

European Public Local Authorities' Network for driving
the Energy Transition



**D2.1 - REPORT ON USER NEEDS AND
REQUIREMENTS FOR ENERGY
TRANSITION AT PUBLIC LEVEL**

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February, 2022 (M 06) - WP2, D2.1



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101032450. The views expressed in this publication are the sole responsibility of the author/s and do not necessarily reflect the views of the European Commission.

Technical References

Project Acronym	ePLANET
Project Title	European Local Public Authorities' Network for driving the Energy Transition

Deliverable No.	D2.1
Dissemination Level	PU
Work Package	WP2 - Governance
Lead beneficiary	02 (ICAEN)
Contributing beneficiaries	01 (CIMNE), 06 (DDGI), 07 (RDFC), 08 (EAZK)
Due date of deliverable	28 February 2022
Actual submission date	31 March 2022

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Versions

Version	Date	Content and changes	Edited by
01	09/02/22	First draft version	Josep Maria Granollers
02	22/3/22	Second draft version	Josep Maria Granollers
03	31/3/22	Final version	Josep Maria Granollers



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Executive summary

The ePLANET project is a Coordination and Support Action cofounded by the European Commission through Horizon 2020 program. This project aims to deploy a **new clustering governance** for energy transition based on a digital framework to share harmonized information, facilitating the adoption of coordinated energy transition actions by the European public sector.

The development of ePLANET is justified to deploy Energy Transition (ET) in public sector, for which the following challenges are targeted:

- Improving coordination between local authorities and regional governments
- Enhancing decision-making process in deployment of ET projects
- Providing coherence and consistency to the energy transition measures (ETM) to be implemented
- Encouraging the digitalization of measures and plans
- Enabling an interoperable ecosystem of data and tools

All these targeted objectives will give the needed support for the energy transition decision-making process and its practical implementation.

This document summarizes the actions performed and the conclusions obtained to define the **user requirements and needs** in relation to Energy Transition **Plans** and Energy Transition **measures**. The methodology followed to build this deliverable is based on a set of specific surveys addressed to several pilot site municipalities, combined with virtual meetings between the pilot site managers of the three pilot regions and the conducting partners. This deliverable includes summary of the responses of the surveys among the interested municipalities of the three different European regions chosen as pilots and the conducting partners (CIMNE, ICAEN and 3OCLOCK). The aim is **to develop a proof of concept** in determining the real needs of public authorities that can facilitate the deployment of energy transition projects.

The three pilot regions are the island of Crete in Greece, the Zlín region in the Czech Republic and the province of Girona in Catalonia. However, the identification of needs from other municipalities, which gave support to this project, will also be taken under consideration if they have been surveyed. Since the number of municipalities belonging to the pilot site regions is large, a long-term survey strategy has been adopted and will extend beyond this deliverable. This deliverable synthesizes the conclusions of the first group of surveys and the remaining ones will be included in a specific section within the deliverable D.4.1.



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Abbreviations and acronyms

ABBREVIATION OR ACRONYM	DESCRIPTION
CILMA	Council of local initiative for the environment (in Girona)
CoM	Covenant of Mayors
DDGI	Girona provincial council
EAZK	Energy Agency of the Zlín Region
ED	Energy data
EP	Energy Plan
ERDF	European Regional Development Fund
ET	Energy Transition
ETG	Energy Transition Governance
ETM	Energy Transition Measure
ETP	Energy Transition Plan
LA	Local Authorities
LEC	Local Energy Community
PA	Public Authority
PAET	Public Advisor in Energy Transition
RDFC	Regional Development Fund of Crete
REAC	Regional Energy Agency of Crete
RES	Renewable Energy Source
SEAP	Sustainable Energy Action Plan
SECAP	Sustainable Energy Climate and Action Plan



1 Background

Energy transition (ET) deployment is one of the main targeted objectives for the EU in order to reach a decarbonized economy and to achieve the 2030 and 2050 EU targets, and at the same time, to make consumers more independent energetically, endowing them to better face possible future energy breakdowns.

In all European countries, currently there are municipalities trying to set up projects on energy transition, normally in the form of local energy communities (LEC). Regulation and standards for LEC are still not in place in the majority of European countries. This is one of the reasons for which there is a need to share ideas, strategies and experiences between different municipalities to determine the different ways that can better facilitate the implementation of ET in municipalities or in a district of a village.

There are many other reasons to promote a common digital environment. All initiatives from different municipalities need to feed with other ideas to help the development of ET projects and its implementation. That is why ePLANET is targeting to increase effectiveness of coordination and ET governance coordination among Public Authorities (PA)

ePLANET aims to be a promoter of ET projects by sharing information in a common digital space between different municipalities and other Public Entities (PA) at different levels, whatever local, regional and even at European level. The approach of this project focusses only in the public sector.

Previous the building of the ePLANET environmental platform we need to gather, understand and analyse the needs of the future users, mainly PA and key stakeholders. The main way considered is through surveys.



2 Introduction

This report identifies municipalities' needs and requirements for the ePLANET Platform as an environmental digital framework that will allow sharing information between the different PA and Stakeholders. The report describes the analysis of different surveys conducted in the three pilot regions, focusing on the identification of key functionalities and outputs that will encourage and promote the energy transition actions.

The requirement of D2.1 defined in the ePLANET Grant Agreement are as follows:

- Define and understand the main needs of future ePLANET users to ensure the future adoption of ePLANET outcomes by PA.
- Identify which are the main barriers (technical and social), obstacles and pains, that PA are facing to establish effective vertical and horizontal coordination at local, regional and national levels.
- Exploit the consultations to detect the main requirements and needs in energy transition knowledge that will allow to design capacity building materials

The process followed to identify the different requirements and barriers has been done in different ways: mainly through *EUSurvey platform*, which is supported by the European Commission's ISA² programme, which promotes interoperability solutions for European public administrations, but as well under discussions, interviews, telephone calls or face-to-face meetings.

2.1 Purpose and organization of the document

The purpose of this document is the identification of needs and requirements from the 3 different European regions involved in the pilot sites of ePLANET, in order to put the tools and services to facilitate the Energy Transition projects and its implementation through a collaborative digital environment named ePLANET.

The organization of this document is structured as follows: first a definition and description of Use Cases of each pilot region, then a description of the questionnaire used by the survey, and finally a summary of the responses of the survey by each municipality and the analysis of responses and its conclusions.

2.2 Scope

The scope of this report comprises the municipalities of the three pilot regions of Zlín-Region, Crete Island and Girona province.

Due to some difficulties and time constraints related to consultations in the province of Girona, which didn't assure us they would be conducted in the allotted time, we decided to start with consultations on municipalities of whole Catalonia to have information to be processed. Due to justified constraints, we have had an extra month to complete the surveys in Girona. The final scope besides the 3 mentioned regions comprises the country of Catalonia too.

Stakeholders are as well within the scope of this report, but there have been surveyed only in Catalonia. No stakeholder's surveys conducted in any pilot region especially.



3 Description of the pilot regions

Error! Reference source not found. shows the map of the three regions involved in ePLANET project as pilot sites.

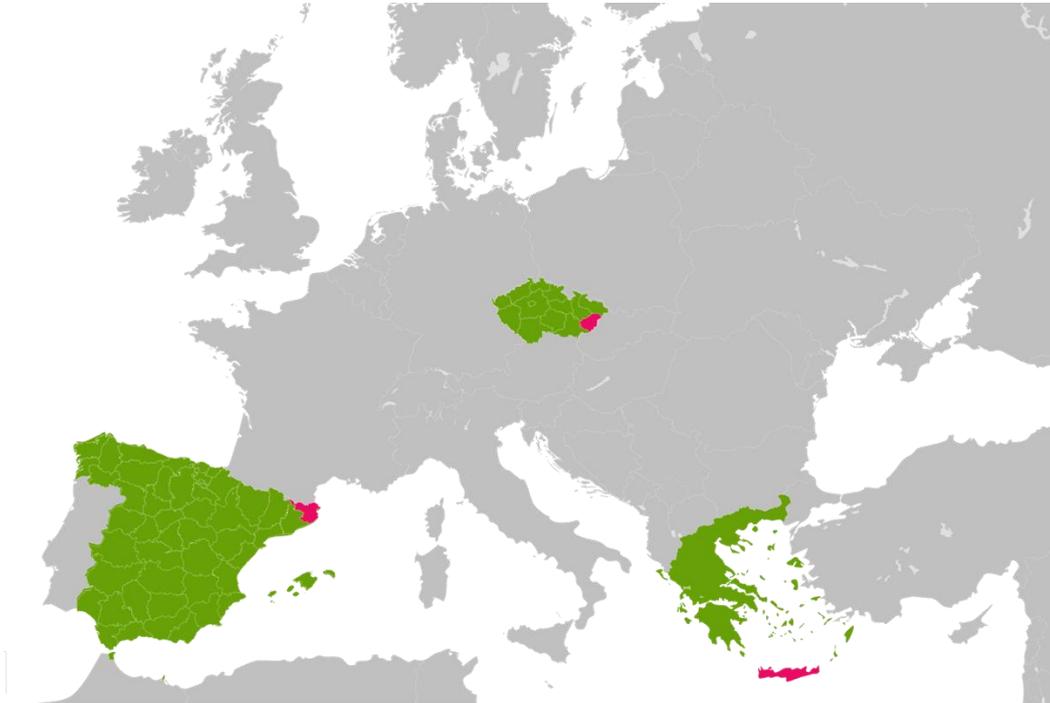


Figure 1. Map of the ePLANET pilot site regions (Girona, Zlín and Crete)

3.1 Pilot site 1: Zlín region

The Zlín Region is a frontier region with both agriculture and industrial tradition and a great density of settlements. There are **307 local authorities**, with a population of 580.119 inhabitants (2021).

The Energy Transition (ET) vertical governance in Zlín Region is solid and well established. Energy transition strategy in the region is mainly defined by EAZK, and later adopted by the region. Local authorities implement the ET rather through planning particular projects and individual implementation; hardly any of them have a real SEAP.

There is a margin to improve horizontal governance of energy transition in the region. There are no signatories of Covenant of Mayors at local level (EAZK is supporting partner since 2014), and most of the energy efficiency measures rely on the effectiveness and active support of EAZK to adapt local level policies and goals to the energy transition. The capacity building of local officers, the deployment of a horizontal governance framework for local authorities, and the deployment of a sharing information platform will foster the multi-level governance of the region.



•••The Zlín Region pilot will be primarily focused on 61 municipalities of the Zlín Region. In ePLANET preparatory phase 48 local authorities have already expressed their interest in joining the project and adopting the different ePLANET tools and strategies. Around 119 more Zlín region municipalities will be engaged during the scale-up



Figure 2. Map of the Zlín pilot site region

3.2 Pilot site 2: Crete region

Crete is the largest and most populous island in Greece, and the fifth most populous Region in Greece with a population of around 625.000 inhabitants. The consortium partner RDFC (Regional Development Fund of Crete) has been established in 1998 as a supporting entity of the Crete Region development planning (including energy planning). RDFC also supports both the Region and the Municipalities of Crete with energy advice, through the Regional Energy Agency of Crete (REAC), which is operated by RDFC. Through REAC, RDFC is the CoM territorial coordinator in the whole island, a signatory of the Pact of Islands and a member of the ManagEnergy and the Clean Energy for Islands initiative.

Crete is currently updating their Energy Action Plan (2016) into a new Energy Transition Plan.

Energy Transition of the public sector in Crete is characterized by a vast adoption of CoM (18 of the **24 local authorities** are CoM signatories, 16 of them with submitted SEAPs) and, at the same time, by little monitoring of the implemented actions and relatively few investments in ET. Energy governance is mainly unidirectional, from region to local authorities (ET strategy is defined by RDFC, and later adopted in SEAPs/SECAPS by local authorities), with limited feedback from the local authorities to the regional entity and with no established sharing information procedure neither intra-local coordination.

The multi-level governance of the Region is expected to be fostered by the following actions:

- the capacity building of local officers,
- the promotion of an harmonized system to monitor and evaluate ETM and SECAP progress,
- the deployment of a vertical and horizontal governance framework for local authorities,
- and the deployment of a sharing information platform



and at the same time, those action will increase the financial opportunities for the adoption of ET measures by the whole public sector in Crete

The Crete Region pilot will be focused on the 16 local authorities that have already submitted their SEAPs and scale-up to the whole Region is the aim of the transferring/replicability phase.

Rest of the Crete region municipalities together with Greece municipalities will be engaged during Scale-up activities



Figure 3. Map of the municipalities of the Crete pilot site region

3.3 Pilot site 3: Girona province

The Girona Provincial Council, (DDGI) is the public local authority for the Girona province. Provides technical, financial and administrative support to all the **221 municipalities** within their operational area. DDGI is a CoM Coordinator and one of their main stakeholders in the province of Girona. It supports all municipalities to sign, join and develop their own Sustainable Energy (and Climate) Action Plans. It also plays a key role in providing technical and financial aid to implement mitigation and adaptation actions via publications, toolkits and services (“Eines PAESgi” toolkit, “Services Plan” for the promotion of energy efficiency and renewable energies, etc.), and the promotion of forest biomass and various grants and subdivides campaigns.

Since 2008, from a total number of 221 local councils, 209 have joined the CoM initiative. 190 of them have approved a SEAP, validated by DDGI and the climate office of CILMA. Currently there are 50 SEAPs monitoring reports and 3 newly approved SECAPs.

DDGI has been providing means to local councils in the Girona area to develop projects under the European Regional Development Fund (ERDF) financial schemes; whereof, among others, aims to support the shift towards a low carbon economy in all sectors from the period 2007-2013 onwards.

DDGI provides technical and legal assistance to create **Local energy communities (LEC)**. More than 10 municipalities are interested in creating LEC and four of them (**La Cellera de Ter, Rupia, Cornella del Terri and Amer**) have received grants from the province to speed up the creation of these LEC.

In Spain there are still no legislation for the LEC, because the National Legal Framework has recently changed. These 4 LEC will be the first experiences at national level. If they are successfully implemented, they will be scaled-up to the whole Province. The number of municipalities interested in creating LEC is growing exponentially.

The Girona’s pilot region focuses on **67 municipalities** of the Girona region.



Besides, in Girona there are several associations of municipalities (La Selva, Alt Empordà and Ripollès amongst others) and own municipalities that have expressed their interest in joining the project and adopting the different ePLANET tools and strategies.

The scale up will include around 145 more municipalities, including other provinces of Catalonia.



Figure 4. Map of the municipalities of the Girona pilot site region

3.4 Main figures of the pilot sites

Table 1: Taula sobre el que sigui

ePLANET Pilots at February 2022			
Main features	Zlín Region	Crete Island	Girona Province
Population	580.000	625.000	780.000
Total # of municipalities	307	24	221
# of municipalities under focus	61	16	67
Who rules ET Strategy	EAZK	RDFC with REAC	DDGI



4 Information gathered from Surveys

4.1 The Questionnaire.

The questionnaire used in the surveys to identify the needs and requirements from municipalities has been structured in four different sections. The first one is to identify the respondent municipality. The second section is related to the energy Plans for the energy transition. The third part relates with the energy data and the last section refers to the governance of the energy transition.

Prior to responding to the questions, a consent of the person who answers is required by typing its name.

To this questionnaire, it has been added an extra part with questions related to capacity building requirements identification for the Task 4.1 (User-centered design of training material).

The resulting questionnaire is rather lengthy, but we have considered that it would be better to carry out a comprehensive survey now, than requiring answers to two different questionnaires within few months.

The following are the questions used in the survey related to the 2.1 task.

A. Profile of Municipality

Name of Municipality	
Location (Province, district, county)	
Population (number of inhabitants)	
Surface (m ²)	
Number of Technicians (for Energy topics)	
Level of expertise of technicians	
Name the 3 main available resources in your municipality: Sun, biomass, water, wind, bio-fuels, other	
Are any local utility company (energy supplier) in your municipality or county?	

B. Energy Transition Plans.

1. Does your Municipality have an Energy Transition Plan?

A sustainable Energy Action Plan (SEAP)	
A sustainable Energy and Climate Action Plan (SECAP)	
None	
Other (specify)	

2. Since when do you have an Energy Transition Plan?

Before 2016	
After 2016	



3. Which are the sectors included in your Action **Plan & Measures** for the energy transition?

Municipal/public Buildings	
Services	
Industrial	
Residential/domestic sector	
Transportation	
Agriculture/Farming	
Fishery	
Mobility	
Tourism	
Waste management	
Other	

4. How often is your Energy Plan reviewed?

Each year	
Each 2 years	
Each 3 years	
Each 5 years	
Other	

5. What kind of **actions** include your Energy Transition Plan?

Energy efficiency in public buildings and facilities	
Energy efficiency in Street Lighting	
Promotion of energy efficiency in different sectors	
Creation of energy infrastructures	
Sustainability on mobility sector & transportation	
Promotion of renewable energy systems	
Improvement of resilience	
Increase of adaptation to Climate change	
Reduction of water consumption	
Other	

6. Which **sources** or services do you use to choose/select measures?

Subcontracting an Energy Service Company (ESCO), installers, Engineering companies,...	
Energy Department of public administration at municipal or regional level	
Other	



C. Energy Data

7. Which energy consumption data do you normally collect?

Type of consumption	collected	periodicity	Format (Excel, csv, access, by hand)
Electricity in public facilities			
Natural Gas in public facilities			
Fuel-oil consumption			
Biomass consumption			
Aggregated consumption of residential buildings			
Aggregated consumption of commercial buildings			
Aggregated consumption of industrial buildings			
Electricity consumption of electric vehicles charging points			
Energy consumption of district heating systems			

8. Which energy generation data do you collect?

Renewable energy generation of publicly managed installations	
Renewable energy generation of privately managed installations	
Energy generated by fossil fuel based installations	
Cogeneration (CHP)	
Other, specify:	
There is no energy generation	

9. Which renewable energy systems are in your municipality?

	public	private
Solar thermal		
Photovoltaic		
Geothermal		
Wind energy		
Biomass		
Other:		

10. Is energy monitored in facilities where energy measures have been implemented?

Yes	
-----	--



No	
----	--

D. Energy transition governance.

11. Who makes and updates the Energy Transition Plans of your Municipality?

Outsourced (Consulting company,...)	
Internal team	
Department at higher level within municipal structure	
other	

12. Who is **responsible** for implementation of energy transition measures?

Municipal energy manager	
Municipal engineer	
Municipal energy agency	
Other:	

13. Do you check and **benchmark** your energy plan?

To previous years	
To other surrounding municipalities	
To other regional or national municipalities	
Other. Specify:	

14. Are you planning common measures with other local authorities?

Yes	
No	

15. Do you **report** your energy transition plan?

No	
To provincial council	
To a regional or national government	
Other:	

16. Which is the **financing scheme** that allows you to implement energy transition measures?

There is no a financing scheme	
Under the ESCO model	
Funded by the regional government	
Other. Specify:	



4.2 Target groups.

The target groups in which the survey has been conducted for all 3-region pilots has been local public bodies represented only by municipalities.

In Greece and in the Czech Republic the public sector is mainly organized throughout the territory by municipal buildings.

The case of Catalonia is different because the public sector is organised not only by municipalities, but by the Catalan government administration which integrates more than 5.000 buildings.

For the Catalan pilot, due to a problem in DDGI to carry out the surveys, the survey has been conducted in different municipalities of the other provinces of Catalonia.

Besides while conducting surveys, it has been realized to have extra inputs from stakeholders that act as advisors for municipalities or other public entities. That is the reason we have included this extra scope for the case of Catalonia.

Samples and statistical populations of each region

Geographical Area	Zlín Region	Crete Island	Girona province	Catalonia	
Scope	Municipalities			Municipalities	Stakeholders
Sample	21	6	7	14	3
Statistical Population	307	24	221	947	25
Significance (%)	5,54%	25%	3,17%	1,48%	12,00%

4.3 Outcomes from the pilots.

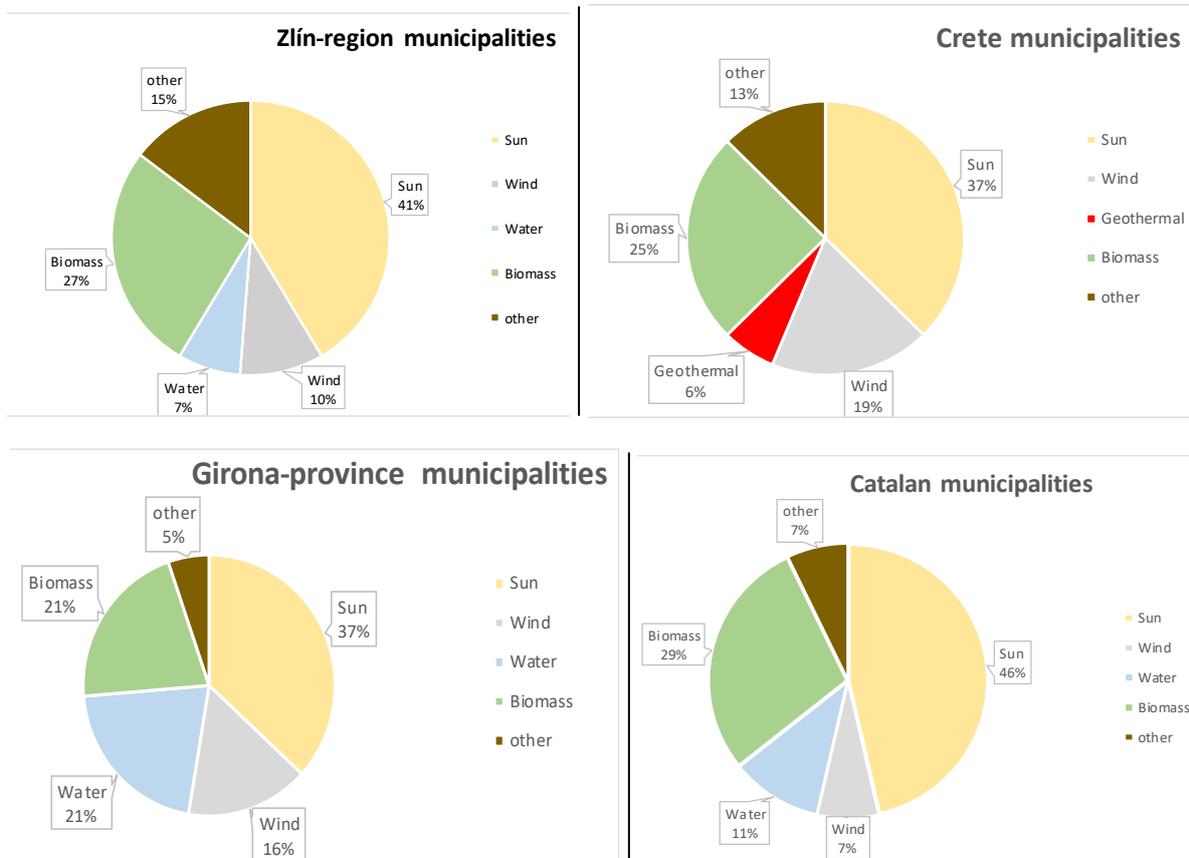
Responses to the surveys are collected hereunder and organized with the main topics for each section of the questionnaire

4.3.1 Profile of the Municipalities for each Pilot

From energy transition perspective, the key aspect compared, is the main renewable **energy resources** available in each pilot region that will help to establish common approach to incentivise the Energy Transition projects deployment.

The profile obtained for the 3 pilot regions, and Catalonia regarding main energy renewable availability is quite similar, as can be seen in the following graphics.





In this first comparison, the pattern followed by the Catalan and Zlín municipalities, are very similar. The difference to the Crete region is that instead water resource, Crete has geothermal resources, due the volcanic nature of the Island that allows the use of natural Earth heat. The case of Girona pilot has same structure than Zlín region but with percentages slightly different.

The two main resources for which investments should be prioritized are solar and biomass technologies.

Another important aspect to facilitate Energy Transition initiatives is having **local utility** companies (DSOs) more open to facilitate ET initiatives. The following table shows the number of DSO in each pilot region:

Pilot region	# of main big National DSO	# of local or small DSOs	% of municipalities aware of local DSO (respect surveyed PA)
ZLín	2		
Crete	1		
Girona	7	13	71%

Province of Girona is very dynamic in small DSO, some of which can operate as traders too at a national level.

In the Zlín Region and Crete, there are no local or small DSO. Only big national operators.



In the case of Zlín region, there are heat energy providers. The surveys have showed heat energy generation based on biomass (1 municipality) and on biogas (3 municipalities). In Crete, there is only one energy community. In both cases, there is no electricity generation.

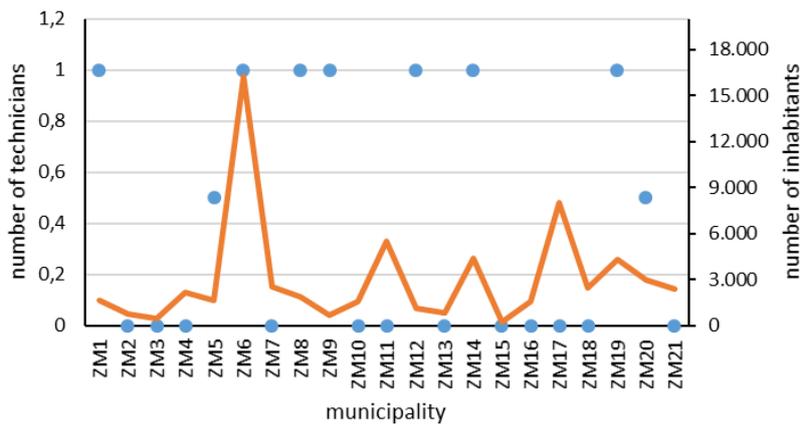
It is important to remark that only small local DSO can facilitate energy transition initiatives respect the restrictive conditions from big national DSOs.

The number of technicians that each municipality has is another key parameter as a resource to carry out energy transition projects and is in direct proportion for a better governance of Energy Transition deployment.

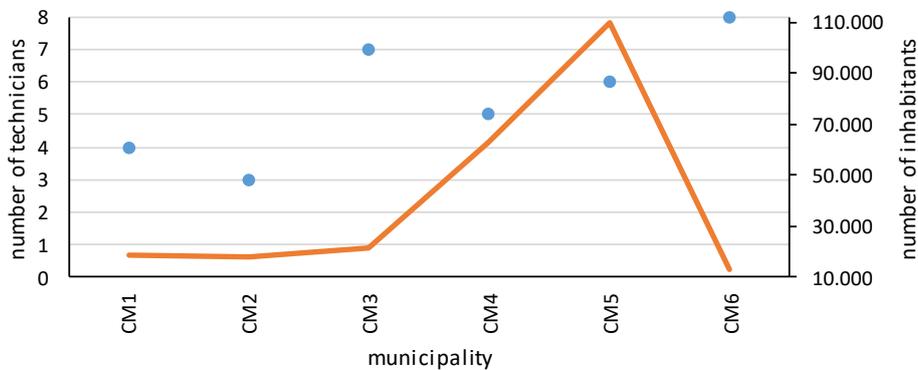
The following graphics represent for the different municipalities of each Pilot Region, the number of technicians compared to the population size for each municipality.

Besides the 3 pilot regions, it is displayed as well values for all Catalonia. Surveys have been done in most of those municipalities that signed letters of support to the ePLANET project. Besides, this was done due to the few surveys performed in the Girona province close to the delivery of this report.

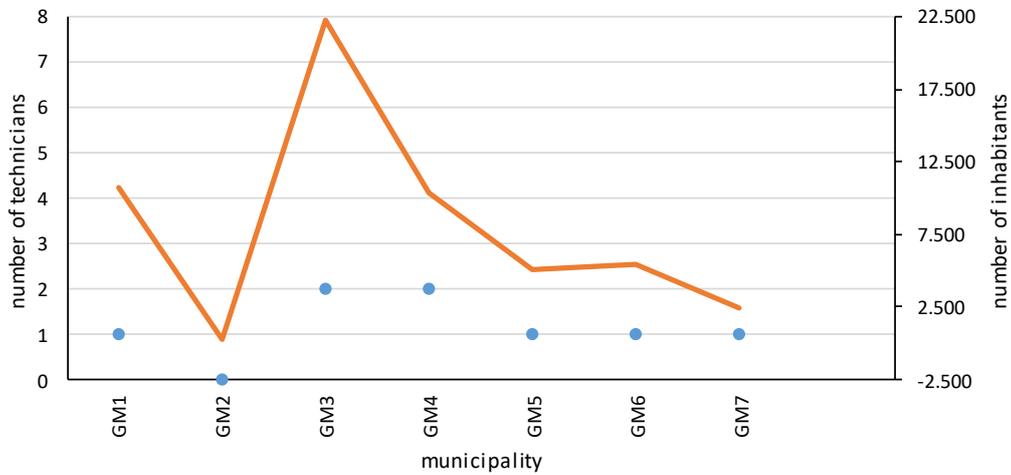
of technicians vs population (Zlín Region)



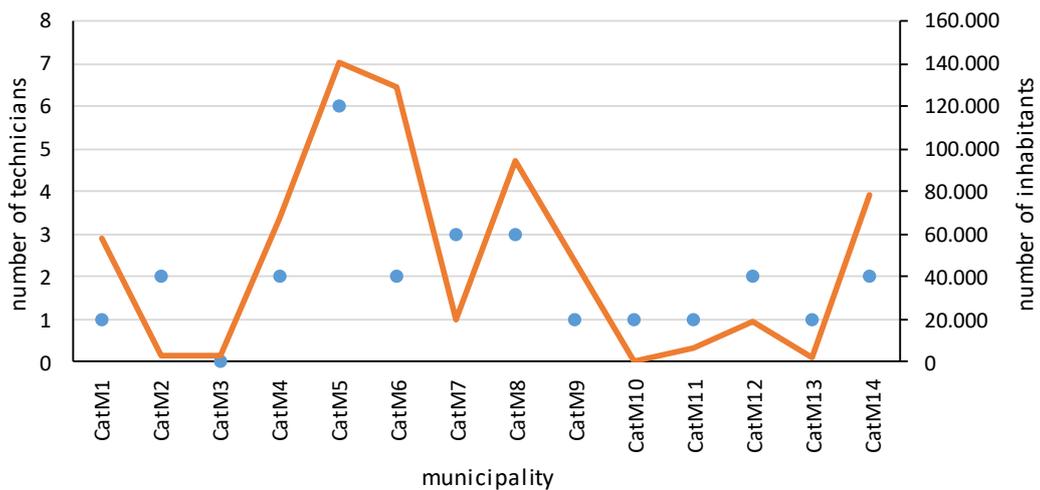
of technicians vs population (Crete)



of technicians vs population (Girona)



of technicians vs population (Catalonia)



For all graphics blue dots represent number of technicians and red line the populations

Normally, the bigger the municipality is, it has more technicians, but not necessarily with specific functions to deploy ET strategies. Anyway, this numbers have to be under consideration for the governance strategies of energy transition in different municipalities.

Another aspect surveyed is the educational level or expertise of technicians. The following table overviews the significance per region:



Pilot region	Municipalities with 1 or more technicians	Level of expertise of technicians		
	%	High (%)	Med (%)	Low (%)
Zlín Region	43%	22%	44%	33%
Crete	100%	25%	50%	25%
Catalonia	92%	58%	17%	0%
Girona	86%	28%	57,5%	14,5%

To ensure successful Energy Transition governance is of key importance to have available skilled technicians.

In the Zlín region, where we have the higher number of consultations, is where the number of technicians per municipality is the lower: that responds not only to the size of municipalities, which are the lowest, but also it might be due to the policy of the region and the country in approaching Energy Transition.



5 ANALYSIS of INFORMATION gathered from Surveys

In this section, information gathered from the surveys is analysed by each of sections B, C and D of the questionnaire per each of region surveyed, including a few stakeholders of Catalonia.

5.1.1 Zlín region answers

Section B. Energy Transition Plans

Q.1. Number of municipalities with an ETP.

Data obtained in the following table:

Is an Energy Transition PLAN in Zlín Region Municipalities?				
SEAP	SECAP	No Energy plan	Don't know	How often is updated
24%	0	71%	5%	Each 5 years (only one answer)

In this pilot region, we got only 5 positive responses of a total of 21 surveyed municipalities. The majority of municipalities have no an Energy Plan or don't give an answer.

It's important to remark that all SEAPs are very simple static documents not complying with the requirements how the SEAP should be according to CoM initiative.

Qs.2 & 4. Since when municipalities have an ETP and how often is reviewed.

For only 5 municipalities having ETP, 3 of them haven't responded in which periodicity they review their Energy Plans:

ET Plans review/update in Zlín Region Municipalities		Number of Municipalities
Since when there is an ETP	Before 2016	0
	After 2016	2 (40%)
	No-answer	3 (60%)
How often is ETP updated/reviewed	Each 5 years	1 (20%)
	Never	1 (20%)
	No-answer	3 (60%)

Q.6. Sources or services used to develop energy plans and its measures.

The majority of municipalities without an energy Plan, have responded that public administration should have the role and responsibility for 'developing' their plans:

Who develops the ETP in Zlín Region municipalities?			
Only Public division, department or Entity (Agency, as EAZK,..)	Only Private Co (ESCo, Engineering,..)	A combination of Public entities & Private Co.	No-answer
76%	0%	14%	10%



The 76% in this table represents 16 of 21 surveyed municipalities, of which an 81% have no Energy Plan, but recognizes or identifies Public Administration or public companies for giving them support in developing their Energy Plans. In fact EAZK as the Zlín Regional Energy Agency do recommendations on EE measures and cooperates with municipalities on a regular basis, but not mainly in order to develop ETP.

A 14% of municipalities identify a mixed solution between public and private entities, for which one-third (1 of 3 responses) have no an Energy Plan.

Q.3. Sectors included in the ETP.

The analysis of sectors has been done on prioritization by the municipalities to include them in their ETP. For the Zlín region, only 3 municipalities of 5 having energy Plans, have responded. The results are:

SECTORS included in the ETP (Zlín Region). Prioritization by municipalities

Public Buildings	Domestic & Residential	Services	Industrial	Transport	Waste	Tourism	Mobility
100,0%			66,7%				33,3%

These results are based on number of respondents (3):

The three sectors of Public Buildings, Domestic-Residential and Services are chosen by all (3) respondents.

The sectors of Industrial, Transport, Waste and Tourism, are included in energy plans of 2 respondents and Mobility sector is only selected by 1 municipality.

Q.5. Actions included in ETP.

In the analysis of actions, the number of responses are 4 of 5 municipalities having an Energy Plan which represents an 80% of significance, but is only 24% of the total surveyed municipalities.

Prioritization of ACTIONS by Municipalities with an ET Plan

EE in Buildings	Street Lighting	EE in Sectors	Adapt to Climate	Building Energy Infrastructures	Transport & Mobility	Resilience	Water	Other (improve skills)	RES
100%		50%		25%				0%	

These results meaning that the actions of EE in buildings and street lighting are included in plans of the all 4 respondents. The actions of EE in different sectors and adaptation to climate change are included in energy plans of 2 respondents and the rest of actions (except RES) are only selected by one municipality.

Responses in both cases are very low as only 24% of the surveyed municipalities have an energy plan, and an even lower number of municipalities have answered.



Section C. Energy Data

Q.7. Energy consumption data collected.

For energy **consumptions**, the following are the responses from the municipalities sample in the Zlín region:

DATA COLLECTION in Public facilities or buildings					Data collection in aggregated consumptions			Other Data collection	
Periodicity	Electricity	Gas	Fuel-oil	Biomass	Residential ¹	Commercial ²	Industrial	EV	DH ³
Monthly	67%	62%	-	50%					100%
Annually	14%	14%	-	50%	100%	100%			
Other	19%	24%	-						
Format									
Excel	71%	71%	-		100%	100%			100%
Manually/Word	19%	14%	-	100%					
No-answer	10%	15%	-						
Electricity&Gas: 21 responses					1: only one response of 21			EV: Electric Vehicles	
Biomass: 2 responses					2: only two answers of 21			DH: District Heating	
					3: only one answer of 21			DH: only 1 facility	

Electricity and Gas are energies used by 100% of surveyed municipalities, for which main pattern is a monthly data collection under excel format, but still far to be used for all municipalities.

Biomass is not very much in use: only in 10% of municipalities, and data is under a manual format.

For aggregated consumption, there is no significance, since the answers are too few, but excel is the pattern used.

Q.8. Energy generation data collected

The follow-up of generated energy (in either a public or private facilities), using or not renewable energy systems, for the Zlín region are in the following table:

DATA COLLECTION by Municipalities of GENERATED Energy				
Periodicity	Public RES	Private RES	Fuel-oil Generation	CHP
Monthly	33%	-	100%	-
Annually	67%	-		-
Other		-		-
Format				
Excel	100%	-	100%	-
Manually/Word		-		-
No-answer		-		-

Number of answers obtained: 5 of 21 municipalities ($\approx 24\%$). All monitored energy generation are from public facilities. Municipalities do not monitor energy generation of private facilities.



The energy generation production from fossil resources is monitored in 2 municipalities, allegedly public facilities. The pattern is the same in periodicity and format of data.

Qs 9 & 10. Renewable energy systems and monitoring of energy production from Energy transition measures implemented.

The main energy production systems in Zlín region are private, as shown in table below

Percentages represent the number of municipalities (over 21 surveyed) having the indicated energy systems.

Number of Zlín Municipalities with renewable energy production systems						
Ownership	Solar thermal	Photovoltaic	Geothermal	Wind energy	Biomass	Other
Public	14%	0%	5%	0%	14%	0%
Private	62%	76%	43%	0%	52%	0%

All municipalities, except one (more than 95%) have production of energy. To have or not an ETP is not a barrier for municipalities in investing in Renewable energy systems. Those investments are mainly from private sector.

Number of Zlín municipalities that MONITOR Energy in facilities with MEASURES implemented	
YES	67%
NO	19%
Don't know No-answer	14%

The majority of municipalities with implemented measures monitor the energy production, allegedly in private facilities, so data might not be available for municipalities.

Section D. Energy Transition Governance

Qs. 11, 13 & 15. Who makes ETP. Their benchmarking and their reporting.

Who performs ET PLANS					Is ET PLAN checked or benchmark?					Is ET PLAN Reported?				
Outsourced (Private Co)	Local Internal Team	Higher level Team	Other (EAZK, Mixt with Private Advisor, Mayor..)	N-A	To previous years	Respect local municipalities	Respect regional or national Mun.	No	N-A	No	To prov. Council	To Reg or national Inst/Gov.	other	N-A
10%	0%	0%	14%	76%	5%	0%	0%	38%	57%	48%	29%	5%	5%	13%

Two of 21 municipalities outsource their Energy plans. The 14% represents three municipalities of which one combines private and public consulting. In one municipality, the Mayor is who performs the Energy Plan.



Respect to benchmarking of energy plans, only in one municipality there is a check to previous years. Benchmark is not a practice for the municipalities of this pilot region.

For the reporting of Energy Plan, about the half do not report. Another 39% of municipalities report the energy Plan to any public entity of different level. The percentage to complete the 100%: 13% represent municipalities that don't give any response.

Qs. 12, 14 & 16. ETP accountability, sharing with others and finance of measures

Who is responsible for Implementation of ET MEASURES						Plan to SHARE MEASURES with other PA?			FINANCE scheme to implement ET MEASURES				
Public Energy manager	Public engineer	Public energy agency (EAZK)	Municipal technician	Other (Mayor)	N-A	Yes	No	N-A	ESCO model	Funded by Regional Gov.	Other	No funding scheme !	N-A
0	0	5%	5%	38%	52%	24%	43%	33%	0	0	33%	52%	15%

The responsibility on implementation measures is mainly to Mayor, as the main person representing the municipality. This responsibility is shared with the energy agency, EAZK, in one case, and in other 3 cases with a municipal technician. A total of 52% of municipalities don't report an answer (11 municipalities)

There are 5 Municipalities (24%) willing to share their plans with other towns to initiate join initiatives in energy transition.

Regarding the funding schemes, there is a high number of municipalities that still haven't raised how they are going to fund their energy projects. This high percentage might be due that the majority of municipalities has no an Energy Plan focussed on energy transition.

The 33% (7 municipalities) should be investigated on which kind of funding they apply.



5.1.2 Crete answers

Section B. Energy Transition Plans

Q.1. Number of municipalities with an ETP.

Data obtained from 6 surveyed municipalities:

Is an Energy Transition PLAN in CRETE Municipalities?				
SEAP	SECAP	No Energy plan	N-A	How often is updated
83%	17%	-	-	each 2 or 5 years (two answers)

The municipality with a SECAP has a SEAP too

The hundred percent of surveyed municipalities have a SEAP. One of these has also a SECAP. Energy plans for Crete region complies with CoM initiative.

Qs. 2 & 4. Since when municipalities have an ETP and how often is reviewed.

The majority of municipalities have energy plans before 2016.

ET Plans review/update in CRETE Municipalities		Number of Municipalities
Since when there is an ETP	Before 2016	5 (83%)
	After 2016	1 (17%)
	No-answer	-
How often is ETP updated/reviewed	Each 2 years	1 (17%)
	Each 5 years	1 (17%)
	Other	2 (33%)
	No-answer	2 (33%)

As energy plans are done for some years, it's very understandable that their review should be each 2 or 3 years. The 66% of answers that don't specify the review periodicity is because it is not visualized as it can be for more than 5 years.

Q.6. Sources or services used to develop energy plans and its measures.

The majority of municipalities involve private sector to develop their ET Plans

Who develops the ETP in CRETE			
Public division or department (only)	Private Co (ESCO &/or Engineering Co,..)	A combination of Public and Private Co. (mixed solution)	Other
17%	50%	33%	-

The 2 mixed solutions involves: ESCo, Engineering Co & Public Administration



The 83% of Crete municipalities involve the private sector to develop their energy plans. There is only one small part of the municipalities using only public resources.

Q.3. Sectors included in the ETP.

The percentages in the following table represent the number of municipalities who selects the specified sector in their energy plans. Each one has to be seen individually

SECTORS in E.T.Plan: Prioritization by CRETE municipalities.

Public Buildings	Waste	Services	Domestic & Residential	Transport	Mobility	Agriculture	Industrial	Tourism
100%	67%	50%			33%		17%	

Sector of public buildings are in all energy plans of surveyed municipalities. Only one municipality (17%) includes the Tourism sector in their energy plan.

These data could also be shown in the following way:

Sector	Does ETP incorporates Sectors	
	YES (%)	NO (%)
Public buildings	100	0
Waste management	67	33
Services	50	50
Domestic and Residential	50	50
Transport	50	50
Mobility	50	50
Agriculture	33	67
Industrial	33	67
Tourism	17	83

Q.5. Actions included in ETP.

This table has to be understood in the same way of the previous one.

Prioritization of ACTIONS by CRETE Municipalities with an ET Plan

EE in Buildings	Street Lighting	Transport & Mobility	RES	EE in sectors	Water	Other	Adaptation to Climate Change	Resilience
83%			67%	50%		33%	17%	

All surveyed municipalities have responded to this question.



Section C. Energy Data

Q.7. Energy consumption data collected.

The following are the energy consumptions collected from Crete municipalities:

DATA COLLECTION in Public facilities or buildings					Data collection in aggregated consumptions			Other Data collection	
Periodicity	Electricity	Gas	Fuel-oil	Biomass	Residential	Commercial	Industrial	EV	DH
Monthly	17%		33%					100%	
Annually	67%	80%	50%						
Daily			17%						
Other (invoices, 5/6 yrs, 4-years....)	16%	20%	-		100%	100%	100%		
Format									
Excel /csv	100,0%	80%	80%		100%	100%	100%	100%	
Manually / use of invoices									
Other									
No-answer		20%	20%						
Electricity: in all 6 municipalities					Residential, Commercial & Industrial: only 1 municipality				
Gas: in 5 municipalities					EV: in only 1 Municipality				
Fuel oil: facilities in all 6 municipalities									
Biomass: No facilities in any municipality									

Only electricity is an energy used by all surveyed municipalities. The periodicity in collecting electrical data is very dispersed, but the format in which data is collected is uniform, excel format

Gas and fuel-oil follow a similar pattern. Aggregated data has no significance since are few responses.

Q.8. Energy generation data collected

Two municipalities (of 6) collect data of energy generation by public facilities and from one private generation site.

DATA COLLECTION by Municipalities of GENERATED Energy				
Periodicity	Public RES	Private RES	Fuel-oil Generation	Other
Monthly		-	-	-
Annually	50%	-	-	-
4 years	50%	100%	-	-
Continuously		-	-	-
Format				
Excel	100%	100%	-	-
Web-csv		-	-	-
Manually/Word	-	-	-	-
Other	-	-	-	-
Only 2 municipalities collect data of energy generation (public) and from only 1 Private generation site				



Qs 9 & 10. Renewable energy systems and monitoring of energy production from Energy transition measures implemented.

The main energy production systems in Crete island as shown below, are private, mainly in technologies regarding Wind, and for biomass and geothermal too.

Number of CRETE Municipalities with renewable Energy Production Systems						
Owneship	Solar thermal	Photovoltaic	Geothermal	Wind energy	Biomass	Other
Public	83%	67%	17%	0%	17%	-
Privat	83%	100%	50%	67%	50%	-

The 100% of municipalities have renewable energy production

Investment in energy generation in private sector is about double than in public sector.

Number of CRETE municipalities that MONITOR Energy facilities with MEASURES implemented	
YES	100%
NO	

All municipalities that implement energy measures for energy generation, monitor their production.

Section D. Energy Transition Governance

Qs. 11, 13 & 15. Who makes ETP. Their benchmarking and their reporting.

Who performs ET PLANS				Is ET PLAN checked or benchmark?				Is ET PLAN Reported?			
Outsourced (Private consulting Co)	Internal or higher level Team	Public Authority or Provincial council	Mixed solution: Private Co & Internal Team	To previous years	Respect local municipalities	Respect regional or national Municipalities.	No	No	To prov. Council	To Regional or National Government	other
50%		-	50%	83%	17%	-	-	17%	83%		

All mixed solutions involves both internal team and outsourced consulting company.

Regarding reporting for one municipality ETP is reported to provincial council and to the government, and for another one, besides this two, reports to RIS, Hellenic Ministry of Environment and Energy.



Qs. 12, 14 & 16. ETP accountability, sharing with others and finance of measures

Who is responsible for Implementation of ET MEASURES				Plan to SHARE MEASURES with other PA?		FINANCE scheme to implement ET MEASURES			
Public Energy manager or Public engineer	Public energy agency	No one	No answer	Yes	No	ESCO model + Funding by Regional Gov.	Funded by Regional Gov. + Own Budget	Only based on Own resources & budget	No funding scheme !
67%		16%	17%	67%	33%	17%	33%	33%	17%

Responsibility on the measures implementation is mainly over public engineers and public energy managers that work in each municipality. One municipality doesn't assign any accountability for energy transition measures even having a plan. This is particularly important to take under consideration to set up strategies to assure implementation of ET measures.

There are 4 of 6 municipalities (67%) willing to share their ETP with other local municipalities. This is a good sign to initiate common projects for ET deployment.

Regarding finance scheme, the ESCo model has a low impact in Crete region. Finance is balanced to own resources and government funding.



5.1.3 Catalan responses

Section B. Energy Transition Plans

Q.1. Number of municipalities with an ETP.

Is an Energy Transition PLAN in Catalan Municipalities?				
SEAP	SECAP	No Energy plan	N-A	How often is updated
50%	43%	7%	0	each 1, 2 or 5 years

5 municipalities have SEAP & SECAPS: 71,5% of the 50% of SEAPs

Practically the 100% of surveyed municipalities have an ETP, weather considering Climate action or not. Only one municipality has no ETP, which is anyway under county programs that reports on potentiality for Energy Transition actions.

Qs.2 & 4. Since when municipalities have an ETP and how often is reviewed.

No response obtained regarding the periodicity in ETP revision or updating:

ET Plans in Catalan Municipalities and its review/update		Number of Municipalities
Number of respondents of 14 surveys:		13 (93%)
Since when there is an ETP	Before 2016	9 (77%)
	After 2016	3 (21,5%)
How often is ETP updated/reviewed	Yearly	2 (14%)
	Each 2 years	5 (36%)
	Each 5 years	2 (14%)
	Other	4 (29%)
	No Plan	1 (7%)

Percentages are respect the total number of 14 surveyed municipalities.

Q.6. Sources or services used to develop energy plans and its measures.

Obtained responses from 100% of surveyed municipalities:

Who develops the ETP in Catalonia			
Public division or department	Private Co (ESCO &/or Engineering Co,..)	A combination of Public and Private Co. (mixed solution)	Other
21%	37%	21%	21%

Participation of private sector (stakeholders) is key (more than 60%) for the development of ETP. Other, might refer to local agencies (small towns) or internal teams (medium size cities).



Q.3. Sectors included in the ETP.

The following results exclude one municipality without an ETP:

SECTORS in E.T.Plan: Prioritization by Catalan municipalities.

Public Buildings	Mobility	Waste	Domestic & Residential	Services	Transport	Agriculture	Tourism	Industrial
100%	92%	77%		69%	54%	42%	31%	15%

100% of Catalan municipalities with an ETP prioritize the sector of their Public Buildings in their energy transition Plan. The sector of Mobility would be the second one prioritized and with less importance is the industry sector.

Q.5. Actions included in ETP.

The number of respondents corresponds to all PA with an ETP (13 of 14 surveyed). Percentages in the following table refer to the number of respondents (13).

Prioritization of ACTIONS by Catalan Municipalities with an ET Plan

EE in Buildings	Street Lighting	RES	Transport & Mobility	E E in sectors	Water	Adaptation to Climate	Resilience	Building Energy Infrastructures
100%		92%	85%	77%	54%	46%		38%

All municipalities prioritize actions in the energy efficiency of their buildings and in the estreet lighting.

As a remark, there are only one municipality not responding to this question, as has no ETP. This municipality implemented, about 5 years ago, a new efficient street lighting in the town.

It should be taken under consideration that some municipalities are implenting ET measures without havin an ET Plan. So even with no action plans, most municipalities implement energy efficiency actions.

Section C. Energy Data

Q.7. Energy consumption data collected.

Only one municipality has not answered this question. Results have been obtained considering in each case the real number of municipalities involved and not respect to all of them.



DATA COLLECTION in Public facilities or buildings					Data collection in aggregated consumptions			Other Data collection	
Periodicity	Electricity	Gas	Fuel-oil	Biomass	Residential	Commercial	Industrial	EV	DH
Monthly	57,1%	43%	50%	33%	0	0	0	93%	100%
Annually	7,1%	0%	12,5%	33%	33%	40%	25%		
Other (invoices/daily, weekly)	35,7%	36%	37,5%	33%	67%	60%	75%	7%	
No-answer	0%	21%	-						
Format									
Excel /csv	64,3%	57,1%	37,5%	67%	83%	80%	75%	83%	50%
Manually/Invoices	-	-	37,5%					17%	
Platform	21,4%	21,4%	25,0%	33%	17%	20%	25%		50%
No answer	14,3%	21,4%	-						
	Fuel oil: facilities in 8 municipalities				Residential data: in 6 municipalities			EV: 6 Municipalities	
	Biomass: facilities in 6 municipalities				Commercial: 5 municipalities			DH: 2 municipalities	
					Industrial: 4 municipalities				

The only energy used by all municipalities is electricity.

Natural Gas is used in the 77% of surveyed municipalities. Fuel oil has a high impact: 61.5 % of surveyed municipalities since is not a renewable source. In addition, biomass is used in 46% of surveyed municipalities.

Respect to aggregated consumptions, the number of responses are under 50% of surveyed municipalities. There is a relevant aspect regarding the format for collecting information. Is increasing the use of platforms to collect and gather data.

Q.8. Energy generation data collected

Regarding the follow-up of generated energy, the answers gives the following results:

DATA COLLECTION by Municipalities of GENERATED Energy				
Periodicity	Public RES	Private RES	Fuel-oil Generation	DH
Monthly	75%			
Annually	12,5%	100%	100%	100%
Other (Real-time)	12,5%			
Format				
Excel	75%	80%		
Access	0	20%		
Manually/Word	0%			
Direct reading	25%			
Invoices			100%	100%
8 of 14 Municipal (57%) have public energy generation facilities				
5 of 14 municipalities have private facilities for RES energy generation				
1 of 14 municipalities has an energy generation based on fossil fuel				
1 of 14 municipalities has a public DH (thermal energy generation)				



Data collection follow-up in facilities generating energy, is conducted by municipalities for following cases: 8 of 14 municipalities (57%) with public energy generation facilities, 5 of 14 municipalities (36%) having private facilities for RES generation, 1 of 14 municipalities has an energy generation system based on fossil fuel, and 1 of 14 municipalities has a public DH (thermal energy generation)

Qs 9 & 10. Renewable energy systems and monitoring of energy production from Energy transition measures implemented.

The majority of monitored energy production in RES facilities are private, but public has a significant relevance as well as shown in results obtained:

Number of Catalan Municipalities with renewable Energy Production Systems						
Ownership	Solar thermal	Photovoltaic	Geothermal	Wind energy	Biomass	Other
Public	64%	79%	29%	0%	57%	-
Privat	86%	93%	29%	14%	64%	-

Number of Catalan municipalities that MONITOR Energy facilities with MEASURES implemented	
YES	79%
NO	21%
Don't know	-

The 100% of surveyed municipalities have any kind of RES system to produce energy. The only system in all municipalities is the photovoltaic generation.

Percentages for each RES system are evaluated respect all municipalities. The 62% for public solar thermal means that the 62% of surveyed municipalities have public facilities in solar thermal.

Section D. Energy Transition Governance

Qs. 11, 13 & 15. Who makes ETP. Their benchmarking and their reporting.

Who performs/updates ET PLANS					Is ET PLAN checked or benchmark?					Is ET PLAN Reported?				
Outsourced (Private Co)	Local Internal Team	Higher level Team	Other: Mixed solution, Private Advisor, Mayor...	N-A or nobody	To previous years	Respect local municipalities	Respect regional or national Municipalities.	No	N-A	No	To prov. Council	To Regional or National Government	other	N-A
36%	0%	0%	43%	21%	71%	0%	0%	29%	0%	21%	43%	7%	29%	0%
	4 cases within mixed solution	1 case in mixed solution				30%	20%							

More than half of Catalan municipalities outsource their ET Plans to private companies, but about 30% of those municipalities choose for a mixt solution with a public internal team. ET Plans developed by public administration itself, it does not reach 40%.



Respect to the benchmarking, there is a high number of municipalities which compare their ET Plans to previous years, the majority.

30% of municipalities that benchmark their plans respect previous years (30% of the 71%) compare their ETP to other local municipalities too. In addition, another 20% (of the 71% on table), benchmark their ETP respect other national or regional municipalities.

Regarding reporting, plans are reported in 79% of the surveyed municipalities.

Qs. 12, 14 & 16. ETP accountability, sharing with others and finance of measures

Who is responsible for Implementation of ET MEASURES						Plan to SHARE MEASURES with other PA?			FINANCE scheme to implement ET MEASURES				
Public Energy manager	Public engineer	Public energy agency	Municipal technician	Other (Mayor)	N-A	Yes	No	N-A	ESCO model	Funded by Regional Gov.	Other	No funding scheme !	N-A
21%	21%	14%	14%	29%	0%	64%	36%	0%	14%	50%	0%	36%	0%

The responsibility to implement ETP is mainly on Mayor and its internal assigned team. Normally Municipal technicians or public energy managers depends on the Mayor or form part of the governance team.

The reported value regarding to public energy agency (2 cases of 14), for both cases is a combined solution so its using internal public resources with external support.

More than 60% of surveyed municipalities have expressed their interest in sharing their ETP deployment with other local municipalities.

In regarding financing for ET measures implementation, the majority of municipalities relies upon programs or subsidies from local government. Very few bet for the ESCO model (EPC).



5.1.4 Girona's Pilot responses

Section B. Energy Transition Plans

Q.1. Number of municipalities with an ETP.

All surveyed municipalities in Girona have both SEAP and SECAP except 2 municipalities that still have only a SEAP.

Is an Energy Transition PLAN in Girona Municipalities ?

SEAP	SEAP + SECAP	No Energy plan	N-A	How often is updated
29%	71%	0	0	each 2 or 3 years
100% of surveyed Girona municipalities have an ETP				

Qs. 2 & 4. Since when municipalities have an ETP and how often is reviewed.

In the following table, it should be checked what the 3 municipalities mean by 'other' on the periodicity for revising their energy Plans:

ET Plans review/update in Girona Municipalities		Number of Municipalities
Since when there is an ETP	Before 2016	4 (57%)
	After 2016	3 (43%)
How often is ETP updated/reviewed	Each 2 years	3 (43%)
	Each 3 years	1 (14%)
	Other	3 (43%)

Q.6. Sources or services used to develop energy plans and its measures.

Consulting companies and ESCOs normally form part for developing and revising ETPs, but always in combination with public technical services of municipality or provincial council.

Who develops the ETP in Girona municipalities

Public division or department	Private Co (ESCO &/or Engineering Co,..)	Public Administration & Private Co. (mixed solution)	Other
43%	0	57%	0

Note that some municipalities (3 of 7) only rely in Public technical services for developing their ETP.



Q.3. Sectors included in the ETP.

The following table regarding the sectors that each municipality includes in their ETP, shows the number of municipalities considering each sector for their ETP.

SECTORS in E.T.Plan: Prioritization by municipalities of Girona.

Public Buildings	Services	Transport	Mobility	Waste	Industrial	Domestic & Residential	Tourism
100%	86%				71%		29%

Percentages are calculated respect the number of respondent (7)

The main sector, as happens with other pilot regions, corresponds to public buildings.

The sectors with a prioritization of 86%, are included in the energy Plans of 6 respondents.

Industrial sector has a high impact compared to other pilot regions, including the general analysis of Catalonia. This is a good sign for this pilot region, as in fact an ETP should incorporate all sectors.

Q.5. Actions included in ETP.

In the analysis of action, the number of responses are 100% of surveyed municipalities.

Prioritization of ACTIONS by Girona' Municipalities with an ET Plan

EE in Buildings	EE in different sectors	RES	Transport & Mobility	Street lighting	Water	Build Energy Infrastructures	Adaptation to Climate Change	Resilience
100%	86%		71%			43%	29%	

The pattern of prioritization of actions by municipalities of Girona is similar to that one of Catalonia as a general one. Any way for example Street lighting has a lower impact in Girona, probably because many actions on this sector had already been undertaken in the past (from year 2008 to 2014)

Actions on energy efficiency in different sectors has also a more impact in Girona that at general country level.

Adaptation to Climate Change and Resilience are the two with less impact probably due to that those ones are very new concepts under SECAP, and the main pattern in this Pilot region is SEAP

Section C. Energy Data

Q.7. Energy consumption data collected.

All surveyed municipalities collects data from Electricity and Natural gas.

Fuel oil and biomass has a much lower impact: 3 and 2 responses of 7 respectively.

Aggregated data has a low impact still: only 2 cases in 7 municipalities.

The following table groups this information in numbers:



DATA COLLECTION in Public facilities or buildings					Data collection in aggregated consumptions			Other Data collection	
Periodicity	Electricity	Gas	Fuel-oil	Biomass	Residential	Commercial	Industrial	EV	DH
Monthly	85,7%	71,4%	67%	50%	-	-	-	-	-
Annually	14,3%	14,3%	-	-	50%	50%	-	-	-
Other (invoices, daily, 6-month, weekly, bi-monthly, timely, 4-yrs ...)	-	14,3%	33,3%	50%	50%	50%	100%	67%	-
Continuously	-	-	-	-	-	-	-	33%	100%
Format									
Excel /csv	71,4%	71%	33,3%	-	-	-	-	-	-
Manually/Invoices	-	-	66,7%	50%	-	-	-	-	-
Platform (Gemweb, Web-csv...)	28,6%	29%	-	50%	-	-	-	67%	-
Other (ISE-SECAP, excel-SECAP, remote management or control, ...)	-	-	-	-	100%	100%	100%	33%	100%
Electricity & Gas: in all 7 municipalities		Fuel oil: facilities in 3 municipalities			Residential data: in 2 municipalities			EV: 3 Municipalities	
		Biomass: facilities in 2 municipalities			Commercial: 2 municipalities			DH: 1 municipalities	
					Industrial: 1 municipality				

Q.8. Energy generation data collected

Regarding the follow-up of energy data from facilities that generates energy in the pilot province of Girona, there are only in 3 different municipalities of a total of 7 surveyed:

DATA COLLECTION by Municipalities of GENERATED Energy				
Periodicity	Public RES	Private RES	Fuel-oil Generation	Other
Monthly		-	-	-
Annually	33,3%	-	-	-
Daily	33,3%	-	-	-
Continuously	33,3%	-	-	-
Format				
Excel	33%	-	-	-
Web-csv	33%	-	-	-
Manually/Word	-	-	-	-
Direct reading	-	-	-	-
Remote management (WIT). (solar-web)	33%	-	-	-
Only 3 municipalities collect data of energy generation				

Each municipality represents a very different case to each other. Data is collected in different periods for each case. Annual data is collected in excel forma, daily data under a web-csv format and continuously data is gathered under a web in a remote management system (WIT).



Qs 9 & 10. Renewable energy systems and monitoring of energy production from Energy transition measures implemented.

The following table shows the number of energy production facilities in RES.

It can be seen the importance of private facilities in from the public ones.

Number of Girona Municipalities with renewable Energy Production Systems						
Ownership	Solar thermal	Photovoltaic	Geothermal	Wind energy	Biomass	Other
Public	43%	71%	0%	0%	43%	-
Privat	100%	100%	71%	0%	86%	-

It's important to remark that Wind energy generation has no impact in public neither in private. This could be due to the fact that this region has no regular winds, or that investments for this source is only available for big companies. This should be checked. If this is the case, research on small wind generators should be done in order to allow small investors and municipalities to use this resource.

Number of Girona municipalities that MONITOR Energy facilities with MEASURES implemented	
YES	86%
NO	14%
Don't know	-

The majority of municipalities in Girona monitor the measures that are implemented. For this table the 14% corresponds to a 1 municipality of 7 surveyed.

Section D. Energy Transition Governance

Qs. 11, 13 & 15. Who makes ETP. Their benchmarking and their reporting.

Who performs/updates ET PLANS					Is ET PLAN checked or benchmark?					Is ET PLAN Reported?			
Outsourced (Private consulting Co)	Internal or higher level Team	Public Authority (ET Office,...) or Provincial	Mixed solution: Consulting Co + Council	N-A	To previous years	Respect local municipalities	Respect regional or national Municipalities.	No	N-A	No	To prov. Council	To Regional or National Government	other
29%		57%	14%	-	71%			29%	-	14%	86%		-
					→ 40%	20%							

Regarding the performance of the ETPs the pattern is not very similar to the general one for the country of Catalonia, because in Girona have responded the 100% of surveyed municipalities.



Provincial council performs ETP in almost 60% of municipalities. This includes public office like the Energy Transition office, specialized in energy transition. Mixed solution combining the public authority and a private company are low.

All benchmarking done is respect to previous years, but some of this do benchmark respect other local municipalities (40%), and other 20% of this 71% makes benchmark respect regional or national municipalities.

Regarding reporting ETP is mainly reported to provincial council. Only one of 7 surveyed municipalities don't report the ETP.

Qs. 12, 14 & 16. ETP accountability, sharing with others and finance of measures

Who is responsible for Implementation of ET MEASURES				Plan to SHARE MEASURES with other PA?		FINANCE scheme to implement ET MEASURES		
Public Energy manager or public engineer	Public energy agency	Municipal Team	N-A	Yes	No	ESCO model	Funded by Regional Govern.	No funding scheme !
57%	-	29%	14%	86%	14%	43%	29%	28%

The responsibility for implementing ET measures is always under public administration and mainly on municipal technicians. In two cases the responsibility is under the government local team.

The number of municipalities expressing their interest in sharing their ETP with other municipalities is the highest value of all regions surveyed. Only 1 municipality wouldn't share their ETP.

Respect financing, ESCO model is identified slightly over the 40%: 3 municipalities. Around 30% seeks funding in local or regional government. It has a quite significance that some municipalities have no funding scheme, which makes very difficult to understand a real ETM implementation.



5.1.5 Stakeholders responses

The stakeholders' surveys have been conducted in Catalonia covering the whole country and not specifically in any pilot region.

The total number of surveys conducted is **three**, one stakeholder in the city of Barcelona and the other two in the province of Girona.

The questionnaire for stakeholders is slightly different to the ones for municipalities.

Stakeholders Profile

The following table defines the main profile characteristics of the stakeholders surveyed

Stakeholder Name	Type of company	Location	Fields of expertise	Number of technicians	Experience (in years)
Energy Agency of Barcelona (AEB)	PUBLIC	Barcelona	1. Energy efficiency 2. RES for local public authorities 3. District Heating	16	18
Wise up (Building Analytics)	PRIVATE	Girona but HQ in Palma	1. Monitoring 2. Control with IoT Own IoT Platform	6	20
Proisotec	PRIVATE	Cornellà del Terri (Girona)	1. Energy efficiency 2. RES	5	10

Only one of those stakeholders (Wise up) do not collaborate with a utility (DSO). The other two, collaborate with big and small local DSOs.

Section B. Energy Transition Plans

Q.1 & 2. Support given to Municipalities in ETP and since when..

Only AEB has expertise in Energy Transition Plans. It has elaborated their own SEAP and SECAP, and has given advice and support on this kind of energy transition plans to some public authorities of Barcelona as AMB (Metropolitan Area of Barcelona) and DIBA (Barcelona provincial Council) to whom has been advising since before of 2016.

The two private stakeholders have not given support in SEAPs/SECAPs. They are focussed in strategic plans and audits.

Q.3. Sectors under which an advice/studies performed to Public entities.

The following table comprises the sectors for which each stakeholder conducted studies and advice.

Name of Stakeholder	Conducted studies and advice to Public Authorities in SECTORS:							
	Public Buildings	Services	Industrial	Residential or domestic sectors	Transport & Mobility	Tourism	Agriculture &/or Fishery	Waste
AEB (Energy Agency of Barcelona)	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Wise up building analytics		Yes						
Proisotec	Yes	Yes	Yes	Yes		Yes	yes	No



Stakeholders are experienced in conducting studies and advising in practically all sectors, except for those ones specializing in data management services (case of Wise up).

Q.4. Are ETP periodically reviewed.

The responses have been the following:

AEB makes a follow-up of their own SECAP every year and an updating each 5 years.(public sector)

Wise-up updates energy / strategic plan for private sector every year.

Proisotec, updating energy plans are very seldom. In the majority of cases there is no an updating.

Q.5. Actions included in ETP.

The following table shows main actions for which the surveyed stakeholders have expertise.

Name of Stakeholder	ACTIONS included in Energy /Strategic Plans of Municipalities advised									
	Ee in Public Buildings	Street Lighting	Ee in Sectors	Infrastructures	Transport & Mobility	RES	Resilience	Adapt to Climate Change	Water	other
AEB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Wise up	Yes					Yes			Yes	
Proisotec	Yes	Yes	Yes		Yes	Yes		Yes		Commissioning & maintenance

Energy efficiency and renewable are both actions known by all stakeholders and the more important, under focus of Energy Transition.

Section C. Energy Data

Q.6. Given services on data collection for Energy consumption and under which formats.

All surveyed stakeholders give support on data collection

Name of Stakeholder	Support of stakeholders on Energy consumption data collection							
	Electricity		Natural Gas		Fuel oil		Biomass	
	Y/N	Format	Y/N	Format	Y/N	Format	Y/N	Format
AEB	Yes	Excel	Yes	Excel	Yes	Excel	Yes	Excel
Wise up	Yes	Platform	no		No		No	
Proisotec	Yes	Excel	Yes	Excel	yes	Excel	No	
	Residential Buildings		Commercial/Industrial buildings		Charging points for EV		District Heating	
	Y/N	Format	Y/N	Format	Y/N	Format	Y/N	Format
AEB	Yes	Excel	Yes	Excel	Yes	Excel	Yes	Excel
Wise up	No		Yes	Excel	No		Yes	
Proisotec	yes	Excel	Yes	Excel	No		yes	Excel



The stakeholder WiseUp that is the only specialized in data analysis, only works with electrical data and the only difference from the others is on using a platform instead of excel.

Q.7. Given services to make a follow-up in energy generation.

All surveyed stakeholders gives services to different energy generation facilities

Given services to follow-up (monitoring) Energy GENERATION data										
Name of Stakeholder	Public RES facilities		Private RES installations		Fossil Fuel Generation		CHP		Other	
	Y/N	Format	Y/N	Format	Y/N	Format	Y/N	Format	Y/N	Format
AEB	Yes		Yes		Yes		Yes		Biogas	
Wise up	No		Yes		Yes		Yes		No	
Proisotec	No		No		No		No		No	

The format was not collected in the survey as it was omitted in the questionnaire.

Q.8. Renewable Energy systems under which given advising

All surveyed stakeholders are active in giving support in main renewable energy systems.

Given Support/Advice for Renewable ENERGY Systems												
Name of Stakeholder	Solar Thermal		Photovoltaic		Geothermal		Wind energy		Biomass		Other	
	public	private	public	private	public	private	public	private	public	private	public	private
AEB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	DH* & aerothermia	
Wise up	No	Yes	No	Yes	No	Yes	No	No	No	No		
Proisotec	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		

* DH: it doesn't need to be RES !

Note that WiseUp Company focuses mainly in private sector; however, this company is giving support in data collection and processing to some public buildings that are not under municipalities' scope.

Section D. Energy Transition Governance

Q. 9 & 12. How stakeholders perform or update ETP for municipalities? Are reporting performed by stakeholders?

The following table shows that all stakeholders surveyed participate in advising ET plans:

How Stakeholders perform or update ET PLANS & its Reporting				
Name of Stakeholder	perform all (Outsourced)	Help internal Team	Other	Do you do Reports of ETP?
AEB		Yes	Own resources of Bcn's SEAP & free advice to municipalities	Yes (own one)
Wise up	Yes	No	No	No
Proisotec	Yes	No	No	No



Note that the characteristics of the public versus private stakeholders are just opposed. Internal teams in municipalities normally are advised by public agencies. The same happens for the reporting. Private stakeholders normally focus on private companies, but they are outsourced as well by some municipalities.

Q. 10 & 11. Are stakeholders contracted to implement ET measures and do benchmarks of energy plans?.

In the following table, we can see that private stakeholders give support to municipalities.

Name of Stakeholder	Have conducted Benchmarks of ET Plan ?				Have implemented ETM?	
	No	Yes. Respect previous years	Yes. Respect othe PA	other	Yes	No
AEB		✓	✓		✓	
Wise up	✓					✓
Proisotec		✓	✓		✓	

Public stakeholders can only give support to public authorities; meanwhile the private ones, give support to private companies or public authorities.



6 Identification of the ePLANET use cases

The use cases for each pilot region were identified from the analysis of the surveys and by the means of a structured use case table which was filled by each regional agency participating in the project (DdGi, EAZK, RDFC). In this table, a list of preliminary use cases was included, and the regional agencies were asked to rate, for each use case, the level of interest and the level of data availability. Possibility was also given to suggest new use cases not included in the initial table. Table 2 displays the initial use cases which were submitted for evaluation through the table.

Table 2 - ePLANET use cases table

Use case	Level of interest (1-5)	Level of data availability (1-5)
Digitalization of the SEAPs implementation and monitoring		
GIS applications to visualize the available data on maps		
Analysis of the consumption of the building stock and identification of target buildings/areas for improvement		
Identification of candidate areas for PV projects		
Energy communities (financing, system design, coefficients allocation, targeting areas)		
Interoperability with other existing software		
Impact evaluation for potential energy transition measures by comparing municipalities		

6.1 Pilot site 1: Zlín region



6.1.1 Analysis of the use cases template

Within the first 4 months of the project, EAZK rated the level of interest and of data availability for a list of potential use cases which could be developed in the Zlín region in the framework of the ePLANET project. As it can be seen in Table 3, three use-cases stood out, having both high level of interest and data availability.

Table 3 - EAZK use cases table

Use case	Level of interest (1-5)	Level of data availability (1-5)	Comments
Digitalization of the SEAPs implementation and monitoring	2	1	There are not SEAPs complying with the format of SEAPs envisaged by CoM
GIS applications to visualize the available data on maps	3	1	
Analysis of the consumption of the building stock and identification of target buildings/areas for improvement	5	4	Public buildings have 100% data availability, some municipal buildings data are available or can be accessed upon request.
Identification of candidate areas for PV projects	5	4	Level of data availability depends on concrete data required for this use case
Energy communities (financing, system design, coefficients allocation, targeting areas)	5	4	The interest is high as "energy communities". EAZK has a list of licensed electricity and heat producers (1909 companies). 97% of electricity is imported to the Zlín Region from other regions. Would it be possible to show them into the map where each specific producer is indicated with a basic description? Would it be possible to aggregate such data for particular municipality on request?
Interoperability with other existing software	2	2	
Impact evaluation for potential energy transition measures by comparing municipalities	4	2	

6.1.2 Summary of the surveys in relation to the use cases table

In this subsection, the answers to the surveys presented in Chapter 5, are analysed in light of the use cases which have been proposed for the ePLANET platform. A first important result is that, in the Zlín region, 71% of the survey respondents indicated that there are no existing energy transition plans in their municipality. This makes the SEAP digitalization use case almost irrelevant.

At the same time, 100% of the surveyed municipalities collect electricity and gas data, and 71% of them store them in Excel files. This confirms the importance of the building energy consumption analysis use case.

95% of the municipalities who participated in the survey have some kind of renewable energy production system, with private PV and solar thermal systems being present in 76% and 62% of the municipalities respectively. On the other hand, none of the surveyed municipalities currently features publicly owned PV installations. These answers highlight the relevance of use cases related with PV systems and the development of energy communities.

6.1.3 Description of the identified use cases

From the analysis of Table 3 and of the results of the surveys which were carried out during the first months of the project, it was decided to pursue the following 3 use cases in the Zlín region:

1. Analysis of the energy performance of the public building stock



2. Rooftop PV potential analysis for municipal buildings using LIDAR data
3. Showcase of the city of Hostětín as a sustainable energy community

A description of each use case follows.

Analysis of the energy performance of the public building stock

EAZK is currently managing monthly electricity, natural gas, and water consumption data for 100 buildings belonging to the Zlín region, and 300 more buildings located in different municipalities of the region. This data is currently collected on a monthly basis and stored in a local database or in Excel files. EAZK identified that it might be beneficial to analyse this data, calculating informative KPIs and providing data visualisations which can help assess the energy performance of the municipal building stock. The results of this analysis will then be used to compare energy performance and identify which are the buildings that should be targeted when carrying out energy efficiency renovations.

Rooftop PV potential analysis for municipal buildings using LIDAR data

This use case is aimed at using LIDAR data to develop a detailed assessment of solar radiation and energy production potential of selected building rooftops, taking into account the shades of neighbouring buildings, trees, or other structures, as well as forecasted cloud cover and other relevant weather data. This analysis will be carried out for a list of selected municipal buildings belonging to EAZK or to local municipalities. The final goal of this use case is to identify, among the buildings belonging to EAZK, which rooftops have the highest energy production potential for the installation of PV or solar thermal systems.

Showcase of the city of Hostětín as an energy community

The Hostětín village, in the Zlín region, is known for its environmental activities, as its main objectives are sustainable development, usage of local sources, renewables, and environment-friendly technologies. The municipality addresses a list of relevant challenges, such as high-quality environment, sustainability, and low energy prices. The third use case for the Czech pilot of ePLANET will be to gather data from the Hostětín village, in order to provide visualisations which can help promote local sustainable energy communities. Electricity consumption and district heating data will be collected at building block level, as well as LIDAR data and information about installed PV power systems. Potential outcomes can include interactive geospatial visualisations of the yearly energy consumption of each building in the village, studies of the rooftop energy generation potential, and an analysis of the impact of the energy efficiency measures implemented until now. Thanks to these visualisations it will be possible to showcase the energy transition strategies implemented in Hostětín, and increase the interest of other municipalities of the Zlín region in sustainable development and the creation of local energy communities.

6.2 Pilot site 2: Crete region

6.2.1 Analysis of the use cases template

Within the first 4 months of the project, RDFC rated the level of interest and of data availability for a list of potential use cases which could be developed in the island of Crete in the framework of the ePLANET project. As shown in Table 4, four use cases were assigned the highest level of interest, although only one of these four. On the other hand, most use cases were characterised by low data availability, with the exception of the use case dedicated to the S(C)EAP digitalization.



Table 4 - RDFC use-cases table

Use case	Level of interest (1-5)	Level of data availability (1-5)	Comments
Digitalization of the SEAPs implementation and monitoring	5	5	The digital Forms (pdf) of SEAPS (16) are already present into the COM Website and eventually in the Municipalities own Sites. The monitoring reports of 4 Municipalities are also in the COM Website.
GIS applications to visualize the available data on maps	5	1	There are two GIS applications (Heraklion Municipality , IMPULSE project / and Region) but, so far there are not visual Energy data.
Analysis of the consumption of the building stock and identification of target buildings/areas for improvement	5	3	Municipal buildings' data are already mentioned inside the existing Municipal SEAPs. Some of it is based on actual consumption data or issued EPCs and some are based on approximate benchmark data. There is also the IMPULSE (Interreg MED) project related building data base with buildings' energy consumption data for the Municipality of Heraklion, and identification of target buildings/areas for improvement. In the framework of the SHERPA (Interreg MED) project, CRES and Region of Crete collected energy consumption data (where available) for the regional buildings of the Region of Crete and undertook energy analysis and identification of target buildings/areas for improvement. Some energy consumption data was also collected for some Municipalities of Crete. All information was integrated into an overall "Energy Renovation of Buildings Roadmap" produced by the Region of Crete with the support of an external consultant.
Identification of candidate areas for PV projects	3	1	There is no exact identification of candidate areas for municipal PV projects (There are specific requirements for the suitable areas defined by a "Matrix" criteria of the relevant Green law. Within IMPULSE and SHERPA projects, some Municipal buildings (of the Municipality of Heraklion) and some Regional buildings were identified where PVs were proposed as a recommended solution (on top/roof of building envelope and/or building systems energy efficiency measures).
Energy communities (financing, system design, coefficients allocation, targeting areas)	5	2	There is one, so far, official Energy community. There are also various activities for forming also other Energy communities, on the island (e.g. Online event organised by Regional Organisations and CRES in the framework of project ENCREMENDO in May 2021, to reinforce capacities of public authorities for forming energy communities in the Region of Crete).
Interoperability with other existing software	3	2	Possibly with the software of IMPULSE MED and SHERPA MED projects and eventually with other projects.
Impact evaluation for potential energy transition measures by comparing municipalities	2	1	Since there are relevant clear Municipal targets, but even in the case that if there are not, the evaluation of the Impact on Energy transition between Municipalities will be positive.

6.2.2 Summary of the surveys in relation to the use cases table

In Crete, all of the surveyed municipalities have either active SEAPs or SECAPs, with more than 80% of them being older than 2016. 83% of the respondents mention that private companies are involved at some stage of the SE(C)AP drafting process. The public buildings sector is the only one which is included in all of the active SE(C)APs, while the Tourism sector has been addressed in their plan by only one municipality.

Electricity data is collected in all the surveyed municipalities, but only 17% of them collect them on a monthly basis. A wide majority of the remaining is collected on annual basis. This shows that a considerable effort is needed in order to enable the analysis of the energy performance of the existing building stock.

All of the municipalities have some kind of renewable energy system. The most popular are solar thermal and PV, with both private and public installations present in the majority of the surveyed municipalities.

6.2.3 Description of the identified use cases

From the analysis of Table 4, and of the results of the surveys which were carried out during the first months of the project, a single use case was identified for the island of Crete:

- 1- Digitalisation of the SE(C)AP drafting and monitoring process



- 2- Analysis of the energy performance of the municipal building stock
- 3- GIS visualisations of building energy consumption and renewable energy generation aggregated at municipality level

A description of the use cases follows.

Digitalisation of the SE(C)AP drafting and monitoring process

In the island of Crete there are 16 active SEAPs, that follow the Covenant of Mayors methodology. RDFC has expressed interest in the possibility of digitalizing the process of creation of new plans, as well as the one of periodic monitoring of existing plans. For the creation of new plans, automatic connection to the data sources used to calculate the Baseline Emission Inventories (BEI), might be provided, while the monitoring will involve calculation of updated emission inventories and evaluation of the impact of the implemented energy transition measures on the total energy consumption and GHG emissions of the different municipalities. The creation of a database of implemented energy transition measures and their associated impact is also considered to be beneficial since it can help benchmark mitigation actions and provide guidance for the creation of new plans.

Analysis of the energy performance of the municipal building stock

RDFC has shown interest in the analysis of monthly electricity consumption data for public buildings belonging to different municipalities in the region. The mentioned consumption data would range between 2015 and 2020, and additional building data might be collected from the Greek cadastre, that would allow for the calculation of advanced metrics and KPIs. The analysis of the energy consumption of municipal buildings was already partially tackled within other projects such as Interreg MED IMPULSE and SHERPA and this use case will continue along the same line. Detailed analysis of the energy performance of the municipal building stock can also help define energy transition plans and strategies, such as SECAPs, which links to the second use case identified for the region of Crete.

GIS visualisations of building energy consumption and renewable energy generation aggregated at municipality level

In the region of Crete, there is already an active GIS platform, but no data related to energy transition is currently displayed in it. It's been identified that it could be beneficial to gather energy-related data at municipal level, such as energy consumption for different sectors, and renewable energy systems installed power, and provide mapped visualisations of this data on the local GIS platform. The display of information about active SEAPs and the relative inventory of emissions could also be considered.

6.3 Pilot site 3: Girona province

6.3.1 Analysis of the use cases template

Within the first 4 months of the project, DdGi rated the level of interest and of data availability for a list of potential use cases which could be developed in the Girona province in the framework of the ePLANET project. DdGi marked the highest interest level for several use cases in Table 5, but also pointed out that different use cases of the table (namely GIS applications, analysis of building energy



consumption, identification of areas for PV projects, and energy communities) could be unified in a single larger use case.

Table 5 - DdGi use cases table

Use case	Level of interest (1-5)	Level of data availability (1-5)	Comments
Digitalization of the SEAPs implementation and monitoring	5	3	In 2022 new versions of most of the SECAPs of the Girona province will be drafted
GIS applications to visualize the available data on maps	3	3	There is already a GIS application in the Girona province (SITMUN)
Analysis of the consumption of the building stock and identification of target buildings/areas for improvement	5	3	It could be interesting to perform this analysis and provide GIS energy consumption visualisations
Identification of candidate areas for PV projects	5	4	There are already some studies of PV generation potential analysis
Energy communities (financing, system design, coefficients allocation, targeting areas)	5	2	DdGi is promoting several local energy communities project, especially aimed fostering collective self consumption of electricity generated with PV installations
Interoperability with other existing software	4	3	
Impact evaluation for potential energy transition measures by comparing municipalities	4	3	

6.3.2 Summary of the surveys in relation to the use cases table

In Girona, all of the surveyed municipalities have active energy transition plans. 3 out of 7 surveyed municipalities stated that they rely only on public departments to develop their plans, while the remaining municipalities 4 develop their SE(C)APs by consulting both private companies and public institutions. The plans of all the 7 surveyed municipalities include public buildings and EE in buildings is an action of highest priority.

All the municipalities collect electricity and natural gas data. More than 70% store this data in Excel files, while the rest use some kind of energy accounting service provided by external companies.

In each of the 7 surveyed municipalities there are private solar thermal and PV systems, while in 70% of them public PV installations are present. The high number of publicly-backed PV systems installation highlights the relevance of the energy communities use case.

6.3.3 Description of the identified use cases

From the analysis of Table 5, and of the results of the surveys which were carried out during the first months of the project, two use cases were identified for the Girona pilot:

- 1- Digitalisation of the SE(C)AP drafting and monitoring process
- 2- Creation of a GIS visualisation tool to support the planning of local energy communities

A description of each use case follows.

Digitalisation of the SE(C)AP drafting and monitoring process

The province of Girona has been very active in recent years with respect to the drafting of SE(C)APs following the Covenant of Mayors methodology. In 2022, DdGi will proceed with drafting new versions



of 204 municipality SECAPs, bundled in 20 supra-municipal joint SECAPs. This use-case has the goal of facilitating the process of monitoring the progress and the impact of implemented SECAPs. More specifically, DdGi expressed interest in a system which can allow automatic calculations of Baseline Emissions Inventories (BEI) and Monitoring Emissions Inventories (MEI). This would facilitate the monitoring of SECAP progress, as it would eliminate the need to periodically request the relevant data required to calculate the inventories, and estimate the impact of implemented mitigation actions. The creation of a database of commonly employed energy transition measures, and their associated impact, has also been discussed as a potential outcome of this use case.

Creation of a GIS visualisation tool to support the planning of local energy communities

This use case encompasses several use cases which are individually included in the table (GIS applications, analysis of building energy consumption, identification of areas for PV projects, and energy communities). The aim of this use case is to leverage all the relevant data available in the province of Girona and include it in a GIS tool which can be used to perform a preliminary screening to identify optimal areas and participants to create local energy communities and PV collective self-consumption projects. DdGi is actively promoting several photovoltaic collective self-consumption projects in different municipalities of the Girona province. Consultations with key stakeholders have suggested that a GIS tool to identify areas with high energy consumption and generation potential could be very helpful in the planning stage that precedes the design of the installations.



7 ePLANET requirements

7.1 Challenges to overcome in relation to the ET (to be completed using data collected in the surveys)

7.1.1 Zlín region

There are only 3 or 4 authorities with transition plans. Not compliant with CoM. No signatories of CoM. The energy agency is doing a lot of activities linked to that. They wouldn't expect municipalities joining CoM in the next years. They do not join officially CoM, although they have some activities going on.

Majority of municipalities are connected to the gas pipeline. They collected letters of support from the municipalities.

Challenges for energy transition

There are still thousands of local coal-fired boilers

Removal of coal from large central heating plants in Otrokovice, Zlín and Uherské Hradiště

Influence of roof color and type on emitted heat - study using drones with thermal imager

Get PV plants on the roofs of buildings and solve their operation

There's several local coal-fired boilers. There's quite a few central heating systems, using coal as fuel, which are hard to phase out.

There's no national requirement to join CoM or create SECAPs. EAZK is dealing with energy transition topics and cooperating on a regular basis with one third of the municipalities. The municipalities are used to ask for help to the energy agency but there is not so many people working on energy transition from the municipalities side.

7.1.2 Crete region

Despite the fact that there's a legislative obligation to draw a plan, there's no such obligation for having a Transition plan by law. Local municipalities and PAs are very busy and energy transition planning is not their priority.

7.1.3 Girona region

There are still very few municipalities starting with Energy Transition initiatives. The main challenge is to create commitment and buy-in to the majority of municipalities, in order to foster them in establishing new ET executive projects and its implementation.

The infrastructure to facilitate an ET model is another big challenge in order to keep growing the number of ET projects and its successful deployment. This infrastructure will be based on creation of necessary figures who will facilitate the right advice on ET to municipalities and other local initiatives in ET.

Another challenge is to reverse the current lack of financing schemes, which is hindering the establishment of new ET projects and assuring their implementation. This represents one of the main barriers for the deployment of ET initiatives. Around 60% of municipalities don't have a funding



scheme or rely on regional funds. The challenge is to establish a methodology and process that will allow getting funding sources independently if there are or not regional funds available.

The ESCO model is a good funding scheme but most of the so-called ESCOs don't apply it in the correct way and the EPC contracting requires expertise which municipalities don't have.

Other alternative funding schemes could include crowdfunding, which represents a great challenge, as it should involve the citizenship, which is one central topic in the Energy transition actions.

7.2 Level of digitalization

7.2.1 Zlín region

One of the main digital tools currently used in the Zlín region is the “Unified digitally technical map - JDTM), which can be found at the following link: <https://jdtmzk.technickamapa.cz/portal/Default.aspx>. This application unifies data from different geographic systems in one application, facilitating the performance of public administration and making spatial data available to authorities and the public. The final goal is to create an efficient and user-friendly public administration and supporting eGovernment in the Czech Republic. Different kind of data can be visualized in the JDTM, among them a cadaster map, an ortophoto map, and technical maps of municipalities including information about water and gas pipelines, the central heating system network, as well as public lighting infrastructure. EAZK controls and guarantees the technical functioning of the map.

EAZK, in cooperation with the Zlín Region, also obtained LIDAR data from five cities, specifically - Kroměříž, Holešov, Val. Klobouky, Vsetín and Uherské Hradiště. These LIDAR shapefiles describe the shape of the building, the number of floors, height, type of heating, number of apartments. It might be possible for EAZK to obtain LIDAR data for additional municipalities of the Zlín region.

Additionally, EAZK manages energy consumption data for 100 buildings belonging to the Zlín region. This data is stored in a Microsoft Access database. This database, which is updated each month, includes daily electricity and gas metering data, as well as the names of the buildings and the contact information of the responsible persons. EAZK is also managing the energy consumption of around 300 buildings belonging to the Zlín Region, located in different municipalities. Monthly electricity and gas consumption readings for these buildings are collected and stored in Excel files. INSPIRE harmonized cadaster data for buildings in the Zlín region is also available at: https://data.europa.eu/data/datasets/https-atom-cuzk-cz-api-responses-cz-00025712-cuzk_cpx_640417-jsonld?locale=en.

For the village of Hostětín, additional the following additional data has been collected:

- Aggregated electricity consumption for the whole municipality for the last 5 years,
- Yearly electricity consumption breakdown for each building in the village from 2020,
- Yearly aggregated heat consumption from biomass district heating,
- Installed power of PV systems on municipal buildings.

7.2.2 Crete region

In the island of Crete, there are 16 active SEAPs, although the information from these plans is stored in Excel files and PDF documents, and hasn't been otherwise digitalized. Electricity consumption and



renewable generation data is also available, at municipality level, in Excel files. Cadaster information for several buildings in Greece is included in an online platform: <https://www.ktimatologio.gr/el> . There is an active GIS platform for the island of Crete, which can be accessed at: <https://gis.crete.gov.gr> and data from the following categories can be retrieved:

- Infrastructure
- Agricultural economy
- Development
- Transportation
- Health
- Civil Protection
- Environment
- Spatial planning - Urban planning

7.2.3 Girona region

In Girona, there are currently 204 active SEAPs, bundled into 20 joined SECAPs, in accordance with the 20 landscape units existing in the province. Information regarding these plans is currently contained in Excel and PDF files. The Girona province also has an active GIS platform (SITMUN-<https://sitmun.ddgi.cat>) where data regarding the Baseline Emissions Inventory created for each SEAP can be visualised. Rooftop potential for PV systems can also be visualised on the SITMUN app, together with other environment data, such geographical coordinates of EV charging points, information about local energy communities, and areas with highest vulnerability to climate change.

Approximately half of the 221 municipalities in the Girona province are currently counting on an external energy accounting service which provides them with a digital platform which can be used to track the electricity and gas consumption of the local public buildings, as well as to register and keep a record of implemented energy efficiency measures in those buildings. Hourly electricity consumption data aggregated at postal code level, and unbundled by tariff type, is also publicly available. The data can be manually downloaded, or accessed through a dedicated API, on the following platform (<https://datadis.es>).

Cadaster data harmonized with the INSPIRE European directive is available for most of the buildings in the Girona province on a digital platform (<http://www.sedecatastro.gob.es>) and through a dedicated API.

A request has also been made, by DdGi on behalf of several municipalities in the province, for local Distribution System Operators to disclose gas and electricity consumption data, aggregated at building block level, with monthly granularity in the case of electricity, and yearly granularity in the case of gas. This data will be shared in the form of Excel files containing street addresses for all the buildings in the municipality in which more than 4 metering points are present (for privacy reasons), and the corresponding aggregated building gas or electricity consumption.

7.3 Technical requirements that the ePLANET tools should comply

7.3.1 Zlín region

In this paragraph, the ePLANET technical requirements for each use case of the Zlín region pilot are presented. The use cases identified for Zlín are:



1. Analysis of the energy performance of the public building stock
2. Rooftop PV potential analysis for municipal buildings using LIDAR data
3. Showcase of the city of Hostětín as a sustainable energy community

Use case 1: Analysis of the energy performance of the public building stock

EAZK is currently managing monthly electricity, natural gas, and water consumption data for 100 buildings belonging to the Zlín region, and 300 more buildings from different municipalities. This data is collected monthly and stored in a Microsoft Access database. Additional information about the mentioned buildings, such as total floor area, year of construction, or the geographical coordinates of the building, might be obtained from the Czech cadastre. All this data will be collected, analysed, and included in a digital platform, with the goal of providing EAZK and the municipalities of the Zlín region the possibility to:

- Visualise the energy performance of their buildings
- Visualise KPIs such as energy usage intensity (kWh consumed per m² of building floor area)
- Benchmark and compare the energy performance of a certain building with the one of other similar buildings (similarity criteria could be total floor area, building primary use building year of construction, etc.)
- Keep track of the energy efficiency measures implemented in the buildings, and evaluate their impact on the consumption
- Calculate baseline energy consumption that take into consideration outdoor temperature values to compare the current energy performance of a building with its past energy consumption values.

Use case 2: Rooftop PV potential analysis for municipal buildings using LIDAR data

By using LIDAR data available for the Zlín region, a detailed assessment of solar radiation and energy production potential of selected building rooftops can be performed. This analysis takes into account the shades of neighboring buildings, trees, or other structures, as well as forecasted cloud cover and other relevant weather data. This functionality will not be available as a solar generation potential GIS map of the selected municipalities, but rather as a detailed study of specific rooftops identified by EAZK.

Use case 3: Showcase of the city of Hostětín as a sustainable energy community

For this use case, the ePLANET platform will process the available data for the village and provide an interactive geospatial visualisation of the yearly energy consumption of each building in the village, as well as analyses of PV generation potential using LIDAR data. There will be a possibility to make this map (or a part of it) available to the general public, to perform dissemination regarding the potential impact of sustainable energy communities in reaching decarbonization goals.

7.3.2 Crete region

In this paragraph, the ePLANET technical requirements for the use case of the Crete pilot are presented. The use case identified for Crete is:

1. Digitalisation of the SE(C)AP drafting and monitoring process
2. Analysis of the energy performance of the municipal building stock
3. GIS visualisations of building energy consumption and renewable energy generation aggregated at municipality level



Use case 1: Digitalisation of the SE(C)AP drafting and monitoring process

Currently, the SEAPs and SECAPs developed in Crete are in forms of Excel and PDF files. In this use case, the development of a digital platform to facilitate the creation of new SE(C)APs and monitor their progress is addressed. If possible, an easier and more automated access to the data required to calculate the emissions inventories will be enabled.

Municipalities in Crete will also be able to register their SE(C)APS on the ePLANET platform, by uploading all the energy transition measures which are included in the plan, marking their corresponding sector and the level of completion. This process will contribute to the creation of an energy transition measures database, which will enable users to:

- Evaluate the impact of implemented measures, establishing a relationship between the achieved progress on emission reduction pledges of specific sectors and the completed measures
- Access a list of measures implemented by other participant municipalities and filter them according to different similarity criteria (geographical proximity, climate conditions, number of inhabitants, economic and census data, etc.)

Use case 2: Analysis of the energy performance of the municipal building stock

RDFC is gathering electricity consumption Excels from different municipalities. The first energy performance analysis pilot will start with data from 4 municipalities among the most engaged ones in the energy transition. Monthly electricity consumption, as well as address and type of the building are going to be collected. Visualisations of the available data is going to be generated with the goal of evaluating the energy performance of the buildings and creating benchmarking and comparisons between municipalities. If the first pilot is successful and the municipalities are engaged, expanding the service to more municipalities of the island will be considered.

Use case 3: GIS visualisations of building energy consumption and renewable energy generation aggregated at municipality level

RDFC is in possession of various Excel files containing data about the energy consumption and renewable energy generation for each municipality of the region of Crete. Excel and PDF files of the 16 currently active SEAPs in the region are also available. This use case will be based on the creation of the necessary harmonization methodologies so that the mentioned data can be successfully displayed on the local GIS platform of the island of Crete. A technical requirement of this use case will also be linked to establishing the required connection between the ePLANET architecture and the Crete GIS platform. For this reason, coordination calls will have to be organized between the technical team of ePLANET and the developers of the Crete GIS platform.

7.3.3 Girona region

In this paragraph, the ePLANET technical requirements for each use case of the Girona pilot are presented. The use cases identified for Girona are:

1. Digitalisation of the SE(C)AP drafting and monitoring process
2. Creation of a GIS visualisation tool to support the planning of local energy communities

Use case 1: Digitalisation of the SE(C)AP drafting and monitoring process

This module of the ePLANET platform will be aimed at facilitating the creation and monitoring of sustainable energy transition plans on two levels.

Firstly, it will provide an easier and more automated access to the data required to calculate the MEI, by ensuring automated connection to all the relevant platforms and services. This data includes:

- Hourly electricity and gas consumption of public buildings and street lighting
- Monthly/yearly electricity and gas consumption of residential, industrial, and non-municipal tertiary buildings
- Fuel sold by gas stations and consumption of EV charging points to estimate the emissions of the transportation sector

As already specified for the Crete use case, in this module users will be able to register their SE(C)APS on the ePLANET platform, by uploading all the energy transition measures which are included in the plan, marking their corresponding sector and the level of completion. This process will contribute to the creation of an energy transition measures database, which will enable users to:

- Evaluate the impact of implemented measures, establishing a relationship between the achieved progress on emission reduction pledges of specific sectors and the completed measures
- Access a list of measures implemented by other participant municipalities and filter them according to different similarity criteria (geographical proximity, climate conditions, number of inhabitants, economic and census data, etc.)

Correspondence between the SECAP fields created in the ePLANET platform and the ones existing in the national Spanish energy savings reporting tool (MENAE - Mecanismo de ENvío de Ahorros Energéticos) will also have to be ensured, in order to facilitate as much as possible the reporting tasks of the individual municipalities.

Use case 2: Creation of a GIS visualisation tool to support the planning of local energy communities

This module of the ePLANET platform will be aimed at harnessing many different data sources to support the planning of local energy communities. DdGi is currently promoting several collective self-consumption projects in different municipalities of the province of Girona. Their goal is, over the next few years, to increase both the number of total communities and the number of participating users and rooftops in each community. In order to support local public authorities and other relevant stakeholders in the selection of participants, rooftops, and target areas, the proposed GIS application will harness the following data sources:

- Monthly electricity and yearly gas consumption data aggregated at building block level, provided by DSOs
- Hourly electricity consumption profiles by tariff and postal code, provided by DSOs
- The PV generation potential study which is included in the SITMUN platform
- Publicly available cadastre and socio-economic information

The data will be treated, analysed, and summarised in an interactive GIS map, either as an independent module on the ePLANET platform, or as an additional tool on the existing SITMUN platform.



8 CONCLUSIONS

From the answers of different surveys, the following conclusions have been identified.

Municipalities of the Zlín Region

Need to raise awareness and increase resources to carry out ET Projects appropriately.

Need more commitment from Municipalities in developing ETP

Private sector is investing in ET, independently of having or not an ETP. Municipalities should take the role to implement ET projects and promote participation and share of information with private ET projects.

Benchmarking should be increased

The majority of municipalities have no funding scheme and the rest do not define anything about how energy projects are funded. There is a strong need to define one or more funding schemes.

Municipalities of Crete

Needs to do the transition from SEAPs to SECAPs.

Need to increase the gathering of aggregated consumptions

The investments in ET projects from municipalities is lower than the private sector. It should increase.

There are some municipalities without a funding scheme. This should be improved

Municipalities of the province of Girona

The majority of municipalities have a SECAP but there is still some municipalities needing to do the transition from SEAP to SECAPs.

Data collection needs to be improved and expanded mainly for aggregated consumptions.

Public renewable energy production facilities needs to increase.

There is a gap in benchmarking ETP or measures, once have been implemented.

Need to define clear funding schemes for the ET Projects. The ESCO model, based on EPC contracting is not being correctly applied and relying on government funds might be a barrier.

Common conclusions from regions profiles

Regarding the available energy resources, sun and biomass are the main resources for any pilot region. Investments in Biomass need to be fostered

Regarding Wind power, it seems to be an available resource, but not exploited. The requirement here would be to get some knowledge of new technologies in Wind power generation that can fit and can be installed in small facilities



It has been identified as a need, the empowerment for municipalities to generate their own energy, getting rid of big utility companies as much as possible. Since this perspective the need is focussed on to involve small local DSO in ET projects.

All technicians that work for municipalities (whatever subcontracted or as employee) should have training under the capacity building programs that will be defined.

For all the requirements mentioned above, a digital platform (for data gathering and processing) should be implemented in order to cover the current gaps.

