



La.Pi.S.
The 1st Smart cities, towns, rural
and mountain villages international Congress



Smart strategies to mitigate causes and effects of climate
change and reduce the environmental footprint
RESTRUCTURA - 21 November 2024
Lingotto Exhibition Center - Oval Pavilion - Turin



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1 – ACEA Pinerolese Energia Srl



Leading innovative ideas to change the future of smart cities



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PROJECT: BACKGROUND



- Buildings are responsible for 40% of greenhouse gas emissions in the European Union;
- Most of the residential buildings in Italy were built in the 60s and 70s during the Italian economic boom, without energy regulations;
- These buildings are not only energy intensive for winter heating, but also the cause of internal discomfort for the residents;
- To create effective condominium energy communities, it is essential to combine interventions of efficiency energy on the building envelope and on installations, to fully exploit the energy locally produced from renewable sources.



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THE PROJECT OBJECTIVES



- Project expects to reduce the heating demand of buildings by at least the 50%;
- Project aims to decrease the use of fossil fuel in condominiums by at least the 80%;
- Project ensures the correct winter heating of buildings by implementing an electrification of the residual thermal load fed by renewable sources;
- Project is open to new solutions in the field of energy efficiency, including experiments, having provided multiple times pilot sites for projects funded by the European Commission.

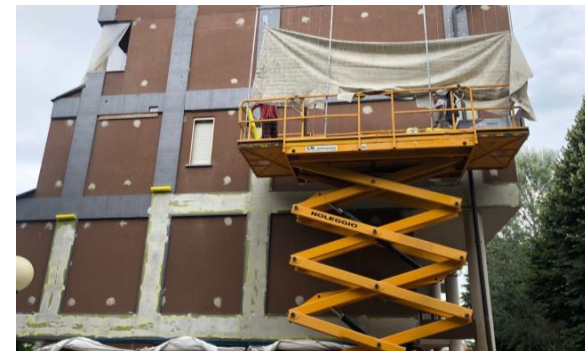


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WORKS BUILDING ENVELOPE INTERVENTIONS

- Insulation of the whole envelope of the building;
- Insufflations and/or coating of the external walls even through ventilated façade solutions;
- Coating of the slab toward cellars or garages and insulation of the unheated attics;
- Replacement of all the external doors and windows of the building, both those of dwellings and common areas.



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WORKS - HEAT PUMP HEATING SYSTEM

- Installation of air to water heat pumps as hot water generators for heating;
- Easy to install and consolidated technology to couple with the existent radiators thanks to the reduction of the thermal load of the building;
- Installation of new systems and equipment for the operation of systems in thermal power plants;
- To keep gas boilers as back up system in case of heat pump alarms, defrosting and in particularly harsh external conditions.



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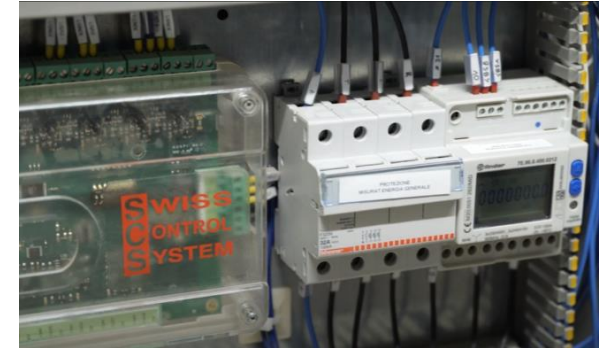
WORKS - PHOTOVOLTAIC AND STORAGE SYSTEM

- Photovoltaic sized according to the supply power of the heat pump systems and the available spaces;
- Photovoltaic sizes between 20 kW and 40 kW;
- Electrochemical storage systems on the DC side of 22 kWh;
- Oversized photovoltaic system in the summer season, for the benefit of the building common services and condominium energy community.



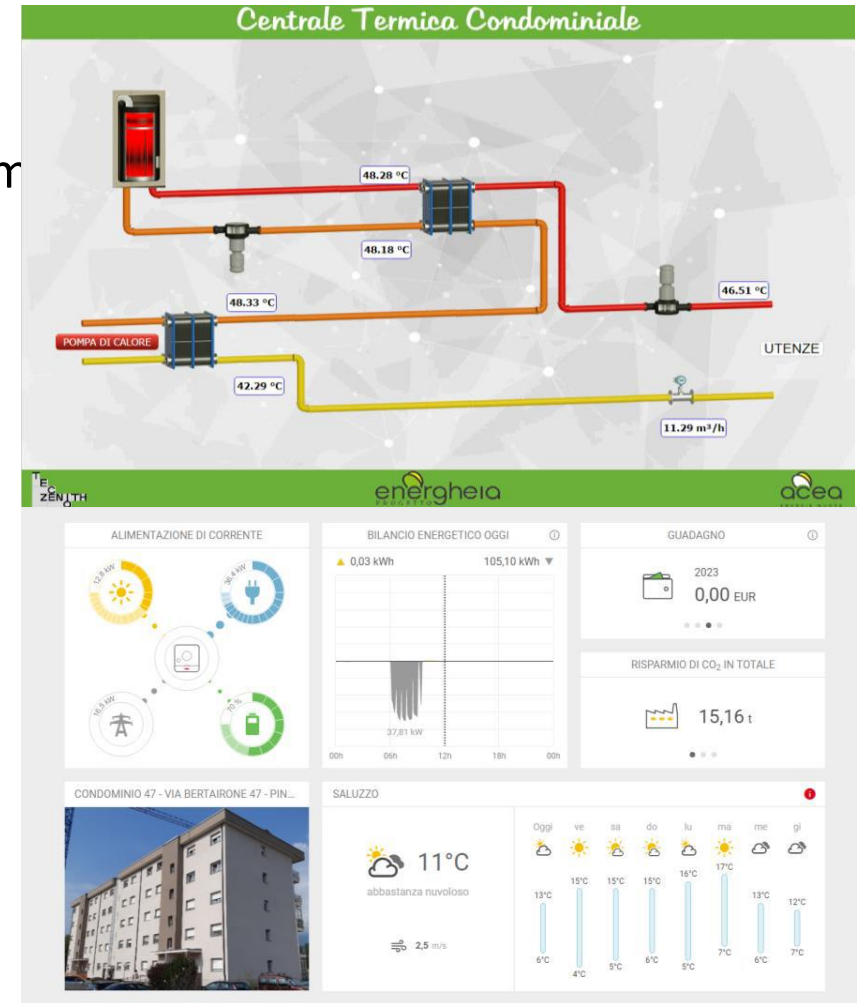
WORKS - BEMS SYSTEM

- SCS building energy and management system for intelligent and advanced control;
- Specific ad hoc strategies for heat pump systems based on external conditions and PV production, with alarm management;
- Electric and thermal energy meters interfaced, for data acquisition and analysis of the trends and quality of the interventions;
- Dedicated BEMS and algorithms for the condominium energy community management and the correct distribution of shared energy among users;
- Graphic pages for users with intuitive synoptic for real time data visualization and gamification to achieve best results on energy community.



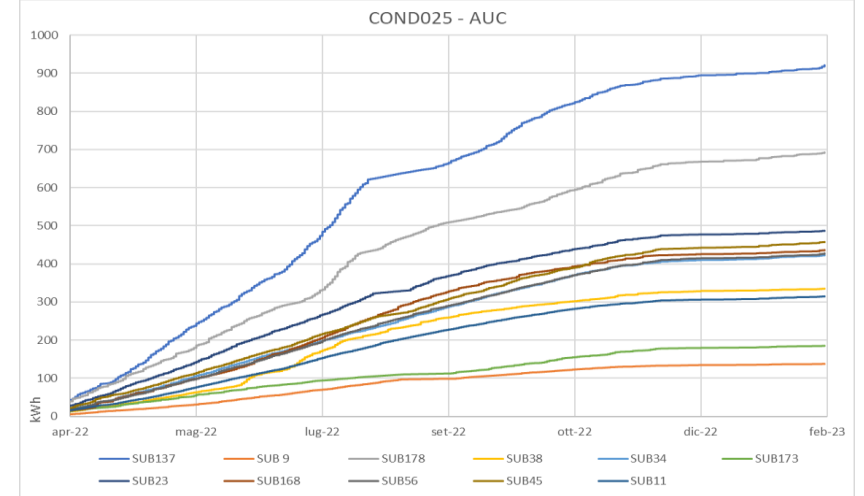
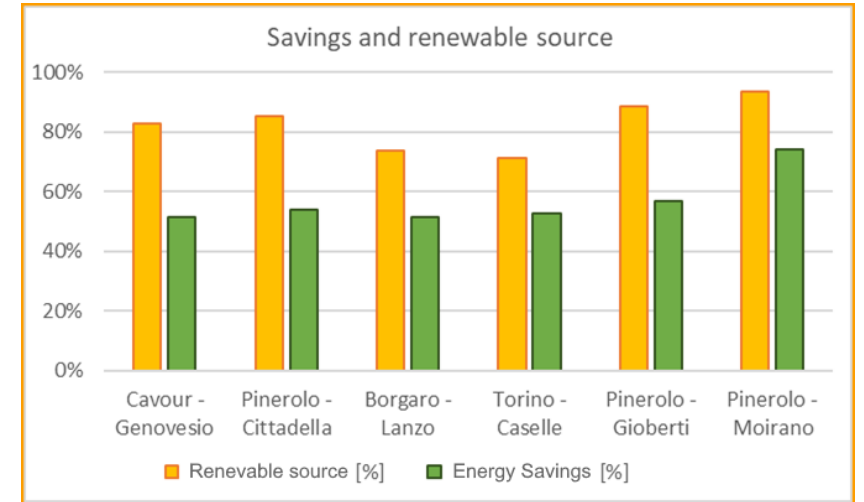
MANAGEMENT AND RESULTS - FUNCTIONING OF THE SYSTEMS

- Heat pumps used most as primary heat source, with radiating system supply temperatures of around 48 - 52 C;
- Existing boilers used only as a back up, with automatic intervention to have no disservices for users;
- Continuous check of PV production and storages status to verify correct operations and ensure renewable energy for buildings;
- Active collective self consumption sharing system, with fair hourly distribution of energy distributed among members.



MANAGEMENT AND RESULTS - ACHIEVEMENTS

- Energy results obtained in line with the provisions of the project;
- Guaranteed energy savings compared to pre intervention situations while respecting internal comfort conditions;
- PV systems and storage that minimize the withdrawal of electricity from the grid to feed the heat pumps during winter;
- Overproduction from PV systems available to users belonging to condominium energy communities.

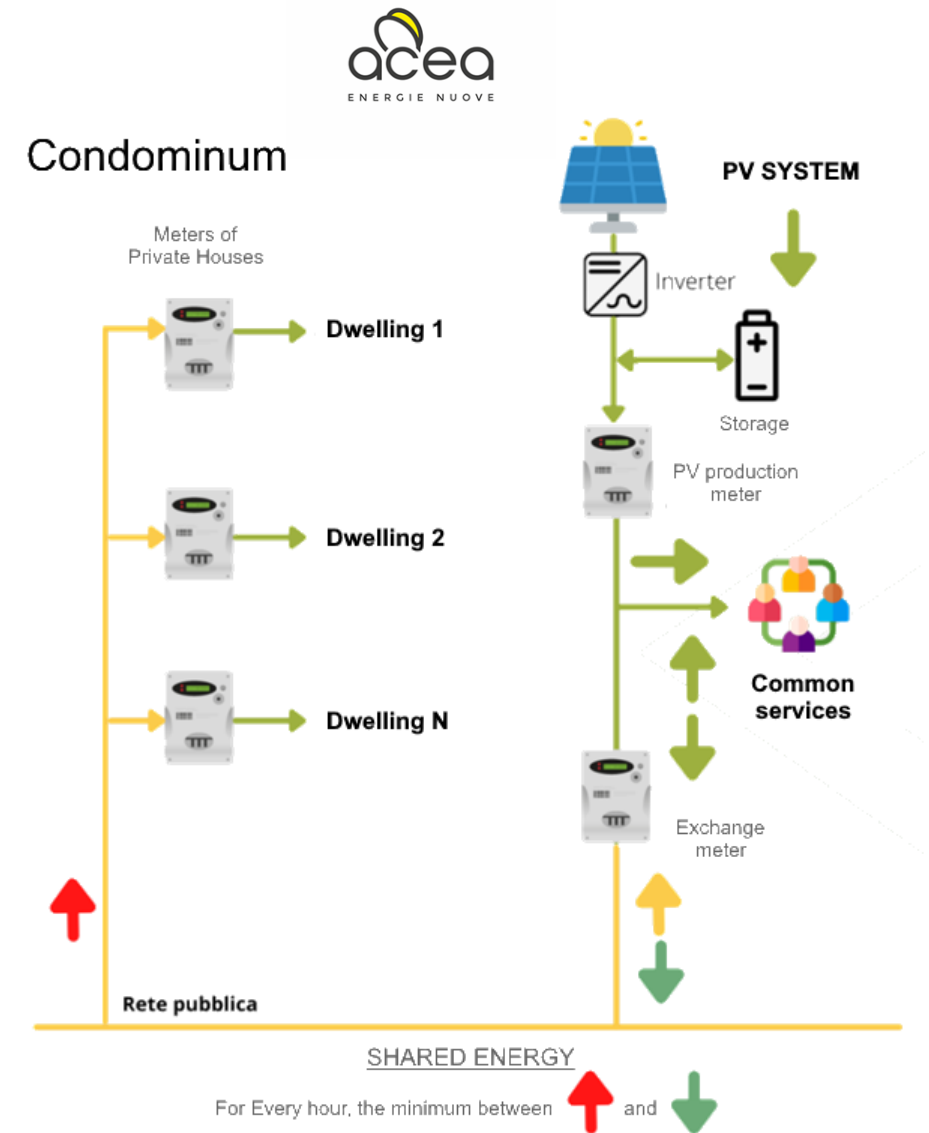


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MANAGEMENT AND RESULTS - AUC

- Collective condominium self consumption (AUC) created in order to take full advantage of PV production, in all seasons;
- Realized through the installation of dedicated electrical meters and of an energy management system with an ad hoc developed algorithm;
- This system was used for the first time Pinerolo in the "Via Cittadella 19" building, it was the first AUC in Italy and then replicated in all the condominiums we manage;
- It allows users to exploit green energy produced on site and economically subsidized, for their domestic uses, without additional costs;



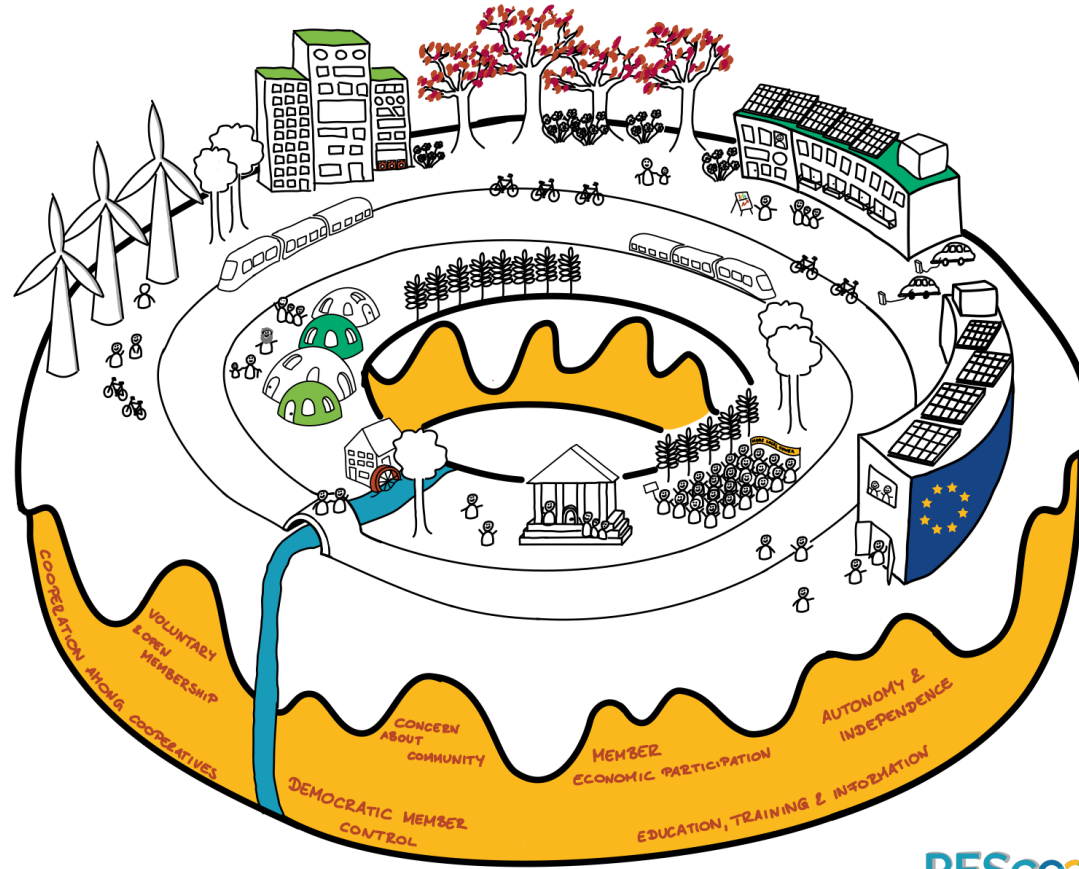
THE NECESSITY TO JUMP AHEAD



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TOWARDS DOUGHNUT ECONOMICS MODEL



REScoop's
EU 2050

THE SAME OBJECTIVES



- Providing environmental, economic or social benefits at the community level to its shareholders or members or to the local areas in which the community operates;
- Decarbonisation with the consequent facilitation of the exchange of energy generated from renewable sources;
- Decentralization of the energy production, with direct citizen empowerment and participation;
- Energy sector as protagonist in the economic revitalization of the region by also stimulating investment for private capital.



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THE SAME MISSION



- To be an active part of the socio-economic development of one's territory;
- To ensure a conscious, active, open and voluntary participation of users and prosumers;
- To foster and co-ordinate co-operation between different members of the energy community;
- To strive for education, training and information on the environmental impact of one's behavior (environment/carbon footprint).



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SCIENTIFIC PARTNERS



COMMUNICATION PARTNER

