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SunSharing - Supporting Solar Energy Communities in SEE

Report on the state of play regarding solar PV energy communities and crowdfunding initiatives in Greece

This document is prepared under the project “SunSharing - Supporting Solar Energy Communities in SEE”. This project is part of the European Climate Initiative (EUKI). EUKI is a project financing instrument by the German Federal Ministry for Economic Affairs and Climate Action (BMWK). The EUKI competition for project ideas is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. It is the overarching goal of the EUKI to foster climate cooperation within the European Union (EU) in order to mitigate greenhouse gas emissions. The opinions put forward in this document are the sole responsibility of the author(s) and do not necessarily reflect the views of the Federal Ministry for Economic Affairs and Climate Action (BMWK)

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1. Executive Summary

Key issues in the sector to be addressed by the SunSharing project

There is high potential for solar energy in Greece, especially on roofs of possible beneficiaries (e.g., residential buildings, schools, public utilities, and municipal buildings). However, apart from community projects in Greece, there is a lack of innovative business models that will stimulate citizens to invest in renewable generation jointly. As a result of the lack of experience and awareness, both citizens (investors) and owners/operators of sunny buildings (beneficiaries) are missing out on economic, social and environmental benefits. The main issues come from a lack of proper legislation on energy communities and crowdfunding. One of the reasons for this issue is the lack of communication between investors (citizens), potential beneficiaries (residential buildings, schools, municipalities, public utilities) and policymakers.

In Greece, the new legislation has provided a new regulatory framework being closer to the corresponding EU Directives. However, the introduction of new terms for Energy Communities, while the already existing Energy Communities are still in force, is rather confusing. Furthermore, the differences between the different types of Energy Communities are not well established, elaborating more the concerns for further legislation updates.

Regarding the numbering of Energy Communities in Greece, although a large amount of Energy Communities is already established, the majority of them is still inactive. The issue for this situation regards mainly the inability of the grid to connect more RES (saturated electrical grids). Furthermore, most of the established Energy Communities are based on a profit basis, which means lack of active citizen participation and the local government. More clear incentives should be provided to the local society in order to become active members and invest on such activities.

Finally, concerning the crowdfunding tool, although there are a few crowdfunding platforms in Greece, no energy projects have selected such kind of financial tool. More traditional ways (e.g., bank lending) and state-aided actions (e.g., participation in the Development Law) have been selected for their funding.

2. General overview of the adoption of legislative framework for energy communities

The Greek government has adopted the EU Directives for the establishment of Energy Communities in Law 4513/2018. According to the rationale of this law, the proposal for a Directive on the promotion of the use of energy sources (COM/2016/0767) and the proposal for a Directive on common rules for the internal market in electricity (COM/2016/0864) have been considered. The Energy Communities are considered as an important tool for the penetration of Renewable Energy Sources in the energy mix, while the participation of the local communities supports the RES acceptance and knowledge. The

Law 4513/2018 is based on the Energy Communities for improving the access to local energy sources and address the energy poverty. The targets of this Law are the following:

- Promotion of social and solidarity economy and innovation in the energy sector,
- Addressing energy poverty,
- Promoting energy sustainability and innovation,
- Energy production, storage, self-consumption, distribution and supply,
- Improvement of energy efficiency of the end user at local and regional level,
- Financial incentives and support measures for Energy Communities
- A special framework for the development of RES power plants for Energy Communities,
- Achievement of the national target for the participation of RES in the energy mix.

The basic points of Law 4513/2018 are the following:

- The locality (origin) of the control and exploitation of local renewable energy resources in order to fulfil the local energy demand and spread the benefit to the members of the Energy Community by producing added value on local communities.
- The islanding areas (island of Aegean Sea), which are not interconnected with the continental Greece. In order to deal with the environmental, economic, social issues from the utilization of conventional fossil fuels in local level and the high cost of energy production, especially in peak hours, the Law introduces special privileges for the Energy Communities established in very small islands. In order to support the transition to green energy production, the Law promotes to citizens, municipalities and local companies to participate actively to this energy transition and to the new energy design model of the country.
- Economic incentives and support measures for the Energy Communities, which mainly concern the development of energy production units from Renewable Energy Sources and the exploitation of the high potential of the RES through the participation of the local communities in order to reach the national targets of RES penetration.
- The energy net metering and the virtual energy net metering are provided as modern technological tools for the Energy Communities for the protection of the vulnerable citizens from the results of the energy poverty and social exclusion.

In Law 4513/2018, the participation of the local municipality is highlighted, since it is considered a decisive factor of the energy transformation and the transition to a green energy, while at the meantime the energy cost of the Local Authorities will be decreased, and the local production reconstruction will be supported through the local workforce.

Concerning the opportunities to the citizens-members of the local communities, except from the reduction of the energy cost, they can take part to the decisions regarding the management of the local renewable energy resources of their territory, the configuration of the production model of their municipality, the environmental protection and the protection of the climate due to the climate

change targeting to diffuse the benefit to the members of the Energy Community and the production of added value to the local society. A special example regards the lignite areas of Greece, where the citizens of Western Macedonia are already dealt with the transformation of the production model, while the local community is still dependent on the energy sector. The challenge of the lignite areas is related to the transition to an environmentally sustainable model, the future of the lignite areas and the assurance of a fair transition by providing resources to the local economy.

The Law 4513/2018 has also considered the transition to green energy production of the Greek islands, since a significant amount of these islanded is still not interconnected to the continental electricity grid and it is based on fossil fuels (mainly oil), which are very expensive and not environmental-friendly. The National Plan for Energy and Climate has prioritized the energy transition and this Law includes special terms and incentives for the cases of very small islands, while it provides the opportunity to create climate neutral islands based on renewable energy through the development of Energy Communities with active participation of the local community (citizens, municipality, business).

Two different types of Energy Communities are included in the Law 4513/2018: profit and non-profit Energy Communities. Furthermore, the Law also determines the details about the kind of members that can participate in Energy Communities (natural persons, public legal entities, municipalities). Furthermore, the special terms for the licensing procedures and the economic incentives are analytically described.

Another two Laws have been added in 2021, trying to correct any errors and omissions and support the Energy Communities. The Law 4821/2021 supports the small RES production and facilitates the competitive procedures for PV with nominal power up to 500kW. The Law 4843/2021 permits the transfer of the Energy Community to other entities (natural persons or legal entities), facilitated the establishment of Energy Communities from companies and increases the limit of the installed RES power for virtual net metering from 1MW to 3MW.

The most recent Law (Law 5037/2023) introduces the terms “Renewable Energy Community (REC)” and “Citizen Energy Community (CEC)”, which are in line with the European Directive 2018/2001 and 2019/944, as a replacement of the previous Law 4516/2018. These Directives put emphasis on the importance of the citizen participation in energy transition, as part of “Clean Energy for All” European legislative package. Both new energy communities types should contain 30 members as a minimum, which is a significant increase to the 5 members of the previous law. The differences among these two new Energy Communities are summarized in the following table.

	Renewable Energy Community	Citizen Energy Community
Area of activity	In one region	In one or more regions
Production units	At least 50% of the members should be of the same origin with the RES location	No restriction regarding the location of the RES

<p>Activities</p>	<p>Production, consumption, storage and sale of energy from RES units Apply for virtual net metering from RES units to meet the members' energy needs and consumers living below the poverty line</p>	<p>Production, self-consumption, storage and sale of energy from RES, distribution and supply of energy, cumulative representation, provision of flexibility and balancing support, energy efficiency services, electric vehicles charging and other energy services to the Community members Sell, store, distribute and procure "green energy", as well as introduce, buy or lease distribution networks and manage them autonomously Provide other energy services: Demand Response and energy efficiency services</p>
<p>Letters of guarantee - fees</p>	<p>Exemption from Producer certification Letter of Guarantee and Final Connection Offer fee. Reduction of Fess for physical installation space and commitment of electric space by 50%</p>	<p>-</p>

The new Law (Law 5037/2023) also provides additional provisions regarding the funding of energy communities. The Energy Communities can make use of the public funds for financial support, while they are also included in the Development Law as a cooperative organization. Additionally, this Law also deals with issues of self-production for apartment buildings, prohibits the transfer of producer certificates and other licenses, and permits the management of microgrids.

3. Overview of the existing energy communities or cooperatives *(in case no communities are recognized)*

Until June 2022, which is the date with the most recent data according to the General Commercial Register (GEMI in Greek), the Energy Communities registered in the entire Greece are 1,217 with another 133 Energy Communities being in the pre-registration status. The previous publication with similar data was in November 2021 counting 1,036 Energy Communities. This means that during these six (6) months (November 2021-June 2022) there is an important increase of 21%. The distribution of the active Energy Communities in the 13 Regions of the country is the following:

- Central Macedonia: 250
- Western Macedonia: 246
- Western Greece: 168
- Attica: 138

- Thessaly: 125
- Eastern Macedonia and Thrace: 99
- Central Greece: 77
- Epirus: 53
- Peloponnesus: 50
- Crete: 27
- Ionian Islands: 15
- South Aegean Islands: 8
- North Aegean Islands: 2

As it can be easily deduced from these numbers, the establishment of Energy Communities is very restricted in Greek islands.

However, this classification changes significantly with regard to the RES integration in Energy Communities. Taking into consideration the applications for new RES and High Performance Cogeneration Heat Power (HP-CHP) installations according to data from the Hellenic Distribution Network Operator (HEDNO), the Central Macedonia remains the first region regarding the RES installation in Energy Communities, while the Western Macedonia region is the fifth region. Analytically, the registered RES capacity in Energy Communities for each region is presented above:

- Central Macedonia: 218.95 MW
- Thessaly: 157.4 MW
- Eastern Macedonia and Thrace: 86.52 MW
- Central Greece: 45.69 MW
- Western Macedonia: 40.54 MW
- Western Greece: 35.73 MW
- Epirus: 32.27 MW
- Peloponnesus: 6.55 MW
- Ionian Islands: 5.31 MW
- Attica: 2.38 MW
- Crete: -
- North Aegean: -

From 2018 until 2022, the interest for new RES installations in Low Voltage (LV) and Medium Voltage (MV) has been increased significantly. In the following graph, the nominal power of the electrified and non-electrified installations and the number of new applications is presented according to data from

HEDNO. As it is noticed, the first applications for RES installations in Energy Communities were submitted during 2019 (344 applications), while the next year 2021 there was a tremendous increase of new applications (by 731%). The first RES installations were electrified during 2020 (43 installations) with aggregated nominal power of 35.36MW. In November 2021, the applications for new RES installations continued to increase (88%) and it is noticed a larger increase in the electrified RES (677 installations, 466.5 MW aggregated nominal power). From November 2021 to May 2022, the increase of new applications from Energy Communities was not large (only 5%), however this trend coincides with the total RES applications in the country.

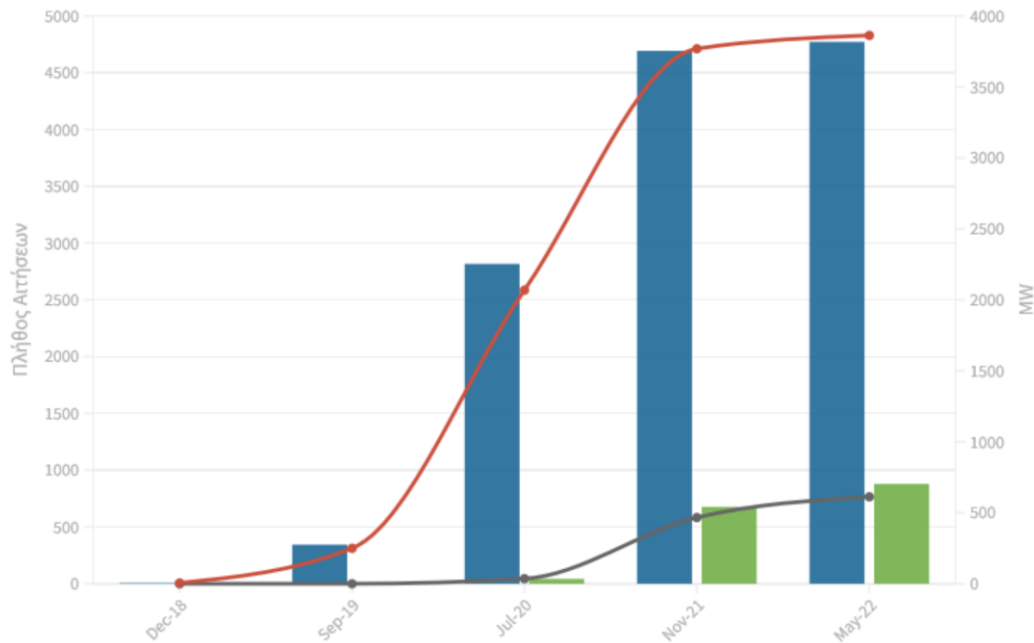


Figure 1 RES installations in Energy Communities: blue colour: non-electrified applications, green colour: electrified applications, red curve: total non-electrified RES (MW), black curve: total electrified RES (MW)

Regarding the virtual net-metering, only 53 out of 643 applications of May 2022 concerned the Energy Communities. The applications for virtual net-metering have an increasing trend (increase 29% during 2021-2022), while the increase of net-metering for Energy Communities is even more (89% in country-level). However, there is still a gap between the electrified and non-electrified installations. Specifically, in May 2022, there were 5 electrified and 48 non-electrified RES installations with virtual net-metering, which correspond to 3.6% and 9.5% of the total electrified and non-electrified RES with net-metering. The graphical presentation appears in the following figure.

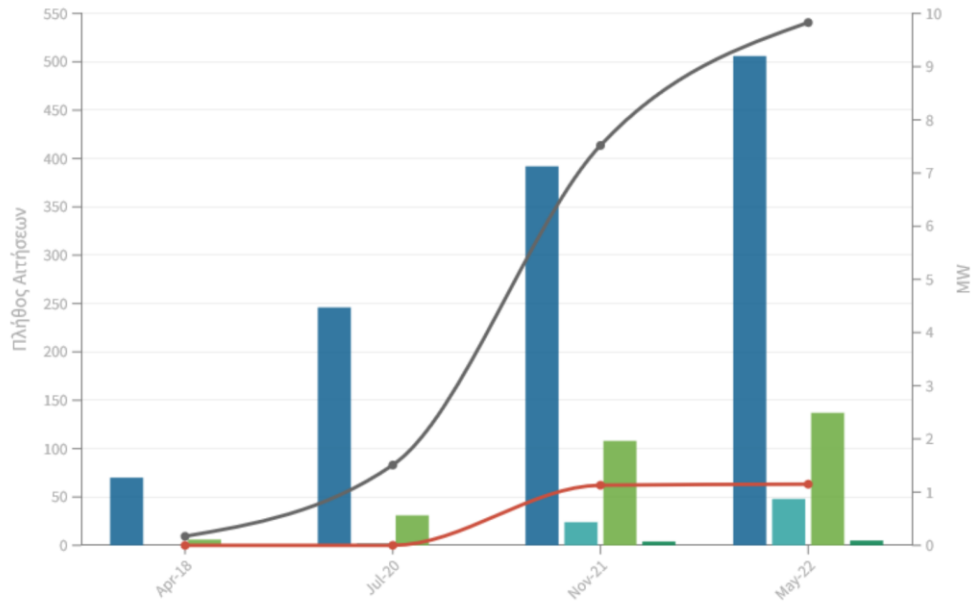


Figure 2 RES installations with virtual net-metering in Energy Communities: blue colour: non-electrified applications, green colour: electrified applications, red curve: total non-electrified RES (MW), black curve: total electrified RES (MW)

An interesting part of the research regards the number of Energy Communities in the lignite areas, such the district of Western Macedonia. The following Table describes the distribution of Energy Communities comparing the data of November 2021 with the respective of May 2022. It is noticed that in Western Macedonia 70 new Energy Communities were installed, which corresponds to an increase of 40%. Most of the Energy Communities are installed in the lignite areas of Florina and Kozani.

Table 1 Distribution of Energy Communities in Lignite areas of Western Macedonia

Distribution of Energy Communities in Lignite areas of Western Macedonia					
	Grevena	Florina	Kozani	Kastoria	Total
November 2021	2	63	103	8	176
May 2022	15	86	137	8	246

4. Assessment of obstacles and potential for development of ECs

The most recent Law in Greece (Law 5037/2023) has included the provisions of the European Directives and introduces the terms of “Renewable Energy Community (REC)” and “Citizen Energy Community (CEC)”, which is very positive and in the correct direction. However, since this law is very recently in force, it is difficult to identify the practical issues that may arise regarding the Energy Communities. This law facilitates the establishment of new Energy Communities in the aforementioned forms, however many problems are still existing and missing from the legislative and regulatory framework.

Many areas within Greece are still considered as saturated, which means no further RES can be installed, due to issues of the distribution grid. Even the fact that the Energy Communities have a priority in the examination of their application for grid connection, they still have to wait a large time before getting the final approval.

Another important problem concerns the funding of the Energy Communities. The law does not provide any specific governmental subsidy or supporting scheme in order to overcome the financing. A solution could be to distribute part of the CO2 auctions income directly to Energy Communities and the establishment of a specific cash especially for Energy Communities in order to facilitate the bank loans (e.g., smaller interest). Furthermore, in the recent National Plan for Energy and Climate, there isn't any specific quantified target regarding the number of Energy Communities in Greece.

Finally, another issue concerns the actual active participation of the citizens in the Energy Communities and the local government. The participation is still very restricted.

5. Local government's role in energy communities and citizen energy initiatives

Many Energy Communities have already been established having as members the local government. Specifically, the Municipality of Tavros in Attica with the National Technical University of Athens, the Municipality of Kavala with the Region of Eastern Macedonia and Thrace for installing a PV park of 16MW, the Municipalities of Florina and Prespes, the Municipality of Riga Fereou, Municipality of Actio-Vonitsa, the Region of Eastern Crete, the Municipality of Mesologgi, the Municipality of Trikala, etc.

As it has been mentioned, the local government (first and second grade) can be part of REC or CEC, according to Law 5037/2023. Furthermore, for enhancing the participation of the local government in Energy Communities, the Law 5037/2023 permits the installation of RES in buildings of public benefit for virtual net-metering, such as the Municipal Water Supply and Sewerage, municipal childcare and infant schools, primary and secondary schools, public sport centers, facilities and networks street lighting, water supply and drainage facilities, as well as other buildings, infrastructure or facility that either belongs to or serves the needs of the local government. The production and consumption energy measurement units for considering the virtual net-metering can be of the same or other legal entity.

Furthermore, according to the Law 5037/2023, the RES installation by RECs or CECs with participation of the local government should support vulnerable consumers and address the energy poverty of citizens of the relevant municipality or region who live below the poverty line. The RES installations are permitted to participate in virtual net-metering, where the installed power of the RES equals to the aggregated power of the consumption energy meters.

6. Overview of the recent crowdfunding initiatives

There is one donation-based funding platform for projects, which helps Greek idea to come to life and it names “Jump Start Greece”. This platform (<http://www.jumpstartgreece.com/>) has been founded in 2016 in order to serve as a tool that will connect people, communities and Non Profit Organisations operating in Greece with people around the world. The target is to promote innovative ideas, which are difficult to find funding from traditional sources (e.g., banks).

Another crowdfunding platform is the “Give & Fund” platform, which serves as meeting, communication and networking point between creators, startups, NGOs and companies that are interested to find or provide funding through crowdfunding (<https://www.giveandfund.com/>). This platform was founded by Ioannis Chatzibeis in 2013 to help people change their lives through its easy-to-use fundraising structure. Following the creator’s philosophy, anyone can start a campaign or choose to do philanthropic activities by donating to active missions.

A very important action in terms of crowdfunding concerns the program called “act4greece”, which provides an innovative initiative for the promotion of social and development banking (<https://www.act4greece.gr/>). It is supported by large companies (EKO, Aegean Airlines, Sklavenitis and MediaMarkt), while has strategic partnership with various foundations and international organisations, including John Latsis Foundation, Bodossaki Foundation and Onassis Foundation. The program covers projects in 7 axes: 1) welfare, health and solidarity, 2) social economy and entrepreneurship, 3) culture and cultural entrepreneurship, 4) young and innovative entrepreneurship, 6) research education and training, and 7) sport activities. The financial resources collected through act4Greece are donations, and in the future, once the appropriate institutional lending (mainly microloans), but also the participation in the same capital of a company, supporting start-up innovative business initiatives.

Other founded platforms for crowdfunding that are known in Greece are the following according to DevelopGreece:

- Kickstarter
- GoFundMe
- Indiegogo
- Whydonate

7. Assessment of the availability and effectiveness of the crowdfunding initiatives in forming of the citizen energy projects

The crowdfunding tool is not well-known in Greece and it is not yet used as a financial tool for funding energy projects or energy communities.