



National Roundtable
Financing energy efficiency in Malta
6th June 2019 – Malta

Energy efficiency improvements in the Maltese building stock -
The EPC contracts for Public Buildings

Arch. Massa Erika, *Stepping Project Manager, MIEMA*



STEPPING

Supporting The EPC Public Procurement IN Going-beyond

Project
budget:
1,94 M €

ERDF:
1,65 M €

Project
duration:
30 months

STEPPING project aims to **increase the adoption of EPC (Energy Performance Contracts)** investment schemes in the elaboration of Energy efficiency plans for **public building** in the MED area, **raising the knowledge of MED institutions** in designing, implementation and managing of energy efficiency plans for public buildings

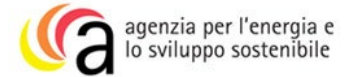
Introduction about STEPPING project

Step up for energy efficiency

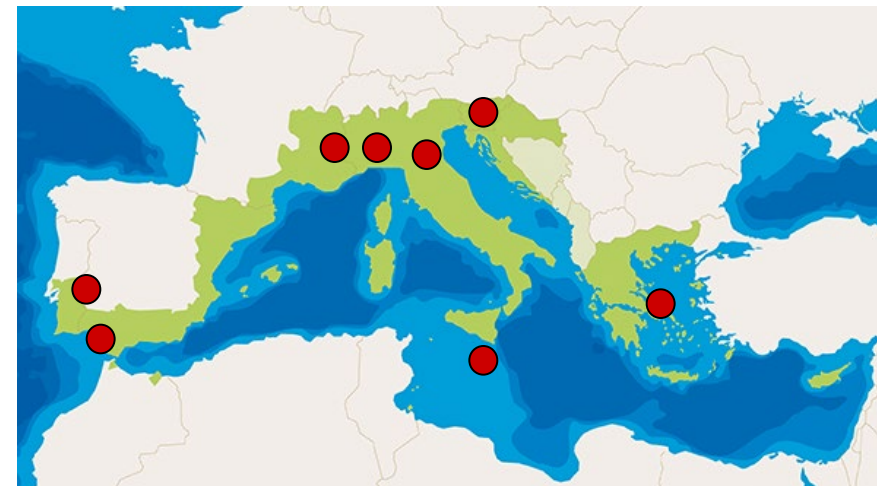
9 Partners from 8 regions of 7 EU countries of MED area, committed in testing and transferring EPC implementation at local level

1.6 M€ of ERDF for delivering:

- 8 Investment Plans involving more than 60 Local Authorities,
- 4 Procurement Tenders for awarding energy efficiency works,
- Transferring results into ordinary tender procedures and,
- Engagement of policy makers and Smes in training activities and policy consultation



Auvergne
Rhône-Alpes
Énergie Environnement



STEPPING project - Concept



- One joint EPC tender for funding and implementing energy retrofit in buildings of different Municipalities
- Joint agreement between the contracting authority and the municipalities

- Simplify EPC tendering steps
- Support small Municipalities in managing EPC
- One sole company (ESCO) to deal with



Energy Performance Contracting

EPC is a 'creative financing' for capital investment which allows funding energy upgrades of buildings from operational cost reductions



BEFORE **AFTER EPC**



STEPPING project – Pilot study



Municipality/PA engagement

**MEDE/FTS
LCA**



Selection of buildings

**5 public buildings :
3 schools, 2 LCs**



Energy Auditing

Selection criteria:

- Construction age
- Energy demand
- Indoor comfort
- Renovation requirements



Studying proposed measures



**Investment plan and EPC
feasibility study/consultation**



STEPPING project – Pilot study on schools

Schools analysed:

Qormi - Primary School - *San Ġorġ*

Santa Lucia - Secondary school - *St Thomas More College*

Kirkop - Middle School - *St Benedict College*



Kirkop Middle School



Qormi - Primary School



Kirkop Middle School



Santa Lucia Secondary



Qormi - Primary School



Energy Audit – Pilot study

Summer Heat gains

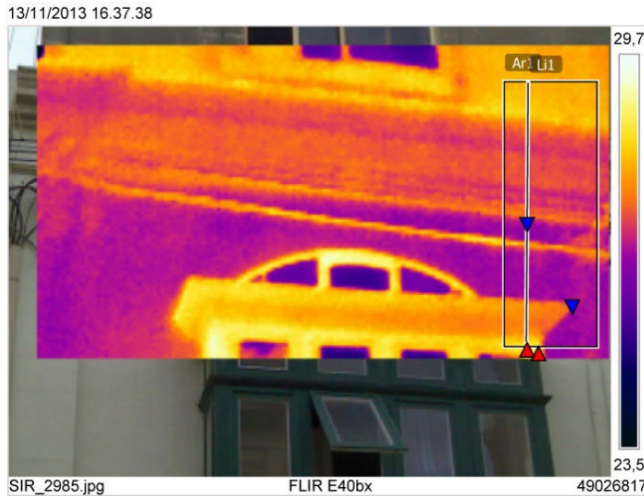


South-facing facade



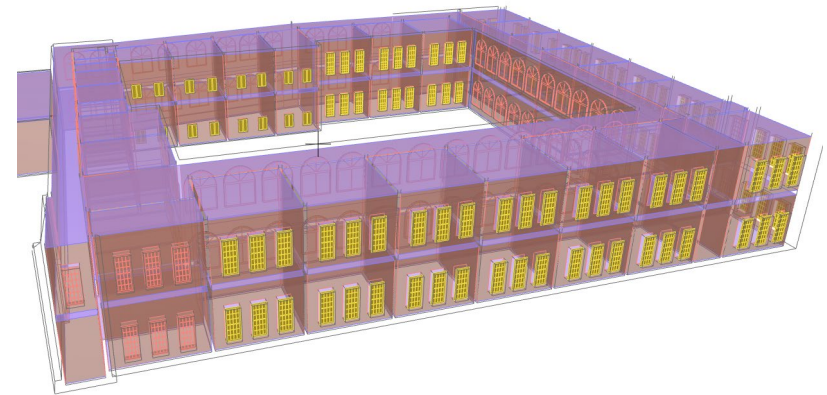
North-facing facade

Winter Heat loss



Energy Audits

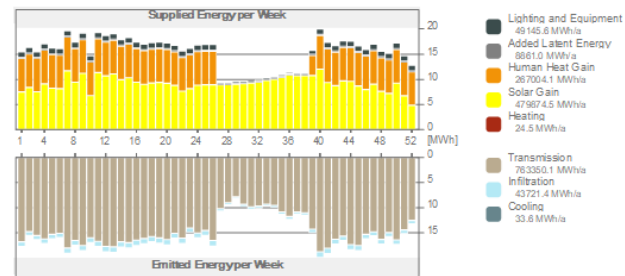
- Energy assessment was conducted to reduce energy requirement and evaluating cost-effective measures for energy refurbishment.
- Each building was modelled and assessed through the use of the **EPRDM** Software, that is the software used in Malta for the energy performance certificate.
- For some buildings the **BIM EcoDesigner** Software was also utilised to have a more complete picture and established different scenarios, including different sets of energy efficiency measures, were simulated.



Key Values

General Project Data		Heat Trans for Coefficients		U value	[W/m ² K]
Project Name:	Untitled	Building Shell Average:		2.46	—
City Location:		Floors:		1.05 - 2.27	
Latitude:	35° 59' 0" N	External:		—	
Longitude:	14° 37' 0" E	Underground:		3.09 - 6.37	
Altitude:	0.00 m	Openings:			
Climate Data Source:	StruSoft server	Specific Annual Values			
Evaluation Date:	03/06/2019 18:10:24	Net Heating Energy:	0.01	kWh/m ² a	
Building Geometry Data		Net Cooling Energy:	0.01	kWh/m ² a	
Gross Floor Area:	3184.15 m ²	Total Net Energy:	0.02	kWh/m ² a	
Treated Floor Area:	2770.32 m ²	Energy Consumption:	17.76	kWh/m ² a	
External Envelope Area:	3142.20 m ²	Fuel Consumption:	17.78	kWh/m ² a	
Ventilated Volume:	12460.42 m ³	Primary Energy:	53.38	kWh/m ² a	
Glazing Ratio:	19 %	Fuel Cost:	2.94	EUR/m ² a	
Building Shell Performance Data		CO ₂ Emission:	4.22	kg/m ² a	
Infiltration at 50Pa:	2.24 ACH	Degree Days			
		Heating (HDD):	598.52		
		Cooling (CDD):	3118.44		

Project Energy Balance



Energy Consumption by Targets

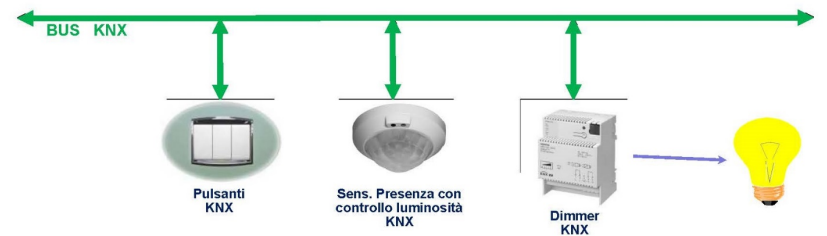
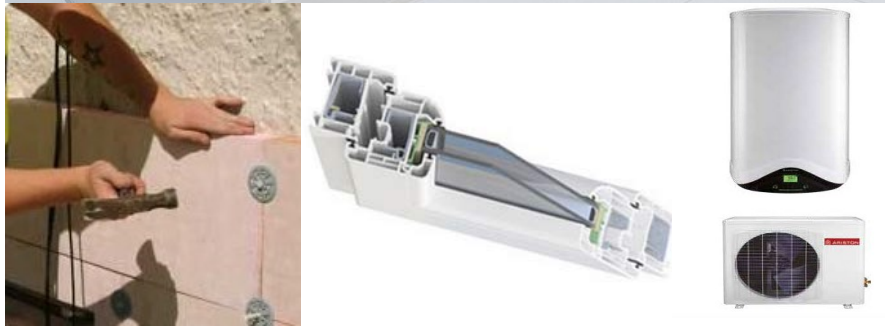
Target Name	Energy			CO ₂ Emission kg/a
	Quantity kWh/a	Primary kWh/a	Cost EUR/a	
Heating	24	73	3	5
Cooling	33	377	13	20
Service Hot-Water	0	0	0	0
Ventilation Fans	0	0	0	0
Lighting & Appliances	49145	147436	7863	11676
Total:	49203	147887	7880	11703



Energy Efficiency Measures



- 1 Addition of insulation to roof structure
- 2 Replacement of single glazed apertures with PVC double glazed windows and shading devices
- 3 Installation of Photovoltaic panels
- 4 Internal/external wall insulation
- 5 Efficient/intelligent LED lighting system
- 6 Energy efficient heat pump water heaters



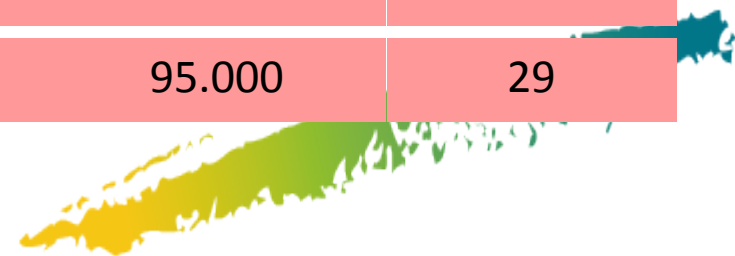
Energy Efficiency Measures - Active measures

Measures (Qormi School)	Energy consumption (kWh/year)	Investment Approx (€)	Annual Energy Savings (kWh/year)	Pay Back- Time (years) Approx.
Replacement of electric geyser with HP water heaters	5.250	2.500	3.060	5.2
Replacement of fluorescent tube lights with LED	49.400	20.000	18.200	6,5
Building Automation / Lighting sensor installation in common areas		4000	10%	6
PV installation (30 kWp)		45.000	53.400	5.6



Energy Efficiency Measures - Passive measures

Measures (Qormi School)	Energy consumption - Approx (kWh/year)	Investment Approx (€)	Annual Energy Savings (kWh/year)	Pay Back-Time (years) Approx.
Replacement of single glazed aperture with U-PVC double glazing	54.650	150.000	11.500	>30
Insulation of roof structure	54.650	70.000	10.500	>30
Installation of Heating and cooling system – VRF	67.000	160.000	/	/
Total EE + Lighting	120.000	404.000	42.000	>30
Total EE + Lighting+RES	120.000	449.000	95.000	29



EPC Financial Sustainability

Consultation with policy makers and bodies involved in tendering procedures in public buildings highlighted the following challenges:

- Due to mild climate and low energy demand, EPC that includes only EE solutions is difficult to justify in terms of investment → (long pay back time and long period contracts)
- Public owned buildings have funds to be allocated for refurbishments, therefore “EPC shared saving” is not an option.
- “EPC guarantee savings” can be an option but it is difficult to find energy service companies that take the risk to guarantee the EE performance especially in long term contracts.
- EPC should include RES to justify investments → Short pay-back period
- Consider indoor comfort as added value in public buildings, especially in schools

Thank you!

For more information on STEPPING:

<http://stepping.interreg-med.eu/>