INTERREG MED	Progetto Pegasus Promoting Effective Generation And Sustainable UseS of electricity	2017-2019

The PEGASUS project (link che riporta al PDR ROLL UP di Pegasus) cofounded by INTERREG MED programme in the frame of European Regional Development Fund, was focused on experimenting a simulation of functioning of microgrids in 7 pilot areas on the basis of concrete situation with real data. This with the aim to reinforce the institutional capacity of Public Authorities to set up operational measures favouring microgrids as an effective tool to optimize electricity production and consumption and also to give evidence of regulatory and administrative barriers hindering their extensive application.

DeMEPA, as partner of the project, designed and (has) taken care of the Municipality of Potenza pilot development. In the pilot two energy-intensive infrastructures are involved: the swimming pool of Montereale Sport Park and the Santa Lucia escalator, 600 meters long, able to transport up to 9000 people/hour from the outskirts to the city centre. The pilot was addressed at demonstrating the achievable advantages, in energy and economical terms , by the application of the Italian regulation “Scambio sul posto Altrove”, an incentive scheme net billing type. The existing boilers in Montereale swimming pool will be partially substituted by a Combined Heat and Power system (CHP) driven by the heat demand of the swimming pool. The related generated electricity is used to meet the electric demand of Montereale swimming pool while the surplus is fed into the local distribution network. In a symmetrical way electricity is withdrawn from the network when local demand overcomes the electric power available from CHP.

Against a thermal demand of the swimming pool, CHP will operates always at its maximum power in order to assure its maximum efficiency. For more thermal energy request the boilers will enter into operation, according to a master-slave logic.

To optimise the CHP size a campaign was carried out to measure the thermal and electric consumption of the pool and the electricity demand of the escalator throughout the year 2018, in order to take account the seasonal effects. The consumption of natural gas and the withdrawals from the grid was acquired every minute and then processed on a monthly basis through a simulink model taking into account the CHP’s power capacities from 30 kW up to 160 kW. The most convenient size of CHP resulted 120 kWt/65 kWe . This CHP during the year 2018 would enable 95 % and 85 % of the required thermal energy and electricity, respectively, of the swimming pool and furthermore to fed into the distribution grid about 20% of the electricity consumed by the escalator, against 66802 s.c.m. of increased consumption of natural gas.

The corresponding Primary Energy Saving, ie the saving of primary energy achievable by a cogeneration system compared to separate systems for the production of thermal energy and electricity, resulted of about 20%. This, in connection with the avoided loss in the distribution network due to the local generation, allow a carbon emission reduction of 80 t/year.

Taking into account:

- the net billing scheme applied to the electricity exchanged with the public grid by the pool and the elevator,
- the lower taxation of natural gas used by the CHP
- the energy efficiency certificates on the electricity generated by CHP

the achievable benefits for the Municipality would amount in 2018 year to 73,000 Euro/year to be compared to the required capital expenditure of 246 M€ . The corresponding financial indicators:

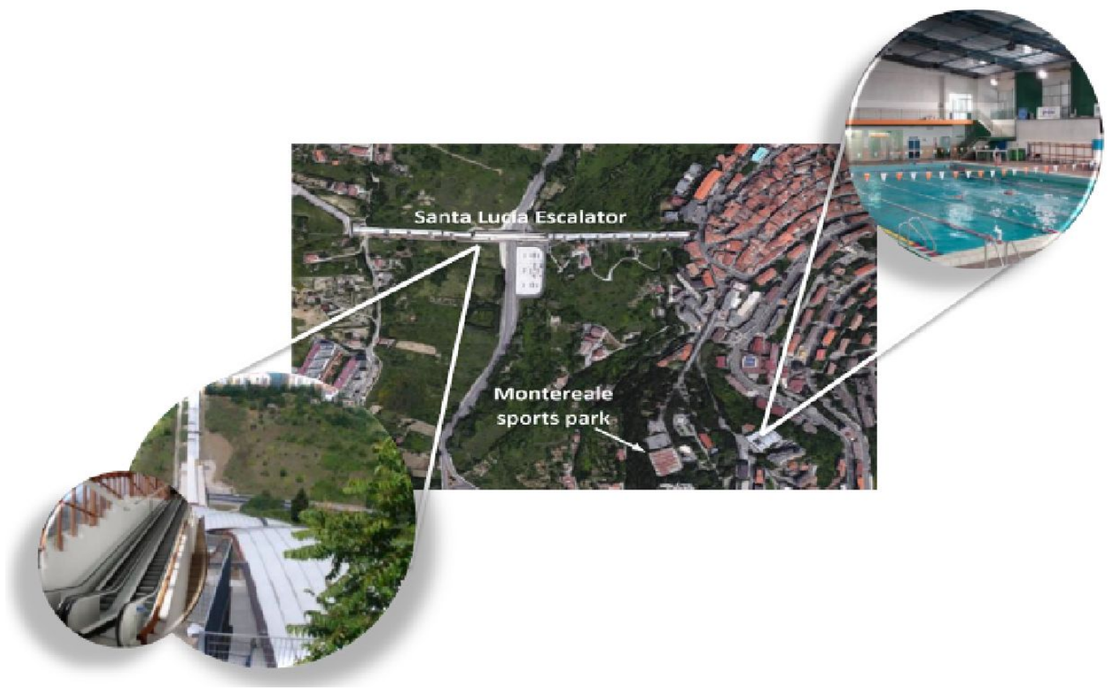
- Net Present Value discounted at 3,5 % after 16 years amounts to Euro 480.000,
- Internal Return Rate equal to 24,7%,

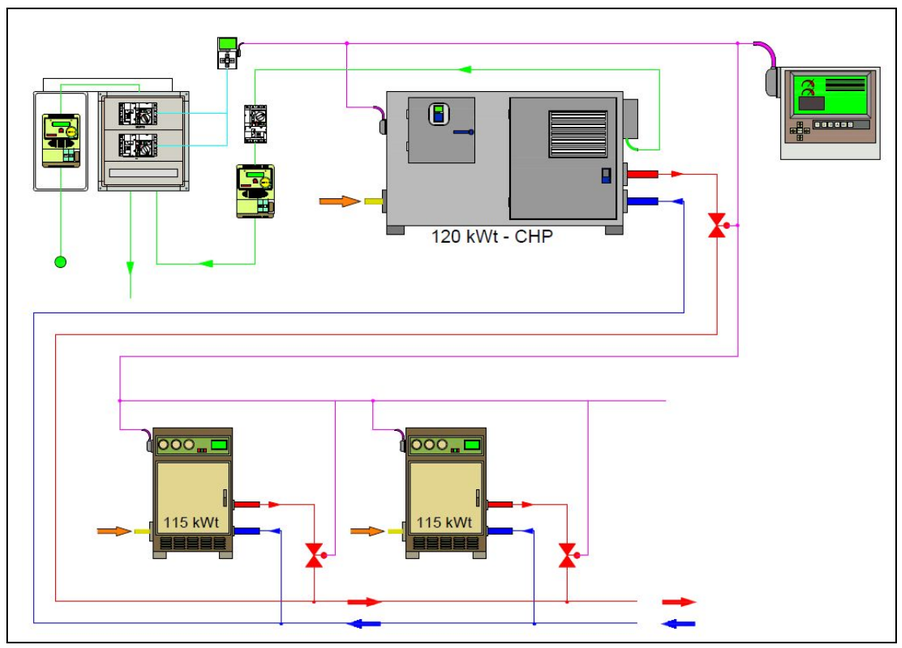
make evident the financial sustainability of the pilot that can be replicated in similar situations characterized by a large thermal requirement in respect of the electricity consumption. With regard to this it should be noted that based on the results obtained in the project a CHP has been installed in the swimming pool at the beginning of 2020 year.

Along the three-year development of Pegasus project DeMEPA :

- contributed to the preparation of the 5 project Newletters of the project and their dissemination at national and international level,
- participated in two local events at the Municipality of Potenza and a national event at Bologna (Italy) to inform policy makers and stakeholders on the results of the PEGASUS project.

Finally DeMEPA prepared the final report concerning the cost–benefit analysis of the 7 pilots, including the reactions of the social and institutional stakeholders, collected by Partners through organized meetings and questionnaires, and the Energy Regulation Authorities position on the microgrids.





Read more: **https://pegasus.interreg-med.eu/**