Scientific Journal of Latvia University of Life Sciences and Technologies
Landscape Architecture and Art
Volume 29, Number 29

DOI: 10.22616/j.landarchart.2026.29.02

ENERGY COMMUNITY DEVELOPMENT MODEL FOR MULTI-APARTMENT RESIDENTIAL BUILDINGS IN LATVIA

Mārtiņš Auders, Ineta Geipele, Sanda Lapuķe, Iveta Amolina, Māra Liepa-Zemeša

Riga Technical University, Latvia

Abstract. The European Union regards energy communities as an important instrument for advancing the energy transition, promoting citizen participation, and expanding renewable energy production. However, despite the legal and policy framework established by the European Union, the practical development of energy communities in Latvia remains limited.

Although previous research has examined energy community governance models and the legal, institutional, and social factors influencing their development, there is still a lack of studies that define a governance model for energy communities adapted to Latvia's institutional, legal, and social context, including the roles of institutional actors and spatial planning aspects influencing their practical implementation. Therefore, this study aims to empirically validate a conceptual model for the development of energy communities in Latvia by identifying the key institutional actors, their roles, and the preconditions required for generating the common good and enabling the practical implementation of energy communities.

The proposed model was developed by integrating the findings of a series of interrelated studies addressing the legal, institutional, and social preconditions for energy community development in order to identify the factors essential for their implementation within the Latvian institutional and regulatory context. To validate and refine the proposed model, a focus group was conducted involving representatives of the principal stakeholders in energy community development, including national public authorities responsible for energy and spatial planning policies, municipalities and municipal representative organisations, residential building managers, and an existing energy community. The discussion focused on the appropriate scale of energy communities, governance arrangements, and the roles of institutional actors, providing recommendations for further refinement of the proposed model.

The findings indicate that the development of energy communities in Latvia is constrained by limited experience in collective action under democratic market conditions and insufficient institutional capacity. Consequently, municipalities should participate alongside citizens as institutional members of energy communities. The study demonstrates that municipalities can play a crucial role in defining the common good, providing institutional support, coordinating local energy community initiatives, and strengthening public trust and cooperation. These findings contribute to the development of a governance framework for energy communities that is better suited to the Latvian context and may support their successful implementation at the local level.

Keywords: energy community, energy transition, common good

Introduction

The Member States of the European Union have committed to reducing greenhouse gas emissions by at least 55% by 2030 compared with 1990 levels, with the objective of making Europe the world's first climate-neutral continent [26]. At the same time, the European Union seeks to ensure access to affordable energy for all citizens while enabling their active participation in the clean energy transition [25]. To achieve these objectives, the European Parliament and the Council have promoted the establishment of at least one energy community in every municipality with more than 10,000 inhabitants by 2025 and require municipalities with more than 45,000 inhabitants to assess the role of energy communities in local heating and cooling plans [28].

European policymakers view energy communities as a mechanism through which citizens collectively manage investments and generate, consume, and share renewable energy using technologies such as photovoltaic systems, wind turbines, and district heating systems [1, 24, 37]. According to the European Commission [24], energy communities could increase the installed renewable energy capacity owned by citizens by as much as tenfold by 2030, enabling 25–30 million households across Europe to produce renewable energy. In Latvia, the residential building sector accounts for approximately 30% of total final energy consumption [41], indicating substantial potential for energy communities to contribute to national energy efficiency and decarbonisation objectives.

The scientific literature identifies energy communities as an important mechanism for advancing energy democracy by redistributing decision-making power from large energy corporations to citizens through collective ownership and management of renewable energy resources [38, 50, 53]. Energy communities are therefore regarded as ideal organisational structures in which citizens actively participate in energy-related decision-making processes [53]. Citizen participation in energy communities is considered essential for achieving climate mitigation and sustainable development goals [17]. Nevertheless, energy communities depend heavily on civic engagement and voluntary contributions and frequently face technical, financial, and organisational constraints [12, 23, 32]. Previous studies also highlight challenges associated with limited community capacity, low levels of trust in public institutions [10], maintaining long-term citizen participation, and scaling successful local initiatives [19].

Although numerous successful examples of energy communities have emerged across Europe [25], the literature suggests that their full potential has not yet been realised and that their long-term contribution to the energy transition remains uncertain [11, 54]. In particular, their contribution will largely depend on their ability to expand beyond niche initiatives and become embedded in mainstream energy governance [11]. Similarly, Broska et al. [13] argue that, if current trends persist, a citizen-led energy transition based on energy communities is unlikely to achieve its expected transformative potential.

Although previous studies have extensively examined the governance models of energy communities and the legal, institutional, and social factors influencing their development, there remains a lack of research defining an energy community

governance model adapted to Latvia's institutional, legal, and social context, including the roles of institutional actors and the mechanisms for creating the common good. This research gap is particularly relevant in countries with limited historical experience of collective action in the energy sector, where governance models described in the international literature cannot be directly transferred without adaptation to local institutional conditions. Therefore, the aim of this study is to empirically validate a conceptual model for the development of energy communities tailored to the Latvian context by identifying the key institutional actors, their roles, and the preconditions necessary for generating the common good and facilitating the practical implementation of energy communities.

Over the three decades following the restoration of its independence, Latvia has transformed its planning system from one characterised by Soviet-style centralised governance to a democratic planning framework supported by a comprehensive national legal system and increasingly ambitious policies promoting citizen participation and local initiatives [8, 40, 49].

The restoration of Latvia's independence in 1991 created the preconditions for the development of democratic governance and public participation [31]. However, at the initial stage, no institutional framework existed to ensure the active involvement of residents in planning processes. A significant turning point occurred in 1994, when the Cabinet of Ministers adopted Regulation No. 194 On Spatial Planning [15], introducing a four-tier planning system and, for the first time, delegating planning responsibilities to local governments. This marked the beginning of the decentralisation of planning and created the foundations for the development of local democracy. Nevertheless, public participation during this period remained largely limited to the publication of planning documents and formal public consultations.

The next stage of development was associated with the adoption of the Law on Spatial Development Planning in 2002 [44], which was substantially revised in 2011 [47] to establish minimum legal requirements for public participation in planning. Public participation became a mandatory component of the planning process [2, 48], facilitating a gradual transition from merely informing citizens towards broader involvement in decision-making. Increasingly, participation came to be understood not simply as informing residents about completed planning proposals but as engaging them from the earliest stages of the planning process through dialogue between municipalities and local communities.

As democratic governance evolved, so too did the role of civil society in planning. Initially, participation was dominated by specialised non-governmental organisations representing environmental protection and cultural heritage interests. Subsequently, as local identity and civic engagement strengthened, neighbourhood associations and other place-based community initiatives increasingly emerged and became institutionalised as non-governmental organisations [51]. These developments marked a transition towards broader and more organised public participation, with local communities becoming not only consultees but also active partners in territorial development planning. Consequently, over the past three decades Latvia's planning system has evolved from a centralised, procedure-oriented approach towards a more democratic governance model that increasingly emphasises collaboration, co-creation, and the active participation of local communities [29, 40].

The development of democratic governance and local community participation has also created favourable conditions for new forms of collective action, including the establishment of energy communities. Unlike traditional forms of public participation, which primarily seek to influence public decision-making, energy communities involve citizens directly in the governance of shared energy resources and in pursuing common economic, social, and environmental objectives [7, 30]. Their establishment therefore requires not only an enabling legal framework but also a well-developed culture of collaboration, mutual trust, and sufficient institutional capacity.

In the Latvian context, the development of energy communities is constrained by citizens' limited experience with voluntary collective action in the energy sector and the absence of a historical tradition of energy cooperatives—the predecessors of today's energy communities. This challenge is not unique to Latvia but is characteristic of post-socialist countries more broadly [36].

Although smaller-scale collaborative initiatives, such as the joint management of multi-apartment residential buildings and building renovation projects, have demonstrated the potential of collective action [42], their success has largely depended on the initiative of individual apartment owners and support provided by municipalities. The establishment of an energy community, however, represents a considerably more complex undertaking, requiring the creation of a dedicated legal entity, the organisation of long-term cooperation, and the coordination of the interests of multiple stakeholders.

As noted by Dóci [21], energy communities may initially succeed through the efforts of a small group of committed citizens. However, as the scale and organisational complexity of these initiatives increase, institutional and organisational support becomes increasingly important. Similarly, Djinlev et al. [20] argue that, compared with other forms of collective action, the establishment of energy communities involves more demanding legal, institutional, and procedural challenges. Consequently, the development of energy communities should not be viewed solely as a technological or economic innovation but rather as the next stage in the evolution of democratic governance and community participation. Their successful implementation depends not only on citizen initiative but also on the active involvement of municipalities, public authorities, and intermediary support organisations.

The European Commission has emphasised that local governments play a crucial role in supporting and collaborating with citizens, while also recognising that municipalities are often insufficiently involved in policy design and lack the authority and resources necessary to implement measures for the benefit of local communities [24]. Nevertheless, participation in policy-making represents only one of the four principal ways in which citizens can contribute to the energy transition. Citizens also participate directly by becoming members of energy communities [55].

Directive (EU) 2019/944 of the European Parliament and of the Council on common rules for the internal market for electricity explicitly allows municipalities to participate in citizen energy communities alongside residents [27]. Municipal involvement is particularly important in addressing energy-related conflicts, which constitute a specific category of common good conflicts—that is, situations in which tensions arise between competing public goods or between common goods and other collective objectives, stakeholder interests, or institutional norms [56, 57]. Given that public opposition to renewable energy projects most frequently emerges at the local level [43], municipalities are well

positioned to facilitate dialogue with local communities, strengthen public participation [9], and enhance the social acceptance of renewable energy projects [10].

Against this background, the present study argues that the development of energy communities in Latvia should be understood as an institutionally coordinated process of collective action, in which, alongside citizen initiatives, the involvement of various institutional actors plays a crucial role. In this process, municipalities may assume a significant role by coordinating stakeholders, linking energy community activities with local development objectives, and facilitating the emergence of the common good. This perspective provides the conceptual foundation for the proposed energy community development model, which is empirically validated in the following sections.

Materials and Methods

The study employed a comparative analysis of scientific literature and policy documents, including an assessment of relevant policy planning documents and regulatory frameworks. These sources were analysed in relation to the findings of previous scientific research and compared with the current practical context of energy community development. The empirical data were collected through a focus group conducted using purposive sampling. The participants represented the key stakeholder groups involved in the development of energy communities, including representatives of public administration institutions responsible for energy policy and development planning, municipalities and organisations representing municipal interests, managers of multi-apartment residential buildings, and representatives of energy communities. The characteristics of the focus group participants are presented in Table 1.

The focus group participants were introduced to the research design of the study "Development Model of Energy Communities in Multi-Apartment Residential Buildings in Latvia" (Figure 1). The detailed findings of the study are presented in a series of thematically related publications [43, 44, 45, 46, 47, 48], which collectively provide a sequential analysis of the elements constituting the energy community development model for multi-apartment residential buildings in Latvia.

The focus group discussions were organised to empirically assess the conceptual energy community development model developed within this study. The discussions were structured around the key elements of the proposed model:

- the optimal scale of energy communities;
- the role of multi-apartment residential building managers in the establishment and operation of energy communities;
- approaches to the formation of energy communities;
- the role of municipalities as institutional actors within energy communities in defining the common good and coordinating development processes;
- the contribution of energy communities to the implementation of the energy transition.

Table 1. Characteristics of the focus group participants [created by the authors]

No.	Organisation	Field of activity	Position
1.	Ministry of Climate and Energy	The leading state administration institution responsible for environmental, energy, and climate policy.	Head of a structural unit
2.	Ministry of Economics	The leading state administration institution responsible for industrial and service policy and entrepreneurship policy.	Head of a structural unit
3.	Ministry of Smart Administration and Regional Development	The leading state administration institution responsible for regional development, municipal development and supervision, development planning, and land management.	Head of a structural unit
4.	Union of Local Governments of Latvia	An association that brings together municipalities of the Republic of Latvia.	Expert
5.	Union of Local Governments of Latvia	An association that brings together municipalities of the Republic of Latvia.	Expert
6.	Riga Energy Agency (municipal agency "Rīgas enerģētikas aģentūra")	An agency responsible for sustainable energy and climate planning, management, and coordination in Riga City Municipality, as well as for implementing sectoral policy planning documents.	Head of a structural unit
7.	Riga Energy Agency (municipal agency "Rīgas enerģētikas aģentūra")	An agency responsible for sustainable energy and climate planning, management, and coordination in Riga City Municipality, as well as for implementing sectoral policy planning documents.	Expert
8.	Riga Energy Agency (municipal agency "Rīgas enerģētikas aģentūra")	An agency responsible for sustainable energy and climate planning, management, and coordination in Riga City Municipality, as well as for implementing sectoral policy planning documents.	Expert
9.	First Energy Community	Energy community	Manager
10.	Latvian Association of Building Managers and Administrators	An association representing companies operating in the real estate management sector.	Manager
11.	Building manager	Management of multi-apartment residential buildings	Expert
12.	Building manager	Management of multi-apartment residential buildings	Expert

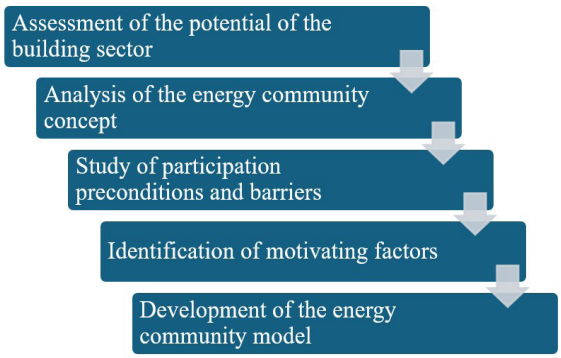


Fig. 1. Research design scheme of the study "Energy Community Development Model for Multi-Apartment Residential Buildings in Latvia"

The focus group results enabled an assessment of the model's applicability within the Latvian institutional context, the identification of potential areas for further refinement, and the clarification of interrelationships between the individual elements of the proposed model.

Results

The research results confirm that the development of an energy community development model is highly relevant, while its practical implementation depends on several institutional and social preconditions. At the same time, the focus group discussions revealed the following key aspects related to the proposed energy community development model.

The focus group discussions identified several interrelated issues that may influence the establishment and practical functioning of energy communities. These issues concern the understanding and definition of energy communities, the roles and capacities of key stakeholders, the involvement of municipalities and spatial planning considerations, as well as the economic rationale for their development. The participants' views were analysed and grouped into key thematic areas, with corresponding solutions proposed to address the identified barriers and support the implementation of the energy community development model. The main findings and proposed solutions are summarised in Table 2.

Discussion

The energy community development model proposed for Latvia assumes the establishment of energy communities at a larger scale than a single multi-apartment residential building, as a single building may already implement collective self-consumption models recognised by Latvian legislation. Through such arrangements, apartment owners can participate in the energy transition [55] and contribute to achieving its objectives [22]. However, collective self-consumption should be clearly distinguished from energy communities, as the latter represent a more complex form of collective action requiring the establishment of a specific legal entity and a broader governance framework.

Unlike collective self-consumption models, energy communities involve not only the joint use of energy resources but also long-term cooperation among different stakeholders, collective decision-making processes, and the definition of common goals and common goods. Therefore, the development of energy communities is closely linked to the evolution of democratic governance, local participation, and new forms of collective resource management.

The focus group results confirmed that a common understanding of the distinction between energy communities and other decentralised energy production models has not yet been established among citizens, building managers, and some market actors. Similar challenges have also been identified in the scientific literature, where the conceptual ambiguity between energy communities, collective self-consumption, and other forms of distributed energy generation is recognised as an important barrier to their development [18]. Therefore, national-level methodological support should be considered, including guidelines, explanatory materials, infographics, model agreements, model statutes, and other practical tools. Such support would help potential participants identify the most appropriate decentralised energy production model according to their objectives and available capacities.

Previous studies indicate that energy community initiatives are most likely to emerge in local communities with prior experience of cooperation and collective action [21, 33]. However, in the Latvian context, such experience remains limited, particularly in the field of collective energy resource management. Although democratic governance has significantly developed in Latvia over the last three decades and local communities have become increasingly involved in planning and territorial development processes [2, 3, 29], energy communities represent a relatively new form of participation requiring a higher level of cooperation, trust, and institutional capacity.

Given that Latvian legislation does not prescribe a specific geographical scale for energy communities [45], this study suggests that the municipality level represents an appropriate scale for their development, with municipalities participating as institutional actors within energy communities. This approach is supported by international research demonstrating the important role of municipalities in managing energy community pilot projects, facilitating their scaling-up, and mediating between potentially conflicting stakeholder interests [11].

The focus group discussions highlighted the municipality's role as one of the most significant aspects of the proposed energy community development model. Participants demonstrated broad agreement that municipalities should assume the role of institutional actors by linking energy community objectives with territorial development priorities and contributing to the definition of common goods at the local level. Municipal involvement would also encourage a more integrated assessment of local renewable energy opportunities and potential restrictions affecting small- and medium-scale energy production facilities. Such an approach would allow municipalities to evaluate not only potential risks but also local benefits associated with energy projects, thereby supporting more context-sensitive decision-making.

Municipal participation in energy communities could also strengthen public acceptance of renewable energy projects. Since municipalities are among the public institutions most closely connected with residents' everyday experiences, their involvement can contribute to trust-building and increased legitimacy of local energy initiatives. This perspective corresponds with broader trends in democratic governance development, where municipalities increasingly act not only as providers of public services or regulatory institutions but also as coordinators of local cooperation and facilitators of co-creation processes [14, 52]. In this context, energy communities can be understood as instruments of participatory governance that extend the relationship between municipalities and citizens from consultation

Table 2. The main findings and proposed solutions[created by the authors]

Key issues	Focus group participants' views	Proposed solutions
Distinguishing energy communities from other decentralised energy production models	Citizens, building managers, and individual market participants alike still lack a common understanding of energy communities. Energy communities are often confused with self-consumption, collective self-consumption, or peer-to-peer trading. The development of energy communities is also hindered by uncertainty regarding procedures and documentation.	National-level template documentation and guidelines are needed that could reduce initial uncertainty, unify terminology, and facilitate cooperation among the parties involved.
Involvement of building managers in the establishment of energy communities	Building managers could explain to apartment owners the contribution of energy communities to building renovation: energy communities can serve not only as a mechanism for optimising electricity consumption but potentially also as an additional financial flow for the building's shared needs. Building managers' capacity and knowledge regarding energy efficiency and the benefits of participating in an energy community vary considerably.	Training, methodological materials, and institutional support for building managers need to be ensured.
The municipality as an institution trusted by residents that can coordinate the processes involved in establishing an energy community within its administrative territory	The municipality is the most important institutional participant in an energy community, because it plans the territory in the context of renewable energy, sets territorial development objectives, and provides public services. The municipality is also a public institution trusted by residents. The municipality's institutional role is closely linked to spatial planning and the possibilities for siting renewable energy infrastructure. Spatial planning requirements can create situations in which the interests of renewable energy development come into contact with landscape protection and other land-use interests.	Municipalities should provide support during the process of establishing an energy community and define the common good at the local level, so that residents understand the significance of energy communities. The municipality should review the restrictions set out in spatial plans on installing renewable energy production equipment, since these affect not only large-scale commercial projects but also small- and medium-capacity solutions – for example, wind turbines ranging from 20 kW to 2 MW – which should be regarded as an obstacle to the development of energy communities. Municipal involvement in an energy community would also allow a qualified economic assessment of the energy community's operation to be carried out; energy managers should be involved in preparing such an assessment.
Economic rationale for establishing an energy community	The advantage of an energy community is that it provides long-term predictability and price stability. An energy community is a mechanism for reducing long-term risk, not an instrument of short-term price competition. Electricity traders are reluctant to cooperate with energy communities. This indicates that the economic viability of energy communities depends not only on the community's members but also on other electricity market participants and the electricity distribution system operator. The conceptual energy community development model prepared in this study may be useful in preparing a study on the economic rationale for establishing an energy community.	An assessment of the economic rationale for establishing an energy community needs to be carried out at the municipal level.

towards joint management of resources and collective value creation.

At the same time, multi-apartment residential building managers may become important information intermediaries in the development of energy communities. According to Latvian legislation, building managers represent apartment owners' associations as their legal representatives [46]. However, as indicated during the focus group discussions, the knowledge and capacity of building managers regarding energy efficiency, renewable energy production, and the benefits of participation in energy communities are often insufficient.

Therefore, improving the education and professional development framework for building managers should be considered an important prerequisite for successful energy community development. Professional training programmes should provide building managers with theoretical and practical knowledge regarding the possibilities for apartment owners and apartment owners' associations to participate in electricity generation, collective energy management, and energy community initiatives. Strengthening the role of building managers would allow them to act as intermediaries between residents, municipalities, and other energy community stakeholders.

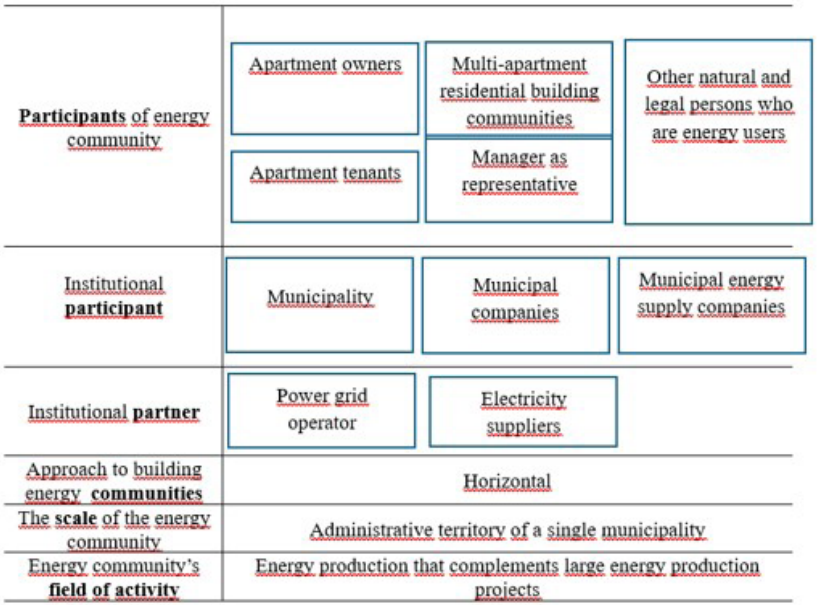


Fig. 2. Energy community development model in Latvia [created by the authors]

The proposed model also highlights the importance of other institutional actors, including electricity distribution system operators and electricity traders, whose involvement is determined by the Latvian regulatory framework [16]. Their cooperation is essential for ensuring the technical feasibility, market integration, and long-term sustainability of energy communities.

Overall, the research findings contribute to the refinement of the conceptual energy community development model for Latvia (Figure 2). The model demonstrates that energy communities should not be understood solely as technological solutions for increasing renewable energy production, but rather as institutional arrangements that integrate energy transition objectives with democratic governance, local participation, and the creation of common goods. The findings indicate that the successful implementation of energy communities in Latvia requires coordinated cooperation among citizens, municipalities, building managers, public administration institutions, and energy market actors. The refined model presented in Figure 2 summarises the identified institutional relationships, stakeholder roles, and key preconditions necessary for the development of energy communities within the Latvian institutional and socio-economic context.

The focus group results also highlight the distinction between the present study, which focuses on developing a conceptual energy community development model, and studies aimed at assessing the economic feasibility of establishing specific energy communities. The energy community development model provides a conceptual framework for understanding energy communities, including their formation approach, appropriate scale, scope of activities, potential participants, and the rationale for municipal involvement as an institutional actor. In contrast, economic feasibility assessments should be conducted at the level of individual municipalities, taking into account their specific technical, socio-economic, and institutional conditions.

Therefore, research on the energy community development model in Latvia and studies assessing the economic feasibility of establishing energy communities at the municipal level should be considered complementary but distinct research directions. Their sequential and integrated application provides a comprehensive foundation for the sustainable development and practical implementation of energy communities within municipalities.

Conclusion

The results of the study confirm that the development of energy communities in Latvia requires a conceptual development model that defines the scale, institutional structure, participants, and operational principles of energy communities while clearly distinguishing them from other models of decentralised energy generation. The developed model provides an institutional and organisational framework for the development of energy communities in the Latvian context and serves as a basis for their practical implementation.

The findings indicate that the development of energy communities in Latvia should be understood not only as an instrument of energy policy but also as a continuation of democratic governance and the development of local community participation. The successful establishment of energy communities depends not only on the regulatory framework and economic conditions but also on the culture of cooperation within local communities, mutual trust, and institutional capacity, which have gradually developed in Latvia over the past thirty years alongside the consolidation of democratic planning practices.

A crucial prerequisite for the development of energy communities is the establishment of a common understanding of their nature, operating principles, and distinction from other decentralised energy generation models. The study results highlight the need for state-level methodological support, including guidelines, model agreements, model statutes, and other methodological materials, which would reduce interpretative differences and facilitate the practical establishment of energy communities.

Municipalities have been identified as key institutional actors within the energy community development model, as they are able to coordinate relevant stakeholders, link energy community activities with local development objectives, and promote citizens' trust and participation. In the Latvian context, municipal involvement is particularly important because it compensates for the limited experience of citizens in collective action in the energy sector and creates institutional preconditions for the development of locally based energy communities.

The results also emphasise the importance of property managers in the development of energy communities, while highlighting the need to strengthen their professional competences in the fields of energy efficiency and energy

communities. Property managers can become important intermediaries between apartment owners, municipalities, and other energy community stakeholders by facilitating information exchange and promoting citizen engagement.

The study further demonstrates that the conceptual energy community development model and the economic justification for establishing energy communities represent complementary but methodologically distinct research directions. The conceptual model defines the institutional and organisational framework of energy communities, whereas economic feasibility assessments should be developed at the level of individual municipalities, taking into account local socio-economic and technical conditions.

The developed conceptual model of energy community development addresses the identified gap between the principles of energy community development described in international literature and their application within the Latvian institutional, legal, and social context. Thus, the study contributes theoretically to the research on energy community governance while also providing a practical foundation for the implementation of energy communities in Latvia.

References

1. **Ahmed, S., Ali, A. D'angola, A.** A review of renewable energy communities: Concepts, scope, progress, challenges, and recommendations. *Sustainability*, 16(5), 2024, 1749.DOI 10.3390/su16051749.
2. **Akmentiņa, L.** Participatory planning in post-socialist cities: A case study of Riga. *Architecture and Urban Planning*, 16(1), 2020, 17–25. DOI 10.2478/aup-2020-0004.
3. **Akmentiņa, L.** E-participation and engagement in urban planning: Experiences from the Baltic cities. *Urban Research & Practice*, 16(4), 624–657, 2023. DOI 10.1080/17535069.2022.2068965.
4. **Auders, M., Amoliņa, I., Balinskis, N., Geipele, I., Lapuķe, S., Drukis, P.** Citizen motivation and collective action in the development of energy communities: A case study of Latvia. *Latvian Journal of Physics and Technical Sciences*, 63(1), 2026, 93–111. DOI 10.2478/lpts-2026-0008.
5. **Auders, M., Lapuķe, S.** Evolving concept of energy communities in the European Union. *Latvian Journal of Physics and Technical Sciences*, 61(3), 2024, 53–60. DOI 10.2478/lpts-2024-0020.
6. **Auders, M., Ozoliņa, J., Liepa-Zemeša, M., Bitterman, A.** Conflicts in striving a common good: The implementation of wind energy in Latvia and the potential of energy communities. Manuscript submitted for publication.
7. **Barabino, E., Fioriti, D., Guerrazzi, E., Mariuzzo, I., Poli, D., Raugi, M., Razaei, E., Schito, E., Thomopulos, D.** Energy Communities: A review on trends, energy system modelling, business models, and optimisation objectives. *Sustainable Energy, Grids and Networks*, 36, 2023, 101187. DOI 10.1016/j.segan.2023.101187.
8. **Bohle, D.** Neoliberal hegemony, transnational capital and the terms of the EU's eastward expansion. *Capital & Class*, 30(1), 2006, 57–86. DOI 10.1177/030981680608800104.
9. **Bokolo, A., J.** The role of community engagement in urban innovation towards the co-creation of smart sustainable cities. *Journal of the Knowledge Economy*, 15(1), 2024, 1592–1624. DOI 10.1007/s13132-023-01176-1.
10. **Bokolo, A., J.** Citizen participation and engagement in local energy communities: Governing sustainable energy transitions through human-centric approaches. *Energies*, 19(4), 2026, 917. DOI 10.3390/en19040917.
11. **Bonfert, B.** 'We like sharing energy but currently there's no advantage': Transformative opportunities and challenges of local energy communities in Europe. *Energy Research & Social Science*, 107, 2024, 103351. DOI 10.1016/j.erss.2023.103351.
12. **Boostani, P., Pellegrini-Masini, G., Klein, J.** The role of community energy schemes in reducing energy poverty and promoting social inclusion: A systematic literature review. *Energies*, 17(13), 2024, 3232. DOI 10.3390/en17133232.
13. **Broska, L. H., Vögele, S., Shamon, H., Wittenberg, I.** On the future(s) of energy communities in the German energy transition: A derivation of transformation pathways. *Sustainability*, 14(6), 2022, 3169. DOI 10.3390/su14063169.
14. **Busengdal, E., Amdam, R.** Co-creation as a strategy for expanding networks and creating a broader collaboration profile for implementing integration policies. Cogent Social Sciences, 9(1), 2023, 2241259. DOI 10.1080/23311886.2023.2241259.
15. **Cabinet of Ministers of the Republic of Latvia.** 1994. *Regulations No. 194 on Spatial Planning. Republic of Latvia.* [Viewed 1 September 2026]. Available from: https://www.vestnesis.lv/ta/id/57584-teritorialplanosanas-noteikumi
16. **Cabinet of Ministers of the Republic of Latvia.** 2024. *Regulation No. 808 of 10 December 2024, Regulations for the Registration and Operation of Energy Communities.* [Viewed 1 September 2026]. Available from: https://likumi.lv/ta/id/357125-energokopienu-registresanas-un-darbibas-noteikumi
17. **Coy, D., Malekpour, S., Saeri, A. K., Dargaville, R.** Rethinking community empowerment in the energy transformation: A critical review of the definitions, drivers and outcomes. *Energy Research & Social Science*, 72, 2021, 101871. DOI 10.1016/j.erss.2020.101871.
18. **De Almeida, L., Cappelli, V., Klausmann, N., Van Soest, H.** Peer-to-peer trading and energy community in the electricity market: Analysing the literature on law and regulation and looking ahead to future challenges. *RSCAS Working Paper*, No. 2021/35, 2021. Florence: Robert Schuman Centre for Advanced Studies, European University Institute. DOI 10.2139/ssrn.3821689.
19. **De Simone, E., Rochira, A., Mannarini, T.** Individual and community catalysts for renewable energy communities (RECs) development. *Current Opinion in Psychology*, 62, 2025, 101987. DOI 10.1016/j.copsyc.2024.101987.
20. **Djinlev, V., Brenner-Fliesser, M., Pearce, B. J.** Beyond energy communities: Comparing citizen engagement, barriers, and behavioral change across collective energy initiatives. *Energy Research & Social Science*, 135, 2026, 104682. DOI 10.1016/j.erss.2026.104682.
21. **Dóci, G.** Collective action with altruists: How are citizens led renewable energy communities developed? *Sustainability*, 13(2), 2021, 507. DOI 10.3390/su13020507.
22. **European Commission.** *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: REPowerEU Plan. COM(2022) 230 final.* Brussels: European Commission, 2022. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52022DC0230
23. **European Commission.** *European Citizens' Energy Efficiency Panel: 9th and 10th recommendation* [online]. European Commission's Citizens' Engagement Platform, 2024 [Viewed 1 September 2026]. Available from: https://citizens.ec.europa.eu/european-citizens-panels/energy-efficiency-panel_en
24. **European Commission.** *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*. COM SWD(2025) 140 final, 2026 [Seen 10 March 2026]. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52025DC0274
25. **European Commission.** *Citizens Energy Package* [online]. [Seen 16 August 2026]. Available from: https://energy.ec.europa.eu/topics/markets-and-consumers/energy-consumers-and-prosumers/citizens-energy-package_en
26. **European Commission.** *EU climate, energy and environmental targets* [online]. [Viewed 1 September 2026]. Available from: https://commission.europa.eu/topics/climate-action/eu-climate-energy-and-environmental-targets_en
27. **European Parliament and Council of the European Union.** *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 (recast)*, 2019. Available from: https://eur-lex.europa.eu/eli/dir/2019/944/oj
28. **European Parliament and Council of the European Union.** Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955 (recast) [online]. *Official Journal of the European*

Union, L 231, 20 September 2023, 1–111. [Viewed 1 September 2026]. Available from: https://eur-lex.europa.eu/eli/dir/2023/1791/oj

29. **Geipele, S., Kundziņa, A., Pudzis, E., Lazdiņš, A.** Evaluation of community involvement in participatory process: Lessons learned in the Baltic Sea region. *Architecture and Urban Planning*, 16(1), 2020, 56–65. DOI 10.2478/aup-2020-0009.
30. **Gjorgievski, V., Z., Cundeva, S., Georghiou, G., E.** Social arrangements, technical designs and impacts of energy communities: A review. *Renewable Energy*, 169, 2021, 1138–1156. DOI 10.1016/j.renene.2021.01.078.
31. **Jacobs, C.** The challenge of public sector reform in EC accession countries: Reflections from the Baltics, especially Latvia. *Public Administration and Development*, 24, 2004, 321–331. DOI 10.1002/pad.312.
32. **Kalkbrenner, B., J., Roosen, J.** Citizens' willingness to participate in local renewable energy projects: The role of community and trust in Germany. energy research & social science, 13, 2016, 60–70. DOI 10.1016/j.erss.2015.12.006.
33. **Krug, M., Radtke, J., Lowitzsch, J., Mey, F.** On the future(s) of energy communities in the German energy transition: A derivation of transformation pathways. *Sustainability*, 14(6), 2022, 3569. DOI 10.3390/su14063569.
34. **Kundziņa, A., Geipele, I., Lapuķe, S., Auders, M.** Energy Performance Aspects of Non-Residential Buildings in Latvia. *Latvian Journal of Physics and Technical Sciences*, 59(6), 2022, 30–42. DOI 10.2478/lpts-2022-0045.
35. **Kundziņa, A., Geipele, I., Auders, M., Lapuķe, S.** Energy Performance Aspects of Residential Buildings in Latvia. *Latvian Journal of Physics and Technical Sciences*, 60(1), 2023, 39–51. DOI 10.2478/lpts-2023-0004.
36. **Kupiec, B., Potrzebowska, J., Kaçiu, E.** *Energy communities and the legacy of post-socialism* [online]. Warsaw: Heinrich Böll Stiftung; CoopTech Hub, 2024. ISBN 978-83-966347-8-8. [Viewed 1 September 2026]. Available from: https://cz.boell.org/sites/default/files/importedFiles/2025/01/21/energy_communities_legacy-of-post-socialism.pdf
37. **Lazaroiu, A., C., Roscia, M., Lăzăroiu, G., C., Siano, P.** Review of energy communities: Definitions, regulations, topologies, and technologies. *Smart Cities*, 8(1), 2025, 8. DOI 10.3390/smartcities8010008.
38. **Lennon, B., Dunphy, N.** Sustaining energetic communities: Energy citizenship and participation in an age of upheaval and transition. *Scientific Reports*, 14(1), 2024, 3267. DOI 10.1038/s41598-024-53367-8.
39. **Liepa-Zemeša, M., Auders, M., Treija, S.** Arguments for the common good in planning: Comprehensive analysis of planning documents in Latvia. *Architecture and Urban Planning*, 21(1), 2025, 177–190. DOI 10.2478/aup-2025-0014.
40. **Liepa-Zemeša, M., Hess, D., B.** Effects of public perception on urban planning: Evolution of an inclusive planning system during crises in Latvia. *Town Planning Review*, 87(1), 2016, 71–92. DOI 10.3828/tpr.2016.5.
41. **Ministry of Economics of the Republic of Latvia.** *Ēku atjaunošanas ilgtermiņa stratēģija* [online]. Riga: Ministry of Economics, 2020 [Viewed 1 September 2026]. Available from: https://likumi.lv/ta/id/342294-eku-atjaunosanas-ilgtermina-strategija
42. **Ministry of Economics of the Republic of Latvia.** *Data on the number of multi-apartment residential buildings not taken over into the management of apartment owners*. Unpublished data provided by the Ministry of Economics of the Republic of Latvia, 13 May 2025.
43. **Pierre, G., Mazaud, C.** Community acceptance of wind energy: Lessons from a case study on a local participatory project in Pays des Mauges (West France). *European Countryside*, 13(4), 2021, 715–733. DOI 10.2478/euco-2021-0038.
44. **Saeima of the Republic of Latvia.** *Spatial Development Planning Law*. Riga: Latvijas Vēstnesis, 2002.
45. **Saeima of the Republic of Latvia.** *Elektroenerģijas tirgus likums* [online]. Latvijas Vēstnesis, 11 May 2005, No. 74. [Viewed 1 September 2026]. Available from: https://likumi.lv/ta/id/108834-elektroenergijas-tirgus-likums
46. **Saeima of the Republic of Latvia.** *Dzīvokļa īpašuma likums* [online]. Latvijas Vēstnesis, 17 November 2010, No. 183. [Viewed 1 September 2026]. Available from: https://likumi.lv/ta/id/221382-dzivokla-ipasuma-likums
47. **Saeima of the Republic of Latvia.** *Teritorijas attīstības plānošanas likums* [online]. Latvijas Vēstnesis, 2011 [Viewed 1 September 2026]. Available from: https://likumi.lv/ta/id/238807-teritorijas-attistibas-planosanas-likums
48. **Seimuškāne, L**. *Iedzīvotāju līdzdalība lēmumu pieņemšanas procesā pašvaldībās Latvijā un to ietekmējošo faktoru izvērtējums* [online]. Doctoral dissertation. Riga: University of Latvia, 2015 [Viewed 1 September 2026]. Available from: https://dspace.lu.lv/handle/7/31338
49. **Seimuškāne, L., Sloka, B., Vilka, I.** Evaluation of citizens participation in local governments of Latvia. *European Integration Studies*, (8), 2014, 163–172. DOI 10.5755/j01.eis.0.8.6942.
50. **Stephens, J., C.** Energy democracy: Redistributing power to the people through renewable transformation. *Environment: Science and Policy for Sustainable Development*, 61(2), 2019, 4–13. DOI 10.1080/00139157.2019.1564212.
51. **Treija, S., Bratuškins, U., Koroļova, A.** University–community engagement: Formation of new collaboration patterns in participatory budgeting process. *Architecture and Urban Planning*, 18(1), 2022, 156–165. DOI 10.2478/aup-2022-0016.
52. **Van Gestel, N., Kuiper, M., Pegan, A.** *Strategies and transitions to public sector co-creation across Europe. Public Policy and Administration* [online]. First published online 26 June 2023. DOI 10.1177/09520767231184523.
53. **Van Veelen, B.** Negotiating energy democracy in practice: Governance processes in community energy projects. *Environmental Politics*, 27(4), 2018, 644–665. DOI 10.1080/09644016.2018.1427824.
54. **Vernay, A., L., Sebi, C.** Energy communities and their ecosystems: A comparison of France and the Netherlands. *Technological Forecasting and Social Change*, 158, 2020, 120123. DOI 10.1016/j.techfore.2020.120123.
55. **Wahlund, M., Palm, J.** The role of energy democracy and energy citizenship for participatory energy transitions: A comprehensive review. *Energy Research & Social Science*, 87, 2022, 102482. DOI 10.1016/j.erss.2021.102482.
56. **Wüstenhagen, R., Wolsink, M. , Bürer, M. J.** Social acceptance of renewable energy innovation: An introduction to the concept. *Energy Policy*, 35(5), 2007, 2683–2691. DOI 10.1016/j.enpol.2006.12.001.
57. **Zelli, F.** *The provision of conflicting public goods: Incompatibilities among trade regimes and environmental regimes* [online]. Tübinger Arbeitspapiere zur Internationalen Politik und Friedensforschung, No. 49. Tübingen: Universität Tübingen, Center for International Relations, 2007. ISBN 3-927604-46-1. [Viewed 1 September 2026].

This study involved human participants through interviews conducted in accordance with established ethical standards. Participants were informed about the purpose of the study, their voluntary participation, and their right to withdraw at any time. Informed consent was obtained, and anonymity and confidentiality were ensured. All data were handled securely and used solely for academic purposes.

The author acknowledges the use of artificial intelligence tools for language assistance and support in reference formatting. The use of these tools was limited to improving language clarity and ensuring consistency in reference formatting. They did not contribute to the research design, data collection, analysis, or interpretation of results, which remain entirely the responsibility of the authors.

Authors

Mārtiņš Auders, PhD Candidate, Faculty of Engineering Economics and Management, Riga Technical University, 6 Kalnciema Street, Riga, Latvia.
E-mail: Martins.Auders@edu.rtu.lv
ORCID ID: https://orcid.org/0009-0001-7973-735X

Ineta Geipele, Dr. oec., Professor, Faculty of Civil and Mechanical Engineering, Riga Technical University, 6A Kipsalas Street, Riga, Latvia.
E-mail: ineta.geipele@rtu.lv
ORCID ID: https://orcid.org/0000-0002-2963-087X

Sanda Lapuķe, Dr. oec., Associate Professor, Faculty of Civil and Mechanical Engineering, Riga Technical University, 6A Kipsalas Street, Riga, Latvia.
E-mail: sanda.lapuke@rtu.lv
ORCID ID: https://orcid.org/0000-0002-4721-5944

Iveta Amoliņa, PhD, Researcher, Faculty of Civil and Mechanical Engineering, Riga Technical University, Riga, Latvia.
E-mail: iveta.amolina@rtu.lv
ORCID ID: https://orcid.org/0000-0003-2500-0501

Māra Liepa-Zemeša, Dr. arch., Director, Architecture and Design Institute, Riga Technical University, 6 Kipsalas Street, Riga, Latvia,
E-mail: mara.liepa-zemesa@rtu.lv
ORCID ID: https://orcid.org/0009-0006-8166-2146

Kopsavilkums

Eiropas Savienība uzskata energokopienas par nozīmīgu instrumentu enerģētikas pārkārtošanās veicināšanai, iedzīvotāju līdzdalības sekmēšanai un atjaunojamo energoresursu enerģijas ražošanas paplašināšanai. Tomēr, neraugoties uz Eiropas Savienības izveidoto tiesisko un politikas ietvaru, energokopienu praktiskā attīstība Latvijā joprojām ir ierobežota.

Lai gan iepriekšējos pētījumos ir analizēti energokopienu pārvaldības modeļi, kā arī juridiskie, institucionālie un sociālie faktori, kas ietekmē to attīstību, joprojām trūkst pētījumu, kuros būtu definēts Latvijas institucionālajam, tiesiskajam un sociālajam kontekstam pielāgots energokopienu pārvaldības modelis, tostarp ņemot vērā institucionālo dalībnieku lomas un telpiskās plānošanas aspektus, kas ietekmē energokopienu praktisko īstenošanu. Tādēļ šī pētījuma mērķis ir empīriski validēt konceptuālo energokopienu attīstības modeli Latvijā, identificējot galvenos institucionālos dalībniekus, to lomas un priekšnoteikumus, kas nepieciešami kopējā labuma radīšanai un energokopienu praktiskās īstenošanas nodrošināšanai.

Piedāvātais modelis tika izstrādāts, integrējot savstarpēji saistītu pētījumu rezultātus, kuros tika analizēti juridiskie, institucionālie un sociālie priekšnoteikumi energokopienu attīstībai, lai identificētu faktorus, kas ir būtiski to īstenošanai Latvijas institucionālajā un normatīvajā kontekstā. Lai validētu un pilnveidotu piedāvāto modeli, tika organizēta fokusa grupas diskusija, kurā piedalījās galveno energokopienu attīstībā iesaistīto pušu pārstāvji, tostarp valsts pārvaldes institūciju pārstāvji, kas ir atbildīgi par enerģētikas un telpiskās plānošanas politiku, pašvaldību un pašvaldību pārstāvošo organizāciju pārstāvji, dzīvojamo ēku pārvaldnieki, kā arī esošas energokopienas pārstāvis. Diskusija bija vērsta uz energokopienu atbilstoša mēroga, pārvaldības mehānismu un institucionālo dalībnieku lomu izvērtēšanu, sniedzot ieteikumus piedāvātā modeļa turpmākai pilnveidei.

Pētījuma rezultāti liecina, ka energokopienu attīstību Latvijā ierobežo ierobežota pieredze kolektīvās rīcības īstenošanā demokrātiskas tirgus ekonomikas apstākļos, kā arī nepietiekama institucionālā kapacitāte. Tādēļ pašvaldībām būtu jāpiedalās energokopienās līdztekus iedzīvotājiem kā institucionālajiem biedriem. Pētījums parāda, ka pašvaldībām var būt būtiska loma kopējā labuma definēšanā, institucionālā atbalsta nodrošināšanā, vietējo energokopienu iniciatīvu koordinēšanā, kā arī sabiedrības uzticēšanās un sadarbības stiprināšanā. Šie secinājumi sniedz ieguldījumu tāda energokopienu pārvaldības ietvara izveidē, kas ir labāk pielāgots Latvijas kontekstam un var sekmēt to veiksmīgu īstenošanu vietējā līmenī.