Cost Efficient Options and Financing Mechanisms for nearly Zero Energy Renovation of existing Buildings Stock

DELIVERABLE 3.3

Report on analysis of current conditions for Errenteira

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CERTUS PROJECT IN BRIEF

Southern European countries undergo a severe economic crisis. This hinders the compliance to the latest Energy Efficiency Directive, demanding strict energy efficiency measures for the public sector. Investments required to renovate public buildings and achieve nearly zero energy consumption have long payback times. So the interest of financing entities and ESCOs is small, especially when banks have limited resources. Many of the municipal buildings in Southern Europe require deep renovations to become nZEB and this should not be regarded as a threat but rather as an opportunity for the energy service and the financing sector.

The objective of the proposed action is to help stakeholders gain confidence in such investments and initiate the growth of this energy service sector.

Municipalities, energy service companies and financing entities in Italy, Greece, Spain and Portugal are involved in this project. The plan is to produce representative deep renovation projects that will act as models for replication. Twelve buildings in four municipalities in each country have been selected. The partners will adapt existing energy service models and procedures and will work out financing schemes suitable for the 12 projects. Consequently, the partners will create materials, such as guides and maxi brochures, suitable to support an intensive communication plan.

The plan includes four workshops with Business to Business - B2B sessions targeted to municipalities, ESCOs and financing entities. These actions shall be complemented by four training activities targeting municipal employees and the participation in international events targeting all 3 stakeholders. We expect that our action will have a significant impact by triggering investments in renovations to achieve nZEB and the uptake of the ESCO market in Southern European member states.

EXECUTIVE SUMMARY

The present document is part of the Work-package 3 on ***Energy Service Models and Optimal Financing Schemes***, in order to get the "Analysis of the economic, regulatory and policy framework of partner municipalities". It includes two kinds of analysis:

- analysis of the economic, regulatory, and policy framework of CERtuS' Municipalities;
- analysis of the cooperation between ESCO's and Municipalities.

The object of this report is to explore the prevailing national and local conditions in view of energy refurbishment of the existing municipal buildings stock in the Municipality of Errenteira, partner of the CERtuS project. The analysis has been focused mainly on the following aspects:

- the Municipality energy budget and financial status;
- expected energy savings from renovation project;
- administrative ability of municipalities to cope with deep renovation projects;
- regulatory and Policy framework (incentives and disincentives);
- obstacles slowing down the involvement of ESCOs in the energy refurbishment of existing public buildings (with the existing services schemes);
- financial issues relevant to renovation project (e.g. loan durations, interest rates, collaterals, credibility of municipalities, warranties, etc..);
- any other relevant issues (e.g. government warranties to municipalities under the current economic crisis).

To in depth investigate the current state of the art in terms of cooperation between Municipalities and ESCOs, a questionnaire has been created by Innova BIC and filled in by the Municipalities of the project. The aim was to understand the main existing barriers to the adoption and spreading of new private financial schemes for the energy refurbishment devoted to the existing buildings stock of Southern Mediterranean Municipalities.

This report includes the analysis of the economic, regulatory, and policy framework and the results of the questionnaire on the cooperation between ESCOs and the CERtuS Municipalities for the Municipality of Errenteira.

1. ANALYSIS OF THE ECONOMIC, REGULATORY AND POLICY FRAMEWORK OF THE MUNICIPALITY OF MESSINA

The objective of this analysis is to explore the starting point of target Municipal activity in terms of energy renovation so far, so as to detect existing barriers to be overcome as well as opportunities to be seized. This analysis aims to point out specific local conditions for each municipality, so as to frame CERtuS intervention as well as to overcome existing national, regional and local barriers to the adoption of financial instruments for the energy refurbishment devoted to the existing municipal buildings stock. To that end, each target municipality was invited to provide relevant information and data regarding the municipal buildings stock, energy consumption, regulatory and policy framework and constraints in which CERtuS actions will took place.

1.1. General Data Of The Municipality Of Errenteira

The town of Errenteira is located in the Spanish province of Gipuzkoa. It is 7 km far from Donostia / San Sebastián, 476 km from Madrid and 10 km from the French borderline. It has an extension of 32.26 km^2 and a population of 39,315 inhabitants, i.e. 1,218.7 inhabitants per km^2. Errenteira is included in the Oarsoaldea region with the municipalities of Oiartzun, Pasaia and Lezo.

Demography

Errenteira has a population pyramid characteristic of de baby boom of the 70s.

Geography

The area is occupied by the foothills of the Pyrenees. As it is close to the coastline, the whole municipality is characterized by its low altimetry, and the contact with the sea through the mouth of the Oiartzun River in the bay of Pasaia. This river crosses the town in its last 15 km, being the characteristic urban river (slow flow).

Climate

The climate is oceanic, warm (but not hot) summers and cool (but not cold) winters, with a relatively narrow annual temperature range: 18-20 ºC in summer and 5-10ºC in winter. Precipitation is abundant and dispersed throughout the year.

Districts

Errenteira is formed by several districts; some of them present the typical Basque rural aspects:

- Agustinak/Agustinas
- Beraun
- Etxe Berriak/Casas Nuevas
- Erdialdea/Centro *(Old Town)*
- Gabierrota
- Iztieta
- Listorreta
- Ondartxo
- Pontika
- Alaberga
- Kaputxinoak/Capuchinos
- Gaztaño
- Fanderia
- Galtzaraborda
- Lartzabal
- Olibet – Ugarritze
- Perurena
- Zamalbide

Housing stock

On housing density, Errenteira is characterized by a medium-high density.

FIGURE 1 - DEMOGRAPHY

AGE	MEN	WOMEN	TOTAL	%
0-4	918	1.030	1.948	4,95%
5-9	968	989	1.957	4,97%
10-14	888	880	1.768	4,49%
15-19	724	783	1.507	3,83%
20-24	703	691	1.394	3,54%
25-29	899	914	1.813	4,61%
30-34	1.384	1.417	2.801	7,12%
35-39	1.856	2.018	3.874	9,84%
40-44	1.619	1.824	3.443	8,75%
45-49	1.549	1.583	3.132	7,96%
50-54	1.256	1.278	2.534	6,44%
55-59	1.198	1.049	2.247	5,71%
60-64	1.387	1.171	2.558	6,50%
65-69	1.374	1.233	2.607	6,62%
70-74	909	770	1.679	4,27%
75-79	1.046	707	1.753	4,45%
80-84	797	510	1.307	3,32%
85-89	480	232	712	1,81%
90-94	195	58	253	0,64%
95-99	50	13	63	0,16%
100-104	3	2	5	0,01%
105-109	0	0	0	0,00%
Total	20.203	19.152	39.355	100,00%
Average Age				
MEN		45,15		
WOMEN		41,95		
TOTAL		43,59		

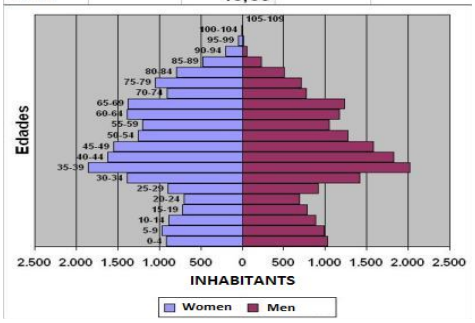


TABLE 1 - HOUSING STOCK

	Area [ha]	Erected dwellings	Projected dwellings	Total dwellings	Density [dwelling/ha]
Residential	282.1	17,057	1,944	19,001	228.1
	Area [ha]		Occupied area [ha]		
Industrial	102,84		83,17		

Municipal priorities

- *Waste management.*

  Currently the Municipality is developing the *Waste load prevention plan*. At this very moment the plan is being considered by the inhabitants of the town. They have a period to make their contributions to the plan before it is elaborated.

- *Public transport and mobility.*

  Cyclist and pedestrian mobility plan. At this very moment the plan is being considered by the inhabitants of the town. They have a period to make their contributions to the plan before it is elaborated.

- *Water.*

  The Municipality is starting to develop a plan to decrease the water consumption. At his very moment the plan is in its initial stages. Thus, it is not possible to add more information.

- *Energy efficiency of residential buildings.*

  The municipal technicians are studying different buildings of the Old Town of Errenteira in order to establish a common policy for the whole district.

1.2. Municipality Administrative And Legal Framework

In order to know the starting point and identify the measures already implemented in energy efficiency, renewable energy, waste, mobility, water and natural environment. In fact, these actions will be assessed and considered with the new measures proposed in the Sustainable Energy Action Plan (SEAP).

These are the plans carried out in Errenteira:

- the Sustainability Action Plan for Errenteira *"Plan de Acción para la Sostenibilidad de Errenteira de Agenda Local 21"*.

- Sustainability Regional Action Plan *"Plan de Acción Comarcal para la Sostenibilidad (Oarsoaldea)"*.
- Action plan to promote the use of bicycles. *"Plan Director de la Bicicleta de Errenteira"*.
- Municipal strategy for the conservation and improvement of the natural environment and biodiversity of Errenteira.
- Environmental municipal strategy.
- Mobility plan for Oarsoaldea.
- Scholar Agenda 21 of Errenteira.
- Sustainability diagnosis of Errenteira (2013).
- Strategic plan 2025 of Errenteira.

In these plans and studies several actions have identified actions that can be incorporated in the SEAP.

1.3. Energy Data Of The Municipality Of Errenteira

Firstly the energy consumption recorded in the whole town will be studied. Then, the Municipality consumption will be analysed.

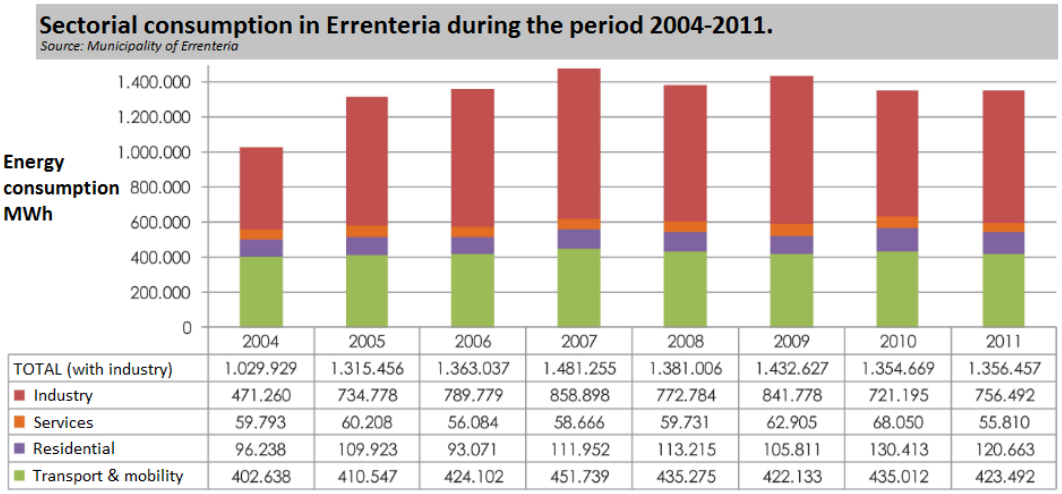
During the studied period (2004-2011), the total energy consumption in Errenteira has been variable. 2007 was the year with the maximum amount recorded, with 1,482 GWh.

Industry is the most energy consuming sector. In all the studied years, except 2004, more than the 50% of the total was consumed by industrial activities. The second sector with more consumption is the transport and mobility.

The industrial sector has increased its energy consumption by 61% in the period 2004-2011. In the same period, the consumption in the residential sector has been also increased by 25%. On the other hand, in the services sector the consumption has decreased by 7%.

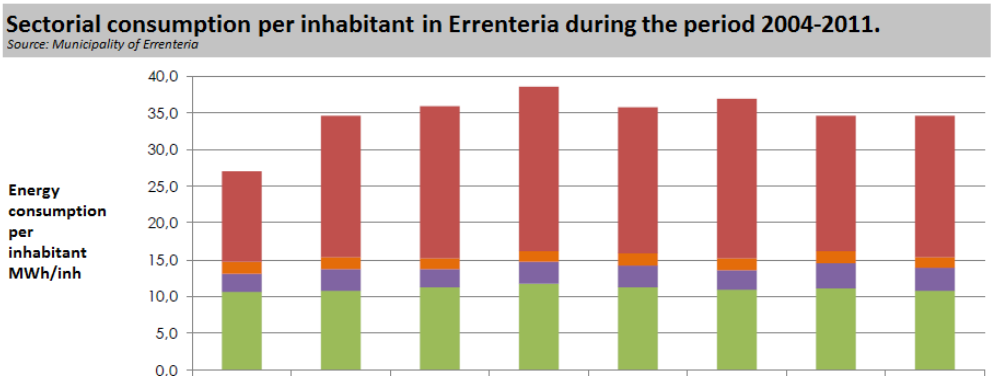
In the Figure 2 it is possible to check the sectorial consumption and in Figure 3 the sectorial consumption per inhabitant, in the period 2004-2011.

FIGURE 2- SECTORIAL CONSMPTION (2004-2011)



	2004	2005	2006	2007	2008	2009	2010	2011
TOTAL (with industry)	1.029.929	1.315.456	1.363.037	1.481.255	1.381.006	1.432.627	1.354.669	1.356.457
Industry	471.260	734.778	789.779	858.898	772.784	841.778	721.195	756.492
Services	59.793	60.208	56.084	58.666	59.731	62.905	68.050	55.810
Residential	96.238	109.923	93.071	111.952	113.215	105.811	130.413	120.663
Transport & mobility	402.638	410.547	424.102	451.739	435.275	422.133	435.012	423.492

FIGURE 3 - SECTORIAL CONSUMPTION PER INHABITANT



	2004	2005	2006	2007	2008	2009	2010	2011
TOTAL (with industry)	27,0	34,7	36,0	38,6	35,9	37,0	34,7	34,6
Industry	12,4	19,4	20,9	22,4	20,1	21,7	18,5	19,3
Services	1,6	1,6	1,5	1,5	1,6	1,6	1,7	1,4
Residential	2,5	2,9	2,5	2,9	2,9	2,7	3,3	3,1
Transport & mobility	10,6	10,8	11,2	11,8	11,3	10,9	11,1	10,8

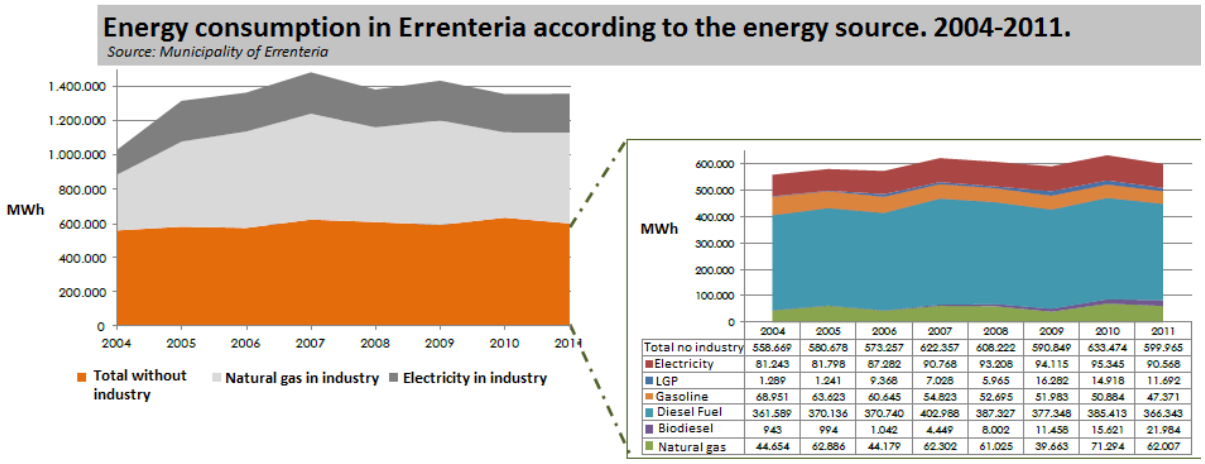
Natural gas has been the energy source with higher demand, ensuring more than the 35% (except 2004) of the consumed energy. Its consumption is mainly registered in industrial activities. Diesel fuel, used by vehicles, is the second most demanded energy source. Its tendency is similar than the observed in transportation and mobility, since 2007 (when the peak was reached, 403 GWh) its use has been decreased by 9%. In the case of the gasoline, there is a constant decrease in its consumption, 69 GWh in 2004, 31% less in 2011.

On the other hand the consumption of biodiesel has been increased in this period due to the policies established to promote the consumption of this fuel in transportation, especially in public transport.

The next energy source in demand is electricity, mainly used in dwellings and services. The evolution of its consumption is similar to the general demand of energy, i.e. ascending until 2010.

Liquefied petroleum gas (LPG) is being used in dwellings and services. This energy source has suffered a progressive increase of demand, probably due to the increasing prices of electricity and natural gas. This data can be checked in Figure 4.

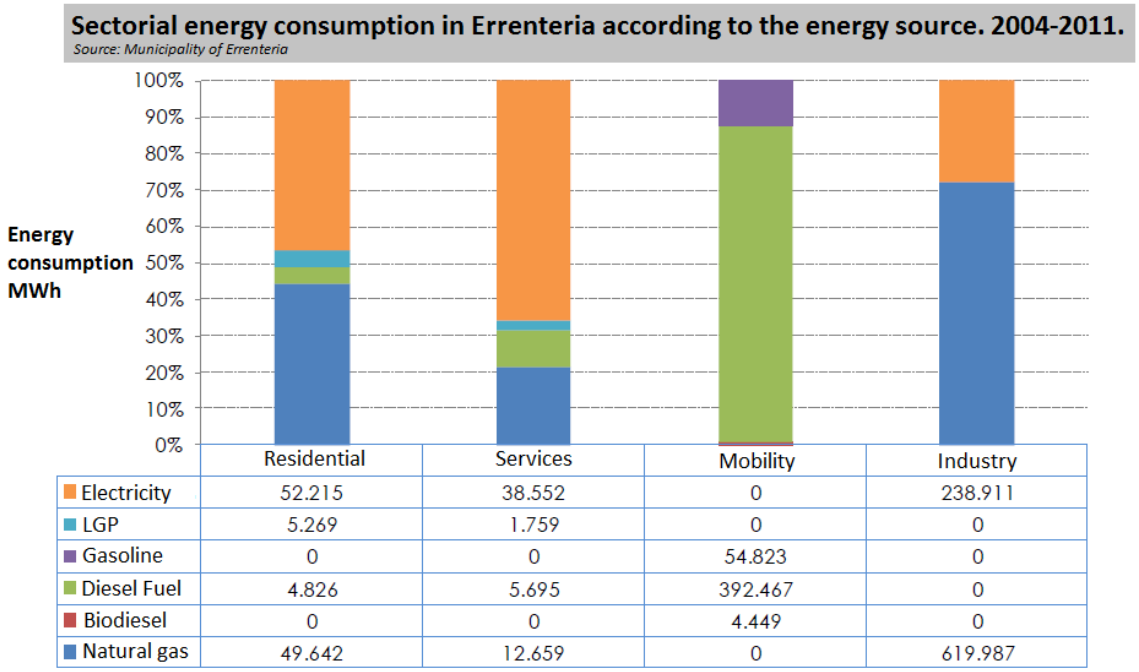
FIGURE 4 - ENERGY CONSUMPTION BY ENERGY SOURCE



	2004	2005	2006	2007	2008	2009	2010	2011
Total no industry	558.669	580.678	573.257	622.357	608.222	590.849	633.474	599.965
Electricity	81.243	81.798	87.282	90.768	93.208	94.115	95.345	90.568
LGP	1.289	1.241	9.368	7.028	5.965	16.282	14.918	11.692
Gasoline	68.951	63.623	60.645	54.823	52.695	51.983	50.884	47.371
Diesel Fuel	361.589	370.136	370.740	402.988	387.327	377.348	385.413	366.343
Biodiesel	943	994	1.042	4.449	8.002	11.458	15.621	21.984
Natural gas	44.654	62.886	44.179	62.302	61.025	39.663	71.294	62.007

2007 has been selected to be the base year for the Sustainable Energy Action Plan (SEAP). In Figure 5 the sectorial energy consumption according to the different energy sources is shown. In transportation and mobility, diesel fuel is the most demanded energy. In the case of the residential sector, natural gas and electricity are the most used (Sustainable Energy Action Plan) energy sources; being electricity the must used service sector and natural gas the must used for the industrial activities.

FIGURE 5 - SECTORIAL ENERGY CONSUMPTION



	Residential	Services	Mobility	Industry
Electricity	52.215	38.552	0	238.911
LGP	5.269	1.759	0	0
Gasoline	0	0	54.823	0
Diesel Fuel	4.826	5.695	392.467	0
Biodiesel	0	0	4.449	0
Natural gas	49.642	12.659	0	619.987

In addition to the energy consumption, the production of renewable energy was also studied for the same period 2004-2011. Table 2 presents the renewable energy production by source and sector.

TABLE 2 - RENEWABLE ENERGY PRODUCTION

Year	Type	Sector	Capacity	Unit	Estimated production [kWh]	Estimated total production [kWh]
2012	Biomass	Residential	19	kW	22,560	6,024,169
	Grid-connected photovoltaic	Industrial	27,850	Wp	27,850	
		Residential	63,470	Wp	63,470	
		Services	163,518	Wp	163,518	
	Off-grid photovoltaic	Primary sector	300	Wp	300	
		Residential	180	Wp	180	
		Services	588	Wp	588	
	Small hydro	Energetic	1,232	kW	5,735,996	

	Thermal solar	Residential	5	m^2	3,856	
		Services	8	m^2	5,851	
2011	Grid-connected photovoltaic	Industrial	27,850	Wp	27,850	6,235,140
		Residential	63,470	Wp	63,470	
		Services	163,518	Wp	163,518	
	Off-grid photovoltaic	Primary sector	300	Wp	300	
		Residential	180	Wp	180	
		Services	588	Wp	588	
	Small hydro	Energetic	1,232	kW	5,969,996	
	Thermal solar	Residential	5	m^2	3,856	
		Services	8	m^2	5,851	
2010	Grid-connected photovoltaic	Industrial	27,850	Wp	27,850	5,751,400
		Residential	63,470	Wp	63,470	
		Services	163,518	Wp	163,518	
	Off-grid photovoltaic	Primary sector	300	Wp	300	
		Services	588	Wp	588	
	Small hydro	Energetic	1,232	kW	5,485,967	
	Thermal solar	Residential	5	m^2	3,856	
		Services	8	m^2	5,851	
2009	Grid-connected photovoltaic	Industrial	3,850	Wp	3,850	6,600,907
		Residential	11,900	Wp	11,900	
		Services	163,518	Wp	163,518	
	Off-grid photovoltaic	Services	588	Wp	588	
	Small hydro	Energetic	1,232	kW	6,411,344	
	Thermal solar	Residential	5	m^2	3,856	
		Services	8	m^2	5,851	
2008	Grid-connected photovoltaic	Industrial	3,850	Wp	3,850	6,552,217
		Residential	11,900	Wp	11,900	
		Services	163,518	Wp	163,518	

	Off-grid photovoltaic	Services	588	Wp	588	
	Small hydro	Energetic	1,232	kW	6,368,505	
	Thermal solar	Residential	5	m^2	3,856	
2007	Grid-connected photovoltaic	Residential	11,900	Wp	11,900	6,938,621
		Services	62,718	Wp	62,718	
	Off-grid photovoltaic	Services	588	Wp	588	
	Small hydro	Energetic	1,712	kW	6,859,559	
	Thermal solar	Residential	5	m^2	3,856	
2006	Grid-connected photovoltaic	Residential	11,900	Wp	11,900	6,037,621
		Services	62,718	Wp	62,718	
	Off-grid photovoltaic	Services	588	Wp	588	
	Small hydro	Energetic	1,712	kW	5,958,113	
	Thermal solar	Residential	5	m^2	3,856	
2005	Grid-connected photovoltaic	Residential	6,300	Wp	6,300	6,674,457
		Services	45,978	Wp	45,978	
	Off-grid photovoltaic	Services	588	Wp	588	
	Small hydro	Energetic	1,712	kW	6,617,735	
	Thermal solar	Residential	5	m^2	3,856	
2004	Grid-	Residential	6,300	Wp	6,300	6,723,801

connected photovoltaic	Services	17,006	Wp	17,006
Off-grid photovoltaic	Services	588	Wp	588
Small hydro	Energetic	1,712	kW	6,696,051
Thermal solar	Residential	5	m^2	3,856

Finally, the consumption of the Municipality is analysed. Within this figure are included:

- those buildings dependent of the municipality
- public lighting
- municipal fleet

These consumptions are summarized in the table 3 (see below).

TABLE 3 - ENERGY CONSUMPTION IN THE MUNICIPALITY BY ACTIVITY

Activity									
	2004	2005	2006	2007	2008	2009	2010	2011	2012
Buildings-public lighting	**MWh**								
Electricity	5,876,853.34	6,023,025.96	5,903,362.64	6,260,108.93	6,339,684.10	6,267,477.97	6,050,293.50	5,715,004.29	5,769,798.22
Buildings	3,437,236.50	3,549,740.61	3,383,556.29	3,741,434.91	3,847,727.05	3,801,293.21	3,683,036.60	3,672,757.24	3,679,022.08
Public lighting	2,439,616.84	2,473,285.36	2,519,806.35	2,518,674.02	2,491,957.05	2,466,184.76	2,367,256.90	2,042,247.05	2,090,776.14
Natural gas		4,359,751.00	4,584,601.00	5,432,997.00	6,047,768.00	5,185,339.00	6,573,798.00	5,064,562.00	6,316,337.00
Vehicles	**Liters**								
Diesel fuel	160,260.72	158,686.22	159,445.00	164,820.85	157,020.74	156,371.96	163,942.06	145,169.45	144,479.11
Gasoline	4,791.94	4,584.72	4,833.58	3,935.52	4,345.92	2,381.39	3,807.43	3,854.21	1,117.90
Biodisel	-	-	-	-	-	-	-	-	-

1.4. Renovation Experiences In The Municipality Of Errenteira

The table below presents rehabilitation actions since 2001. Most of these actions are related to the installation of photovoltaic panels or lighting improvements. All of these actions are shown in table 4.

TABLE 4 - RENOVATION BACKGROUND

Year	Action	Municipal department
2001	Galtzaraborda sport centre. Replacement of a former diesel fuel boiler by a more effective gas CHP.	Urban maintenance Urbanism
2001	Agreement with the "Ente Vasco de la Energía" to promote the rational use of the energy and the renewable energy sources in the town.	Urbanism
2003	Municipal sport centre. Replacement of a former diesel fuel boiler by a more effective gas CHP.	Sport and leisure Urbanism
2006	The Municipality participates in the "II Ekitaldi of Town and Climate".	Environment and mountains
June 2006	Installation of photovoltaic panels in the building Listorreta-Barrenlegoia.	Environment and mountains
November 2006	Improvement of the public lighting: replacement of luminaries and installation of suitable control panels.	Urban maintenance
December 2006	Replacement of former parking meters by new ones that works by means of photovoltaic electricity.	Traffic
March 2007	Elaboration of a study which aims to the	Environment and

	reduction of the light pollution.	mountains
April 2007	Installation of informative panels in the town. These panels worked with photovoltaic electricity.	Traffic
May 2007	Installation of photovoltaic panels in three public schools: Beraun-Berri, Cristóbal Gamón and Langaitz.	Urban maintenance
June 2009	Agreement with EUDEL (confederation of Basque municipalities) to monitor some public municipal buildings in order to establish policies to save energy in that king of buildings.	Environment and mountains

Moreover, the Municipality has done four “Ekoscans” in different public buildings. An “Ekoscan” is an action done by Ihobe (public agency of environment, belonging to the Department of the Environment and Territorial Policy of the Basque Government) to know the energetic performance of those buildings. Those buildings are included in table 5.

TABLE 5 - BUILDINGS UNDER ECOSCANS ACTION

Year	Action	Municipal department
2005	Galtzaraborda sport centre.	Sport and leisure Urbanism
2006	Sagrado Corazón retirement home for the elderly.	Urbanism
2006	Maintenance warehouses.	Urban maintenance Urbanism
2008	Maintenance warehouses.	Urban maintenance Urbanism Environment and mountains

Finally, the public subsidies given to the Municipality to carry out actions in the field of sustainability, specifically those relating to mitigate the climate change are displayed in table 6 (in Spanish).

TABLE 6 - SUSTAINABILITY ACTIONS

Nº	Medida (obra o proyecto)	Orden	Fecha solicitud	Presupuesto	Fecha concesión	Importe
1	Agenda 21 Escolar 2010/2011	Gobierno Vasco 30/7/2010	04/10/2010	35.000 €	BOPV 31/1/2011	14.830,50 €
2	Programa de Ayudas a la Eficiencia Energética en Ayuntamientos (2010)	Ente Vasco de la Energía		145.292 €		59.334 €
3	Agenda 21 Escolar 2011/2012	Gobierno Vasco 02/03/2011	16/04/2011	35.000 € (sin IVA 29661 €)	BOPV 03/10/2011	14.830,51 €
4	Programa de Ayudas a la Eficiencia Energética en ayuntamientos (2011):	Ente Vasco de la Energía	30/11/2011	173.696 €	BOPV 02/03/2012	43.359 €
	4.2 Instalaciones de climatización y/o producción de agua caliente sanitaria ACS (Polideportivo)			14.953 € Justificado 12.833€		5.981 € 5.133 €
	4.3 Instalaciones de iluminación interior:			115.621 €		15.817 €
	Langaitz Ikastola			Justificado		14.392 €
	Biblioteca			41.119 €		
5	UDALSAREA 21: CONSOLIDACIÓN DEL PROCESO DE AGENDA LOCAL 21 (2012)	IHOBE 29/02/2012	2012/03/14 hasta	86.478 €		5.880 €
6	SUBVENCIÓN PARA IMPULSAR LA EJECUCIÓN DE LOS PLANES DE ACCIÓN DE LAS AGENDAS LOCALES 21 (2012) BIODIVERSIDAD	Diputación BOG 18/04/2012	hasta 19 mayo 2012 2013	134.753 € 8.324 €	BOG 19/09/2012	68.677 €
7	BIODIVERSIDAD	29/05/2012		128.440 €		82.882 €
8	PROGRAMA DE AYUDAS A LA EFICIENCIA ENERGÉTICA EN AYUNTAMIENTOS (2012):	Ente Vasco de la Energía	hasta 30/11/2012	264.964 €	BOPV 28/12/2012	78446 € 53822 €
	Proyecto de eficiencia y ahorro energético en Colegio Beraun Berri			41.416 €	28/12/2013	10.354 €
	Plan de Acción para la Energía Sostenible en Errenteria			50.000 €	28/12/2013	37.500 €
	Renovación de Alumbrado Público de la calle Beraun			48.327 €	28/12/2012	5.968 €
	Renovación de la iluminación interior en el Polideportivo de Galtzaraborda			72.502 €	28/12/2012	14.733 €
	Residencia de Ancianos: sustitución de ventanales de planta 2ª			52.719 €	21/11/2012	9.891 €
	Arramendi Huertas Sociales: Sistema fotovoltaico-Eólico			11.054 €	31/01/2013	2.212 €
9	ACTUACIONES EN MATERIA DE PREVENCIÓN Y REUTILIZACIÓN DE RESIDUOS URBANOS (2013):	Diputación Foral de Gipuzkoa	hasta 27/03/2013	73.626 €	BOPV 25/02/2013	8.705,17 €
	Implantación del barrio de compostaje de Errenteria, una herramienta hacia la reducción			28.626 €		
10	ACCIONES QUE PROMUEVAN EL DESARROLLO SOSTENIBLE:	Gobierno Vasco Orden 19/06/2013	hasta 13/8/2013	75.000 €		
	Programa de dinamización del proceso de la Agenda 21 Escolar de Errenteria en el curso escolar 2013/2014			25.000 €		
	BIODIVERSIDAD: Trabajos de conservación y mejora de hábitats y especies forestales y acuáticas de interés en las ZEC y en el Parque de Lau Haizeta			50.000 €		
11	PROGRAMA DE AYUDAS A LA EFICIENCIA ENERGÉTICA EN AYUNTAMIENTOS (2013):	Ente Vasco de la Energía	hasta 30/09/2013	581.848 €	BOPV	
	Proyecto de eficiencia y ahorro energético en Colegio Beraun Berri			41.416 €		
	Plan de Acción para la Energía Sostenible en Errenteria			40.535 €		
	Residencia de ancianos: sustitución carpintería exterior 3ª planta			60.917 €		
	Sustitución de alumbrado exterior e interior en el Polideportivo de Galtzaraborda			178.991 €		
	Edificio Markola: renovación de ventanas y reparación de fachada			189.122 €		
	Edficio Oiarso: reparación de la cubierta			70.868 €		
12	SUBVENCIONES PARA IMPULSAR LA EJECUCIÓN DE LOS PLANES DE ACCIÓN DE LAS AGENDAS LOCALES 21:	Diputación Foral de Gipuzkoa 2013/04/23	hasta 23/05/2013	8.083 €	BOG 13/09/2013	4.284 €
	Proyecto de revisión del Plan de Acción local de Errenteria					

In this context, and with the aim of continuing the initiatives implemented in Errenteira in recent years, the Mayor of Errenteira signed in November 2012 the European Covenant of Mayors. Signatories of the Covenant of Mayors voluntarily commit to increasing energy efficiency and the use of renewable energy sources on their territories. By their commitment, they support the European Union 20% CO_2 reduction objective to be reached by 2020.

In the following six pages the Sustainable Energy Action Plan (SEAP) of Errenteira is summarised (in Spanish). Each page represents a different working line:

- Municipality – Public buildings
    1. Energy efficiency.
    2. Renewable energies, mobility, water, waste.
    3. Natural environment, primary sector.
- Residential
    4. Energy efficiency. Renewable energies.
    5. Mobility, water, waste, natural environment.
- Services
    6. Energy efficiency, renewable energies, mobility, water, waste.

Energy efficiency, renewable energies, mobility, water, waste.

TABLE 7 - A SUMMARY OF THE MEASURES TAKEN IN THE SEAP SECTOR: TOWN HALL. STRATEGIC LINE: ENERGY LINE: ENERGY EFFICIENCY. SOURCE: OWN ELABORATION

Sectores y conceptos energéticos	Acciones	Nº	Ahorro energético térmico en 2020 (kWh)	Ahorro energético eléctrico en 2020 (kWh)	Reducción de emisiones en 2020 (tCO_2b)	Reducción de emisiones en el periodo del PAES (tCO_2b)	Coste previsto (€)	Ahorro económico (€/año)	Tasa de Recuperación Simple
AYUNTAMIENTO									
Eficiencia Energética	Rehabilitación de edificios municipales incluyendo criterios de eficiencia energética	1	71.100		14,74	59	285.000	3.667	78
	Realizar control y gestión en el uso de la energía en las instalaciones y servicios municipales	2	315.817	261.197	140,60	984	97.000	46.282	2
	Sustitución de combustible en calderas de gasoil o eléctricas por calderas que consuman gas natural.	3			2,42	10	285.000	3.667	78
	Optimizar el rendimiento de la caldera	4	57.762		12	82	0	2.671	0
	Sectorización calefacción por plantas	5	92.558		18,68	131	14.000	4.917	3
	Controlar las temperaturas interiores. La temperatura en verano no disminuirá de los 26°C y en invierno no aumentará de los 21°C	6	302.746		121,54		285.000	3.667	78
	Sustitución de lámparas fluorescentes convencionales por lamparas mas eficientes.	7		6.256	2,34	16	4.104	942	4
	Sustituir iluminación del edificio Beraun Berri por iluminación mas eficiente.	8		56.756	3,01	21	41.416	973	43
	Sustitución de lámparas halógenas por lámparas con tecnología LED en aseos	9		8.686	3,01	21	41.416	973	43
	Sustitución de lámparas de descarga por fluorescentes (Polideportivo)	10		9.677	3,60	25	31.844	4.627	7
	Sustitución y reorganización de las luminarias de la pista polivalente del polideportivo.	11		20.984	7,80	55	31.844	4.627	7
	Aprovechar el calor del agua de renovación de las piscinas.	12	221.844		44,80	314	9.000	8.386	1
	Instalar sensores de paso en pasillos	13		1.201	0,45	3	500	180	3
	Alumbrado público: Sustitución de lámparas de descarga actuales por lámparas de mas eficientes.	14		235.422	87,52	875	290.778	24.368	12
	Alumbrado público: Instalación de reguladores de flujo para disminuir el consumo energético del alumbrado	15		869.824	323,38	3.234	330.515	92.071	4
	A la hora de comprar equipos para los edificios municipales (fotocopiadoras, lámparas…) tener en cuenta aspectos de eficiencia energética	16		25.268	9,39	38	149.400	3.538	42
	Organizar charlas especializadas para que los trabajadores de los edificios municipales interioricen valores relacionados con el crecimiento eficiente.	17							

TABLE 8 - A SUMMARY OF THE MEASURES TAKEN IN THE SEAP. SECTOR: TOWN HALL. STRATEGIC LINE: RENEWABLE ENERGY, MOBILITY, WASTE, WATER. SOURCE: OWN ELABORATION

Sectores y conceptos energéticos	Acciones	Nº	Ahorro energético térmico en 2020 (kWh)	Ahorro energético eléctrico en 2020 (kWh)	Reducción de emisiones en 2020 (tCO_2b)	Reducción de emisiones en el periodo del PAES (tCO_2b)	Coste previsto (€)	Ahorro económico (€/año)	Tasa de Recuperación Simple
AYUNTAMIENTO									
Energías renovables	Instalación de placas fotovoltaicas	18		65.898	24,50	209,99	175.000,00	9.225,72	18,97
	Instalación de placas solares térmicas	19		15.000	3	20	15.000	600	25
	Instalación de placas fotovoltaicas en los equipos de OTA	20		4.336	2	13	2.970	607	5
	Instalación de Biomasa	21			28	141	192.960		
Movilidad	Promover la utilización de biocombustibles en la flota municipal	22		201.948	55	382	1.148.483	27.749	41
	Sustitución de vehículos por otros más eficientes (eléctricos o híbridos enchufables)	23		29.195	7	55	2.184.620	4.221	518
	Desarrollo de cursos de conducción eficiente para los trabajadores del Ayuntamiento	24		16.424	4	35	12.000	1.604	7
	Desarrollo de campañas de sensibilización en relación a la movilidad en el sector Ayuntamiento	25		no procede	no procede	no procede	24.000	0	0
Residuos	Inclusión de criterios ambientales en la organización de eventos culturales, impulsando la utilización de cubiertos y vajilla reutilizable en las actividades que conlleven el montaje de txoznas o tabernas	26					22.752		
Agua	Optimización de la red de abastecimiento de agua	27			1.814	7.257	120.000	428.124	0,28
	Colocación de dispositivos ahorradores de agua en los edificios municipales	28			87	348	900	20.508	0,04
	Adopción de criterios de prevención en el consumo de agua en la redacción de nuevos proyectos urbanísticos: techos y terrazas verdes	29							
	Campañas de sensibilización en el sector Ayuntamiento	30					13.200		

TABLE 9 - A SUMMARY OF THE MEASURES TAKEN IN THE SEAP. SECTOR: TOWN HALL. STRATEGIC LINE: NATURAL ENVIRONMENT, PRIMARY, CROSS SECTOR. SOURCE: OWN ELABORATION

Sectores y conceptos energéticos	Acciones	Nº	Ahorro energético térmico en 2020 (kWh)	Ahorro energético eléctrico en 2020 (kWh)	Reducción de emisiones en 2020 (tCO_2b)	Reducción de emisiones en el periodo del PAES (tCO_2b)	Coste previsto (€)	Ahorro económico (€/año)	Tasa de Recuperación Simple
AYUNTAMIENTO									
Medio Natural	Restauración de plantaciones forestales con fines protectores	31					18.000		
	Aplicar los mecanismos de planificación existentes para minimizar el consumo de suelo mediante el reciclaje efectivo del terreno en los desarrollo urbanísticos e industriales del municipio.	32							
	Creación de una zona de ecosistemas de alta complejidad y bosques maduros en la reserva de Añarbe	33							
	Incremento del secuestro de carbono en terrenos destinados a agricultura y / o ganadería mediante el aumento de la presencia de arbolado	34			570	2458	33.282	0	-
Sector primario	Aprobación de la Ordenanza Municipal Reguladora del uso ganadero en el monte público Añarbe	35							
	Fomento de la sustitución de la agricultura convencional por agricultura ecológica	36			8	36	3.000	0	-
Transversal	Cálculo de la Huella de Carbono	37					20.000		
	Acceso a sistemas de financiación de proyectos de reducción de emisiones de GEI	38					20.000		

TABLE 10 - A SUMMARY OF THE MEASURES TAKEN IN THE SEAP. SECTOR: RESIDENATIAL. STRATEGIC LINE: ENERGY EFFICIENCY AND RENEWABLE ENERGY. SOURCE: OWN ELABORATION

Sectores y conceptos energéticos	Acciones	N°	Ahorro energético térmico en 2020 (kWh)	Ahorro energético eléctrico en 2020 (kWh)	Reducción de emisiones en 2020 (tCO_2b)	Reducción de emisiones en el periodo del PAES (tCO_2b)	Coste previsto (€)	Ahorro económico (€/año)	Tasa de Recuperación Simple
RESIDENCIAL									
Eficiencia Energética	Sustituir las ventanas de cristal simple por ventanas de doble cristal y carpintería mas eficiente.	39	3.043.395		564	2.256	7.165.800	143.953	50
	Renovación de la carpintería exterior del edificio, colocando material aislante	40	2.434.780		451	1.805	7.165.800	115.165	62
	Instalar calderas de condensación	41	1.217.390		226	902	2.547.840	57.583	44
	Instalar válvulas termostáticas en radiadores	42	365.297		68	271	382.176	17.279	22
	Limitar la temperatura interior de las viviendas. En verano será superior a 26°C y en invierno será inferior a 21°C	43	1.332.839		247	1729	597.150	63.043	9
	Instalación de suelos radiantes	44	86.264		16	64	1.109.520	4.080	272
	En bloques de viviendas, reducción de la luz artificial en zonas comunes mediante control, detectores de presencia y temporizadores	45		136.007	51	202	85.990	19.041	5
	Instalación de detectores de presencia en ascensores de edificios de viviendas	46		190.410	71	283	124.207	26.657	5
	Instalar lámparas de bajo consumo en viviendas	47		512.753	191	763	95.544	71.785	1
	A la hora de comprar equipos eléctricos en hogares, interiorizar criterios de eficiencia energética	48		1.929.033	717	2.869	9.305.986	270065	34
	Campañas para reducir el consumo eléctrico y térmico.	49					6.600		
Energías Renovables	Fomentar el uso de paneles solares térmicos y fotovoltaicos en edificios existentes.	50	143.700	127.089	76,97	385	416.000	22.048	19
	Instalar calderas de Biomasa para el aporte termico de las viviendas.	51			479,61	2.398	374.117	23.815	16
	Instalar un sistema de aprovechamiento geotermico para el aporte termico de las viviendas.	52	1.032.048		383,69	1.918	810.000	48.816	17

TABLE 11 - A SUMMARY OF THE MEASURES TAKEN IN THE SEAP. SECTOR: RESIDENTIAL. STRATEGIC LINE: RENEWABLE ENERGY, MOBILITY, WASTE, WATER. SOURCE: OWN ELABORATION

Sectores y conceptos energéticos	Acciones	Nº	Ahorro energético térmico en 2020 (kWh)	Ahorro energético eléctrico en 2020 (kWh)	Reducción de emisiones en 2020 (tCO_2b)	Reducción de emisiones en el periodo del PAES (tCO_2b)	Coste previsto (€)	Ahorro económico (€/año)	Tasa de Recuperación Simple
RESIDENCIAL									
Movilidad	Desarrollo del Plan de Movilidad Municipal de Errenteria para peatones y ciclistas	53	no aplica	no aplica	no aplica	no aplica	22.869	no aplica	no aplica
	Sustitución de vehículos por otros más eficientes (eléctricos o híbridos enchufables) en el sector residencial	54	no aplica	2.961.734	582	2.329	7.301.871	349.480	21
	Promover formas de desplazamiento más sostenibles	55	no aplica	639.200	3.755	29.025	6.523.751	93.333	70
	Desarrollo de cursos de conducción eficiente para la ciudadanía	56	no aplica	883.800	236	818	126.208	62.353	2
	Desarrollo de campañas de sensibilización en relación a la movilidad en el sector residencial	57	no aplica	no aplica	no aplica	no aplica	46200	no aplica	no aplica
Residuos	Desarrollo de campañas de sensibilización para la reducción en la generación de residuos en los sectores Ayuntamiento, Residencial y servicios e impulso de la recogida selectiva y el reciclaje	58			900	5.800	60.000	No aplica	No aplica
	Mejora de la gestión de residuos definiendo una estrategia de gestión: 4º contenedor, puerta a puerta, etc.	59					24.000		
Agua	Instalación de reductores de flujo en viviendas	60			1.198	6588	252.446	282.665	1
	Ayudas para la adquisición de electrodomésticos de bajo consumo de agua	61			104	415	1.577.790	97.846	16
	Campañas de sensibilización en el sector residencial	62					16.500		
Medio Natural	Desarrollo de campañas y mecanismos de sensibilización en el sector residencial	63					42.000		

TABLE 12 - A SUMMARY OF THE MEASURES TAKEN IN THE SEAP. SECTOR: SERVICES. STRATEGIC LINE: RENEWABLE ENERGY, ENERGY EFFICIENCY, MOBILITY, WASTE, WATER, CROSS-SECTOR. SOURCE: OWN ELABORATION

Sectores y conceptos energéticos	Acciones	N°	Ahorro energético térmico en 2020 (kWh)	Ahorro energético eléctrico en 2020 (kWh)	Reducción de emisiones en 2020 (tCO_2b)	Reducción de emisiones en el periodo del PAES (tCO_2b)	Coste previsto (€)	Ahorro económico (€/año)	Tasa de Recuperación Simple
SERVICIOS									
Eficiencia Energética	Instalación de lámparas de bajo consumo en locales del sector servicios	64		558.529	164,26	657	157888	67023	2
	Implantar medidas para el uso de la luz natural de manera eficiente en locales del sector servicios	65		256.815	75,53	302	7.401	30.818	0,2
	Instalación de calderas de condensación en locales del sector servicios	66		1.549.800	287,18	1.149	492.000	73.306	7
	Controlar las temperaturas interiores en locales del sector servicios. La temperatura en verano no disminuirá de los 26°C y en invierno no aumentará de los 21°C	67	2.150.523		398	2.789	92.500	101.720	1
	Renovación de ventanas antiguas, instalando ventanas de doble cristal y renovando su carpintería en locales del sector servicios	68	393.944		73	292	442.800	18.634	24
	A la hora de comprar equipos eléctricos en locales del sector servicios, interiorizar criterios de eficiencia energética	69		477.313	140	562	960.364	57.278	17
	Campañas para reducir el consumo eléctrico y térmico.	70					6.600		
Energías renovables	Fomentar el uso de paneles solares térmicos y fotovoltaicos en edificios existentes.	71	170.311	301.248	134,03	670	394.720	44.205	9
Movilidad	Desarrollo de campañas de sensibilización en relación a la movilidad en el sector servicios	72	no procede	no aplica	no aplica	no aplica	46.200	no aplica	no aplica
Residuos	Servicio de recogida selectiva de residuos en el sector servicios bajo demanda	73					9.000		
Agua	Instalación de reductores de flujo en locales del sector servicios	74			67,29	269	2832	63520	0
	Campañas de sensibilización en el sector servicios	75					13200		
Transversal	Fomento del cálculo de la Huella de Carbono	76					10500		

With this compact acquired the commitment to carry out the Plan of action for sustainable energy (SEAP) of Errenteira to reduce in at least 20 GHG emissions by 2020, to save energy and increase the contribution of renewable energy sources, going beyond the objectives of the energy policy of the European Union.

1.5. Regularly And Policy Framework On Energy Efficiency And Nearly Zero Energy Buildings In Spain

Building energy rehabilitation

Since the publication of the EPBD, Spain has worked to implement its transposition into national law. The initial transposition of this Directive consisted of the following Royal Decrees:

- Royal Decree 314/2006, of the 17th of March, approving the Technical Building Code (TBC).
- Royal Decree 47/2007, of the 19th of January, approving the basic procedure for the energy certification of new buildings.
- Royal Decree 1027/2007, of the 20th of July, approving the Thermal Building Regulations, modified by the Royal Decree 1826/2009, of the 27th of November.

A new Royal Decree was published in April 2013, replacing the Royal Decree 47/2007, for the legislation regarding the energy certification of existing buildings, taking into consideration the 2010/31/EU Directive (recast EPBD). The Royal Decree 235/2013 of the 13th of April, and the update of the Thermal Building Regulations with the Royal Decree 238/2013 of the 13th of April, were also published.

The transposition of the EPBD related to the Energy Performance (EP) requirements consists of the Royal Decree 314/2006 approving the TBC. It sets the minimum requirements that must be met by all new buildings (residential, non-residential, public and private buildings), as well as by existing buildings undergoing a renovation of more than 25% of their area. This basic standard consists of 5 documents:

CTE DB HE1 – LIMITATION OF ENERGY DEMAND

This document replaced the former regulation, NBE-CT-79, on the thermal conditions of buildings, considerably tightening the requirements demanded for the building envelope (Table 13).

TABLE 13 - LIMITATION OF ENERGY DEMAND

	α	A	B	C	D	E
Max U value of walls and elements in contact with the ground [W/m^{2}K]	1,35	1,25	1,00	0,75	0,60	0,55
Max U value of roofs and floors in contact with the air [W/m^{2}K]	1,20	0,80	0,65	0,50	0,40	0,35
Max U value of openings [W/m^{2}K]	5,70	5,70	4,20	3,10	2,70	2,50
Air permeability of openings [m^3/h m^2]	<50	<50	<50	<27	<27	<27
Max U value of indoor partitions between different types and common areas [W/m^{2}K]	1,35	1,25	1,10	0,95	0,85	0,70
Max U value of horizontal indoor partitions between same types [W/m^{2}K]	1,90	1,80	1,55	1,35	1,20	1,00
Max U value of vertical indoor partitions between same types [W/m^{2}K]	1,40	1,40	1,20	1,20	1,20	1,00

ENVELOPE PERFORMANCE LIMITS BY CLIMATE ZONE (α-E) ACCORDING TO DECREE FOM/1635/2013,

CTE DB HE2 – PERFORMANCE OF THERMAL INSTALLATIONS (RITE)

As a result of the EPBD, this document was revised in 2007, introducing the concept of periodic inspections on energy efficiency to be implemented by the Autonomous Communities.

CTE DB HE3 – ENERGY EFFICIENCY IN LIGHTING INSTALLATIONS

This document defines requirements on lighting, limiting the minimum energy efficiency of the tertiary building lighting systems. For so doing, the concept of the Energy Efficiency Value of the Installation (VEEI) is introduced. VEEI is the relation between the lamp power plus auxiliary equipment, the illuminated surface and the average maintained illuminance. The minimum value of this factor is limited as a function of the use of the various rooms in the building.

CTE DB HE4 – MINIMUM SOLAR CONTRIBUTION FOR HOT SANITARY WATER

In buildings, with demand forecast hot water or pool heating cover , where so stated in the CTE , a part of the thermal energy requirements It derived from this demand will be met by incorporating therein systems collection, storage and use of low-temperature solar energy , adequate radiation

global solar emplacement and hot water demand of the building or the pool.

The values derived from this basic requirement shall be considered minimal, notwithstanding

values that may be set by the competent authorities and contributing to the sustainability , taking into account the characteristics of its location and territory.

CTE DB HE5 – MINIMUM PHOTOVOLTAIC CONTRIBUTION FOR ELECTRIC POWER

The use of Renewable Energy Sources (RES) became compulsory in order to meet part of the energy needs of buildings, either to produce sanitary hot water (for both residential and non-residential buildings), as set forth in the CTE DB HE4, or to produce electric power in tertiary buildings as set in the CTE DB HE5. As this requirement is included in the TBC 2006, which is a national regulation, the use of RES in new buildings is mandatory in the whole Spanish territory.

According to the Royal Decree 235/2013 on the Energy Certification of Buildings, the Autonomous Communities are in charge of the registration, inspection and control of the Energy Performance Certificates (EPCs). The certificate for new buildings came into force in November 2007. The Royal Decree 235/2013 transposes the recast EPBD, in relation to the energy certification of existing buildings. This is a key point to reduce the energy consumption of the housing stock. The global energy rating is assessed according to the CO_2 emitted per unit floor area per year [$kgCO_2/m^2$ year], as well as the primary energy consumption [kWh/m^2 year].

Moreover, there are partial ratings depending on the demand and energy consumption for the various energy-consuming services (heating, cooling, sanitary hot water and lighting for tertiary buildings). The calculated values are compared with a series of reference values that vary according to the local climate, and with a reference building of the same shape, which abides by the building energy regulations, depending on whether it is a new or existing building, or a residential or non-residential one.

In addition to the national regulations there are some municipal requirements, for example solar thermal obligations in Barcelona and Madrid, which continue to apply, provided they are stronger than the national legislation. The Catalonian Government has a Decree regulating the environmental and building ecoefficiency criteria (Generalitat de Catalunya Decreto 21/2006, of 14 February 2006). This methodology is widely used by a large number of companies, and is complementary to the government building regulations.

Funding schemes

The main strategy developed for the improvement of the energy efficiency of the building stock in Spain was drafted by the Ministry of Industry, Tourism and Commerce, along with the IDAE

(Institute for Energy Diversification and Savings). The resulting Energy Savings and Efficiency Action Plan 2011-2020 includes, among others, measures to boost the ESCOs market (Plan to Promote Energy Service Contracts, known as Plan 2000 ESCO) and the proposal of actions to guarantee the necessary exemplary role of the public sector (Energy Saving & Efficiency Activation Plan in the buildings of the State's General Administration), which will also supports to meet the EED requirement of achieving 3% renovation rate for central Government buildings.

This plan directed to public buildings was approved in Cabinet Meeting the 1st December 2009 with the objective of achieving energy savings of 20% in 2016 in 330 energy consumers centres of the State's General Administration, by carrying out saving and energy efficiency measures implemented by ESCOs. The Plan to Promote Energy Service Contracts (approved in Cabinet Meeting as of 16th July 2010), involves the extension to the rest of the Regional Public Administrations of the former plan, affecting 1000 energy-consuming centres belonging to the Regional and Local Administration and other 1000 ones belonging to the state's general administration.

The specific measures to intensify energy savings in buildings sector which have taken place in last Action Plans are:

- Regarding the energy saving measures affecting buildings, one key measure is the restriction on indoor temperatures in climate-controlled non-residential buildings and other public spaces, with the exception of hospitals and other centres requiring special indoor environments.
- In the framework of the renewal plan for tourism infrastructure, which has a budget of 500 million euros for 2009, part of this line will be set aside to finance investments promoting energy savings in tourism facilities.
- Amendment of the Royal Decree on Energy Efficiency in New Buildings to make it obligatory for new national administration buildings to achieve a high energy rating.

The specific measures to intensify energy savings in the buildings sector which are detailed in Energy Saving and Efficiency Action Plan 2011-2020 are:

- Energy refurbishment of thermal envelope of existing buildings.

- Energy efficiency improvement of thermal installations for existing buildings.
- Energy efficiency improvement of lighting indoor systems for existing buildings.
- Promoting high EPC for new and existing buildings (at refurbishment context).
- Promoting nZEB buildings (new buildings or refurbishment of existing buildings).
- Energy efficiency improvement of cooling systems for tertiary sector.
- Energy efficiency improvement of appliances stock.

Regarding meeting the EED article 4 requirement for developing a long term strategy for mobilising investment in the renovation of the national building stocks, there is, so far in place, the National Housing and Refurbishment Plan 2009-2012 which promotes the refurbishment of residential building sector. This plan grants subsidies in order to improve the energy performance of dwellings. Within the Energy Savings and Efficiency Action Plan 2011-2020, there are other plans like this planned to be developed until 2020.

PER 2011-2020 (ACTION PLAN FOR RENEWABLE ENERGY)

After completion of the earlier period of the PER 2005-2010, it was a response to the need to incorporate the objectives of Directive 2009/28 / EC of the European Parliament and of the Council of 23 April 2009 on the promotion of renewable sources. This standard established binding minimum targets (20% share of energy from renewable sources in gross final energy consumption by 2020). These objectives were also established nationally in Article 78 Law 2/2011 on Sustainable Economy.

The PER 2011-2020 analyses the current status of the various renewable technologies and sets targets for 2020, with corresponding improvement proposals, support frames and impact assessment in economy, employment, etc. It is directly applicable to urban HVAC networks (especially thermal biomass, geothermal and solar thermal). It also makes explicit some contributions in the field of district networks, as a particular case of each renewable source.

The Plan makes some general observations on the vital importance of the development of urban HVAC networks to improve energy efficiency of buildings, suggesting that these facilities normatively prevail against the individual, when technically and economically feasible.

It also incorporates some policy proposals to promote this technology, such as the need to adapt buildings certification procedures to the case of centralized networks feeding or the inclusion of these systems in the Regulation of Thermal Installations in Buildings.

ACTION PLAN FOR SAVINGS AND ENERGY EFFICIENCY 2011-2020

The plan provides specific measures to promote cogeneration, as one way of saving energy in urban air conditioning installations, (Table 14).

TABLE 14 - ACTION PLAN FOR SAVINGS AND ENERGY EFFICIENCY

Start – End Dates	2011 - 2020
Type of programme	Subsidies
Budget	27.322 M€ goes to building sector (2.883 M€ from Public Sector + 24.439 M€ from Private Sector)
Measures covered	Industry, transport, buildings (thermal envelope, thermal systems, lighting), equipment, public services, agriculture, CHP generation
Programme impacts	The final & primary energy savings of Action Plan 2011-2020 have been established for years 2016 & 2020, in accordance with the same methodological criteria and the indicators for year 2010. The measures included in this Action Plan 2011-2020 will involve savings of final energy for 2020 worth 17,842 ktoe and of primary energy worth 35,585 ktoe, calculated with reference to year 2007 and in accordance with the methodology proposed by the European Commission.
Targeted Building Types	New buildings Existing buildings Residential Non Residential

ENERGY SAVINGS AND EFFICIENCY ACTION PLAN 2011-2020

GRANTS FOR ENERGY EFFICIENCY IN BUILDINGS

IDAE (Instituto para la Diversificación y Ahorro de la Energía - Institute for Diversification and Saving of Energy) is Spain's national agency in charge of promoting energy efficiency and renewable energies. Since February 2012, IDAE is attached to the Ministry of Industry, Energy and Tourism (MINETUR) through the State Secretary for Energy.

An Energy saving and Efficiency Action Plan for the buildings of the State's General Administration (SGA) has been agreed. Further, Spain's Energy Efficiency Action Plan, sets out 4 main measures relating to building efficiency:

- Improving the energy efficiency of the thermal envelope.
- Improving the energy efficiency of heating and lighting.
- Replacing conventional energy with biomass in thermal installations.
- Replacing conventional energy with geothermal energy in thermal installations.

With respect to energy efficiency measures for buildings, lines of economic support are created annually for each of the 4 measures and managed by each autonomous community; public administrations are encouraged to play exemplary roles in pursuing the objectives of each measure. A budget of €804m has been made available for the period 2008-2012 to undertake these measures.

IDAE has launched a package of financial support programmes to promote renewable energy sources within the building sector. The different programmes, named BIOMCASA, GEOTCASA and SOLCASA support the generation of heat, hot water and air conditioning using biomass, geothermal energy or solar energy, respectively. In May 2011, the IDEA launched the new GIT programme (Grandes Instalaciones Térmicas – large thermal installations) to provide financial support to all projects for renewable thermal energy not rewarded by BIOMCASA, GEOTCASA or SOLCASA due to their size and complexity.

Best practices

Spain was the first European country to make the implementation of solar thermal energy obligatory in new and refurbished buildings. In March 2006, the Spanish government adopted a new Technical Building Code (TBC, or in Spanish CTE), which includes an obligation to cover 30-70% of the Domestic Hot Water (DHW) demand with solar thermal energy. The required solar contribution varies between 30 and 70% depending on three main factors:

- domestic hot water demand of the building (litters/day);
- climate zone;
- conventional fuel to be replaced (only for refurbishments).

It is important to point out that the municipal solar obligations, approved in the last few years in dozens of Spanish municipalities, including Barcelona in 2000 and Madrid in 2003, remained in force as long as they were stronger than the national obligation included in the CTE.

The effects on the market have been partially offset by the unexpected slowdown in the Spanish construction market in 2008 and 2009. However, solar obligations became a driver in the Spanish solar thermal market since estimates show that over 80% of installations were motivated by CTE or municipal ordinances.

The City of Barcelona has been the pioneer for Solar Regulations in Europe. The first Solar Ordinance came into force in 2000 and required that a certain share of the domestic hot water demand be supplied by solar thermal, in new buildings and those undergoing major refurbishment.

The implementation led to a significant increase in the use of solar thermal, thereby even stimulating the market for buildings not covered by the ordinance. The regulation was popular with decision makers and received widespread public support. Therefore, the number of buildings targeted increased and procedures, architectural integration as well as quality requirements improved thanks to the revision approved in 2006. As a part of the Solar Thermal Action Plan, developed within the K4RES-H project coordinated by ESTIF, the Barcelona Energy Agency published an analysis of the lessons learned during the implementations of the Barcelona solar regulation.

Inspired by the positive experience of Barcelona, Madrid and dozens of municipalities approved solar obligations all over Spain. The Spanish Technical Building Code could serve as a model for policy makers all over Europe and beyond.

Future development

The WWF (World Wide Fund for Nature) report "Challenges and Funding Opportunities for the Energy Efficient Renovation of Spain's Residential Building Stock" highlights the fact that it is also necessary to remove regulatory barriers to greater energy efficiency, such as the ones that hinder decision-making in multi-unit dwellings, and to clearly promote the benefits of deep renovation through information campaigns to Spanish citizens. In addition, it is also critical to align the economic interests of the different building sector stakeholders, concentrate investments in deep renovations, and deliver long-term and low-cost funding for retrofits. The report concludes that by 2020, Spain can deliver the deep renovation of 3.3 million housing units, through the creation and maintenance of 150,000 jobs and with the reduction of 8 million tons of CO_2 emissions per year. The total investment required is 46.7 billion Euros to achieve this goal. Seventy-seven percent of this amount can be repaid directly in a period of 20 years, through the energy savings eight percent through the reduction of CO_2 emissions and the remaining 15% through subsidies (direct/or incentives). In addition, beyond 2020 the report projects that there will be no further need for direct subsidies, as the market will then be consolidated and future economies of scale will make it more profitable to renovate.

2. ESCOs AND MUNICIPALITIES COOPERATION FRAMEWORK

Innova BIC, with the support, of:

- Municipalities of Messina (Italy);
- Municipalities of Errenteira (Spain);
- Municipalities of Coimbra (Portugal);
- Municipalities of Alimos (Greece)

explored the previous experienced and the potential obstacles of the cooperation between municipalities and ESCOs. This analysis is an important part of the task 3.1 (*analysis of the economic regulatory and policy framework*), because - as mentioned in the document of the projects "building envelope improvements entail quite long payback times which are not attractive to ESCOs or commercial banks under current market practice", while municipalities are often reluctant to collaborate with for different reasons. To that end, a questionnaire has been developed to investigate the current "state of the art" of the relationship between municipalities of Messina, Errenteira, Coimbra, Alimos and ESCO agencies. This questionnaire has been created to get the point of view of the municipalities' partners of the project. The questionnaire was shared with the project coordinator before sending it to the Municipalities in order to gather suggestions and inputs to better address and improve the analysis. This collection of the information together with the *Analysis of the economic, regulatory and policy framework of CERtuS' Municipalities* will be used to address a proper future strategies about the financial schemes and the kind of initiative to increase the cooperation between energy agencies and the public administrations. This deliverable will analyse not only the result of the questionnaire filled in by Municipality of Errenteira, but it will take into consideration also the ones coming from the others CERtuS municipalities (Messina, Coimbra and Alimos) in order to outline a general framework and to compare the experiences of different Municipalities.

2.1. METHODOLOGY

Innova BIC has realized a questionnaire, devoted to partner municipalities to gather their experience and point view with regard to cooperating with ESCOs, with a set of *open and closed questions*. The questionnaire has been divided in two sections:

1. Section 1: questions about the general profile of the municipalities;
2. Section 2: questions on cooperation status.

The questionnaire has been sent to municipalities in order to explore the state of the art in the cooperation between ESCOs and CERtuS municipalities as well as to detect the key elements for improving this relationship. In particular, it has been highlighted that: "the cooperation between ESCOs and Municipalities can play a key role in turning energy-consuming Municipal premises into Nearly Zero Energy Buildings, through accelerating the pace of investment and mobilizing private sector finance". In other words, the object of the questionnaire is to explore the state of the art of ESCOs and municipalities cooperation so far, so as to detect existing barriers to be overcome as well as opportunities to be seized. The choice of the questions has been made taking into consideration three main indicators:

- Estimate of time to fill out the questionnaire;
- Number of questions appropriate to have a general framework of the cooperation between the ESCOs and Municipalities without lost important information;
- Mix of open and closed questions.

The questions are 14. In the section 1 (questions about the general profile of the municipalities) we asked:

1. Country and Name of Municipality
2. Name of the interviewee
3. Position held of organization

In the Section 2 (questions on cooperation status), a set of 10 questions have been selected with different answer mode:

- *Closed format questions* - Yes or not (dichotomy variable). In both cases the respondents must explained why

- *Closed format questions* - a set of statements where the respondents must indicated no more than two characteristics
- *Open format questions*

Below the list of the questions:

Has your municipality ever cooperated with an ESCO?

- What of these characteristics you consider fundamental for ESCOs and Municipality cooperation?
- In your opinion, do you consider the precedent characteristic, indicated by yourself, part of your experience?
- Which kind of contract did you agree with ESCOs?
- Please, indicate the main futures of the contract agreed?
- Which kind of intervention was funded?
- Indicate the amount of investment?
- The payback period agreed with the ESCO for covering the investment was respected?
- What of these statements could you consider correct?
- Is your organization interested in cooperating soon with an ESCO for improving energy performance of its buildings?
- According to you, cooperation with ESCOs is useful for improving the energy performance of your organization. Why?

The questionnaire has been created last July and sent to the municipalities in September. It has been sent through as an email attachment in word format. The questionnaire is available in Annex A.

2.2. General Analysis Of Results

Errenteira, Coimbra and Alimos have never cooperated with ESCOs. We can state that the CERtuS project is a first step in this direction. In this section, the results of the questionnaire on the cooperation between the four municipalities, partners of the project, and the ESCOs are presented.

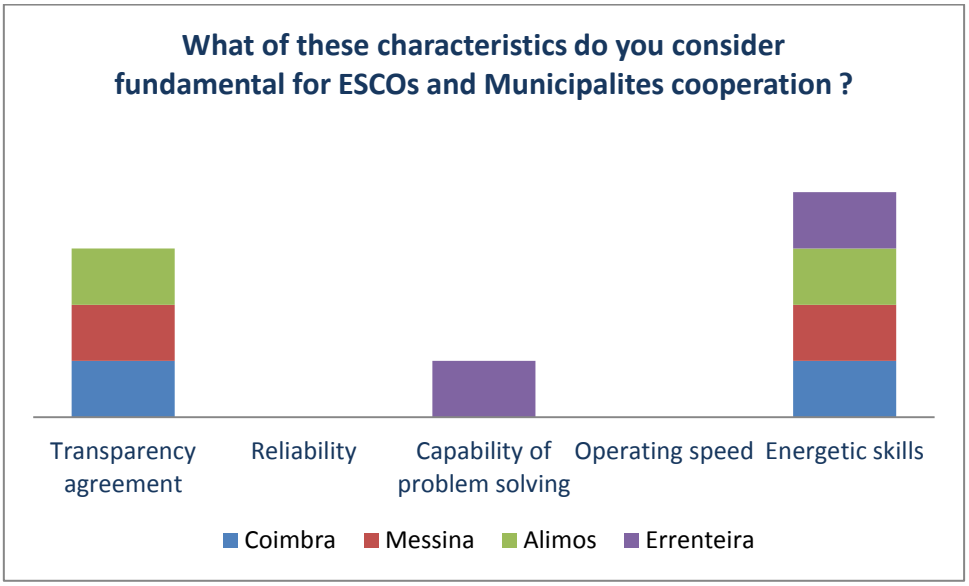
The analysis of the closed format questions regards two kinds of questions:

- *Closed format questions* - Yes or not (dichotomy variable). In both cases the respondents must explained why they have answered in that way.
- *Closed format questions* - a set of statements where the respondents must indicated no more than two characteristics

In general, the analysis of the closed questions has shown a lack of cooperation with the ESCOs and Municipalities. Except for the Municipality of Messina, who experienced a collaboration with an ESCO in the occasion of the SEAP preparation (Sustainable Energy Plan - Covenant of Mayor). As a matter of fact, on this occasion the Municipality of Messina did not get any energy financial service but rather a consultancy support. While, from the open format questions, we can figure out that notwithstanding the other municipalities did not experience any cooperation with ESCOs, they expressed their intention and availability in the future to work with them. However, some requirements towards this cooperation have been highlighted, in other words they are available to cooperate with ESCO but within a specific regulatory plan. In that regard, they ask as essential features: transparency agreement and energetic skills. Regard this point, it seems important to identify and evaluate energy saving opportunities and to secure the project costs coverage and the support from project design to monitoring. Finally, in the future it will be important to pave the way for clear agreements between the Municipalities and the ESCOs, based on clear rules and responsibility, without any “bad surprise” and high risks.

Figure 12 shows the key features for cooperating with ESCOs. Energetic skills is an essential factor for choosing to be supported by ESCOs, followed by the transparency of agreements instead of “reliability”. Reliability in fact depends on mutual trust, while transparency of agreements is something “more” and relies on objective elements.

FIGURE 6 - KEY FACTORS IN COOPERATION BETWEEN ESCOS AND MUNICIPALITIES



2.3. Analysis Of Results: Municipality Of Errenteira

As mentioned before the Municipality of Errenteira has never had experiences with ESCOs, because it is not easy to find this kind of services in Spain. The national EPC - Energy Performance Contracting – market is at the beginning stage, so there are no companies that can offer these services.

The main requirements requested to an ESCO are the *capability of problem solving* and *energetic skills*. The energetic skills is the key element requested by all the CERtuS municipalities. The reason is based on the need expressed by the municipality of Errenteira to receive a ***turnkey services*** by ESCOs, from project design, installation to monitoring.

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ANNEX A: SURVEY ON COOPERATION BETWEEN CERTUS MUNICIPALITIES AND ESCOS

CERtuS, acronym for Cost Efficient Options and Financing Mechanisms for nearly Zero Energy Renovation of existing Buildings Stock, is a project co-funded by the Intelligent Energy Europe Programme of the European Union, involving 13 Partners.

Southern European countries undergo a severe economic crisis. This hinders the compliance to the latest Energy Efficiency Directive, demanding strict energy efficiency measures for the public sector. Investments required to renovate public buildings and achieve nearly zero energy consumption have long payback times and the interest of financing entities is often low. Public entities often encounter difficulties in raising finance for investments. They often are not able to finance their whole investment programme directly from public funding and their capacity to leverage debt is increasingly limited. Many public buildings in Southern Europe require deep renovations to become nearly Zero Energy Buildings (nZEB) and this should not be regarded as a threat but rather as an opportunity for the energy service and the financing sector. Municipality buildings have large potential in terms of energy saving from fossil fuel. Cooperation between ESCOs and Municipalities can play a key role in turning energy-consuming Municipalities premises into Nearly Zero Energy Buildings, through accelerating the pace of investment and mobilizing private sector finance.

Therefore, the objective of this survey is to explore the state of the art of ESCOs and Municipality cooperation so far so as to detect existing barriers to be overcome as well as opportunities to be seized.

General Profile

1. Country and Name of the Municipality: ……
2. Name of the interviewee:……..
3. Position held in the organization: ……..

Questions

4. Has your municipality ever cooperated with an ESCO?

a. If yes, describe which kind of cooperation

……

……

……

……

b. If not, according to you which is the main reason

……

……

……

……

5. What of these characteristics you consider fundamental for ESCOs and Municipality cooperation? (Please, indicate no more than two characteristics)

1. Transparency agreement
2. Reliability
3. Capability of problem solving
4. Operating speed
5. Energetic skills

6. In your opinion, do you consider the precedent characteristic, indicated by yourself , part of your experience?

Yes

No

If no, please indicate the reasons

……

……

……

……..

7. Which kind of contract did you agree with ESCOs?

(Please, indicate the years also)

……

……

……

……..

8. Please, indicate the main features of the contract agreed?

……

……

……

……

9. Which kind of intervention was funded

1. Equipments upgrading
2. Energy Refurbishment
3. the management and maintenance of energy supply
4. Other, please specify_____

10. Indicate the amount of investment?

……

……..

11. The pay-back period agreed with the ESCO for covering the investment was respected?

Yes No

If no, indicate the main reasons

……

……

……

……

12. What of these statements could you consider correct ?

- The cooperation with ESCOs has been an excellent experience
- The Cooperation with ESCOs cannot be considered a good experience
- I have never collaborated with ESCOs, but I'm going to collaborate soon

13. Is your organization interested in cooperating soon with an ESCO for improving energy performance of its buildings?

……

……

……

……

14. According to you, cooperation with ESCOs is useful for improving the energy performance of your organization. Why?

……

……

……

ENEA – Italian National Agency for New Technologies, Energy and Sustainable Economic Development (IT)

Municipality of Messina (IT)

Municipality of Errenteria (ES)

Municipality of Coimbra (PT)

Municipality of Alimos (EL)

ISR – University of Coimbra (PT)

SINLOC - Sistema Inizative Locali Spa (IT)

ETVA VI.PE. S.A. (EL)

TECNALIA Research & Innovation Foundation (ES)

EUDITI Energy and Environmental Design LTD (EL)

Innova B.I.C. Business Innovation Centre S.r.l. (IT)

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