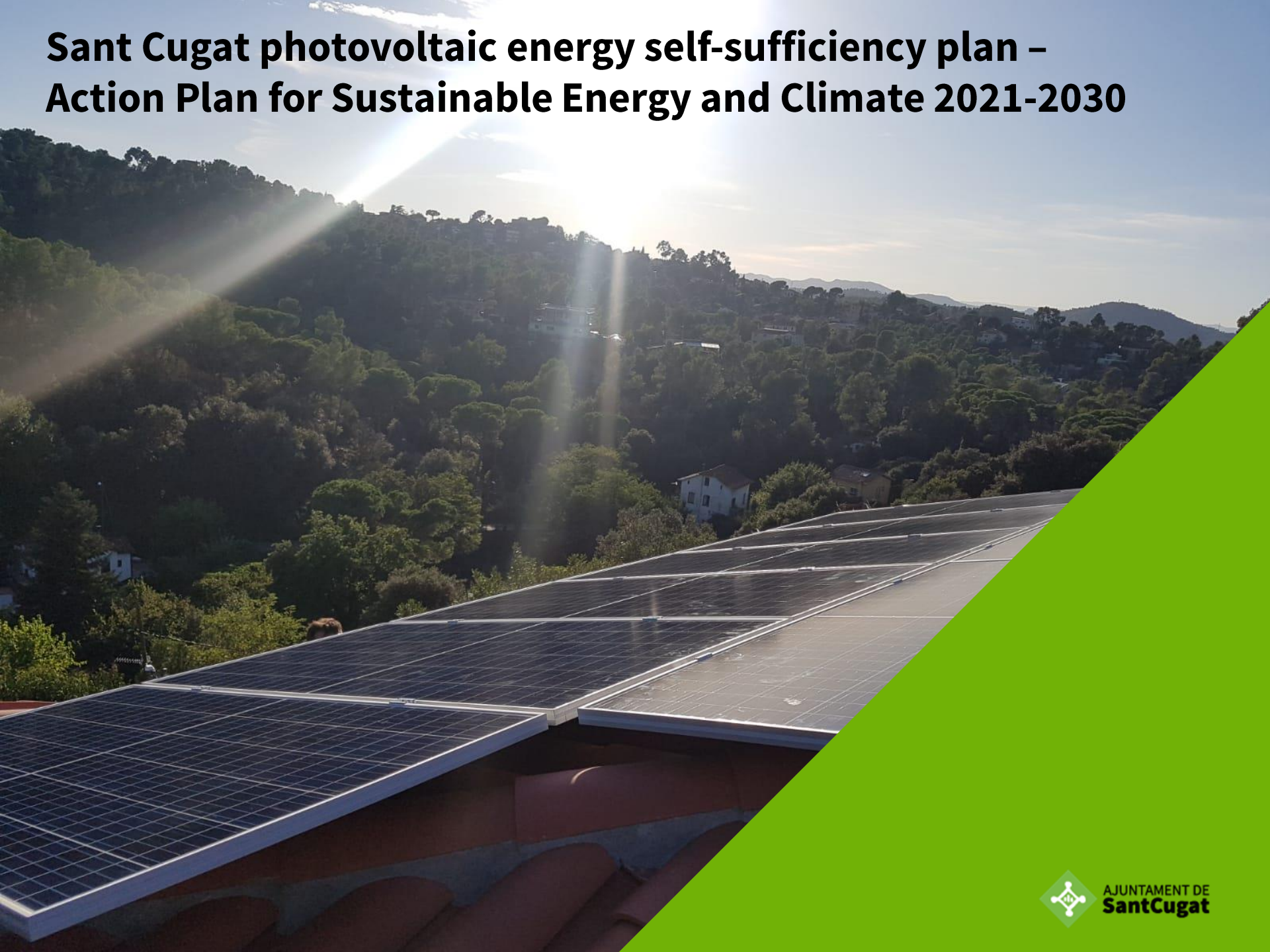
Sant Cugat photovoltaic energy self-sufficiency plan – Action Plan for Sustainable Energy and Climate 2021-2030



AJUNTAMENT DE SantCugat

Local challenges for solar self-consumption

PAESC 2030 in Sant Cugat (*local plan SECAP Covenant of Mayors*)

1. A deployment of renewable energies in the municipality of 27% with respect to the final energy consumption of the entire municipality.
2. A reduction of 62.5% in greenhouse gas CO2 emissions with respect to 2005
3. 62 mitigation and adaptation actions to be implemented in the city (energy an water transition, mobility, waste reduction, biodiversity, cultural transition)

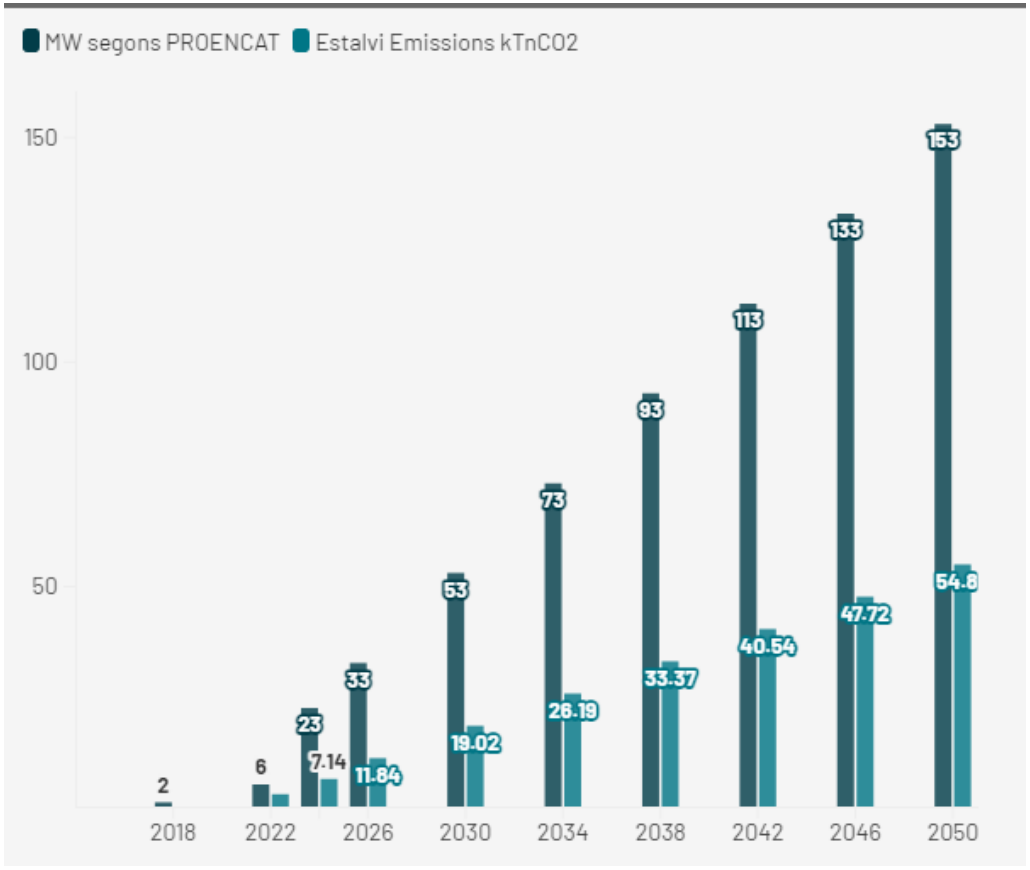
Taula 5.1.1. Indicadors existents i proposta de fites a assolir el 2030. S'indica si els indicadors fan referència al Pla de mitigació (M) o al Pla d'adaptació (A).

	Àmbit PEC	Indicadors	Valor a 2019	Fita a 2030	Motivació
M	Transversal	Emissions de GEH per càpita en l'àmbit PAESC (t CO_{2eq}/hab)	4,5 * (valor del 2018)	2,2	Reducció del 62,5% respecte el 2005, d'acord amb el PAESC.
M	Transició energètica i aigua	Reducció del consum d'energia final a l'àmbit PAESC respecte el 2005	12%	32,5%	La UE demana una millora de l'eficiència energètica de com a mínim el 32,5%
M	Transició energètica i aigua	% de consum d'energia renovable respecte el consum energètic final de tot el municipi	1,3%	27%	Valor proposat pel CADS, d'acord amb l'Agenda 2030.
A	Transició energètica i aigua	Mitjana del consum d'aigua domèstica per habitant i dia (litres/habitant dia)	131,99	110	Valor proposat pel CADS, d'acord amb l'Agenda 2030.
M	Mobilitat sostenible	Reducció de les emissions per càpita associades al	1,4	0,58	Reducció del 62,5% respecte el 2005, d'acord amb el

Local challenges for solar self-consumption

PROENCAT 2050 in Sant Cugat (*Catalonia's government plan*)

1. Deployment of renewable energies in the municipality of **50%** of the final energy consumption of the entire municipality.
2. It foresees a self-consumption of **153 MW** on roofs but also on the ground.
3. It is expected to reduce the consumption of buildings with their rehabilitation.



Why PV photovoltaic solar energy in buildings?

- To reduce emissions and mitigate the effects of climate change
- To reduce energy dependence and price energy fluctuations
- To empower citizens reducing family expenses
- To produce Km0 green electricity
- To electrify buildings

PAESC Actions developed in the municipality:

Phase 1- 2020 -2024

1. Implementation of ***IBI (real state tax) /ICIO(construction and building works tax) incentives*** for voluntary PV systems
2. La Teulada "***The roof***" Office Opening to boost PV systems
3. Execution of PV/Biomass/Geothermal installations for municipal facilities

Phase 2- 2025 -2030

1. **5 MW per year**: keep promoting PV shared systems in multifamily buildings
2. Promoting **CEL-Local energy Communities**: Mirasol Neighbourhood
3. Refurbishment online tools for buildings

Phase 3- 2031 -2050

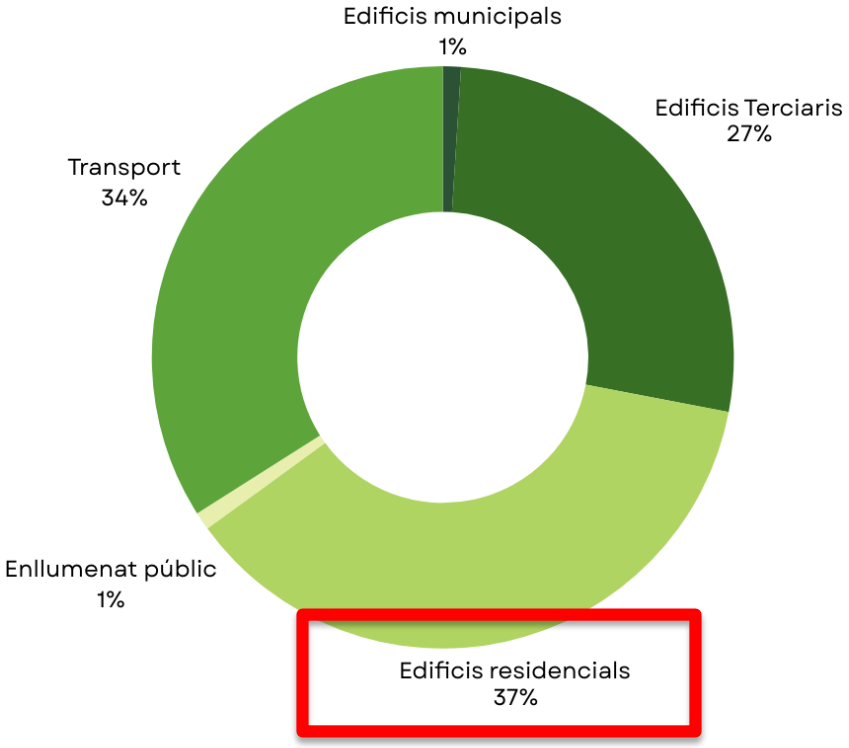
1. Refurbishment Spanish national plan
2. Electrifying buildings

PAESC Actions developed in the municipality:

Phase 1- 2020 -2024

1- Implementation of IBI (real state tax) /ICIO(construction and building works tax) incentives for voluntary PV systems

37% of CO2 emissions in the municipality are due to energy consumption in homes (including domestic hot water)



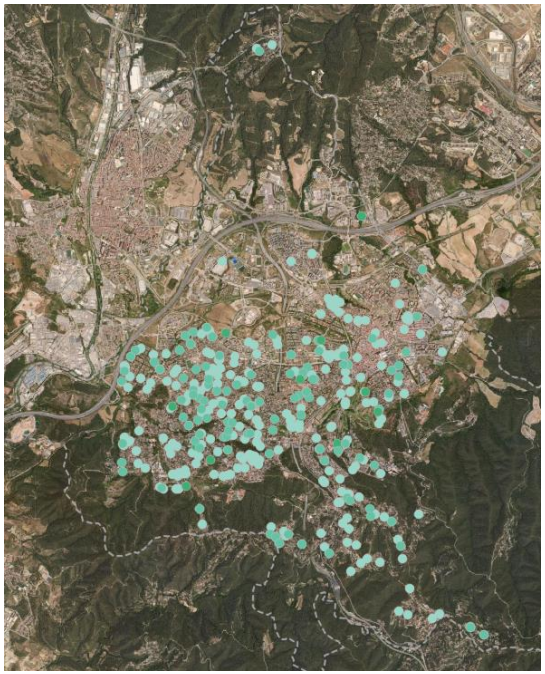
PAESC Actions developed in the municipality:

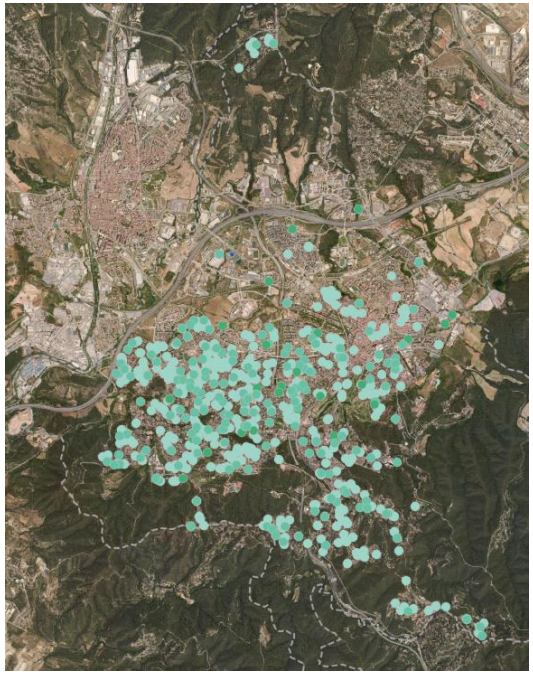
Phase 1- 2020 -2024

AJUNTAMENT DE SantCugat

1- Implementation of IBI (real state tax) /ICIO(construction and building works tax) incentives for voluntary PV systems

2016-2020- 417 PV systems-2,4MW **2021- 749 PV SYSTEMS– 4,35MW** **2022- 1128 PV SYSTEMS- 9,97MW**



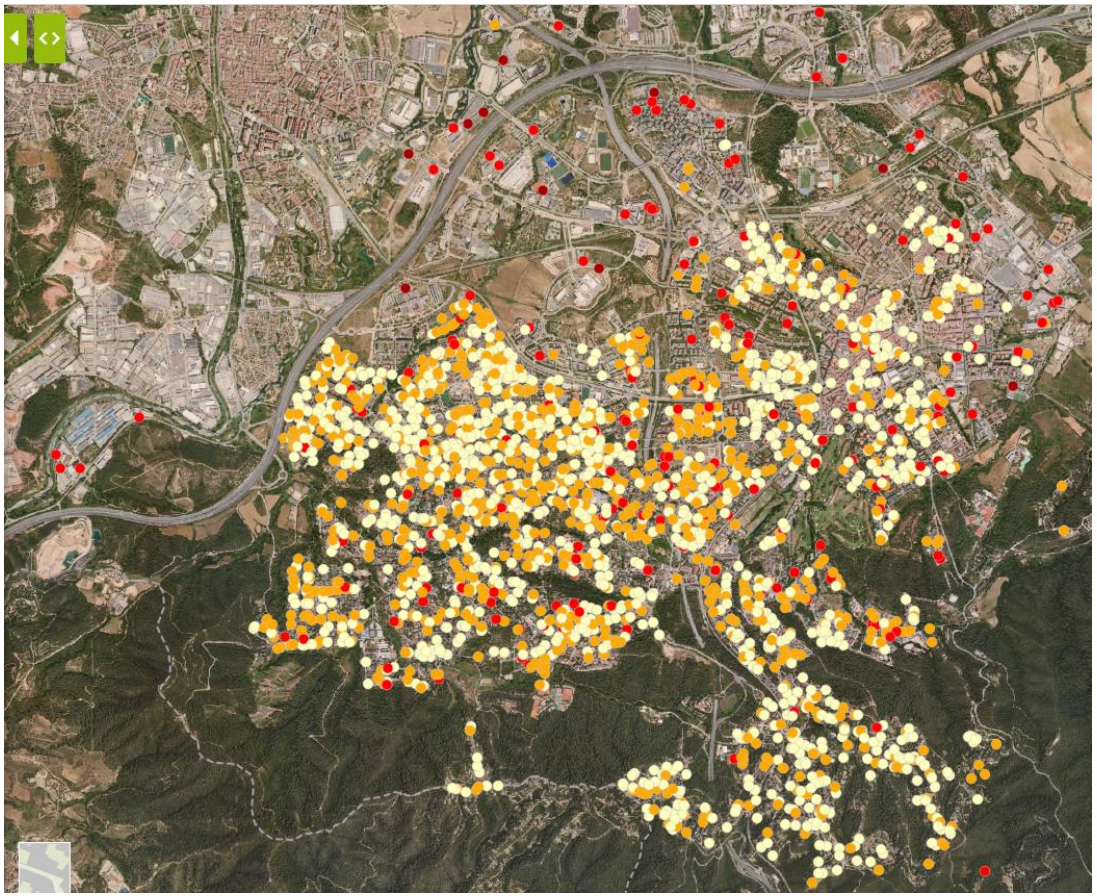


PAESC Actions developed in the municipality:

Phase 1- 2020 -2024

1- Implementation of IBI (real state tax) /ICIO(construction and building works tax) incentives for voluntary PV systems

2024 – 2945PV SYSTEMS- 23MW



Llegenda

- Fins a 5 kW
- Fins a 10 kW
- Fins a 100 kW
- Més de 100 kW

Instal·lacions d'autoconsum fotovoltaic a Sant Cugat : Dades procedents de la Generalitat de Catalunya (actualitzades a març de l'any 2022)

Metadades

Informació
Localització de les instal·lacions d'autoconsum fotovoltaic.

Dades procedents de la Generalitat de Catalunya

Enllaç geoservei
https://geociutat.santcugat.cat/apps/giscube-admin/layerserver/geojsonlayers/ma_fv_2024

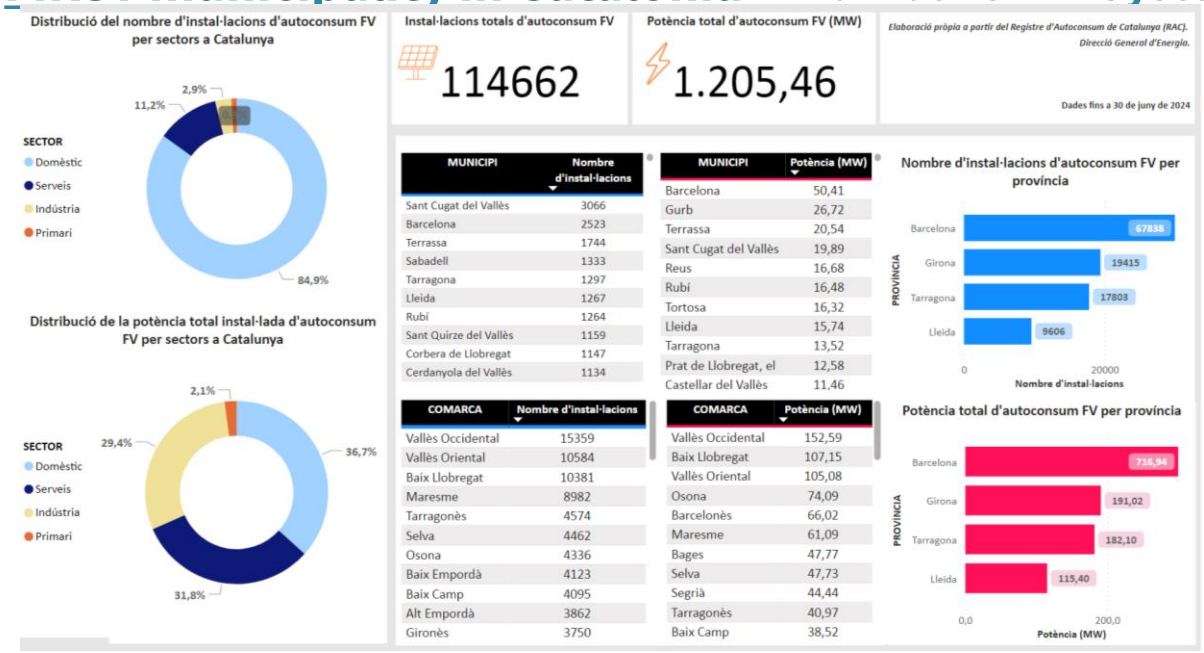
Tipus GeoJSON

PAESC Actions developed in the municipality:

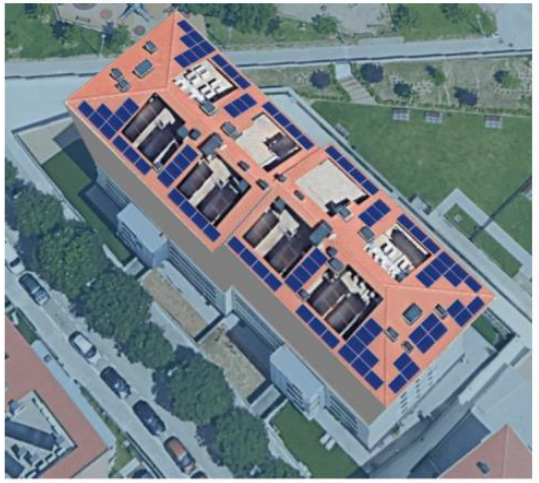
Phase 1- 2020 -2024

1- Implementation of IBI (real state tax) /ICIO(construction and building works tax) incentives for voluntary PV systems

- FIRST municipality in Catalonia in number of PV Systems installed:



Distribución 80 módulos

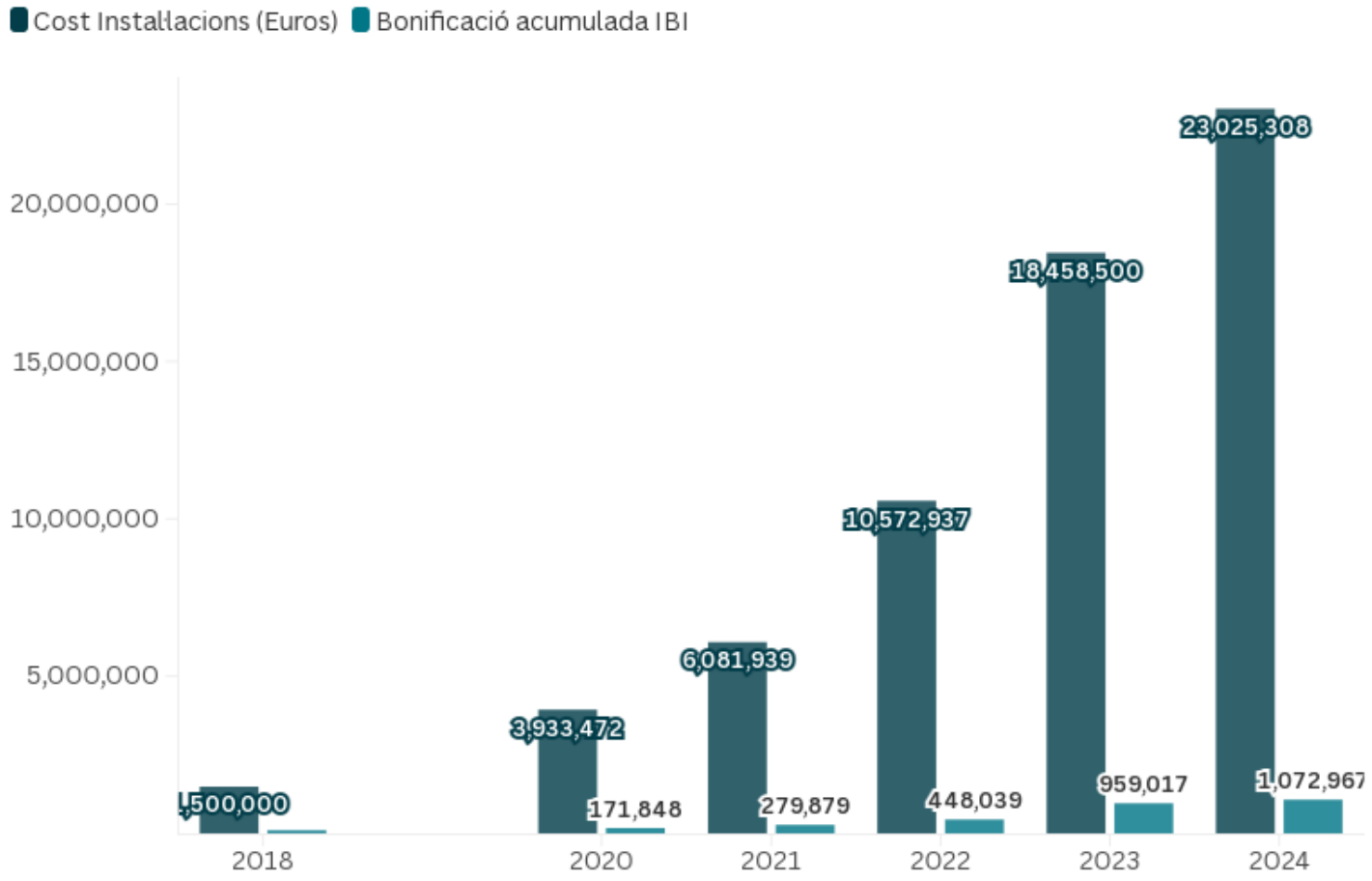


- **3066 PV systems** in private and public buildings *(june2024)*
- **23 MW** of TOTAL installed power *(goal 153 MW in 2050)*
- Electricity production Km0: **31740 MWh/Year**
- **6%** of the municipality's electricity consumption
- 8,25 kTnCO2 saved
- We reduce cost of energy for the citizens

PAESC Actions developed in the municipality:
Phase 1- 2020 -2024

1-Implementation of IBI (real state tax) /ICIO(construction and building works tax) incentives for voluntary PV systems

Total costs of PV systems carried Vs total amount of IBI bonus:

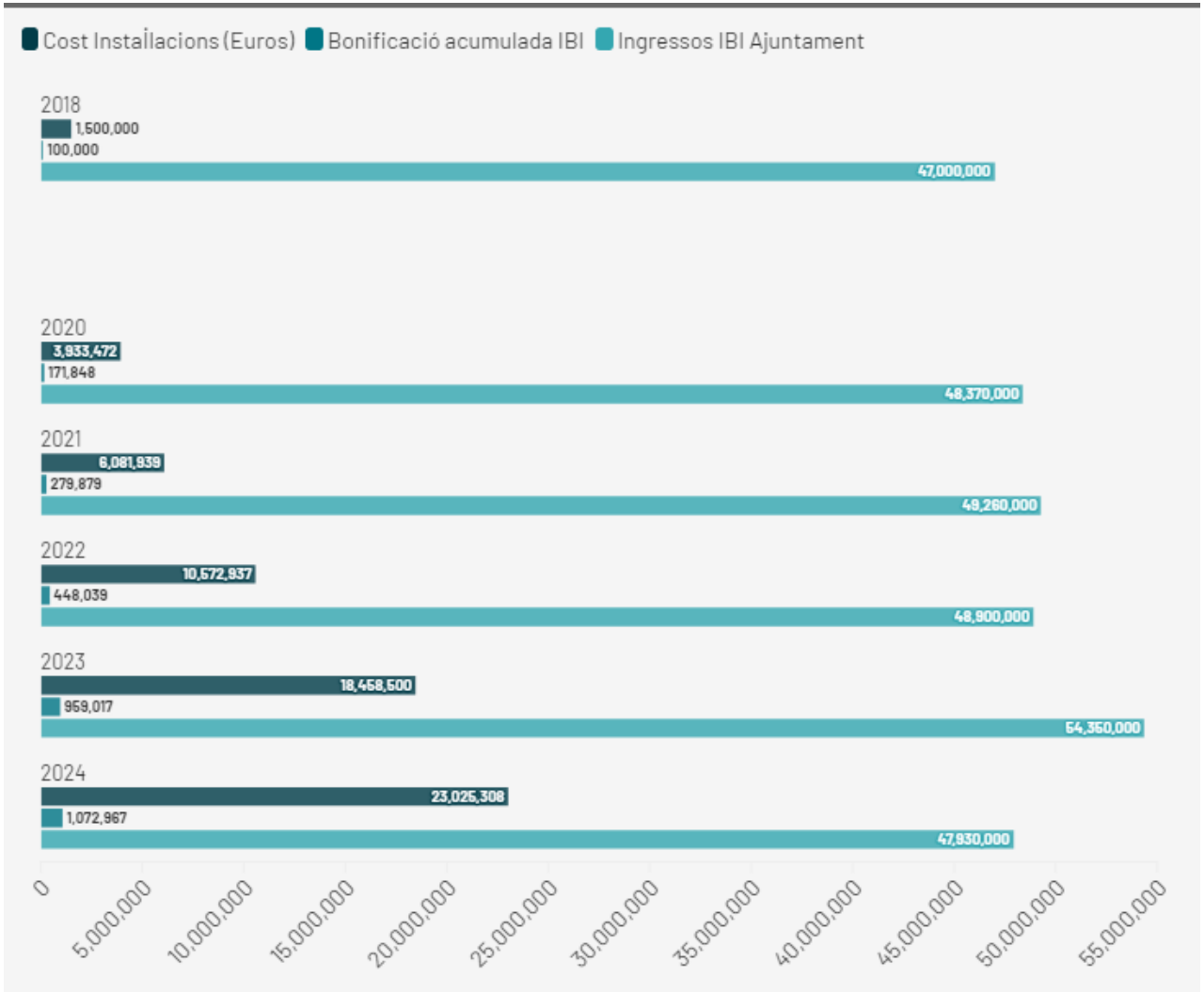


PAESC Actions developed in the municipality:
Phase 1- 2020 -2024

AJUNTAMENT DE SantCugat

1-Implementation of IBI/ICIO/tax incentives for voluntary PV installations in buildings

Impact of the solar IBI bonus on total IBI annual income in the municipality:



PAESC Actions developed in the municipality:
Phase 1- 2020 -2024

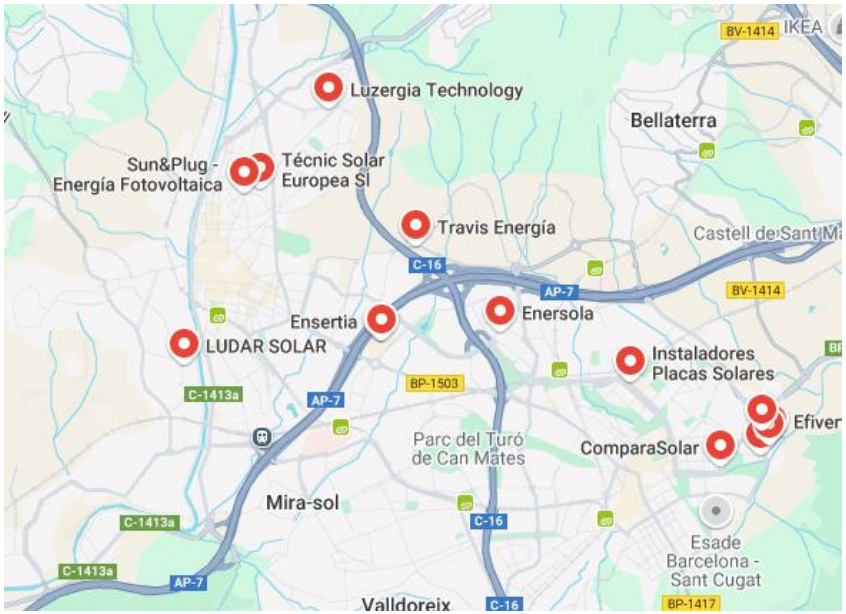
1-Implementation of IBI (real state tax) /ICIO(construction and building works tax) incentives for voluntary PV systems

Boosting Local Green Economy

- Support for solar panel installations strengthens local companies:
  → +15 installers, suppliers, and service providers

- Over 3,000 systems installed (until Mar 2025)→ €23M in turnover for the sector

- ***Solar growth = new jobs*** and clean tech innovation in Sant Cugat



PAESC Actions developed in the municipality:
Phase 1- 2020 -2024

AJUNTAMENT DE SantCugat

1-Implementation of IBI (real state tax) /ICIO(construction and building works tax) incentives for voluntary PV systems

Improving the purchasing power of citizens:
Electric self-consumption reduces dependence on the grid and generates savings on the electricity bill: 3.500 kWh × 0,2 €/kWh = **700 €/year**

Year	PV in new buildings/ 700 € savings/year	Nº years	Savings in energy bills €
2020	500*700€=350.000€	5	1.750.000 €
2021	300*700€=210.000€	4	840.000 €
2022	920*700€=644.000€	3	1.932.000€
2023	900*700€=630.000€	2	1.260.000€
2024	300*700€=210.000€	1	210.000€
total	2920 homes	5 years	5.992.000 €

€6M saved across 2,920 homes in 5 years

Families reinvest savings in local goods and services
→ **Boosts local economy and commerce**

PAESC Actions developed in the municipality:
Phase 1- 2020 -2024

1-Implementation of IBI (real state tax) /ICIO(construction and building works tax) incentives for voluntary PV systems

Calculation of Economic and Environmental Return (Green ROI)

Utilitzem la fórmula:

$$GreenROI = \frac{\text{Benefici Ambiental} + \text{Impacte Econòmic Indirecte}}{\text{Pèrdua d'Ingressos Municipals}} \times 100$$

Substituint valors:

$$GreenROI = \frac{(160.000€ + 2.250.000€)}{1.875.000€} \times 100 = 128$$

Green ROI: (968.042,50 € + 5.992.000 €) / 2.931.747,87 €

Green ROI=237

Return on Public Investment

For every €1 not collected by the City Council, **€2.37** is returned in **economic and environmental benefits** for the city

PAESC Actions developed in the municipality:
Phase 1- 2020 -2024

AJUNTAMENT DE SantCugat

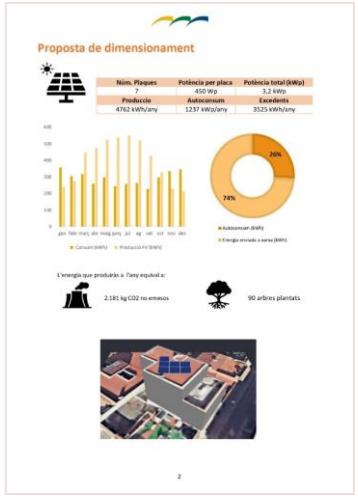
2- La Teulada "***The roof***" Office energy advisory service *(since september 2023)*

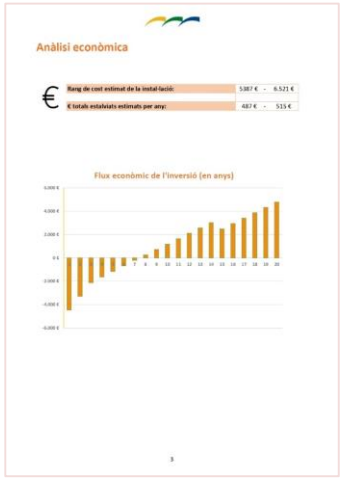
Personalized attention through different channels

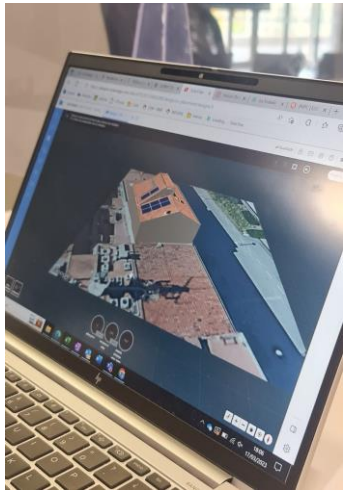
- Whatsapp
- email
- Appointment at the town hall
- Telephone
- Videocall

Single window for all questions about photovoltaics

- Legal and administrative questions
- Technical inquires
- Doubts about bonuses and subsidies







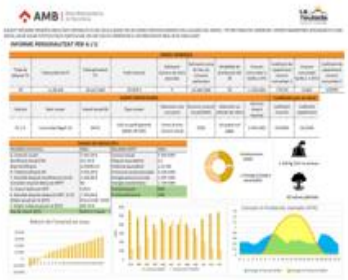
PAESC Actions developed in the municipality:
Phase 1- 2020 -2024

AJUNTAMENT DE SantCugat

2- La Teulada "***The roof***" Office energy advisory service *(september 2023)*

AMB

Service: collective self-consumption report



Energy and economical data REPORT:

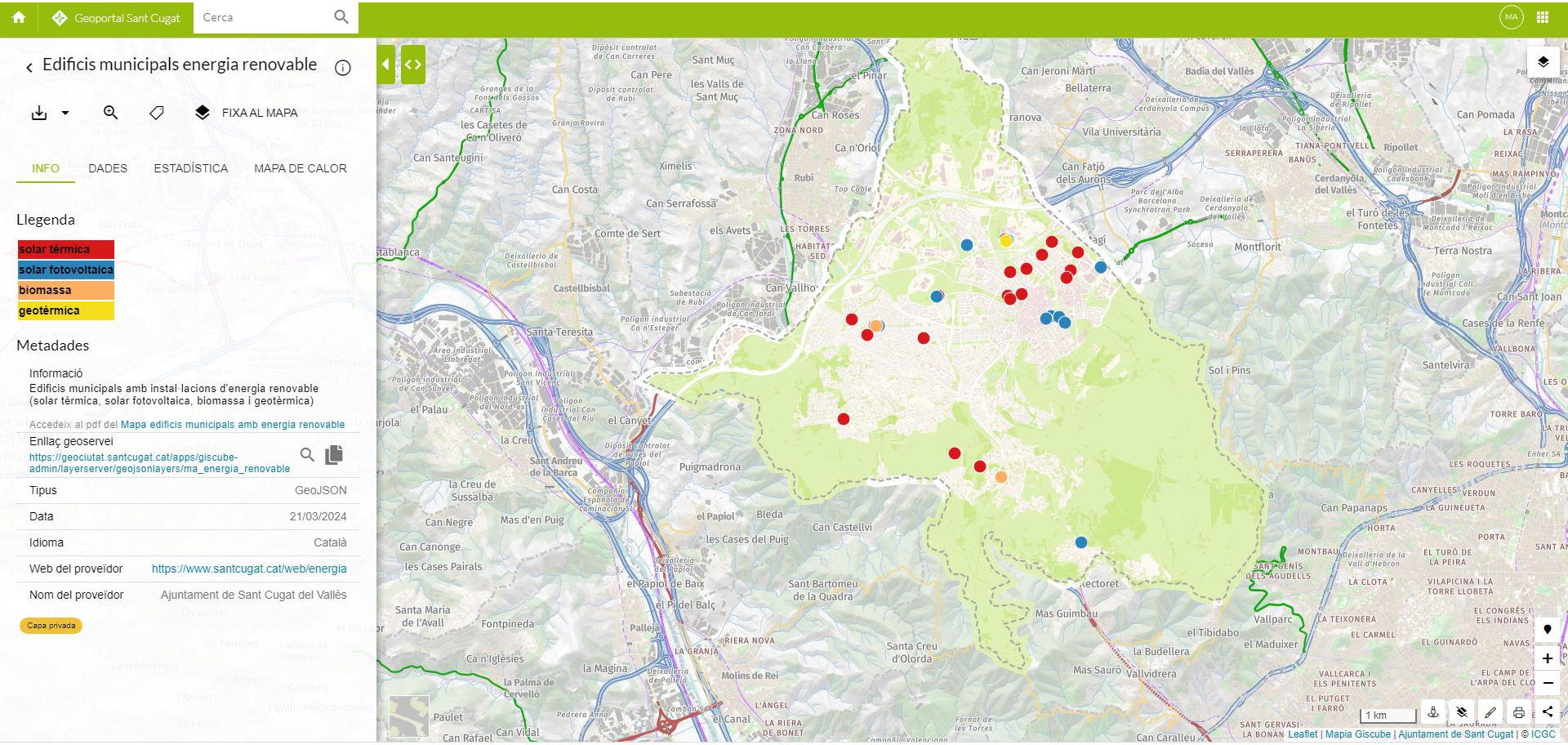
- % Self-consumption, self-sufficiency and surpluses
- Distribution coefficients
- Installed capacity and generation
- Estimated investment
- Monthly savings per PV Municipal bonuses (amount and duration)
- Aid applied to the final calculation

La Teulada
Experts en energia solar

PAESC Actions developed in the municipality:
Phase 1- 2020 -2024

AJUNTAMENT DE SantCugat

3- Execution of PV/Biomass/Geothermal installations for municipal facilities



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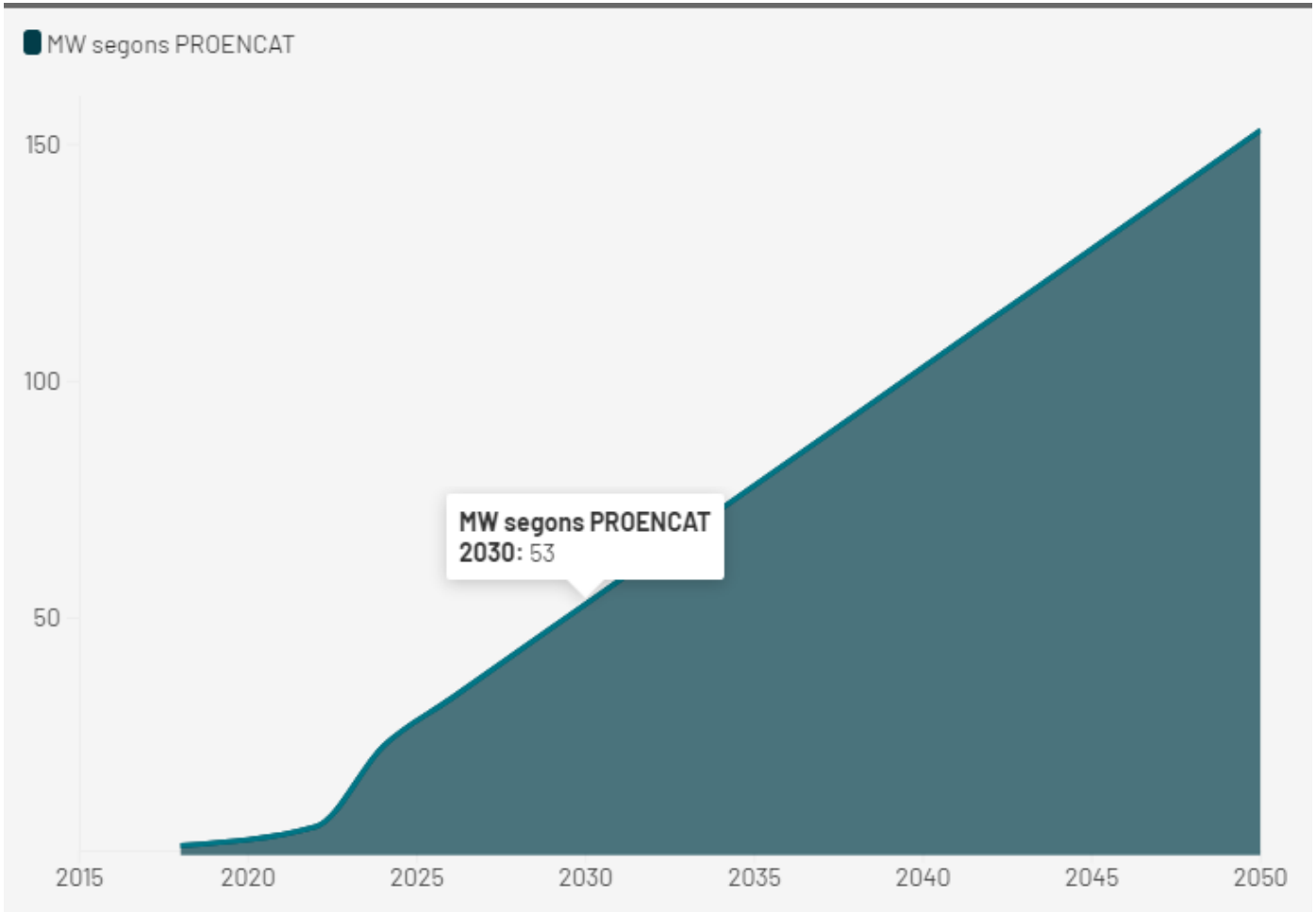
Mostra-ho tot

PAESC Actions TO BE developed in the municipality: Phase 2- 2025-2030

1- How to achieve 5MW of power to be installed each year?

-To achieve the PROENCAT 2050 objective, the growth rate must be 5 MW/YEAR to cover 50% of the electricity consumption in the municipality:

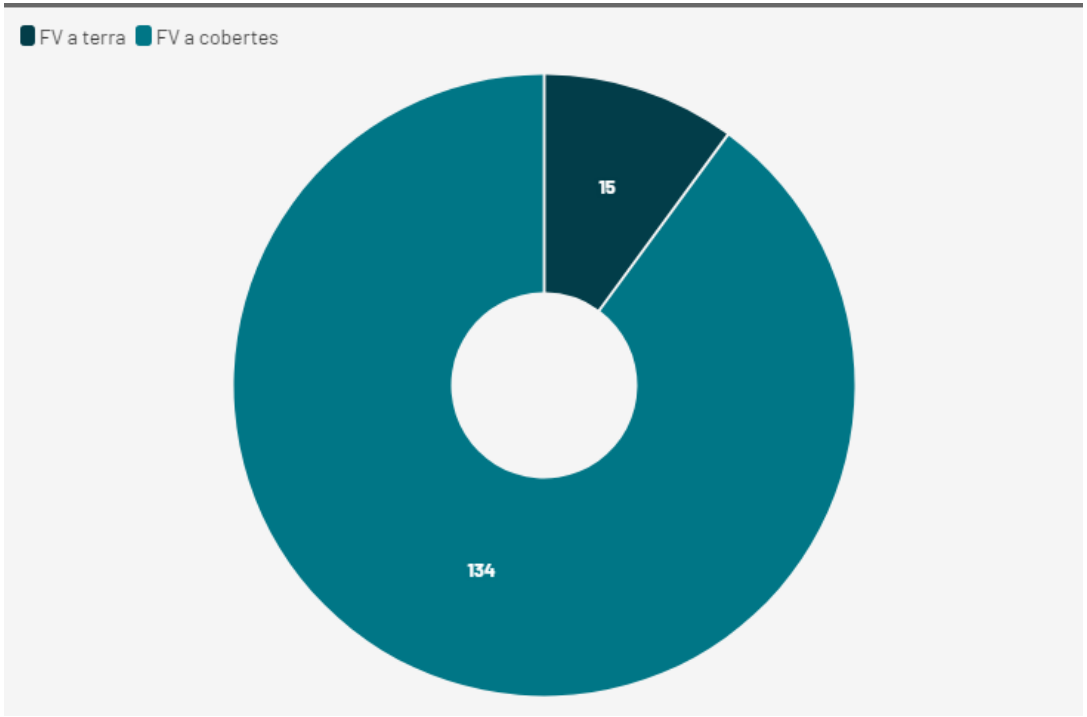


PAESC Actions TO BE developed in the municipality: Phase 2- 2025-2030

1- How to achieve 5MW of power to be installed each year?

Challenge: Scaling Up Solar Capacity
To meet 50% of electricity demand by 2050 → 149.96 MW needed
→ Requires installing **5 MW/year from 2025 onward**

Roof potential is not enough
→ 15.44 MW on land, degraded areas & infrastructure
→ 134.52 MW on rooftops



PAESC Actions TO BE developed in the municipality: Phase 2- 2025-2030

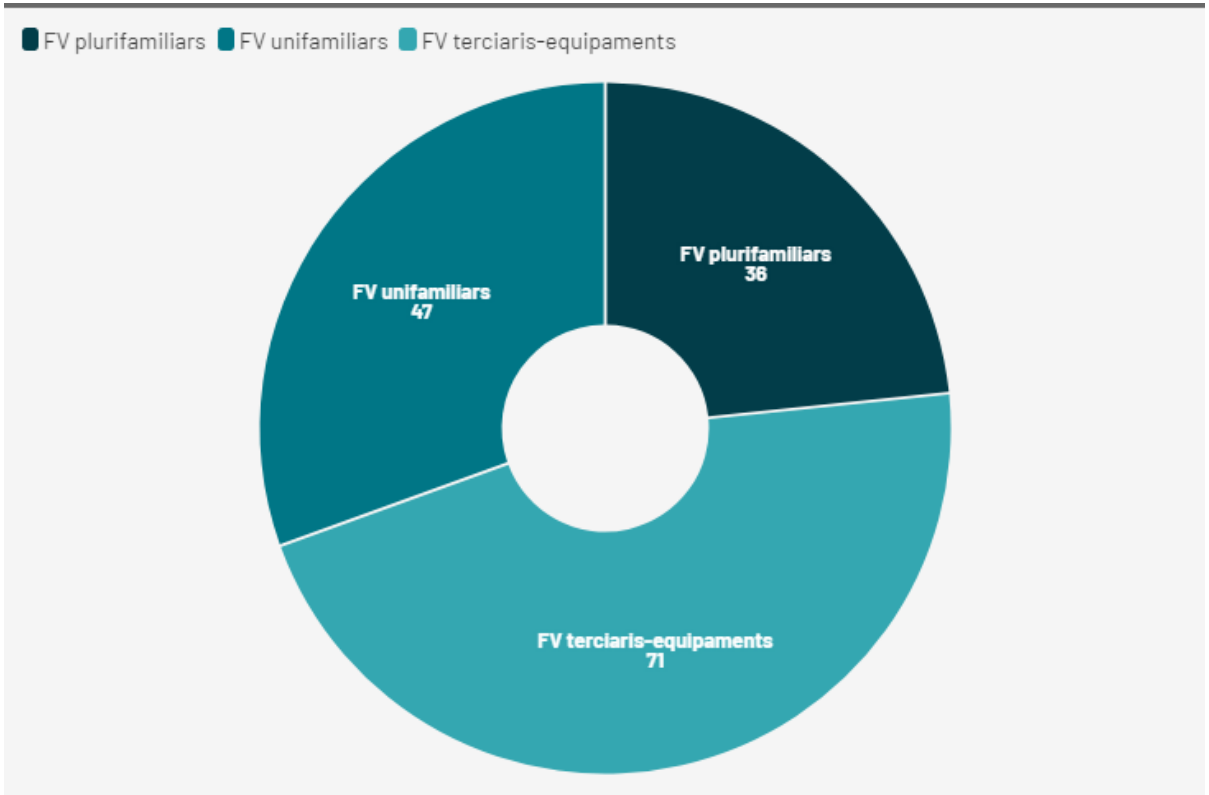
AJUNTAMENT DE SantCugat

1- How to achieve 5MW of power to be installed each year?

Challenge: Scaling Up Solar Capacity

134,52MW in roof of existing and new buildings:

- Roof potential in **Multifamily** buildings: 36,12MW
- Roof potential in **Single family** buildings: 47,16 MW
- Roof potential in **Tertiary/industrial** buildings: 71,13 MW

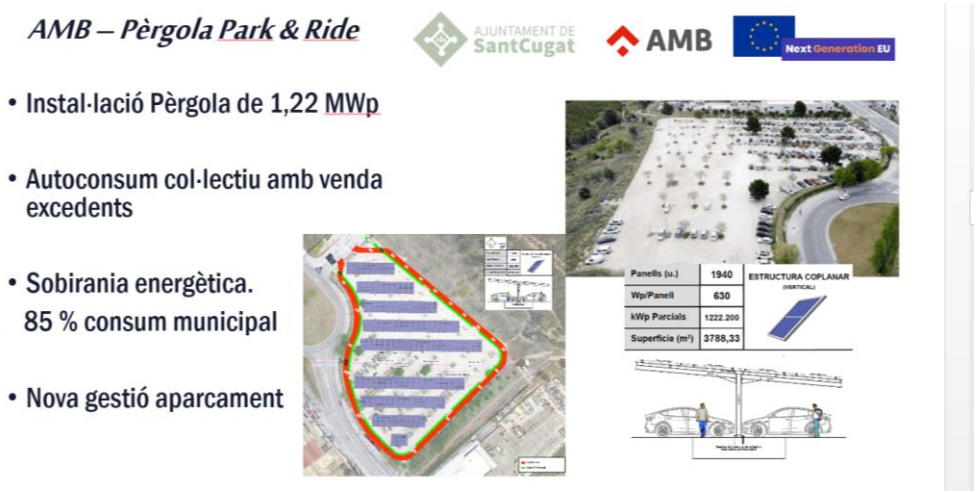


PAESC Actions TO BE developed in the municipality: Phase 2- 2025-2030

1- How to achieve 5MW of power to be installed each year (2025-2050)?

Public & Private Investment

→ Municipal funds, AMB PPA with purchase option, subsidies, investment partners



Unlock Available Spaces

→ Identify unused municipal rooftops

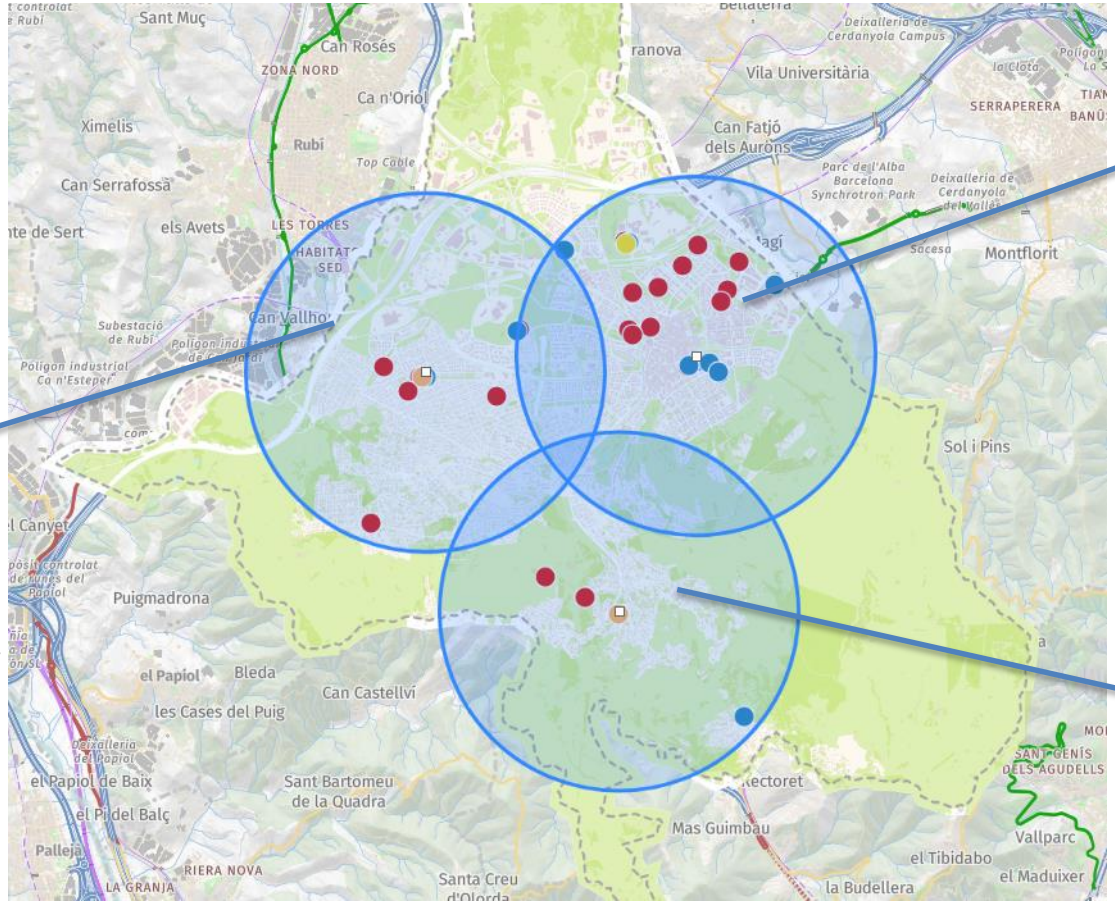
→ Expand on degraded land & infrastructure (car parks, roads, bridges, pergolas)

Maintain Incentives

→ Keep IBI & ICIO tax discounts→ Support via La Teulada advisory service

PAESC Actions TO BE developed in the municipality: Phase 2- 2025-2030

2-Creation of 3 LOCAL ENERGY COMMUNITIES (CEL): respond to and create/accompany the CELs for shared self-consumption with existing PV producers and potential consumers.



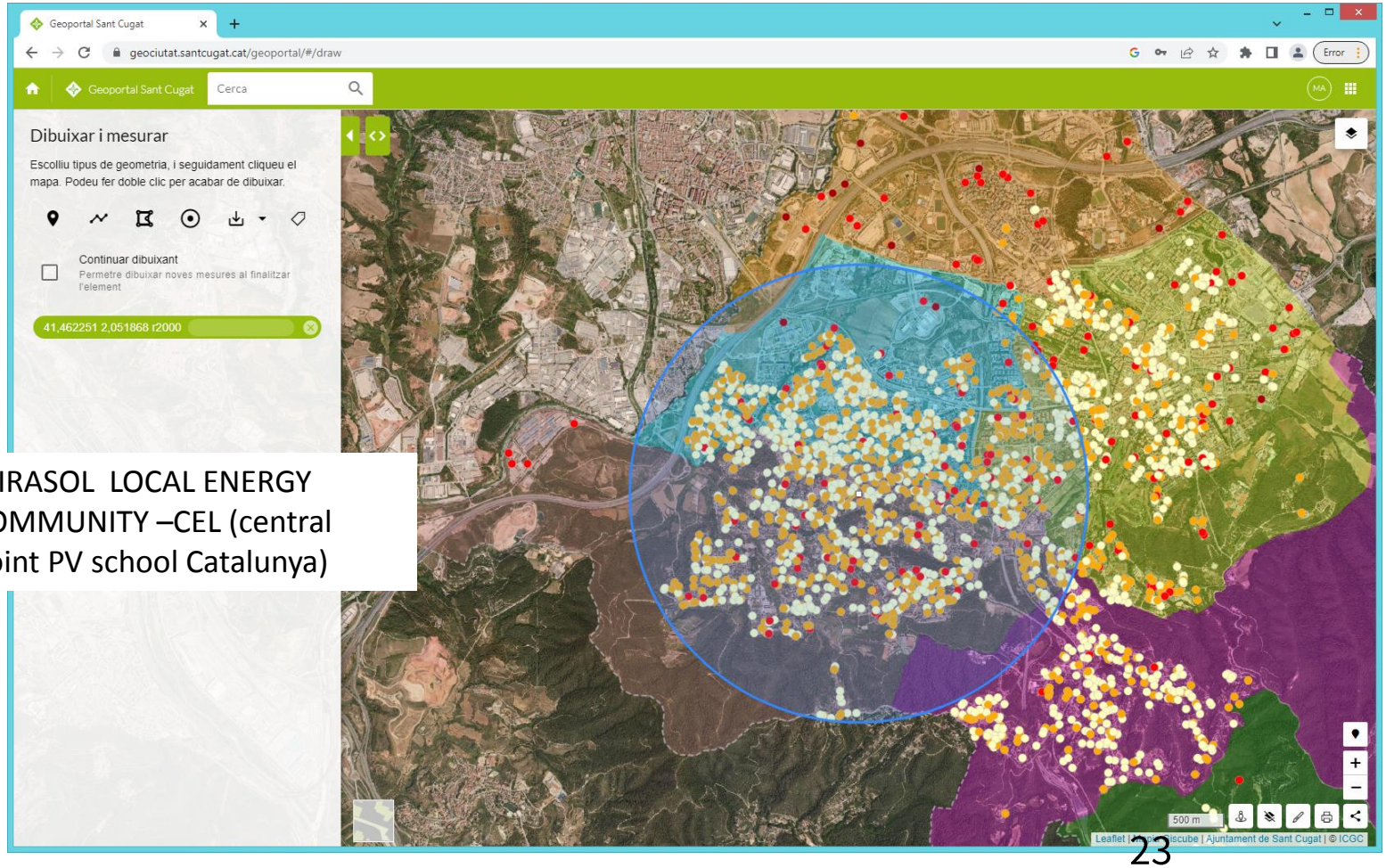
1-ENERGY SHARED SELF-CONSUMPTION MIRASOL (central point PV school Catalunya)

3-SHARED ENERGY SELF-CONSUMPTION SANT CUGAT (central point PV headquarters building)

2-LA FLORESTA-LES PLANES SHARED ENERGY SELF-CONSUMPTION (central point La Floresta health center-PV must be executed)

PAESC Actions TO BE developed in the municipality: Phase 2- 2025-2030

2-Creation of 3 LOCAL ENERGY COMMUNITIES (CEL): respond to and create/accompany the CELs for shared self-consumption with existing PV producers and potential consumers.



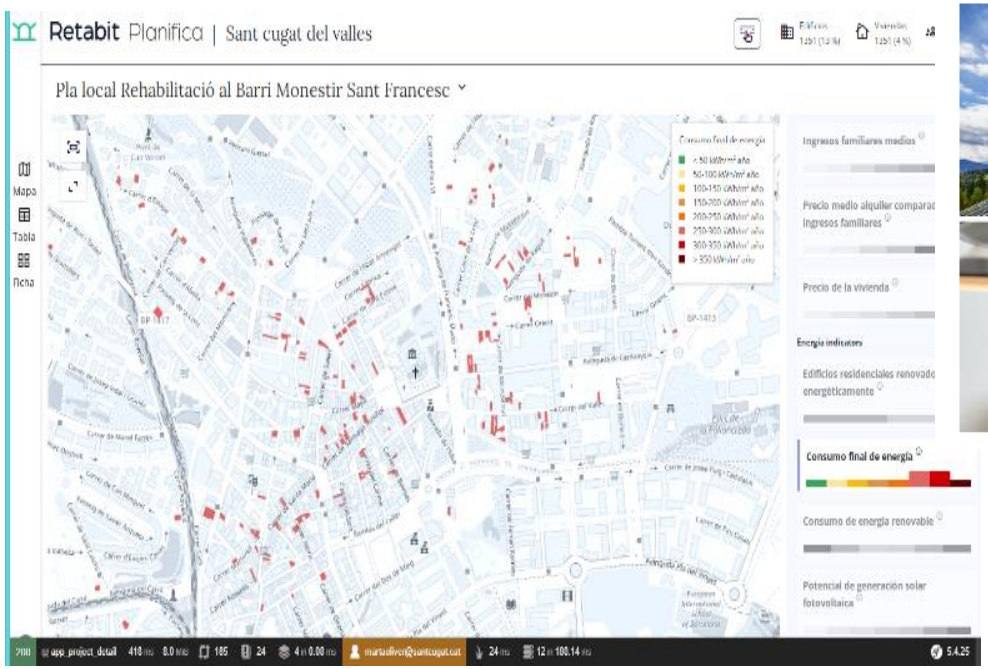
MIRASOL LOCAL ENERGY COMMUNITY –CEL (central point PV school Catalunya)

PAESC Actions TO BE developed in the municipality: Phase 3- 2030-2050

1-Energy renovation plans for buildings prioritizing old buildings (over 50 years old) to reduce energy demand for heating or air conditioning.

To identify the homes with the highest energy consumption, the oldest and with below-average incomes in order to carry out a joint and subsidized action for energy improvements.

We select only the age of buildings and final energy consumption between 250 and 350 kWh/m2 to include multi-family buildings in the selection

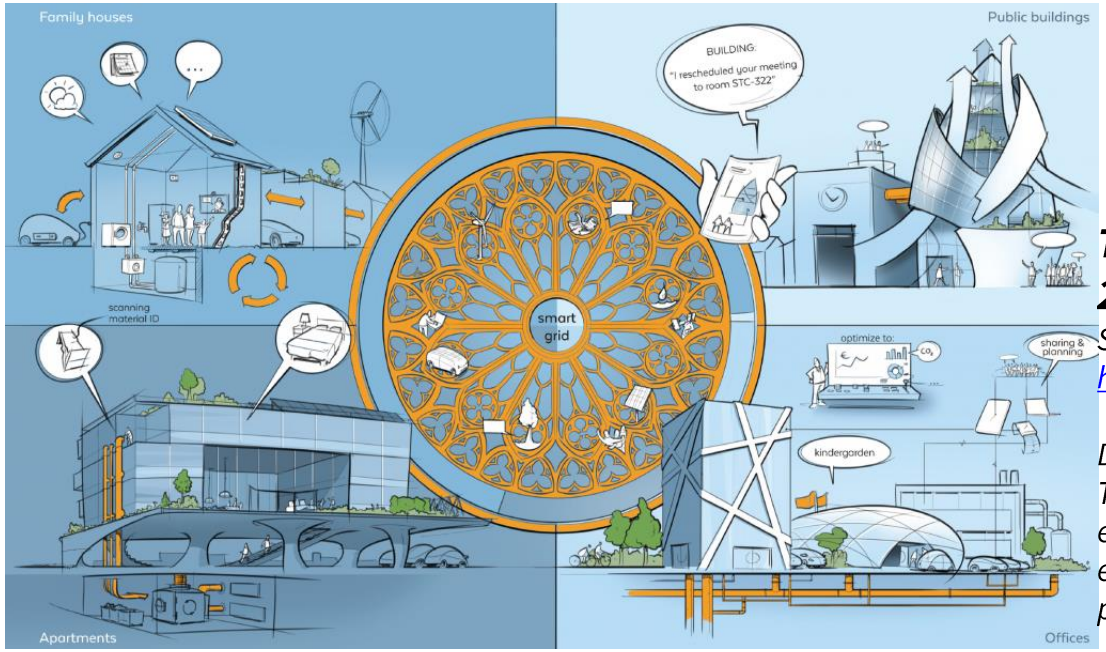


PAESC Actions TO BE developed in the municipality: Phase 3- 2030-2050

2- **Building Electrification in Sant Cugat (2030–2050)**

Goal: 100% electric buildings by 2050.

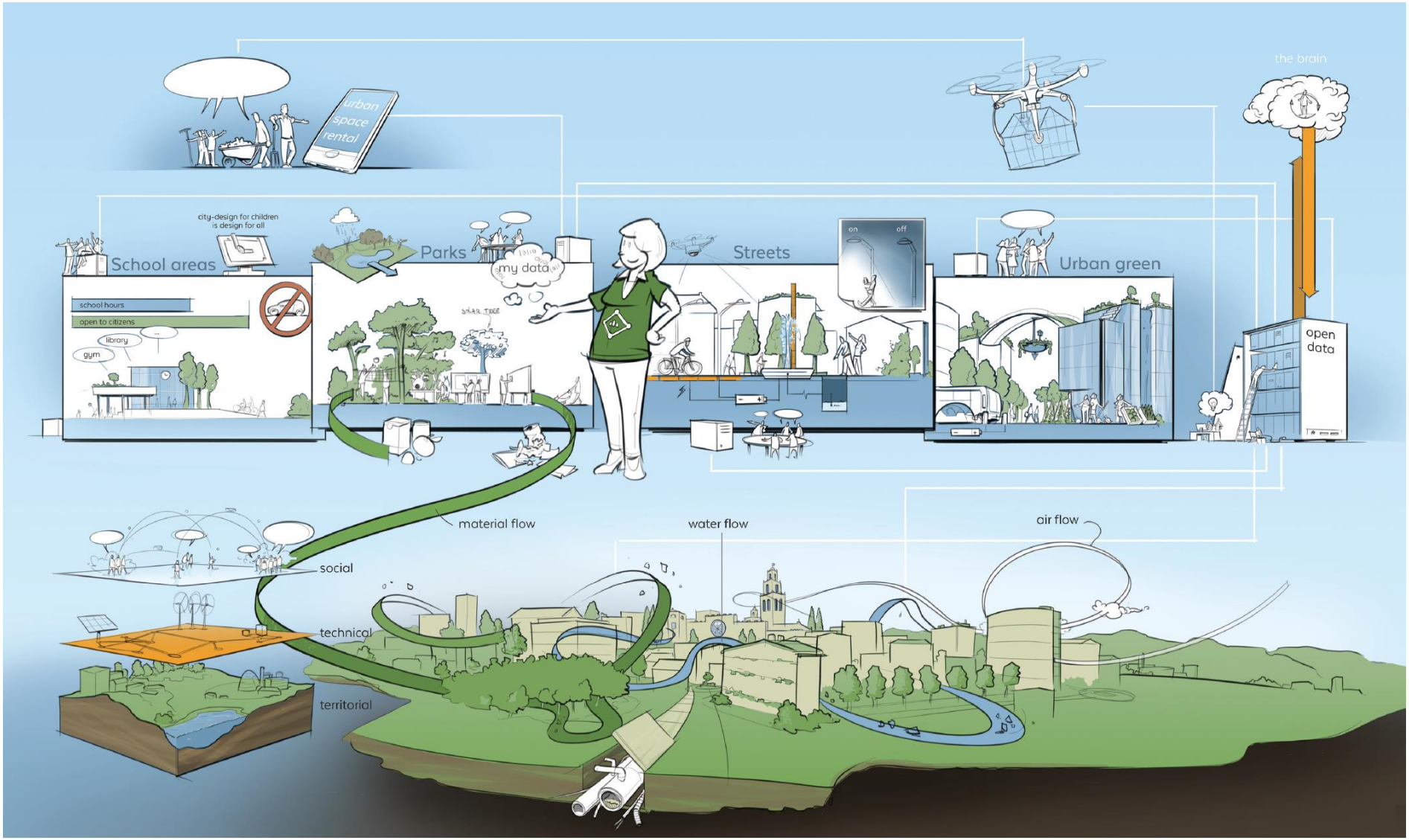
- **2030:** All new buildings electric. Public buildings start phasing out gas.
- **2040:** Retrofitting accelerates. Fossil fuel heating banned in upgrades.
- **2050:** All buildings run on renewable electricity. Zero direct emissions.
- **Focus: Solar panels, heat pumps, smart grids**



Title: Sant Cugat Vision Development 2050

Source: Roadmaps for Energy
https://roadmapsforenergy.eu/

Description:
The image illustrates a city with buildings equipped with energy-saving technologies, integration of renewable energy sources, and a smart grid connecting buildings and public services.



Thanks for your kind attention!

martaoliver@santcugat.cat

AJUNTAMENT DE SantCugat