



Cross border seminar: Accelerating energy retrofitting investments in Mediterranean university buildings

Local workshop - Spain

Workshop Report

Date: 17th June 2021



DISCLAIMER

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Med-EcoSuRe Project

Project Title	Mediterranean University as Catalyst for Eco-Sustainable Renovation
Project acronym	Med-EcoSuRe
Funding scheme	European Union under the ENI CBC Mediterranean Sea Basin Programme 2014-2020
Start date	September 1st, 2019
Duration	36 months

Med-EcoSuRe is a project funded by the European Union, under the ENI CBC MED programme 2014-2020. The programme is managed by the Autonomous Region of Sardinia (Italy) and aims to promote cross-border cooperation in the Mediterranean region.

The main objective of the project is to propose and implement innovative and eco-sustainable energy renovation solutions for Mediterranean university buildings and introduce an active collaborating approach for decision support, among key actors involved, in the framework of a Living Laboratory: MED beX.Live (Live the eXperience of university building environment).

Scope of the Event

In the framework of Med-EcoSuRe, a cross order seminar was organized with the aim to propose innovative financing schemes, business models, organizational structures and partnerships to accelerate the energy retrofitting of the university building stock in the Mediterranean.

The seminar included:

- **National workshops** organized to investigate opportunities, innovative tools and financing schemes in Tunisia, Palestine, Italy and Spain. These workshops targeted local and regional authorities, national energy agencies, ministries and fund managers, organisations providing training to cities and regions, banks and financing institutions.
- **A cross border conference** in which each partner of the project presented the outputs of the local workshops, with the aim to trigger a debate about local specificities on existing financing schemes and opportunities to accelerate the energy renovation of universities buildings.

This report summarizes the outputs of the local workshop organized online on the 17th of June 2021 by:

The Spanish Solar Energy Cluster (SOLARTYS)

University of Seville (US)

I. Executive summary

On Thursday 17th of June 2021, the Asociación Española para la Internacionalización y la Innovación de las Empresas Solares (SOLARTYS) in collaboration with the University of Seville (US) held an online event on the existing financing schemes of Energy Renovation in Spain. During the event, professors, students, energy agencies and companies representing the solar sector participated.

II. Addressed issues

- Investment strategies for energy efficiency in buildings renovations
- Discussions on the assessment of local strategies & recommendations

III. Welcome

Ms. Yeimy Ospina, project manager at SOLARTYS, presented the scope of the local workshop which will be followed by a cross-border seminar in order to discuss about the challenges and opportunities of financing schemes to promote energy retrofitting in public buildings, especially Universities.

IV. Presentation of SOLARTYS and Med-EcoSuRe

Mr. Jordi Ortiz intervened to present the values and objectives of Solartys and presented the Med-EcoSuRe project, highlighting that it brings together researchers, decision makers and stakeholders to build a common understanding of the eco-sustainable building renovation issues in a collaborative “living lab”. The project foresees to value innovative energy renovation solutions and foster sustainable science and policy progress.

V. Policies promoting energy retrofitting investments in buildings

Mr. Molina presented the current situation of Energy consumption in tertiary buildings; savings opportunities due to interventions in air conditioning, ventilation, lighting and DHW equipment; and the funding program to promote the rehabilitation of public buildings in Spain (PIREP).

About the current situation of Energy consumption in tertiary building, Mr. Molina highlighted that there has been an increase of energy consumption due to several reasons, such as population growth, economy growth, within others. However, following the content of the image

below, even with this social and economic growth, in the educational sector (which includes universities buildings) a lot of energy is being consumed:



Sector Servicios ⁽¹⁾

Unidad	Consumo del sector servicios	Cobertura en la demanda energética		Número de empleados en el sector servicios	Consumo térmico por empleado	Consumo eléctrico por empleado	Valor Añadido del sector servicios ⁽⁴⁾
	Mtep	Energías renovables ⁽⁷⁾	Electricidad				
2000	6,7	12,0	64,4	9.703	0,688	5.279	525.250
2018	10,8	24,3	59,4	14.839	0,727	5.109	801.895

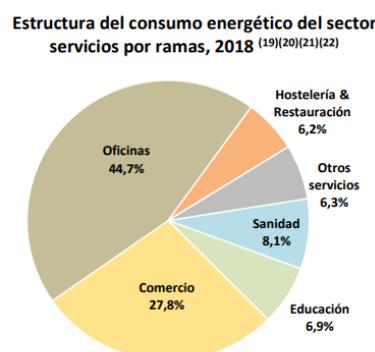
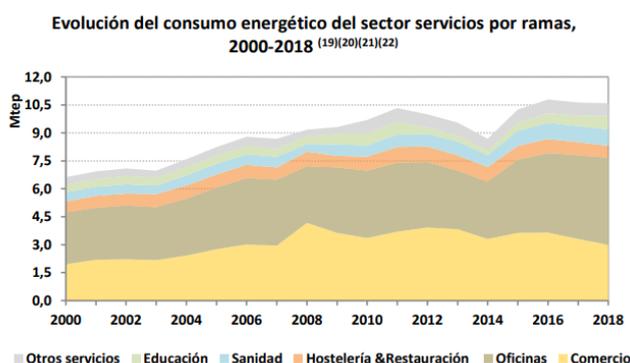


Figure 1. Most recent summary report on energy efficiency indicators in Spain

The problem highlighted is that Universities buildings are “orphans”, which means that it is extremely difficult to take responsibilities about the energy consumption. Considering this and that Article 2 of Directive 2010/31/EU of 19 May 2010 on the energy performance of buildings, as amended by Directive (EU) 2018/844, requires each Member State to develop a long-term strategy to support the renovation of its national stock of residential and non-residential buildings, both public and private, transforming them into energy-efficient and decarbonised building stock by 2050, facilitating the cost-effective transformation of existing buildings into nearly zero-energy buildings. Spain, in fulfilment of this mandate, has developed the **ERESEE 2020: 2020 Update of the Long-term Strategy for Energy Rehabilitation in the Building Sector in Spain**: <https://www.mitma.gob.es/el-ministerio/planes-estrategicos/estrategia-a-largo-plazo-para-la-rehabilitacion-energetica-en-el-sector-de-la-edificacion-en-espana/trabajos-apoyo>.

ERESEE 2020 is the study that prepared the framework of long-term strategy for energy rehabilitation in the building sector in Spain, and which contains the savings opportunities due to interventions in air conditioning, ventilation, lighting and DHW equipment. More concretely, it is important the one entitled: Report on foresight and future evolution of air conditioning systems and DHW in tertiary buildings (<https://cdn.mitma.gob.es/portal-web>

[drupal/planes_estartegicos/Informe_5_terciario.pdf](#)) because it studies all air-conditioning systems currently used in all tertiary buildings and it classifies them according to the sector to which they belong. Hence, this study shows which is the energy consumption in heater, refrigeration, and DHW in university buildings as well as the most probable interventions to save in energy consumption. For example, replacing the boiler with a condensing boiler and a reversible heat pump.

Another possibility that is stated in the study is the maximum level of saving in energy consumption that could be accomplished depending on the type of building. For universities, for example, changing in lighting to LED supposes a saving of 50% in energy consumption; and changing the boiler with a condensing boiler only supposes a maximum saving of 20-22% in energy consumption (see figure 2).

MEDIDAS DE EFICIENCIA ENERGÉTICA		OFICINAS		Hoteles/ Residencias		Hospitales		Centros Comerciales		Centros Universitarios		Colegios/Institutos		Supermercados	
		AB	CDE	AB	CDE	AB	CDE	AB	CDE	AB	CDE	AB	CDE	AB	CDE
		ILUMINACIÓN	Cambio a LED	50	50	50	50	50	50	50	50	50	50	50	50
Iluminación natural	10		10	5	5	5	5	15	15	5	5	15	15	15	15
Control de presencia e interruptores	5		5	10	10	5	5	2	2	10	10	5	5	2	2
CLIMATIZACIÓN	Mejora de producción	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	Cambio a caldera de condensación (*)	22	20	20	18	20	18	22	20	22	20	22	20	22	20
	Renovación de enfriadoras y BdC	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	Cambio de calderas a BdC (*)	50	40	40	30	40	30	50	40	50	40	50	40	50	40
	Mejora en la distribución														
	Cambio de 4T a 2T	20	20	25	25	25	25	20	20	20	20	-	-	-	-
	Circuitos hidráulicos a velocidad variable	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	Ventiladores a velocidad variable	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	Ahorro de energía														
	Uso de recuperadores	8	12	10	15	10	15	8	12	8	12	8	12	8	12
Enfriamiento gratuito (**)	15	20	7	10	7	10	15	20	10	12	-	-	14	16	
Control del caudal de ventilación	5	5	8	8	5	5	20	20	15	15	-	-	25	25	
Automatización, control y monitorización	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
Mantenimiento	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
ACS	Cambio a caldera de condensación			15	15	15	15					15	15		
	Aislamiento de las tuberías			20	20	20	20					20	20		
	Instalación solar			50	50	50	50					50	50		
ET	Aislamiento (*)	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	Mejora huecos	20	20	20	20	20	20	20	20	20	20	20	20	20	20

Figure 2. Assessment of the proposed actions for tertiary buildings. Values in %.

Finally, it is highlighted that after having incorporated all the replacements mentioned, the maximum of saving in energy consumption in university buildings if, for instance, a traditional boiler is replaced for a condensing boiler is only of 2,3% of energy consumption. In short,



Med-EcoSuRe

although the systems are much more efficient, the results in energy consumption savings are not as high as expected (see figure 3).

MEDIDAS DE EFICIENCIA ENERGÉTICA		OFICINAS		Hotels/ Residencias		Hospitales		Centros Comerciales		Centros Universitarios		Colegios/ Institutos		Supermercados	
		AB	CDE	AB	CDE	AB	CDE	AB	CDE	AB	CDE	AB	CDE	AB	CDE
ILUMINACIÓN	Cambio a LED	9,5	10,0	5,0	5,5	5,0	5,0	20,0	20,0	17,5	17,5	25,0	17,5	12,0	10,0
	Iluminación natural	1,9	2,0	0,5	0,6	0,5	0,5	6,0	6,0	1,8	1,8	7,5	5,3	3,6	3,0
	Control de presencia e interruptores	1,0	1,0	1,0	1,1	0,5	0,5	0,8	0,8	3,5	3,5	2,5	1,8	0,5	0,4
CLIMATIZACIÓN	Mejora de producción														
	Cambio a caldera de condensación (*)	0,9	1,7	2,8	3,2	3,4	3,5	2,6	4,2	2,3	3,5	4,6	6,3	2,5	3,6
	Renovación de enfriadoras y BdC	4,9	3,1	2,8	1,6	3,3	2,3	4,9	2,8	4,1	2,4	0,8	0,8	4,2	2,4
	Cambio de calderas a BdC (*)	2,1	3,4	5,6	5,3	6,7	5,9	6,0	8,4	5,3	7,0	10,5	12,6	5,6	7,3
	Mejora en la distribución														
	Cambio de 4T a 2T	6,1	5,3	7,9	7,4	9,4	8,9	8,0	8,0	6,8	6,8	-	-	-	-
	Circuitos hidráulicos a velocidad variable	2,4	2,0	2,2	2,0	2,7	2,5	3,0	2,8	2,5	2,4	1,9	2,7	2,7	2,4
	Ventiladores a velocidad variable	1,9	1,6	1,9	1,8	2,3	2,2	2,5	2,5	2,1	2,1	1,8	2,6	2,2	2,2
	Ahorro de energía														
	Uso de recuperadores	1,9	2,5	2,5	3,6	3,0	4,3	2,5	3,8	2,1	3,3	1,9	4,2	2,2	3,4
	Enfriamiento gratuito (**)	2,9	2,5	0,8	0,7	0,9	0,9	2,9	2,2	1,6	1,2	-	-	2,4	1,6
	Control del caudal de ventilación	1,2	1,0	2,0	1,9	1,5	1,4	6,3	6,4	4,0	4,1	-	-	7,0	7,0
	Automatización, control y monitorización	3,6	3,1	3,7	3,5	4,4	4,2	4,7	4,7	4,0	4,0	3,5	5,0	4,2	4,1
Mantenimiento	2,9	2,5	3,0	2,8	3,5	3,4	3,8	3,8	3,2	3,2	2,8	4,0	3,4	3,3	
ACS	Cambio a caldera de condensación			1,5	1,7	1,1	1,2					0,6	0,8		
	Aislamiento de las tuberías			2,0	2,2	1,4	1,6					0,8	1,0		
	Instalación solar			5,0	5,5	3,5	4,0					2,0	2,5		
ET	Aislamiento (*)	1,5	2,9	4,9	6,1	5,9	6,9	4,2	7,4	3,7	6,1	7,4	11,0	3,9	6,4
	Mejora huecos	4,7	4,2	5,0	4,8	6,0	5,7	6,3	6,4	5,4	5,5	4,9	7,0	5,6	5,6

Figure 3. Assessment of the proposed actions for tertiary building.

Considering the aforementioned, the Funding Program to promote the rehabilitation of public buildings in Spain (PIREP) is launched as an initiative **endowed with 1,080 million**, in four years, to intend for territorial public administrations (Autonomous Communities and Local Entities) with buildings that can be rehabilitated taking into account that a large part of the public park built was built before the year 79 and presents energy deficiencies and problems to adapt to home working. It will be possible to invest in **1.35 million m2** of public buildings of all kinds (administrative, educational, healthcare, sports, health, cultural or public service, etc.), without losing sight of the main **objective of an average energy saving of more than 30%**.

The actions that may be financed with this plan may be of several types:

- Actions type A. Interventions aimed at improving the energy efficiency of public buildings. These interventions are rated with a Climate Contribution Coefficient of 100% and will be 100% funded.
- Actions type B. Works aimed at improving environmental efficiency in terms of water, use of materials, waste management, and adaptation to climate change and protection of biodiversity. These two interventions are rated with a 40% climate contribution and are funded at 85%.
- Actions type C. Actions to improve accessibility. Interventions that remove barriers and improve physical, cognitive and sensory accessibility. These interventions are 85% funded and are considered to have no climate contribution.
- Actions type D. Actions to improve habitability. These interventions are 85% funded and are considered to have no climate contribution.
- Actions type E. Actions of conservation of the buildings. Actions aimed at improving the conservation of the building. These interventions are 85% funded and are considered to have no climate contribution.
- Actions type A bis. Drafting of projects and other works necessary for the realization of the works included in group A. Climate contribution coefficient of 100%. They will be financed 100%.
- Actions type B bis, C bis, D bis, and E bis. Drafting of projects and other work necessary for the implementation of the actions included, as appropriate, in groups B, C, D and E. These interventions are 85% funded and are considered to have no climate contribution.

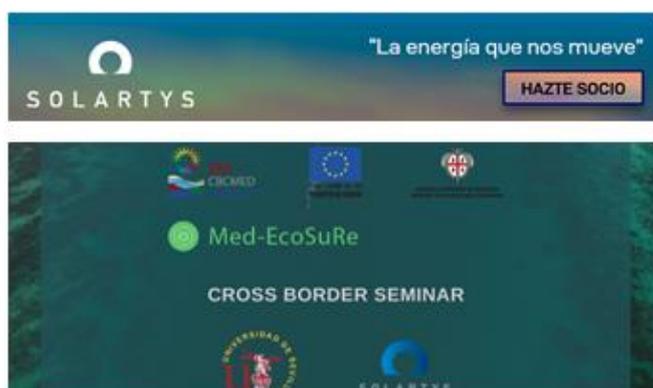
To choose the projects, **allocation criteria** will be established based on energy, environmental and implementation indicators of digitized management systems, as well as architectural interest, improvement of the built environment or other parameters related to sustainability, inclusion / accessibility and habitability (New European Bauhaus or bring the Green Pact to the centre of cities promoting creativity and culture). In the case of the **Autonomous Communities** and the autonomous cities, the funds will be transferred directly (**480 million**), according to the distribution fees previously set, for the best territorial balance. The sectoral conference will approve the agreement for the implementation of this plan, which will include the requirements and criteria of the actions to be financed. The financial commitment and eligible projects shall be laid down in the relevant Agreements.

In the case of **Local Entities (municipality, islands and provinces)**, for which **600 million** have been reserved, the objective is to articulate two calls for aid in a competitive competition regime, analogous to the aid program for the rehabilitation of historical heritage with charge to the 1.5% cultural, managed by this Ministry, with a long history and experience.

Conclusions and recommendations

- The subsidized rehabilitation strategy requires the saving of 30% of energy consumption.
- This level of savings is not achieved by the best of conventional interventions in university building facilities, nor by a plausible combination of several of them. Therefore, innovative energy-saving measures must be designed.

Agenda



[17 de junio 2021 | 10:00h - 11:00h | Online]

Inscripciones

Solartys, junto con la Universidad de Sevilla, te invitamos a participar en el seminario que organizamos en el marco del Proyecto Europeo [Med-EcoSuRe](#) con el objetivo de proponer esquemas de financiación innovadores, modelos de negocio y estructuras organizativas para acelerar la readaptación energética de edificios públicos.

PROGRAMA:

10.00h-10.05h	Bienvenida – Solartys
10.05h-10.20h	Presentación del Proyecto europeo Med-EcoSuRe- Director General Solartys
10.20h-10.40h	Estrategias de inversión para la eficiencia energética en la renovación de edificios- Subdirectora General de Arquitectura y Edificación, Ministerio de Transporte, Movilidad y Agenda Urbana
10.40h-10.55h	Debate sobre la evaluación de las estrategias locales y recomendaciones
10.55h-11.00h	Conclusiones y cierre

no te pierdas la oportunidad de descubrir de la mano de la Subdirectora General de Arquitectura y Edificación, del Ministerio de Transporte, Movilidad y Agenda Urbana, Marta Callejón, las estrategias de inversión para la eficiencia energética en la renovación de edificios públicos.

Reconocimientos:



Con la colaboración de:

Speakers:

- Jordi Ortiz, Solartys and Secartys General Director.
- Yeimy Ospina, Project manager at SOLARTYS
- Marta Callejón Cristóbal, Sub General Director for Architecture and Construction, Directorate General for the Urban Agenda and Architecture, Ministry of Transport, Mobility and Urban Agenda.
- José Luis Molina, professor at University of Seville