

September 2022

ENERGY COMMUNITIES IN GREECE AND ITS LIGNITE AREAS #2

REVIEW OF DEVELOPMENTS



Energy Communities in Greece and in its lignite areas #2

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Summary

The analysis of relevant available data by the General Commercial Registry (GEMI) and the Hellenic Electricity Distribution Network Operator (HEDNO) on energy communities in Greece, on the one hand, reveals an increased interest in energy communities; on the other hand, however, it highlights several issues hindering their development. In particular:

1. Compared to November 2021, the number of active energy communities has increased by 21% in Greece overall, by 40% in Western Macedonia and by 5.5% in Megalopoli; this growth underscores the continued momentum in the establishment of energy communities. Nevertheless, the interest of local communities in establishing energy communities does not match their capability to implement projects, as the Regions with the highest installed capacity from projects of energy communities do not coincide with those where the highest number of energy communities is recorded.

2. In May 2022, 12% of the total installed capacity of low and medium voltage RES plants corresponds to projects by energy communities, while pending requests by energy communities account for 20.3% of the capacity requested by low and medium voltage RES projects in Greece.
3. By May 2022, the recorded installed capacity of RES projects by energy communities in low and medium voltage in Greece overall and in lignite areas in particular was 613 MW and 40.5 MW, respectively. Nevertheless, virtual net-metering projects by energy communities merely account for 1.15 MW and 0.03 MW of installed capacity nationwide and in lignite areas, respectively. Therefore, so far, the 'instrument' of energy communities has been used primarily to make a profit from the sale of electricity to the grid rather than to meet own electricity needs.
4. However, future prospects are highly optimistic, as connection requests by energy communities with regard to virtual net-metering projects nationwide have increased by 89% compared to November 2021. In fact, under the current circumstances, in view of the ongoing energy crisis, energy communities are invaluable in addressing energy poverty and supporting households that opt for collective self-production of electricity.
5. Over the period 2021-2022, there is a higher increase in requests regarding low and medium voltage RES projects in Western Macedonia (9%) compared to Greece as a whole (5%), which reflects that interest in RES projects is flourishing in this Region; this is not the case in Arcadia, where the interest appears to be significantly lower. In the Region of Western Macedonia, projects by energy communities account for 14.9% of total installed RES capacity.
6. The highest demand in virtual net-metering projects by energy communities is recorded in the Region of Western Macedonia. Connection requests increased from November 2021 to May 2022 (14 requests), highlighting the growing interest in using the virtual net-metering mechanism to meet own electricity needs in this region.
7. The discrepancy between electrified and non-electrified RES projects by energy communities is significant. As of May 2022, there are 4,772 pending applications for such projects with a total capacity of 3,863.1 MW, while only 879 low and medium voltage projects with a capacity of 613 MW have been electrified nationwide. The electrified capacity of energy communities' projects represents 13.6% of the total requested capacity of low and medium voltage RES projects by energy communities nationwide. The electrification rate of RES projects by energy communities is low, turning the spotlight on the issues of grid availability for projects by energy communities and the obstacles of bureaucracy.
8. The nature of energy communities remains predominantly for-profit. Merely 19 public-benefit energy communities -out of a total of 246 energy communities- have been recorded in Western Macedonia, while there is only one public-benefit energy community in the Regional Unit of Arcadia. Therefore, energy communities are emerging as yet another business activity, while their potential as public-benefit institutions remains unexplored.
9. A legislative amendment has abolished the required designation of a municipality or a municipal district within Greece as the seat of an energy community. Thus, there is now greater flexibility in designating the seat of energy communities; this works significantly in

their favor, as it constitutes an important step towards releasing the resources of the previous and current programming periods, as well as the Green Fund's revenues from the 2018 CO₂ auctions, in order to finance projects by energy communities.

10. Nevertheless, institutional changes to promote citizen participation in the energy transition through energy communities have been minimal: the relevant European Directives have not been integrated into national Law, while there remain unresolved issues regarding the allocation of electricity space to projects by energy communities that are mainly aimed at meeting own or local energy needs.
11. It is evident that energy communities are showing a growing interest in introducing their projects into the low and medium voltage RES market, while virtual net-metering is appealing to energy communities aiming to meet their own electricity needs. Thus, the adaptation of the grid so as to allocate sufficient 'electrical space' to projects of energy communities is of paramount importance, as is the provision of institutional and financial support for these efforts.

Finally, based on the analysis, this review of developments recommends policy measures to support and strengthen energy communities, such as the following: provision of subsidies for part of the cost of installing RES projects by public-benefit energy communities (whether the latter are composed by local authorities or natural persons), whose main objective is meeting their own electricity needs through net-metering; distinction between energy communities and other beneficiaries of the development bill, by the standard of the Just Development Transition Program (PDAM) 2021-2027, so as to both enhance citizen participation in the just energy transition and reduce energy poverty; activation of the resources that have been earmarked for energy communities and definition of specific quantitative targets for the latter in the National Energy and Climate Plan (NECP) that is currently under review.

Introduction

The energy crisis that began in June 2021 as a crisis in the fossil gas market, along with the recent geopolitical developments following Russia's invasion of Ukraine, have underscored the urgent need to accelerate independence from fossil fuels and transition to clean forms of energy. At the same time, these conditions have brought to the fore the potential of Renewable Energy Sources (RES); through the latter, citizens have the opportunity not only to address energy poverty but also to meet their own energy needs as self-producers, individually or collectively.

In particular, the European Commission's REPowerEU plan¹, which aims to reduce Europe's dependence on Russian fossil gas and accelerate the green transition, will allocate the vast majority of its funds – about €300 billion – to the development of large- and small-scale RES and electricity grids, as well as to projects aimed at expanding electricity storage, saving and increasing energy

¹ European Commission (May 2022), REPowerEU: affordable, secure and sustainable energy for Europe, <https://bit.ly/3Q58t34>

efficiency, accelerating the pace of installation of heat pumps for heating electrification, and increasing the production of biomethane and green hydrogen².

More specifically, in the context of REPowerEU, the European Solar Energy Strategy³ is of particular interest, as it emphasizes citizen participation and the use of RES, either individually or collectively, to achieve European objectives. This strategy aims to install more than 320 GW of large and small-scale solar photovoltaics by 2025 (more than doubling 2020 levels) and nearly 600 GW by 2030. According to REPowerEU, this installation rate could lead to the substitution of 9 bcm of fossil gas consumption per year by 2027. In order to address the challenges in the short term, four initiatives have been proposed: a) harnessing rooftop solar energy, b) simplifying procedures, c) establishing a large-scale EU skills partnership for onshore renewables and d) a European Alliance for the solar PV sector. Specifically, measures include the mandatory installation of photovoltaics in new buildings and the establishment of at least one Renewable Energy Community in each municipality with a population of at least 10,000 inhabitants by 2025.

At the same time, the fact that the Territorial Just Transition Plans for EU's lignite areas are now being drafted and/or awaiting approval by the European Commission⁴ favors the inclusion of both small-scale RES projects by citizens and energy communities' (EnCom) projects in the planning of the transition, always in line with the guidelines of the REPowerEU plan.

Therefore, the present circumstances are extremely favorable for strengthening citizen participation in the energy transition through energy communities, both across Europe and in Greece, while at the same time critical with regard to ensuring that the energy transition will be just and leave no one behind.

Following-up on our November 2021 review of developments regarding energy communities in the lignite regions of Greece⁵, this report offers a critical assessment of their current state. Specifically, this review presents an outline of the relevant institutional developments and an analysis of the challenges that energy communities face, while it highlights the opportunities that exist for development; finally, it concludes with recommendations aimed at strengthening the institution of energy communities in the context of the Just Transition.

Energy Communities (EnCom) in numbers

² According to the European Commission's announcement, €278 billion of the REPowerEU budget (€300 billion) is expected to be allocated to investments in savings, biomethane, green H₂ storage and RES, <https://bit.ly/3cRyuUs>

³ European Commission, May 2022, EU Solar Energy Strategy, <https://bit.ly/3zr0WV2>

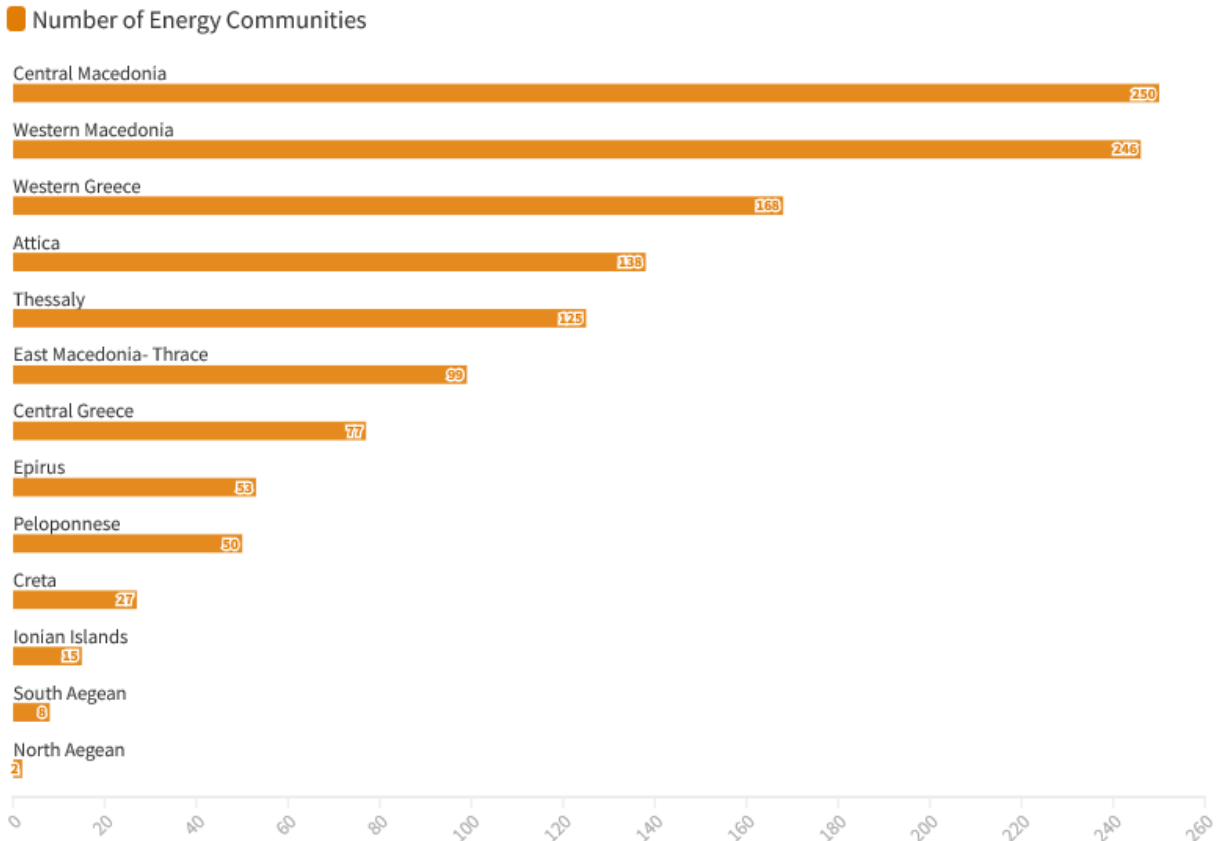
⁴ Territorial Just Transition Plans are a necessary condition for the absorption of Just Transition Mechanism resources by the lignite areas. These plans should, inter alia, identify the territories and sectors to be funded, define specific goals and actions to which the resources will be channeled, and describe the governance mechanisms and structures that will operate in order to implement the transition in each Member State..

⁵ The Green Tank, November 2021, Review of Developments. Energy communities in Greece's lignite areas, <https://bit.ly/3NXsVRF>

Nationwide

Number of Energy Communities

According to May 2022 data, in Greece, there are 1217 energy communities registered in the General Commercial Registry (GEMI)⁶ as active, 33 energy communities that have been pre-registered⁷ and 122 energy communities that have been deleted and cleared. In November 2021, when the previous review was published, the number of active energy communities⁸ in Greece was 1036; therefore, recent figures indicate a 21% increase over six months. The distribution of active energy communities across the country's 13 Regions in May 2022 is shown below, in Figure 1.



Source: General Commercial Registry (GEMI)

Figure 1: Distribution of active energy communities (EnCom) by Region, May 2022

We observe that the majority of active energy communities are located in Central Macedonia (250); Western Macedonia ranks at a very close second place (246), even though it has a much smaller

⁶ GEMI, 2021, <https://bit.ly/3ozIsQN>

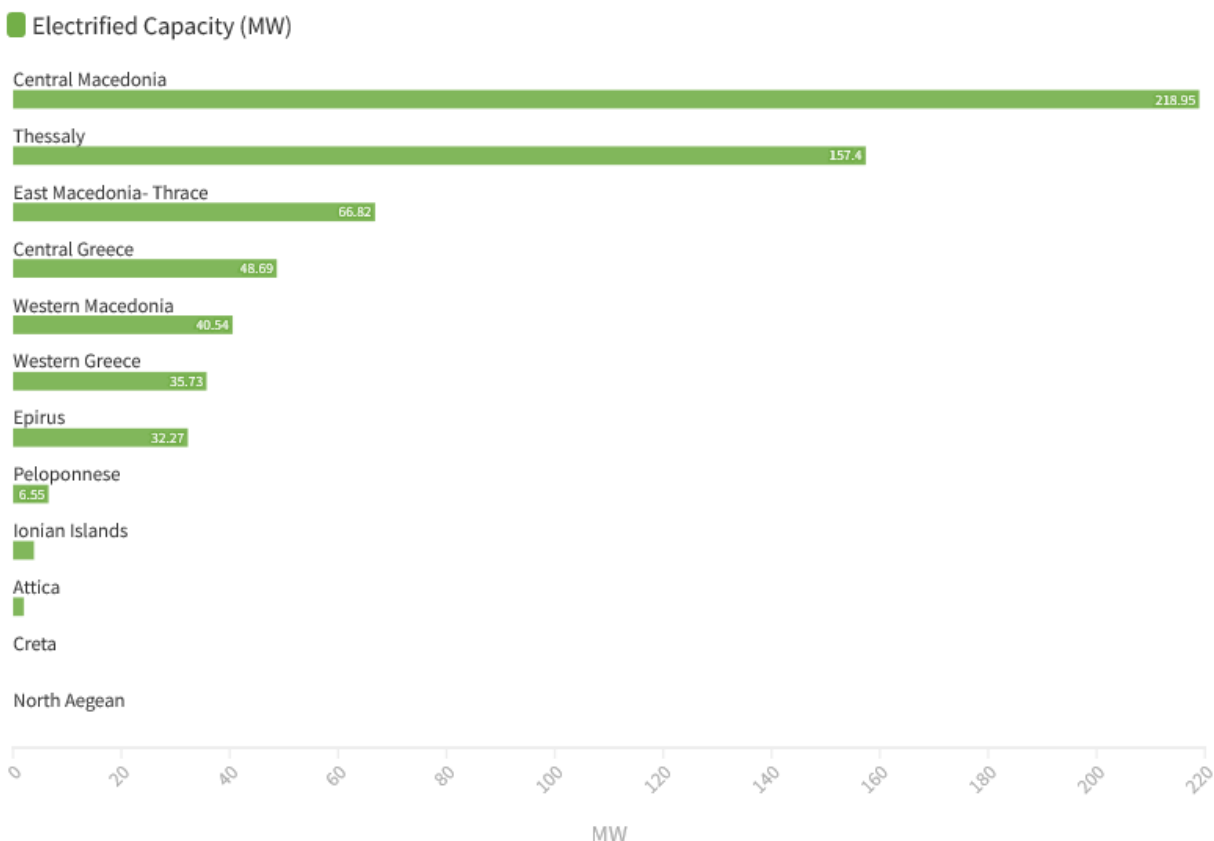
⁷ The process of starting a business begins with pre-registration at the competent chamber of commerce, where the distinctive title of the business is registered. The pre-registration certificate is valid for 2 months and the business must complete the start-up procedure (activity registration at the tax office, seat designation, TIN etc.) within this time period).

⁸ 'Active' energy communities are considered those registered in the General and Commercial Register (GEMI) as active and pre-registered.

population. These are followed by Western Greece (168), Attica (138) and Thessaly (125), while very little use of the institution of energy communities is observed on the islands.

The above ranking changes significantly when the implementation of projects by energy communities is taken into account, namely, with regard to projects that have already been connected to the grid. The requests for the connection of low and medium voltage RES and Combined Heat and Power (CHP) projects to the grid maintained by the Hellenic Electricity Distribution Network Operator (HEDNO)⁹ indicate (Graph 2) that Central Macedonia remains in first place, boasting the highest installed capacity of RES projects by energy communities (218.95 MW). Next, however, ranks Thessaly (157.4 MW), the region that came in fifth in terms of the number of energy communities, followed by Eastern Macedonia - Thrace (66.82 MW), Western Macedonia (40.54 MW) and Western Greece (35.73 MW), which ranked, respectively, sixth, second and third in terms of the number of energy communities. The above variations illustrate that local communities' interest in establishing energy communities does not match the rate of project implementation. It could be assumed that the regions boasting higher installed capacity have greater grid space availability and better infrastructure to support the development of projects by energy communities.

⁹ HEDNO, File of Requests for the connection of RES and CHP plants under the competence of HEDNO (May 2022) <https://bit.ly/303PJMj>



Source: HEDNO (low- medium voltage)

Figure 2: Capacity of installed EnCom projects in Greece, May 2022

Projects by Energy Communities in Low – Medium Voltage

Since 2018, when the energy communities were established, low and medium voltage RES projects overall have followed an upward trend, as illustrated in Figure 3, which presents the capacity of electrified and non-electrified projects and the number of relevant connection requests based on HEDNO's official data¹⁰. The number of requests rises over the period 2018-2022, with a higher increase observed between July 2020 and November 2021 (21.5%) and a lower increase recorded between November 2021 and May 2022 (5%). Nonetheless, the installation rate of RES projects is lower; namely, the number of electrified projects does not increase at a respective pace. No significant change is observed in the number of electrified RES projects during the period 2018-2020, while the project installation rate increases by 11% in 2021 and 13% in 2022. Specifically with regard to 2022, we observe that the increase in electrified projects (13%) is higher than the rise in requests (5%), while the capacity of non-electrified projects increases by 4%, namely, much less than over the previous period 2020-2021 (41%).

¹⁰ The time periods included in the analysis indicate the perios when HEDNO publishes data regarding requests for RES and CHP low and medium voltage projects. They do not correspond to chronological years.

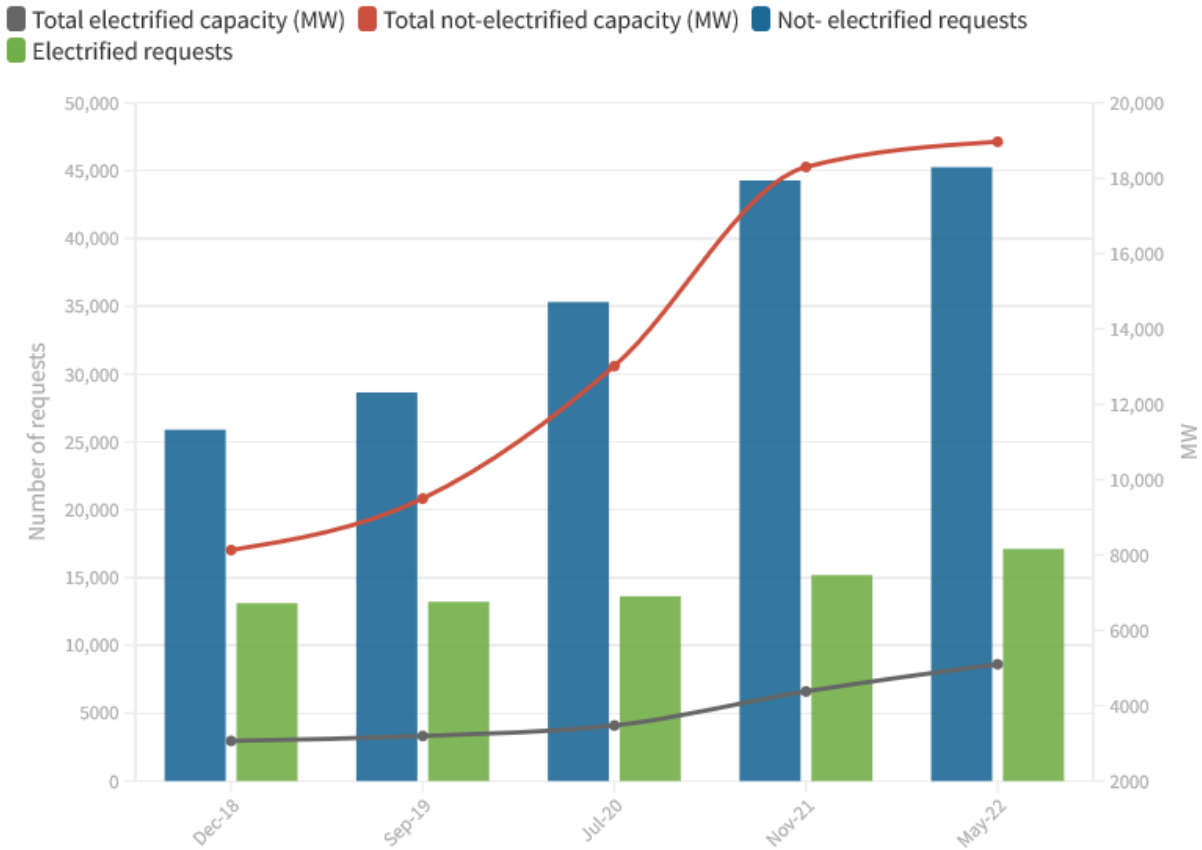
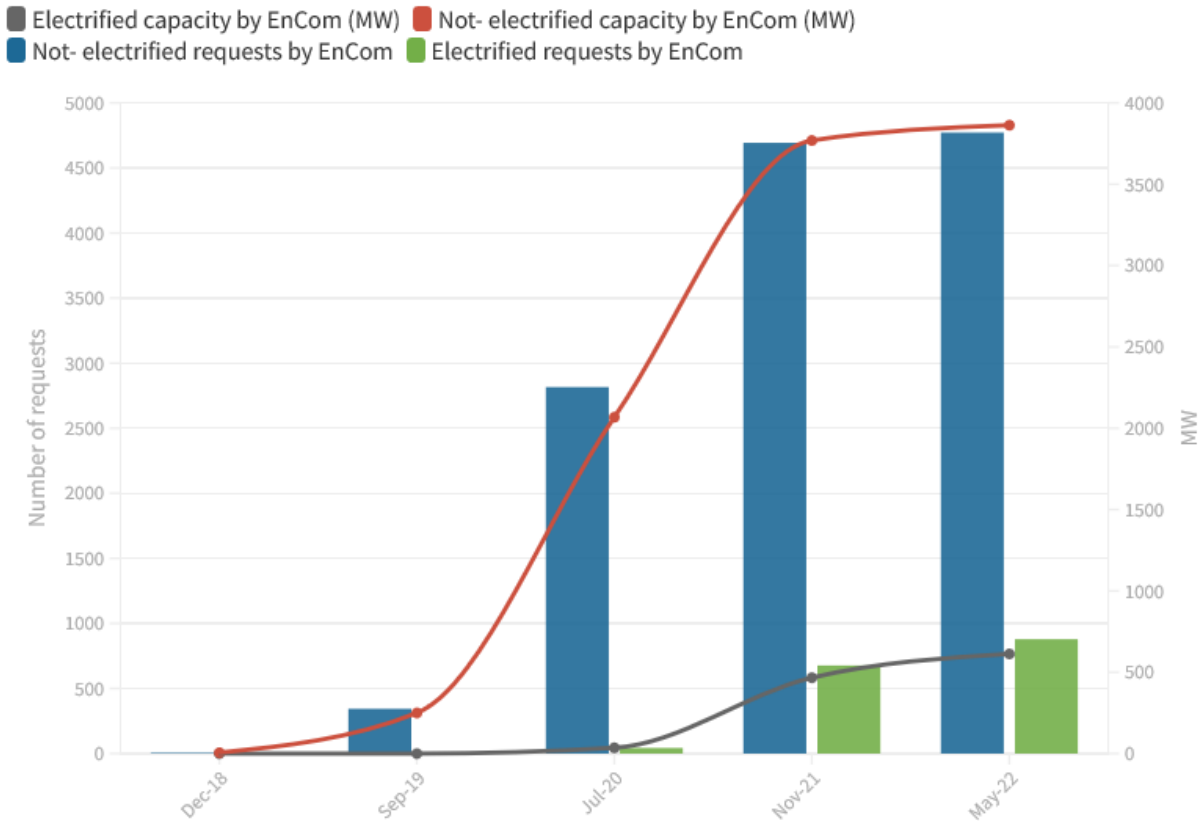


Figure 3: RES projects in Greece (2018-2022, low - medium voltage)

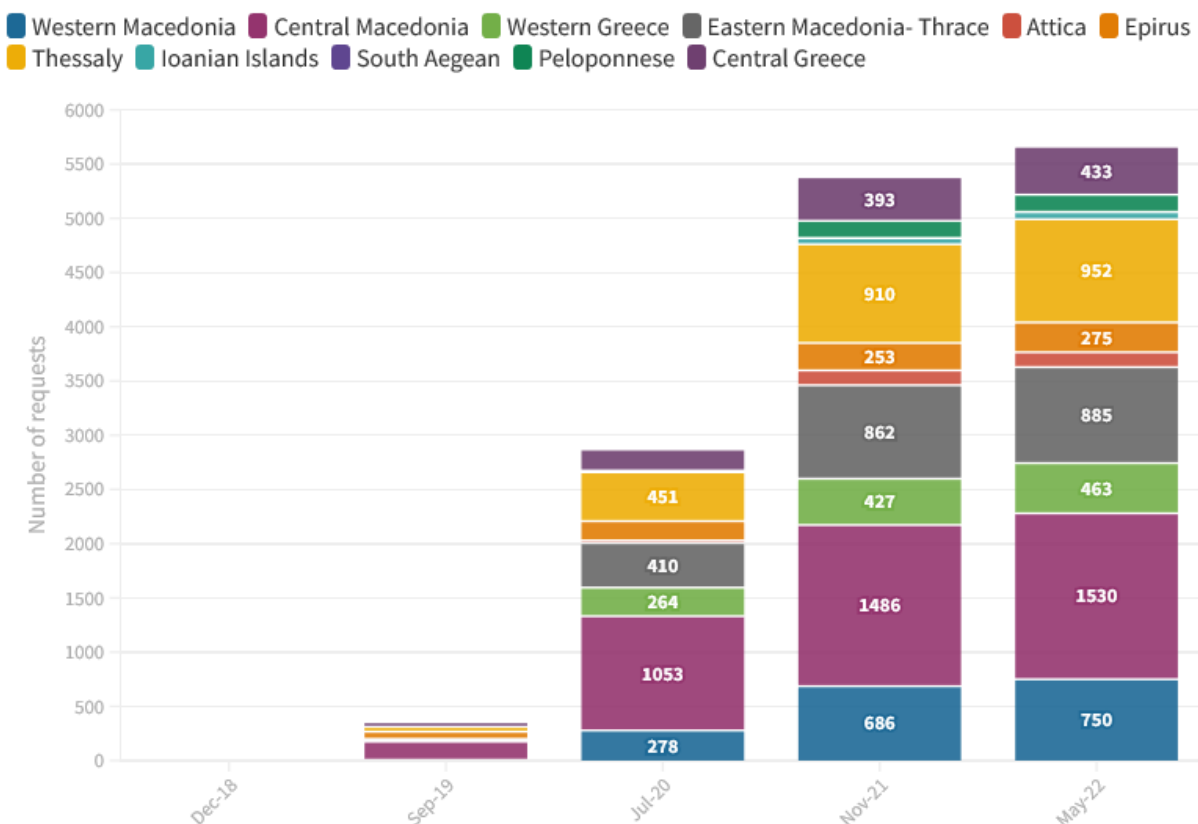
As observed in Figure 4, the course of RES project development by energy communities alone resembles that of RES projects overall. In particular, the first RES project requests by energy communities were filed in 2019 (344 project connection requests), while the following year (2020) saw a surge (731%). In 2020, the first RES projects by energy communities were connected (43 projects) with a capacity of 35.36 MW. November 2021 saw a rise in electrification requests by projects by energy communities (88%) and the largest increase in connected projects by energy communities (677 projects with 466.5 MW of installed capacity). Between November 2021 and May 2022, the increase in connection requests for RES projects by energy communities was smaller (5%) but equal to that of RES projects overall in the country, while the corresponding capacity of non-electrified projects showed a slight upward trend (2%). As in RES projects overall (Figure 3), both the number and capacity of electrified projects continued to grow (30% and 31%, respectively) but at a reduced rate over the six-month period of November 2021-May 2022, as compared to the previous period.



Source: HEDNO

Figure 4: Energy communities RES projects in Greece (2018-2022, low-medium voltage)

It is also interesting to observe the distribution time-line of connection requests for RES projects by energy communities in the 13 Regions from 2018 to date, which is presented in Figure 5. Requests peaked in most of the country's Regions over the period 2020-2021. Specifically, particular growth was noted in the Regions of Central Greece (112%), Eastern Macedonia - Thrace (110%), Thessaly (101%) and Western Macedonia (88%) and, at a lower rate, Central Macedonia (41%). Over the same period, requests in the Regions of Peloponnese and Attica increased ninefold and fourfold, respectively. The six-month period of November 2021-May 2022 in Greece was marked by an overall deceleration. The Ionian Islands recorded the largest increase in the number of connection requests for RES projects by energy communities (17%), followed by Central Greece (10%), Western Macedonia (9%), Epirus and Western Greece (8%). Even though a very small increase was recorded in Central Macedonia and Thessaly (3% and 5%, respectively), these two regions had once again the highest number of requests (1530 and 952, respectively). RES projects in the Peloponnese and Attica Regions, which showed the highest increase in 2020-2021, remained stagnant over the period of November 2021-May 2022. It is worth noting that the increase recorded in Western Macedonia (9%) over the November 2021-May 2022 six-month period exceeded that of the country as a whole (5%). This highlights the increased interest in RES projects by energy communities in the region that for decades has constituted the lignite heart of the country. In the Peloponnese, and particularly in the lignite area of Megalopoli, interest was significantly lower.



Source: HEDNO

Figure 5: EnCom RES project requests by Region (2018-2022, low - medium voltage)

With regard to RES projects by energy communities across Greece, according to HEDNO's data, there was a total of 879 projects in May 2022, with a total installed capacity of 613 MW. Of particular interest is the fact that project requests from energy communities amounted to 4.476 MW out of a total of 24.069 MW of RES projects nationwide; namely, RES projects by energy communities account for 18.5% of Greece's potential RES capacity at low and medium voltage. While the current installed capacity of projects by energy communities (613 MW) represents 12% of the total installed capacity of RES projects in Greece (5,100.5MW), the 4,772 pending requests by energy communities account for 20.3% of low and medium voltage RES projects' requested capacity nationwide. Similarly, in November 2021, 11% of Greece's total installed capacity from RES at low-medium voltage corresponded to projects by energy communities and the pending requests by energy communities accounted for 20.5% of low and medium voltage RES projects' requested capacity nationwide. The above figures highlight the consistent participation of energy communities in Greece's RES market over the November 2021-May 2022 six-month period.

Virtual Net-Metering

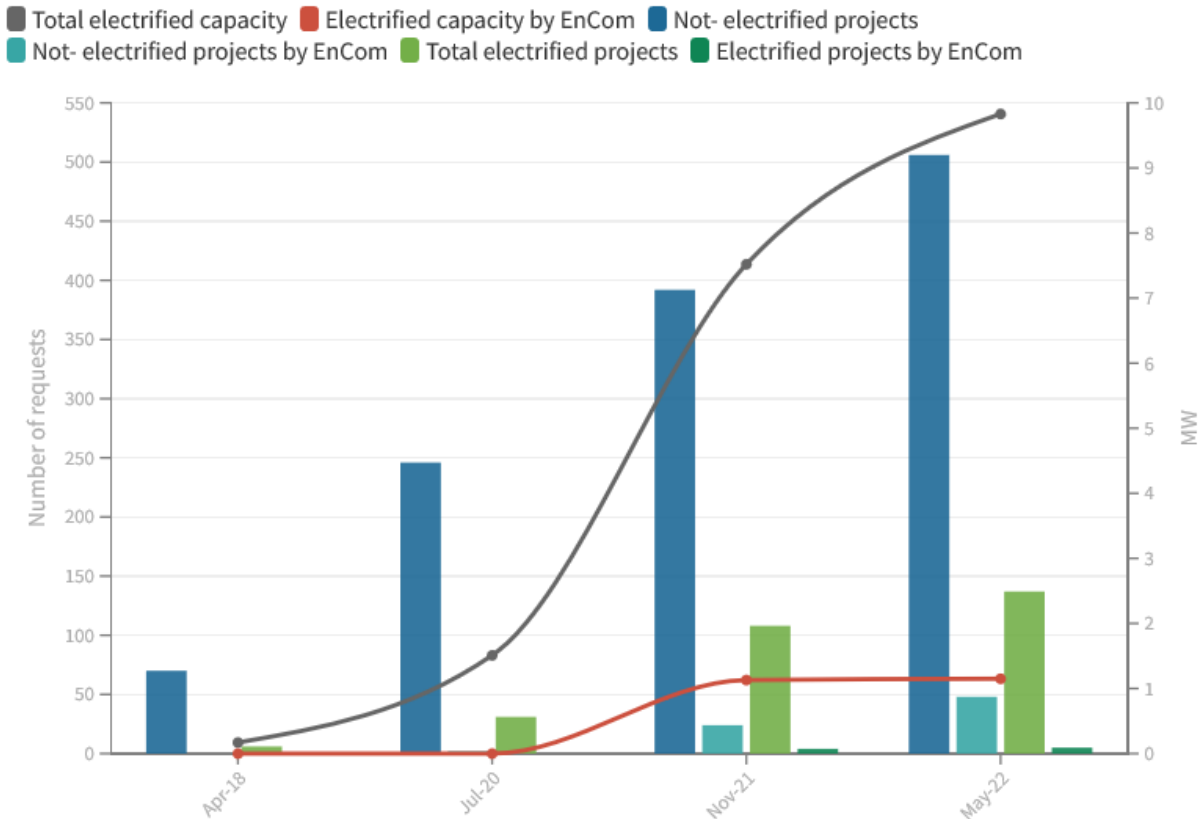
RES market participation, as presented above, constitutes merely one dimension of the activities of the energy communities. Beyond this purpose, energy communities are also established so as to meet the energy needs of their members through RES. To this end, energy community members use

virtual net-metering. Hence, the data from HEDNO on virtual net metering¹¹ can be utilized to determine energy communities' level of coverage of own electricity needs via RES projects.

In May 2022, out of 643 requests nationwide, only 53 were submitted by energy communities. The course of requests for virtual net-metering overall and from energy communities in particular, as well as the installed capacity of the respective projects over the period 2018-2022 is presented in Figure 6. The total requests for net-metering projects follow an upward trend (29% over the period 2021-2022), while, compared to November 2021, there is a marked increase in requests by energy communities for connection of virtual net-metering projects nationwide (89%). However, as in the case of low-medium voltage, non-electrified projects significantly outnumber electrified ones. In particular, in May 2022, energy communities accounted for 5 out of a total of 137 electrified virtual net-metering projects and for 48 non-electrified net-metering projects out of a total of 506 requests (3.6% and 9.5%, respectively); these figures highlight the momentum that energy communities are gradually gaining in the use of the virtual net-metering mechanism.

Nonetheless, the delay in the electrification of virtual net-metering projects by energy communities is troublesome. From November 2021 to May 2022 only one (1) energy community project (0.02MW) was electrified; this is illustrated in Figure 6 by the nearly flat line that corresponds to the electrified capacity of projects by energy communities for this time period. Throughout Greece, only 1.15MW of virtual net-metering projects by five (5) energy communities were electrified from 2020 to May 2022.

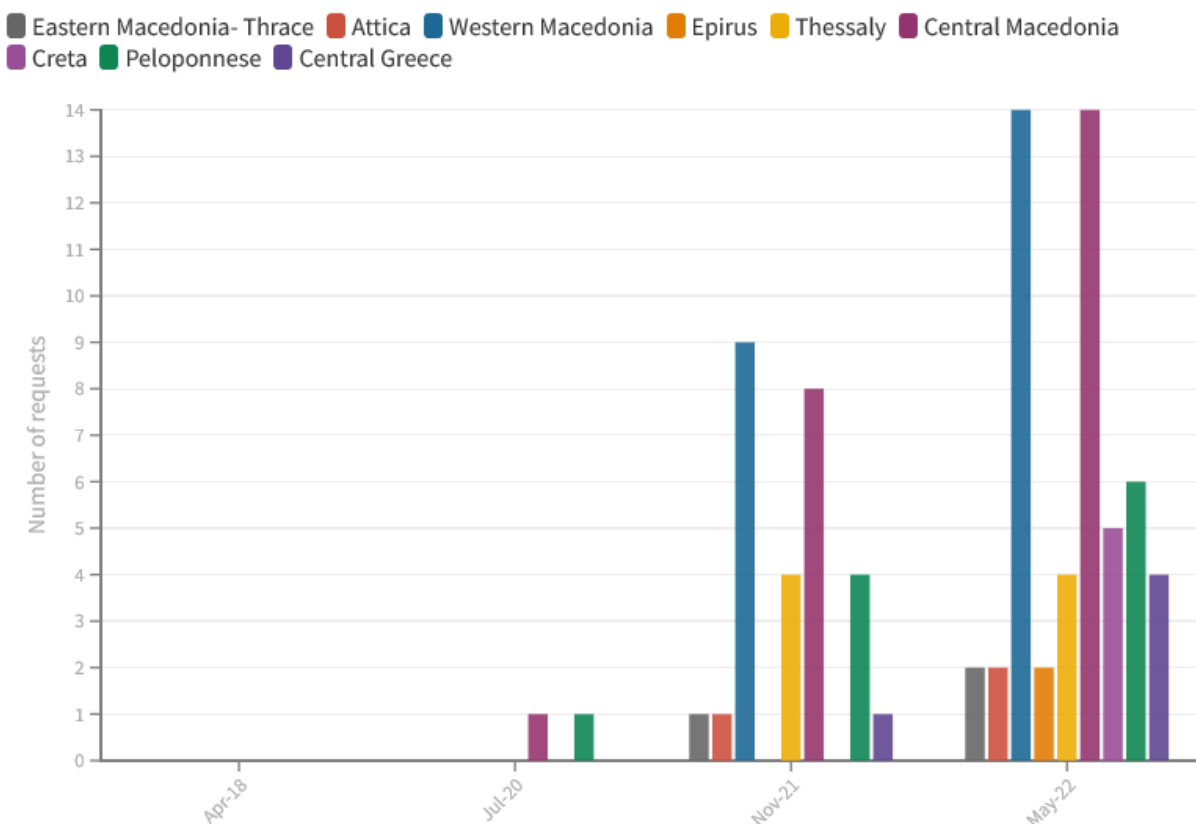
¹¹ HEDNO, File of Requests for the Mainland & the Interconnected Islands (May 2022), regarding requests of self-producers with virtual net-metering, <https://bit.ly/3yYyt8w>



Source: HEDNO

Figure 6: Virtual net-metering: Project requests and capacity, overall and by EnCom (2018-2022)

Figure 7 shows the distribution of virtual net-metering RES projects by energy communities in Greece's 13 Regions for the period 2018-2022. As illustrated, energy communities essentially started using net-metering in 2021. Moreover, the lignite region of Western Macedonia shows the highest demand for virtual net-metering projects; in fact, in 2022, it shares the first place with regard to demand with Central Macedonia. Specifically with regard to Western Macedonia, over the six-month period of November 2021 - May 2022, the increase in requests for virtual net-metering projects by energy communities was much higher (56%) than that for RES projects in low and medium voltage (9%), a fact that is noteworthy given that this Region ranks fourth in terms of the number of requests by energy communities for low and medium voltage RES projects. This trend can be observed in other regions as well. For instance, even though Central Macedonia traditionally ranks first in the number of requests for low and medium voltage RES projects, this Region too experienced a larger increase in requests for RES projects with virtual net-metering by energy communities (43%) than for RES projects in the low and medium voltage by energy communities (3%). The Peloponnese, which lags significantly behind Western Macedonia in projects by energy communities overall, ranked third in 2021 and 2022 with regard to virtual net-metering projects; furthermore, in 2020, it was one of the first two Regions to submit requests for virtual net-metering projects. Nevertheless, it should be stressed that none of the above projects in the Peloponnese relate to the lignite area of Megalopoli.



Source: HEDNO

Figure 7: EnCom Requests for virtual net-metering projects by Region (2018-2022).

Lignite Regions

Focusing now on the evolution of energy communities in the lignite regions, GEMI's data indicate that they amount to 246 in Western Macedonia and 19 in Arcadia. Table 1, below, displays their distribution and expansion since the previous recording (November 2021):

Distribution of active energy communities in the lignite regions					
Region of Western Macedonia					
	<i>Grevena</i>	<i>Florina</i>	<i>Kozani</i>	<i>Kastoria</i>	<i>Total</i>
November 2021	2	63	103	8	176
May 2022	15	86	137	8	246
Regional Unit of Arcadia					
	<i>Megalopoli</i>	<i>Tripoli</i>	<i>Other areas</i>	<i>Total</i>	
November 2021	2	13	3	18	
May 2022	2	14	3	19	

Table 1: Distribution of active energy communities in the lignite areas.
GEMI data analysis (May 2022)

Western Macedonia

Greece's two lignite regions differ significantly with regard to the development of energy communities and their characteristics. From November 2021 to May 2022, 70 new energy communities were launched in Western Macedonia (an increase of approximately 40%), 57 of which were established in purely lignite areas. Specifically, the majority of energy communities in Western Macedonia have been established in the purely lignite areas, namely in Florina and Kozani, and their development continues predominantly in these areas; this can be attributed to the energy tradition of these two regional units.

In May 2022, in Western Macedonia, the capacity of electrified RES projects by energy communities in low and medium voltage amounted to 40.5MW (69 projects), which accounts for 14.9% of the total installed capacity of RES projects in this Region. It is worth noting that, over the six-month period of November 2021-May 2022, the number of electrified projects and the electrified capacity increased by 60% and 65%, respectively. Moreover, the 681 pending requests for the connection of RES projects by energy communities constitute 19.1% of all pending connection requests, while their capacity (565.2 MW) represents 31.7% of the total capacity of pending low and medium voltage RES projects in the Region of Western Macedonia.

With regard to the coverage of own energy needs, HEDNO's data on Western Macedonia show that only 14 out of a total of 66 virtual net-metering projects (both electrified and non-electrified) belong to energy communities¹²; these are photovoltaic projects with a total capacity of 8.16MW. More specifically, so far, only one (1) energy community net-metering project has been electrified (with a capacity of 0.03 MW), while the remaining 13 requests (8.13MW) are pending.

In the Region of Western Macedonia, the requests for connection of virtual net-metering projects specifically by energy communities increased by 56% compared to November 2021, out-rivalling the growth rate (16%) of such projects overall in the Region; this trend highlights citizens' increasing tendency to collaborate through energy communities in order to meet their own electricity needs. Compared to November 2021, the largest increase in virtual net-metering project requests was observed in Kozani (22%), while no change was recorded in Florina -nor in Megalopoli, Arcadia (Table 2). However, despite the increase in virtual net-metering project requests, just one (1) project by one (1) energy community in Western Macedonia with a capacity of 0.03 MW had been electrified by May 2022.

Arcadia

During the period November 2021-May 2022, only one (1) new energy community was founded in the Regional Unit of Arcadia; what is more, it was established in Tripoli rather than in the lignite area of Megalopoli. Clearly, this demonstrates a weaker dynamic compared to the lignite regional units of Kozani and Florina in Western Macedonia, which saw the establishment of 57 new energy

¹² The remaining requests concern citizens, agricultural cooperatives and other natural and legal persons other than energy communities.

communities over the same time period. Overall, by May 2022, there were 16 energy communities in Arcadia, merely two (2) of which had been established in Megalopoli.

As of May 2022, the electrified capacity of projects by energy communities in Arcadia has reached 2.3MW (five (5) projects), which accounts for merely 1.5% of the Regional Unit's total installed capacity of RES projects; moreover, all five projects are located in Tripoli, rather than in the lignite area of Megalopoli. Despite the fact that, to date, no energy community has completed a RES project in the area of Megalopoli, the eight (8) pending requests for the connection of RES projects by energy communities constitute 25.8% of all pending connection requests and represent 52.5% of total requested capacity in the area.

To date, the mechanism available to energy communities aiming to meet their own electricity needs has not found a fertile ground in Arcadia; until May 2022, energy communities had not submitted any requests for virtual net-metering in this Regional Unit. This comes in stark contrast to the momentum observed in Western Macedonia, where the respective requests increased by 56% over the six-month period of November 2021-May 2022.

Public-benefit energy communities

The founding legislation regarding energy communities (Law 4513/2018) allows their establishment as either for-profit¹³ or not-for-profit¹⁴. However, all energy communities can engage, inter alia, in low-medium voltage RES projects to trade electricity or in virtual net-metering projects to meet the electricity needs of its members.

In the present analysis, energy communities in lignite regions shall not be categorized as for-profit and not-for-profit, but, instead, as for-profit or public-benefit. The latter shall include non-profit energy communities, as well as energy communities established by local authorities (whether for-profit or not-for-profit), which by definition aim at the common good. Public-benefit energy communities usually employ net-metering to meet their own energy needs. On the contrary, for-profit energy communities offer their members the economic benefits derived from trading the electricity produced on the market.

In Western Macedonia, the nature of energy communities remains predominantly for-profit: there are only nineteen (19) public-benefit energy communities out of a total of 246. This fact illustrates that energy communities are developing faster as a business activity and slower as a mechanism to meet own electricity needs. Nonetheless, it is worth noting that this Region is experiencing a significant increase in the number of public-benefit energy communities (58.3%) compared to November 2021; furthermore, public-benefit energy communities constitute 9.8% (7 out of 71) of the energy communities established in the six months leading up to May 2022 and 7.7% of all energy communities in the Region.

¹³ Financial surpluses are distributed to the members of the energy community.

¹⁴ Surpluses are not distributed to the members of the energy community.

Adding virtual net-metering project requests to low and medium voltage project requests by public-benefit energy communities, we observe that there is only one (1) electrified project of a public-benefit nature with a capacity of 0.03 MW in Western Macedonia. In addition, 24 non-electrified public-benefit projects are still pending, with a total capacity of 15.43 MW, which represents 2.7% of the total capacity (573.3 MW) of requests by energy communities for both for-profit and public-benefit projects. Thus, there appears to be a significant delay in the electrification of public-benefit projects (4%), as compared to the electrification of low-medium voltage projects by energy communities overall (9.2%).

In the Regional Unit of Arcadia, records show just one (1) public-benefit energy community, which is not located in the lignite area of Megalopoli. As mentioned above, public-benefit energy communities have not yet been developed in the area, as there are neither requests for virtual net-metering nor low-medium voltage projects by public-benefit energy communities.

Table 2 provides an overview of low and medium voltage RES projects and virtual net-metering nationwide, as well as in Greece's two lignite regions, complementing the facts and figures presented in the previous sections.

Energy Communities in numbers (May 2022)														
			Total number of requests		Total capacity (MW)		Not-electrified				Electrified			
							Number of requests		Capacity (MW)		Number of requests		Capacity (MW)	
			Quantity	Change	Capacity	Change	Quantity	Change	Capacity	Change	Quantity	Change	Capacity	Change
RES in low-medium voltage	Greece	Total	62,382	5%	24,069.5	6%	45,260	5%	18,969.0	4%	17,122	13%	5,100.5	16%
		EnCom	5,651	5%	4,475.9	6%	4,772	2%	3,863.1	2%	879	30%	612.8	31%
	Regional Unit of Kozani	Total	2,604	12%	1,159.8	14%	2,050	25%	1,032.6	13%	554	8%	127.2	22%
		EnCom	510	9%	410.9	10%	457	6%	378.4	7%	53	71%	32.5	66%
	Regional Unit of Florina	Total	1,311	2%	569.7	3%	986	2%	507.2	3%	325	4%	62.5	8%
		EnCom	218	6%	178.0	4%	203	6%	170.5	3%	15	25%	7.5	49%
	Regional Unit of Arcadia	Total	1,051	9%	388.8	12%	772	41%	244.1	20%	279	1%	144.7	1%
		EnCom	66	0%	49.2	0%	61	-4%	46.9	-2%	5	67%	2.3	76%
Virtual Net-Metering	Regional Unit of Kozani	Total	31	11%	12.36	5%	27	8%	12.20	4%	4	100%	0.16	351%
		EnCom	11	22%	8.07	7%	10	27%	8.04	7%	1	0%	0.03	0%
	Regional Unit of Florina	Total	26	18%	1.97	15%	15	36%	1.06	33%	11	0%	0.91	0%
		EnCom	1	0%	0.05	0%	1	0%	0.05	0%	0	0%	0.00	0%
	Regional Unit of Arcadia	Total	4	0%	3.10	0%	4	0%	3.10	0%	0	0%	0.00	0%
		EnCom	0	0%	0.00	0%	0	0%	0.00	0%	0	0%	0.00	0%

Table 2: EnCom RES projects (May 2022), HEDNO data analysis

** Change refers to the six-month period of November 2021 – May 2022

Recent Institutional Changes

Between November 2021 and May 2022, certain institutional changes have taken place in relation to energy communities. One such change is the regulation on the participation of energy communities in competitive procedures, which mainly concerns the extension of deadlines. Specifically, Law 4876/2021 (Government Gazette 251 A, Article 68) has granted energy communities a new extension for entering into a feed-in-tariff contract for photovoltaic plants with a capacity of up to 500 KW each, a provision that had been legislated by Law 4821/2021 and was analyzed in The Green Tank's previous Review of Developments on Energy Communities (November 2021)¹⁵. In particular, with regard to photovoltaic plants developed by energy communities, this law stipulates that after 01.07.2022, the same energy community cannot enter into more than two (2) feed-in-tariff contracts for photovoltaic plants with a capacity of up to 500 KW each, without prior participation in a competitive bidding procedure. Exceptionally with regard to energy communities in the Region of Western Macedonia, the previous deadline has been extended by 18 months, while for the region of Megalopoli there is no relevant provision. Nonetheless, the above amendment mainly addresses a formality; it does not structurally change the participation of energy communities in the RES market, as would, for instance, the establishment of a special bidding procedure -exclusively for projects by energy communities- that would both reinforce their participation in competitive procedures and prevent issues that have ensued in other countries (e.g. in Germany).

The most important institutional change was introduced by Law 4951/2022 (Government Gazette 129 A) and relates to the definition of an energy community's seat. In particular, Articles 105 and 106 provide that energy communities no longer need to designate a municipality or a municipal district within the Greek territory as their seat; this amendment leaves more flexibility in the designation of the seat, as the energy community can be established and operate anywhere. However, it is expressly provided that the requirements for the members of the community as to the region within which it carries out its activities are maintained, along with the geographical limitation regarding the implementation of its activities (namely, within a region)¹⁶. The designation of the seat, as provided for in the founding law of energy communities (Law 4513/2018), had constituted a major obstacle to the inclusion of projects by energy communities in funding programs, as it conflicted with the State aid regulatory framework. Therefore, the removal of this restriction is a positive development, as energy communities are now granted access to previously unavailable resources from both the previous and the current programming periods, as

¹⁵ The provision of Law 4821/2021 sought to support small RES producers by exempting them from the competitive procedures stipulated in Law 4759/2020. The law provided for the exemption of small photovoltaic power plants from competitive procedures, thus, enabling natural or legal persons to install photovoltaic plants of up to 500 KW outside of competitive procedures, provided that they do not already have 2 projects of that technology outside of competitive procedures and under specific deadlines.

¹⁶ In other words, the provisions of Article 2 of Law 4513/2018 (founding law regarding energy communities), which defines who can be a member of an energy community and the minimum number of members, are maintained. The new regulation provides that at least 50% plus one of the members of an energy community must be related to the Region where its activities are carried out, rather than to its seat.

well as from the Green Fund -from CO₂ allowances auctioning revenues- in order to finance their projects.

The same law also includes a provision for the allocation of a 10MW absorption margin per substation in addition to the existing margin by the grid operator exclusively for the installation of RES and CHP plants by self-producers, self-producers using net metering, self-producers with virtual net-metering and producers who fall under the special photovoltaic system development program. Unfortunately, however, energy communities are not included under this provision, which would offer them grid space for their development. More specifically, it is stipulated that for the allocation of the above margin, the operator shall grant final connection offers with a maximum capacity limit of 10 KW per power supply; this, however, does not include group requests of up to 10 KW each that could be submitted by energy communities. Therefore, even though this regulation resolves to a certain extent self-producers' demands for additional grid space, it does not address the corresponding issue with regard to virtual net-metering projects by energy communities that aim to meet the electricity needs of their members. Thus, the issue of grid availability for energy communities remains unresolved.

The aforementioned law (Law 4951/2022) includes further provisions regarding energy communities, explicitly stipulating that agricultural cooperatives may participate in one or more energy communities as members, regardless of whether community members belong to the same agricultural cooperative (Article 106). Furthermore, this law grants an exemption from the provision of a letter of guarantee to energy communities with more than sixty (60) members, of which at least fifty (50) members are natural persons, as well as to energy communities involving local or regional authorities. In addition, a special provision is included with regard to energy communities operating in the lignite regions, as the above exemption shall also apply to photovoltaic plants with a capacity of up to one megawatt (≤ 1 MW), installed in the Region of Western Macedonia or in the Municipality of Megalopoli of the Peloponnese Region (Article 6). Finally, this law also addresses saturated grids' power margin, for which energy communities can request the connection of a photovoltaic power plant, providing for its reduction from eight (8) to five (5) MW per energy community (Article 104).

Furthermore, a recent Ministerial Decision (MD)¹⁷ by the Ministry of Environment and Energy has modified the priority framework for the granting of final connection offers for RES and CHP plants by the grid operator¹⁸, affecting energy communities across the country, as well as those in the lignite areas. According to the new decision, projects are classified into six groups that are further divided into subgroups; group order determines priority in the distribution of grid space. Energy communities are classified in groups B, C and D and follow the corresponding order of priority. In particular, virtual net-metering projects by energy communities fall under Group B. Group C comprises the following: joint requests for the granting of a final connection offer by energy communities whose members include local and regional authorities, as well as joint requests by

¹⁷ Ministerial Decision by the Ministry of Environment and Energy YPEN/GDE/84014/7123 (Government Gazette 4333/B/12.08.2022)

¹⁸ GG B 940/20.3.2020

energy communities with a total capacity of more than 100 MW for the Regional Units of Kozani and Florina; wind farms developed by energy communities; wind and photovoltaic plants belonging to energy communities that (a) are not-for-profit or (b) have more than 60 members, of which at least 50 are natural persons or (c) include first or second degree local authorities as members. Finally, wind and photovoltaic plants belonging to for-profit energy communities fall under Group D. A similar order of priority was provided by the previous MD. Both the incorporation of virtual net-metering projects by energy communities into the second priority group and the inclusion of other categories of projects by energy communities in the subsequent priority groups are favorable.

Despite these developments, between November 2021 and May 2022, no institutional changes have been adopted to increase citizen participation in the energy transition through energy communities, while several important challenges regarding the expansion of the latter have yet to be addressed. In particular, the expected integration of the European directives on the promotion of the use of energy from renewable sources (Renewables Energy Directive II, REDII) and on common rules for the internal electricity market (Directive 2019/944: Internal Electricity Market Directive, IEMD) into national Law has not progressed. These directives include definitions for Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs), as well as other regulations on energy communities, the integration of which is expected to bring significant changes to the relevant institutional framework (for instance, regarding the definition of energy communities, the members, the scope of activity) and, consequently, reshape the current regime. Furthermore, the issues regarding the allocation of grid space to projects by energy communities that are mainly aimed at meeting own or local energy needs remain unresolved.

Sources of Funding for Energy Communities

The most important development regarding the funding of energy communities in lignite areas is the allocation of the European Just Transition Fund resources through the Just Development Transition Program (PDAM) 2021-2027¹⁹, which constitutes the first such program of an EU Member State to be approved by the European Commission²⁰. The PDAM clearly includes energy communities as beneficiaries, mainly with regard to projects involving energy efficiency; self-production from RES; the installation of heat pumps for heating/cooling and/or systems for the production of electricity from RES to be utilized in heating/cooling through heat pumps; self-production using clean energy individually, in public/municipal buildings and infrastructure, residential or office buildings and production units; the construction of residual biomass plants for electricity production and district heating; and the construction of small biogas plants utilizing livestock, poultry and agricultural residues, following the standards of similar plants that have been built in Greece. These projects are included in Priority 2: Energy Transition - Climate Neutrality, which has been allocated a total budget of €211.5 million. These resources are specified by intervention axis; in particular, the budget set aside for projects by energy communities amounts to €132.5 million.

¹⁹ Just Development Transition Program 2021-2027, <https://bit.ly/3PLQE8G>

²⁰ Press Release (16.07.2022), "EU Cohesion Policy: €1.63 billion for a just climate and energy transition in Greece", <https://bit.ly/3BgLm0u>

The national resources allocated to the Just Transition, which come from the revenues of emission allowances auctions and are managed by the Green Fund, have not yet been released. Specifically, with regard to the 2018 auctioning revenues (€31.4 million)²¹, €3.5 million has been earmarked to support energy communities in lignite areas through Priority Axis 3: Energy Communities Program; these resources shall finance support actions (€1 million) and pilot projects (€2.5 million). With regard to the respective 2019 resources (€30,067,018.30), the Greek Ministry of Environment and Energy has approved a new Green Fund financing program²². This program is structured on new priority axes and measures, excluding energy communities from funding, despite them being a growing activity in lignite regions. A new decision is expected on the allocation of the corresponding 2020, 2021 and 2022 resources.

Green Fund resources are of paramount importance for lignite regions, as, to date, they constitute the main national resource for the Just Transition. Approximately €112 million have been raised from the auctioning of emission allowances through this Fund, for the period 2018-2021, specifically for lignite areas and for all types of projects; only 3.5% of this sum is allocated to support projects by energy communities. With regard to 2022, 3.5% of the emission allowances auctioning revenues will be allocated to lignite areas²³. Based on the course of public revenues from the emissions exchange up to August 2022 and the projections by the Renewable Energy Sources Operator & Guarantees of Origin S.A. (DAPEEP) regarding the expected carbon prices throughout 2022, this amount is estimated at €40 million. Therefore, channeling part of these resources to the local communities of lignite areas through energy communities is imperative. The aforementioned sources of funding for energy communities in lignite regions are displayed in Table 3.

²¹ Government Gazette B 1149/05.04.2019, “Financing of projects and actions for the development of sustainable economic activities of low carbon and environmental footprint in the Regional Units of Kozani and Florina and the Municipality of Megalopoli in the Regional Unit of Arcadia from emission allowances auctioning revenues”

²² Ministry of Environment and Energy (17.11.2021), Approval of Funding Program: “Financing of projects and actions for the development of sustainable economic activities of low carbon and environmental footprint in the Regional Units of Kozani and Florina and the Municipality of Megalopoli in the Regional Unit of Arcadia from the emission allowances auctioning revenues of 2019”) and allocation of €30,567,018.30 for its implementation for the year 2021, <https://bit.ly/3z8xPpl>

²³ Amendment of Joint Ministerial Decision by the Ministry of Environment and Energy no. YPEN/DKAPA/7264/118/27.01.2022 “Method of distribution of revenues from auctions of greenhouse gas emission allowances for the year 2022”. (B481)

Sources of funding for energy communities in lignite areas				
Fund	Program	Period	Total Budget (million €)	EnCom budget (million €)
Green Fund	Emission allowances auction revenues	2018	31.4	3.5
		2019	30.2	0
		2020	5	Should be allocated
		2021	45	Should be allocated
		2022	40(estimate)	Should be allocated
		By 2030	-	undetermined
Just Transition Fund	Just Development Transition Program (PDAM)	2021-2027	1600	132.5

Table 3: Sources of funding for energy communities in lignite areas (2022)

Source; Analysis by The Green Tank

Thus, to date, the development of energy communities in lignite areas has relied solely on local community resources, as the funds intended to support them have not yet been activated. Nonetheless, in the next period, the Just Transition Fund is expected to release the first European funds, which local communities can claim through the energy communities. For the latter to be able to absorb these resources, the removal of existing barriers -such as the aforementioned seat restriction- is of paramount importance. In particular, public-benefit energy communities, which aim to meet the energy needs of their members, face additional challenges in accessing funds through private financial institutions; therefore, the use of all other available resources is key to their further development.

Political Parties and Energy Communities

The institution of energy communities and its development constitutes an issue of concern to political forces; the latter have highlighted its different aspects in Parliament, through parliamentary questions and reports.

In particular, the Coalition for the Radical Left (SYRIZA) has submitted parliamentary questions and reports on the following issues: energy communities' and small RES investments' inability to access the electricity grid²⁴; the need for public guarantees regarding loans for net-metering projects by energy communities, with special emphasis on earthquake-ridden Arkalochori²⁵; and the recommendations by the Energy Community 'MINOA' regarding the support of broad-based energy communities and energy communities in Crete overall²⁶. So far, these questions and reports remain unanswered.

²⁴ Greek Parliament (2022), Question by K. Vetta, <https://bit.ly/3ba7f72>

²⁵ Greek Parliament (2022), Report by E. Igoumenidis, <https://bit.ly/3zd0xbC>

²⁶ Greek Parliament (2022), Report by C. Mamoulakis, <https://bit.ly/3QQ1xXt>

PASOK - Movement for Change (KINAL) has submitted a question on the saturation of the electricity grid and the inability of self-producers to connect their projects²⁷; so far, this question, too, remains unanswered.

The European Realistic Disobedience Front (MERA-25) has highlighted the need to institute financial mechanisms for non-profit energy communities, especially in the context of supporting agricultural production and Local and General Land Reclamation Organizations (TOEB-GOEB)²⁸, as well as the important role energy communities have in addressing the difficulties faced by local authorities²⁹. These questions were answered, but in a general manner. The answers did not provide specific information on the role and potential of energy communities; they loosely described the financial provisions for RES projects in the Rural Development Program (RDP) 2014-2020 and the provisions for the use of RES in irrigation infrastructure that are included in the Sectoral Development Program 2021-2025 of the Ministry of Rural Development and Food, without focusing on how energy communities are foreseen to use these financing instruments. In addition, a question was submitted regarding the establishment process of the energy community in Halki³⁰; the Municipality of Halki answered the question, providing clarifications on the community's establishment and operation, as well as on the Municipality's role in it.

Recommendations

The Green Tank has previously submitted recommendations on the development of the institution of energy communities and the latter's contribution to the Just Transition of lignite areas in its Review of Developments regarding energy communities in Greece (November 2021). Furthermore, it continuously intervenes in the public debate by submitting proposals, either in the context of the Just Transition planning consultation³¹, or by commenting on upcoming legislation and policies³², as well as through lectures³³, presentations³⁴ and publications³⁵. These recommendations mainly refer to the integration of energy communities in the competitive procedures of the energy market, as well as to the funding instruments; moreover, they underline that broader political support is vital for the development of energy communities. In particular, the following are recommended:

²⁷ Greek Parliament (2022), Question by C. Gokas, <https://bit.ly/3bcxolR>

²⁸ Greek Parliament (2022), Question by Y. Varoufakis, <https://bit.ly/3viCCDp>

²⁹ Greek Parliament (2022), Question by G. Logiadis, <https://bit.ly/3PZsRC8>

³⁰ Greek Parliament (2021), Question by F. Bakadima, <https://bit.ly/3cDa1C9>

³¹ The Green Tank (2021), Hearing for actors on Just Transition in the Parliament, <https://bit.ly/3b7na6m>

³² The Green Tank (2021), Comments on the Ministry of Development and Investments bill on Development, <https://bit.ly/3J8bJHU>

³³ The Green Tank (2022), Energy Communities: Paving the way to energy democracy, <https://bit.ly/3PWRHCn>

³⁴ The Green Tank (2022) The role of community energy in the Just Transition: the Greek example, challenges and prospects, <https://bit.ly/3b5uyz7>

³⁵ Theodosiou I. (11.02.2022), State aids and energy communities: Power to the Citizens, <https://bit.ly/3PSAx8U>

1. Provision of subsidies for part of the cost of RES project installation should be instituted for public-benefit energy communities (involving either local authorities or natural persons), whose main objective is to cover their own needs through net-metering.
2. Energy communities to be listed as distinct beneficiaries under Greece's Development Law, based on the model of the PDAM 2021-2027, so as to enhance citizen participation in the just energy transition while combating energy poverty.
3. A minimum fixed allocation of annual resources from the auctioning of CO₂ emission allowances should be established, to be utilized according to the priorities of the Territorial Just Transition Plans (TJTTPs) and the corresponding Just Development Transition Program (PDAM), with a focus on energy communities.
4. The funds of 2018 that have been already allocated to energy communities in lignite areas should be immediately activated, through the issuance of a call by the Green Fund for the utilization of €3.5 million from the 2018 CO₂ auction revenues. A similar call should be issued for the resources of the following years for a significantly larger amount, as €3.5 million will not suffice for more than four (4) to five (5) 1 MW projects.
5. A development fund (or an intermediary body) should be set up specifically for energy communities, in order to facilitate access to loans, provide guarantees, cover the costs of participating in competitive procedures, and subsidize the costs of projects' preliminary phases.
6. It is essential to enhance citizen participation in large-scale RES projects implemented in lignite areas by large companies such as the Greek Public Power Corporation (PPC); this could be achieved by instituting share ownership and reserving part of the shares to be purchased by energy communities.
7. The grid should be upgraded and sufficient electrical space should be reserved for the connections of projects by energy communities, so as to guarantee the implementation of the latter. Priority should be given to projects by energy communities of local authorities and citizens whose objective is meeting own electricity needs; these projects should be guaranteed sufficient "electrical space" along with a suitable -in terms of size- land area for the installation of photovoltaic plants in the Lignite phase-out Zones.
8. The National Energy and Climate Plan (NECP) that is currently under review should set specific quantitative targets for energy communities.
9. The Directives on the promotion of the use of energy from renewable sources (Directive 2018/2001, REDII) and on common rules for the internal electricity market (Directive 2019/944, IEMD) should be promptly transposed into the Greek Law, so as to put an end to the uncertainty regarding the potential forms of energy communities and allow the latter to further develop in a stable institutional environment.
10. A special framework for conducting competitive procedures for RES projects should be introduced, involving only energy communities and, thus, ensuring a level playing field.
11. An information hub for energy communities should be launched by the Ministry of Environment and Energy, aimed to strengthen the institution through the collection and publication of data on energy communities and the formulation of proposals (indicatively, regarding support schemes, business models, institutional changes, etc.), as well as to

provide direct information on all relevant institutional developments and to address any issues that arise.