

v1.2 / 07.12.2020 / Athens

Project	Mapping of Energy Communities in Greece
Reference No	HP1AB-00256
Coordinator:	ELECTRA ENERGY
	Olimpionikon 7, Ilioupoli, Athens, PC16342
	http://electraenergy.coop
	info@electraenergy.coop
Work Package	WP1
Date	07.12.2020
Version	1.2

Contents

1. INTRODUCTION		4
2. CONTRIBUTORS AND ACKNOWLEDGEMENTS		5
3. ENERGY COMMUNITIES: PRINCIPLES, CRITERIA AND CONDITIONS		6
4. MAPPING OF ENERGY COMMUNITIES		8
<u>4.1 List</u>	8	
<u>4.2 Online map</u>	8	
4.3 Findings	9	
5. QUESTIONNAIRE SURVEY		15
5.1 The questionnaire	15	
5.2 Design of the questionnaire	21	
5.3 Survey	23	
6. CASE STUDIES		36
7. REFERENCES		44

1. Introduction

In 2018 the European Commission's Clean Energy Package acknowledged the right of local communities and citizens to play an active role in the energy sector by defining "Energy Communities".

"Energy communities" are specified in two separate laws of the Clean Energy Package. The revised Renewable Energy Directive (EU) 2018/2001 sets the framework for "Renewable Energy Communities" covering renewable energy. The revised Internal Electricity Market Directive (EU) 2019/944 introduces new roles and responsibilities for "Citizen Energy Communities" in the energy system covering all types of electricity.

Following the transposition of the Renewable Energy Directive (EU) 2018/2001, Greece defined "Energy Communities" under the law 4513 in 2018. An "Energy Community" is a cooperative aiming to promote the social and solidarity economy and innovation in the energy sector, to address energy poverty and to promote sustainable energy production, storage, energy management, self-consumption, distribution and energy supply, as well as to enhance energy self-sufficiency and security.

This report is the result of a 4-month survey aiming to investigate the progress of the development of Energy Communities in Greece since the introduction of law 4513/2018. To achieve that, the research team analyzed qualitative and quantitative data and information extracted from the official bodies and registries, as well as from Energy Communities directly.

2. Contributors and acknowledgements

Vasilakis Athanasios - Researcher, School of Electrical and Computer Engineering, National Technical University of Athens (NTUA)

Vrettos Christos - BSc in Biodiversity and Conservation

Kitsikopoulos Dimitris - BSc in Electrical Engineering, MSc in Information Technology for Manufacturing

Kontolati Athina - Researcher, BSc in Geography

Koukoufikis George - Researcher and social scientist, Ph.D in urban studies

Margosi Maria - Researcher, Department of Economics, National and Kapodistrian University of Athens

Palaiogiannis Foivos - Researcher, School of Electrical and Computer Engineering, National Technical University of Athens (NTUA)

We would like to acknowledge Smart RUE Research Group of the Institute of Communication and Computer Systems (ICCS) of the National Technical University of Athens for its invaluable contribution.

3. Energy Communities: Principles, criteria and conditions

Energy Communities are characterized by some key elements and conditions described in the corresponding EU directives and defined in Greek Laws 4513/2018 and 1667/1986.

Conditions and elements (Caramizaru, & Uihlein, 2020):

Energy Communities are characterized by the following conditions and elements

- Governance: Participation is 'open and voluntary'. More specifically, participation in renewable energy projects is open to all potential local members based on non-discriminatory criteria.
- Ownership and control: Participation and effective control by citizens, local authorities and smaller businesses whose primary economic activity is not the energy sector.
- Purpose: The primary purpose is to generate social and environmental benefits rather than focus on financial profits.
- Geographical scope: The proximity between the renewable energy project and the Energy Community is of high importance.
- Activities: Energy Communities can cover a broad range of activities referring to all forms of renewable energy in the electricity and heating sectors.
- Participants: Natural persons, Local authorities and micro, small and medium-sized enterprises whose participation does not constitute their primary economic activity. Energy Communities should also ensure that participation is accessible to consumers in low-income or vulnerable households.
- Autonomy: An Energy Community 'should be capable of remaining autonomous from individual members and other traditional market actors that participate in the community as members or shareholders.'

Energy Communities must also respect the seven (7) cooperative principles outlined by the International Cooperative Alliance (ICA). The principles are:

- Voluntary and Open Membership
- Democratic Member Control

~ 6 ~

- Economic Participation through Direct Ownership
- Autonomy and Independence
- Education, Training and Information
- Cooperation among Cooperatives
- Concern for Community

4. Mapping of energy communities

4.1 List

A detailed list of all Energy Communities registered until August 2020 is presented in Appendix I.

4.2 Online map

An online map has been designed, including all Energy Communities registered until August 2020.

By clicking <u>here</u> the user can pan and zoom in the various pins that represent the existing Energy Communities in Greece, according to the conducted research. The information incorporated into the online map consists of the name, title, registration date, activity status, and address details, i.e. region, and postal code, of each Energy Community.

Figure 1 illustrates-in a static form-the online dynamic map that was created for the purpose of this report.

It should be noted that for 26 Energy Communities (out of the total 409) information about their address was not available. These Energy Communities were not included in the online map.



Figure 1: Existing Energy Communities in Greece

4.3 Findings

The information and data for the purpose of this study were mainly extracted from the GEMI business registry; at a secondary level information was also collected upon request from the local chambers.

Location

Figure 2 illustrates the findings of the mapping at a general spatial level. More specifically, it depicts the existing Energy Communities in Greece by regions. As it suggests, there is a greater concentration of Energy Communities in the Northern mainland Greece in contrast with the Southern. The region where most Energy Communities are based is Central Macedonia (143 Energy Communities). As Figure 2 also suggests, the development of Energy Communities in the islands is limited, with the exception of Crete where five (5) Energy Communities are already active. The number of Energy Communities per Region is also depicted in Table 1.



Figure 2: Existing Energy Communities in Greece by Regions (NUTS 2 level), 2020.

Region	Number of Energy Communities
South Aegean	0
Ionian Islands	0
North Aegean	0
Crete	5
Central Greece	14
Peloponnese	14
Epirus	23
Attica	31
Thessaly	35

Western Macedonia	44
Western Greece	47
Eastern Macedonia-Thrace	52
Central Macedonia	143

Table 1: Number of Energy Communities per Region.

Registration period

Most Energy Communities were registered in the second semester of 2019.

It is noted that for 29, out of a total of 409 Energy Communities, the registration date was not available.

Registration period	Number of Energy Communities registered during the period
1 st semester of 2018	2
2 nd semester of 2018	21
1 st semester of 2019	99
2 nd semester of 2019	168
1 st semester of 2020	88

Table 2: Registration period per number of Energy Communities.

Deliverable 1.1



Figure 3: Registrations of Energy Communities

Cooperative capital

Most Energy Communities have a cooperative capital of less than 10.000 euro, approximately 35% have a cooperative capital of 10.000 - 100.000 euro, and 4% have a cooperative capital that exceeds 100.000 euro.



Figure 4: Cooperative capital

Gender balance and leadership

In regards to the presence of women in the Board of Directors (BoD) of the Energy Communities, it was found that there is a lack of female representation, as 93% of Energy Communities have less than 2 women participating in the Board of Directors.

In more detail, 42% of the Energy Communities do not have a female member; only 34% and 17% of the Energy Communities have 1 and 2 female members respectively in their BoD, and just 5% have 3. Furthermore, just 1% of the total Energy Communities have 4 or 5 women in their BoD (Table 3). It is noted that information about this specific characteristic was collected from 329 Energy Communities out of 409 in total.

	Number of Energy Communities	Percentage of Energy Communities
0 women in the BoD	139	42%
1 woman in the BoD	113	34%

2 women in the BoD	55	17%
3 women in the BoD	17	5%
4 women in the BoD	3	1%
5 women in the BoD	2	1%
Total	329	100%

Table 3: Number of women in the BoD.



Figure 5: Women participation in the Board of Directors

5. Questionnaire survey

5.1 The questionnaire

For the purpose of this study, the research team designed a questionnaire in order to extract valuable information from the Energy Communities.

The questionnaire

In the context of the research project undertaken by the Electricity Systems Laboratory of National Technical University of Athens and ELECTRA Energy, we are conducting the following questionnaire. The target group of the questionnaire is the Energy Communities that operate in Greece.

The aim of the questionnaire is to investigate the characteristics of the Energy Communities, their needs as well as the challenges they face due to the complex environment in which they operate.

The Questionnaire is anonymous and concerns only those who are directly involved in the activity of an Energy Community.

The results of the research will be used in an attempt to develop the appropriate tools to support Energy Communities in Greece.

Taking a few minutes from your time to answer some questions will be a great contribution for our research.

Thanks you in advance for your time.

1. Regional unit in which the Energy Community operates.



2. Municipality that activities are located.



3. Establishment year of the Energy Community

4. How many are the members of the Energy Community?

5. How many are the cooperative portion of the Energy Community?

6. How long did the consultation, between the members of the Energy Community, last from the conception of the initial idea till the beginning of the establishment procedures?

- <= 6 Monthos
- 1 year

>1 year

7. You wanted the Energy Community project to be:

- open to members of the local community
- only to your friends and family
- other

7.1	never	rarely	occasionally	To a considerable degree	always
To what extent you communicated your project to the local community before it started?					

8. Please fill in what percentage of the existing or expected capital comes from (or you estimate that it will come from) the following sources:

	Rate (%)
Members	
Subsidy	
Borrowing	

9. Do you offer or intend to offer to your members or the local community services related to the context of your project?

- YES
- *NO*

lf yes,

9.1. What are or will be the services:

- Energy saving tips
- Energy storage services
- Educational services around issues of energy sustainability and RES
- Information for motivating more people to join the project.

- Informing the citizens and local organizations about the results of the project and their prospects
- Sharing energy with socially vulnerable consumer groups
- Other service

10. What technologies does the Energy Community use or intend to use?

- Photovoltaic
- solar thermal
- wind
- biomass
- geothermal
- co-production
- energy storage in batteries
- other technology

if 'other' selected:

10.1 Please fill in what other technology you use or intend to use.

11. How long after the foundation did you start or do you estimate that the first project of the EC will start to be implemented. (ex. development of facilities) (in months)



- YES
- NO

If, 'yes', is selected:

12.1 How long after the establishment of the EC did energy production start?



12.2 Energy production aims at:

	YES	NO
sale of energy		
self-consumption		

13. Please fill in for each sentence below whether it was a driving force for the creation of your team and your Energy Community.

	Not Important	Important	Fairly Important	Slightly Important	Very Important
The prospect of direct and active participation of citizens, local actors, small and medium enterprises in an energy plan for a transition to more environmentally friendly energy production.					
Enhancing environmental awareness at the local level.					
Enhancing the social acceptance of RES at the local level.					
The reduction of energy costs consumed for personal / corporate use.					
Strengthening the ties of the local community through a common goal.					
The most democratic organization of the means of production of the energy sector.					
Fighting energy poverty at regional level.					
The profit from the sale of the produced energy in the market					

14. How many people have a paid employment relationship (permanent or rotating) with the Energy Community?

15. How many members offer unpaid services or useful time to the Energy Community?

16. How many extraordinary general meetings have been held in the last year?

17. Please fill in for each sentence to what extent we meet the practices described in your Energy Community.

	Never	Seldom	Sometimes	Often	Almost Always
The functioning of the EC depends on specific individuals.					
The vision and objectives of the EC are clearly defined and understood by all involved.					
There is a clear distinction of roles and responsibilities between those directly involved and called upon to carry out the day-to-day tasks.					
A defined model of corporate procedures that defines the roles of the involved parties, is applied for the effective management of the works and the financial figures.					
There are several meetings of members, EC stakeholders and people working in the EC.					
There is a specific strategy for communication, information and involvement of members and stakeholders in the work of the EC.					
The investment objectives for the next period have been clearly defined.					
The investment strategy to be followed is clearly defined: the existing resources have been allocated, the possible financing methods have been found and the necessary funds have been raised.					

18. Would you be interested in creating a federation of Energy Communities in Greece with the aim of exchanging information, experiences and as well as for collective actions and claims?

- YES
- NO

Please, if you wish to be informed about the results of the survey, fill in a contact e-mail.

5.2 Design of the questionnaire

Questionnaire Presentation

The Questionnaire consists of three main parts, of which the second part can be separated in three subparts.

1st Part:

The first part of the questionnaire consists of six questions. The focus is on gathering the typical characteristics of the Energy Community, for example the location, year of establishment, number of participants, cooperative shares and duration of consultation before the official founding.

2nd Part:

The second part of the questionnaire focuses on keeping track of the constitutive characteristics of the Energy Community.

The first subpart consists of three questions that try to capture the relations that are formed between the Energy Community and the citizens of the local community. Those questions aim at recording whether there is a proper communication and information provision of the activities that the Energy Community will be undertaking in the region. Proper and thorough communication and information provision are considered key elements according to the vision of establishment and operation of Energy Communities in Europe (Caramizaru, & Uihlein, 2020).

The second subpart consists also of three questions that focus on the actual energy related activities of the Energy community.

Finally, the third subpart consists of five questions that try to capture the vision and the mission behind the Energy Community's founding. These five questions aimed firstly at recording the driving motivations behind each Energy community's founding, and secondly the mode of operation of each Energy community.

More specifically, concerning the mode of operation - through question 17 - we try to capture the maturity level of the Energy Community. The term 'maturity level' refers to the ability of the Energy Community to operate efficiently in order to fulfill its purpose and to improve its operations in a variety of process areas, such as management, strategic investment, continuous delivery, marketing, security and several other aspects, depending each time in which area there is a need of focusing (Bandara et al., 2007; Tarhan et al., 2016). Given the short time period that Energy Communities have been operating in Greece, we focused on the appropriate areas of operation that could best reflect the maturity level of each community. Those areas are: motivation, business governance and stakeholder management.

3rd Part:

In the final part we pose two questions in order to capture future intentions. In more detail, the first question addresses whether or not the representative of the Energy Community (the one responding to the questionnaire) is interested in forming a federation of Energy Communities. The second question presents the responder with the opportunity to stay updated regarding the survey outcomes by asking them to input their e-mail address.

Research Implementation

The research took place in Greece during the period 05/07/2020 to 30/09/2020 during which 32 questionnaires were collected. The online form of the questionnaire was sent to Energy Communities across Greece by e-mail. The respondents were allowed to fill-in the questionnaire on their own, during their free time. The survey was sent two times, first through the initial e-mail and then through a follow-up e-mail a month later. Energy Communities that had already replied were excluded from the follow-up e-mail.

We encountered several difficulties during the response collection process, with the two most noteworthy being: 1) A lack of interest by Energy Communities in completing the survey and 2) A general difficulty in managing to find a representative for each Energy Community. In addition, there were a few cases

~ 22 ~

where the Energy Community representatives were concerned about the validity of the survey, as well as whether the right steps were taken to ensure anonymity.

5.3 Survey

Approaching energy communities

Approaching Energy Communities and retrieving their contact data proved to be a challenging endeavor. Out of all the Energy Communities registered at GEMI only 65 of them had declared a contact email address and only 107 a phone contact number. Adding to that, in the vast majority of those cases, the contact details (phones and/or emails) where usually not directly linked to the members or administrators of the Energy Communities. Frequently, the contact details were actually linked to those of external legal consultants, e.g. lawyers' or accountants' offices. Given the above, the potential sample was reduced to below 50% of the identified active energy communities in Greece.

We decided to approach the ones with available contact details with a two-phase procedure. The first phase took place between the 15th and the 30th of July 2020. The online survey was sent in two waves of emails (initial and reminder) to the 65 energy communities, for which we already had e-mail contacts. The second phase took place from the 15th of September to the 8th of October.

During this period, the remaining Energy Communities for which we had valid phone numbers, were contacted. The communication was hindered in part due to the external legal consultants' reluctance to reveal the data and contact details of the Energy Community owners, with the former citing privacy concerns.

Nevertheless, the phoning approach yielded an additional 51 email addresses. Following that, another dual round of emails with the survey link was sent.

Characteristics of the survey sample

In total, we received 32 complete responses to the survey out of 116 invitations, which is a satisfactory response rate for this type of survey.

The geographical distribution indicated a greater participation interest (response rate) in the northern regions of Thrace, as well as central and west Macedonia, which together account for 54% of the total responses.

The respondents represent energy cooperatives of different sizes in terms of members (from 150 to 5) while the vast majority of them (75%) have a membership between 10 and 20 people.

Additionally, in most of the cases (>80%) the process of creating the Energy Community, from the conceptualization of the initial idea to the actual establishment, took less than six months.

The sample is equally divided between Energy Communities that made a broader call for open participation to the local community and the ones that have been created only within a small network of family and friends.

When it comes to technologies, PV installations appear to be the main mode and entry point to the energy market for all the Energy Communities of the sample. Given the climate conditions and the low entry barriers that is of no surprise. Furthermore, energy storage, wind power and biomass are also technologies that appear to attract some energy communities (figure 6).

~ 24 ~



Figure 6. Technologies used or planned to be used by surveyed Energy communities

Analysis of incentives over the creation/participation of Energy Communities

We used a five-point likert scale series over a series of questions trying to interpret the incentives that mobilised the responders to create and participate in an energy community (ranging from unimportant to very important).

The responses (table 4 and figure 7) indicate that the possibility to profit from investing in RES via Energy Communities was the key incentive for most of them. It is common for responses to this type of survey question to concentrate around the neutral midpoint (3). Indeed, the median of the answers received in 7 out of 8 of our question is very close to the midpoint (+ or - 0.25), while answers appear to be rather spread throughout the scale.

Only the question related to profit making through participation in the energy market seems to have strong support with a median of 4.3 and a low standard deviation (below 1), indicating that most of the answers were close.

Nevertheless, we expect energy communities to provide broader benefits to local communities through 1) greater familiarization and acceptance of RES and 2) by creating new and more opportunities for participation in the energy transition. The Energy Communities we surveyed indicate strong interest (84% of them) in offering services to the localities they operate (such as providing information regarding RES, direct local investment via energy communities, energy efficiency trainings etc.) while 1 out of 4 of them is planning to offer energy support to vulnerable social groups.

Please fill in for each	Unimportant	Of Little	Moderately	Important	Very		
sentence below	1	Importance	Important	4	Important		
driving force for the		2	3		5	Median	Standard
creation of your							Deviation
team and your							
Energy Community:							
1 The present of							
1. The prospect							
of direct and							
active							
participation of							
citizens, local							
actors, small							
and							
medium-sized							
enterprises in	12.5%	18.8%	25.0%	25.0%	18.8%	3.188	1.306
an energy plan							
for a transition							
to more							
environmentally							
friendly energy							
production.							
2 Enhancing	6.3%	15.6%	37.5%	28.1%	12.5%	3,250	1.078
environmental							

awareness at							
the local level.							
3 Enhancing the							
social							
acceptance of							
RES at the local	6.3%	18.8%	37.5%	21.9%	15.6%	3.219	1.128
level							
4 Reducing the							
cost of energy							
consumed for	21.9%	15.6%	15.6%	15.6%	31.3%	3.188	1.575
personal /							
corporate use.							
5 Strengthening							
the ties of the							
local community	15.6%	25.0%	34 4%	15.6%	9.4%	2.781	1 184
through a	13.070	23.070	51.170	19.070	5.170	2.7.01	1.101
common goal.							
6 The most							
democratic							
organization of							
the means of	10.00/	12 50/	20.10/	25.00/	15.6%	2.052	1 2 4 2
production of	18.8%	12.5%	28.1%	25.0%	15.6%	3.063	1.343
the energy							
sector.							
				_			
7 Fighting							
energy poverty	12.5%	15.6%	25.0%	28.1%	18.8%	3.250	1.295
at regional level.							

8 The profit							
from the sale of							
the produced	3.1%	0.0%	15.6%	25.0%	56.3%	4.313	0.9
energy in the							
market.							

Table 4. Investigating incentives for participating on energy communities



Figure 7. Visualization of responses' range over the 8 questions

Analysis of maturity and internal cooperative structure

As expected, given the inauguration of the legislative framework, all of the surveyed Energy Communities formed between 2018 and 2020. The incubation period between the initiation of the Energy Community and the first planned project ranges from 6 to 30 months (14 months on average). So far, only three of the surveyed energy communities (9.3%) already have operational projects that produce energy. All three are used for commercial purposes rather than self-consumption. For those three, the projects' incubation period ranged between one and four months since the initial planning.

These delays also seem to be negatively affecting the potential of Energy Communities to create employment opportunities for their members and others. So far, only approximately 1/3 of the Energy Communities have managed to create part-time or full-time jobs, employing 28 people in total. The vast majority of work and day-to-day operations seem to be carried out on a voluntary level. Approximately 1 out of 4 members is offering voluntary services to their energy communities. There is a weak positive correlation between the size of the community and the number of volunteers, but no pattern of statistical significance can be reported.

When it comes to financing, several communities (1/4) report that the members will completely cover the initial investment using their own funds. For the rest, funding the project and the operation of the energy communities seems to be mixed combining internal funds (on average 31.5% of the total investment) and lending (on average 65.5% of the total investment). While four energy communities report that they expect to cover a small percentage of the financing through subsidies.

There is no observable pattern on the division of the cooperative capital into shares. There is variation with some Energy Communities adopting a 1 to 1 ratio (one member one share), while others choosing dozens or hundreds per member, with one issuing 4000 shares per member.

A set of questions was used to understand several aspects of the internal structure of the energy communities, specifically seeking to understand to what extent their decision-making procedures are democratic and participatory. However, given that the questionnaires were answered mainly by the administrators of the Energy Community and not regular members, answers on this part of the questionnaire may be somehow biased.

From the responses (table 5) it appears that Energy Communities, no matter their size, usually depend on a small number of people to deal with the management and everyday activities of the initiative. Day to day tasks are defined and allocated clearly, while the question regarding the frequency of meetings with all the members of Energy Communities seems to score the lowest, indicating that probably

~ 29 ~

these meetings are rare. Indeed, most of the Energy Communities (65%) didn't host any meeting or only hosted one (typically required based on the *articles of association*) general assembly with all members present within the last 12 months.

As many of the Energy Communities are on the planning stages, without having installed any RES, they require a limited amount of consultation or labor, limited to bureaucratic procedures handled by the administration, thus potentially negating the need for regular general assemblies. It could also be the case that more hierarchical management models are emerging across Energy Communities. Further qualitative researcher can provide additional insights into this.

Furthermore, the vision and goals of the initiatives seem to be well understood and communicated (questions 2 and 3). This indicated that the initial plans, used to convince participants to join the Energy Communities, contained a particular set of goals and objectives and possibly roadmaps on how to get there. However, following the launch of the initiative, communication starts to diminish (questions 5 and 6). Similarly, while financial planning seems clearly defined (question 7), the operationalization of it (question 8) appears more problematic.

Please fill in for each sentence the level of agreement or to what extent we meet the practices described in your Energy Community	Never, Not at all 1	Seldom 2	Someti mes 3	Often 4	A lot 5	Almost always , Too much 6	Median /	Standard Deviation
 The functioning of the EC depends on specific individuals. 	0.00%	0.00%	9.38 %	18.75%	31.25%	40.63 %	5.03	1.00
2 The vision and objectives of the EC are clearly defined and understood by all involved.	0.00%	3.13%	3.13 %	28.13%	15.63%	50.00 %	5.06	1.11

3 There is a clear distinction of roles and responsibilities between those directly involved and called upon to carry out the day-to-day tasks.	0.00%	0.00%	15.63 %	15.63%	31.25%	37.50 %	4.91	1.09
4 A defined model of corporate procedures that defines the roles of the involved parties, is applied for the effective labor and economic management.	3.13%	6.25%	15.63 %	15.63%	37.50%	21.88 %	4.44	1.34
5 There are several meetings of members, EC stakeholders and people working in the EC.	6.25%	9.38%	12.50 %	31.25%	21.88%	18.75 %	4.09	1.44
6 There is a specific strategy for communication, information and involvement of members and stakeholders in the work of the EC.	3.13%	15.63%	21.88 %	6.25%	31.25%	21.88 %	4.13	1.54
7 The investment objectives for the next period have been clearly defined.	0.00%	0.00%	6.25 %	15.63%	46.88%	31.25 %	5.03	0.86

8 The investment								
strategy to be followed								
is clearly defined: the								
existing resources have								
been allocated, the	2 1 20/	12 500/	15.63	20 120/	10 750/	21.88	4.12	1 42
possible financing	3.13%	12.50%	%	28.13%	18.75%	%	4.13	1.43
methods have been								
found and the								
necessary funds have								
been raised.								

Table 5. Understanding the maturity and cooperative structure

In addition to the above analysis, some interesting direct outputs of the questionnaire survey are presented in the following figures.

Note that all direct outputs of the questionnaire survey are presented in Appendix II and in Appendix V.



Figure 8. From conception to realization



Figure 9. Openness to friends, family, local community and others



Figure 10. Maturity level indicator

~ 33 ~



Would you be interested in creating a federation of Energy Communities in Greece?

General comments / remarks

This survey provided some valuable insights into the emerging ecosystem of Energy Communities in Greece.

It seems that following the introduction of the relevant legal framework, Energy Communities have become popular and have also been able to attract significant numbers of participants. However, realization and operationalization of projects appears to be limited.

Although Energy Community members seem to value collective action, empowerment in terms of ownership, and environmental awareness, the most important determinant for membership is financial investment. This does not mean that Energy Communities are limited to profit-making. Their presence and development can have a positive effect on RES acceptance by local communities. It can also increase opportunities for broader participation in the energy transition through collective, rather than individual, management of common resources.

Figure 11. Interest in a federation of Energy Communities

Mainstreaming Energy Communities can lead to the creation of new financial mechanisms. As more Energy Communities start to emerge, financial tools will diversify accordingly, offering individually tailored and more sophisticated solutions that are best suited for the sector as a whole.

In line with this, 90% of the surveyed cooperatives support the idea for a creation of a federation of Energy Communities in Greece with the aim of exchanging best practices and experiences, facilitating information flows, and organizing collective actions to promote the model at the institutional level.

6. Case studies

This study also consisted of identifying and further investigating six (6) cases that were of special interest.

Relevant information and data were collected through a series of online and telephone interviews, or through other means in cases where this wasn't possible.



Figure 12. Map of case studies

CASE STUDY 1: Minoan Energy Community

Arkalochori, Region of Crete



Date: 21.10.2020 Representative: Dr. D. Katsaprakakis

Minoan Energy Community was founded in October 2019 and it is based in the island of Crete.

Within less than a year, Minoan Energy Community Organized several workshops in rural and urban locations, engaging farmers, local enterprises, citizens, municipalities, cooperatives and the Regional authority of Crete.

Minoan Energy Community is currently planning and working on the development of a wide range of projects including: Wind parks, Photovoltaic installations, hybrid RES projects and energy storage.

Four (4) working groups have been formed in order to support the development of the cooperative in its early stages. The 4 groups are in charge of the following tasks: Technical, Administrative, Promotion & Communication, Educational.

Website: https://minoanenergy.com/

Special characteristics						
1	2	3				
Wide base	Island	Expertise, research and knowledge transfer				
Within less than a year of operation the Energy Community has managed to build a wide base of members including:	Islands have special characteristics and attributes	 A group of scientists and experts contribute to the ongoing development of the Energy Community. 				

CASE STUDY 2: Atlas Energy Community

Lamia, Region of central Greece

Date: 19.09.2020 Representative: G. Karagiannis



Atlas Energy Community was founded in 2020 and it is based in central Greece.

Atlas is aiming to tackle energy poverty in

mountainous areas of central Greece and to develop RES projects that will contribute to the development of the Agrifood sector.

Atlas is currently designing and developing a portfolio of projects and services, including clean energy generation, storage, energy efficiency and capacity building.

Website: http://atlasenergy.gr

Added value					
1	2	3			
Rural areas	Agrifood sector				

		Energy poverty in mountainous areas
Active in rural and remote areas of central Greece	Aiming to provide energy services to farmers, cooperatives and agrifood businesses.	Aiming to tackle energy poverty in mountainous areas of central Greece

CASE STUDY 3: Hyperion Energy Community

Athens, Region of Attica

Representative: D. Kitsikopoulos Date: 06.09.2020



Hyperion Energy Community was founded in 2020 and is based in Athens.

Hyperion is aiming to apply the virtual net-metering model to generate clean electricity for households and small enterprises in Athens.

Hyperion is also working on developing tools and services to tackle energy poverty in urban areas.

The Energy Community is aiming to replicate its model in other areas in Greece and the Balkans.

Special Characteristics						
1	2	3				
Replicability	Collective self consumption	Energy poverty in urban areas				

Hyperion is developing,	Hyperion is offering	Hyperion is designing and
testing and validating	collective self	developing solutions in
services, models and	consumption services to	order to tackle energy
projects that can be	its members by applying	poverty in urban areas.
replicable.	the virtual net-metering	
	model	

CASE STUDY 4: Enosi Agriniou

Agrinio, Region of Western Greece

Date: 26.10.2020 Representative: F. Berikos



"Union of Agrinio" was established in 1930 by the Cooperatives of tobacco and olive producers, who were operating in the region of Aetoloakarnania.

Apart from its successful commercial activities in the agrifood sector, the Union took a strategic decision to get involved in renewable energy projects. The Union has already developed 17 energy communities. 10 of them will build wind projects with a capacity of 168MW, involving 1750 families. 7 of them will develop solar projects with a capacity of 126MW, involving 500 families.

Special characteristics			
1	2	3	
Agricultural cooperatives	Big portfolio	Social acceptance	
Successful engagement of the agricultural cooperatives of the Union.	A wide portfolio of investments, services and projects leading to economies of scale. Also, big investors and financial institutions from Greece and abroad were attracted by the portfolio.	High rate of social acceptance, including large scale wind projects	

Website: https://www.e-ea.gr

CASE STUDY 5: Collective Energy Community

Athens, Region of Attica



Representative: A. Vasilakis Date: 28.10.2020

Collective Energy (CoEn) is a newfound Energy Community (registered in 15/01/2020), located in the Attica Region, Greece and formed under the principles that guide a citizens' cooperative. It has been established upon the common belief, shared among its

members, that the climate crisis and the energy transition require grassroots action.

The people who make up the Energy Community come from various backgrounds and have different aspirations. Among its founding members there are highly qualified researchers who have extensive experience in the preparation and implementation of research programs, both at the European and national level. Moreover, the non-profit social enterprise "School of Earth" is member of the CoEn with years of experience on developing educational courses and awareness-raising activities around contemporary social and ecological issues.

The ultimate goal of CoEn is to contribute in the development of sustainable and just energy solutions both for its members and for the local community. It aims to become an active "cell" within which its members learn how to collaborate, experiment and act for a common purpose.

Special Characteristics			
1	2	3	
Urban	Micro level	Research	
Collective Energy Community is active in urban environments	Collective Energy Community is aiming to test the model of "micro" Energy Communities, referring to a limited number of members (approximately 5-20)	For Collective Energy Community It is of high importance to design, test, evaluate and validate special technological tools and methodologies and to extract valuable information. The cooperative is aiming to share the outcomes among energy communities and run knowledge-transfer and educational activities	

CoEn is on the process of creating its first energy sharing project for its members.

CASE STUDY 6: Promitheus Energy Community

Pogoniani, Region of Epirus

Date: 27.10.2020 Representatives: E. Gimouki, S. Bousias



Promitheus Energy Community was founded in February 2020 and it is based in a remote area of the Epirus region.

The Energy Community is

currently designing its first 500kwp PV plant, aiming to produce and sell clean energy in order to support disabled people and vulnerable groups.

Special Characteristics			
1	2	3	
Sustainable tourism	People with disabilities	Social and solidarity economy	
Design and develop services in order to support the sustainable touristic sector of the Epirus region	Through its activities and services, Promitheus Energy Community will support local citizens with disabilities	It is the first and currently the only Energy Community in Greece that conforms to law 4430/2016 (Social and Solidarity Economy). Hence, it is an Energy Community and a Social & Solidarity Economy organization at the same time	

7. References

Bandara, W., Indulska, M., Chong, S., & Sadiq, S. (2007). Major issues in business process management: an expert perspective, European Conference on Information Systems

Caramizaru, A., & Uihlein, A. (2020). Energy Communities: An Overview of Energy and Social Innovation. *JRC Science for Policy Report JRC119433*.

Tarhan, A., Turetken, O., & Reijers, H. A. (2016). Business process maturity models: A systematic literature review. *Information and Software Technology*, *75*, 122-134.