Green ProcA
Green Public Procurement in Action

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Case study on Italy's lighthouse projects

Evaluation and Monitoring

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1. Introduction

The implementation of lighthouse projects in Italy provided Consip Spa with the chance to set up an innovative tender built on energy efficiency and consumption savings and to observe the main difficulties that Public Authorities face when they have to manage directly such a tender.

The procurement of electricity and heating and cooling power for the Administrations adhering to the lighthouse projects was, therefore, cheaper and matched with energy efficiency actions aimed at guaranteeing the savings target. Nonetheless, this kind of tenders besides guaranteeing a minimum pre-fixed savings implies a deep supervision ability by the local Administration that should be able to judge the technical performance of the supplier and the energy efficiency actions suitability. This ability, as we will see later on, is not always in the possession of the Administrations which might be sometimes unable to execute a technical verification. It is, indeed, extremely relevant to assess whether the provided product, service or work is compliant with the technical requirements set out in the tender documentation and formally offered by the supplier. A correct evaluating process consists of checking that the awarded product, service or work has:

- a relevant Ecolabel or another label fulfilling the criteria required as presumption of conformity;
- a test report from a recognised body (e.g. body accredited to issue test reports according to standard ISO 17025 and accredited to required test) demonstrating that the criteria are met;
- a correct application of the principle of equivalence with reversal of proof born by the supplier that asks for an equivalent means of proof;
- a consolidated dataset gathering the results to be used as a basis for future supply analysis (best selection of the technical points in the framework of most advantageous tenders).

On the other hand, a consolidated supply analysis is another important element for the correct and successful implementation of green criteria in a tender. Including green criteria means that the market meets public Administration innovation needs and is ready to follow and anticipate them. This is why the suppliers have not been required to implement excessively innovative actions with the purpose to avoid the risk of a “desert” tender. It is, although, unquestionably true that less innovative green criteria generate a less competitive and stationary market. Therefore, it is important to involve all the stakeholders in terms of objectives and achievements to spread the awareness that more energy efficiency in public buildings translate into less fiscal burden for the society at large.

2. Italy’s lighthouse projects description

The municipalities of the lighthouse projects, Arenzano, Catania, Mascalucia, Licata, La Spezia, Gualtieri, Noceto, Padova, Fiorenzuola d’Arda and Reggiolo, procured thermal and electric energy services integrated with energetic efficiency within the initiative SIE 3 (Servizio Integrato Energia 3 – Integrated Energy Service 3). The object of the initiative is the procurement of the thermal energy carrier and the implementation of energy efficiency interventions of the building-plant system with a goal of 25% reduction in consumption. The heating energy service can be complemented with the supply and management services for cooling and electric power. All these services are supplemented with the following by services:

- Creation and management of the technical registry;
- Creation and management of the IT system;
- Call Center;
- Programming and operational control.

SIE 3 consumption reduction target was achieved through the redaction of energy efficiency projects of the building-plant systems and the commitment of the supplier to implement energy efficient initiatives on the buildings of the Administration. This energetic performance contract included:

- supply of the energy carrier (both thermal and electrical);
- supply of all the materials required to ensure a correct and constant service provision;
- ordinary and extraordinary maintenance of the heating and cooling facilities and of the electric systems;
- remote management and control of the systems and of the relevant provided service levels;
- take on the responsibilities connected with the systems management (so-called role of the Third responsible);
- first aid on emergency call in case of technical failure or malfunction;
- execution of all technical and bureaucratic requirements;
- production of sanitary hot water;
- energy efficiency of the building-plant systems of 25% on historical consumption.

2.1 Tender type

SIE3 was activated on 20/12/2013 and was divided into 12 lots. The initiative attributed a prominent relevance to the efficient use of resources and, therefore, was aimed at inhibiting:

- inefficient performance of the building-plant system
- high energy consumption due to the incorrect management and maintenance
- unrespect of the CO2 emissions in the atmosphere.

SIE 3 ensured a thermal comfort with a temperature between 18° and 22°. The contract held in consideration the Environmental Minimum Criteria (Criteri Ambientali Minimi - CAM) related to the taking in charge of the energy services for buildings, adopted by the Ministry of the Environment with the Ministerial Decree 07 March 2012 (Official Gazette n.74 dated 28 March 2012). Moreover, it dealt with the proper disposal of the waste generated by the Convention operations. The protection of users and workers health and safety was guaranteed by the provision of compliance with the obligations on the correct and efficient disposal both in the extraordinary maintenance stages and the so-called regulatory compliance stages (interventions on technical systems and building-plant systems to ensure that the most modern technical standards are respected).

2.2 Environmental criteria

The lighthouse projects procurement framework left plenty of room to environmental criteria since the suppliers were obliged to perform an initial energetic check of the building-plant system in order to assess the primary energy demand. Subsequently, the suppliers within the first year after the taking over of the systems are obliged to make an energy audit of the building-plant system. This audit was aimed at providing an overall outlook of the energy consumption and at identifying a plan of actions for energy improvement, consumption and GHG emissions reduction and use of renewable sources. The suppliers equipped all the buildings under the SIE3 Convention with an energetic certification and committed to ensure the respect of the emission limits fixed by the relevant regulation. The combustion process of boilers had to respect the emissions threshold levels identified in the regulation and its subsequent amendments and revisions for the several types of fuels. The suppliers within the beginning of the second heating season installed and managed a controlling system to quantify the savings. This consumption reduction was obtained thanks to the realization of interventions aimed at enhancing the efficiency of the systems. These operations are expected to have direct benefits connected with health and safety.
Lastly the suppliers were responsible for the correct disposal of the waste coming from the cleaning services and the removal and disposal of the residues of asbestos.

2.3 Tender process

The procurement process provided that the Administration identified an Energy Manager to issue the supply order, to support the Administration during the inspections, to evaluate the technical and economic estimate presented by the supplier, to monitor the timely execution of the contractual obligations, to verify the fulfilment of the qualitative standards and to supervise the achievement of the energy targets.

The procurement process in some cases lasted even more than 18 months due to the complexity of the adhesion and subsequent stages of the supply proposal. The Administrations took part in the initiative by adopting a municipal resolution of expenditure commitment that was followed by the following contractual rounds:

1. The Administration issued the request to obtain the service supply
2. The supplier prepared and sent to the Administration the technical and economic estimate and the relevant attachments
3. Evaluation of the Economic and Technical Plan
4. The Administration issues the request to obtain the supply of the services as identified by the supplier

After having evaluated and approved the estimate, the Administration issued the request of the Convention services that has a duration of 6 years. Then, the supplier had to write the minutes of service taking over representing the official document of obligation assumption.

3 Efficiency actions

The efficiency actions undertaken by the suppliers on the buildings of the several Administrations participating in the lighthouse projects belong to several categories and were done on different types of public buildings, although with a prevalence of school premises. The most common efficiency actions were done on plants and systems and on the envelope of municipal buildings. Installation of co-generators, more efficient condensation generators, remote control heating and cooling systems, automatic regulating devices, thermostatic valves and inverter electro-circulators or accelerators. Often generators have been replaced with condensing boilers, methane has been set as the main energy carrier and pipes have been insulated. Some boilers have been powered by biomass and the layout of several distribution systems has been renovated.

The initiatives provided the adoption of a consumption control and monitoring system to obtain reliable information on the actually achieved energy savings also through remote systems. Some supplier offered to conduct the monitoring and to forecast the expected benefits by means of the IPMVP protocol (International Performance Measurement and Verification Protocol). The measures of energy efficiency considered by the protocol include savings in the use of fuel and water, the temporal shifts of electric power, the reduction of electric consumption through the installation or modification of the systems and the change of management procedures.
After the implementation of the identified actions, the data are collected again according to the same collection method used during the first stage.

The suppliers emphasized the key role of the conduct adopted by the Administrations since it can prejudice the good performance of the building-plant systems. An analysis of the interactions between users and system was performed to define unique objective levels of comfort perception. The analysis was made mapping the user profile, interviewing the users to elaborate suggestions on the behaviours to adopt or avoid, verifying the implications and the discomfort of the users behaviours, producing a manual of good practices and behaviours to be favoured.
Further analysis were conducted at micro-environmental level to allow the collection of data on wellness, air quality, average radiant temperature. Lastly, the discomfort indexes were identified and incorporated in a report containing the design guidelines for the elimination of the criticalities.
For the Energy Management service the supplier provided a total monitoring solution of the system functioning, the energy consumption and other data representative of the environmental conditions. This solution allowed to access the monitoring data both from the stations located in the contractual management seats and the operations room that is endowed with visualization systems allowing to inspect remotely each building-plant system and afterwards to aggregate the punctual data.

4 Cost, energy and CO_2 savings

Lighthouse project 1: ARENZANO	
Project name	Efficient Arenzano
Product group	Buildings
Project region	City: Arenzano, Province: Genova, Region: Liguria
Cost savings (expressed in EUR)	Annual energy savings Thermal consumption reduction objective (natural gas): € 16.899,74
Energy savings (expressed in MWh)	Annual energy savings Thermal consumption reduction objective (natural gas): 331,368 MWh
CO2 savings (expressed in tep)	Annual CO2 savings Thermal CO2 savings objective (natural gas): 66,94 tCO2

Lighthouse project 2: LA SPEZIA	
Project name	Efficient La Spezia
Product group	Buildings
Project region	City: La Spezia, Province: La Spezia, Region: Liguria
Cost savings (expressed in EUR)	Annual energy savings Thermal consumption reduction objective (natural gas): € 300 218.13
Energy savings (expressed in MWh)	Annual energy savings Thermal consumption reduction objective (natural gas): 5.886,630 MWh
CO2 savings (expressed in tep)	Annual CO2 savings Thermal CO2 savings objective (natural gas): 1.189, 10 tCO2

Lighthouse project 3: LICATA	
Project name	Efficient Licata
Product group	Buildings
Project region	City: Licata, Province: Agrigento, Region: Sicily
Cost savings (expressed in EUR)	Annual energy savings

	Thermal consumption reduction objective (natural gas): € 21 515.97
Energy savings (expressed in MWh)	Annual energy savings Thermal consumption reduction objective (natural gas): 285,357 MWh
CO2 savings (expressed in tep)	Annual CO2 savings Thermal CO2 savings objective (natural gas): 57,64 tCO2

Lighthouse project 4: MASCALUCIA	
Project name	Efficient Mascalucia
Product group	Buildings
Project region	City: Mascalucia, Province: Catania, Region: Sicily
Cost savings (expressed in EUR)	Annual energy savings Thermal consumption reduction objective (diesel): € 3.560,51 Thermal consumption reduction objective (natural gas): € 14 509,03
Energy savings (expressed in MWh)	Annual energy savings Thermal consumption reduction objective (diesel): 33.276 MWh Thermal consumption reduction objective (natural gas): 192,428 MWh
CO2 savings (expressed in tep)	Annual CO2 savings Thermal CO2 savings objective (diesel): 8,92 tCO2 Thermal CO2 savings objective (natural gas): 38,87 tCO2

Lighthouse project 5: GUALTIERI	
Project name	Efficient Gualtieri
Product group	Buildings
Project region	City: Gualtieri, Province: Reggio nell'Emilia, Region: Emilia Romagna
Cost savings (expressed in EUR)	Annual energy savings Thermal consumption reduction objective (natural gas): € 44.147

Energy savings (expressed in MWh)	Annual energy savings Thermal consumption reduction objective (natural gas): 865,632 MWh
CO2 savings (expressed in tep)	Annual CO2 savings Thermal CO2 savings objective (natural gas): 174,86 tCO2

Lighthouse project 6: NOCETO	
Project name	Efficient Noceto
Product group	Buildings
Project region	City: Noceto, Province: Parma, Region: Emilia Romagna
Cost savings (expressed in EUR)	Annual energy savings Thermal consumption reduction objective (natural gas) : € 45.491
Energy savings (expressed in MWh)	Annual energy savings Thermal consumption reduction objective (natural gas): 891,97 MWh
CO2 savings (expressed in tep)	Annual CO2 savings Thermal CO2 savings objective (natural gas): 180,18 tCO2

Lighthouse project 7: REGGIOLO	
Project name	Efficient Reggiolo
Product group	Buildings
Project region	City: Reggiolo, Province: Reggio nell'Emilia, Region: Emilia Romagna
Cost savings (expressed in EUR)	Annual energy savings Thermal consumption reduction objective (natural gas): € 40.162,50
Energy savings (expressed in MWh)	Annual energy savings Thermal consumption reduction objective (natural gas): 787,500MWh
CO2 savings (expressed in tep)	Annual CO2 savings Thermal CO2 savings objective (natural gas): 159,07 tCO2

Lighthouse project 8: FIORENZUOLA D'ARDA	
Project name	Efficient Fiorenzuola
Product group	Buildings
Project region	City: Fiorenzuola d'Arda, Province: Piacenza, Region: Emilia Romagna
Cost savings (expressed in EUR)	Annual energy savings Thermal consumption reduction objective (natural gas): € 68.913,50
Energy savings (expressed in kWh)	Annual energy savings Thermal consumption reduction objective (natural gas): 1.351,245 MWh
CO2 savings (expressed in tep)	Annual CO2 savings Thermal CO2 savings objective (natural gas): 272,95 tCO2

Lighthouse project 9: PADOVA FIT	
Project name	Padova Fit
Product group	Buildings (residential and tertiary)
Project region	City: Padova, Province: Padova, Region: Veneto
Cost (expressed in EUR)	15.872.573 € in the private market
Energy savings (expressed in MWh)	Annual energy savings 15.200 MWh
Renewable energy production (expressed in MWh)	Annual energy savings 2.300 MWh
CO2 savings (expressed in tep)	Annual CO2 savings 4.850 CO2 tCO2

Lighthouse project 10: CATANIA	
Project name	Efficient Catania
Product group	Buildings
Project region	City: Catania, Province: Catania, Region: Sicily
Cost savings (expressed in EUR)	Annual energy savings Thermal consumption reduction objective (diesel): € 121.386 Thermal consumption reduction objective (natural gas): € 37.348

Energy savings (expressed in MWh)	Annual energy savings Thermal consumption reduction objective (diesel): 1.134,45 MWh Thermal consumption reduction objective (natural gas): 495,33 MWh
CO2 savings (expressed in tep)	Annual CO2 savings Thermal CO2 savings objective (diesel): 304,03 tCO2 Thermal CO2 savings objective (natural gas): 100,1 10 tCO2

5 Challenges, unexpected situations and open issues

The most ambitious energy efficiency interventions are obviously also the most expensive and, therefore, there is a trade-off between the cost of the efficiency actions in the short term and the energy savings that they can provide in the long term. In this tender framework, the suppliers have not an incentive to perform significant actions due to the high costs. That is why an encouraging mechanisms has been adopted to push the suppliers towards more structured and long-lasting interventions through the sharing of the extra savings between the Administration and the supplier.

The tender required the suppliers to realize energy efficiency interventions identified on the base of the needs and opportunities detected during the inspections, emerged from the energy check and the audit. This exposed the suppliers to unexpected situations due to exogenous factors and provided an insurance to the Administrations which obtained maintenance and efficiency interventions to resolve inefficiency and neglect. Moreover, the initiative implied a high degree of technic-administrative complexity requiring management skills, knowledge of field regulations and the strong ability to supervise the contract management.

The energy mapping and the technical registry of the municipal buildings allowed an increasing awareness of the challenges that the Administration is asked to face. Therefore, the action plan is expected to become more and more systematic and ambitious since it is aimed at ensuring a governance of all the real estate assets. The final purpose is to achieve an high efficiency level in the criticality management and a more effective resources use.

Another challenge for the future is to increase the awareness of the users in order to favour the onset of virtuous behaviours contributing to the consumption reduction and the relevant polluting emissions and to promote a wellness culture of the occupants. The target to enhance wellness is motivated by the eagerness to improve the life quality in terms of environmental, thermal and visual comfort and to reduce the effect of the other polluting sources.

6 The continuity elements between lighthouse projects' energy efficiency interventions and SEAPs

The municipalities adhering to the lighthouse projects are all signatories of the Covenant of Mayors and, therefore, they had adopted a SEAP beforehand and they have an audit of emissions and energy absorption by fuel type and sector at city level. The totality of these cities/towns identified the intervention on municipal real estate as fundamental actions to achieve the CO2 reduction objective declared in their SEAPs. We can then conclude that the participation in the lighthouse projects by means of Consip Spa convention SIE 3 provided them with the opportunity to approach their Covenant of Mayors' target in terms of energy efficiency and thus CO2 emissions reduction.

The majority of the municipalities obtained energy efficiency interventions in the framework of the lighthouse projects on school and city hall buildings through the replacement of doors and windows with low-transmittance ones, the thermal insulations of circuits, plants and envelope, the installation of photovoltaic plants and the replacement of the heat boilers with more efficient ones. All the actions results have been closely monitored to assess progress and eventual bottlenecks through consumption accounting systems and energy consumptions management systems.

Nonetheless, we must be frank in acknowledging that the impact of municipal buildings on the overall budget represents only a minor share. This means that significant results can be achieved only provided a combination of actions targeted at other municipal scopes of action and to other sectors such as residential and tertiary buildings. Thus, for what concerns the actions going beyond the interventions on real estate, the SEAPs identified measures such as:

- Public lighting: replacement of mercury vapor lamps with high pressure sodium or more effectively with LED lamps; installation of flow regulators, astronomic clocks and remote control devices; refit the artistic lanterns of the historic city center.
- Urban mobility: development of "soft-mobility" by building urban bicycle paths, implementing car-sharing and car-pooling, coastal cabotage through electrically powered boats; replacement of municipal automobile fleet with low environmental impact vehicles powered by biomethane or electric vehicles; campaign for the sensitization to sustainable mobility; creation of limited traffic zones; implementation of a monitoring system of the vehicular traffic.
- Green energy: procurement of certified energy from renewable sources, promotion of energy production from renewable sources for agricultural, industrial and tertiary sectors.
- Residential buildings: installation of solar photovoltaic plants and support to increase the energy performance levels of private buildings by granting subsidies; promotion of energy production from renewable sources.
- Secondary and tertiary sectors: installation of photovoltaic plants on industrial warehouses and greenhouses; establishment of a technical committee for the enhancement of energy

efficiency and renewable sources in the industrial sites and tertiary sector.

- Municipal building regulation: obligation to comply with the energetic requirements of the energy class A for new buildings or existing buildings subject to energy renovation; insertion of an energetic section to the municipal building code.
- GPP: adoption of "green criteria" in the public purchasing procedures of goods and services with respect to the product groups: stationary, cleaning services, electric and electronic equipment and devices (e.g. PC, monitors and printers) and catering.
- Communication and training: training for municipal employees on the GPP and environmental sustainability topics; sensitization campaigns addressed to the school pupils and information plans addressed to citizens; stakeholders involvement through a consultation plan or a permanent stakeholders' forum on the SEAP topics; creation of an energy info point; establishment of local certifications to promote green products, services or conducts.

On the other hand, the SEAPs were in some cases rather ambitious and identified actions going beyond both the interventions on real estate and the most common energy sources and readily exploitable technologies, such as:

- Installation of solar panels.
- Exploitation of tide power for the production of renewable energy.
- Promotion of energy production from renewable sources in both municipal and residential buildings through the installation of biomass systems, thermal solar plants and micro-wind power plants.

7 Lessons learnt and conclusion

This case study on the lighthouse projects drew the attention on some lessons learnt that worth to be listed.

First of all, the Administrations taking part to the lighthouse projects learned how to manage in a sustainable and with an organic approach their real estate and obtained a guaranteed savings of at least 25%. This savings has been achieved through a number of efficiency interventions identified according to the climate area of the municipality. This allowed to elaborate a coherent plan of actions with respect to the peculiar conditions of the climatic zone.

Secondly, the actions described in the SEAP were used by the local Authorities to set up the energy efficiency interventions plan to be implemented by the SIE3 suppliers who have a thorough knowledge of the territory and can, then, provide targeted actions keeping into accounts criticalities and peculiarities. Therefore, the lighthouse projects municipalities harmonized the energy efficiency actions with the commitments made with the adhesion to the Covenants of Mayors.

Lastly, the lighthouse projects provided a tangible evidence of the applicability of advanced protocols such as the IPMVP also to the public authorities' buildings thus creating an important evidence of the feasibility and of the progress in the required standards of the public contractor.

This systematized approach to monitoring allows to obtain disaggregated data for elaborations to trace the consumption trends (e.g. by time slots), the ordinary and extraordinary maintenance operations (e.g. systematic failures) and more generally on the functionality of the building-plant systems.

In conclusion, given the broad adhesion of the Italian cities and towns to the Covenant of Mayors, the Convention SIE 3 managed by Consip Spa might provide more significant technological improvements and more radically promote the use of advanced energy certifications and protocols. Moreover, an overall comfort based on proper light conditions, suitable thermal standard and high air quality should be adopted and there should be an explicit prohibition to use materials and substances that have been classified as harmful by the European Union. Last but not the least, data collected in the monitoring phase represent a precious starting point for the elaboration of analysis aimed at assessing the actual efficiency of the implemented actions and at formulating proposals for the advancement of the following editions of the Convention.

8 Bibliography

1) Sito web Green ProcA Italia: http://gpp-proca.eu/it/bestpractice/
2) Consip's SIE 3 Convention – tender documents: https://www.acquistinretepa.it/opencms/opencms/main/pa/strumenti/dettaglio.jsp?tipo_utente=PA&idT=67637&tipoVis=descr&nome=Servizio+integrato+energia+3&frompage=convenzioni.jsp&orderBy=attivazione&sort=desc&__pagina=1&__element=&categoria=1&tipoStrumento=Convenzione