

Energy Performance Contracting in the Metropolitan City of Venice.

by Sergio Zabet – January 2020

The first phase of AMICA-E, a project conceived and directed by the Metropolitan City of Venice (Ve-MC), which provides for the energy requalification of public buildings and public lighting systems of the Municipalities of their territory that have signed the Covenant of Mayors, has been successfully concluded. In particular, this first phase saw the conclusion of a public tender addressed to Energy Service Companies (ESCO), for the award of Energy Performance Contracts (EPC) with Result Guarantee and Third Party Financing (TPF), for the energy refurbishment and management of 97 public buildings, mainly schools, owned by 16 Municipalities, plus 4 buildings of the Metropolitan City itself, for a total of 101 buildings.

The public tender, divided into 3 lots, was conducted by the Environment Area of the Venice Metropolitan City as Contracting Authority on behalf of 16 consortiated municipalities: Caorle, Dolo, Eraclea, Fiesso d'Artico, Fossalta di Piave, Jesolo, Noale, Pramaggiore, San Stino di Livenza, Torre di Mosto, Santa Maria di Sala, Mirano, Camponogara, Cona, Fossò, Vigonovo, plus the Venice MC itself.

The current costs of the grouping, for Fuels, Electricity and Operation & Maintenance, amount to € 1,780,000 and the minimum investment required to obtain at least 20% of monetary savings amounts to € 2,770,000.

The ESCo that won the tender, AcegasApsAmga Servizi Energetici (ASE), offered almost 11 million Euros of investment, guaranteeing 55,5% savings in terms of primary energy, of which 7.5% recognized to the Municipalities and to MC-Ve itself which, added to another 6.5% offered as a reduction in O&M costs, bring the immediate annual budget relief for the Public bodies of the grouping to € 77,000, for a contractual term of 15 years.

The contractual scheme also provides that 30% of the extra savings, that should occur in case of overperformance, is granted to the Municipalities & the Venice-MC. The contractual tender model provides, in fact, that the savings are shared between the ESCo and the Consortium entities for the duration of the concession. At the end of the contract, 100% of the savings will be attributed to the Municipalities and the Venice-MC. The supply of energy carriers is excluded from the Concession, which will be acquired directly from the associated entities, through the IT platforms of the Public Administration purchasing centers.

The whole initiative was developed and implemented thanks to a contribution provided by the European Investment Bank (EIB) from Community funds, within the ELENA (European Local Energy Assistance) facility, which covered all the Technical Assistance costs (TA), namely: energy diagnosis, determination of energy and economic baselines, drafting of the Terms of References, contractual schemes, offers evaluation system, monitoring procedures, verification of results and reporting.

TA's activities were handled by an Advisor team headed by the law firm Gianni, Origoni, Grippo, Cappelli & Partners (GOP), associated with Sinloc Spa for economic and financial aspects. The energy diagnoses of the buildings and the baselines assessment were entrusted to several local engineering firms.

In addition, for the coordination of all the activities of the initiative, a dedicated Project Development Unit was set up, coordinated by the Director of the Environment Area and made up of officials from the Impact and Sustainability Assessment Unit and other areas of the Ve-MC, as well as by external collaborators specialized in energy, economic-financial and legal matters.

It should be noted that ASE correctly interpreted the spirit of the tender which required and rewarded, on the one hand, global design with reference to the balance between interventions on building envelopes, on the plants and the use of renewable energy sources, and on the other, the degree of definitive design for each of the 101 facilities. In fact, the winning project foresees approximately 42,600 m² of insulation between coats, attics and slabs, 3,800 m² of new thermal break windows and shatterproof glass with a global transmittance U_w lower than 1.3 W / m²K, 420 m² of thermal solar collectors in 26 schools; 200 kW of photovoltaic solar panels distributed over 23 systems, the installation of 23 heat pumps for hot water production replacing as many electric boilers. On the purely thermal side, new condensing boilers are

planned in 44 sites for a total power of 9,200 kW, the installation of 320 kW of heat pumps and almost 4,000 thermostatic valves. For the lighting of spaces, the project provides the replacement of over 24,000 lighting fixtures with LED lamps and the installation of presence sensors and electronic regulators. In addition, the installation of Building Energy Management Systems (BEMS) is envisaged on all buildings and regulatory compliance where necessary.

Finally, the project proposal provides for the upgrade of two nearly Zero Energy Buildings (nZEB). The energy refurbishment will affect one primary school and one kindergarten, where the proposed interventions will make the seasonal need for fossil energy almost nil. For 2 other buildings, ASE offers the certification of sustainability according to the LEED protocol for existing buildings (LEED v4 for Building Operations and Maintenance).

The system proposed for performance control and consumption accounting, based on Building Energy Management Systems interfaced with all buildings and adhering to the guidelines of the International Performance Monitoring & Verification Protocol (IPMVP), is interesting and certainly cutting-edge .

Finally, the proposed methods for the implementation of behavior modification programs for the school population are valuable. These programs provide information campaigns, including "Street Art" activities, aimed at keeping the buildings and the environment intact, disposing of waste correctly, achieving energy and water savings. Dynamic communications are foreseen via LCD screens installed in all 16 Municipalities and at the Headquarters of the Metropolitan City, which will report in real time the trend of climatic, energy consumption and renewable energy production parameters. There will be awareness-raising meetings with citizens on energy saving, training courses for employees, teachers and students; interdisciplinary educational workshops and finally organization of competitions among schools with the aim of transforming the schools itself, according to the level of Education, into incubators for the development of a new mentality oriented towards sustainability and energy saving. Finally, 5 power meters will be made available to each school, equipment that allows to measure the energy savings that can be achieved by putting virtuous behaviors into practice.

Main Parameters	Total Lots
Primary Energy Baseline - PEB [kWh]	24.576.945
Monetary Energy Baseline - MEB_€	1.623.206 €
Operation & Maintenance Baseline - O&MB_€	156.882 €
Total Monetary Baseline - TMB_€	1.780.088 €
Number of Buildings	101
Minimum Investment Required	2.770.000 €
Investment proposed (w/o VAT)	10.776.476 €
Guaranteed Energy Saving (GES_{kWh prim.})	55,5%
Savings Recognised to Munis (% on GES)	7,5%
Immediate Budget Relief	76.922 €

Primary Energy is calculated as: kWh nat. gas X 1,05 + kWh gas-oil X 1,09 + kWh Electricity X 1,95

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