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STEPPING - Supporting The EPC Public Procurement IN Going-beyond

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Evaluation of STEPPING pilot results and corrective measures

Synthesis

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AURA EE

Table of contents

Introduction

This document is a report on the results and outcomes of the application of common EPC methodologies developed by the Stepping project in Mediterranean countries.

Each partner produced a regional report in which they gave feedback on their context, pilot experience, failures and success concerning all the steps of the project implementation.

1 - Pilot project results analysis

The table in annex 1 gives a global overview on the 12 Stepping pilot projects from the different partners.

The direct results are completed by the calculation of efficiency ratio to give inputs for the comparison.

With 67 municipalities involved, 158 buildings, 255 000 m², and €17,4M investment, the results are very interesting and significant. The Italian contribution is very high because it includes half of the projects.

	AURA-EE	RegPiem 1	RegPiem 2	RegPiem 3	RegPiem 4	AESS 1	AESS 2	BSC	Huelva	AREANAT	AEGEA	MIENA
		Cuneo	Vercelli	Novara	INRiM	Forli	Carpi-					
Municipalities	5	13	4	2	1	7	2	2	11	11	4	5
Buildings	5	19	7	6	8	64	5	3	15	12	11	3
m2	9 400	28 959	10 669	7 913	18 805	60 200	7 763	3 390	46 041	31 424	11 485	20 500

The following table gives the aggregated results:

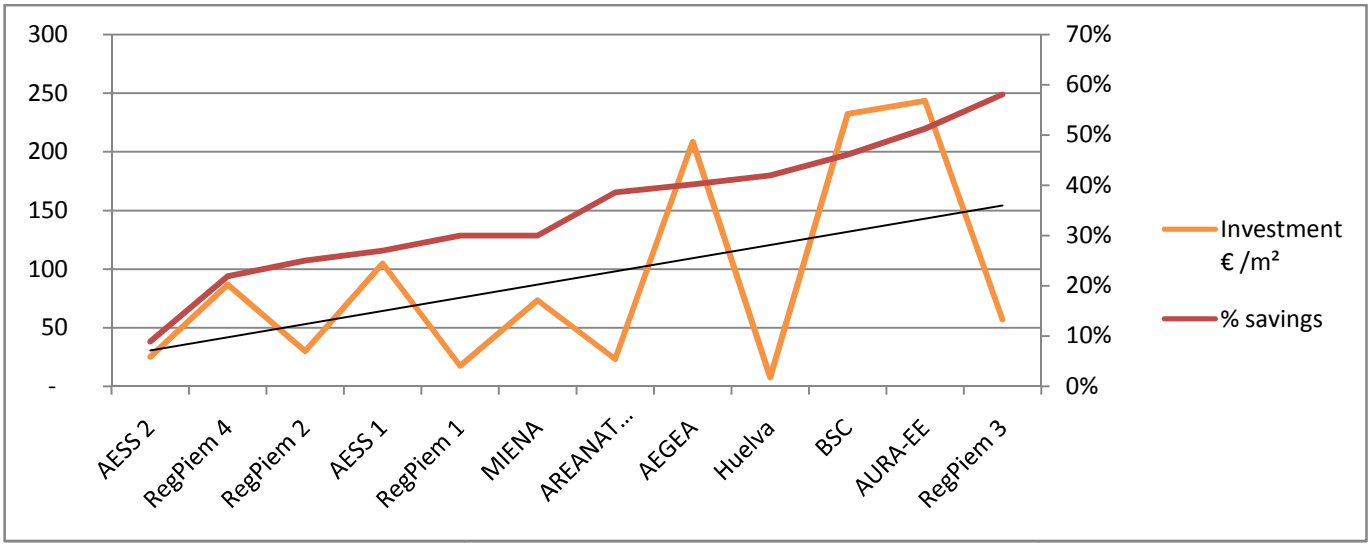
	Total
Municipalities	67
Buildings	158
M^2	256 549
Heating Degree days	22 886
MWh consumption	42 881
kWh/m²	**167**
% savings	25%
MWh savings	10 874
Investment k€	17 434
Investment € /m²	**68**
kWh savings / € investment	**0,6**

The average energy consumption of 167 kWh/m² is low due to the south climate and the choice of schools as pilot buildings by 3 partners: Spain, Malta and France (schools have low consumption due to their intermittent use). The range of values is very high from 20 kWh/m² in Spain or Malta to more than 300 kWh/m² in Modena or AEGEA. The climate is also visible in the range of heating degree days from 550 in the south to 3300 in Slovenia.

The average energy savings of 25% is good in comparison with the average €68 investment per m² but these values are not very representative as the range of values is very high from 9% to 58% of savings and from €7/m² to €232/m² investment.

The following table and graph (Investment/m² VS % savings) give some indications on the relation between the level of investment and the energy savings objectives.

	AESS 2	RegPiem 4	RegPiem 2	AESS 1	RegPiem 1	MIENA	AREANA Tejo	AEGEA	Huelva	BSC	AURA-EE	RegPiem 3
% savings	9%	22%	25%	27%	30%	30%	39%	40%	42%	46%	51%	58%
Investment € /m²	**25**	**87**	**30**	**105**	**17**	**73**	**23**	**209**	**7**	**232**	**243**	**57**



In a global approach, higher investment leads to higher energy efficiency but the very high differences between the climate, the building types (from schools to hospitals) and the initial performance of the buildings cause to many exceptions such as high investments leading to poor energy savings or small investments leading to high energy savings.

The pilot projects seem to be divided in two groups considering the investment/m²:

- The first group is composed of projects with less than 30% savings and an investment lower than €100/m². The efficiency rate is high with between 1 to 2 kWh saved per invested euro. **The motivation of these projects is clearly economic.**
- The second is composed of projects with more than 45% savings and an investment around €250/m². The efficiency rate is low with between 0.1 and 0.3 kWh saved per invested euro. **The motivation is not only economic but also building conservation; energy savings being just a part of a wider renovation project.**

The leverage factor (cost of assistance VS investment) is > 20 for 5 partners especially in countries where an EPC market and a framework exist (Italy, France). Such leverage factor is compatible with ELENA or H2020 PDA projects. On the opposite, the ratio is < 10 for 3 partners in countries where the EPC awareness has to be increased and the EPC framework to be re-enforced (Slovenia, Spain, Portugal). **This highlights the additional efforts that partners have to pursue to create a favourable context.**

	AURA-EE	RegPiem 1	AESS 1	BSC	Huelva	AREANAT	AEGEA	MIENA
Leverage factor :	**22**	**19**	**36**	**8**	**3**	**8**	**26**	**32**

2 - Synthesis of the feedbacks

2.1 – About the national/regional context

The national and local contexts regarding EPC and public building renovation policies have a large influence on the pilot projects development.

To convince, on one side, Local Authorities and, on the other side, ESCOS to adopt EPC, several conditions are mandatory:

- Existence of a national legal framework for EPC also with standard documentation
- Awareness/knowledge concerning EPC and the efficiency of savings guarantee
- Existing ESCOS and energy supply market

Without these conditions, it is extremely hard to develop pilot project because of the need to set up a favourable context within the project that is time consuming.

Additionally, some conditions can facilitate the projects:

- Voluntary or mandatory SEAP and Environmental plans
- National policies to give tertiary buildings renovation obligations
- Investment capacity of municipalities or subsidies for building renovation

Without this, the pilot project has to find its own motivation and the financial ones are not sufficient for the moment in South European countries.

2.2 – About the preliminary phase (municipalities and first building selection)

Regarding the preliminary phase, the Stepping feedback is that the selection of pilot projects and buildings is facilitated by:

- Energy management or energy advisory services by Local energy agencies (see French and Slovenian examples)
- The legitimacy of the partner: Leadership (Deputation of Huelva), links with its public members (AESS, AREANATejo)

- Capacity/experience of the partner in terms of EPC financial compatibility

➔ **Then, two ways of selection have been tested with success during Stepping:**

- **Selection by building type with good technical (high consumption) or financial (subsidies) potential**
- **Selection by municipalities with motivation to renovate a pool of buildings but in this case, a second step of building selection is necessary**

The pilot projects have highlighted an important feature concerning the pilot building pool selection. EPC is a specific business with, in most countries, a limited number of ESCOS. Consequently, a minimum budget (> 1 or 2 Million euros) is needed to interest the market and the ESCOs. This budget is composed of Energy supply and Investment in energy efficiency measures. In case of low consumption building (low use and/or warm climate), the pay-back of measures takes more time and the number of selected measures small. Therefore, the energy supply stake is also too low to interest the market.

Two alternatives have been tested in the Stepping project:

- A higher investment made not only with economic incentives but also with building conservation incentives and subsidies opportunities.
- Additional investment in RES production like PV that increases investment and energy sale business.

➔ **The feasibility of an EPC project is not only a question of pay-back time of the investment but also a question of project budget size and of ESCOs' target and interest.**

➔ **A first analysis of the project in terms of market is needed at the end of the preliminary phase to verify the feasibility and to adapt the building choice if needed.**

➔ **EPC must not only be considered as a financial instrument but also as a saving-guarantee tool.**

2.3 – About the energy audit

The building type selection must integrate the local context and conditions.

- Type of buildings selection criteria:

- High energy consumption (old building, intensive use, internal comfort: hospital VS school)
- High energy intensity of systems (swimming pool VS school)
- **Level of obsolescence/conservation (regulation, comfort, image, etc)**
- **Influence of climate change (summer comfort in schools in May/June) or others (air quality)**
- **Buildings targeted by subsidies**

➔ **Energy consumption cannot be the only selection criteria. For example, schools can be a bad target in Spain because of low consumption whereas school can be a good target in Greece because of subsidies and a good target in France because of the building conservation priority.**

- Type of measures to be analysed:

- Services: regulation, contracts
- Basic HVAC systems, lighting
- Insulation roofs (good), windows (bad)
- **Users' involvement**
- Led lighting
- **RES production and district heating**

➔ **The traditional type of measures with HVAC or insulation must be improved with led lighting, RES production to increase the investment potential and users' involvement to increase the efficiency and sustainability of the measures.**

2.4 – About detailed analysis phase and investment plan

Audits must be carried out to analyse pilot projects results. The results have to be credible and usable for the next steps (tender and baseline).

Each measure proposed must be feasible to implement. For example, one audit has highlighted the use of wood pellet boiler to reduce consumption. However, it appeared that the size of the boiler was too big for the door and the stairs and it was impossible to install it.

The investment must also be estimated +/- 10-15% but not +/- 30%.

➔ **The quality of the audits has to be guaranteed by internal or external experts to avoid damaging audits that lead to ineffective outcomes.**

Definition of the audit scenarios: the audit has to define the feasibility and costs of saving measures as well as the optimized scenarios combining measures to reach the objectives.

In general, the first scenario is the shorter pay-back time scenario (3-5 years?), a second can be the European goal (20% savings, 20% RES) and a third, the maximum saving scenario (factor 4 in 2050).

➔ **All 3 scenarios, even the most ambitious, have to be studied carefully because of the impact of subsidies and/or side criteria like comfort.**

Concerning the financial approach, the following criteria have to be taken into account:

- Investment constraints: investment capacity of the building owner
- Economic efficiency of measures and scenarios
- Subsidies available

About the reference: initial situation or initial and mandatory measures. In general, the financial comparisons take into account a project with a current situation. It is sometimes not right and suitable. For example, if the building has a 40 years old boiler, this boiler has to be changed within 10 years and then, the financial comparison has to compare the renovation project with the current situation with the new boiler.

➔ **Do not forget that the project budget has to be calculated for the all contract duration.** Investment is made once at the beginning, but energy supply and O&M have to be multiplied by the contract duration.

➔ **When the investment plan is completed, a check has to be done regarding the market and the tender procedure constraints to verify the feasibility.**

The question to keep in mind is whether the investment plan is adapted:

- **to the legal framework and tender procedure? (For example, in some countries a minimum size is necessary to use certain EPC procedures).**
- **to the envisaged grouping organisation? (for example, are the constraints of the individual building renovation timetable compatible with a common tender?)**

2.5 – About EPC market

Energy Performance Contract is a market, and the project have to be attractive for the market. Most Stepping partners have just communicated to the market via conferences or seminars. However, the communication seems not sufficient when the EPC market is small. The risk is simply to have no offer if the market is not interested.

➔ **For countries with a low EPC market, there is a real interest/need sourcing to make as soon as possible to define the ESCOs' interests, the minimum project budget size or the type of ESCOS/companies that can be interested.**

For example:

- In case of an EPC service with short pay-back time measures; energy supply is the most important part of the contract (70-90%)
  - ⇨ Only big energy suppliers can be interested, and their interest starts at minimum €1 or 2M contract
- In case of global refurbishment, O&M and energy supply represent less than 20% of the budget:

- ⇨ SMEs are more concerned because they are not able to make good supply offers and, in this case, energy supply is less important
- ⇨ Investment is high and risky. Municipalities have to participate to reduce the risk.

➔ **Sometimes, a market has to be created for the project and it takes time. For example, lighting measures and insulation are not made by the same companies than HVAC (traditional ESCO companies and sometimes, a gathering is necessary from companies' side to organize an offer).**

2.6 – About tender schemes, contracts and specifications for the proper deployment of the pilots

Different types of tenders can be used for EPC depending on the project and the legal framework of the country:

Service contract, work contract, PPP contract.

➔ **The type of tender has to be decided as soon as possible in the project because it leads to some specific constraints. It appears that some projects cannot be launched without the tender procedure foreseen.**

Grouping/pooling project is needed to reach a project size and interest the market but is not so easy.

The Stepping project has shown that there are two ways for grouping/pooling project:

- The traditional one with a **common tender** lead to some constraints like having a leader to launch the tender for all and a common timetable for all buildings' renovation.
- **A different one with one tender per building or per municipalities but linked through a common operator insuring a market size. This common operator can be a public ESCO launching the tenders for the municipalities or eventually an energy agency or a public body working as a common facilitator**

This second solution is particularly interesting to implement a sustainable EPC market not only for one project but for many projects in the next years. It is more complicated to set up, but it is more reassuring and efficient for the municipalities and for the market. The same tender model will be used many times and will save time for both demand and offer sides.

The tender content of the Stepping pilots shows a relative common content:

- Tender specifications
- Management and **technical specifications**
- M&V plan

- EPC contract scheme with duties, liabilities,
- **Risk matrix**
- Templates for the financial offers

The most important differences concern:

- The technical specifications: the level of details of the technical specifications gives more or less capacity to ESCOS to adapt their offers and to demonstrate their knowledge (design and implementation studies)
- The risk matrix also dedicated to the project including investment from the ESCO.

➔ **The more the investment is included, the more the ESCOs have to be able to design their offers but also the more the budget must be higher to integrate the risk.**

3 - Conclusions

- A stable legal framework for EPC and EPC awareness is needed in each country
- EPC is complex and specific skills are needed
- To define the frame of a project, opportunities/constraint, subsidies, market, legal framework, grouping capacity, tender specifications, are to be explored as early as possible. All steps are linked from the first analysis to detailed audits and depend on the model/opportunities.

➔ **Create EPC awareness: organizing informative campaigns and training formats to increase the knowledge and share the knowledge between ESCOS and municipalities**

➔ **Support energy advisory and energy management services, and create EPC technical assistance/facilitator services for the public sector**

- It is necessary to pool small projects to interest the EPC market, but it is difficult to pool municipal projects in one common tender.

➔ **There are different solutions to bundle projects: common tender or different tender linked together**

➔ **The bundling process for each municipality is a more viable procedure**

- Considering the long pay-back time, some projects are not suitable for third party financing. From the economic point of view, the ambitious energy renovation is not financially justified. However, energy rehabilitation contributes to social benefits and it has to be taken into account.

- EPC is not only a question of pay-back time or investment but also a question of market/budget for ESCOS.

➔ In case of low consumption, PV production can be a way to increase the EPC budget and profitability.

➔ Subsidies are needed for municipalities/or ESCOs that can be combined with ERDF subsidies.

➔ EPC can be seen as a tool to guarantee savings and not as a financial tool.

Annex 1: Pilot results synthesis table

RegPiem 1	RegPiem 2	RegPiem 3	RegPiem 4	AESS 1	AESS 2	BSC	Huelva	ARE
30	Vercelli	Novara	INRiM	Forli	Carpi-			
13	4	2	1	7	2	2	11	
19	7	6	8	64	5	3	15	
959	10 669	7 913	18 805	60 200	7 763	3 390	46 041	31
2350	2 391	2 227	2 434	2 435	2 249	3 300	578	1
929	1 448	1 449	4 774	20 195	971	675	1 127	2
136	**136**	**183**	**254**	**335**	**125**	**199**	**24**	
30%	25%	58%	22%	27%	9%	46%	42%	
179	362	607	3 728	729	86	311	473	
500	319	450	1 632	6 300	194	787	344	
17	**30**	**57**	**87**	**105**	**25**	**232**	**7**	
2,4	**1,1**	**1,3**	**2,3**	**0,1**	**0,4**	**0,4**	**1,4**	
19				**36**		**8**	**3**	

Annex 2: Reports from each partner