European Commission

Smart Cities Marketplace

Looking at energy communities through a local authority lens: perceptions, experiences and needs

POLICY PAPER

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Introduction

The current energy transition is drastically changing the energy system with a shift from fossil to renewable energy sources, changing the traditional top-down organization, with electricity being generated in large power plants and transported to the end consumer, to energy networks characterised by both centralised and de-centralised production.

Recognizing the crucial involvement of local entities in the shift towards sustainable energy, the European Commission incorporated measures pertaining to the notion of energy communities[1] in the Clean Energy for All Europeans package[2]. These measures encompass the empowerment of consumers to independently manage their energy supply, production, and storage, whether as individual prosumers or as collectively acting consumers. Expanding on these provisions, the concept of energy communities was elaborated upon in both the revised Renewable Energy Directive[3] and the Internal Electricity Market Directive.[4] These directives established a regulatory framework governing renewable energy communities (RECs) and citizen energy communities (CECs) within the European Union.

Meister et al. (2020)[5] show the beneficial impact of municipal support on energy communities (e.g., planning provisions, financial support, or targets for citizen participation or citizen-led initiatives). Their research shows that municipalities are specifically keen on supporting if they are a member of the energy community. Evidence of Flemish energy communities (Peeters et al., 2024)[6] further shows that being well-connected with the local and regional political level enables better access to subsidies at municipal and provincial level, and/or being offered the opportunity to develop a project on municipal property (e.g., PV on the roof of a public building).

Energy communities are a new actor in the energy market in most Member States, allowing citizens, local authorities, and small and medium sized enterprises to actively participate in the energy transition. The primary purpose of this new type of actor is to provide environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates, rather than financial profits.

Currently, member States have realised various transposition levels of the directives, and introduced diverse supporting measures. Consequently, energy communities throughout Europe face different challenges, but also receive different opportunities through national, regional, and local initiatives.

Within the framework of the Smart Cities Marketplace, a comprehensive series of 44 interviews was undertaken with cities and municipalities across Europe to assess the understanding of local authorities on the topic of energy communities, as well as the current dynamics between local authorities and energy communities. Drawing from the gathered information, this paper presents the analysis of local authorities' understanding of the topic of energy communities and extracts lessons on how local authorities could support energy communities.

1 What is an energy community? - European Commission (europa.eu) (rural-energy-community-hub.ec.europa.eu/energy-communities/what-energy-community)
2 Clean energy for all Europeans - Publications Office of the EU (europa.eu) (op.europa.eu/s/zQiV)
3 Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652.
4 Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU.
5 Meister, T., Schmid, B., Seidl, I. et al. (2020). How municipalities support energy cooperatives: survey results from Germany and Switzerland. Energ Sustain Soc 10, 18. doi.org/10.1186/s13705-020-00248-3
6 Peeters, L., Decat, S., Baets, J., & Blaauw, M. (2024). Energie-gemeenschappen: Krachtige samenwerkingen voor duurzame toekomst [Report]. EDURGY. www.think-e.be/sites/default/files/paragraph/files/2024-01/ESF-Energie-Case%20studies.pdf

Methodology

Structured interviews

The information used to inform the analysis and recommendations in this paper was gathered through a series of structured interviews with local authorities throughout Europe. The Smart Cities Marketplace network of local experts was enlisted to support this task. This allowed for the interviews to be conducted in the native language of the interviewees. At the same time, the selection of municipalities and interviewees was facilitated by the local experts, who have better knowledge of the local context. The questionnaire can be consulted in the Annex.

Eight Member States were selected to cover the different parts of the European Union as much as possible, and to provide variation in terms of both legal context and experience in the topic of energy communities. The selection considers the difference in progress in national frameworks of the Renewable Energy Community and Citizen Energy Community definitions, and in the enabling framework. This led to the following list: Belgium (Flemish region), Italy, Germany, Luxembourg, Cyprus, Croatia, Spain, and the Netherlands.

- Belgium (Flemish and Brussels region) has its implementation completed[7] and is one of the few countries where an effective impact study has preceded the decision not to grant exemptions on the tariffs to energy communities.
- Italy has finalized the implementation[8] and provides energy communities with substantial financial support through the Italian state aid scheme under the Recovery and Resilient Facility.[9,10]
- Germany has mainly two types of CECs: Energiegenossenschaften and Stadtwerke. Additionally Germany introduced a new type of energy sharing in 2024: "Gemeinschaftliche Gebäudestromversorgung" ("community building power supply"), restricted to the same building.[11] Energiegenossenschaften and Stadtwerke are not granted any sort of tariff reduction. They act as normal energy suppliers. Their property as a CEC is only relevant for their internal economic and social structure. Different from that, Gemeinschaftliche Gebäudestromversorgung is granted a tariff reduction similar to joint self-consumption. No specific studies were conducted.
- Luxembourg has recently finalized its framework,[12] with no impact assessment and limited exemptions or support measures specifically for energy communities.
- The Cypriot Regulatory Authority for Energy has not yet approved the relevant regulations for the formulation and operation of energy communities, but expects it to be completed by the end of 2025.
- In a similar vein, Croatia has finalized the framework[13] but sees little uptake due to challenges in implementing the effective framework.
- Spain has recently completed a partial framework[14], while it allocated - albeit in the absence of an impact study – elaborate benefits to energy communities with regard to the sharing of energy and provisions through the Spanish Recovery, Transformation, and Resilience Plan.
- The Netherlands have recently adopted a new Energy Act[15], while they also have elaborate experience with, and support mechanisms in place for, cooperative energy projects.

7 Article 4.8.4 of Vlaamse Codex (codex.vlaanderen.be/Zoeken/Document.aspx?DID=1018092&param=inhoud&AID=1291906)
8 Decreto Ministeriale dell'Ambiente e della Sicurezza Energetica www.mase.gov.it/sites/default/files/Decreto%20CER.pdf
9 Greppo and Pistis, 2024 (www.mondaq.com/italy/renewables/1410982/renewable-energy-communities)
10 While there has not been a formal impact study related to tariff exemptions for energy communities, Italy had several definitions of self-consumption already accepted in the legislation. An additional pilot has been launched in 2023 for self-consumption at building level.
11 German Bundestag (www.bundestag.de/dokumente/textarchiv/2024/kw17-de-eeg-photovoltaik-999570)
12 Law of June 9, 2023, Luxembourg Mémorial A288, n°7876 (legilux.public.lu/eli/etat/leg/loi/2023/06/09/a288/jo)
13 Croatian Law on the Electricity Market (NN 111/21, 83/23)
14 The Spanish Royal Decree-Law 5/2023, and Royal Decree-Law 23/2020, Amend law 24/2013 on the Electricity Sector, and partially transpose into national law Directive 2018/2001 as regards RECs, and Directive 2019/944. (www.boe.es/eli/es/rdl/2023/06/28/5, www.boe.es/eli/es/rdl/2020/06/23/23/con, www.boe.es/eli/es/l/2013/12/26/24/con). However, Spain has not yet approved the Royal Decree developing both ECs in detail (www.miteco.gob.es/content/dam/miteco/es/energia/files-1/_layouts/15/Proyecto%20de%20Real%20Decreto-61313.pdf) and currently it has not included in national legislation any possibility for ECs to engage in distribution activities. Autonomic legislation can further develop the legislative and regulatory framework for ECs, but it is still lacking.
15 Regels over energiemarkten en energiesystemen (Energiewet) | Tweede Kamer der Staten-Generaal (www.tweedekamer.nl/kamerstukken/wetsvoorstellen/detail?cfg=wetsvoorsteldetails&qry=wetsvoorstel%3A36378)

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Box 1: European funding to facilitate the implementation of energy communities.

The **Italian** State aid scheme of EUR 5.7 billion, facilitated through the Recovery and Resilience Facility[16], aims to bolster renewable energy communities and self-consumers. The scheme supports the construction of new renewable energy production plants as well as the expansion of existing plants with a capacity less or equal to 1 MW. The scheme consists of:[16]

- A premium tariff on the quantity of electricity consumed by self-consumers and renewable energy communities, paid over a 20-year period. This measure, with a total budget of EUR 3.5 billion, is financed through a levy on the electricity bill of all consumers.
- An investment grant up to 40% of eligible costs, for a total budget of EUR 2.2 billion financed through the Recovery and Resilience Facility. Eligible projects should be operational before 30 June 2026 and located in municipalities with less than 5.000 inhabitants.

Within the framework of **Spain**'s Recovery, Transformation, and Resilience Plan[17], the dedicated incentive program CE IMPLEMENTA has been established for energy community pilot projects, both small-, medium- and large-scale. Only energy community projects can benefit from this program, meaning that individual self-consumption, and collective/shared self-consumption schemes not established within an existing EC cannot be beneficiaries. This funding is applicable for single pilot renewable energy projects (including EE, EV charging, and demand response) that promote participation in the energy sector of actors not traditionally involved in it. Additionally, the fund can cover conducting studies, developing contracts, and covering expenses related to technical assistance and legal counselling, provided that this facilitates the effectiveness of the eligible pilot project investment. The first call (budget: EUR 10 million) resulted in 45 small projects supported in 14 regions, while the second call (budget: EUR 30 million) resulted in 29 medium to large projects supported in 12 regions. The third and fourth calls (budget: EUR 10 million and EUR 30 million, respectively), resulted in 52 small and 25 medium and large beneficiary projects. Among others, the following energy community pilot projects received funding and were also mentioned during the interviews with the Spanish local authorities as leading examples: energy community of Crevillent, Valencia[18], energy community of La Palma[19], and energy community Toda Energía, Navarra[20].

16 IP_23_5787_EN.pdf (ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_23_5787/IP_23_5787_EN.pdf)
17 Plan de recuperación transformación y resiliencia (2021) (lamoncloa.gob.es/temas/fondos-recuperacion/Documents/160621-Plan_Recuperacion_Transformacion_Resiliencia.pdf)
18 Grupo Enecroop press release: Transforming Crevillent into a pioneering local energy community in Europe (www.grupoenercoop.es/enercoop-convertira-crevillent-en-una-comunidad-energetica-local-pionera-en-europa)
19 Inicio - Energía Bonita (energiabonita.coop)
20 SOLARINFO.es, Toda Energía, un modelo de comunidad energética de Navarra para replicar en la geografía española (www.solarinfo.es/2022/08/03/toda-energia-modelo-comunidad-energetica-navarra-para-replicar-geografia-espanola)

Box 2: Fund to support energy communities during their initial stages of development.[21]

The Development Fund for Energy Cooperatives ('Ontwikkelfonds voor energiecoöperaties') has been established by the Ministry of Economic Affairs of the Netherlands. EnergieSamen manages the Development Fund in collaboration with regional umbrella organizations and project offices. The Development Fund extends loans to energy cooperatives[20] officially registered with the Chamber of Commerce. Even if a cooperative is still in the process of being established, it is encouraged to apply. The fund supports projects focused on the large-scale generation of wind or solar energy, with the requirement that the energy cooperative becomes a majority owner (at least 50%) of the corresponding wind or solar park. Eligible projects must be in the provinces of Drenthe, Limburg, Utrecht, Zuid-Holland, or the Achterhoek. These projects should be in one of the four specified development phases, each involving distinct activities. The entire development trajectory may span several years, and the loan amount increases with each progressive phase. Projects are eligible to loan up to 70% of the expenses associated with the development phase of the project (from idea to financial close). The remaining 30% needs to be self-funded, whether through financial contributions, donations, or voluntary hours. Furthermore, the Development Fund is now complemented by a separate Realization Fund ('Realisatiefonds'), which offers business loans ranging from EUR 30 000 to EUR 1 million to facilitate the realization of photovoltaic projects. Energy cooperatives can secure up to 75% of the total project size through this financing, while the remaining 25% or more must be sourced through equity or subordinated obligations.

A total of 44 interviews were conducted with civil servants active in the field of energy policy, representing five to seven municipalities within each of the above listed countries. The focus was primarily on smaller to medium-sized cities (i.e., with a population below 100,000 inhabitants). Figure 1**.** presents the characteristics of the interviewed municipalities.

In the selection, 19 out of the 44 municipalities state to have energy communities active on their territory. These could be initiatives targeting the territory of the municipality, as well as regional or national energy communities that are accessible for citizens of the municipality. All these initiatives were indicated to have activities on renewable energy generation. Eleven of the 19 municipalities further indicated that these communities include local authorities as shareholders, without further specifications on the active engagement of their specific municipality in such initiative. Aside from Croatia, where no energy communities were reported among the 7 interviewed cities, and Luxembourg where all interviewees claimed to have at least one energy community active on the territory of the municipality, the interviewed cases in all other countries were a mix of municipalities with and without energy communities active on their territory.

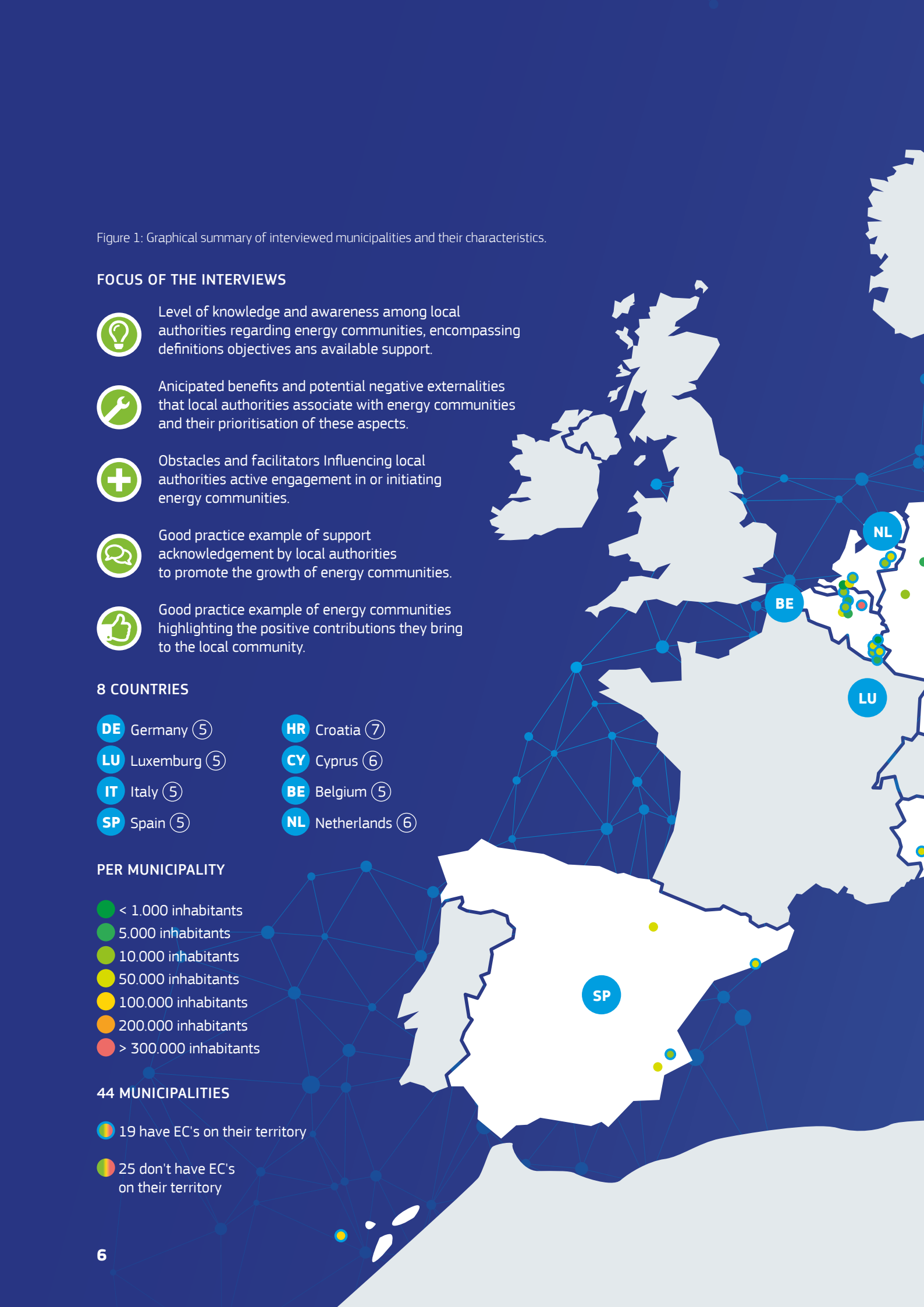
The below analysis highlights those results relevant to policy makers. As such, the focus is not on each individual answer but on specific combinations of answers provided by individual interviewees. Based on this approach, 6 statements are extracted. Each of the statements is elaborated below.

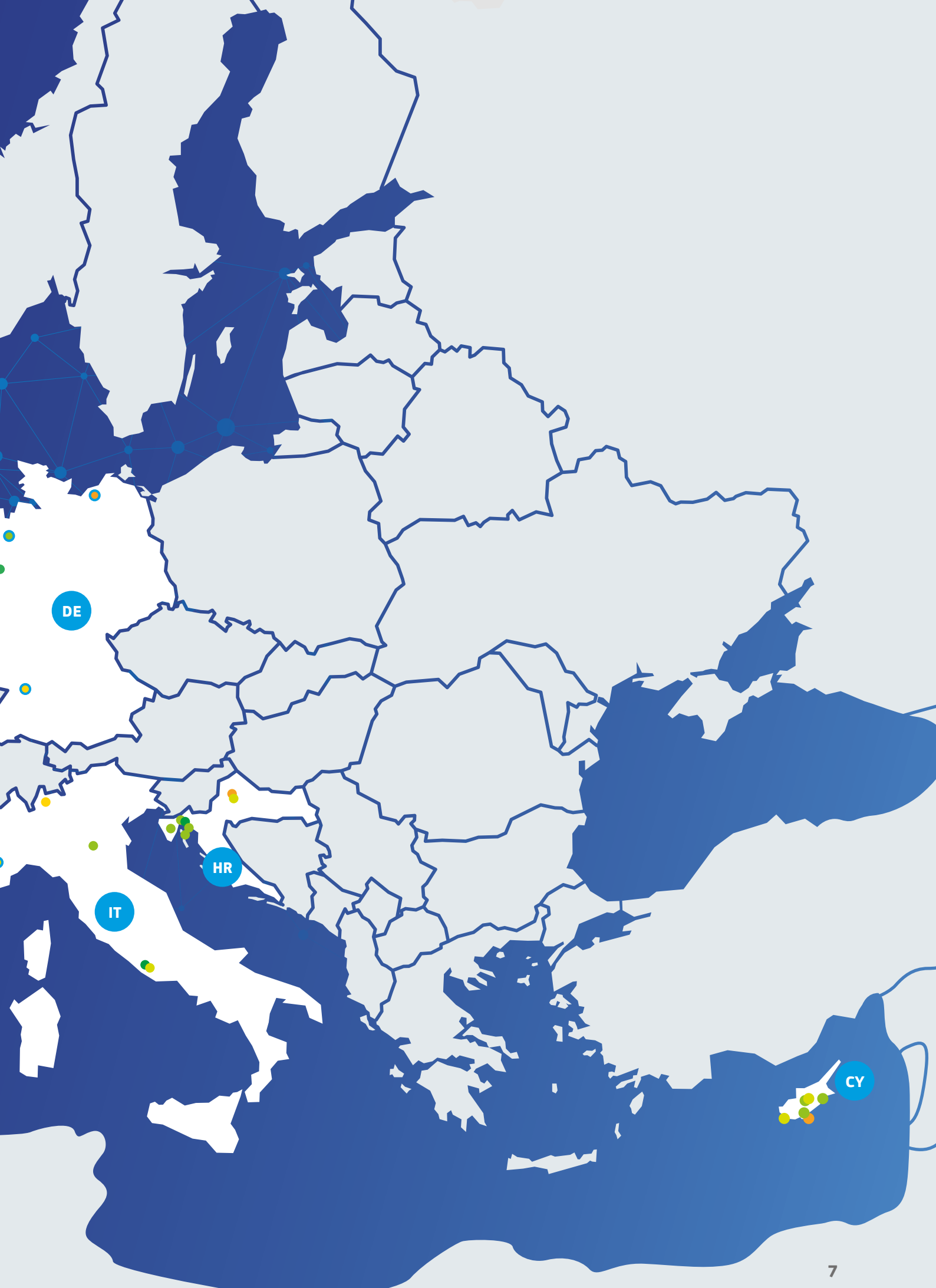
21 Example provided by interviewees Ontwikkelfonds voor energiecoöperaties - Energie Samen. (energiesamen.nu/pagina/77/ontwikkelfonds-voor-energiecooperaties)

Limitations

Although the sample was set up to extract insights that are applicable on a more general level, it is important to mention that the energy communities' landscape can vary significantly between countries and regions, and the exclusion of certain countries may affect the comprehensiveness of the insights presented. Furthermore, differences in legal frameworks, cultural contexts, and historical backgrounds may influence the dynamics of energy communities in ways that are challenging to capture accurately. The study acknowledges the need for caution when making direct comparisons between countries. Additionally, the legislation regarding energy communities is relatively recent and not all countries have fully transposed or implemented these new regulatory frameworks. Furthermore, not all member states have the same ambition regarding energy communities, and hence not the same supporting measures. This is expected to have an influence on the experiences of the municipalities, and hence to be reflected in the experience of the interviewee. Despite these limitations, the interviews provide valuable insights into the perspectives and needs of local authorities regarding energy communities. They provide practical guidance, establish a groundwork for future research, and inform policy considerations.

Figure 1: Graphical summary of interviewed municipalities and their characteristics.




DE
HR
IT
CY

Results of the interviews

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Statement 1: There is a general lack of understanding, knowledge and awareness among local authorities regarding the definition of energy communities.

The overwhelming majority of municipalities (76%) could not convey any definition of what energy communities are. On the one hand, 34% admitted to being unaware of the existence of national or regional definitions of energy communities. On the other hand, 42% knew their Member State or region has these definitions, but the interviewees could not recall the basic principles of those definitions. Additionally, of the remaining 24% of municipalities, 16% demonstrated clear confusion and/or misinformation on what an energy community is. Thus, only 8% of the municipalities have a sufficient to good understanding of the concepts underpinning the definitions of energy communities. Surprisingly, of the 5 interviewed municipalities that mentioned being part of a European project on energy communities, 4 (80%) could not provide a clear and accurate concept of the definitions.

The notions that were provided were diverse, divergent from the definitions, and/or incomplete. Among others, responses from the surveys included the following elements:

Type of energy communities: existence of "energy sharing communities" or "P2P communities" as a third energy community type aside from Citizen Energy Communities or Renewable Energy Communities; existence of unlimited types of energy communities (infinite combinations depending on members, legal form, activities, etc., including "apartment buildings" and "municipal administrations" as specific and separate energy community types).

Members/shareholders: affirmation that natural persons cannot be members; inclusion of enterprises as allowed members regardless of their size; inclusion of all public authorities, not just local authorities, as allowed members; equation of members solely as consumers, but not as energy producers nor prosumers.

Activities: focus on energy sharing as the main activity in which energy communities engage, including understanding energy communities purely as a way to trade and share energy in different locations in the grid.

Legal form: the affirmation that energy cooperatives are all considered as energy communities and energy communities have to be cooperatives; ambiguity or even omission of the energy community's legal entity nature by definition, including energy communities model notions like "a group of [natural] persons or legal entities", "a collaboration", or "a way to trade and share energy (...) in a community".

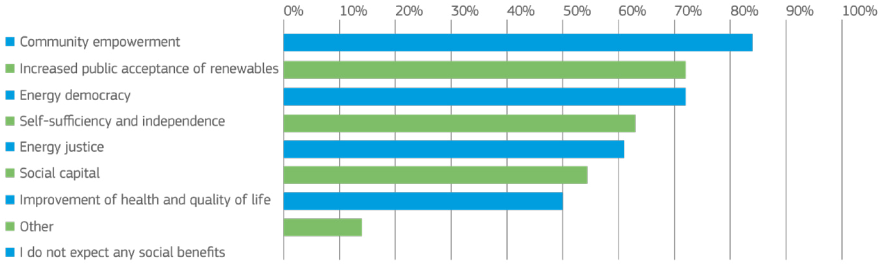
Omissions of essential legal requirements: open and voluntary participation; effective control by members or shareholders; energy communities' primary purpose of providing environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates rather than financial profits; size-limit for enterprises to become members or shareholders; autonomous nature of the energy community; and renewable energy project control.

When viewed together, these observations shed light on the absent, incomplete, or even skewed understanding of the concept of energy communities. Furthermore, even with this observation on the (lack of) understanding, all interviewed municipalities indicated specific economic, environmental, and social benefits that energy communities would bring to the local community. Furthermore, of those 76% of interviewees who did not know the definition, over 57% have expressed their clear ambitions for support and/or clear targets for energy communities (9%) at the municipal level.

Statement 2: Energy democracy is considered an important positive benefit of energy communities, though it is not well understood.

Among the expected social benefits, a vast majority of the interviewees indicate energy democracy (see Figure 2).

Figure 2: Percentage of local authorities expecting energy communities to deliver different types of social benefits.



The term energy democracy is however complex, and there currently is no single understanding of its meaning (Szulecki, 2017)[22]. Interpretations range from a normative goal related to legitimacy, fairness and justice, to a more operational notion regarding decentralized and participative decision-making in actual energy initiatives. For example, Jochemsen et al. (2022)[23] reflect that inclusive participation is hardly ever present in the studied group of Dutch citizen sustainability (energy and other "green") initiatives. Citizen initiatives, especially energy-related ones, face great obstacles in their ambition to be inclusive. Hanke et al. (2021)[24] emphasize the male-dominated governance boards, while Lazoroska et al. (2021)[25] find less opportunities for participation in decision-making and leadership for female members. Another obstacle to democratic participatory governance is identified by Hannoset (2019)[26], who points to social pressure when members have to vote in public.


Quang Nguyen, Unsplash

22 Szulecki, K. (2017). Conceptualizing energy democracy. Environmental Politics, 27(1), 21-41. doi.org/10.1080/09644016.2017.1387294

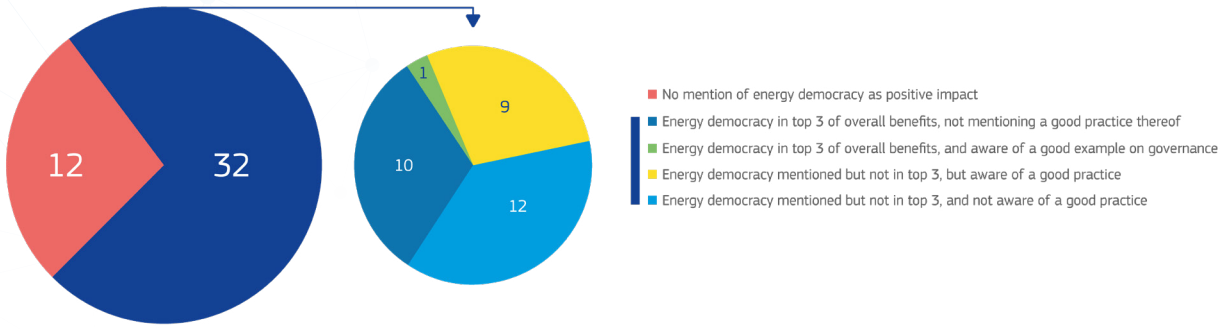
23 Jochemsen, N., Mees, H., Bronsvoort, I. & Meijer, A. (2022). Exploring the challenges of citizen initiatives for a more sustainable Utrecht. Citizen Engagement and Urban Sustainability (CITEUS). www.uu.nl/sites/default/files/geo-CITEUS%20research%20summary%202021-2022%20final.pdf

24 Hanke, F., Guyet, R., & Feenstra, M. (2021). Do renewable energy communities deliver energy justice? Exploring insights from 71 European cases. Energy Research & Social Science, 80, 102244. doi.org/10.1016/j.erss.2021.102244

25 Lazoroska, D., Palm, J. & Bergek, A. (2021). Perceptions of participation and the role of gender for the engagement in solar energy communities in Sweden. Energ Sustain Soc 11, 35. doi.org/10.1186/s13705-021-00312-6

26 Hannoset, A., Tuerk, A., Peeters, L. (2019). Energy Communities in the EU Task Force Energy Communities. BRIDGE horizon 2020 www.researchgate.net/publication/365146206_Energy_Communities_in_the_EU_Task_Force_Energy_Communities

Figure 3: Energy democracy as an expected benefit of an energy community, and awareness of examples thereof.



Important aspects of energy democracy are hence inherently linked to governance and decision-making structures in the energy community. This was reflected during the interviews in the examples of energy democracy manifestations provided to municipalities (e.g., active political citizenship, change in power structures). However, of the 32 municipalities that expect energy democracy as a key social benefit, almost half of them also did not know or failed to provide a good example of an energy community (Figure 3). Additionally, of the 11 initiatives that indicated energy democracy in the top 3 of the overall benefits of energy communities, only 1 interviewee refers to the governance principles as the reason why the given energy community example is a good one. None of the other 10 mention any aspect related to energy democracy in the reason to highlight the given example as a best practice.

This observation indicates a lack of understanding of what energy democracy is and how it translates in the organisation and operation of an energy community. This is not surprising given the complexity of the concept of energy democracy. Ranville (2021)[27] assesses effective democracy in cooperatives. She refers to democracy as measures in "participation", though emphasizes that participation has several dimensions such as economic participation, control, ownership, perception of participation, and aspects such as trust, loyalty, and motivation. Ranville proposes a definition that combines the membership rules, candidacy procedures and voting system, with more participatory aspects such as satisfactory outcome of a vote and sufficient candidates to elected positions. This, as the author claims, is to be combined with a measurement of subjective assessment of democracy. Also Wahlund and Palm (2022)[28] touch upon the lack of attention to representative democracy, and a bias towards decentralised energy systems in the literature on the matter.

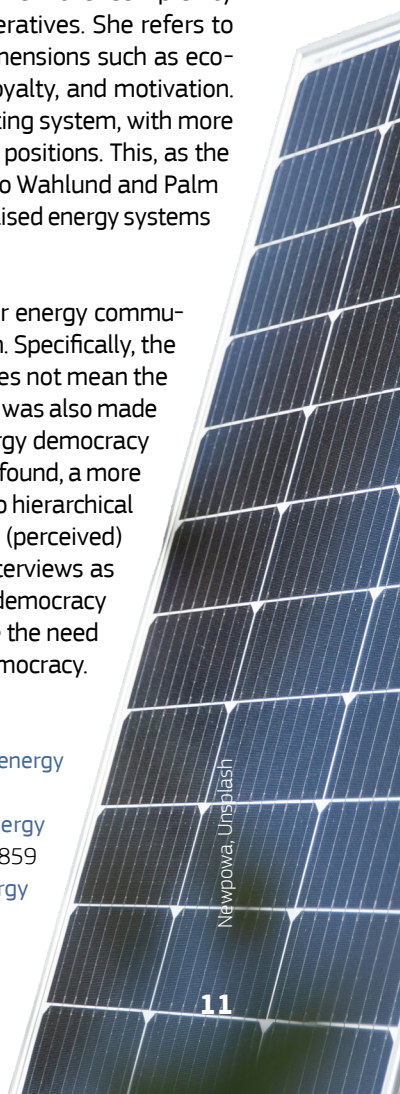
There is currently insufficient evidence on the effective governance and organizational models for energy communities to answer the question whether they effectively lead to meaningful democratic participation. Specifically, the perception of energy democracy seems somewhat equated with citizen participation but that does not mean the participation is „meaningful" from a political democracy theory perspective. The same conclusion was also made by Bielig et al. (2022)[29], where the studies on energy democracy show that they do promote energy democracy due to the underlying democratic principles and shared ownership models. However, as the authors found, a more critical perspective on equality in access and potential difficulties for participatory governance due to hierarchical and decision-making structures is needed. Petrovics et al. (2024)[30] have additionally found that (perceived) energy democracy can take different forms from one country to another. The results of the 44 interviews as part of this Smart Cities Marketplace assessment confirm the need for more clarity on what energy democracy means and how it is perceived in the different European Member States, but especially emphasize the need for objective and more prudent communication on energy community benefits related to energy democracy.

27 Ranville, A. (2021) Measuring democracy in cooperatives. shs.hal.science/halshs-03167609

28 Wahlund, M., & Palm, J. (2022). The role of energy democracy and energy citizenship for participatory energy transitions. Energy Research & Social Science, 87, Article 102482. doi.org/10.1016/j.erss.2021.102482

29 Bielig, M., Kacperski, C., Kutzner, F., & Klingert, S. (2022). Critically reviewing the social impact of energy communities in Europe. Energy Research & Social Science, 94, 102859. doi.org/10.1016/j.erss.2022.102859

30 Petrovics, D., Cobut, L., Huitema, D., Giezen, M., & Orsini, A. (2024). Diverse scaling strategies of energy communities. Earth System Governance, 19, 100203. doi.org/10.1016/j.esg.2024.100203


Nenpowa, Unsplash

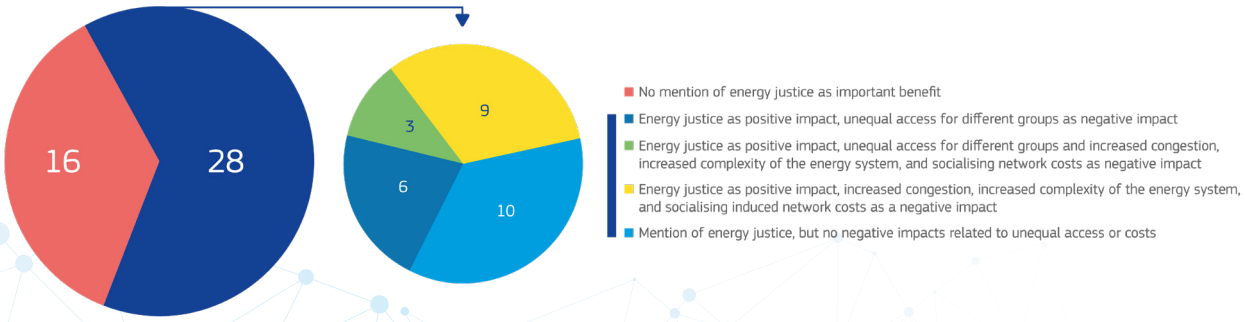
Statement 3: Justice is considered an important social benefit of energy communities though there is no reflection of the system impact and justice implications for all social groups.

The Green Deal supports the transformation of the EU into a fair and prosperous society. Justice is a key element of this transition. Nearly two thirds of the interviewees (28 out of 44) indicated energy justice as one of the important social benefits (Figure 2), with 16% considering it in the top 3 of the overall positive impacts that an energy community can bring. The link is however not self-evident. Bielig et al. (2022) have specifically assessed the social impact of energy communities, including energy justice.

The authors highlight challenges observed with regard to broad and equal participation and participatory governance (linking also to energy democracy), and effective contributions to energy poverty. The referenced research of Hanke et al. (2021) observed that the majority of energy communities did not address underrepresented groups (58 %) or energy poverty (76 %). More recent work of Hanke et al. (2023)[31] confirms that the majority of energy communities struggles to reach out to vulnerable and minority groups.

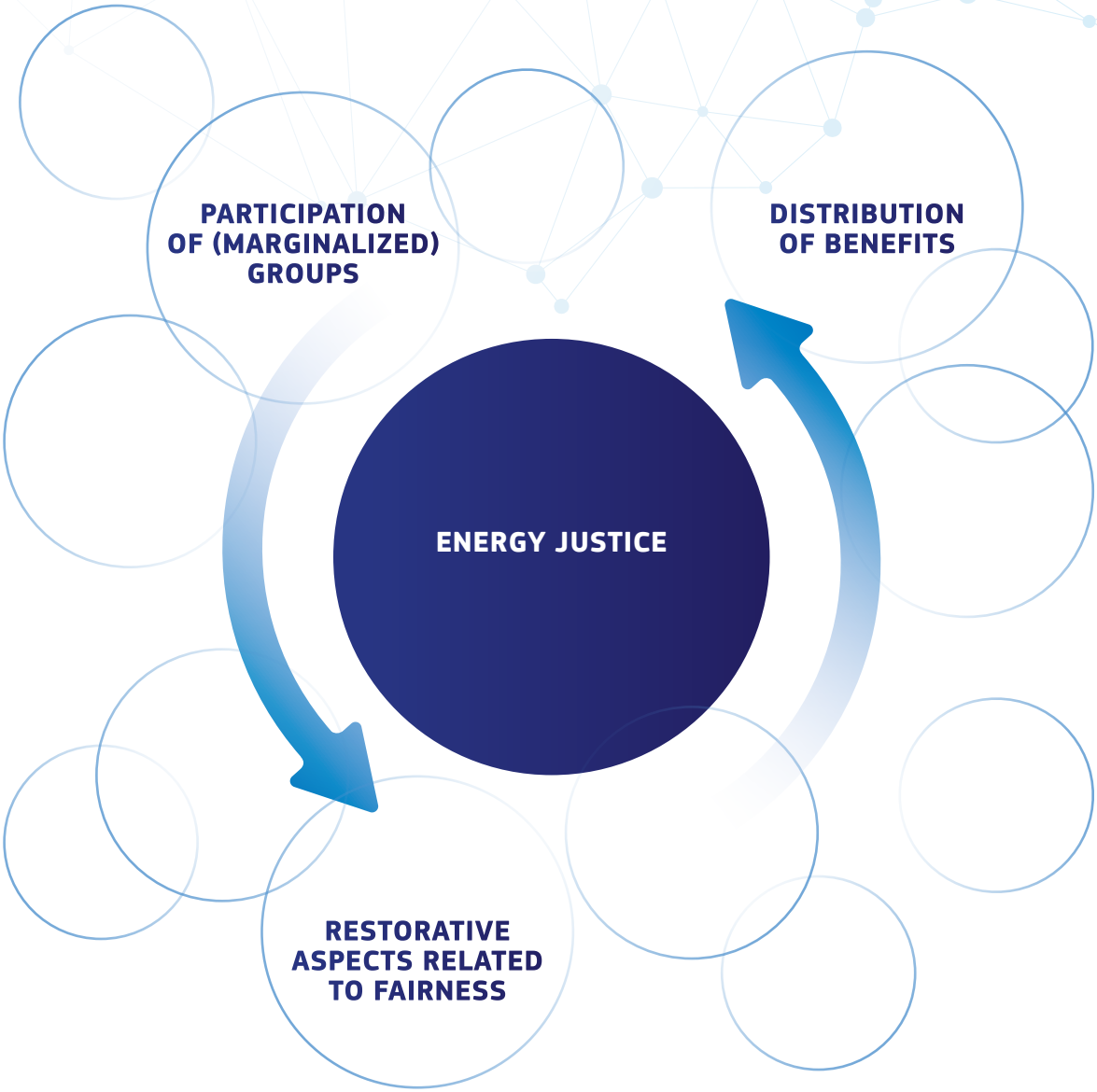
Out of the 28 interviewed municipalities that indicated energy justice as an expected positive impact, 9 indicate that they expect not all social groups to have equal opportunities to participate in and benefit from energy communities (Figure 4). Energy justice in the survey being explained by examples that included participatory governance, equality in access to an energy community, their resources and participation, and reduction of energy poverty. Hence, 32% indicate seemingly conflicting positive and negative impacts that an energy community would bring to the local community. Twelve out of the 28 expect increased congestion, a more complex energy system, and/or socialisation of network costs induced by the energy community to have to be borne by those not participating in the energy community. These 3 aspects of congestion, complexity, and socialisation of induced costs are all expected to lead to increased network operating and investment expenditure. As previously assessed by Tuerk & Peeters (2020)[32] for Austria, increasing costs will impact the risk for energy poverty and even more so for those that cannot participate in the energy community.

Figure 4: Perceived energy justice combined with expected negative impacts related to increased costs and equal participation.



31 Hanke, F., Guyet, R. (2023). The struggle of energy communities to enhance energy justice: insights from 113 German cases. Energ Sustain Soc 13, 16. doi.org/10.1186/s13705-023-00388-2

32 Tuerk, A., Peeters, L., Hannoset, A., Frieden, D. (2020). CEER meets BRIDGE Task Force Energy Communities. Joanneum Research Forschungsgesellschaft mbH. doi.org/10.13140/RG.2.2.12023.65449



Energy justice is a complex matter with several nuances linked to among other procedures, participation of (marginalized) groups, distribution of benefits, and restorative aspects related to fairness. It can be concluded that municipalities recognize the potential of energy communities to contribute to energy justice and a relevant share of them indirectly also acknowledge potential risks. Though, there is a need for a better understanding of how energy community models and governance structures lead to effective energy justice.

Energy justice is a multi-layered, human-centric theoretcal concept that challenges injustice and inequality in the energy sector. It does this by recognising who should have a say when energy systems are being designed and deployed, and what the implications of such systems are and to whom (Sussex, 2023)[33]. Energy democracy is an umbrella term, as there is currently no single understanding of its meaning (Szulecki, 2017)[34], which ranges from a normative goal related to legitimacy, fairness and justice, to a more operational notion regarding decentralized and participative decision-making in actual energy initiatives.

33 University of Sussex. (2023, August 17). What is energy justice? Sussex Online. study-online.sussex.ac.uk/news-and-events/what-is-energy-justice

34 Szulecki, K. (2017). Conceptualizing energy democracy. Environmental Politics, 27(1), 21-41. doi.org/10.1080/09644016.2017.1387294

Statement 4: Lowering energy bills is seen as one of the main economic benefits, though it is often combined with recognized increased complexity of the energy system, increased congestion, and the demand for financial incentives.

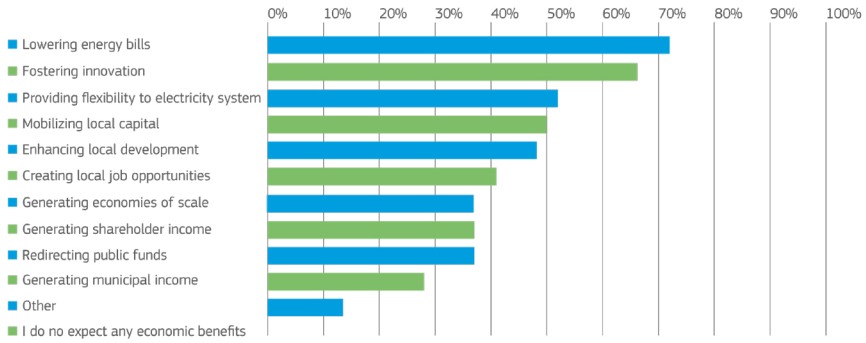
Lowering energy bills and stable electricity prices are, especially since the energy price surge following the invasion of Russia in Ukraine, a more prominent concern of local authorities. However, limited objective assessments have dived into the claim of reduced energy bills for energy communities. During the recent energy crisis, some energy communities did temporarily not allow new members in order to keep energy prices low for their members by avoiding to have to buy additional electricity at a high price on the electricity market. Aside from such anecdotal evidence, there is little proof that energy communities effectively lower the energy bill for the end-consumers unless they benefit from special tariffs. Such is the case for communities that share energy within specified distances in e.g., Spain, Italy, and Luxembourg. Though, due to missing grid impact assessments in those countries, it is to be further analysed what savings are realized that justify the implemented tariff reductions (Tuerk & Peeters, 2020)[35].

Arthur Lambillotte, Unsplash

35 Tuerk, A., Peeters, L., Hannoset, A., Frieden, D. (2020). CEER meets BRIDGE Task Force Energy Communities. Joanneum Research Forschungsgesellschaft mbH. doi.org/10.13140/RG.2.2.12023.65449

Among the 44 interviewed municipalities, 32 (73%) indicated lowering the energy bill as the most important economic benefit of an energy community (Figure 5). When asked about the top 3 of all benefits of energy communities, including economic, social, and environmental, nearly 40% of all interviewed energy communities selected lowering energy bills in the top 3.

Figure 5: Percentage of local authorities expecting energy communities to deliver different types of economic benefits to their local community.



Eleven out of the 32 further selected the combination of a lower energy bill, shareholder income through dividends and/or municipal income through taxes and rents. At the same time, 16 out of the 32 combined the positive impact of a lower energy bill with a more complex energy system, and/or more congestion, and/or socializing of the induced network costs. Eight of these 16 combined that with additional income for the municipality and/or dividends to the shareholders. This implies an assumption that there are relevant margins on the cost charged for electricity (including through municipal taxes) or that an attractive price could be charged for surplus energy sold. These charges or income would then allow for the expenses and reductions, while still relying on the role of conventional actors such as regulated grid operators, commercial suppliers with balancing responsibilities, and generators.

The potential savings are different in each of the member states, and depend among other on the energy infrastructure, the market organisation and operation, the wholesale and production prices versus the sales price, as well as the responsibilities that different actors in the energy market must bear.

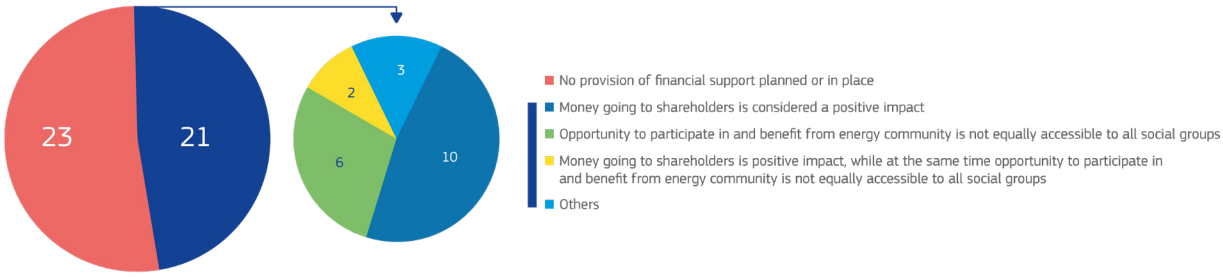
A basic understanding of the electricity market, balancing responsibility (and the cost of a disbalance), the role of different actors and how tariffs are set, would help stakeholders to gain a better understanding of the feasibility of claimed benefits. Capacity building activities should include these elements, both for municipalities as for (emerging) energy communities.

Statement 5: The demand for funding and financing for energy communities is often combined with the recognition of financial profit to a selected group.

The lack of access to funding and finance is often mentioned as one of the main barriers to the development of energy communities. Without initial capital, it is difficult for an energy community to join the market and compete with well-established competitors or oligopolies in the energy sector that can make use of the economies of scale (Huybrechts & Mertens, 2014)[36]. However, due to the lack of legitimacy, inflexible market structures, uncertainties around feed-in-tariff levels and the risk aversion of financial institutions and investors for innovative projects, this initial capital can be difficult to secure (Huybrechts & Mertens, 2014; Reis et al., 2021)[37; 37]. This is particularly the case for vulnerable households, whom both do not have access to capital and prefer not to take financial risks (Hanke et al., 2021)[38]. The role of market incentives and support mechanisms for energy communities is therefore considered important (Dóci, 2017; Koirala et al., 2016)[39; 40]. This could include the clustering of communities to pool resources, whether or not combined with support mechanisms. Furthermore, access to credit sources can be improved by demonstrating the viability and strong business case of the project (Reis et al., 2021)[38]. Also, governmental guarantees for financial loans and awareness among financial institutions is a means to enable access to financing. Though, the lack of an effective business case is – at least partially - linked to the lack of effective added value from a system perspective (Vandevyvere et al., 2021)[41]. This reality negatively impacts the risk assessment of the investment and hence the decision by the financing body.

Among the 44 interviewed municipalities, 21 are advocating for, delivering, or planning to deliver, financial support to energy communities (Figure 6). Twelve of the group of 21 in favour of financial support have at the same time indicated to be aware of money going to the shareholders through dividends. Also, 8 out of the 21 identified the negative impact of the energy community not providing the same opportunities to participate in or benefit from the energy community to all social groups.

Figure 6: Planned or current financial support to energy communities combined with accessibility of profit sharing.



36 Huybrechts, B., & Mertens, S. (2014). The relevance of the cooperative model in the field of renewable energy. Annals of Public and Cooperative Economics, 85(2), 193–212. doi.org/10.1111/apce.12038

37 Reis, I., Gonçalves, I., Lopes, M.., & Henggeler Antunes, C. (2021). Business models for energy communities: A review of key issues and trends. Renewable and Sustainable Energy Reviews, 144, 111013. doi.org/10.1016/j.rser.2021.111013

38 Hanke, F., Guyet, R., & Feenstra, M. (2021). Do renewable energy communities deliver energy justice? Exploring insights from 71 European cases. Energy Research & Social Science, 80, 102244. doi.org/10.1016/j.erss.2021.102244

39 Dóci, G. K. (2017). Renewable energy communities: A comprehensive study of local energy initiatives in the Netherlands and Germany. [PhD-Thesis]. research.vu.nl/en/publications/renewable-energy-communities-a-comprehensive-study-of-local-energ-2

40 Koirala, B. P., Koliou, E., Friege, J., Hakvoort, R. A., & Herder, P. M. (2016). Energetic communities for community energy: A review of key issues and trends shaping integrated community energy systems. Renewable and Sustainable Energy Reviews, 56, 722–744. doi.org/10.1016/j.rser.2015.11.080

41 Vandevyvere, H. (Ed.), Delnooz, A., Hannoset, A., Legon, A.-C., & Peeters, L. (2021). The impact of the EU's changing electricity market design on the development of smart and sustainable cities and energy communities [Report]. Smart Cities Marketplace. smart-cities-marketplace.ec.europa.eu/sites/default/files/2021-03/5950_SCIS_Report3_web.pdf

All positive and negative externalities are to be added to the analysis on financial support, which could result in a decisive positive impact of the provision of funding and financing. However, the recognized risk of allocating financial benefits to a selected group may create a haze of unfairness or unequal treatment. One could argue that energy communities provide a low-risk investment that supports the much-needed shift to renewable energy and see that in perspective with other financial offers for private investors. However, in most conventional energy cooperative models one's investments is locked for 3 to 5 years. Aside from the height of the investment, putting aside even a small amount in an inflexible manner is not equally feasible for all.

An authority could request compensating measures for specific marginal or vulnerable groups linked to the provided financial support (example in Box 3). In addition, energy communities in itself could be an instrumental (social acceptance) or stand-alone (citizen engagement) objective, especially when combined with meaningful participation of the members.

Box 3: Local authorities and energy communities collaborate to make local renewable energy accessible for all.

The city of Eeklo, Belgium, and the energy cooperative Ecopower are joining forces to develop a model enabling vulnerable households to access locally produced renewable energy at equitable rates[42]. Through a dedicated financial fund, budgetary provisions are made to pre-finance the membership shares for these households to join the cooperative. Initially, the pilot project aims to facilitate the inclusion of 100 families in the cooperative. As of day one, the shareholders have full membership entitling them to all associated benefits, such as fair-priced renewable energy and a voice in Ecopower's decision-making processes. Over a period of five years, these families reimburse the loan through monthly instalments, utilizing savings from reduced electricity bills. Subsequently, the city administration can allocate the repaid entry fees to support additional vulnerable households. The rolling fund of pre-financed social energy shares makes local renewable energy more accessible to all.

42 Power Up in Belgium – Power Up (www.socialenergyplayers.eu/belgium)

Statement 6: Municipal support can make a key difference, but may threaten equal treatment for energy community initiatives.

Meister et al. (2020)[43] show the beneficial impact of municipal support on energy communities (e.g., planning provisions, financial support, or targets for citizen participation or citizen-led initiatives). Their research shows that municipalities are specifically keen on supporting if they are a member of the energy community. Evidence of Flemish energy communities (Peeters et al., 2024)[44] further shows that being well-connected with the local and regional political level enables better access to subsidies at municipal and provincial level, and/or being offered the opportunity to develop a project on municipal property (e.g., PV on the roof of a public building). Also, the guaranteed prices that municipalities pay for offtake of excess energy from the energy community (Box 4), and diverse technical, legal, and financial types of support (Box 5 and Box 6), reduce risks for, and enable a faster growth of, the energy community initiative.

Box 4: Energy community supported by the city of Mechelen with staff and resources, and offtake of excess energy at a fixed and guaranteed price.

In 2022, the City of Mechelen, the social housing association Woonland, and citizen energy cooperative Klimaan, established the energy community Otterbeek[45]. In 2022, solar panels were installed on residential buildings in the social neighbourhood Otterbeek. The social housing tenants do not invest themselves in the installation but can benefit from the electricity produced at a price lower than what they would normally pay. The municipality has subscribed a guarantee to buy the surplus of electricity that is not used within the energy community. The municipality participates at a fixed price for 20 years to reduce the risk for the energy cooperative.

43 Meister, T., Schmid, B., Seidl, I. et al. (2020). How municipalities support energy cooperatives: survey results from Germany and Switzerland. Energ Sustain Soc 10, 18. doi.org/10.1186/s13705-020-00248-3

44 Peeters, L., Decat, S., Baets, J., & Blaauw, M. (2024). Energie-gemeenschappen: Krachtige samenwerkingen voor duurzame toekomst [Report]. EDURGY. www.think-e.be/sites/default/files/paragraph/files/2024-01/ESF-Energie-Case%20studies.pdf

45 Example provided by interviewees -Otterbeek wijk, Mechelen (coop.klimaan.be/project/otterbeek), and Wonen en delen: inspirerende voorbeelden - Stad Mechelen (www.mechelen.be/anders-wonen/wonen-en-delen)

Box 5: Support to energy communities including guidance for community creation, training, and assistance in outreach activities, case of Navarra region.

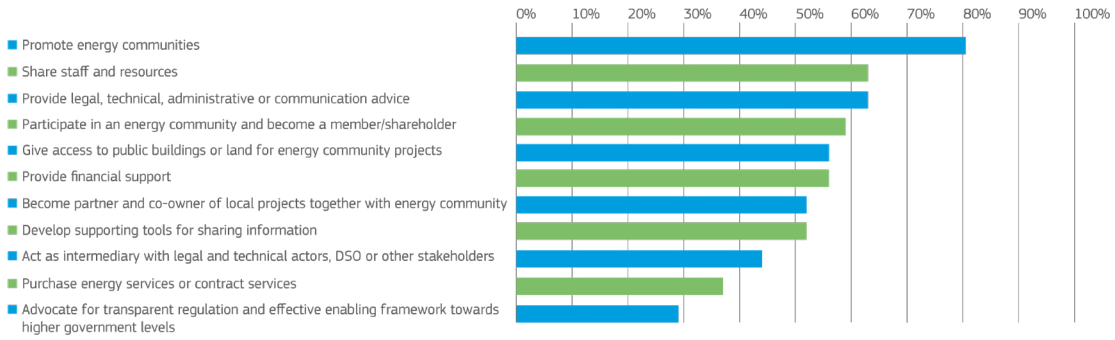
The Regional Department of Industry and Ecological and Digital Business Transition in **Navarra** has established the Office for Community Transformation, VIKENA[46], with the aim of promoting the creation and growth of energy communities in the region. The office was established with a grant of EUR 890 000 from the Institute for Diversification and Saving of Energy (IDAE), as part of the National Plan for Recovery, Transformation, and Resilience. The project is led by the Government of Navarra, with the involvement of the City Council of Pamplona and other public entities. VIKENA operates through collaboration with various stakeholders and has a central office managed by the Government of Navarra, as well as local offices in areas covered by the project. It provides free advice and support to citizens, public administrations, and companies interested in establishing and developing energy communities. Services offered by VIKENA include legal guidance for community creation, training, and assistance in outreach activities. The funding for these services comes from IDAE's grant program, as well as resources from the Department of Industry and the Department of Ecological Transition and Digital Entrepreneurship.

Box 6: Providing advice on legal, technical, administrative or communication aspects.

The Energy Advisory Office in Pamplona[47] offers a range of services, including awareness-raising, dissemination, promotion, and training in the field of energy and energy communities. The office provides guidance and assistance for those looking to establish an energy community, along with information on available grants for both energy communities and renewable energy installations. This office represents the initial step in a broader plan of the Pamplona City Council to establish a network of energy information offices in various neighbourhoods over the coming years. The network as well as the energy communities play a crucial role in achieving the objective of positive energy districts or neighbourhoods.

The primary forms of support offered or planned to be offered by the interviewed local authorities include promoting energy communities through activities such as information campaigns, events, and municipal newsletters (81%), sharing staff and resources (64%), and providing advice on legal, technical, administrative or communication aspects (e.g., one-stop-shop services) (64%) (Box 6).

Figure 7: Percentage of local authorities currently offering or planning to offer a specific type of support to energy communities.



46 Example provided by interviewees - Vikena (www.vikena.es)

47 Example provided by interviewees - Oficina de Asesoramiento Energético del Ayuntamiento de Pamplona | Ayuntamiento de Pamplona (www.pamplona.es/entidades/oficina-de-asesoramiento-energetico-del-ayuntamiento-de-pamplona)

The 3 most popular support measures that are (planned to be) delivered to energy communities are:

The promotion of such initiatives

Sharing staff and resources

Provision of legal, technical, administrative or communication advice.

There are 2 relevant concerns related to this (intended) offer.

The first one is linked to the need for capacity building towards municipalities on what energy communities are and what their impacts could be, as is clear from the assessment linked to the previous statements.

The second one is related to the need for objective information. Seyfang et al. (2014) found that intermediaries, lobbyists, and policymakers - consciously or not - select the lessons they wish to transmit to others.

The authors therefore emphasize the need for enabling direct peer exchange, where energy community initiatives themselves decide what is most important. This networking was specifically mentioned by 4 of the interviewed municipalities, but not linked to peer exchanges. Specifically, networking was seen as enabling contacts with local service providers, organising information meetings for stakeholders interested in setting up an energy community, and meetings to share information and gather citizens' views and to discuss potential projects.

Additionally, in the light of the above observations, including the lack of a full understanding of what energy communities are and the objective assessment of their positive and negative impacts, it is not self-evident that municipalities provide a level-playing field among different initiators of energy communities. At this early stage of experimenting, municipalities aim to contribute to successful energy communities by offering to buy excess electricity at fixed conditions, or providing access to the roof of a public building in which case the municipality will pay for self-consumed energy in that building. These models support the business case of the energy community and de-risk the investment. However, as acknowledged by 30% of the interviewees, the benefits are not equally accessible for all social groups. The well-intended support hence includes an inherent risk of a Matthew effect.[48] Additionally, such support is not easily expandable to all future energy communities in the municipality.

Most of the interviewed municipalities are in favour of supporting energy communities and aim to contribute to successful energy communities within their geographical area. However, the lack of understanding combined with assumptions on both positive and negative impacts can lead to unintentionally favouring specific models or creating non-replicable support for pioneering energy communities (e.g., agreements on buying surplus energy from the community, allowing the development of PV-projects and the sale of generated electricity on municipal property with high self-consumption). It could be a good practice to organise co-creation sessions with emerging energy communities, inviting various (and as diverse as possible) existing energy communities from other municipalities, and jointly develop the municipal support offer.

48 The Matthew Effect refers to a pattern in which those who begin with advantage accumulate more advantage over time and those who begin with disadvantage become more disadvantaged over time.

Markus Spiske, Unsplash

Conclusion & Recommendations

Within the framework of the Smart Cities Marketplace, interviews with 44 local authorities across Europe have been undertaken to assess the perspectives, experiences and needs local authorities have regarding energy communities. The results show interesting findings regarding a rather limited understanding of what the definitions of citizen energy communities and renewable energy communities entail, as well as contradictions in expected positive and negative impacts of these energy communities, both for the municipality and for other stakeholders. However, the results also indicate a general interest in developing community projects, whether they are interpreted as local renewable energy projects or actual energy community projects. The results further show that there is a willingness to provide support to emerging and existing citizen projects, which is highly relevant given the local targets on energy and climate that municipalities have to realise.

The results have been consolidated into 6 statements that can further guide policy and support measures foreseen in the roll-out and evaluation of energy communities. The 6 statements are given below:

1 The study reveals **a diverse (and often incomplete) understanding among local authorities regarding the definition and concepts of energy communities**. Despite this, the interviewed stakeholders did not hesitate to list a diversity of positive and negative impacts that energy communities are expected to bring to the municipality or to other stakeholders through their activities and organizational form.

2 While recognized as an important benefit of energy communities, interviewees showed to **not fully comprehend the meaning of energy democracy and how it translates into the governance and operation of these communities**. Their interpretation was merely limited to citizen participation. This highlights the need for clarity and objective communication on energy democracy, including how it is measured, and the variations it can take across various member states.

3 There was a sound understanding of the benefits of energy communities to their members, such as financial benefits and access to (participation in) clean energy projects. Energy justice (e.g., participatory governance, equality in access to energy community, their resources and participation, reduction of energy poverty) is considered a crucial social benefit of energy communities, but there is **limited reflection on how the redistribution of costs and benefits impacts different social groups, particularly concerning energy poverty**. There is a need for an objective analysis to better understand which energy community models effectively contribute to energy justice and (energy) poverty reduction.

4 Lowering energy bills is seen as a primary economic benefit of energy communities. This **expected benefit of lower energy bills seems to collide with expected system complexity, and thus, costs**.

5 Municipalities identify the **relevance of financial support to (emerging) energy communities, while at the same time acknowledging the risk for non-equal distribution** of this benefit of an energy community over different social groups, and the allocation of financial benefits to members or shareholders only.

6 Municipalities recognize the importance of their role in the success of energy communities, but there are challenges in ensuring equal treatment among different initiatives. **Support measures often favour specific models or create non-replicable support for pioneering energy communities**, highlighting the need for more inclusive and transparent approaches.

Overall, the conclusions emphasize the complexity of energy communities and the importance of addressing various challenges, including the need for better and facts-based understanding of energy communities among local authorities. Such increased understanding combined with sharing of good practices of the role of municipalities, can lead to effective and equitable support mechanisms to ensure the successful development of energy communities and their contribution to a just energy transition.

Gerd Altmann, Pixabay

Thomas G. Pixabay

Figures

Annex

Overview of the interview questions

A. Organization and role

1. **Which city/municipality do you represent?**
   ☐ Free text
2. **In which country is this city/municipality located?**
   ☐ Drop-down menu with country selection. (only one selection possible)
3. **What is the size of this city/municipality? (only one selection possible)**
   ☐ <10 000
   ☐ 10 000-50 000
   ☐ 50 000-100 000
   ☐ 100 000-500 000
   ☐ >500 000
4. **What is your role in this city/municipality? Please specify:**
   ☐ Job title: Free text.
   ☐ Organisation/entity: Free text.
   ☐ Department/team: Free text.
5. **How many years of experience do you have on the topic of energy communities and related policies?**
   → Field requiring a number.

B. Policy Framework and Objectives

1. **Is there any definition for energy communities in your country, region or municipality?**
   ☐ Yes, please specify the definition(s) for energy communities and provide link to relevant websites or attach relevant documents for more details, if available.
   → Description of definition(s) (e.g., number of definitions, legal entities that are allowed, eligibility criteria, geographic proximity): Free text.
   → Relevant weblink: Free text.
   → Attachment.
   ☐ No (Go to next question)
   ☐ I do not know (Go to next question)
2. **Are there any national or local targets or objectives for energy communities?**
   ☐ Yes, please specify the target(s) for energy communities and indicate if the target(s) are national or local. Provide link to relevant websites or attach relevant documents for more details, if available.
   → Description of targets: Free text.
   → Relevant weblink: Free text.
   → Attachment.
   ☐ No (Go to next question)
   ☐ I do not know (Go to next question)

C. Impacts of Energy Communities

3. **Are there energy communities active in your city/municipality?**
   - ☐ Yes (Go to next question)
   - ☐ No (Go to 7)
   - ☐ I do not know (Go to 7)

4. **How many energy communities are active in your city/municipality? (approximately)**
   - ☐ Field requiring a number.

5. **What are the main activities of these energy communities? (multiple choice)**
   - ☐ Renewable energy generation (heat, electricity)
   - ☐ Electricity generation (non-renewable)
   - ☐ Energy efficiency services (including buildings renovations)
   - ☐ Energy Self-consumption
   - ☐ Energy sharing
   - ☐ Energy Supply
   - ☐ Energy Distribution
   - ☐ Energy Storage
   - ☐ Flexibility services
   - ☐ Aggregation
   - ☐ E-mobility services
   - ☐ Other, please specify:
     - → Free text.
   - ☐ I do not know

6. **Who are the main shareholders or members of these energy communities? (multiple choice)**
   - ☐ Natural persons
   - ☐ Small and medium-size enterprises (SMEs)
   - ☐ Small enterprises
   - ☐ Local authorities, including municipalities
   - ☐ Other, please specify:
     - → Free text.
   - ☐ I do not know

Expected impacts

7. What economic benefits do you expect energy communities to provide to your local community? (Multiple Choice)

- ☐ Creating local job opportunities
- ☐ Lowering energy bills
- ☐ Generating shareholder income (e.g., dividends paid to shareholders)
- ☐ Generating municipal income (e.g., taxes, land rental payments)
- ☐ Mobilizing local capital (e.g., opportunities to invest in projects and services with significant benefits to the local community)
- ☐ Fostering innovation (e.g., innovative business models, fundraising tools, innovative technologies, socially innovative solutions)
- ☐ Redirecting public funds (e.g., reallocating public funds to renewables instead of fossil fuels, preservation of local funds)
- ☐ Enhancing local development (e.g., reinvestment of profits contributing to local development, boost competitiveness of local businesses)
- ☐ Generating economies of scale (e.g., accumulation of human resources, capital and knowledge)
- ☐ Providing flexibility to the electricity system through demand response and storage
- ☐ Other, please specify:
  - → Free text.
- ☐ I do not expect energy communities to provide any economic benefits

8. What ecological/environmental benefits do you expect energy communities to provide to your local community? (Multiple Choice)

- ☐ Increased renewable energy production
- ☐ Energy savings
- ☐ Reduction of greenhouse gas emissions
- ☐ Protection of local environment
- ☐ Other, please specify:
  - → Free text.
- ☐ I do not expect energy communities to provide any ecological/environmental benefits

9. What social benefits do you expect energy communities to provide to your local community? (Multiple Choice)

- ☐ Energy justice (e.g., participatory governance, equality in access to energy community, their resources and participation, reduction of energy poverty)
- ☐ Energy democracy (e.g., presence of democratic principles in the decision-making of the energy community, shared ownership, change in power structures)
- ☐ Community empowerment (e.g., knowledge development, skill development, energy literacy, access to information)
- ☐ Social capital (e.g., social networks, social identification with the community, community trust)
- ☐ Energy self-sufficiency and independence (because of increased resilience of the energy system and security of supply)
- ☐ Increased public acceptance of renewables
- ☐ Improvement of health and quality of life (e.g., less air pollution, better comfort)
- ☐ Other, please specify:
  - → Free text.
- ☐ I do not expect energy communities to provide any social benefits

10. Please select from the list below the 3 benefits of energy communities that are most important to your local community. (3 options have to be selected)

- ☐ Creating local job opportunities
- ☐ Lowering energy bills
- ☐ Generating shareholder income (e.g., dividends paid to shareholders)
- ☐ Generating municipal income (e.g., taxes, land rental payments)
- ☐ Mobilizing local capital (e.g., opportunities to invest in projects and services with significant benefits to the local community)
- ☐ Fostering innovation (e.g., innovative business models, fundraising tools, innovative technologies, socially innovative solutions)
- ☐ Redirecting public funds (e.g., reallocating public funds to renewables instead of fossil fuels, preservation of local funds)
- ☐ Enhancing local development (e.g., reinvestment of profits contributing to local development, boost competitiveness of local businesses)
- ☐ Generating economies of scale (e.g., accumulation of human resources, capital and knowledge)
- ☐ Providing flexibility to the electricity system through demand response and storage
- ☐ Increased renewable energy production
- ☐ Energy savings
- ☐ Reduction of greenhouse gas emissions
- ☐ Protection of local environment
- ☐ Energy justice (e.g., participatory governance, equality in access to energy community, their resources and participation, reduction of energy poverty)
- ☐ Energy democracy (e.g., presence of democratic principles in the decision-making of the energy community, shared ownership, active political citizenship, change in power structures)
- ☐ Community empowerment (e.g., knowledge development, skill development, energy literacy, access to information)
- ☐ Social capital (e.g., social network, social identification with the community, community trust)
- ☐ Energy self-sufficiency and independence (because of increased resilience of the energy system and security of supply)
- ☐ Increased public acceptance of renewables
- ☐ Improvement of health and quality of life (e.g., less air pollution, better comfort)
- ☐ Other, please specify:
  - → Free text.

11. What negative impacts do you expect energy communities to have for your local community?

- ☐ The local energy system becomes more complicated
- ☐ Increased tension among local actors (e.g., renewable energy installations occupy land available for other activities such as agriculture, tourism, real estate)
- ☐ Not contributing to local job creation and development (e.g., by contracting companies outside municipality/city for outsourcing services)
- ☐ Renewable energy installations have negative impacts on the environment (e.g., impact on biodiversity and local ecosystems, noise pollution, stroboscopic shadow)
- ☐ The opportunity to participate in and benefit from the energy community are not distributed equally among social groups
- ☐ Network costs induced by the energy community are socialised, and thus borne by those not participating in the energy community
- ☐ Increased congestion of the local grid
- ☐ Other, please specify:
  - → Free text.
- ☐ I do not expect energy communities to create any negative impacts

12. Please select from the list below the 3 negative impacts of energy communities that are most important to your local community. (min 1, max 3 options to be selected)

- ☐ The local energy system becomes more complicated
- ☐ Increased tension among local actors (e.g., renewable energy installations occupy land available for other activities such as agriculture, tourism, real estate)
- ☐ Not contributing to local job creation and development (e.g., by contracting companies outside municipality/city for outsourcing services)
- ☐ Renewable energy installations have negative impacts on the environment (e.g., impact on biodiversity and local ecosystems, noise pollution, stroboscopic shadow)
- ☐ The opportunity to participate in and benefit from the energy community are not distributed equally among social groups
- ☐ Network costs induced by energy community are socialised, and thus borne by those not participating in the energy community
- ☐ Increased congestion of the local grid
- ☐ Other, please specify:
  - → Free text.
- ☐ I do not expect energy communities to create any negative impacts

E. Good practice examples

13. Can you provide an example of an energy community that you consider a good practice with regard to the benefits that are provided to the local community? Please provide link to relevant websites or attach relevant documents for more details, if available.

a. Brief description of good practice (e.g., location, activities, legal entity, members): Free text.
b. Relevant weblink: Free text.
c. Attachment

14. Please explain why you consider this example to be a good practice and how could it benefit your municipality/city.

d. Free text.

F. Support for energy communities

15. Is there support available that enables the emergence and further development of energy communities in your city/municipality (e.g., capacity building, technical assistance, information provision, access to financing)?

- ☐ Yes (Go to next question 16)
- ☐ No (Go to question 17)
- ☐ I do not know (Go to question 17)

16. Please, provide 2 examples of the support available that you consider most effective in enabling the emergence and further development of energy communities in your city/municipality. Then go to question 18

- ☐ Example 1
  - → Provide a brief description of the support (type of support, aim, geographic scope, eligibility criteria, where it is/has been implemented)
  - → Please provide relevant weblinks if available: Free text.
  - → Please add any relevant attachments.
- ☐ Example 2
  - → Same as above

17. Please, provide 2 examples of support that you would consider most effective in enabling the emergence and further development of energy in your city/municipality. Then go to question 18

☐ Example 1

→ Provide a brief description of the support (type of support, aim, geographic scope, eligibility criteria, where it is/has been implemented)

→ Please provide relevant weblinks if available: Free text.

→ Please add any relevant attachments.

☐ Example 2

→ Same as above

18. Can you explain why you consider these examples to be most effective in enabling the emergence and further development of energy communities in your city/municipality?

☐ Free text.

G. Challenges and opportunities

19. Does the local authority support the emergence and further development of energy communities (as initiator, partner or enabler) in your municipality/city?

☐ Yes, the city/municipality is already supporting or having plans to support energy communities. (Go to next question)

☐ No, the city/municipality does not support nor has specific plans to support energy communities. (Go to question 23)

☐ I do not know (Go to question 23)

20. How does the local authority support the emergence and further development of energy communities in your municipality/city? (multiple choice)

☐ Become partner and co-owner of local projects together with an energy community

☐ Participate in an energy community and become a member or shareholder

☐ Purchase energy services (related to e.g., energy supply) or contract services (for the purpose of e.g., developing renewable energy production and energy efficiency measures in public buildings)

☐ Provide financial support (e.g., grants, low-interest loan, guarantees)

☐ Share staff and resources

☐ Give access to public buildings or land for energy community projects

☐ Act as intermediary with e.g., legal and technical actors, the distribution system operator (DSO), or other local stakeholders

☐ Develop supporting tools for sharing information (e.g., online platforms)

☐ Provide legal, technical, administrative or communication advice (e.g., one-stop-shop)

☐ Promote energy communities (through e.g., information campaigns, hosting events, municipal newsletter)

☐ Advocate for transparent regulation and effective enabling framework for energy communities towards higher government levels

☐ Other, please specify:

→ Free text.

21. Please, briefly describe 2 examples of support provided by the local authority that you consider most effective in enabling the emergence and further development of energy communities in your city/municipality.

☐ Example 1:

→ Provide a brief description of the support the local authorities offer (type of support, aim, geographic scope, eligibility criteria)

→ Please provide relevant weblinks if available: Free text.

→ Please add any relevant attachments.

e. Example 2:

☐ Provide a brief description of the support the local authorities offer (type of support, aim, geographic scope, eligibility criteria)

→ Please provide relevant weblinks if available: Free text.

→ Please add any relevant attachments.

22. Can you explain why you consider these examples of local support to be most effective in enabling the emergence and further development of energy communities in your city/municipality?

☐ Free text.

23. What restrains the local authority to play a more active role in the investment in or the initiation of an energy community?

☐ Free text.

24. What does the local authority need to play a more active role in the investment in or the initiation of an energy community?

☐ Free text.

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