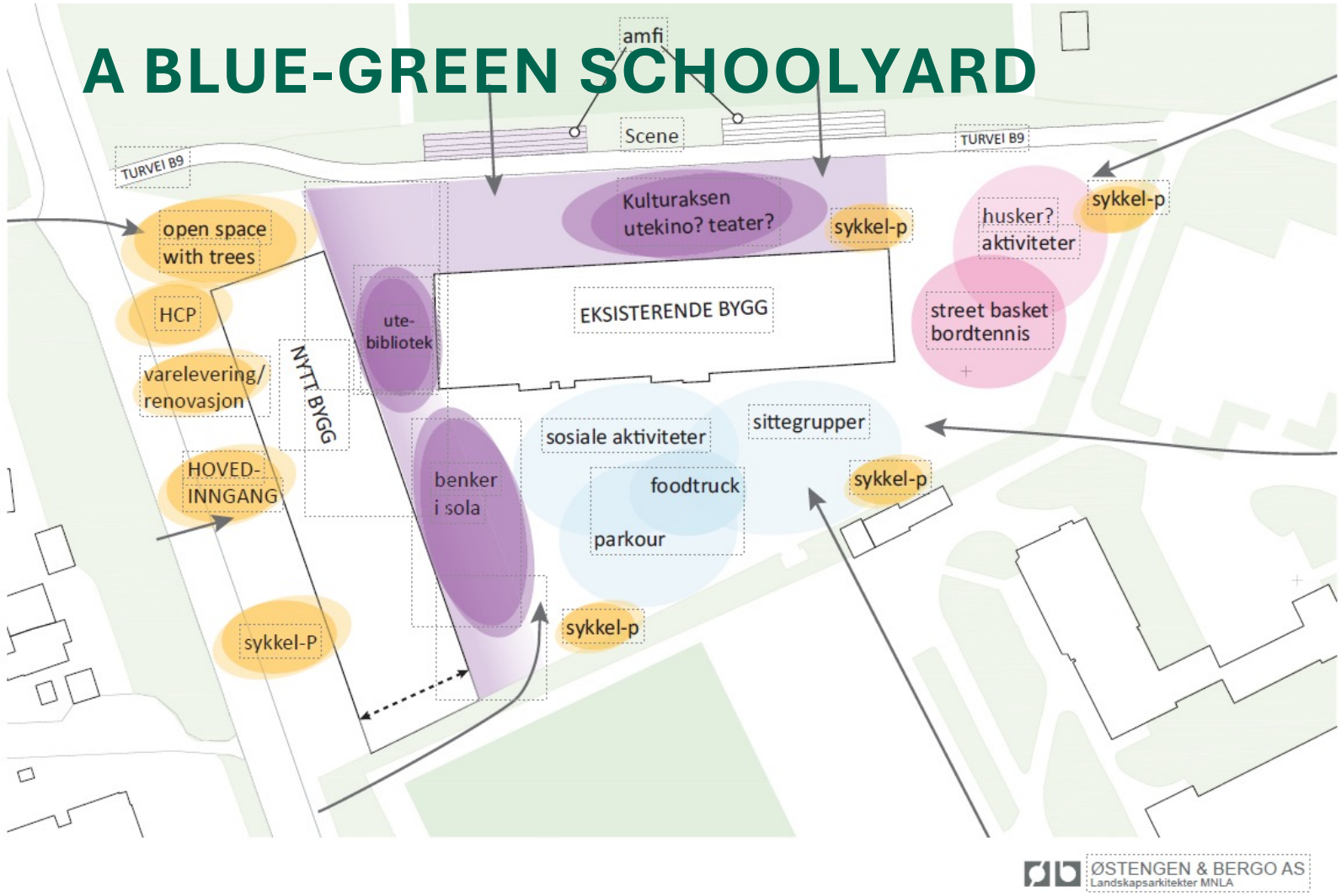
Parametric design of BIPV, a threefold challenge:

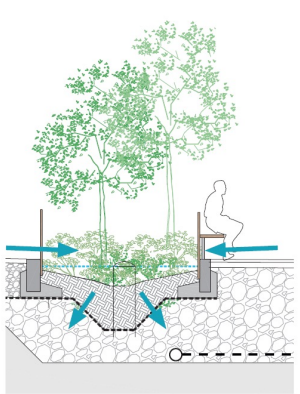
- Non-optimal building orientation
- Need for a non-homogenous façade appearance
- Plus energy performance goal

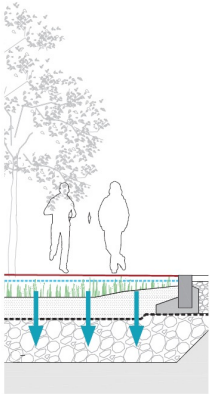
ADAPTIVE REUSE AND RENOVATION OF THE HISTORIC 1922 BUILDING, NOW HOUSING THE CULTURAL CENTRE


Selective reuse of structural and non-structural elements
Source: Oslobygg

A BLUE-GREEN SCHOOLYARD

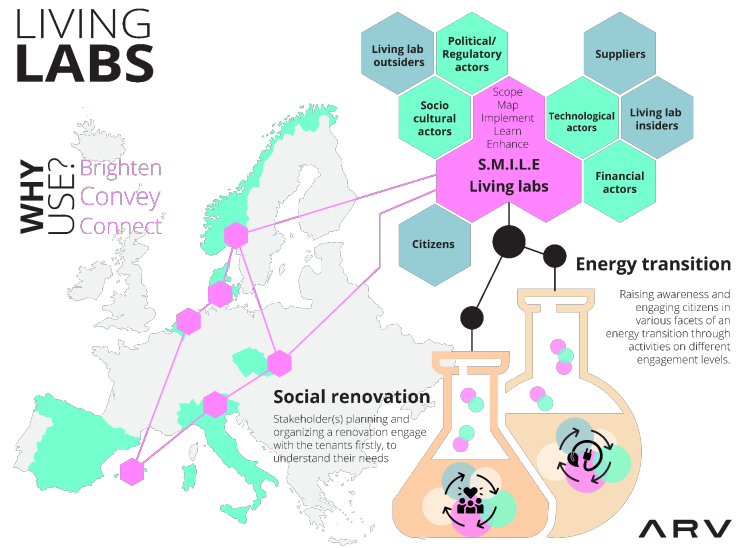






Climate adaptation & landscape design

STUDENTS CREATE CIRCULAR ART, USING REDESIGN AND RECYCLING AS GUIDING PRINCIPLES



School + cultural hub acting as a **community anchor**
Strong **co-creation with students and users**
Building used as a **living lab for sustainability education**
High-quality indoor and outdoor environments supporting well-being Inclusive public space with climate-adaptive design

PALMA DE MALLORCA – LLEVANT INNOVATION DISTRICT

1 Large Scale retrofitting action in Llevant Innovation District of 200 - 300 private dwellings by means of a novel Public Private Partnership mechanism.

2 New Positive Energy Social Housing Building by IBAVI

5 Creating a Citizen Energy Community with public / private crowd-funded mechanisms. Installing PV on public and private roofs in the area.

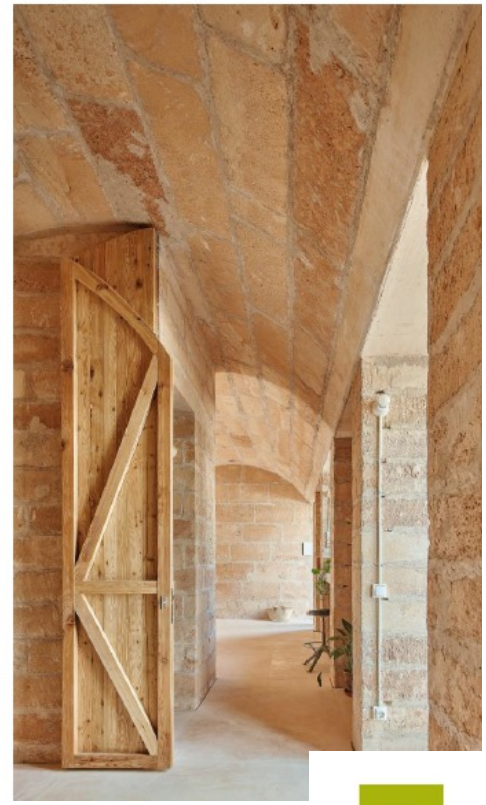
6 Living Lab for community engagement and One-Stop-Shop

4 Proposal of Energy Renovation of a flagship heritage protected building from the 70's

3 Flexible operation of HVAC centralized systems in new high efficiency multifamily buildings. (Metrovacesa)

36-UNIT POSITIVE ENERGY SOCIAL HOUSING (IBAVI) | 1,750 M^2 | LOCAL MATERIALS | CLIMATE RESILIENCE

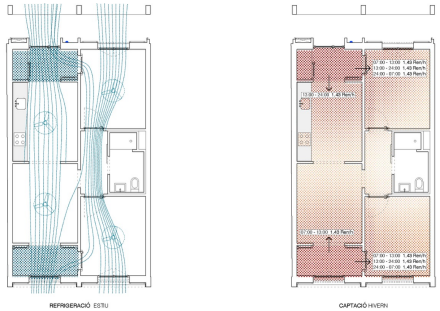
- Cross-ventilation
- High thermal mass (stone / local materials)
- Solar control through shading
- Reduced dependence on mechanical cooling



Source:The Balearic Social Housing Institute IBAVI

ADDRESSING NO MECHANICAL COOLING CHALLENGE THROUGH PASSIVE DESIGN AND LOCAL MATERIALS

Source: IBAVI

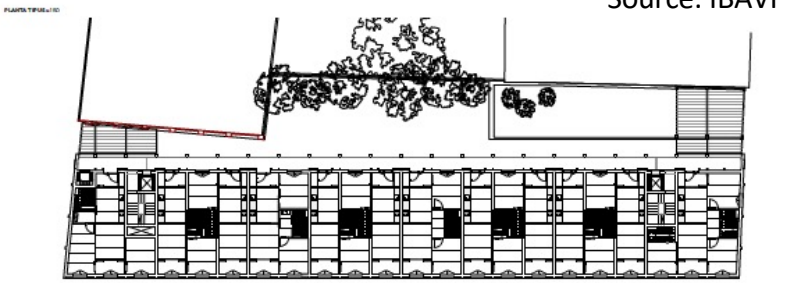


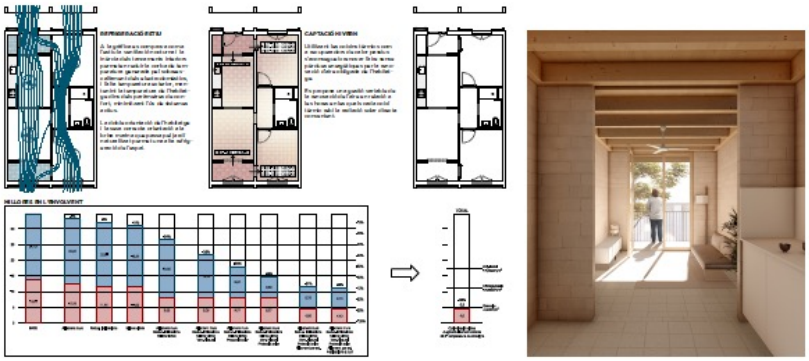
Source: IBAVI

Comfort is achieved through local materials, passive design strategies and careful performance calculations instead of energy-intensive mechanical systems.

Source: IBAVI

Source: IBAVI





SOCIAL HOUSING – PALMA ARV DEMO

Affordable housing provision
High environmental quality for vulnerable groups
Integrated into:
Living Lab ("Es Laboratori")
Participatory processes with residents

- Social housing as a frontrunner

Demonstrates high performance at affordable cost

- Passive + active synergy

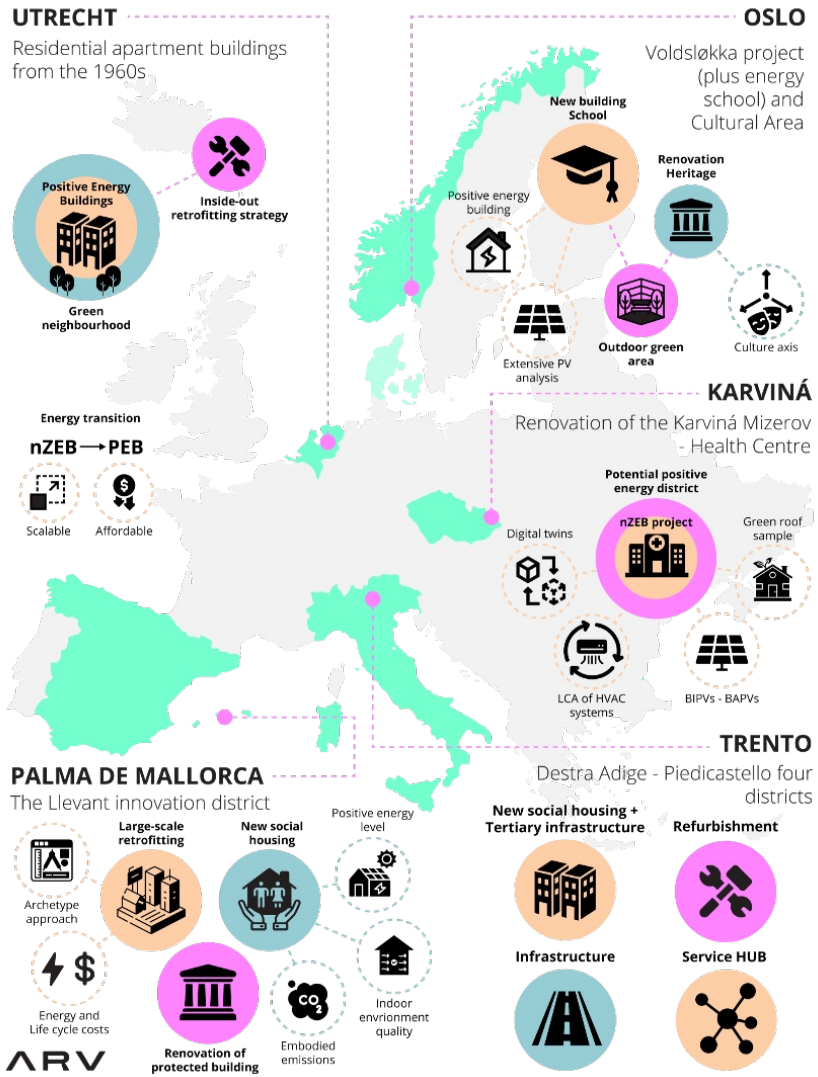
Mediterranean passive design + renewable generation

- Circular & local

Materials, construction, and economy aligned with circularity principles

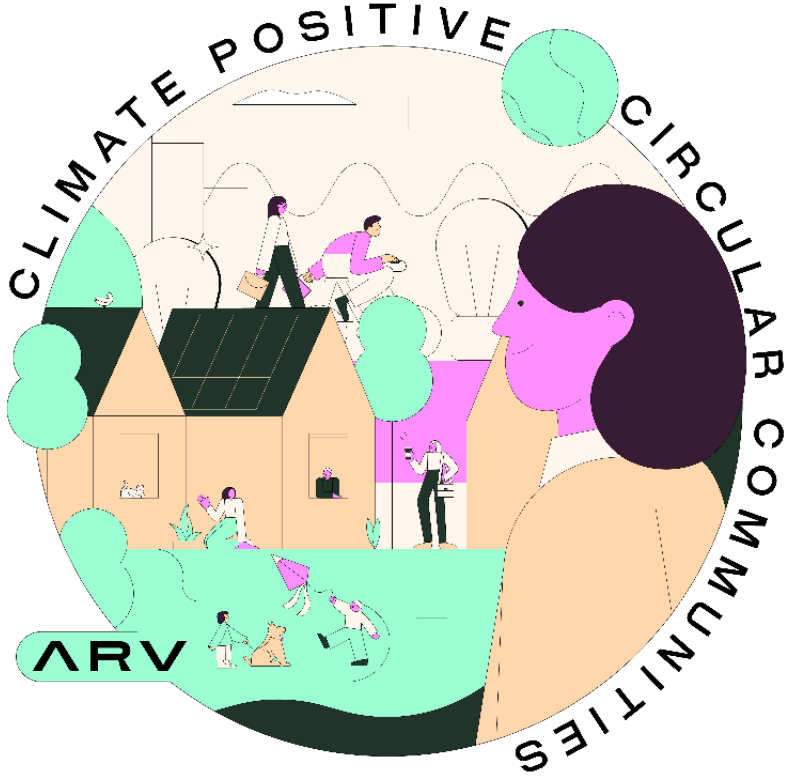
- Integrated at neighbourhood scale. Building is part of:
  - Energy community
  - Digital systems
  - Social innovation ecosystem

DEMOS DESIGN
GUIDELINES



- **Sustainability**– Deep renovations and new-build solutions across six European sites significantly reduce both operational and embodied carbon emissions.
- **Circularity** – Design and construction prioritize reuse, repair, and low-impact materials, supporting a circular built environment.
- Resource Efficiency – Integrated renewable energy systems, smart management, and adaptable design ensure long-term low energy consumption.
- **Affordability** – Sustainable, high-quality housing solutions are delivered with a strong focus on social and low-income households.
- **Aesthetics & Heritage** – Local identity and cultural heritage are preserved while enhancing public spaces, façades, and everyday community experiences.

The ARV demos show that social sustainability is not one-size-fits-all: in Palma it is about equitable living and community, while in Oslo it is about learning, participation, and civic life.
Together, they demonstrate how climate-positive transitions must be both technically effective and socially embedded



Thank you!

https://greendeal-arv.eu/

https://www.linkedin.com/company/arv-h2020/

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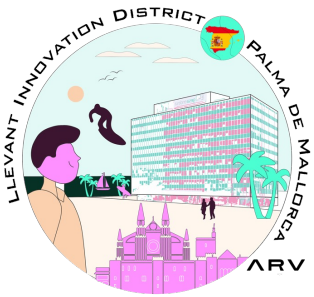
References

1. The European Green Deal, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
2. Design Guidelines for refurbished and new buildings in the Positive Circular Community in Palma, https://greendeal-arv.eu/library/d4-3-design-guidelines-for-refurbished-and-new-buildings-in-the-positive-circular-community-in-palma-draft-pending-approval-from-the-european-commission/
3. Design Guidelines for refurbished and new buildings in the Positive Circular Community in Oslo, https://greendeal-arv.eu/library/d4-1-design-guidelines-for-a-climate-positive-circular-community-in-oslo-draft-pending-approval-from-the-european-commission/
4. Design Guidelines for refurbished and new buildings in the Positive Circular Community in Utrecht, https://greendeal-arv.eu/library/d4-2-design-guidelines-for-a-climate-positive-circular-community-in-utrecht-draft/
5. Design Guidelines for refurbished and new buildings in the Positive Circular Community in Trento, https://greendeal-arv.eu/library/d4-5-design-guidelines-of-climate-positive-circular-community-in-trento-draft-pending-approval-from-the-european-commission/
6. Design Guidelines for refurbished and new buildings in the Positive Circular Community in Karvina, https://greendeal-arv.eu/library/d4-4-design-guidelines-for-the-zero-emission-positive-energy-renovation-of-the-health-care-centre-in-karvina-draft-pending-approval-from-the-european-commission/
7. Guidelines for integrated design and implementation of renewable energy systems and energy storage systems for building and neighbourhood energy needs in Sonderborg, https://greendeal-arv.eu/library/d6-2-guidelines-for-integrated-design-and-implementation-of-renewable-energy-systems-and-energy-storage-systems-for-buildings-and-neighborhood-energy-needs-in-sonderborg-draft-pending-approval/



Renovation of Social Housing:

the power(s)
of the building envelope

UN environment programme

Global Alliance for Buildings and Construction

Prof. **Lorenzo Pagliano**
Full professor Building Physics
Co.chair of **Passsive Cooling Working Group**, of UNEP

Actors:

- Arch. **Fabrizio Manzoni**, Arch **Silvia Bardeschi**, Arch. **Alessandro Bernardi**
- Ufficio Prestazioni Energetiche Edificio
- Area Edilizia Demaniale
- Direzione Tecnica

- Arch **Maugeri**
- Direttore dell'Area Edilizia Demaniale e Socio Assistenziale

- Arch. **Bortolotta**, Arch **Mazziotti**
- Ufficio Relazioni Internazionali, Comune di Milano

- Ing **Andrea Sangalli**
- Technical responsible of eERG-Laboratory

- Ing. **Anwar** ... PhD candidate...

- Ing **Roberto Armani**., dynamic simulations eERG

Prrof. **Silvia Erba**, associate professor Building Physics

- Prof. **Lorenzo Pagliano**
- Full professor Building Physics
- Co.chair of Passsive Cooling Working Group, UNEP

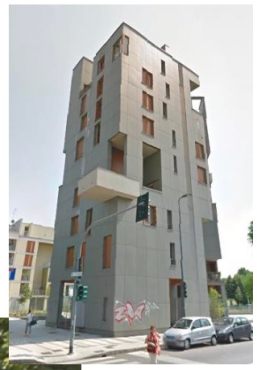
POLITECNICO MILANO

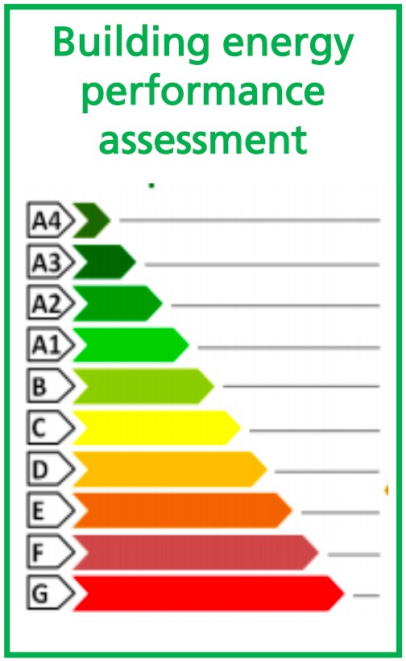
end-use Efficiency Research Group

Context

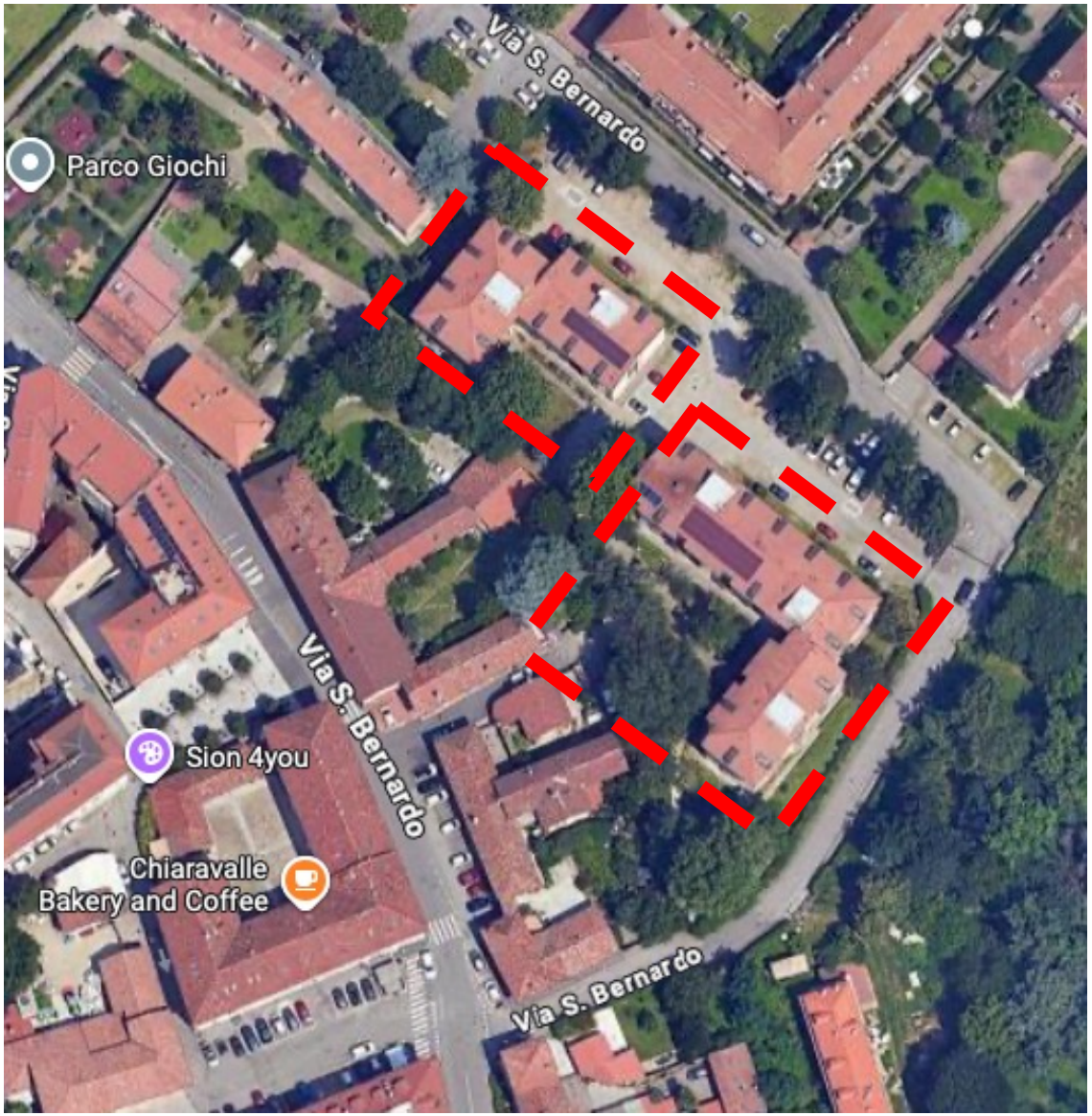
An overview on public residential building included in the building stock of the municipality

29.000 dwellings **IN** **752 buildings**





Construction period and energy performance		
Before 1991	Between 1991 and 2007	After 2008
G rating	E – F rating	B - D rating
90% of buildings	9,5% of buildings	0,5% of buildings



Where:

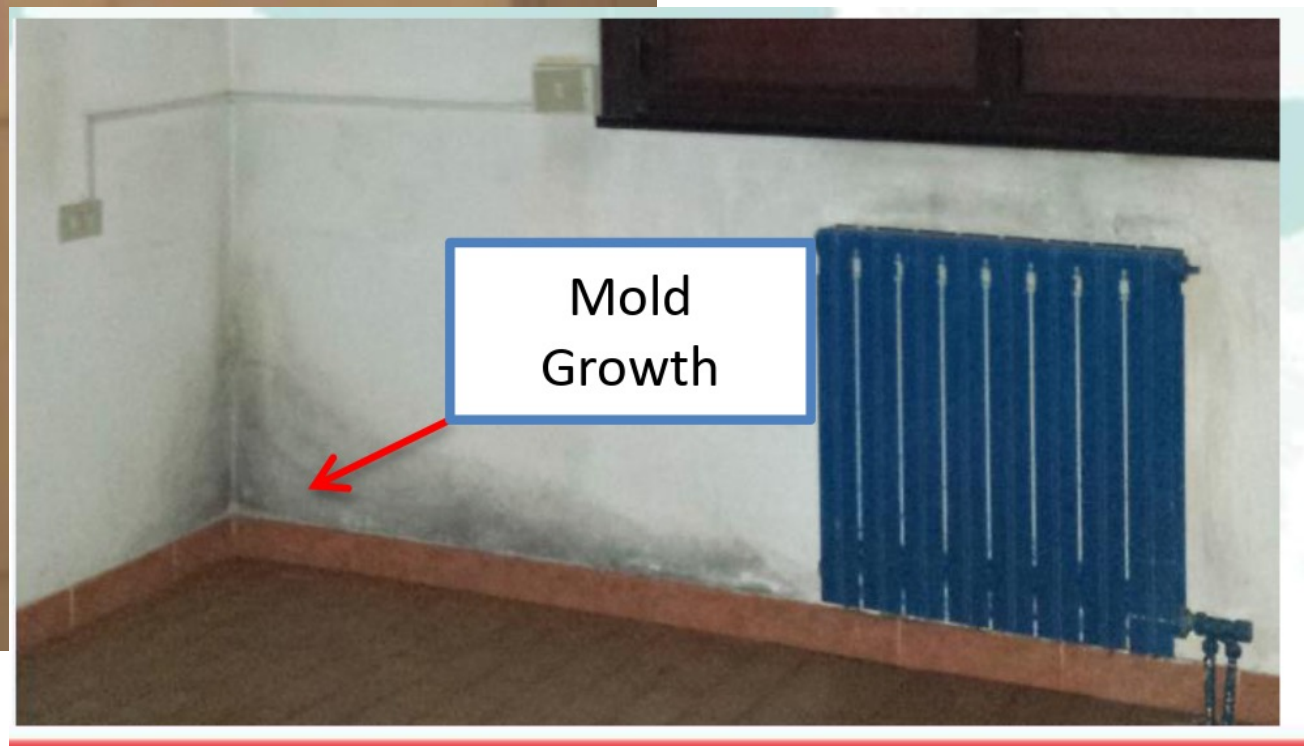
Chiaravalle district, south of Milano,

two social housing

residential buildings,

4 floors
60 apartments
4170 m2

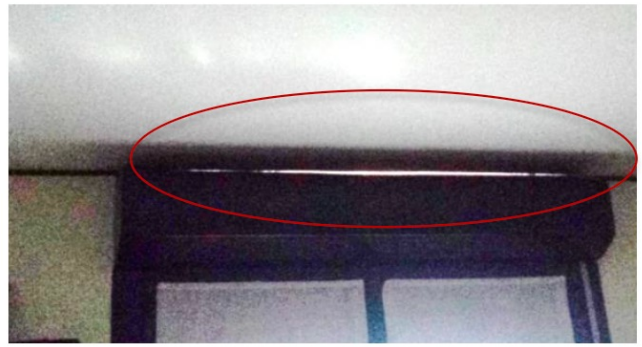
Starting point



External insulation, 25 cm

Existing Windows:
Windows combined with not insulated roller shutters box.

U_w = 4,10 W/m²K



Draughts of cold air through air gaps between windows frame and slab/wall

Heat losses

VS

Air thightness

New Windows:
Windows with insulated venetian blinds box

U_w max = 1,25 W/m²K

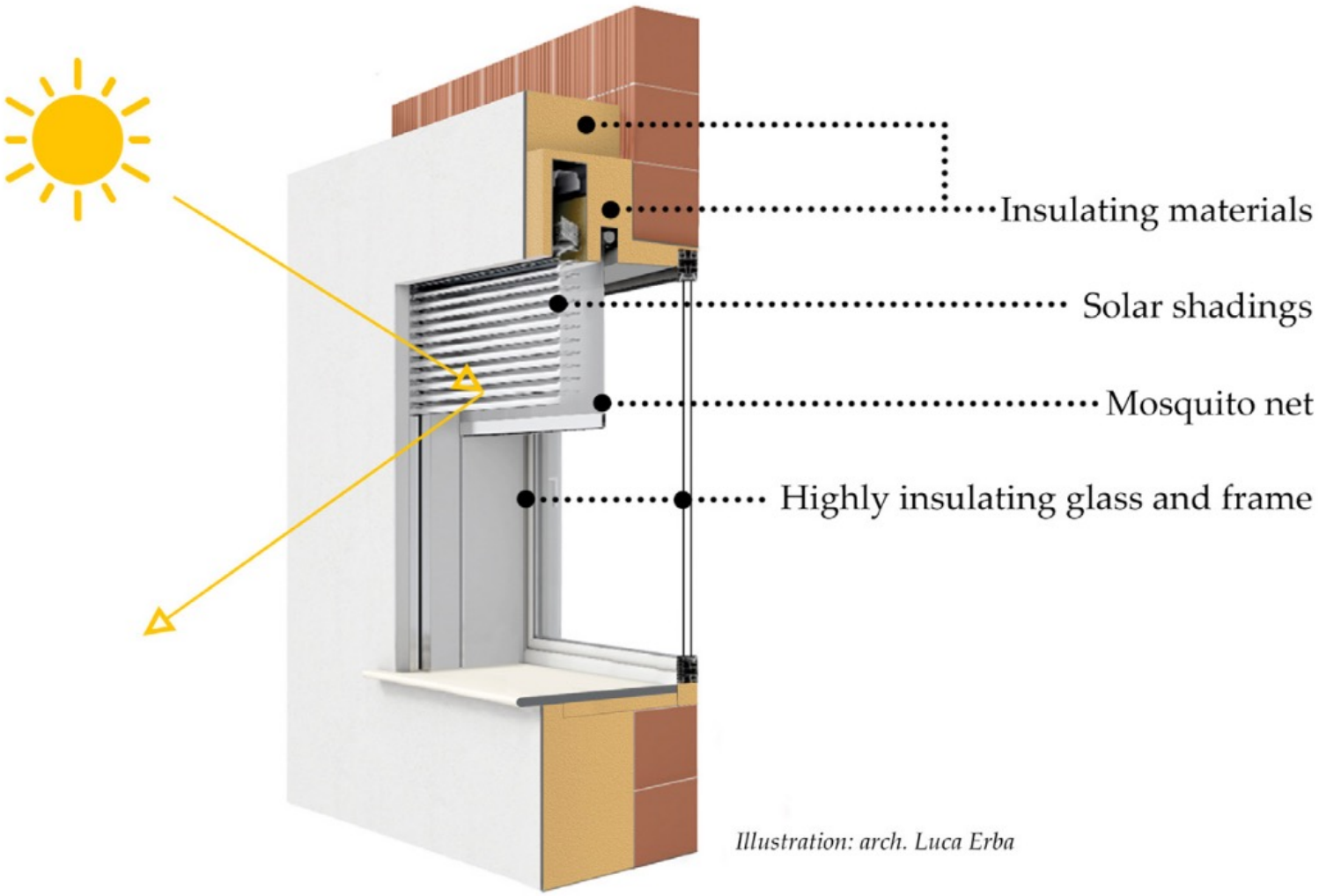
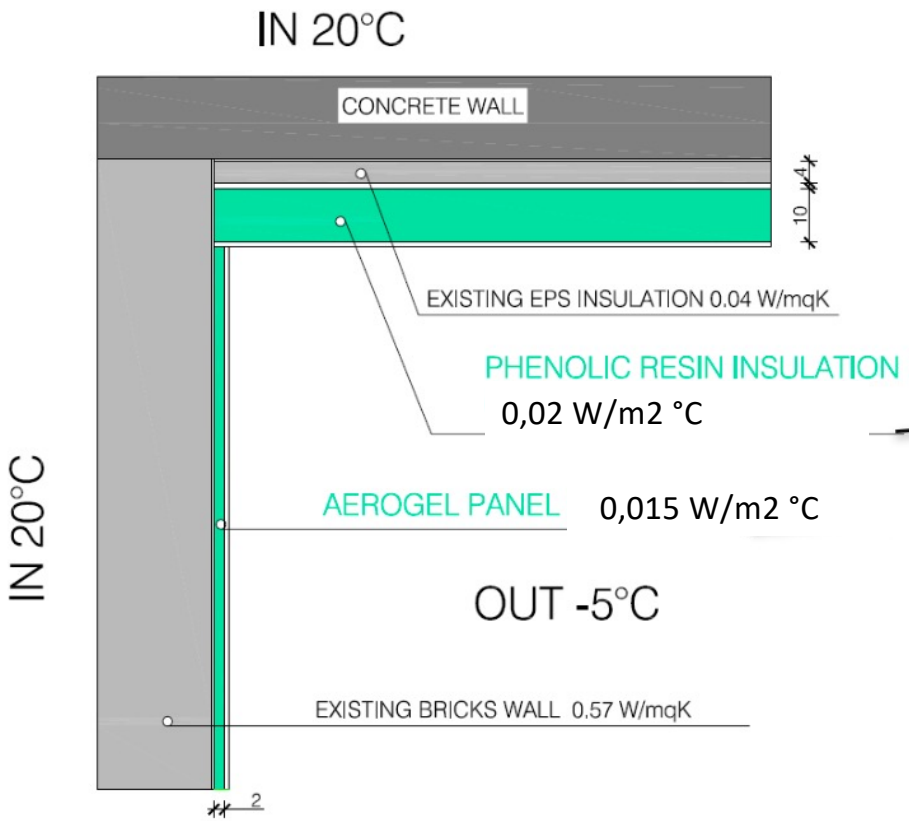


Illustration: arch. Luca Erba

Adapting insulation to available space



- Residents remained in their apartments through the work, since almost all work (except window nd blids replacement) was external

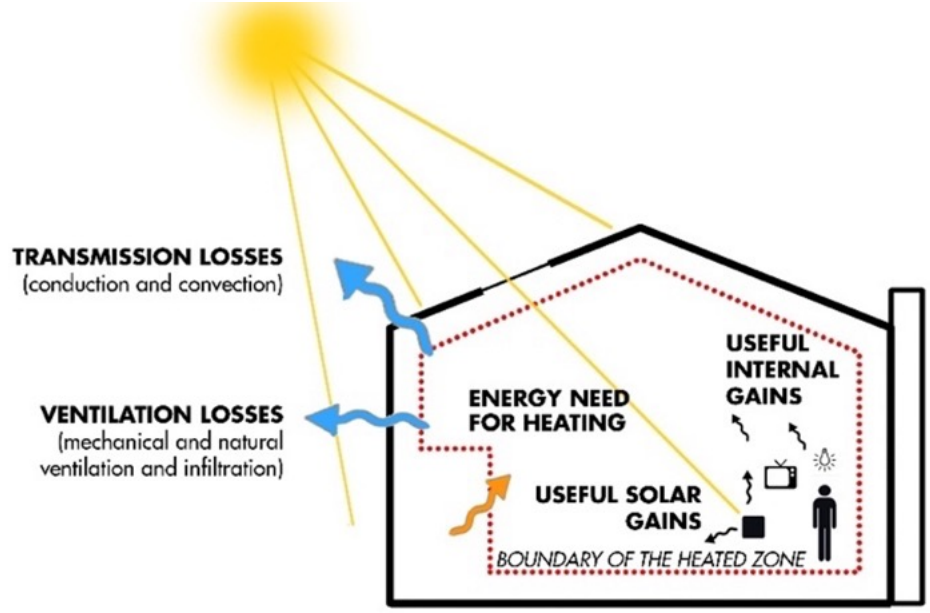
- Internal distribution piping untouched, radiators retained with addition of thermostatic valves

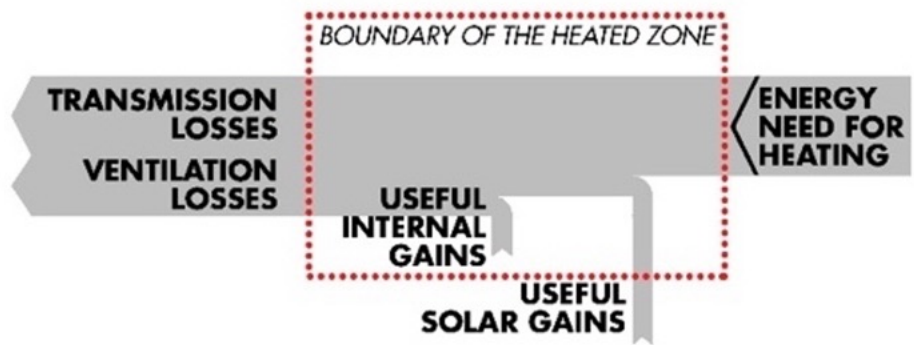
- Added Technical Building Systems:
  - double flow **mechanical ventilation with heat recovery** (80% efficiency)
  - **water to water heat pump** (1 water well capting water from underground, later fed into a nearby water canal), 116 kW thermal for the two buildings, about 33,7 W/m2
  - A **backup gas condensing boiler** (140 kW, oversized)
  - Some **solar thermal panels**

  - HP possible thanks to reduction of yearly energy needs and energy needs/second (heating power) from 400 to about 90 kW for the two buildings

Results: Energy savings at low cost

- "**Energy needs for heating**" reduced from 200 to 20 $kWh_{\_thermal}/m^2y$, from G to A2 rating
- Costs 400 - 500 €/m2, half paid by a National incentive scheme (energy saving obligation as foreseen in EED)





energy need for heating

heat to be delivered to a *thermally conditioned space*

to maintain the intended space temperature conditions

during a given period of time

Bonus:
- flexibility for using renewables when available
- thermal safety

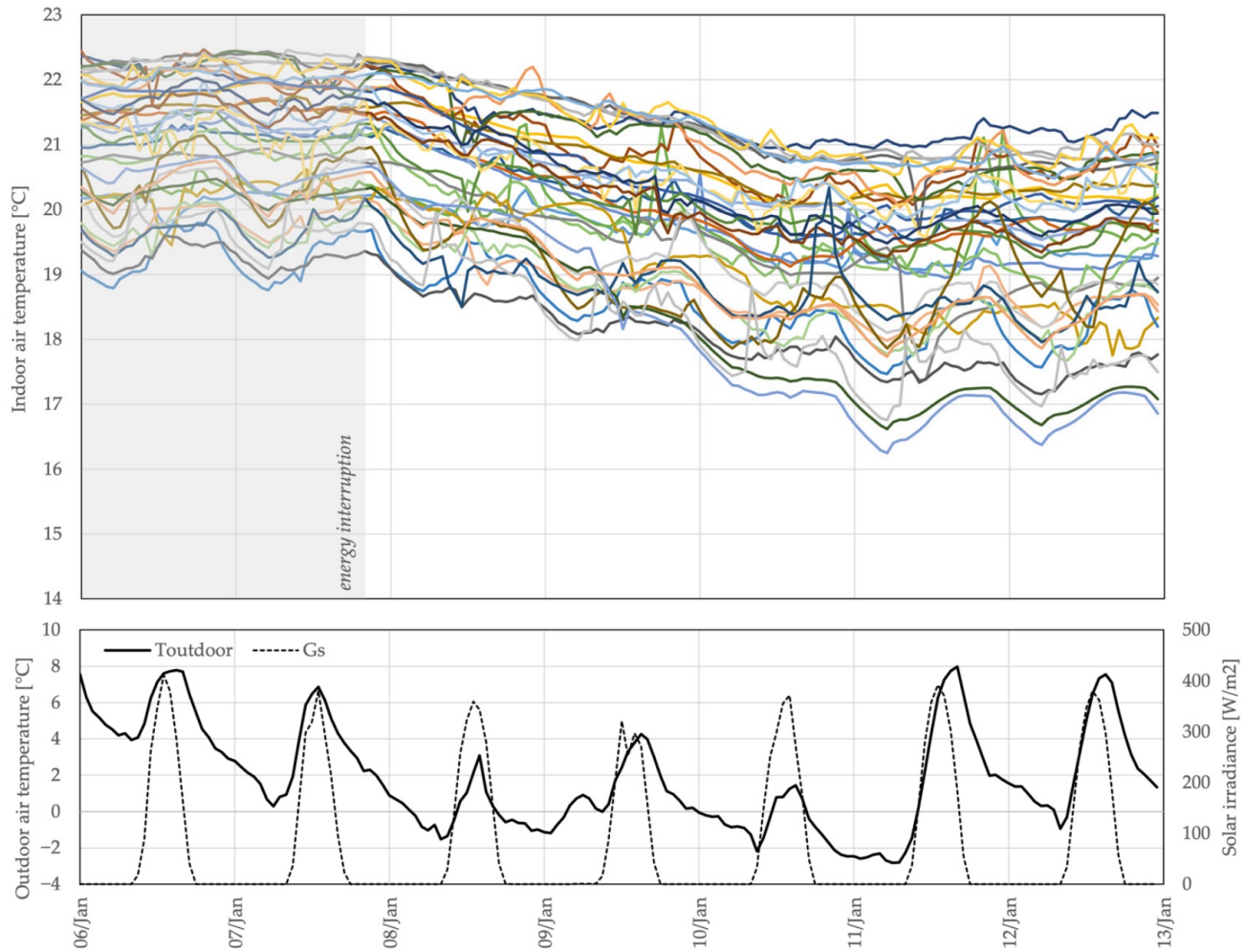
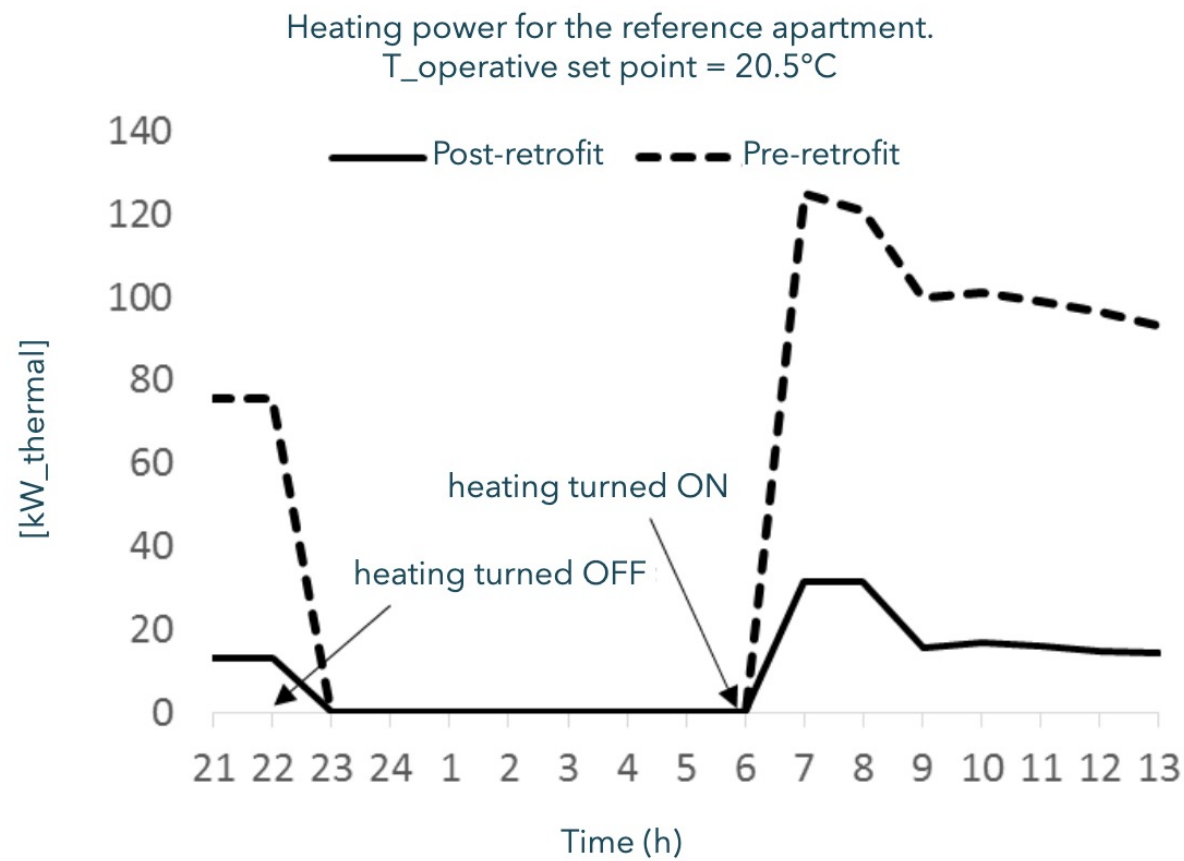


Figure 11. Upper part: Measured indoor air temperature in various apartments of the building during the January power outage (7 to 12 January 2022). Lower part: outdoor air temperature and global horizontal solar irradiance during the same days.

Bonus: heat pump possible and creating little burden to the grid at peak time



Bonus:
1 well
rather than 4

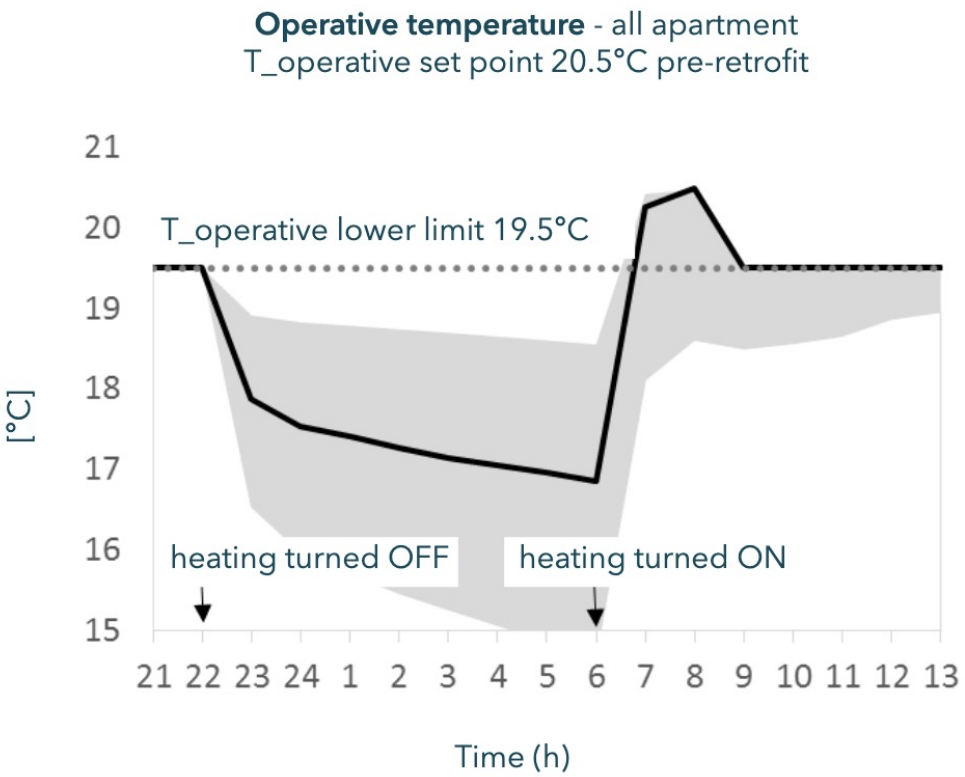
HP possible thanks to reduction of yearly energy needs and energy needs/second (heating power) from 400 to about 90 kW for the two buildings

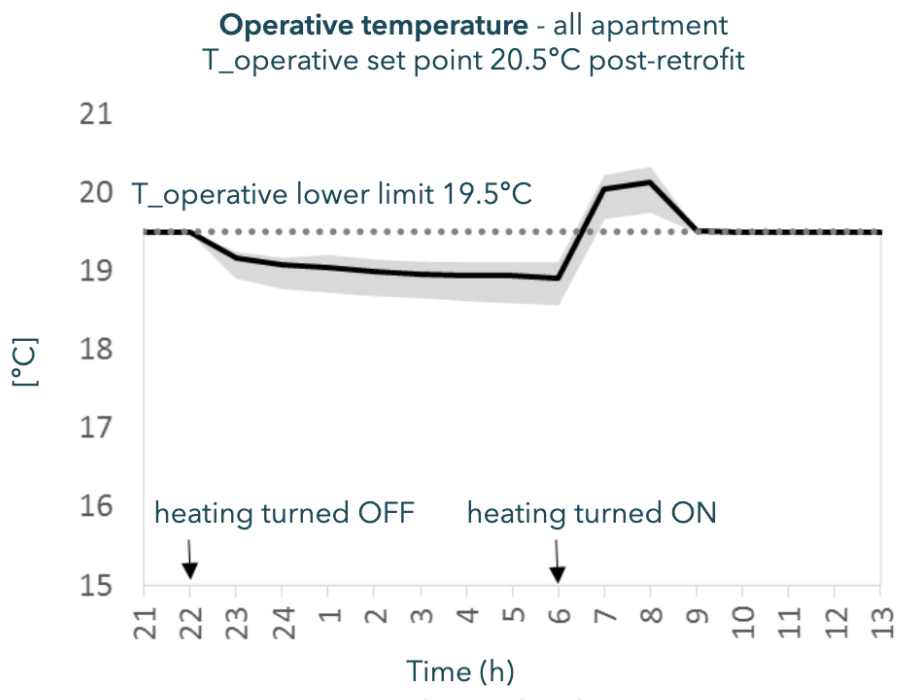
Geothermal wells drilling

Geothermal pipe in the well drilled

Geothermal probes plant

Bonus: uniform comfort



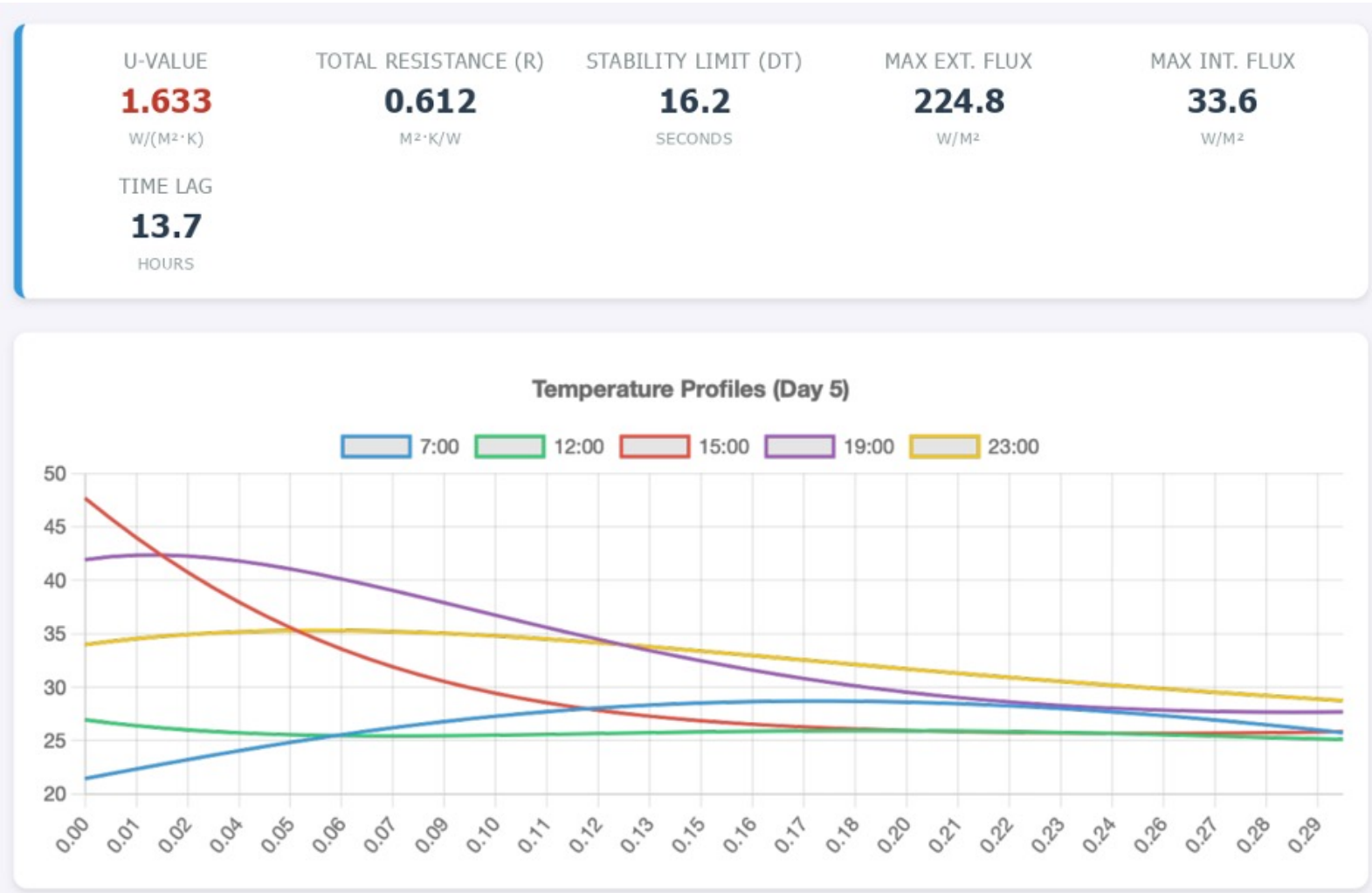


Bonus: Summer comfort obtained by solar protection and night ventilation, no AC.
Flexibility for integration of renewables

- Graph pending

External insulation does NOT cause overheatingit PROTECTS from overheating

Under dynamic summer conditions heat does not escape through walls, it can only be exported via ventilation




passo carrabile

Panel discussion

Moderated by Gearoid CARVILL

Co-Chair of the ACE Sustainable Architecture Work Group

Luca VOLPI
Societat Organica, presentation of the WikiHousing Barcelona projec

Mellis HAWARD
Director at Archio Ltd

Niki GAITANI
Associate Professor at the Dept. of Architecture and Technology, Norwegian University of Science and Technology (NTNU)

Lorenzo PAGLIANO
Professor at Politecnico di Milano, representative of the UN Environment Programme (UNEP) Member of the ACE Executive Board

Closing remarks

Judit KIMPIAN

ACE Executive Board Member
& Coordinator of the *"Achieving Quality in the Built Environment"* Thematic Area

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SUSTAINABLE ENERGY WEEK

COCKTAIL & CLOSING REMARKS

Anacláudia Rossbach
Executive Director, UN Habitat

Hanane Hafraoui
GlobalABC Lead, UNEP

16:30 -17:30 Rooftop Room

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Thank you for your attention!

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