Spanish Demonstration Site

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EXCESS

"A sustainable city should mobilise creative thought and technology in order to guarantee the future of humanity in this small planet of finite resources".

Cities for a small planet. Richard Rogers.

NIVALIS

SMART HEALTHY SOLAR CITY & LIVING LAB

U·rb atelier

NIVALIS will be the first **eco-friendly, sustainable and intelligent urban development** in Spain.

Nivalis aims to create a **100% renewable and self-supplying energy system, betting on sustainable mobility with zero carbon emissions.**

A place to **live, work, enjoy, learn and share knowledge**.

View of the central path of "NIVALIS Downtown". U·rb **/** Design

A strategic location in an exceptional enviromnment

Madrid - Granada
- 4h
- 2h 40 min.
- 1h 05 min.

Barcelona - Granada
- 8h
- 6h
- 1h 30 min.

Sevilla - Granada
- 2h 40 min.
- 3h

Málaga - Granada
- 1h 30 min.
- 2h 10 min.

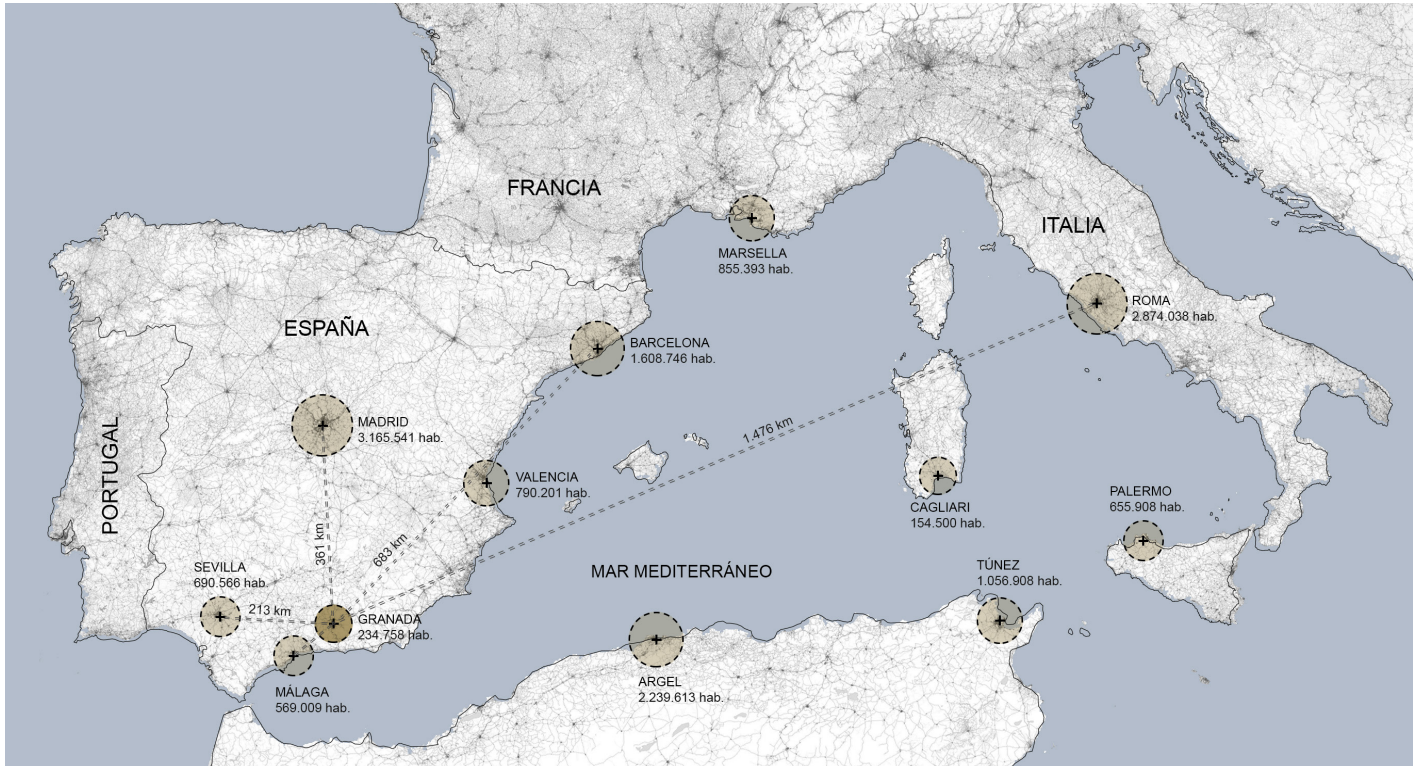
Granada downtown
- 20 min.

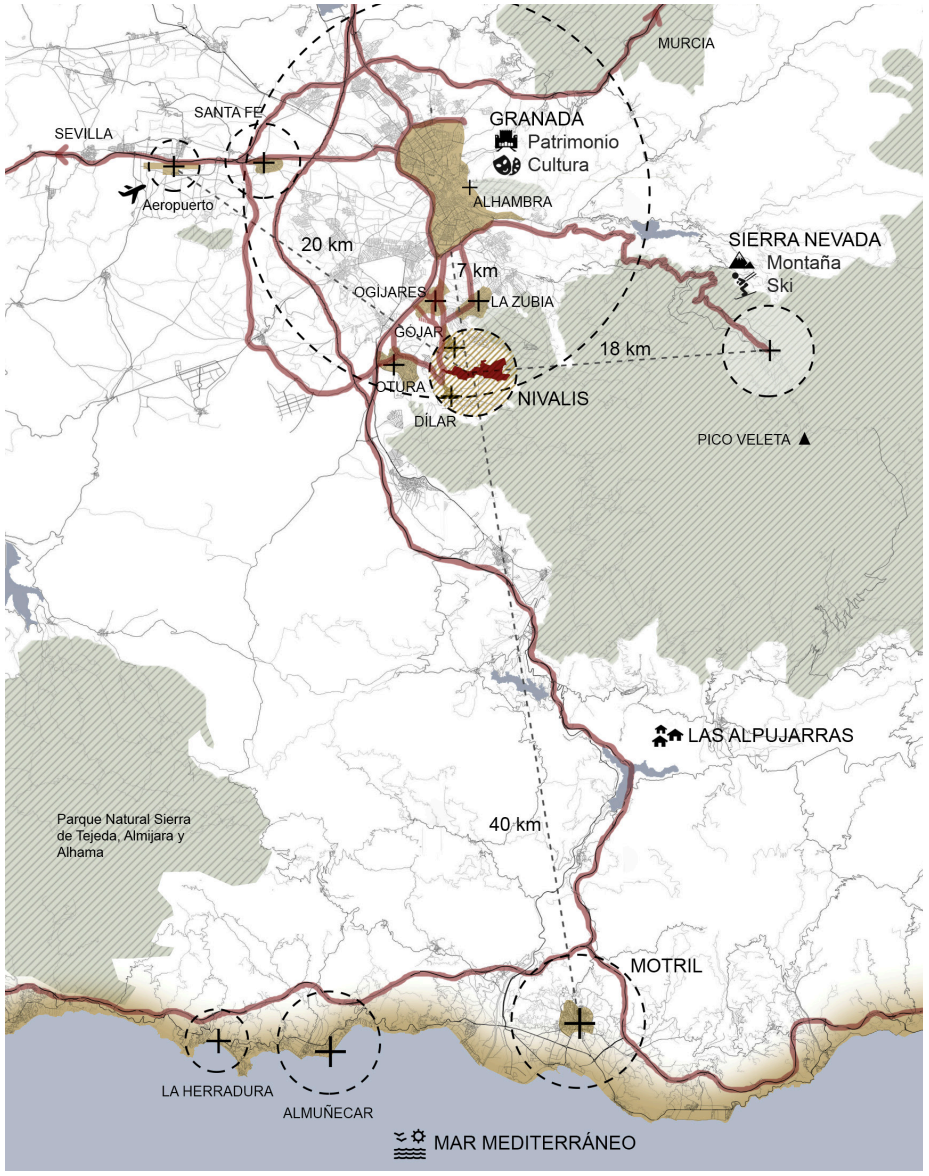
Airport
- 20 min.

La Alpujarra
- 35 min.

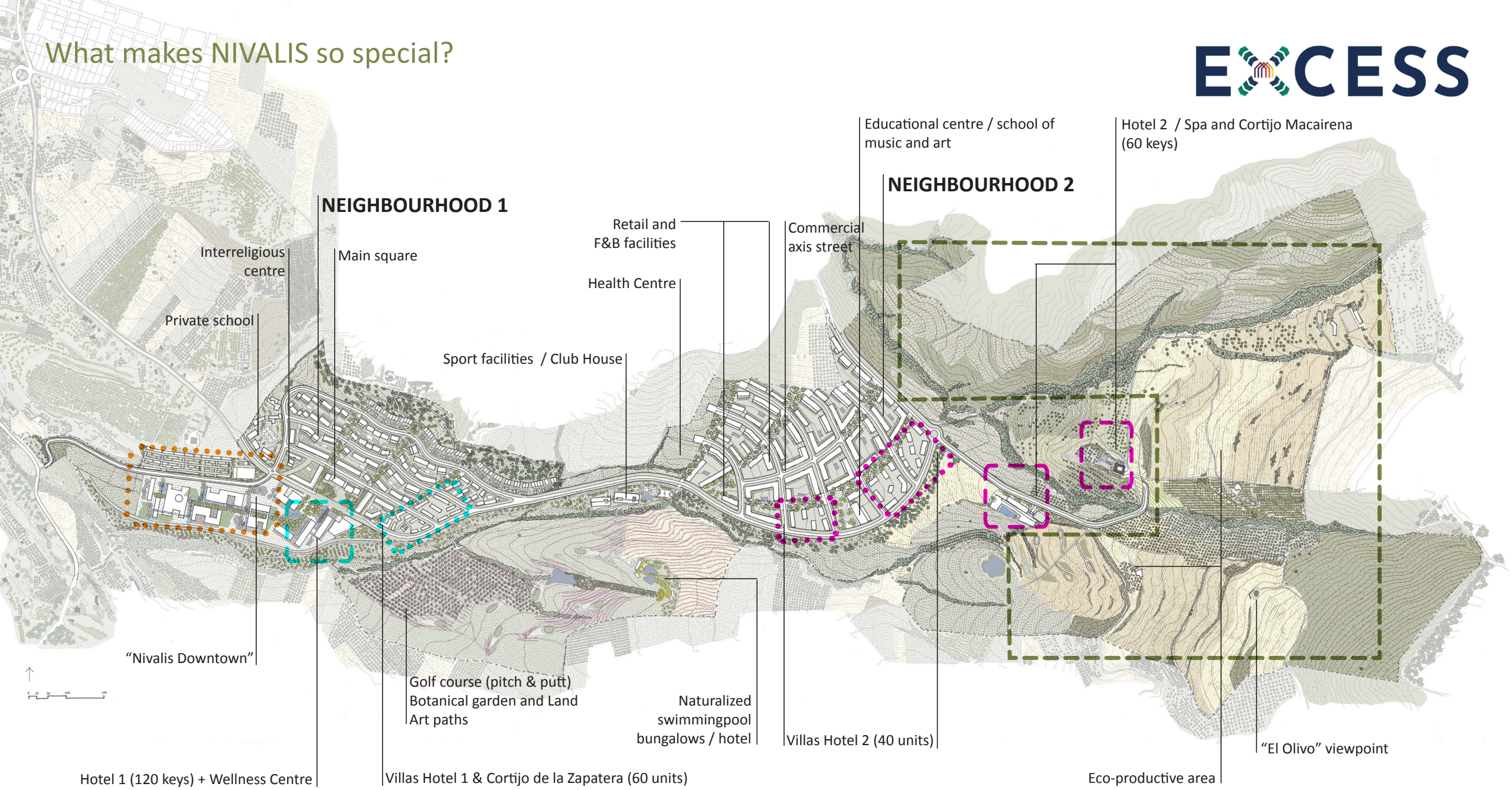
Sierra Nevada
- 40 min.

Mediterranean Sea
- 40 min.





What makes NIVALIS so special?



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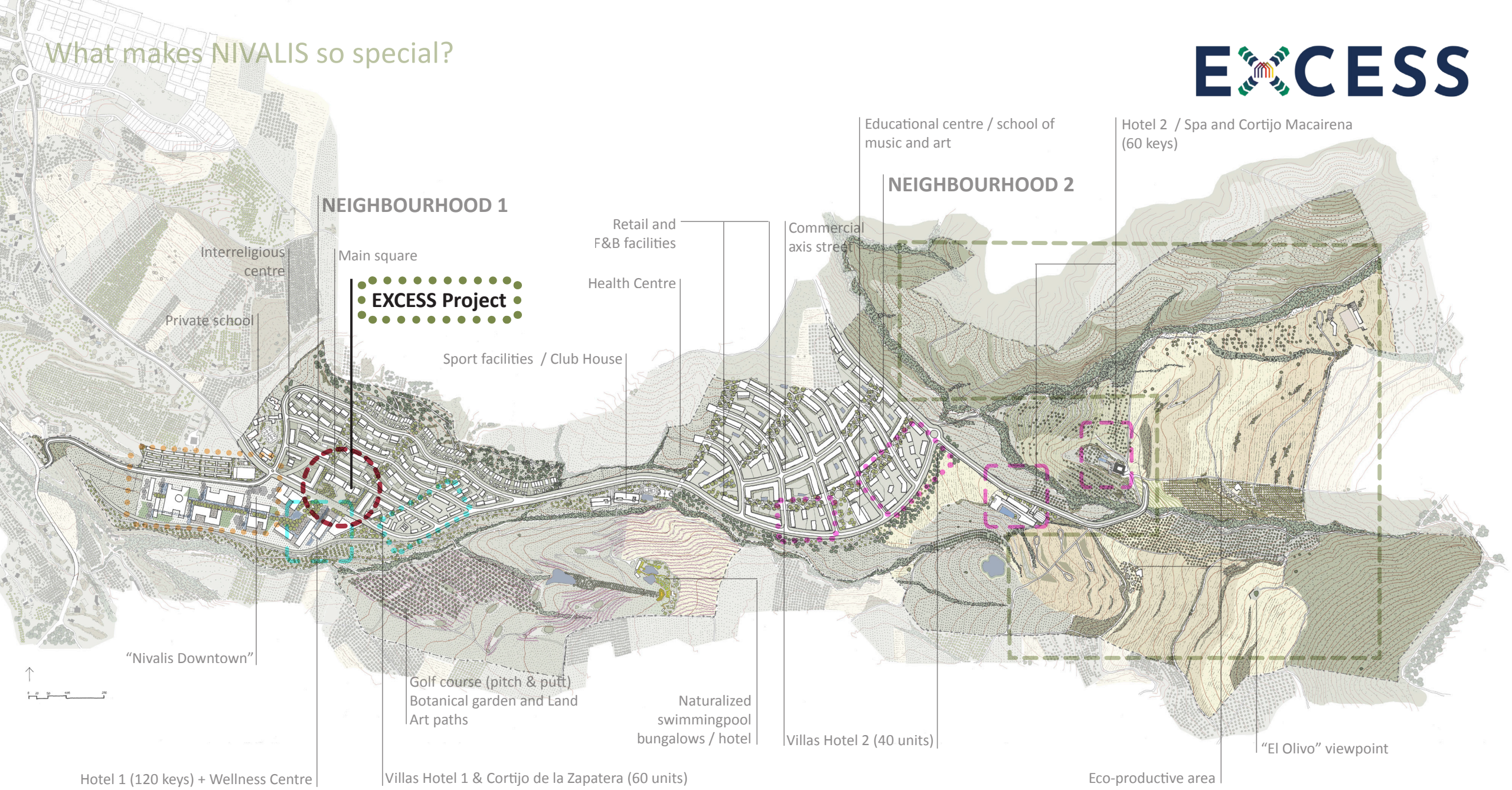


View from EXCESS building from the main square U·rb / Design guidelines

Main use: Residential

Nº of housing units: 31 units

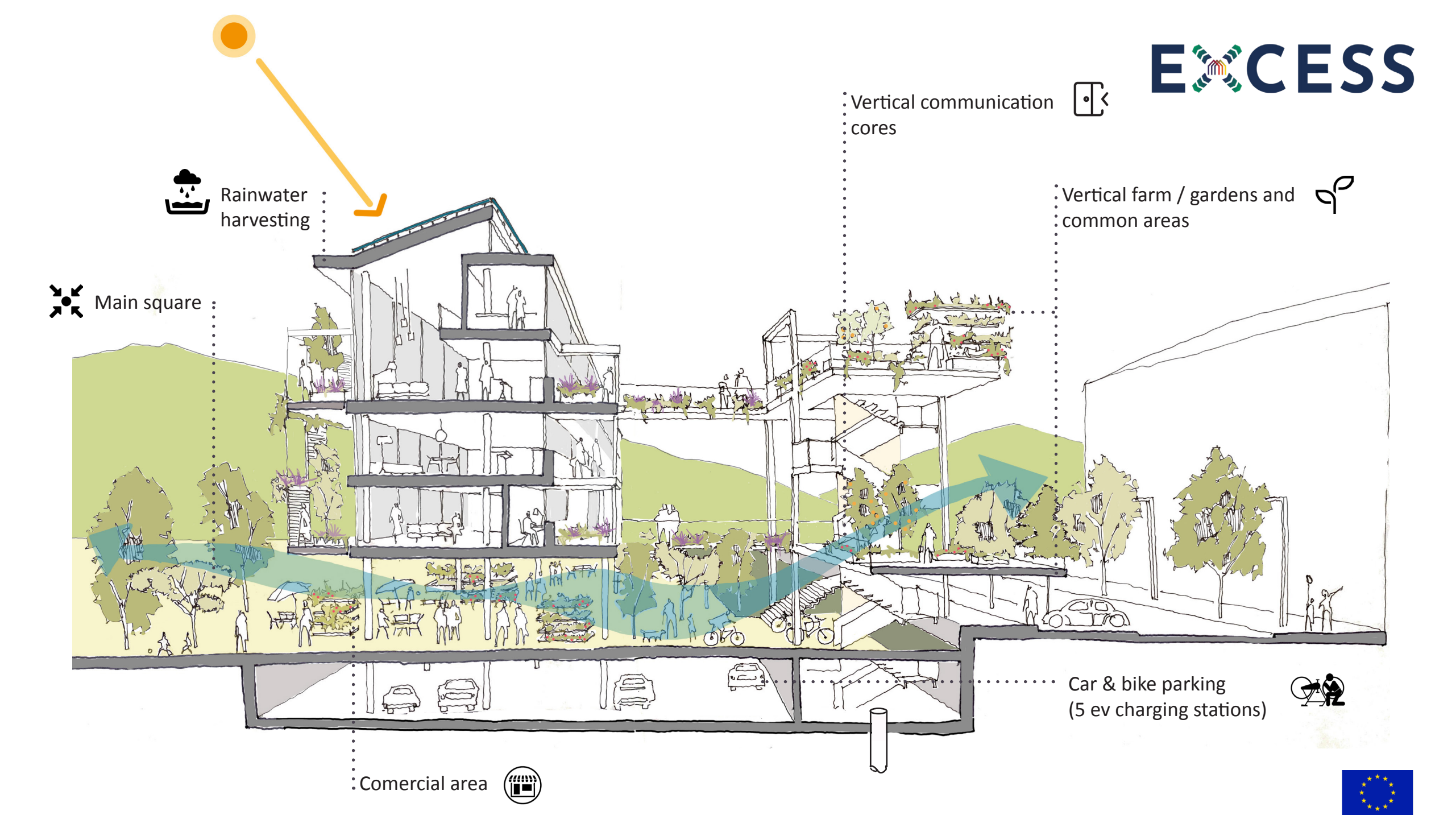
Plot area: 2.928,22 m²

Max. Buildability.: 4.537,59 m² + groundfloor

Residential: 3.681,09 m²

Comercial: 856,50 m²

View from EXCESS building from the main square U-rb / Design guidelines

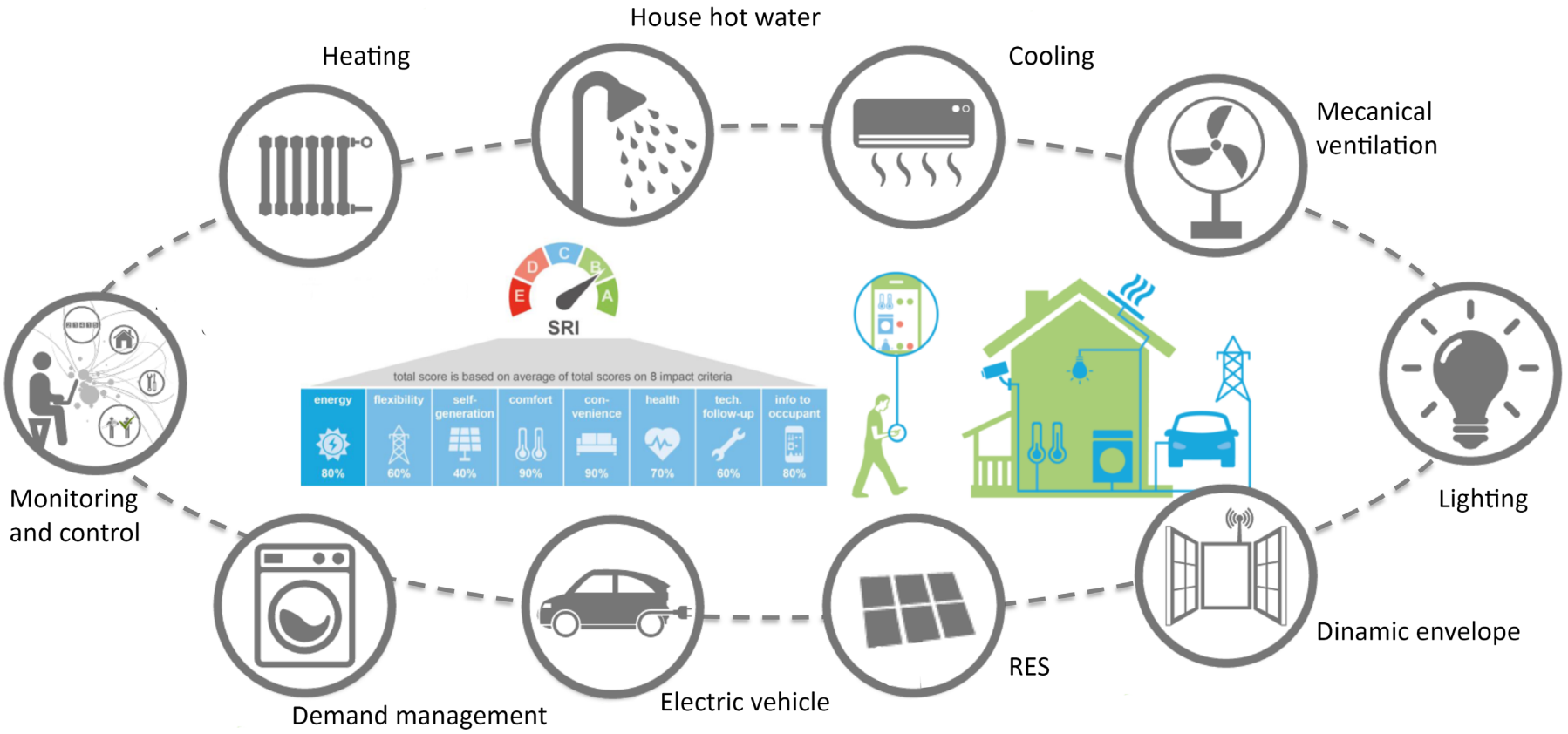

Rainwater harvesting
Main square
Vertical communication cores
Vertical farm / gardens and common areas
Car & bike parking (5 ev charging stations)
Comercial area

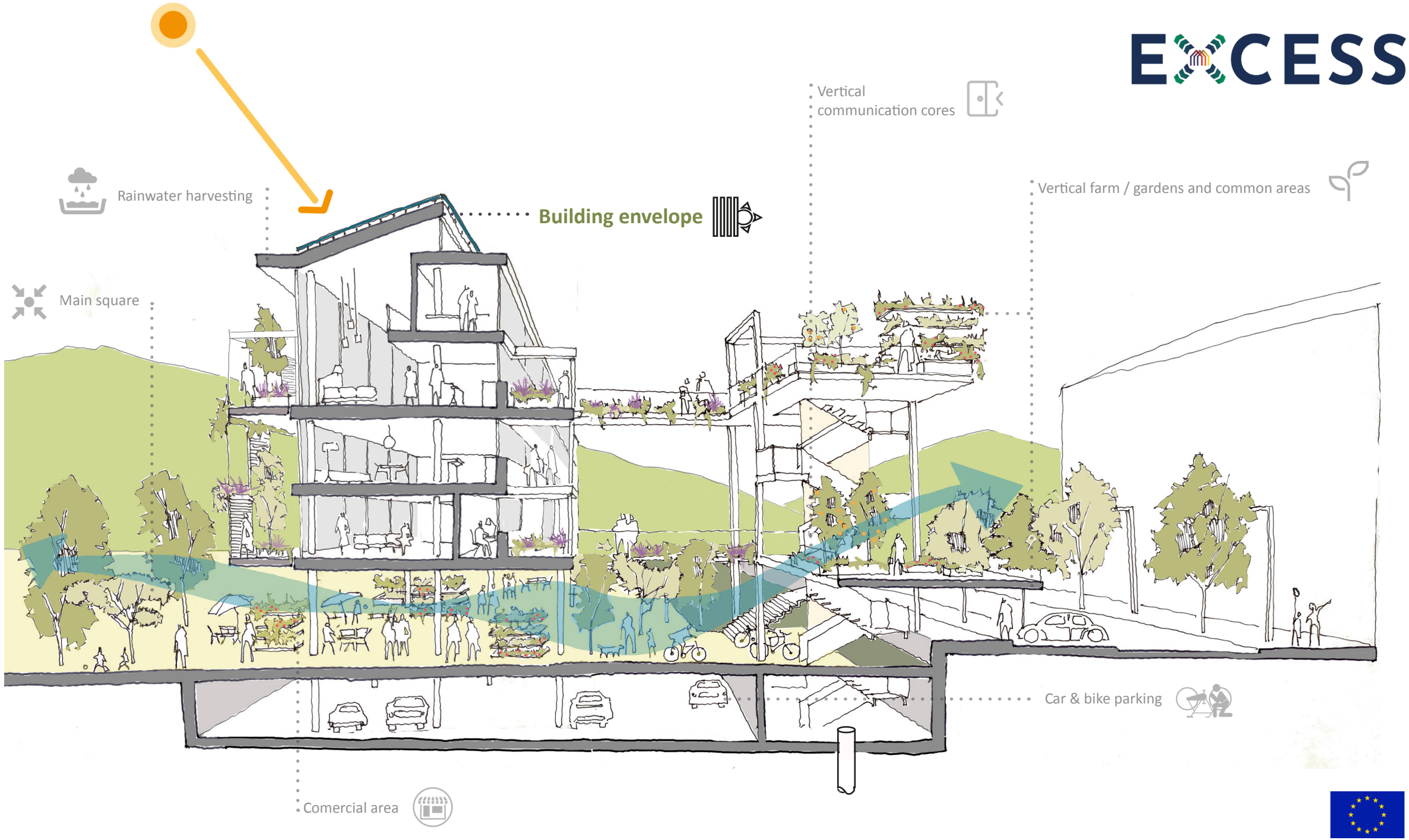
View from the groundfloor and the productive areas. U·rb / Design guidelines

EXCESS PEB CONCEP - SPANISH DEMO

- M**inimize the building thermal demand** (passive and active solutions), and optimize the sizing and working of the thermal generation system.

- **Maximize the electricity production** provided by PV panels




Rainwater harvesting
Main square
Comercial area
Building envelope
Vertical
communication cores
Vertical farm / gardens and common areas
Car & bike parking

Building envelope

- **High insulated envelope** --> thermal characteristics defined in the table below
- **External shading control** --> Motorized blinds

ENVELOPE			WINDOW		
FAÇADE [U (W/m²K)]	ROOF [U (W/m²K)]	GROUND FLOOR [U (W/m²K)]	GLAZING [U (W/m²K)]	GLAZING [g]	FRAME [U (W/m²K)]
0.17	0.16	0.22	0.9	0.55	1.1

Envelope Definition. Source: Nivalis Design Guide (CENER)

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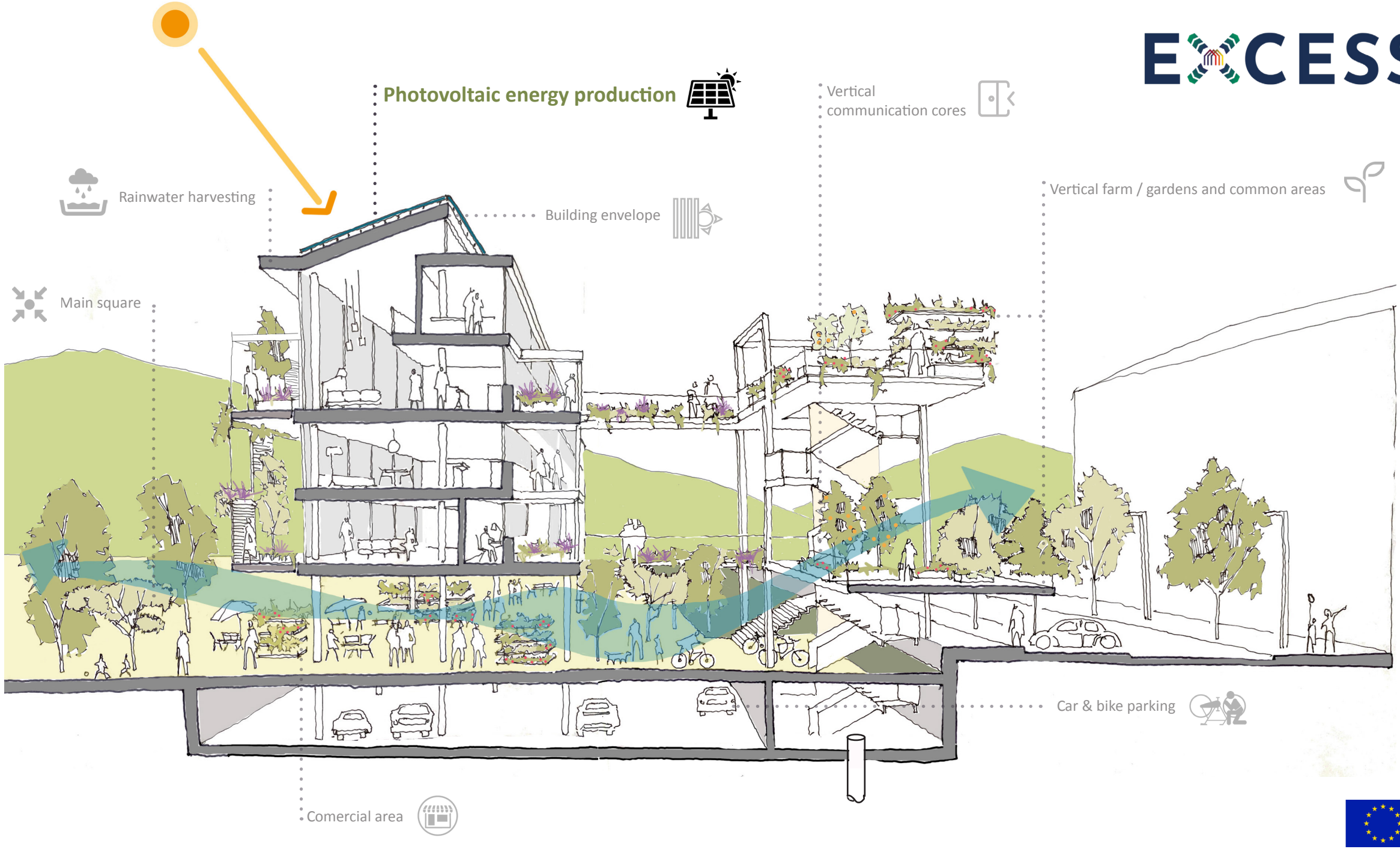
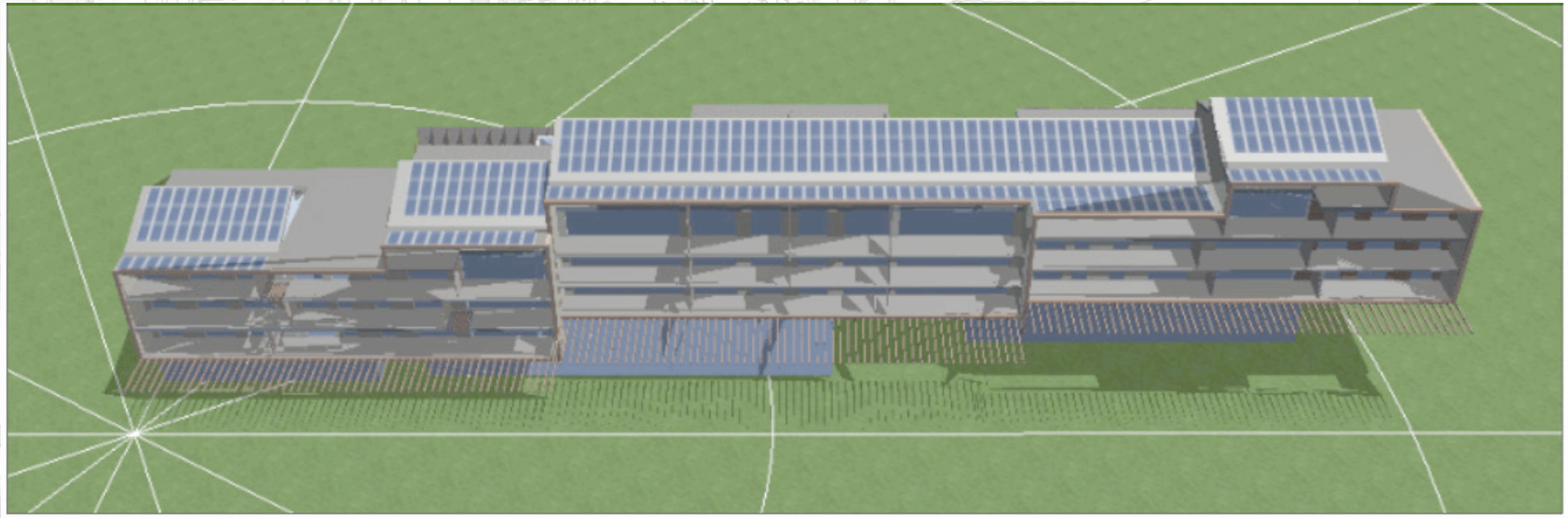

Photovoltaic energy production
Vertical communication cores
Rainwater harvesting
Building envelope
Vertical farm / gardens and common areas
Main square
Car & bike parking
Comercial area

Photovoltaic energy production

- It's the **main source for renewable power generation** of this PEB
- Around 700 m^2 of roof are needed
- **50-52 kWh/m^2 year** (residential buildability)
- **Lithium - ion batteries** will be incorporate
- An **Energy Management System** will be installed



Virtual 3D Recreation of BIPV in Spanish Demo Building. Source: CENER (PV

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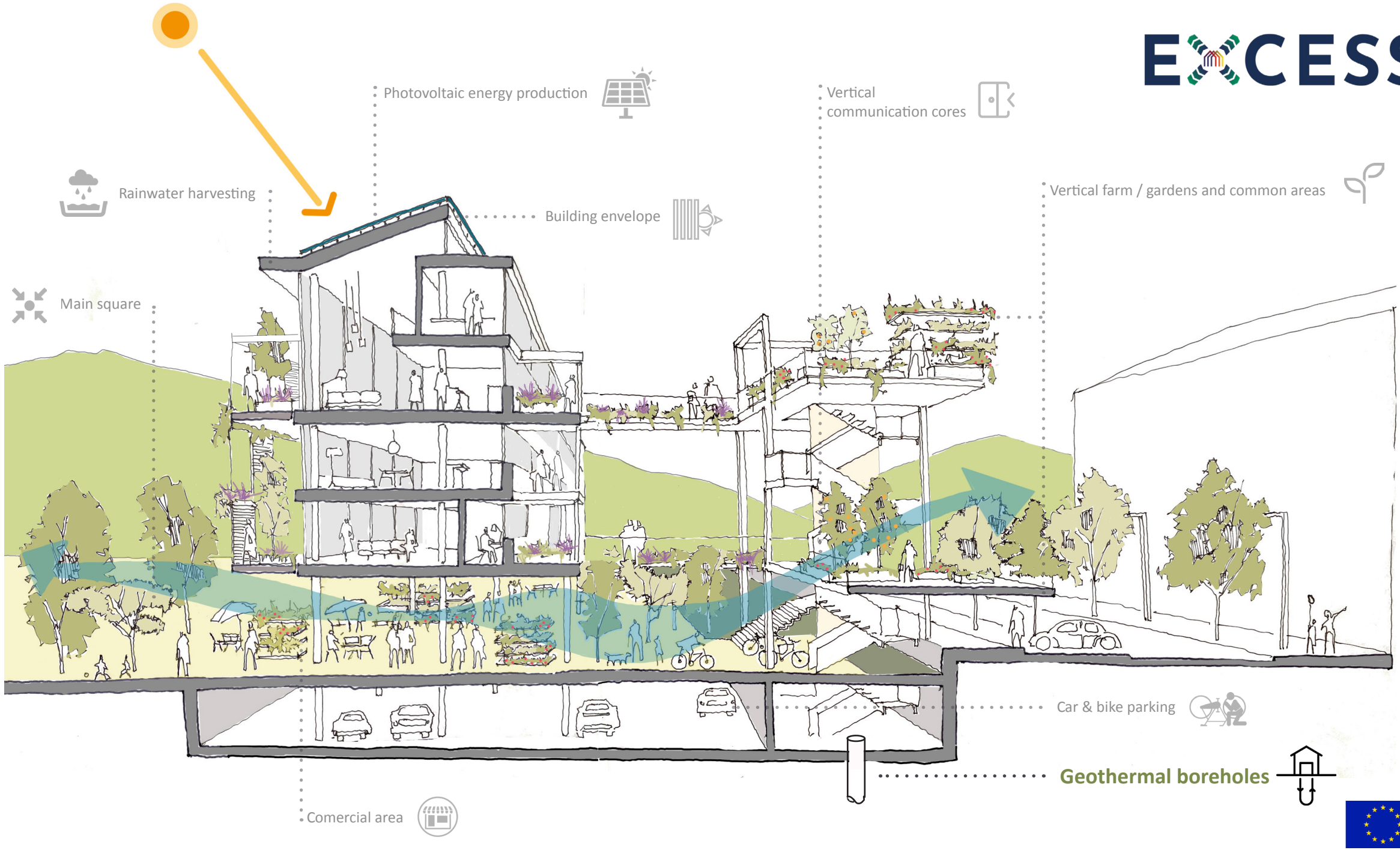
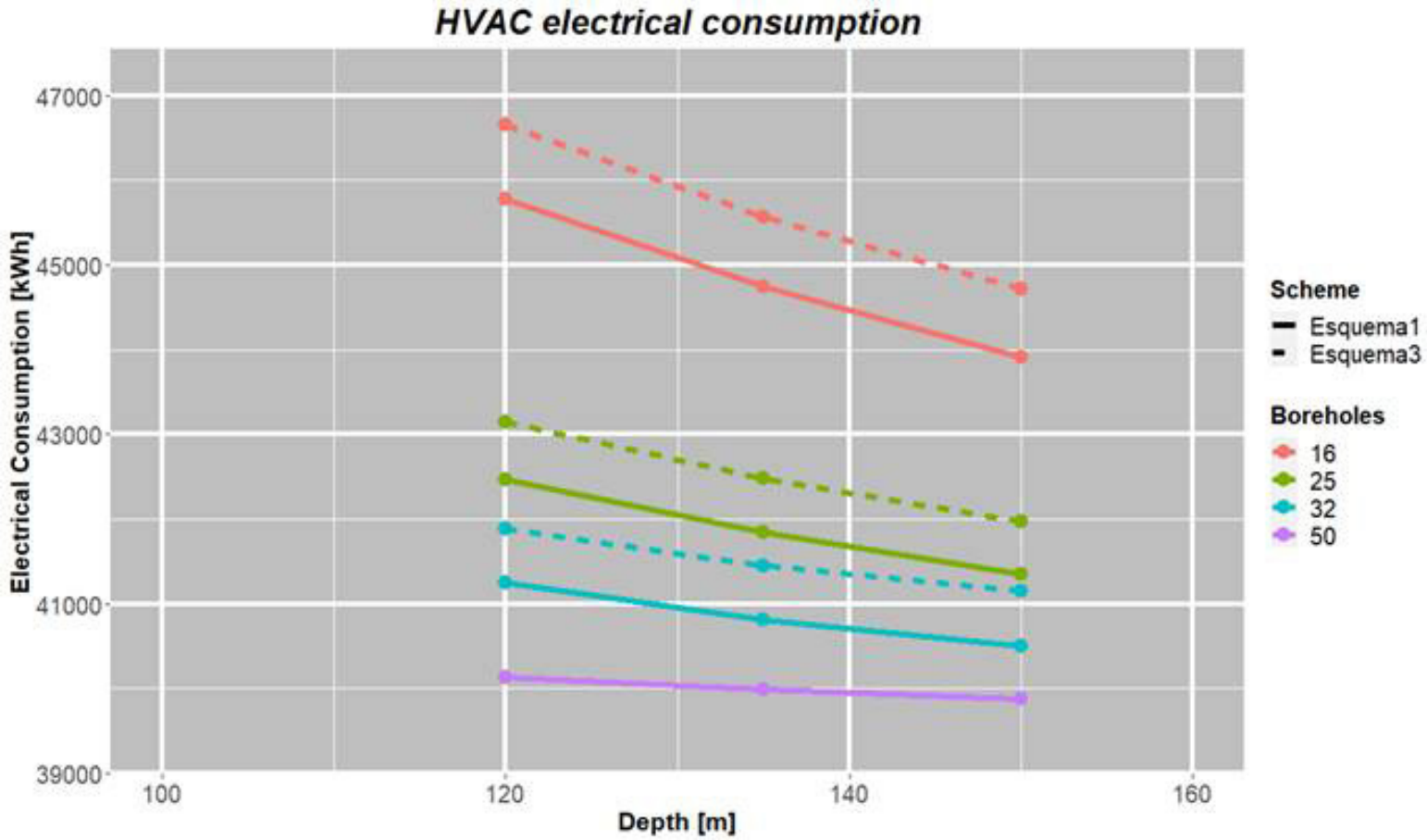

Photovoltaic energy production
Vertical
communication cores
Rainwater harvesting
Vertical farm / gardens and common areas
Building envelope
Main square
Car & bike parking
Geothermal boreholes
Comercial area

Thermal generation systems

- The heating & cooling system will be **water-based floor heating with low water design temperatures**
- **2 Schemes** of thermal generation system:
  - Heating, Cooling and DHW demands --> supplied by **two GSHP**
  - One **GSHP** for Heating & Cooling **+ an Aerothermal HP** for DHW (in summer)
- **16 / 25 boreholes** - 150 m of depth



Thanks!

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