



Development of an Energy Community: Design, governance, and business model

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TABLE OF CONTENTS

1	INTRODUCTION	6
1.1	OVERVIEW OF THE PROJECT	6
1.2	OBJECTIVE OF THE ACTION ENERGY COMMUNITIES	6
1.2.1	NEB Action Team	7
1.3	OBJECTIVE OF THIS DELIVERABLE	8
1.4	DEFINITIONS OF ENERGY COMMUNITIES	8
1.4.1	EU definition	9
1.4.2	Definition in Germany	10
1.4.3	Aspects of directives and implementation	12
2	DESIGN OF AN ENERGY COMMUNITY	14
2.1	ANALYSIS OF POTENTIAL AND CURRENT SITUATION	14
2.1.1	Best Practice	16
2.2	STAKEHOLDER ANALYSIS	18
2.3	BUSINESS MODEL	23
2.3.1	Innovation Model	38
2.3.2	Social Models	39
2.4	GOVERNANCE STRUCTURE	41
2.5	MARKETING AND OUTREACH	53
2.5.1	Digital Media	54
2.5.2	Print Media	60
2.6	DIMENSIONING	65
3	CONCLUSION	71
3.1	KPIS ACHIEVED TO DATE	72
4	PERSPECTIVE	73
5	SOURCES	74
6	APPENDIX	75

LIST OF TABLES

Table 1 Aspects of Directives about Energy Communities	12
Table 2 Stakeholders with advantages and disadvantages regarding energy communities	19
Table 3 Business Model Canvas (BMC)	24
Table 4 Business Model Canvas	37
Table 5 Organizational structure.....	42
Table 6 Organizational structure with subject fields.....	44
Table 7 Organizational structure with a financing structure	48
Table 8 Risk Management Matrix RACI	49
Table 9 Risk Assessment Matrix	50
Table 10 Risks for the foundation and management of an energy community	50
Table 11 Organizational structure with communication streams.....	53
Table 12 Subject fields with tasks of the organisational structure.....	75

LIST OF FIGURES

Figure 1 Solar potential map with the surface potential for PV	15
Figure 2 Solar potential map with roof surfaces containing PV	16
Figure 3 Existing citizen energy communities in Bavaria.....	17
Figure 4 Flyer Web-Forum Energy Communities at Bauzentrum München	18
Figure 5 Stakeholder mapping.....	23
Figure 6 Business Model Diagram.....	36
Figure 7 Innovation Cooperations Model.....	38
Figure 9: Social situation in Neuperlach in contrast to other districts in Munich	39
Figure 10: Overview of the social catalogue for a social business model.....	40
Figure 11 Example of the communication stream timeline for one month	53
Figure 12 Website's homepage	55
Figure 13 Website section Introduction	56
Figure 14 Website section The Project Creating NEBourhoods Together.....	57
Figure 15 Website section How to participate.....	58
Figure 16 Website's registration form	59
Figure 17 Leporello.....	60
Figure 18 Flyer of an information event and information sheet.....	61
Figure 19 Registration form	62
Figure 20 Poster einer Informationsveranstaltung und zur Gründung	63
Figure 21 Orte mit ausgelegten Flyern und aufgehängten Postern im Projektgebiet.....	64
Figure 22 Localisation of the pilot projects used for dimensioning.....	65
Figure 23 Visit of the pilot projects for dimensioning	66
Figure 24 Building Perlacher Herz roof surface with interference factors and calculated PV system	67
Figure 25 Building church wooden substructure.....	68
Figure 26 Building church roof surface and calculated PV system	68
Figure 27 Financing model of the first PV project Perlacher Herz with foundation costs.....	69
Figure 28 Financing model of the PV project Evangelische-Freikirchlichen Gemeinde Munich-Perlach	70
Figure 29 NEBourhoods Pavilion in Neuperlach with a PV module inside	73

VERSION

Version	Date	Author	Organisation	Description
1.0	01.05.2024	Serena Keller, Thomas Auer	TUM	First draft Structure
1.1	09.05.2024	Serena Keller, Thomas Auer	TUM	Second draft Working document
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GLOSSARY

EC	European Commission
EU	European Union
M	Project Implementation Month
NEB	New European Bauhaus
NEBourhoods	Creating NEBourhoods Together
NGO	Non-Governmental Organisation
NPL	Munich Neuperlach
OA	Open Access
T	Task
WP	Work Package
Organisation Name (Consortium)	
MUC	Landeshauptstadt München
AGM	Architekturgalerie München e.V.
BYF	Bayerische Forschungsallianz Bavarian Research Alliance GmbH
GC	Green City e.V.
HM	HM Hochschule München University of Applied Sciences
MGS	MGS Münchner Gesellschaft für Stadterneuerung mbH
SCE	Strascheg Center for Entrepreneurship
STR	Str.ucture GmbH
SAAD	Studio Animal-Aided Design GmbH
SSR	Studio Stadt Region Forster Kurz Architekten und Stadtplaner Partg Mbb
TUM	Technische Universität München
UTUM	UnternehmerTUM GmbH
MS	UnternehmerTUM MakerSpace GmbH
Organization Name (in Cooperation with)	
MER	Münchner Ernährungsrat e.V.
MIN	Münchner Initiative Nachhaltigkeit
OTH	Ostbayerische Technische Hochschule Regensburg
Organization Name (Associated Partners)	
ByAK	Bayerische Architektenkammer, Körperschaft des öffentlichen Rechts
BYD	Bayern Design GmbH
BDA	Bund Deutscher Architektinnen und Architekten e.V.
BDA-By	Bund Deutscher Architektinnen und Architekten Bayern e.V.
PV	Photovoltaics
AM	Active Member
I	Investor
S	Surface
BMC	Business Model Canvas

1 INTRODUCTION

1.1 OVERVIEW OF THE PROJECT

"Creating NEBourhoods Together" is one of the six lighthouse demonstrators of the New European Bauhaus funded by the EU to address climate, environment, and health challenges. The aim is to collaborate on the European Green Deal to create more sustainable, inclusive, and beautiful living environments across the EU. The project focuses on Munich-Neuperlach (NPL), one of Europe's largest post-war urban expansion areas. NEBourhoods, together with citizens and stakeholders from culture, science, and business, implement ten NEB Actions from all fields of urban development. Combining co-creation and entrepreneurship, placing culture and creativity at the core of the transformation process, the project delivers accessible and empowering solutions to make the EU Green Deal beneficial for all in Munich-NPL and beyond.

This city district will be carefully cultivated into a resilient urban innovation landscape. For just over two years, we are creating the NEBourhoods path together and showing how we can realise circular thinking and acting in society and the economy. We intend to activate the green transformation in building, mobility, energy, food, and health and enhance public space.

1.2 OBJECTIVE OF THE ACTION ENERGY COMMUNITIES

The NEB Action energy communities is one of the ten NEB Actions of the NEBourhoods project. Energy communities offer the opportunity to support the energy transition envisioned by the European Green Deal. These communities aim to decentralise energy production, enhance social cohesion, and involve citizens actively in sustainable energy practices. The European Commission intends for consumers to be at the core of the energy markets and provides an enabling framework for energy communities. Energy Communities can operationalise governance and potentially become a standard model for neighbourhood energy systems in particular and for a decentralised energy system in general.

Our demonstrator will be an energy community in a neighbourhood pilot project in Neuperlach, designed through a co-created framework and business model. The implemented community will provide access to the production, consumption, storage, and selling of solar electricity for citizens. It will reduce energy bills and stimulate extensive solar and energy efficiency potential exploitation to reach climate neutrality goals. Specifically, the energy community in Neuperlach is designed as a pilot project and visible flagship to demonstrate the feasibility, profitability, and societal benefits of local renewable energy production and consumption. The barriers and challenges of implementation are being explored. The approach involves two key steps reflected in the deliverables.

First, D5.2 describes the step: "Development of an Energy Community: Design, Governance, and Business Model" focusing on creating an initial framework for the energy community, including the designs, governance structures, and a business model tailored to local conditions. Second, D5.7 includes the "Demonstration of an Energy Community" (scheduled for autumn 2024) and builds on this initial framework by developing the energy community in a real-world setting, the "Living Lab". D5.2 includes models and methods for creating a foundation with tools for application and replication. Through co-creation with local residents, the basic design, governance, and business model will continue to be readapted and refined based on practical experiences and community feedback. The second deliverable (D5.7) presents the implemented energy community and the co-creative process of implementation with the final documents.

The NEB Action aims to create a replicable model for other urban areas in Munich, Germany, and across the European Union by following these steps. The governance and business model follows the EU directives; however, different geographic, technological, demographic, cultural, institutional, and regulatory conditions in other European countries may require adaptation.

The primary research objectives include identifying the current technical requirements, economic viability, and social models that support the establishment and operation of energy communities. The goal is to develop an energy community implemented within a living lab with the core values of innovation, transparency, and social inclusion. The energy community is a role model and demonstrates best practices while pioneering, developing, and implementing new approaches. It transforms the neighbourhood and enables residents to participate in the energy transition, which continues to scale and can consistently be replicated. Citizens will be empowered to independently develop solutions toward sustainable neighbourhoods. Based on our pilot energy community, they can establish new climate-friendly routines in everyday life or new energy communities.

1.2.1 NEB Action Team

The team of the NEB Action Energy Community consists of Serena Keller, Claudia Hemmerle, and Thomas Auer from Technical University Munich (TUM), Chair of Building Technology and Climate-Responsive Design.

The team is supported by NEBourhoods' TransitionHub team (Munich University of Applied Sciences and City of Munich's Team of Excellence for the Cultural and Creative Industries) and creatives for the co-creation of transition, by MGS (Münchner Gesellschaft für Stadterneuerung mbH) for replication, by Architekturgalerie München e. V. for communication, by UnternehmerTUM for entrepreneurial thinking, and the City of Munich (MUC) as a central stakeholder for advice and support.

The team is advised by the Energy Communities Repository of the European Commission in

an online twinning with Bündnis Bürgerenergie e.V. and Die Bürgerenergie eG.

Furthermore, the work is supported through the implementation in the following study formats: the TechChallenge at UnternehmerTUM ("Hacking Neuperlach"), the social entrepreneurship practice project at Munich University of Applied Sciences, the statics seminar paper at TUM (Chair of Timber Construction and Building Design), as well as the ProPENS project lab at TUM (Chair of Renewable and Sustainable Energy Systems).

1.3 OBJECTIVE OF THIS DELIVERABLE

This deliverable focuses on developing the energy community's design, governance structure, and business model, creating an initial framework as a guideline for the subsequent implementation phase. The energy community is being implemented through a co-creation process with local residents, ensuring that the community's needs and feedback are integrated into the design and operations. This process occurs in a real-world setting, functioning as a "Living Lab" where practical applications are tested and refined.

The framework presented in this deliverable is not final; it is intended to evolve within the Living Lab. Initial results and adjustments from this phase are documented in the deliverable. Additionally, this deliverable provides detailed instructions as a guideline for setting up an energy community within a Living Lab (method) and the German legal framework, supporting continuous improvement and adaptation.

Furthermore, the contents of this deliverable inform about the statutes and rules of procedure for the energy community, ensuring that the governance model is robust and adaptable. By creating a structured design for the energy community, this deliverable will provide the basis for practical implementation, continuous innovation, and adaptation to local conditions, thereby contributing to the NEB Action's overall objectives of promoting sustainable energy practices and strengthening social cohesion in urban neighbourhoods.

1.4 DEFINITIONS OF ENERGY COMMUNITIES

This chapter delves into the conceptual framework and legal definitions of energy communities within the European Union and the country of the project area, Germany. In the EU, energy communities are recognised as key players in transitioning towards a more decentralised and sustainable energy system. The EU framework provides a broad definition that encourages member states to foster the development of these communities to harness local energy resources and promote social, economic, and environmental benefits. There is no specific definition of energy communities in Germany. Since 2021, the Renewable Energies Act (EEG) has coined the term "Bürgerenergiegesellschaften" (§ 3 Abs. 15 EEG). This word can be understood as the EU-defined term energy communities, which is used below for the definition.

This section compares these definitions between the EU approach and the German approach. Through this comparison, the chapter aims to provide a clear understanding of how energy communities are structured and recognised legally, paving the way for a discussion on their potential impact and the challenges they face in the subsequent sections of this deliverable.

1.4.1 EU definition

The European Union recognises the importance of citizen participation in the energy market through the concept of energy communities. Various EU directives provide definitions and frameworks to promote these communities, highlighting their role in the transition to sustainable energy. The key directives that shape the EU's approach to energy communities are Directive 2019/944 and Directive 2018/2001.

EU Directive 2019/944

Art. 2 Nr. 11 EU/2019/944: 'citizen energy community' means a legal entity that:

- (a) is based on voluntary and open participation and is effectively controlled by members or shareholders that are natural persons, local authorities, including municipalities, or small enterprises;
- (b) has for its primary purpose to provide environmental, economic, or social community benefits to its members or shareholders or to the local areas where it operates rather than to generate financial profits; and
- (c) may engage in generation, including from renewable sources, distribution, supply, consumption, aggregation, energy storage, energy efficiency services, or charging services for electric vehicles or provide other energy services to its members or shareholders;

Directive 2019/944 on the internal market for electricity actively promotes citizen participation in the energy market through the concept of citizen energy communities. These communities are legal entities based on voluntary participation, aiming to provide ecological, economic, or social benefits. A crucial aspect of this directive is members' fair and transparent involvement in the energy market. Citizen energy communities have the right to generate, consume, store, and sell energy without discriminatory treatment, particularly concerning access to energy markets and networks. (EU/2019/944)

EU Directive 2018/2001

Art. 2 Nr. 16 EU/2018/2001: 'renewable energy community' means a legal entity:

- (a) which, in accordance with the applicable national law, is based on open and voluntary participation, is autonomous, and is effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects that are owned and developed by that legal entity;
- (b) the shareholders or members of which are natural persons, SMEs or local authorities, including municipalities;

- (c) the primary purpose of which 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.

The revised Renewable Energy Directive 2018/2001 expands this vision with specific provisions to promote the use of energy from renewable sources. It mandates that member states support establishing and operating renewable energy communities, enabling consumers to produce their own energy. This includes regulations that allow such communities to generate and use renewable electricity within the community, supported by joint financial aids and streamlined administrative processes. (EU/2018/2001)

Common Elements

Both directives emphasise the importance of transparency, fairness, and consumer protection. They envision energy communities playing a central role in the energy transition by giving citizens more control and direct involvement in sustainable energy production. Ensuring access to adequate information and the ability to participate in the market without undue barriers are essential components of this framework.

The EU's definition of energy communities underlines their significance in empowering citizens, fostering local renewable energy production, and ensuring equitable participation in the energy market. These communities are vital to achieving the EU's broader energy and climate goals.

1.4.2 Definition in Germany

The "Bürgerenergiegesellschaften" in Germany are associations of individuals who collectively generate renewable energy and promote the expansion of renewable energy installations. These communities can be organised as cooperatives or other societies and are key players in the decentralised energy transition. (§ 3 Nr. 15 EEG 2023)

Legal Definitions and Requirements

According to the German Renewable Energy Act (EEG 2023),

a "Bürgerenergiegesellschaften" is defined by several key criteria in § 3 Nr. 15 EEG 2023,:

- Membership (§ 3 Nr. 15 lit. a EEG 2023)
The community must consist of at least 50 natural persons who are voting members or shareholders.
- Local Control (§ 3 Nr. 15 lit. b EEG 2023)
At least 75% of the voting rights must be held by natural persons residing within a 50-kilometer radius of the planned installation, as per the Federal Registration Act. For solar installations, this distance is measured from the outer edge of the installation, and for wind energy installations, from the center of the tower.
- Small Enterprises and Municipalities (§ 3 Nr. 15 lit. c EEG 2023)

Voting rights not held by natural persons must exclusively belong to small and medium enterprises (SMEs) as defined by the EU recommendation 2003/361/EG, or to municipal corporations and their legal associations.

- Voting Rights (§ 3 Nr. 15 lit. d EEG 2023)

No member or shareholder may hold more than 10% of the voting rights in the community. Additionally, voting rights should typically allow for real influence on the community and participation in decision-making processes. In the case of a merger of multiple legal entities, each member of the new entity must meet the requirements. For a society wholly owned by another society, the latter must meet these requirements.

Under the previous definition in § 3 Nr. 15 EEG 2021, an energy community must have at least ten natural persons with voting rights. At least 51 % of these voting rights had to be held by individuals registered with their primary residence in the relevant district or city for at least one year before the bid submission. Additionally, no member or shareholder could hold more than 10 % of the voting rights. Similar to the EEG 2023, a merger of multiple legal entities required that each member meet these criteria. (§ 3 Abs. 15 EEG 2021)

Purpose and Activities

The primary goal of “Bürgerenergiegesellschaften” is to promote unbureaucratically local renewable energy projects, such as wind or solar parks, thereby contributing to the sustainable development of their regions. These communities enable local citizens to participate in and benefit from renewable energy projects, fostering local engagement and ensuring that the benefits of renewable energy production stay within the community. (Entwurf eines Gesetzes zu Sofortmaßnahmen für einen beschleunigten Ausbau der erneuerbaren Energien und weiteren Maßnahmen im Stromsektor, 2022)

Practical Implementation

A “Bürgerenergiegesellschaft” seeking subsidies or support must adhere to the abovementioned criteria. The community can then collectively manage and operate renewable energy installations within their locality, like wind turbines or photovoltaic (PV) systems. These initiatives provide environmental benefits by reducing carbon emissions and offer economic advantages through local energy production, which can lower energy costs and create local jobs. (Schwintowski, 2023)

In summary, energy communities in Germany are legally defined structures that facilitate local participation in renewable energy projects, ensuring that majority control remains within the local community. This model promotes both environmental sustainability and economic resilience at the local level.

1.4.3 Aspects of directives and implementation

The table provided in this section offers a concise overview of key aspects derived from EU directives that serve as guidelines for member states to implement energy communities. These directives outline various provisions, including definitions, objectives, non-discriminatory access rights, and simplifications in administrative procedures. Each row in the table corresponds to specific articles from the directives 2019/944 and 2018/2001, detailing how they support the establishment and operation of energy communities. This systematic breakdown helps clarify the regulatory framework and operational guidance that should facilitate the growth and sustainability of energy communities within the EU. This table places an additional focus on how these guidelines are implemented in German law and practice. This experience will be gathered during the project and enriched in the table. The final aim is to recognise the deficits and draw up recommendations.

Table 1 Aspects of Directives about Energy Communities

EU Directive	Aspect	Description
2019/944	Definition and goals	Citizen energy communities are legal entities based on voluntary and open participation and aim to promote environmental, economic, or social community benefits. They enable members to generate, consume, store, and sell energy.
2019/944	Non-discriminatory access rights	Energy communities have the right to produce, consume, store, and sell energy. They should have non-discriminatory access to the energy markets, similar to other market participants, to guarantee fair competitive conditions.
2019/944	Administrative and regulatory simplification	The directive emphasises the need to simplify the bureaucracy for energy communities to facilitate the establishment and management of energy communities and their participation in the market.
2019/944	Consumer and member rights	Energy communities must provide their members with clear information about their rights and obligations, including the right to information and transparency regarding community activities.
2019/944	Organisational and operational requirements	Energy communities must have fair and transparent operating models that benefit all members.
2019/944	Technological support and innovation	Promote using advanced technologies in energy communities to improve energy efficiency and production.
2018/2001	Promotion of renewable energies	Support renewable energy communities through support measures to increase the share of renewable energy.
2018/2001	Financial support	Specific measures are called for to provide financial support for projects in energy communities that utilise renewable energy.
2018/2001	Legal and regulatory framework conditions	The Directive calls for a clear and supportive legal and regulatory framework to facilitate establishing and operating renewable energy communities.

EU Directive	Aspect	Description
2018/2001	Energy self-sufficiency	Regulates the self-supply of renewable energy within communities, authorises and promotes the collective use and sale of surplus energy.
2018/2001	Interconnectivity and grid integration	Support the technical integration of renewable energy communities into the existing energy supply grid to ensure efficient energy distribution.
2018/2001	Education and awareness creation	Promote education and awareness programs on the benefits and opportunities of using renewable energy in communities.

2 DESIGN OF AN ENERGY COMMUNITY

The design of an energy community within the Neuperlach project area aims to establish a foundation for its implementation. The resulting components are dynamic and unfold in the collaborative environment of an Action's Living Lab. Here, the design evolves through co-creative processes, enriched by the input and experiences of participants, thereby transforming the design framework from a static blueprint into a working model for developing the community's demonstrator.

The initial phase of the design process involves a thorough analysis of both the potential and the current situational context within the project area. This analysis is critical as it reveals synergies that can be harnessed within the project's scope and inform the subsequent development of the business model by integrating user promises, value propositions, and identified risks. Furthermore, a stakeholder analysis constitutes an integral component of the design phase, identifying key groups and individuals who may be interested in or impacted by the NEB Action. This analysis informs the business model and governance structure and prepares the groundwork for implementation. Another crucial aspect of the design involves dimensioning and preparing the pilot project through studies of the existing structures and simulations.

These elements are incorporated into the business model and governance structure, providing templates and models for development and implementation. Overall, the design of the energy community is conceptualised as a dynamic model that serves as the basis for implementation, ensuring that the structure is adaptable and responsive to the inputs and evolving conditions of the Living Lab environment.

2.1 ANALYSIS OF POTENTIAL AND CURRENT SITUATION

To assess the potential of the NEBourhoods project's NEB Action Energy Communities for the project area Neuperlach, the solar potential map from the GEO portal of the city of Munich (GeodatenService München, n.d.) was analysed.

Figure 1 shows a map of the district of Ramersdorf-Perlach. A boundary around the neighbourhood delineates the project area Neuperlach. The rooftops are colour-coded based on the intensity of solar radiation they receive: green indicates high solar irradiation, suggesting high suitability for PV systems, while red indicates low solar irradiation, potentially making these areas unsuitable for PV installations. It is important to note that these areas require further investigation as unrecognised factors and shading could impact the results. As visible in Figure 1, many areas within the project site are green, with a few areas marked in red. Additionally, the spaces are larger compared to neighbouring districts. This extensive area is attributed to the architectural style typical of the district, characterised by buildings with large flat roofs, which possess high potential for PV installations. This analysis shows that the project area Neuperlach has excellent potential for using PV on the roof surfaces.

SOLARPOTENTIALKARTE

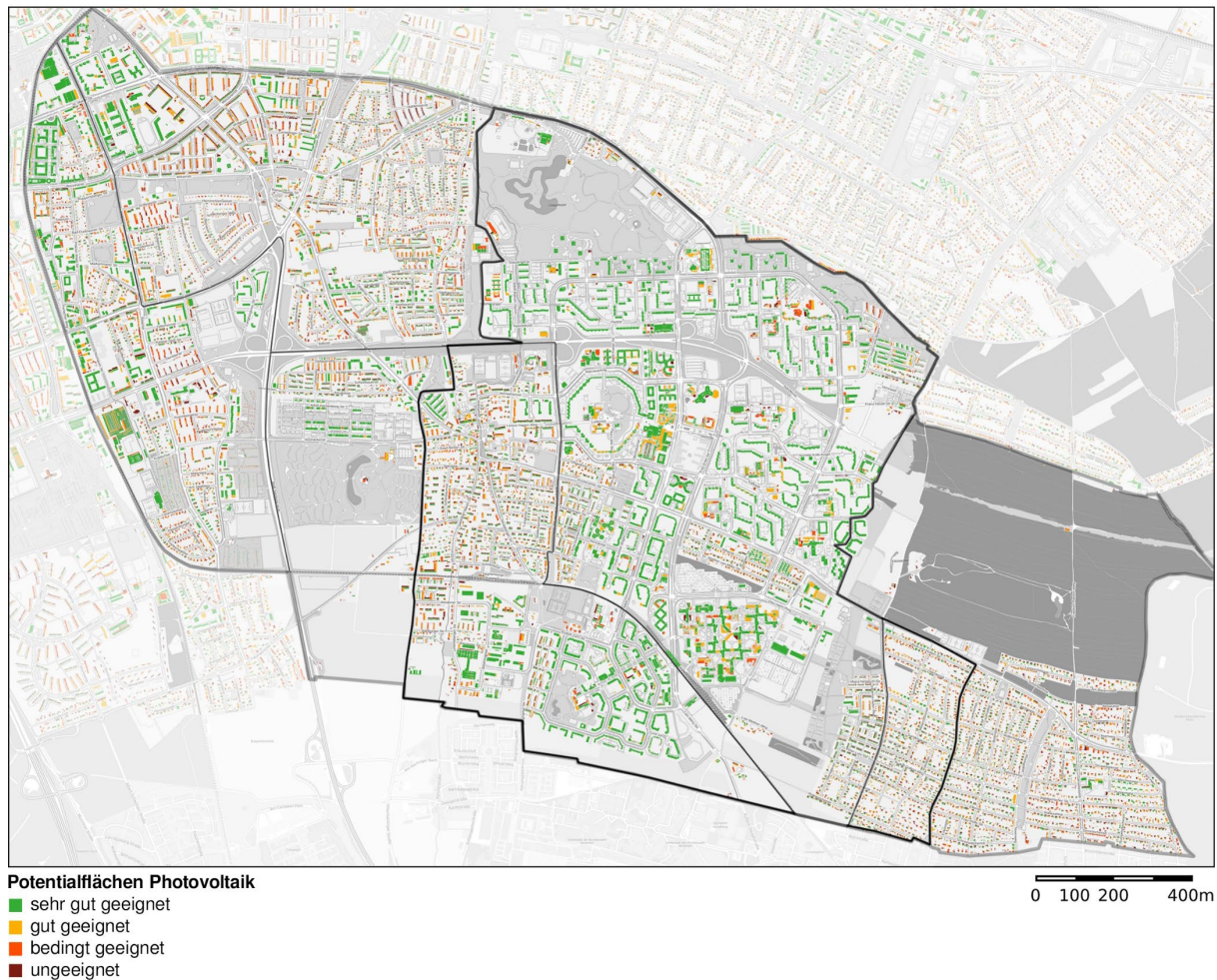


Figure 1 Solar potential map with the surface potential for PV (Adapted from GeodatenService München, n.d.)

In Figure 2, the site plan of the project area is shown with roof areas featuring existing PV modules marked in purple. This analysis was conducted using Google Maps and Google Earth. The results indicate that there are sporadic areas with existing PV installations. The presence of PV is high on smaller properties such as single-family homes or terraced houses. In contrast, larger areas like multi-family and industrial or public buildings have a lower prevalence of PV installations. An analysis of the ownership structure, which cannot be published for data protection reasons, reveals that PV installations are more frequently implemented on small buildings owned by private individuals.

The potential for PV in the Neuperlach project area, analysed through solar radiation in Figure 1 and the currently unused potential shown in Figure 2, is high.

LAGEPLAN

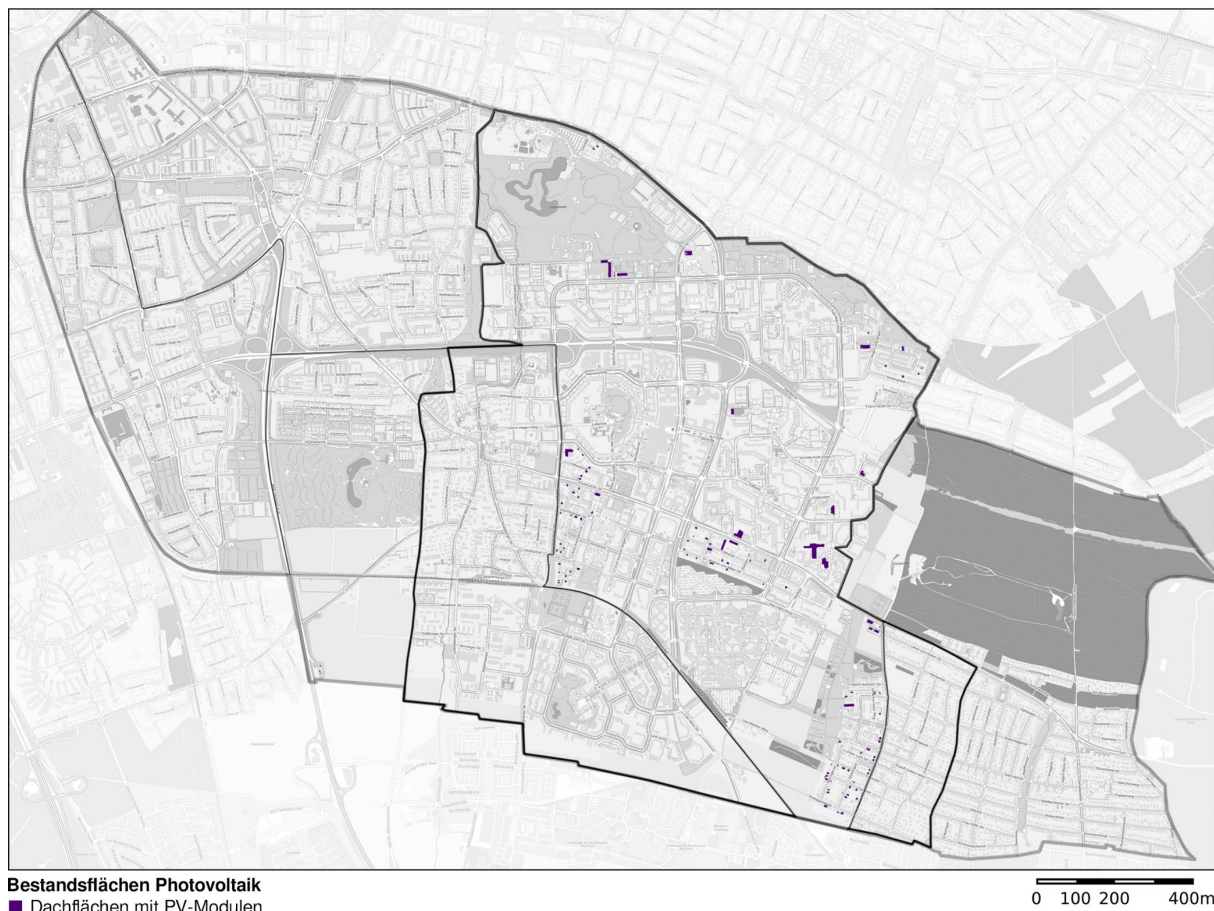


Figure 2 Solar potential map with roof surfaces containing PV (Adapted from GeodatenService München, n.d.)

- ➔ If the implementation of PV is less complex due to the ownership of the building and a smaller surface area, PV is already being implemented to an increased extent
- ➔ The residents are engaging with the topic
- ➔ The barriers for large-scale PV and if the owners do not inhabit the building themselves are more significant and appear to inhibit the implementation of PV

2.1.1 Best Practice

In the design of an energy community, understanding the potential and the existing landscape within the project area is crucial. Additionally, it is essential to review existing reference projects in the region to determine the necessity and feasibility of similar initiatives in the target area. This chapter provides an analytical overview of best-practice examples from surrounding regions, which illustrate the success and operational models of neighbouring energy communities and highlight the gaps in coverage. Particularly in the project area of the east-west corridor of Munich, where no such initiatives currently exist. Figure 3 maps out these citizen energy communities, visually representing the existing projects' distribution and density.

For best practice experience, interviews were conducted with:

- Bündnis Bürgerenergie e.V.
- Bürgerenergiegenossenschaft BENG eG
- fei Bürgerenergie eG
- Energiegenossenschaft Krefeld eG
- Sonnensegler Bürgerenergiegenossenschaft eG
- Neue Energie Achental eG

In addition, a twinning consultation was conducted with Bündnis Bürgerenergie e.V. and fei Bürgerenergie eG, advised by the European Commission's Energy Communities Repository.

ENERGIEGEMEINSCHAFTEN IM UMKREIS

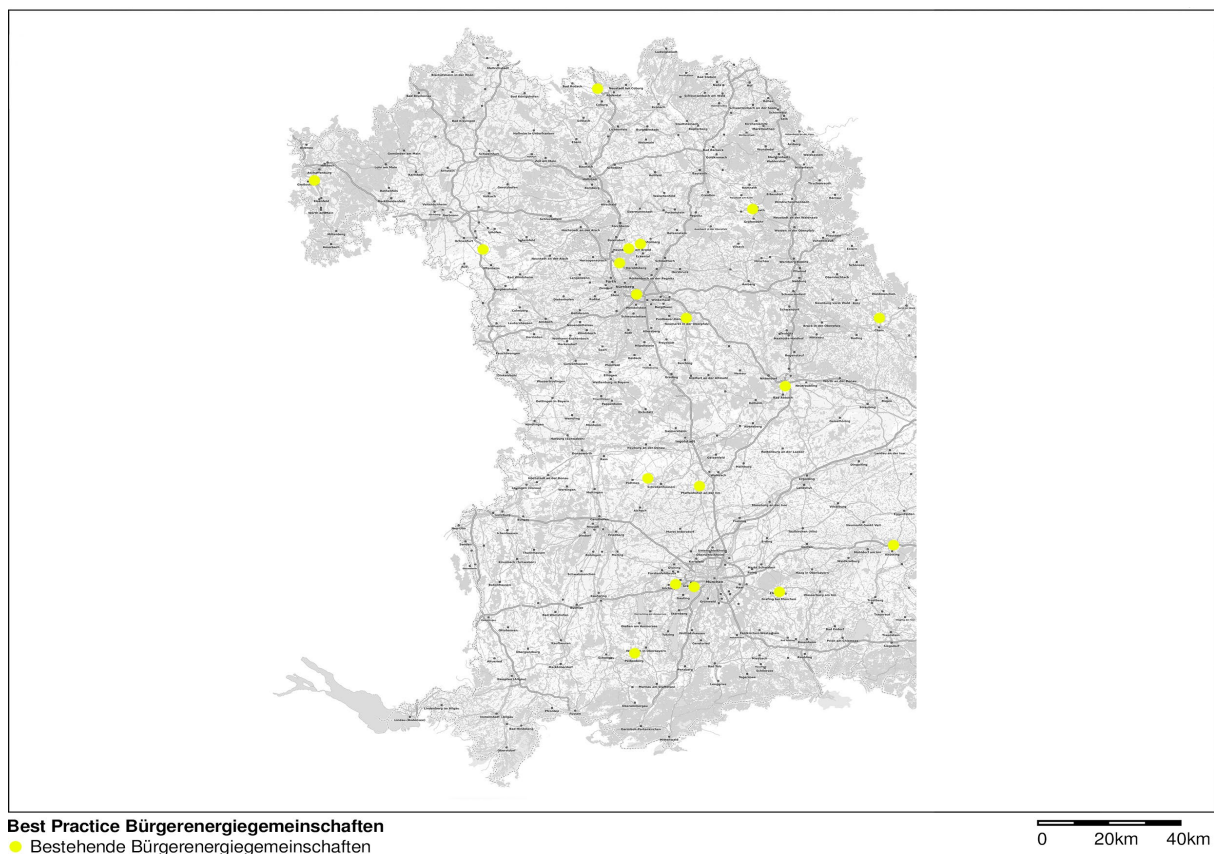


Figure 3 Existing citizen energy communities in Bavaria (Adapted from GeodatenService München, n.d. and BBEn, n.d.)

To gain an overview of the possibilities and the state of the art, a web forum on energy communities with expert presentations was held at the Bauzentrum München in cooperation with the EU-funded research project ASCEND (Accelerate Positive Clean Energy Districts). This was an online event in the lecture series "Klimaneutrale und klimaresiliente Quartiere 2023 – Teil 3" (Climate-neutral and climate-resilient neighbourhoods 2023 - Part 3). The expert forum on the on-site supply of renewable energy in neighbourhoods consisted of six presentations followed by a panel discussion and addressed the following questions:

- What organisational forms can energy communities be formed in?
- Which business models are viable in the current legal situation, and what prospects do upcoming reforms promise?
- What can we learn and transfer from existing examples in other EU countries?
- How can fair participation by all consumers be achieved?

The programme and content can be found on the Bauzentrum München (Public Centre for Advise on Construction) website under: <https://veranstaltungen.muenchen.de/bauzentrum/veranstaltungen/bauzentrum-web-forum-energiegemeinschaften/>



Figure 4 Flyer Web-Forum Energy Communities at Bauzentrum München

2.2 STAKEHOLDER ANALYSIS

The stakeholder analysis for the energy community aims to identify and evaluate the various groups and individuals who are interested in or can impact the creation of an energy community in Neuperlach. This analysis helps to understand their concerns, potential contributions, and the overall influence they can have on the success of this NEB Action.

The analysis is conducted by research to gather relevant data on the demographics, economic conditions and energy usage patterns in the Neuperlach area, including reviewing existing literature, reports and case studies on similar projects. Discussions with local cooperatives and similar organisations provided valuable insights into the operational challenges and benefits of community energy projects, helping to identify common concerns and best practices. In addition, public events were attended to engage directly with

community members. During these events, the interests and concerns of participants were analysed and identified in cooperation with a creative professional from the project's Workpackage 2, "Co-Creating Transition". People or organisations interested in the topic could register through a printed form (see Figure 11) or online via the website (see Figure 7).

Table 2 Stakeholders with advantages and disadvantages regarding energy communities (AM = Active Member, I = Investor, S = Surface)

Stakeholder and category (AM, I, S)	Disadvantages, Concerns, Effort	Advantages, Added Value, Gain
Residents (AM, I, S)	<ul style="list-style-type: none"> • Workload, varying availability • Demands • Lack of knowledge • Lack of interest in community, sustainable investment • Investment costs • Possible language barrier 	<ul style="list-style-type: none"> • Advancing the energy transition/ sustainability • Local energy/ cost savings/ return on invest • Strengthening the neighbourhood • Community involvement • Gain experience and knowledge • Passing on knowledge
Families (AM, I)	<ul style="list-style-type: none"> • Scheduling conflicts due to childcare • Workload • Complexity of the topic • Lack of knowledge • Uncertainties, new project • Possible language barrier • Investment costs 	<ul style="list-style-type: none"> • Role model position • Local energy/ cost savings/ return on invest • Advancing the energy transition/ sustainability • Strengthening the neighbourhood • Community involvement • Gain experience and knowledge • Passing on knowledge
Single Parents (AM, I)	<ul style="list-style-type: none"> • Scheduling conflicts due to childcare • Workload • Complexity of the topic • Lack of knowledge • Uncertainties, new project • Possible language barrier • Investment costs 	<ul style="list-style-type: none"> • Local energy/ cost savings/ return on invest • Community support • Role model position • Advancing the energy transition/ sustainability • Strengthening the neighbourhood • Gain experience and knowledge • Passing on knowledge
Singles (AM, I)	<ul style="list-style-type: none"> • Workload, possible time constraints • Complexity of the topic • Lack of knowledge • Uncertainties, new project • Possible language barrier • Investment costs 	<ul style="list-style-type: none"> • Community involvement • Gain experience and knowledge • Passing on knowledge • Advancing the energy transition/ sustainability • Local energy/ cost savings/ return on invest • Strengthening the neighbourhood

Retirees (AM, I)	<ul style="list-style-type: none"> • Fixed income for investments • Physical limitations • Lack of interest in community, sustainable investment • Complexity of the topic • Possible language barrier 	<ul style="list-style-type: none"> • Passing on knowledge • Community involvement • Investing in environmental sustainability • Local energy/ cost savings/ return on invest • Strengthening the neighbourhood • Gain experience and knowledge
Students (AM, I)	<ul style="list-style-type: none"> • Limited financial resources • Varying time for participation • Possible lack of practical knowledge • Potentially migrating • Possible language barrier 	<ul style="list-style-type: none"> • Gain practical experience and knowledge • Advancing the energy transition/ sustainability • Local energy/ cost savings/ return on invest • Community involvement • Passing on knowledge • Strengthening the neighbourhood
Members with time/ expertise without financial resources (AM)	<ul style="list-style-type: none"> • Lack of knowledge • Demands • Lack of interest in community, sustainable investment • Investment costs • Possible language barrier 	<ul style="list-style-type: none"> • Return on invest/cost savings / local energy • Community involvement • Passing on knowledge • Gain experience and knowledge • Investing in environmental sustainability • Strengthening the neighbourhood
Members with investment resources (Shares, loans, donations) (AM, I, S)	<ul style="list-style-type: none"> • Complexity of the topic • Uncertainties, new project • Low financial added value 	<ul style="list-style-type: none"> • Return on invest/ cost savings/ local energy • Investing in environmental sustainability • Advancing the energy transition • Strengthening the neighbourhood • Community involvement • Gain experience and knowledge • Passing on knowledge
Community Groups (AM, I, S)	<ul style="list-style-type: none"> • Workload, varying availability • Demands • Lack of knowledge • Lack of interest in sustainable investment • Investment costs • Possible language barrier 	<ul style="list-style-type: none"> • Strengthening the neighbourhood • Community involvement • Advancing the energy transition/ sustainability • Gain experience and knowledge • Passing on knowledge • Return on invest/ cost savings/ local energy
Educational institutions (Universities, Schools) (AM, S)	<ul style="list-style-type: none"> • Workload • Organisation and coordination with multiple stakeholders • Restrictions on neighbourhood • Possible language barrier 	<ul style="list-style-type: none"> • Practical teaching • Possibilities for research • Role model position • Advancing the energy transition/ sustainability • Local energy/ cost savings/ revenue from lease payments • Passing on knowledge • Strengthening the neighbourhood

Start-Ups (AM, I)	<ul style="list-style-type: none"> • Lack of experience, practical knowledge • Uncertainties, new project • Coordination with multiple stakeholders • Lack of interest in community, sustainable investment 	<ul style="list-style-type: none"> • Practical test bed/ building cooperation • Advancing the energy transition/ sustainability/ brand image • Gain experience and knowledge • Passing on knowledge • Community involvement/ built contacts
Small and medium-sized companies (I, S)	<ul style="list-style-type: none"> • Lack of interest in community, sustainable investment • Making the building accessible • Restriction of flexibility of the building, sale, refurbishment • Renovation measures required 	<ul style="list-style-type: none"> • Revenue from lease payments/ local energy/ cost savings • Increased property value • Handling of installation and maintenance • Advancing the energy transition/ sustainability/ brand image • Strengthening the neighbourhood • Gain experience and knowledge • Passing on knowledge
Housing Associations (S)	<ul style="list-style-type: none"> • Making the building accessible • Restriction of flexibility of the building, sale, refurbishment • Renovation measures required 	<ul style="list-style-type: none"> • Revenue from lease payments/ local energy/ cost savings • Increased property value • Handling of installation and maintenance • Advancing the energy transition/ sustainability • Strengthening the neighbourhood • Gain experience and knowledge • Passing on knowledge
Local authorities, Public Institutions (AM, S)	<ul style="list-style-type: none"> • Coordination with multiple stakeholders • Regulatory requirements • Workload, complexity of the topic • Making buildings accessible • Restriction of flexibility of the building, refurbishment • Renovation measures required 	<ul style="list-style-type: none"> • Advancing the energy transition/ sustainability/ role model position • Handling of installation and maintenance • Increased property value • Gain experience and knowledge • Passing on knowledge • Revenue from lease payments/ local energy/ cost savings/ • Strengthening the neighbourhood • Increased public awareness
Local Energy Producers (AM)	<ul style="list-style-type: none"> • Regulatory requirements • Technical integration effort • Uncertainties own added value/ role • Coordination with multiple stakeholders 	<ul style="list-style-type: none"> • Practical test bed/ building cooperation • Local support in the energy transition • Knowledge transfer/ Community with knowledge
Electricity grid operator (AM)	<ul style="list-style-type: none"> • Regulatory requirements • Technical integration effort • Uncertainties own added value/ role • Provide grid • Coordination with multiple stakeholders 	<ul style="list-style-type: none"> • Practical test bed/ building cooperation • Local support in the energy transition • Knowledge transfer/ Community with knowledge

Homeowners (AM, I, S)	<ul style="list-style-type: none"> • Making the building accessible • Restriction of flexibility of the building, sale, refurbishment • Renovation measures required 	<ul style="list-style-type: none"> • Local energy/ cost savings/ revenue from lease payments • Increased property value • Handling of installation and maintenance • Advancing the energy transition/ sustainability • Strengthening the neighbourhood • Community involvement • Gain experience and knowledge • Passing on knowledge
Schools, Kindergarten and Daycare (S)	<ul style="list-style-type: none"> • Making the building accessible • Restriction of flexibility of the building, sale, refurbishment • Renovation measures required 	<ul style="list-style-type: none"> • Role model position • Local energy/ cost savings • Advancing the energy transition/ sustainability • Strengthening the neighbourhood • Community involvement • Gain experience and knowledge
Hospitals (S)	<ul style="list-style-type: none"> • Making the building accessible • Restriction of flexibility of the building, sale, refurbishment • Renovation measures required 	<ul style="list-style-type: none"> • Local energy/ cost savings • Handling of installation and maintenance • Role model position • Advancing the energy transition/ sustainability • Strengthening the neighbourhood • Community involvement
Police and Fire Department (S)	<ul style="list-style-type: none"> • Making the building accessible • Restriction of flexibility of the building, sale, refurbishment • Renovation measures required 	<ul style="list-style-type: none"> • Role model position • Local energy/ cost savings • Handling of installation and maintenance • Advancing the energy transition/ sustainability • Strengthening the neighbourhood • Community involvement
Parking Areas (S)	<ul style="list-style-type: none"> • Making the area accessible • Restriction of flexibility • Renovation measures required • Coordination 	<ul style="list-style-type: none"> • Local energy charging stations • Handling of installation and maintenance • Potential shading • Visible sustainability efforts • Increased awareness
Public Space (S)	<ul style="list-style-type: none"> • Making the space accessible • Restriction of flexibility of space • Coordination 	<ul style="list-style-type: none"> • Community benefit, public energy • Handling of installation and maintenance • Potential shading • Visible sustainability efforts • Increased public awareness

The stakeholders can be grouped into three clusters depending on the resource involved

- Surface
- Working hours
- Financial resources

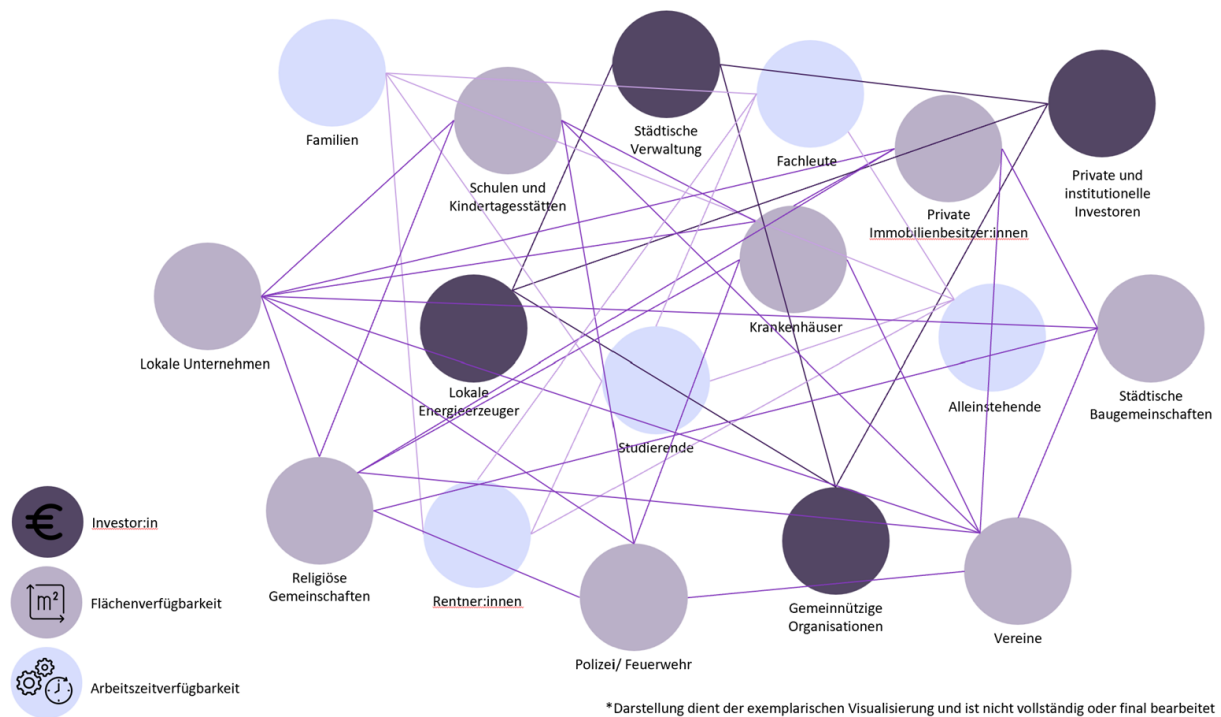


Figure 5 Stakeholder mapping

- ➔ The use of the clusters has functioned well during development
- ➔ A practical understanding of the stakeholders could be established
- ➔ Initial interest was high, and the first contacts were made
 - Very few have become active participants
- ➔ The topic turned out to be very complex and difficult to grasp
 - A subtle target group-oriented approach is necessary

2.3 BUSINESS MODEL

The concept of an energy community encompasses a cooperative approach to local energy production, distribution and consumption, emphasising sustainability, social inclusion and economic benefits. This chapter elucidates the business model of an energy community using the Business Model Canvas (BMC) model (see Table 3), which provides a structured method to understand and analyse the components essential to the success of an energy community.

The BMC model comprises nine main building blocks: Key Partners, Key Activities, Value Proposition, Customer Relationships, Customer Segments, Key Resources, Channels, Cost Structure and Revenue Streams. Each component was populated with information specific to the energy community, providing a comprehensive overview of its business model.

Further, the BMC is extended to include the additional elements "Team" and "Values" to better capture these organisations' unique characteristics and objectives. The business models of energy communities prioritise social cohesion and neighbourhood improvement alongside economic and environmental goals. The "Team" component highlights the diverse expertise and collaborative effort necessary to manage and innovate within the community. The "Values" component underscores the commitment to sustainability, transparency and social integration, reflecting the community-centric ethos. This extension of the BMC is essential for accurately representing the holistic approach of energy communities, which integrates social and environmental benefits with economic sustainability. This is also emphasised in the founding documents by a preamble.

The content of the Energy Community business model is listed and explained below. In conclusion, a BMC table for Energy Communities summarises the content.

Table 3 Business Model Canvas (BMC) (Bundesministerium für Wirtschaft und Energie, n.d.)

Key-Partner Who are our key partners? Who are our key suppliers? Which key activities come from partners?	Key activities Which key activities require our <ul style="list-style-type: none">Value proposition?Channels?Customer relationships?Sources of revenue?	Value proposition What benefits do we offer the customer? Which customer problems or service packages do we offer? Which customer needs do we satisfy?	Customer relations What kind of customer relationships do the different types of customers want from us? Which ones have we already achieved? How do they fit in with the rest of the business model? What costs do they generate?	Customer segments Who do we offer a benefit to? Who are our most important customers?
	Key resources What key resources do we need for our <ul style="list-style-type: none">Value proposition?Channels?Customer relationships?Sources of revenue?		Channels Through what channels do our customers want to be reached? How do we reach them now? How do these channels work together? Which ones work best? Which ones are particularly cost-beneficial? How can we bring them into contact with typical customer activities?	
Costs What are the most important costs in our business model? Which key resources are particularly cost-intensive? Which key activities are particularly cost-intensive?		Sources of income What benefits are our customers willing to spend money on? What are they currently spending it on? How do they currently pay? How would they prefer to pay? What proportion of total revenue do the respective revenue sources account for?		
Team Who should be on our team and why? What professional skills does our company need? What social aspects does our company need?		Values What values does our company embody? What is important to us, what is unimportant? What should our company represent? Do we want to communicate our values to the public? If so, how?		

Key Partners

Key partners are essential for pooling resources, expertise and support. In energy communities, partnerships with local authorities, technology providers, financial backers and other stakeholders are crucial for project implementation and sustainability.

The stakeholder analysis provides the basis for identifying the key partners. In addition, key partners were identified through research and discussions with existing energy cooperatives and local people.

- **Active Members**
Individuals actively participate in the community, contributing to decision-making and operations. They have a diverse range of backgrounds and expertise. The governance structure has subject fields, tasks, and responsibilities to structure the active members.
- **Investors and Donors**
Financial contributors supporting the community's initiatives. Members can invest in the community by investing in shares in the energy community, loans or donations. For large projects, external investments may also be relevant.
- **Surface Providers**
Entities or individuals providing a surface for the installation of renewable energy facilities. Surfaces on the roof, on the façade or open spaces in the neighbourhood can be considered for PV. There must be sufficient sunlight on the surface. Areas facing south, west or east are particularly suitable. Also, unshaded flat roofs or areas over 250 m² are often well-suited. In addition, a high on-site consumption of the energy produced increases economic efficiency.
- **Technical Partners**
Members and companies specialising in the realisation and maintenance of renewable energy projects. Depending on the expertise available within the energy community, external services play a corresponding role for the energy community. The technical equipment and expertise are relevant for various areas within the energy community, such as renewable energy systems, distribution and billing of energy, storage, smart use of energy, billing and financial administration, management, marketing and communication.
- **Grid Operators**
They are facilitating technical connections and energy exchange. To connect renewable energy systems, the grid operators must approve the system by applying and drawing up a commissioning protocol. If surplus energy is fed into the grid, they pay a grid feed-in tariff for the energy to the energy community.
- **Innovation Partners**
Collaborating for continuous development and technological advancements.
- **Networks**
Integrating the energy community into the neighbourhood brings diverse expertise, value development and growth.

- **Authorities/ Government Bodies**
Supporting through policies, subsidies and strategic collaborations. They provide support through subsidies for renewable energies and impact the laws and regulatory framework for energy communities.
- **Auditing Associations**
Ensuring compliance and accountability. They assist with the establishment and operation and can provide support with legal and regulatory expertise. They regularly review the processes and transactions of the energy community.

Key Activities

Key activities outline the essential actions required to run the energy community effectively. This includes planning, constructing and managing renewable energy systems and engaging with the community.

Best practices from existing energy communities are used to inform these activities. Based on the key activities, detailed process plans and timelines can be developed for activities such as project planning, member recruitment, marketing and energy production.

- **Foundation and operation of the energy community**
A series of tasks are involved in the foundation and operation of the energy community. In order to structure and divide these tasks for the operation of the energy community, the governance provides an organisational structure and defines tasks with responsibilities (see 41). For the foundation process, additional one-off tasks are required before the operation of the energy community to adopt a legal form. This includes the following key activities.
 - Formation of the community, founding group (min. three founding members)
 - Create a business model
 - Establish statutes
 - Draft rules of procedure
 - Create financing
 - Plan and hold the founding meeting
 - Assign formation audit
 - Register with the registry court
- **Member and Surface Acquisition, Marketing**
The central point of the energy community is the members who form the community. They consist of active members who take care of the daily business of the energy community and members who promote projects through investments. Additional locations for the projects are needed to implement the renewable energy projects. Therefore, acquiring members and sites for projects along with the associated marketing is a key activity.
- **Planning, construction and operation of renewable energy projects**
The energy community's central aim is to implement renewable energy projects. The key activities include planning the projects with feasibility analysis of the area,

dimensioning with technical planning and connection of the systems, planning the implementation, managing with stakeholders such as manufacturers and installers, and final construction and implementation. Once the projects have been implemented, they must be accompanied by monitoring, maintenance and necessary repairs. Depending on the expertise available within the energy community, more tasks can be carried out internally, or more services will be required from specialists.

- **Management of energy production, distribution, consumption and storage**
As soon as the projects are realised, the management of the energy produced becomes relevant. The energy management already plays a role in the planning and economic feasibility planning phase. This requires a concept of the energy flow, monitoring and accounting. Technical equipment is required. Energy management questions are: how much energy is produced, how much is consumed on-site, and what happens to the surplus energy?
- **Continues development and innovation**
Development and innovation are key activities to ensure continued development, growth, and progress in the energy community. It is of such central importance as the regulatory conditions of the energy communities develop, new experiences are gained, and technology evolves. The Energy Community wants to contribute to the energy transition and drive innovation through its initiative. Strategic cooperation and collaboration support the key activity.
- **Social inclusion**
A central element of the energy community includes openness, transparency and low-threshold communication. In addition, social approaches and mechanisms are to be implemented to minimise participation barriers. The first approaches will be implemented in the energy community to achieve this, which must be monitored and adapted if necessary. There is little best practice for such approaches, which is why it is defined as a key activity to develop innovative approaches.

Value Proposition

The value proposition defines the unique benefits the energy community offers, such as affordable, sustainable energy and social cohesion. It differentiates the energy community from traditional energy providers.

The value proposition was defined in discussions with interested members. To sharpen the value proposition, a communication workshop identifies the central themes.

- **Supply of low-cost, environmentally friendly electricity from local production**
The energy is produced by plants owned by the energy community locally in the neighbourhood. With current storage and sharing options, the energy produced will be used as much as possible to cover consumption on-site in the building to avoid losses. The surplus energy is then fed into the public grid. The energy fed into the grid is not physically passed on to other energy community members; rather, it is passed on via the public grid.

- **Dividend**
Financial returns for community members. The dividends represent a share of the profits distributed to members based on their participation in the community. These dividends are paid from the surplus revenue generated by the community's energy projects.
- **Promotion of energy autonomy through local energy production and use**
The community's efforts to generate its energy from local resources promote self-sufficiency and allow it to rely less on external energy supplies, reduce energy costs and minimise its environmental impact. For the community, this means greater control over energy sources, stability in energy costs and an increased commitment to sustainability.
- **Focus on social benefits through the community, social inclusion**
In an energy community, the focus is on social benefit by making a collective effort to promote energy efficiency and sustainability, as well as social cohesion and economic benefits for all members. This approach fosters a sense of community and mutual aid as members support each other in reducing energy costs, improving local energy resilience and raising environmental awareness. The energy community members pool their resources, creating new opportunities with social benefits for the community. It strengthens community cohesion while improving the member's quality of life through joint energy initiatives.
- **Educational Opportunities and Knowledge Acquisition**
In an energy community, educational opportunities and knowledge acquisition are about providing and enabling members and the wider community to learn about sustainability and energy technologies. In addition to information and workshops, this includes practical projects where members learn and are educated about renewable energy sources, management, energy efficiency techniques and sustainable lifestyles. By promoting a better understanding of energy issues, the community empowers its members to make informed decisions and actively contribute to energy conservation and environmental protection that they can pass on to others.

Customer Relationships

Building strong relationships with members and stakeholders is vital for long-term success. Transparent communication, active member involvement and reliable support services foster trust and engagement.

The governance model contains a communication strategy with processes and channels to ensure the care of customer relationships.

- **Clear Governance Structure with Responsibilities and Tasks**
Establishes a well-defined organisational framework that outlines specific subject fields, responsibilities and tasks for all members and stakeholders, ensuring clarity and accountability within the community. It is part of the governance model and includes the rules of procedure for management positions.

- **Open Opportunities for Participation in Social Inclusion**
Encourages all community members, regardless of their background or economic status, to participate actively in the community's activities, fostering a sense of belonging and equality. Promoted through the communication strategy and values of the energy community.
- **Active Involvement of Members through Regular Meetings and Decision-Making Processes**
Engages members by involving them in regular meetings and collective decision-making processes, which enhances member satisfaction and commitment by giving them a voice in community matters. Active participation is to be increased through clear and transparent communication of possible participation.
- **Active Internal Exchange and Transparency**
Promotes open communication and sharing of information among members, facilitating an environment of trust and cooperation through transparent operations and interactions.
- **Publication of Documents, Templates, and Contracts with Explanations**
It provides members access to essential documents, including templates and contracts, accompanied by clear explanations, which helps them understand the community's operational procedures and legal agreements. Ensures the transparency of the energy community.
- **Transparent and Regular Communication about Current Developments, Energy Production and Use**
Keeps members well-informed about the latest developments within the community and detailed reports on energy production and consumption, which supports informed participation and engagement.
- **Reliable Customer Service for Technical Support and Emergency Response**
Offers dependable customer service that provides technical support and rapid response to emergencies, ensuring members feel supported and valued. This is crucial for maintaining trust and securing the energy projects.

Customer Segments

Identifying target customer segments ensures that the energy community can tailor its services and communication to meet the specific needs of different groups, such as households, businesses and public institutions.

The stakeholder analysis provides the basis for identifying the customer segments. The key groups are shown below, and the stakeholder analysis provides a detailed overview of the customer segments.

- **Active members, investors from different social and financial backgrounds**
Are a central element of the energy community that power the system. It comprises individuals or groups actively participating in and investing in the community,

representing a diverse range of socio-economic statuses and ensuring a broad support base and resilience.

- Households in Neuperlach: different sizes and income classes
Energy communities are a local and decentralised initiative. Local households are a key customer segment. Household benefits are opportunities for cost savings, revenue stream and sustainable energy solutions that are particularly attractive to private users with different energy needs and financial means. This involvement helps to create a broad support base and ensure that the benefits are shared throughout the community.
- Local small and medium-sized businesses interested in sustainable energy
These businesses are key customer segments as they can significantly benefit from reduced energy costs and enhanced public image by participating in sustainable practices. Their involvement also strengthens the community's economic fabric by promoting local growth and sustainability.
- Public institutions
Public institutions such as schools and government buildings are essential because they often consume large amounts of energy. By participating in an energy community, they can achieve their sustainability goals, reduce spending on energy and serve as role models for environmental responsibility in the community.
- Social institutions
These organisations often operate under tight budget constraints and have a strong mandate for social responsibility. By joining an energy community, they can reduce operating costs through sustainable energy use or generate revenue while promoting their commitment to social well-being and environmental responsibility. They can strengthen the network and function as role models.
- Building owners
Building owners are targeted because they can benefit directly from integrating sustainable energy solutions that increase property value, reduce energy costs and make their properties more attractive to potential tenants or environmentally conscious buyers. An energy community offers the opportunity to minimise the costs and effort for building owners.

Key Resources

Key resources include the financial, human and technical assets needed to operate the energy community. These resources are fundamental to building and maintaining infrastructure and providing services.

The established goals and the tasks defined in the governance structure result in the key resources of an energy community.

- Committed members and their expertise
Their expertise, active participation and resources. Members are the backbone of any energy community. Their commitment ensures ongoing participation, and their

diverse expertise contributes to various community management and problem-solving aspects. This resource drives the community's initiatives and fosters a collaborative environment.

- Financial resources

Financial capital is crucial for funding the community and maintenance of energy projects, from purchasing equipment to covering operational costs. Stable financial resources ensure the community can invest in high-quality technology and sustain its energy initiatives over time.

- Space resources

Space, such as rooftops, façades, or open land, is essential to realise the energy projects. The community's energy projects are implemented in these physical locations, making them critical for the practical execution of energy generation and distribution.

- Technical Resources

This includes the technology and infrastructure necessary to generate, store and distribute energy. Technical resources are fundamental for the community's ability to produce and manage energy efficiently and reliably.

- Know-how and innovation

The knowledge and innovative capacity within the community ensure the operation of the energy community and promote continuous improvement and adaptation to new technologies or methods. This resource is key to overcoming challenges, increasing opportunities and maintaining competitiveness. It provides internal opportunities to explore new possibilities to improve sustainability and energy independence.

Channels

Channels are the means through which the energy community reaches and interacts with its members and stakeholders. Effective channels ensure that information and services are accessible.

The communication strategy within the governance model includes communication flows and regularities. The exact channels have been earmarked but must then be adapted to the processes of the operating energy community.

- Networks

The network is an essential channel for publicising the energy community locally. Networks facilitate partnerships and collaborations that can provide access to resources, expertise and opportunities, enhancing the community's capacity to innovate and grow.

- Information Events and Workshops (Hybrid)

These events engage and educate members and the public, enhancing understanding and support for community initiatives while reaching a broader audience through physical and digital participation.

- **Digital Platform with Access to Information, Data, and Documents**
A digital platform is a central hub for members to access important information, share data and retrieve documents, streamlining communication and management processes.
- **Print Publication with Information**
Print publications distribute important information to members who prefer physical media or do not have consistent internet access, ensuring all members are informed and engaged.
- **Communication Channel Intern and Extern (Phone, Mail, Chat)**
Effective internal and external communication channels are crucial for timely and clear communication, supporting everything from daily operations to emergency responses and customer service.
- **Management, Accounting Software**
Management and accounting software helps efficiently handle administrative, financial and operational tasks, ensuring accuracy, compliance and streamlined processes within the community.
- **Local Print and Digital Media**
Utilising local media outlets increases the community's visibility, attracts new members, and keeps the broader community informed about the energy community's activities and benefits, thereby boosting local support and engagement.

Cost Structure

Understanding the cost structure is critical for financial planning and sustainability. It includes all expenses related to the establishment and operation of the energy community.

- **Foundation and auditing costs**
One-off costs are required for the foundation audit. The amount varies depending on the auditing association. Some associations offer additional counselling besides the audit, which increases costs. After the one-off audit costs, the auditing association charges annual audit costs. The amount of the expenses also differs between the various auditing associations. Various auditing associations are requested for the foundation audit. For the financial plan, 2,500 € is calculated for the foundation audit of the new company without consulting and 1,000 € for the annual audit. These figures are taken from a proposal without obligation from the auditing association "Genossenschaftsverband Bayern".
- **Acquisition costs for technology**
The implementation of renewable energy systems involves initial investment costs for the technology. The developing energy community has already been offered roof surfaces for developing PV systems. The first system is in the planning stage, and others have been simulated using the Sunny Design software (SMA Solar Technology AG, n.d.).

For the financial calculation, the costs from the cost estimate of a PV provider (Emondo GmbH) for the system in planning are used. Costs of 18,500 € are calculated for the first PV system. For further cost planning, the values from the simulations are used.

- **Maintenance, repairs**
Running costs and repairs are incurred for the operation of the PV systems. Contracts can be concluded with the manufacturer and insurance companies for this purpose. For the cost calculations, 1 % of the investment costs of the system are assumed. This value is transferred from the Sunny Design simulation software template and results in 185 € per year.
- **Ongoing operating costs**
Costs are also incurred for operational costs like marketing and public relations to implement the key activities of the energy community, such as costs for the digital platform, costs for posters and brochures, events, materials for workshops, and renting spaces.
- **Dividends, interest**
Members of the energy cooperative pay € 100 for a share in the energy community. The amount of the share is defined by the energy community and is listed under income. The energy community uses its income to invest in installing PV systems. This generates revenue from the electricity produced and services provided. The dividend is the share of the Energy Community's profit distributed to members each year. It is based on the liquidity of the energy community and is, therefore, a dynamic amount. Through the dividend, members benefit from their investment in renewable energies. Reference dividends range between 3 - 7.5 %. For the cost calculation, 3 % is assumed and calculated.
- **Lease fees**
Building owners receive a lease for surfaces provided to the energy community. This can be offset against the electricity consumed in the building or paid externally to the building owner. This is calculated at a rate of 6% of the income from the surface area.
- **Legal and internal reserves**
The reserves consist of a legally prescribed part and a part defined by the energy community. The legally prescribed part amounts to 5.0 % of the annual surplus. The reserves provide security for the financial situation of the Energy Community and cover balance sheet losses.
- **Reinvestment**
Depending on the surplus income and reserves, the energy community defines an amount to be reinvested in growth, development and new projects. The amount must be defined and adjusted regularly.

Revenue Streams

Identifying revenue streams is essential for financial sustainability. Revenue can come from energy sales, member contributions, government grants and other sources.

- **Energy Sales**
The energy produced by the PV systems generates income for the energy community. The energy demand in the building can be covered directly using the energy generated. Consumers then pay their share of the electricity costs to the energy community. An amount slightly below the current electricity price is calculated for this.
- **Excess Energy Sales**
Next to the covered energy demand of the building, the surplus electricity is fed into the grid, which generates income through the feed-in tariff or energy trading. The electricity consumption of the buildings is known for the calculation and is simulated with the generated electricity. The legally defined feed-in tariff is calculated for surplus electricity.
- **Member Contributions**
The members of the energy community invest in the community. The revenue is generated by the shares purchased at € 100 per share and subordinated loans of € 500 or more. The amount of the shares is defined by the Energy Community and is based on the aim of minimising the amount required for social inclusion. Nevertheless, the running costs must be covered in addition to a share of income.
- **Grants and Collaborations**
Subsidies and support are available from the City of Munich for renewable energy projects. The current possibilities for subsidies are taken into account in the financial calculations.
- **Donations**
Donations can be made to the energy community to support and promote local energy production and the energy transition. Since this is an irregular and uncertain source of revenue, it is not considered in the financial calculation.
- **Services**
The knowledge gained and the equipment purchased can result in services in the energy community that produce revenue.

Team

The team is the backbone of the energy community, providing the necessary skills and leadership to manage operations and drive innovation.

The relevant subject fields, task fields and tasks are defined and subdivided in the governance model. This allows them to be assigned to teams with clear communication of responsibilities. Reports on experience and lists of best practice examples serve as a basis for the defined tasks and teams.

- **Management and finance team**
Oversees financial planning and management, coordinates administrative and operational activities, and maintains relationships with partners and stakeholders to support the community's objectives.
- **Marketing team**
Handles branding and communication strategies, engages in member recruitment and outreach, and manages public relations and media interactions to enhance community visibility.
- **Legal team**
Responsible for ensuring compliance and risk management, managing contractual agreements and documentation, and navigating regulatory and legal affairs relevant to the community.
- **Engineering teams**
Focuses on the system design and configuration, oversees construction and installation, and ensures ongoing maintenance and safety of energy systems.
- **Development team**
Leads knowledge transfer and capacity building, drives research and innovation initiatives, and implements strategic development projects to advance the community's goals.
- **Management, supervisory board and initiatives**
The Management Board, Supervisory Board and Initiatives are the bodies within the Energy Community that provide additional structure to the teams.

Values

Values reflect the core principles and ethos of the energy community, such as sustainability, transparency, and social inclusion. These values guide decision-making and foster community trust.

The values are embedded in the preamble to the Energy Community's statutes and strengthen the motivation and background of the initiative. They are defined by the interested members and refined through communication strategy workshops.

- **Sustainability**
Focus on renewable energy sources, CO2 reduction and promotion of the energy transition
- **Community**
Strengthening local cohesion and promoting social integration
- **Transparency**
Public structure and models, open communication about the energy community, finances and decision-making
- **Co-creation**
Members join and have a say in important decisions

- Education
Transferring knowledge about renewable energies and the energy transition
- Innovation
Promotion and implementation of research and innovation, energy community as a living lab

The business model of an energy community integrates sustainable energy production with community engagement and financial viability.

By leveraging the strengths of its members, partners and resources, the energy community aims to achieve local energy production, social cohesion and environmental sustainability. The structured approach provided by the Business Model Canvas ensures a comprehensive understanding and effective implementation of the community's objectives.

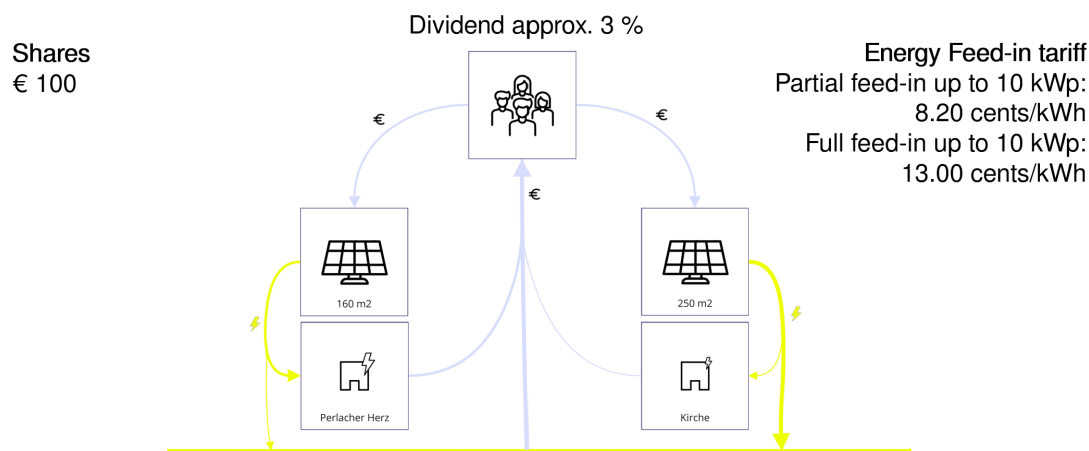


Figure 6 Business Model Diagram

Table 4 Business Model Canvas

Key-Partner <ul style="list-style-type: none"> - Active members - Investors, donors - Providers of surface area - Technical partners - Electricity grid operators - Partners and cooperations - Networks - Authorities/ Government - Audit association 	Key activities <ul style="list-style-type: none"> - Foundation and operation of the energy community - Acquisition of members, surfaces, marketing - Planning, construction and operation of renewable energy projects - Management of energy production, distribution, consumption and storage - Documentation, monitoring and continuous optimisation - Continues development and innovation - Social inclusion 	Value proposition <ul style="list-style-type: none"> - Supply of low-cost, environmentally friendly electricity from local production - Dividend - Promotion of energy autonomy through local energy production and use - Focus on social benefits through the community - Social inclusion - Educational opportunities - Promotion of innovation and development - Knowledge acquisition 	Customer relations <ul style="list-style-type: none"> - Clear governance structure with responsibilities and tasks - Open opportunities for participation in social inclusion - Active involvement of members through regular meetings and decision-making processes - Active internal exchange and transparency - Publication of documents, templates and contracts with explanations - Transparent and regular communication about current developments, energy production and use - Reliable customer service for technical support and emergency response 	Customer segments <ul style="list-style-type: none"> - Active members, investors from different social and financial backgrounds - Households in Neuperlach: different sizes and income classes - Local small and medium-sized businesses interested in sustainable energy - Public institutions: Schools, municipal buildings- Social institutions - Building owners
	Key resources <ul style="list-style-type: none"> - Committed members and their expertise - Financial resources - Space resources - Technical resources - Know-how and innovation 		Channels <ul style="list-style-type: none"> - Networks - Information events and workshops (hybrid) - Digital platform with access to information, data and documents - Print publication - Communication channel intern and extern (phone, mail, chat) - Management, accounting software - Local print and digital media 	
Costs <ul style="list-style-type: none"> - Foundation and auditing costs - Acquisition costs for technology - Repairs - Ongoing operating costs - Dividends, interest - Lease fees - Legal and internal reserves - Reinvestment 		Sources of income <ul style="list-style-type: none"> - Sale of energy - Sale of surplus energy to the grid or customers - Shares invested by members and investors - Subordinated loans, credits - Subsidies - donations - Services and income from cooperation - Research funds and grants for further development 		
Team <ul style="list-style-type: none"> - Management and finance team - Marketing team - Legal team - Engineering teams - Development team - Management, supervisory board and initiatives 		Values <ul style="list-style-type: none"> - Sustainability: Focus on renewable energy sources, CO2 reduction and promotion of the energy transition - Community: Strengthening local cohesion and promoting social integration - Transparency: Public structure and models, open communication about the energy community, finances and decision-making - Co-creation: members have a say in important decisions - Education: Transferring knowledge about renewable energies and the energy transition - Innovation: Promotion and implementation of research and innovation, energy community as a living lab 		

2.3.1 Innovation Model

To ensure ongoing development and innovation, a key aim of the business model is to test an innovation cooperation model. How such cooperation is integrated into the organisational structure of the Energy Community is explained in the following chapter, 2.4 Governance Structure within the section Cooperation and Innovation.

Part of the Innovation Cooperations Model is the connection of the project and the demonstrator of the Energy Community with education and research through academic cooperation in the Living Lab. Various formats are used to implement challenges and issues from the energy community into education. These include for example, TechChallenges of the UnternehmerTUM within the project in which students develop technical prototypes on questions such as "How can we optimise the distribution of electricity, money, and surfaces for an energy community in the neighbourhoods to maximise fairness and efficiency?" or a practical project on social distribution models for energy communities of the Munich University of Applied Sciences as part of the "Social Entrepreneurship" module. Individual work, such as seminar papers or project internships on specific issues, is also done. The energy community benefits from a portfolio of innovative approaches, while education benefits from practical assignments. The structure of the cooperation is shown in the diagram in Figure 6. The academic side is shown in blue, the energy community is shown in yellow, and the project is shown in purple. The connections show the interrelationships and the added value. The cooperation is being established and tested and can continue beyond the project period. The following chapter shows the result of the innovation cooperation model.

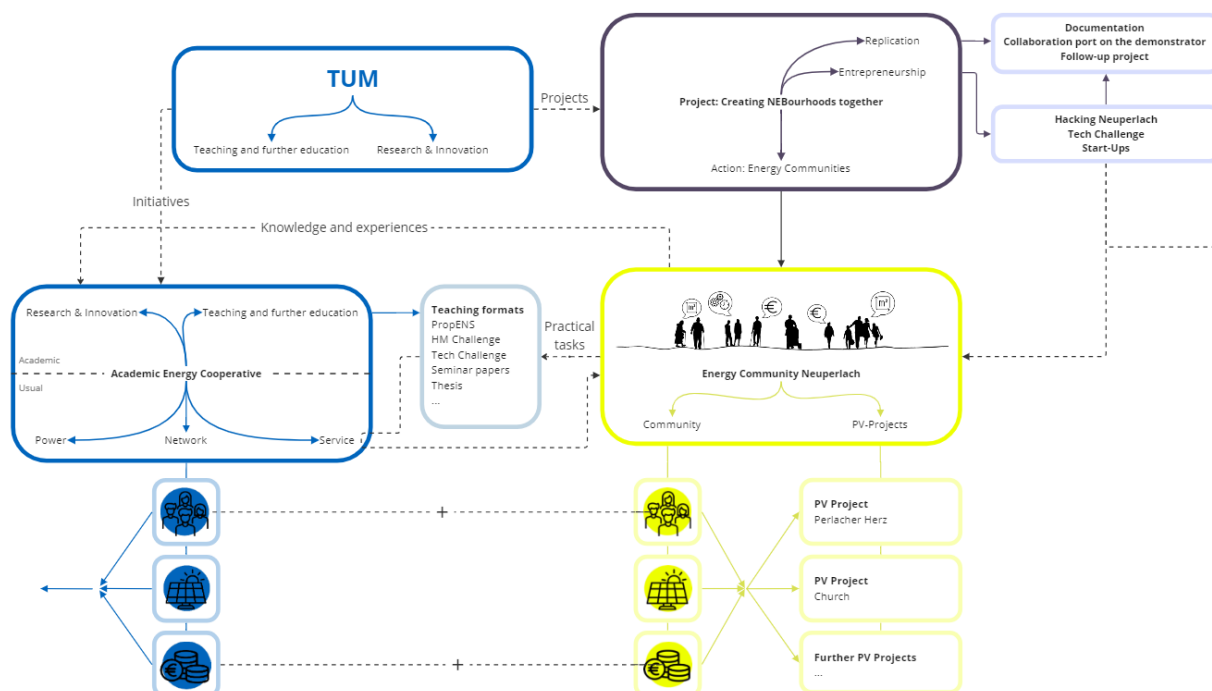


Figure 7 Innovation Cooperations Model

2.3.2 Social Models

A key aim of the NEB Action is to make sustainably produced electricity available to socially and financially disadvantaged people. The energy community is, therefore, to be developed as an explicitly social model. The following content is based on a practical project that was developed in collaboration with a group of students (Vanessa Reiser, Moritz Aichner, Marius Hämmerle, Stefan Wittmann, Nicole Brunner) as part of the "Social Entrepreneurship" academic module at Munich University of Applied Sciences in cooperation with the NEB Action (Sozial gerechte Verteilung am Beispiel von Energiegemeinschaften, 2024 (unpublished)). Following preliminary research, several interviews were conducted with existing energy communities on this topic. The insights were used to develop five business models for a social energy cooperative.

Social situation in Neuperlach

The following chart shows the index for socio-demographic challenges of all districts in Munich. It can be seen that the "target group" is represented above average in the project area. The index is made up of the following factors:

- Share of people with a migration background in the total population
- Share of children and young people with a migrant background in the population under the age of 18
- Share of unemployed persons SGB II+III in the population aged 15-64 years
- Share of young unemployed persons (under 25) SGB II+III in the population aged 15-24 years
- Share of long-term unemployed among the unemployed SGB II+III
- Share of single parents in all households
- Share of households with children in all households
- Share of the population aged 70 and over in the total population
- Share of people in communities of need in the total population

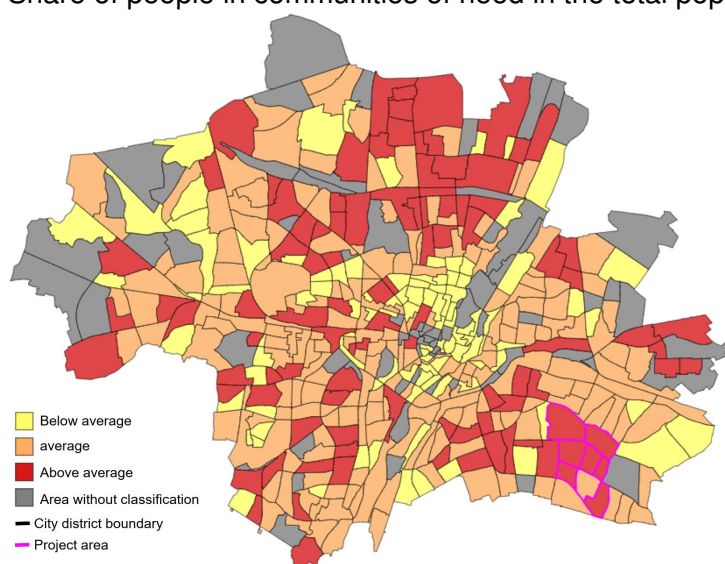


Figure 8: Social situation in Neuperlach in contrast to other districts in Munich (Landeshauptstadt München, n.d.)

The social situation in Neuperlach shows that the project area has great potential to test social models in the business model of the energy community.

Within the work on the social models, an analysis of the causes for the lack of social energy community was conducted through research and interviews.

Solution catalog for a social business model

Different solutions were developed as part of the students project. An overview is given in the Figure 9. All the solutions developed are designed to benefit both people who are socially/financially vulnerable and energy communities. The solution proposals are briefly explained in this chapter.

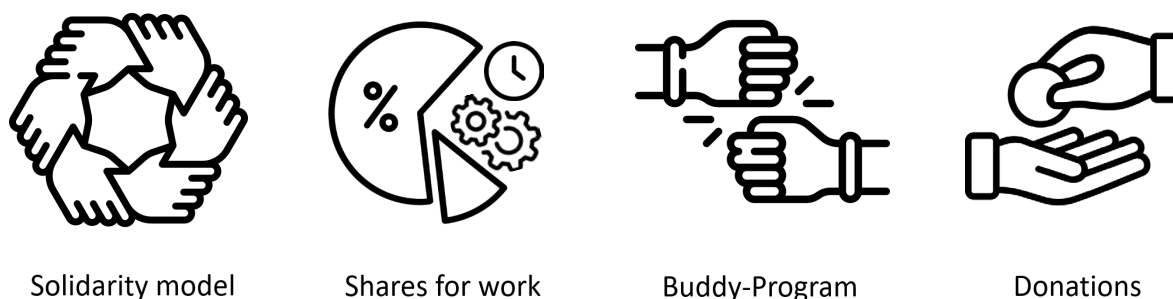


Figure 9: Overview of the social catalogue for a social business model

Solidarity Model

In the energy cooperative's solidarity model, members can sponsor electricity shares for those who cannot afford to buy them. Members may also forgo their dividends to provide shares to socially disadvantaged individuals, promoting inclusive participation in the renewable energy sector.

Shares for Work

To include socially disadvantaged individuals without financial means, the energy cooperative offers the option to earn shares through labour. For example, 6.67 hours of work can equate to one share worth 100 €, enabling participation without financial investment.

Buddy Program

The buddy program pairs experienced members with others to share knowledge and skills, enhancing the cooperative's human capital and fostering social inclusion. This program helps reduce loneliness and educational gaps while promoting social cohesion within the cooperative.

Donations

The cooperative can facilitate a donation model where funds are specifically used to buy shares for financially disadvantaged individuals, allowing them to join the sustainable energy movement. This model supports ecological and social goals without impacting the cooperative's cash flow like the work-for-shares model.

Social pricing models can have an impact on members' dividends. A calculation model created for the project as an Excel file is used to analyse the effects. An initial model will be implemented within the Living Lab and evaluated and adapted based on experience. The energy community demonstrator intends to test and further develop other models after the project period. The references serve this purpose.

2.4 GOVERNANCE STRUCTURE

The governance structure of the NEB Energy Community is detailed in its constitution. Key components include the organisational structure, membership criteria, decision-making processes, financing and resource management, daily operations, compliance and risk management, transparency and communication, collaboration and networking, and continuous improvement and innovation.

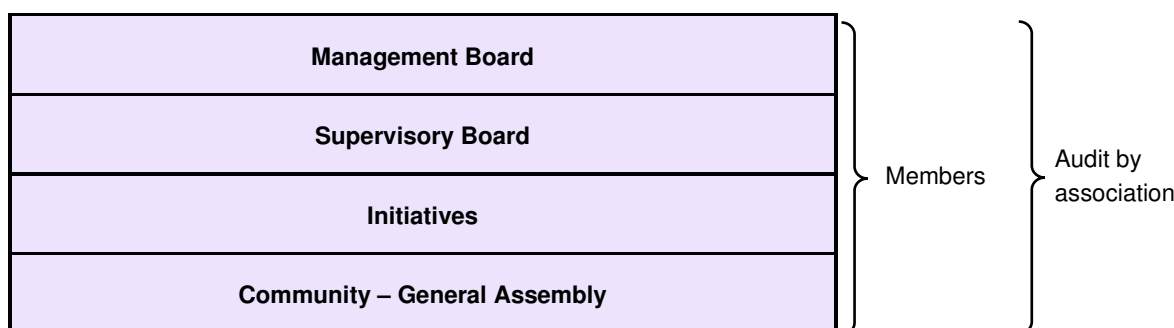
Organisational Structure

The NEB Energy Community is founded legally as a cooperative. Various key bodies manage the energy community, and the form of a cooperative legally defines the framework. This results in the following organisational structure.

- Management Board
 - Comprised of a minimum of 2, preferably 3 - 5 members, each responsible for overseeing 1 - 2 thematic fields.
 - Leads the cooperative
 - Reports to the Supervisory Board
 - Manages daily operations
 - There is a first board member among the board members to represent them
- Supervisory Board
 - Consists of a minimum of 3, preferably 3 - 5 members, responsible for monitoring the Management Board.
 - Oversees the Management Board
 - Elects members of the Management Board
 - Represents the cooperative in legal matters involving the Management Board
 - Ensures compliance with statutes and laws
 - There is a first board member among the board members to represent them

- Initiatives
 - Initiatives work on the different subject fields and tasks
 - Cooperation can be integrated as an initiative
 - They can be founded for new or temporary topics and projects to drive them forward
 - Initiatives appoint a manager internally
- General Assembly
 - Holds at least two per year where members can exercise their rights and participate in decision-making processes
 - Exercises member rights
 - Elects members of the Supervisory Board
 - Approves major decisions like changes to statutes, annual financial statements, and use of surpluses

Table 5 Organizational structure



Cooperations and Innovation

The organisational structure is designed to facilitate the integration of targeted cooperations for innovation and development. Furthermore, this structure supports the replication potential of the model.

To facilitate this, the organisation includes an Initiatives structure. These initiatives can address specific subject fields of the energy community and include a cooperative initiative. An example of such a collaborative initiative is being tested through an academic collaboration that promotes knowledge exchange by integrating challenges and questions into academic curricula. This initiative benefits the academic side through exposure to practical learning opportunities while providing the energy community with innovative insights from academia.

Additionally, it is conceivable that through such initiatives, further energy community structures with other project areas could be linked to the energy community in Neuperlach. Depending on the size and capabilities, the autonomy of such an initiative or the specifics of the cooperation need to be defined individually.

Subject fields and task fields

To manage and allocate the tasks within the organisational structure, the individual tasks are grouped into task fields, which in turn are clustered into subject fields. This is intended to create a clear structure. The tasks have been compiled through research and interviews with existing energy cooperatives and can be expanded or adapted. As a result, the following subdivision and allocation of tasks can be created.

- Engineering
 - System Design and Configuration
 - Construction and Installation
 - Maintenance and Safety
- Marketing & Public Relations
 - Branding and Communication
 - Member Recruitment and Engagement
 - Public Outreach and Media
- Legal
 - Compliance and Risk Management
 - Contractual Agreements and Documentation
 - Regulatory and Legal Affairs
- Management & Organisation
 - Financial Planning and Management
 - Administrative and Operational Coordination
 - Partnership and Stakeholder Relations
- Education, Research & Development
 - Knowledge Transfer and Capacity Building
 - Research and Innovation
 - Strategic Development and Implementation
- (Projects)
 - Recruiting, Initiation and Planning
 - Execution and Management
 - Monitoring and Evaluation

The individual tasks are arranged in the task fields at the next level of detail. The particular tasks are sorted thematically by grouping them into subject fields and can be easily assigned to the appropriate interested parties or expert groups. In addition, the number of tasks can be broken down into a general overview, which makes the content more manageable.

Nevertheless, the individual groups can address the tasks provided for the topic in more detail. A complete list of the subject fields, assigned task fields, and individual tasks is shown in the Appendix. The tasks can be integrated into the organisational structure through the subject fields, as shown in Table 3.

Table 6 Organizational structure with subject fields

Management Board				
1. Board Management	2. Board Marketing	3. Board Legal	4. Board Engineering	5. Board Development
Supervisory Board				
1. Board Management	2. Board Marketing	3. Board Legal	4. Board Engineering	5. Board Development
Initiatives				
1. Initiative Management	2. Initiative Marketing	3. Initiative Legal	4. Initiative Engineering	5. Initiative Development
Community – General Assembly				

}

Members

}

Audit by association

In the case of new and temporary topics to be promoted, a corresponding Initiative can be established. Cooperation and collaboration can also be integrated through an Initiative.

Membership and Participation

Anyone connected to the Energy Community and the project area can participate as a member. The types of membership are subdivided according to the required resource groups. Members can also belong to several groups - they just show the possibilities of participation.



Active members



Surface providers



Investors

Members can get actively involved and contribute to projects by participating in the Management Board, Supervisory Board or Initiatives. There are divided task fields, regular meetings with workshops, decision-making processes and general assemblies for participation.

Membership takes place by joining the cooperative and purchasing a share. Everyone with a share holds one voting right for the Energy Community. Multiple shares do not increase the number of voting rights. To minimise the barrier to participation, additional social mechanisms are integrated to support memberships (see Chapter 2.3.2 Social Models). Membership is promoted through marketing and networking to attract new members (see Chapter 2.5, Marketing and Outreach).

Decision-Making Processes

The decision-making processes within the energy community are designed to be inclusive, transparent, and efficient, ensuring active participation from all members and stakeholders. The key elements of the decision-making process include:

- **Management Board**
 - Operates within the framework of its internal rules of procedure
 - Responsible for daily operations and strategic decisions
 - Each member oversees specific thematic fields
 - Decisions are made collectively, supported by Initiatives
- **Supervisory Board**
 - Operates within the framework of its internal rules of procedure
 - Oversees the activities of the Management Board
 - Provides guidance and feedback on major decisions
 - Reviews annual reports and financial statements
- **Annual General Assembly**
 - Held at least twice a year for all community members
 - Major decisions, such as amendments to bylaws and election of board members, are made
 - All members can add topics to the agenda within a defined time frame
 - Each member has one vote, ensuring equal participation

Election Procedures

- The General Assembly elects members of the Supervisory Board
- Each member of the cooperative has one vote, regardless of the number of shares held
- A show of hands typically conducts voting unless a secret ballot is requested by the board or by 50 % of the attending members
- The Supervisory Board elects the members of the Management Board
- The Supervisory Board is elected for a term of two years

Majority Requirements

- General decisions require a simple majority of the valid votes cast
- A three-quarters majority is required for
 - Amendments to the statutes
 - Dismissal of Supervisory Board members
 - Exclusion of members from the cooperative
 - Withdrawal from cooperative associations
 - Mergers, divisions, or changes in the form of the cooperative
 - Dissolution of the cooperative

- A nine-tenths majority is needed for any changes to the statutes that impose new obligations on members

Submission of Agenda Items

Members can submit items for the agenda in writing, stating the purpose and reasons, at least ten days before the General Assembly.

Conflict Resolution

The conflict resolution processes within the energy community are designed to handle disagreements efficiently, transparently, and fairly, ensuring that all members' concerns are addressed and resolved amicably.

General Assembly

- The General Assembly serves as the primary forum for resolving conflicts
- Members can raise issues and discuss them during the assembly
- Decisions made by the General Assembly are binding and aim to resolve conflicts transparently and democratically

Supervisory Board

- The Supervisory Board oversees the actions of the Management Board and ensures compliance with the cooperative's regulations
- It acts as an intermediary in conflicts involving the Management Board

Internal Processes

- Members can file complaints or disputes with the Supervisory Board
- The Supervisory Board reviews the complaints and makes decisions following the cooperative's statutes and regulations
- If a member is excluded, they have the right to appeal to the Supervisory Board within one month of the exclusion notification
- If internal resolution is not satisfactory, members can pursue legal action as a last resort, following the cooperative's guidelines for conflict resolution

The key elements of the conflict resolution process include:

1. Initial Resolution Attempt

Direct Communication

- Members involved in a conflict are encouraged to discuss the issue directly and seek a mutual resolution.

Mediation

- If direct communication does not resolve the conflict, a neutral mediator from within the community or an external mediator can be appointed to facilitate discussions.

2. Supervisory Board Involvement

Escalation

- If the conflict remains unresolved, it can be escalated to the Supervisory Board.

Investigation

- The Supervisory Board reviews the conflict, considering all perspectives and relevant information.

Facilitation

- The board facilitates a meeting between parties to discuss the issue and seek a resolution.

3. Management Board Review

Further Escalation

- If the Supervisory Board cannot resolve the conflict, it is escalated to the Management Board.

Objective Review

- The Management Board conducts an objective review of the conflict, ensuring all parties have an opportunity to present their case.

Decision

- The Management Board makes a binding decision to resolve the conflict, guided by the community's bylaws and principles.

4. Community Involvement

General Assembly

- For conflicts that significantly impact the community or involve major decisions, the issue can be presented at the Annual General Assembly.

Collective Input

- The community discusses the conflict, and a resolution is sought through collective input and a majority vote if necessary.

Financing and Resource Management

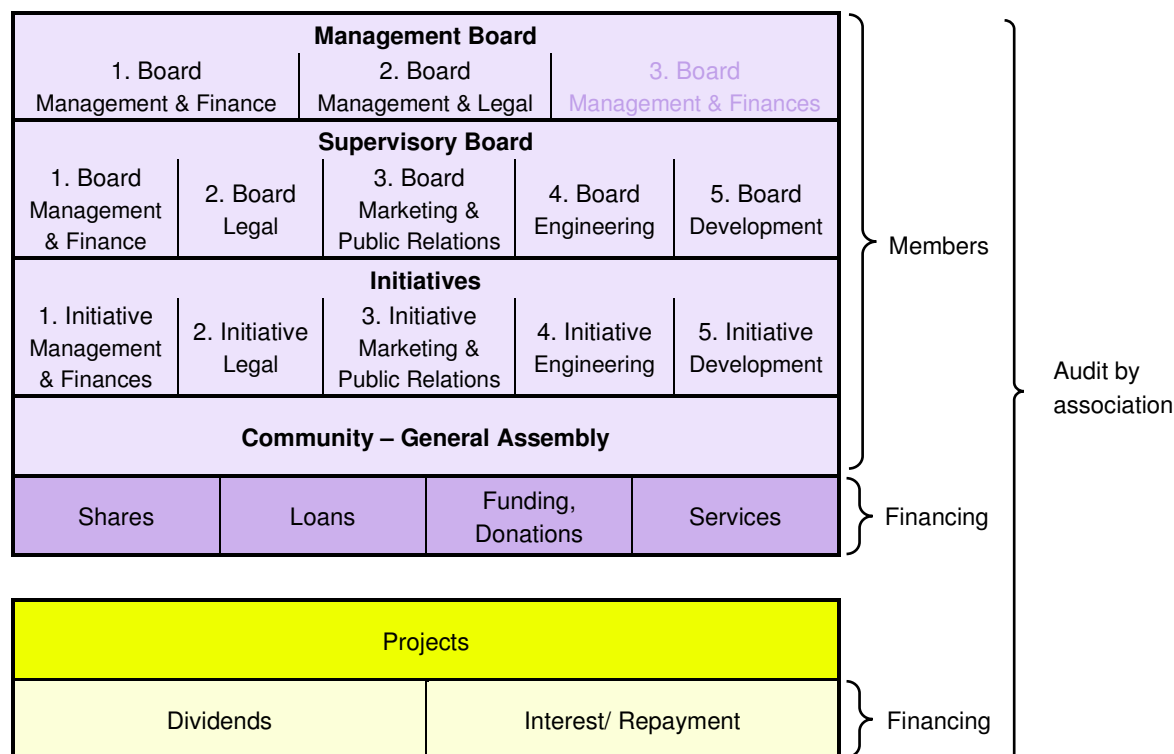
The community is financed through

- Membership shares
- Subordinated loans
- Funding
- Donations
- Income from energy sales/ feed-in tariffs
- Services they provide

The Energy Community opens a financial account for the community. The account will be opened after the cooperative has been founded and registered. The costs of the foundation need to be paid after the foundation. The energy community may have or develop the expertise to manage the resources, or an external service can be hired. For the management of finances and resources, the 1. Board Management and Organization are responsible.

Managed by the Management Board, monitored and assisted by the Supervisory Board and possibly supported by an Initiative.

Table 7 Organizational structure with a financing structure



Risk Management

Effective risk management is crucial for the success of energy communities. It involves identifying, assessing and responding to potential risks that could impact the community's objectives. The Risk Management Matrix and Risk Assessment Matrix are helpful tools in this process, enabling systematic evaluation and mitigation of risks.

The Risk Management Matrix provides a framework to outline responsibilities and track the implementation of risk management activities. It assigns roles across different boards and initiatives, ensuring that the members cover all aspects of risk management. This matrix helps clarify who is responsible, accountable, consulted and informed for each risk-related activity.

Responsibilities of risk management

Management Board

- Accountable for overseeing and approving the risk identification by the Supervisory Board and responsible for carrying out risk management activities, including risk assessment, developing mitigation plans and monitoring.

Supervisory Board

- Responsible for identifying risks while assessing the processes and accountable for overseeing and approving risk management activities proposed by the Management Board. This board also plays an advisory role and needs to be informed about significant developments.

Initiatives

- Involved in implementing specific measures and strategies, particularly within their area of expertise. They are consulted and informed to ensure that the measures are practical and monitored to report the risks and mitigation plans.

Community – General Assembly

- Regularly informed about risk management activities to ensure transparency and community involvement.

Table 8 Risk Management Matrix RACI (Based on Reiss & Reiss, 2009)

	Roles			
	Management Board	Supervisory Board	Initiatives	Community
	A	R	C	I
	R	A	C	I
	R	A	C	I
	A	C	R	I
	A	C	R	I
	R	A	C	I

R

Responsible

- The person or board responsible for executing the task.

A

Accountable

- The person or board that ultimately is accountable and approves the final decision.

C

Consulted

- Groups consulted because they possess relevant knowledge or are affected by the task.

I

Informed

- Persons or groups must be informed about the execution and results.

On the other hand, the Risk Assessment Matrix allows for prioritising risks based on their likelihood and impact. This tool aids in identifying which risks require immediate attention and resources, guiding the development of strategies to mitigate high-priority risks effectively.

Table 9 Risk Assessment Matrix (Based on Nohl & Thiemecke, 1988)

		Impact			
		1 without	2 light	3 heavy	4 very heavy
Probability	5 very likely	4	5	6	7
	4 probably	3	4	5	6
	3 possible	2	3	4	5
	2 impossible	1	2	3	4

For the foundation and operation of the energy company, the following risks were identified and measures defined. The risk management is carried out during the implementation of the energy community.

Table 10 Risks for the foundation and management of an energy community

	Description	Measures
Legal and Regulatory Risks	Complex permit and license requirements, insufficient changes in regulation and legislation to promote the economic viability of energy communities, non-compliance with legal requirements, changes in energy legislation, or specific local regulations that could affect the operation of the community.	Consulting, actively monitoring legislative changes, and ensuring that all activities of the energy community comply with regulatory requirements, as well as future-proof and flexible planning.
Financial Risks	Uncertainties in funding, high initial investment, insufficient capital reserves, fluctuations in cash flow resulting from the volatility of the energy market, and feed-in tariffs. Balance between social and economic aspects	Transparency of finances, establishing a financial base through shares, loans, donations, and other funding sources. Implementation of financial planning and regular review of the economic strategy. Defining common goals, monitoring and adaptation.

Risk of Limited Member Growth	The energy community may struggle to attract and retain a sufficient number of members, which could limit its operational effectiveness and financial sustainability. With a low number of active members, the work of individuals increases.	Implementing marketing strategies, using and strengthening the network, establishing cooperation, transparency, modest entry barriers and implementing social approaches.
Technological Risks	New technologies, supply shortages, technological failures, lack of equipment compatibility, insufficient existing technology	Insurance, professional expertise, timely planning, regular maintenance, monitoring, training members on technology handling
Market Risks	Changes in energy prices, new competitors, altered consumer preferences, and the general economic condition.	Flexible pricing models, active market monitoring, and offerings tailored to community needs.
Environmental Risks	Natural disasters and climatic conditions could impair energy production and technologies.	Development of emergency plans, investment in robust infrastructures that can withstand extreme weather conditions, and insurance against environmental damage.
Operational Risks	Lack of or inefficient internal processes, staff turnover, and technical failures.	Implement effective internal control systems, provide professional training for members, and build team expertise and commitment.
Social and Cultural Risks	Resistance within the local community and cultural misunderstandings could affect the acceptance of the energy community.	Transparent communication policy, active reputation management, and regular feedback from members and stakeholders to improve services.

Continuous Improvement and Innovation

Feedback mechanisms are to be implemented. Integrating a feedback function via the website or digital tool is possible. In addition, feedback can be collected and gathered at assemblies and meetings. A board takes care of the feedback regularly, analyses it and passes it on to the correct fields or acts on the feedback opportunities.

An innovation cycle is to be implemented to ensure continuous improvement and innovation. Below are the contents and steps.

1. Idea Generation
Collecting a wide range of potential ideas through brainstorming and other co-creation techniques. Workshops can be organised for this purpose.
2. Idea Screening

Filtering out less feasible ideas to focus on the most promising ones based on set criteria like alignment with organisational goals or market potential. The risk assessment matrix can be reinterpreted and applied to weigh the ideas according to the requirements.

3. Development and Testing

Developing concepts into prototypes and gathering feedback to assess viability and refine the product or service. Ideas, issues and challenges can be transferred to academic institutions through cooperation with teaching and research.

4. Commercialization

Evaluating the business aspects such as cost, revenue potential, and marketing strategies, followed by a limited market test.

5. Launch and Evaluation

Launching the product or service to the market with marketing and distribution, followed by continuous monitoring and feedback collection for future improvements.

In addition to transparency, the innovation strategy includes collaborations with research and educational institutions to promote innovation and adapt to new challenges and opportunities.

Transparency and Communication

Transparency Measures

- Documents and Information are made available online for download
- Templates and References are made available online for download
- Explanatory texts are available for documents such as the Articles of Association
- Translations into various languages are to be offered
- Regular events provide members with information

Communication Strategies

1. Message Development with core message and supporting message.

2. Communication Channels

Digital Media: Website updates, regular newsletters and social media presence.

Print Media: Flyers, posters and regular newsletters with distribution.

Community Engagement: Workshops, events and public meetings for direct interaction and feedback.

3. Implementation Timeline

Monthly: Newsletters and website updates.

Quarterly: Community workshops and evaluation meetings.

Annually: Comprehensive review of communication strategy effectiveness and adjustments based on feedback.

4. Evaluation and Feedback

Metrics: Website traffic, social media engagement rates, workshop attendance and feedback forms.

Continuous Improvement: Regularly feedback through surveys and community meetings to refine and adapt the communication strategy.

Communication Streams

- 1 Initiative Your Fix every two weeks
- 2 Subject field Your Fix every two weeks
- 3 Management Board Your Fix once a month
- 4 General Assembly two to six times a year
- 5 Audit once a year

Table 11 Organizational structure with communication streams

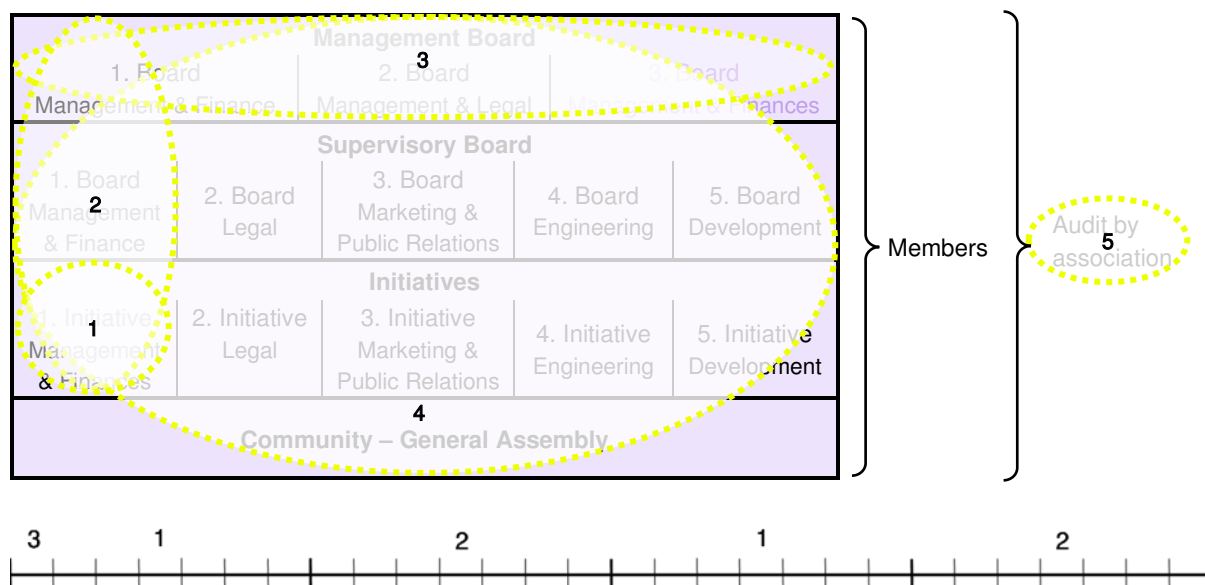


Figure 10 Example of the communication stream timeline for one month

2.5 MARKETING AND OUTREACH

The marketing strategy is based on the stakeholder analysis outlined in Chapter 2.2 Stakeholder Analyses. In addition, the marketing approach consists of the following components:

- Events
- Project Contact Points (NEBourhoods Makerspace Container, Pavillon)
- Information Sessions
- Workshops
- Presentations
- Physical Presence

- Posters
- Flyers
- Articles
- Digital Presence
- Project Channels (Instagram, LinkedIn, Website)
- Website
- Email
- Signal Group Chat

This multi-faceted marketing strategy aims to effectively engage with the community, raise awareness about the energy community project, and encourage active participation. Through events, physical materials, and digital platforms, we strive to reach a broad audience and provide information and support to all stakeholders.

A visual language for the energy community has been developed for the marketing materials. This includes visual elements such as sketches, logos and images representing the community's mission. As colours, the common project colours are used to match the corporate identity. The visual language ensures that all communication materials, from posters and flyers to social media posts and the website, are consistent and recognisable. This helps to build a cohesive identity for the energy community.

2.5.1 Digital Media

For the online presence of the energy community, there is a dedicated website in addition to the NEBourhoods project channels on LinkedIn, Instagram, and the main project website. This website provides an introductory overview of the energy community and the background of the NEBourhoods project. Additionally, it explains how to participate and offers the opportunity to register or get in touch directly through the website. There is also a section for news updates, which the energy community can manage in the future. After the foundation, the website will be expanded with information about the members, structure, and a document download area. It is also feasible that the Energy Community will use the website to inform its members. The website will be handed over to the energy community at the end of the project period. Below is an overview of the website, its content and functions. The main website is in German, and the project area is in Germany. Underneath the screenshots of the website, you can find an English translation of the content.

Overview of the Website



Energiegemeinschaften

Solarstrom gemeinsam produzieren. FairTeilen.

Lokal FairMarkten. In Neuperlach.

Steigende Energiepreise sind eine große Belastung für private Haushalte und Unternehmen. In einer Energiegemeinschaft nimmt die Nachbarschaft ihre Energieversorgung selbst in die Hand. Gemeinsam wird vor Ort durch Solaranlagen Energie produziert, gespeichert, verbraucht.

Figure 11 Website's homepage

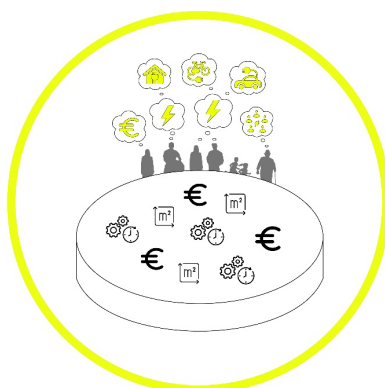
Translation:

Energy Communities

Producing Solar Power Together. Sharing Fairly, Locally in Neuperlach.

Rising energy prices are a significant burden for private households and businesses. In the energy community, the neighbourhood takes control of its energy supply. Together, energy is produced, stored, and consumed locally through solar panels.

Es gibt verschiedene Möglichkeiten, sich in der Energiegemeinschaft zu beteiligen: Einige können leere Flächen für Solaranlagen zur Verfügung stellen, andere würden gerne finanziell unterstützen – und wiederum andere hätten die Zeit, sich um die Anlage oder Organisation zu kümmern. In einer Energiegemeinschaft arbeiten Menschen, lokale Einrichtungen oder Unternehmen zusammen, um gemeinsam erneuerbare Energie zu erzeugen. Es entsteht ein lokales Netzwerk, in dem alle Beteiligten die Möglichkeit haben, sich einzubringen und mitzuentcheiden.



Durch die Gemeinschaft können Ressourcen Flächen, Zeit und finanzielle Mittel der Beteiligten gebündelt werden. Die Gemeinschaft organisiert den Aufbau der Solaranlage und begleitet ihren Betrieb. Die Finanzierung erfolgt durch die Gemeinschaft und mögliche Fördermittel. Der erzeugte nachhaltige Strom wird fair zwischen allen Beteiligten verteilt. Dadurch ermöglicht die Energiegemeinschaft eine gerechte Teilhabe.

Der in Energiegemeinschaften selbst produzierte und genutzte Solarstrom verringert die Energiekosten und Abhängigkeiten für die Mitglieder. Die Energiegemeinschaft fördert Zusammenhalt und trägt dabei aktiv zum Klimaschutz bei. So bleibt mehr für alle: für die Bürger:innen, die lokalen Unternehmen und natürlich auch für unser Klima.

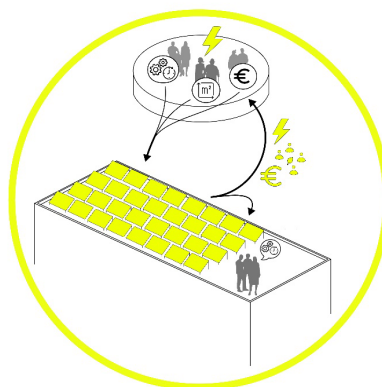


Figure 12 Website section Introduction

Translation:

There are various ways to participate in the energy community: some can provide empty spaces for solar panels, others may want to offer financial support, and others have the time to take care of the installation or organisation. In an energy community, individuals, local facilities, or businesses collaborate to generate renewable energy together. This creates a local network where all participants can contribute and have a say.

Resources such as space, time, and financial means can be pooled through the community. The community organises the construction of the solar panels and oversees their operation. The community and potential subsidies provide financing. The sustainably generated electricity is distributed fairly among all participants, enabling equitable participation.

Solar power produced and used within energy communities reduces energy costs and members' dependence. The energy community fosters cohesion and actively contributes to climate protection. This benefits everyone: the citizens, local businesses and, of course, our climate.

Das Projekt

Creating NEBourhoods together

Energiegemeinschaften sind wichtiger Teil von Projekten der EU im Kontext von dem European Green Deal. Dieser wurde am 11. Dezember 2019 von der Europäischen Kommission unter Ursula von der Leyen vorgestellt und hat zum Ziel, die Netto-Emissionen von Treibhausgasen in Europa bis 2050 auf null zu reduzieren. Somit soll Europa der erste klimaneutrale Kontinent werden. Im Zuge dieser riesigen Initiative sind verschiedene Arbeitsfelder entstanden. Auch das Baugewerbe wird unter die Lupe genommen, weil hier besonders viele Emissionen anfallen. Um diesen Sektor zu revolutionieren, wurde das „New European Bauhaus“ ins Leben gerufen. Zentrale Aspekte sind hierbei Nachhaltigkeit, Ästhetik und Inklusivität.

Und genau hier kommt unser Neuperlach ins Spiel: Als eines von fünf Leuchtturmprojekten wird Neuperlach eine zentrale Rolle im New European Bauhaus einnehmen. Insgesamt werden zehn Actions dazu beitragen den Stadtteil mit Innovationen zu transformieren. So werden wir Vorreiter und Beispiel für wichtige Systeme, welche Bau und Gesellschaft nachhaltig aufstellen. Energiegemeinschaften helfen autonom Strom zu gewinnen und damit auch die Abhängigkeit von beispielsweise steigenden Energiepreisen zu lösen. Gemeinsam können wir es schaffen unseren lokalen Energiebedarf eigenständig und nachhaltig zu transformieren.

Wir unterstützen und begleiten die Gründung von Energiegemeinschaften in Neuperlach um eigenen Strom lokal zu gewinnen und fair zu verteilen. So bleibt mehr für alle: für unsere Haushalte, für unsere lokalen Unternehmen und natürlich auch für unser Klima.

→ NEBourhoods

CREATING
NEB
OURHOODS
TOGETHER

Figure 13 Website section The Project Creating NEBourhoods Together

Translation:

The Project

Creating NEBourhoods Together

Energy communities are an essential part of EU projects within the context of the European Green Deal. This initiative was introduced on December 11, 2019, by the European Commission under Ursula von der Leyen, aiming to reduce net greenhouse gas emissions in Europe to zero by 2050. Thus, Europe is set to become the first climate-neutral continent. Various fields of work have emerged from this significant initiative, including the construction industry, which is a primary source of emissions. The "New European Bauhaus" was established to revolutionise this sector, focusing on sustainability, aesthetics, and inclusivity.

This is where Neuperlach comes into play: As one of five flagship projects, Neuperlach will play a central role in the New European Bauhaus. A total of ten NEB Actions will contribute to transforming the district with innovations. We will become pioneers and examples of essential systems that sustainably shape construction and society. Energy communities help generate electricity locally and reduce dependence on rising energy prices. Together, we can transform our local energy needs independently and sustainably.

We support and accompany the founding of energy communities in Neuperlach to generate and distribute local electricity fairly. This benefits everyone: our households, our local businesses, and, of course, our climate.

Wie kann ich mitmachen?



Ich wirke aktiv mit

Du möchtest dich aktiv in der Gemeinschaft eingringen? Hast die Zeit oder Expertise in der Organisation mitzuwirken?
Die Bereiche und Möglichkeiten sind vielfältig: von der Begleitung der PV-Anlage über Förderung, Finanzierung, Abrechnungsfragen mit einem sozialen Strompreismodell bis hin zur Organisation der Verteilung.



Ich habe Fläche

Du hast eine ungenutzte Dach- oder Fassadenfläche die du für PV-Anlagen zur Verfügung stellen möchtest?
Ideal ist eine Fläche mit einer möglichen Ausrichtung nach Süden, Westen oder Osten und einer Fläche > 250 m².



Ich bin Investor:in

Du möchtest die Gemeinschaft finanziell stärken und dich als Investor:in einbringen?
Das Finanzierungsmodell wird im Rahmen der Gemeinschaft entwickelt.
Einen Geschäftsanteile der Gemeinschaft gibt es für 100 € und ein Nachrangdarlehn kann ab 500 € geleistet werden.

„Deine Energie. Deine Kraft. Gemeinsam erzeugen wir eigenen Strom!“

Figure 14 Website section How to participate

Translation:

How can I participate?

I participate actively

Do you want to actively contribute to the community? Do you have the time or expertise to get involved in the organisation? There are numerous areas and opportunities, from overseeing the PV system to support, financing, billing issues with a social electricity pricing model, and organising the distribution.

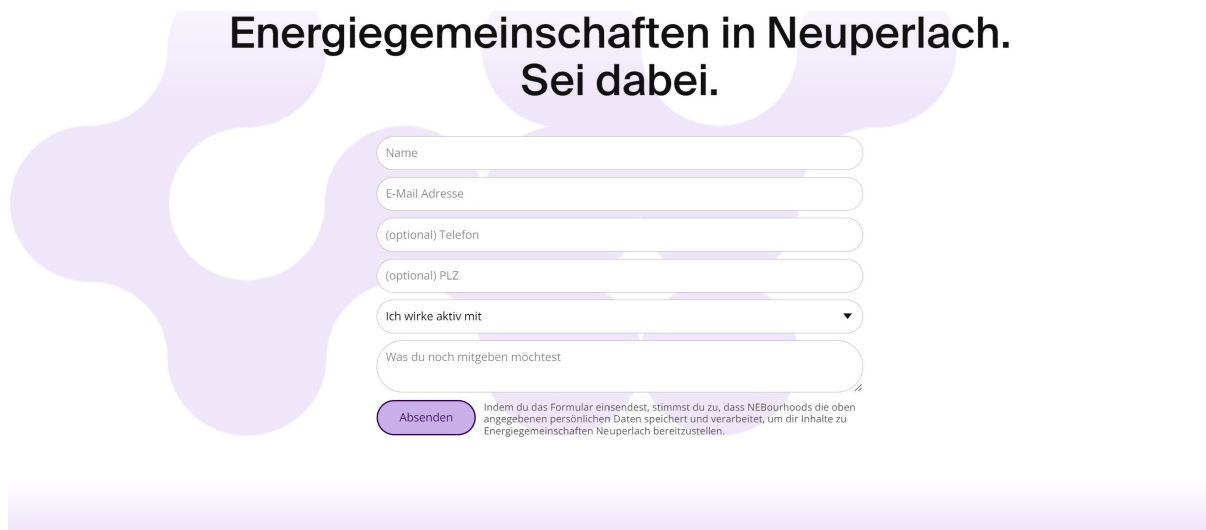
I have surface

Do you have unused roof or facade surfaces that you want to make available for PV systems? An ideal space has a possible orientation towards the south, west, or east and an area of more than 250 m².

I am an investor

Do you want to financially support the community and participate as an investor? The financing model is developed within the community. A community share is available for 100 €, and a loan can be made starting from 500 €.

"Your energy. Your power. Together, we generate our own electricity!"



**Energiegemeinschaften in Neuperlach.
Sei dabei.**

Name

E-Mail Adresse

(optional) Telefon

(optional) PLZ

Ich wirke aktiv mit

Was du noch mitgeben möchtest

Absenden

Indem du das Formular einsendest, stimmst du zu, dass NEBourhoods die oben angegebenen persönlichen Daten speichert und verarbeitet, um dir Inhalte zu Energiegemeinschaften Neuperlach bereitzustellen.

Figure 15 Website's registration form

With the registration form, interested parties can directly express their interest. Initial information such as name, email, phone number, and postal code is collected. Through a dropdown menu, participants can select the type of participation they are interested in. The options correspond to those in Figure 6, with an additional option for "other." There is also an additional comment field.

Additionally, the website features a section for news updates, a contact form, an imprint and a privacy policy.

Online Channels

In addition to the website, the project's online channels on Instagram and LinkedIn are used during events. Event-specific images are created for Instagram Stories and posts, as well as for LinkedIn events. The promotional material and its dissemination are a collaboration between the NEB Action Energy Communities and Workpackage 6: Communication, Replication & Dissemination.

- Several requests have been received through the website
- Translation into other languages is planned
- It allows communicating information externally but requires maintenance
- After the project period, it may be useful to expand the online presence of the energy community

2.5.2 Print Media

The print media is used to generate awareness for establishing the community and upcoming events. The goal of the energy community is social inclusion, so we provide printed media alongside digital options. This approach ensures that we reach those who are less accessible digitally and enhances visibility.

This section will present a selection of print media, including flyers, posters, informational leaflets, registration forms and newspaper articles. The printed media are designed with the visual language of the energy community and are used in the neighbourhood. The aim is to increase visibility and create recognizability.



Energiegemeinschaften

Steigende Energiepreise sind eine große Belastung für private Haushalte und Unternehmen. In einer Energiegemeinschaft nimmt die Nachbarschaft ihre Energieversorgung selbst in die Hand. Gemeinsam wird vor Ort durch Solaranlagen Energie produziert, gespeichert, verbraucht.

Wir unterstützen und begleiten die Gründung der ersten Energiegemeinschaft in Neuperlach. Mit dem Ziel, bis Mai 2024 gemeinsam eine Solaranlage zu planen und umzusetzen.

Gemeinsam Solarstrom produzieren, fair teilen, lokal vermarkten

Wie kann ich bei der Energiegemeinschaft mitmachen?

1 Es gibt verschiedene Möglichkeiten, sich in der Energiegemeinschaft zu beteiligen: Einige können leere Flächen für Solaranlagen zur Verfügung stellen, andere würden gerne finanziell unterstützen - und wiederum andere hätten die Zeit, sich um die Anlage oder Organisation zu kümmern.

2 Durch die Gemeinschaft können Ressourcen (Flächen, Zeit und finanzielle Mittel der Beteiligten) gebündelt werden. Die Gemeinschaft organisiert den Aufbau der Solaranlage und begleitet ihren Betrieb. Die Finanzierung erfolgt durch die Gemeinschaft und mögliche Fördermittel.

3 Der in Energiegemeinschaften selbst produzierte und genutzte Solarstrom verringert die Energiekosten und Abhängigkeiten für die Mitglieder. Die Energiegemeinschaft fördert Zusammenhalt und trägt dabei aktiv zum Klimaschutz bei.

So bleibt mehr für alle: für die Bürger:innen, die lokalen Unternehmen und natürlich auch für unser Klima.

www.NEBourhoods.de
@NEBourhoods

Mitmachen

Alle Interessierten Neuperlacher:innen und Initiativen vor Ort können Teil der ersten Neuperlacher Energiegemeinschaft werden. Die Beteiligung ist dabei auf unterschiedliche Weise möglich:

Sie möchten Strom aus einer lokalen Solaranlage beziehen, die sie gemeinsam mit anderen betreiben?

Sie haben eine Dachfläche und möchten in einer Gemeinschaft eine Solaranlage umsetzen?

Sie können die Gemeinschaft mit finanzieller Unterstützung stärken?

Termine

Energiegemeinschaften - gemeinsam Solarstrom im Quartier erzeugen und nutzen
5. Juli 2023, 9-12:30 Uhr (online)

Informationsveranstaltung für alle, die sich für Energiegemeinschaften und solare Stromversorgung im Quartier engagieren wollen.

Online-Veranstaltung der Stadt München/Bauzentrum München
Anmeldung und Information zum Programm auf www.nebourhoods.de/news

Runder Tisch der Energiegemeinschaft Neuperlach
17. Oktober 2023, 19-21 Uhr

Beginn der Planungsphase. Treffen aller Mitmacher:innen, um an der Entwicklung und Gründung der Energiegemeinschaft zu arbeiten.

Anmeldung unter:
energiegemeinschaften@NEBourhoods.de

Wo: Quide35 - Raum für Stadtsanierung Quidestraße 35, Neuperlach

Wenn Sie mitmachen möchten, wenden Sie sich an unser Team:

Serena Keller
Technische Universität München,
Lehrstuhl für Gebäudetechnologie und klimagerechtes Bauen

Claudia Hemmerle
Technische Universität München,
Lehrstuhl für Gebäudetechnologie und klimagerechtes Bauen

Thomas Auer
Technische Universität München,
Lehrstuhl für Gebäudetechnologie und klimagerechtes Bauen

Creating NEBourhoods Together - Gemeinsam schöne und umweltgerechte Nachbarschaften gestalten

Creating NEBourhoods Together hat zum Ziel, gemeinsam mit Bürger:innen, Kreativen und Expert:innen das Leben und Arbeiten in der Stadt zukunftsfähig, sozial gerecht und umweltfreundlich zu gestalten.

Creating NEBourhoods Together ist ein Vorprojekt für das Neue Europäische Bauhaus (NEB) der Europäischen Union. Das NEB will die Lebensqualität durch die Förderung von Nachhaltigkeit, Ästhetik und Inklusion erhöhen und sucht neue Wege, wie Europa klimaneutral werden kann. Bis Ende 2024 setzen wir im Stadtgebiet von Neuperlach zehn NEB-Aktionen im Sinne des neuen Europäischen Bauhaus um. Machen Sie mit!

Interessierte können sich bei der Projektleitung melden unter:
Telefon +49 1525 5808634
E-Mail NEBourhoods@munichen.de

Personen, die besondere Unterstützung für die Teilnahme an den Aktionen benötigen, können sich gerne an oben stehenden Kontakt wenden.

Kontakt Serena Keller:
energiegemeinschaften@NEBourhoods.de

Finanziert von der Europäischen Union

© NEBourhoods/Architekturgalerie München e.V., Juni 2023 (Änderungen vorbehalten)
Bildrechte: ADEPT, Astrid Eckert, Stephanie Büchel Photography

NEB-Aktion

Energiegemeinschaften

Figure 16 Leporello

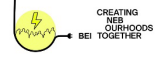
The Leporello shown in Figure 8 is available in the neighbourhoods at places like the NEBourhoods Pavilion and the neighbourhood office. It offers basic information and guides people to the website or contact for more details. This helps residents easily learn about the energy community and get involved. The Leporello was created by Work Package 6 and is used for marketing within the project. They are available for every NEB Action in the project.



Figure 17 Flyer of an information event and information sheet

In addition to the Leporello, an information sheet is available for attendees to take home from events. For advertising events, specific flyers and posters are also used. Figure 9 shows a flyer from a past event. Alongside event details, all print media include a link to the website and contact information.

The information on flyers and posters is intentionally simplified to capture interest without overwhelming the audience. Attendees can find more details at information events. Looking ahead, plans include enhancing the website with detailed information and document downloads. There is potential for creating a detailed print medium, such as a booklet, to increase social inclusion.



Energiegemeinschaften Neuperlach

Solarstrom gemeinsam produzieren. FairTeilen. Lokal FairMarkten

„Deine Energie. Deine Kraft. Gemeinsam erzeugen wir eigenen Strom!“
Sei dabei und gründe mit.

Wie kann ich mitmachen?

Ich wirke aktiv mit

Du möchtest dich aktiv in der Gemeinschaft einbringen? Hast die Zeit oder Expertise in der Organisation mitzuwirken? Die Bereiche und Möglichkeiten sind vielfältig, von der Begleitung der PV-Anlage über Förderung, Finanzierung, Abrechnungsfragen mit einem sozialen Strompreismodell bis hin zur Organisation der Verteilung.

Ich habe Fläche


Du hast ein ungenutzte Dach- oder Fassadenfläche die du für PV-Anlagen zur Verfügung stellen möchtest? Ideal ist eine Fläche mit einer möglichen Ausrichtung nach Süden, Westen oder Osten und einer Fläche > 250 m².

Ich bin Investor:in

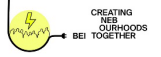
Du möchtest die Gemeinschaft finanziell stärken und dich als Investor:in einbringen? Das Finanzierungsmodell wird im Rahmen der Gemeinschaft entwickelt. Geschäftsanteile der Gemeinschaft gibt es für 100 € und ein Nachrangdarlehen kann ab 500 € geleistet werden.

Anmeldeformular

Nachname	Vorname	Postleitzahl
E-Mail Adresse		Telefonnummer
<input type="checkbox"/> Ich wirke aktiv mit <input type="checkbox"/> Ich habe Fläche <input type="checkbox"/> Ich bin Investor:in		
Interesse Arbeitsbereich (Organigramm) Expertise - Flächenbeschreibung		
Investitionsrahmen (unverbindlich) <input type="checkbox"/> Geschäftsanteile (je 100 €), Anzahl: _____ <input type="checkbox"/> Nachrangdarlehen (ab 500 €), Höhe: _____		
Unterschrift (hiermit stimmen Sie zu, dass NEBourhoods die oben genannten persönlichen Daten zur späteren Kontaktaufnahme via E-Mail und Telefon verwenden darf)		



Funded by the European Union





Energiegemeinschaften Neuperlach

Solarstrom gemeinsam produzieren. FairTeilen.

Anmeldeformular

Kontakt:		
Nachname	Vorname	Postleitzahl
E-Mail Adresse		Telefonnummer
Hintergrund (Beruf, Studium, Interesse)		
Mein Bereich/ meine Bereiche in der Gemeinschaft sind:		
<input type="checkbox"/> Ich wirke aktiv mit Welchen Themenbereich möchten Sie unterstützen? <input type="checkbox"/> Technik <input type="checkbox"/> Recht & Verwaltung <input type="checkbox"/> Management <input type="checkbox"/> Finanzierung <input type="checkbox"/> Marketing & Weiterentwicklung	<input type="checkbox"/> Ich verpachte Fläche Wie groß ist die Fläche? <input type="checkbox"/> In Quadratmeter (m²) Art der Fläche: <input type="checkbox"/> Flachdach/ Giebeldach/ Fassade/ Freifläche Stromverbrauch vor Ort: <input type="checkbox"/> Vorhanden <input type="checkbox"/> Nicht vorhanden *Stromverbrauch in Kilowattstunden (kWh)	<input type="checkbox"/> Ich bin Investor:in Wie viele Anteile möchten Sie erwerben? Ein Anteil kostet 100 € für circa 3 % Dividende Möchten Sie ein Darlehen geben? <input type="checkbox"/> Ja <input type="checkbox"/> Nein In welcher Höhe? Ein Darlehen beträgt min. 500 € <input type="checkbox"/> Ich möchte zusätzlich Informationen über das Projekt NEBourhoods erhalten
Stunden pro Woche, Tage pro Monat *Stromverbrauch in Kilowattstunden (kWh)		
Unterschrift (hiermit stimmen Sie zu, dass die NEB Energiegemeinschaft die oben genannten persönlichen Daten zur späteren Kontaktaufnahme via E-Mail und Telefon verwenden darf)		

Funded by the European Union

Figure 18 Registration form

Additionally, a registration form is available for the energy community, as seen in Figure 11. These forms, which have evolved throughout the project's duration, collect basic personal information such as name, background, and contact details. They also allow potential members to specify their type and area of interest. This is particularly useful during the initial phase of the energy community when it has not yet been formally established, and legal membership is not possible. The information provided about active membership and areas of expertise helps assess the existing knowledge within the community. Details about available space allow for an estimation of potential uses, while information on share purchases and willingness to provide loans gives insights into financial capabilities. These details are used to make preliminary assessments without guarantee.

Another design used in print media advertising is the posters shown in Figure 12. These focus less on the structure of the energy community and its components and more on showcasing the technical aspects through PV panels. It has been observed that many people are already engaged with and interested in PV technology, but some lack the knowledge or resources to implement it. These individuals are a target audience for the energy community and are intended to be reached through this design. The posters can be used to promote both the community's founding and specific events. A corresponding flyer is also available.



+

Einladung zur Infoveranstaltung

Energiegemeinschaft Neuperlach

06. Juni 2024, 15:30–17 Uhr
im NEBourhoods Pavillon
im Wohnring/Theodor-Heuss-Platz 1 beim Spielplatz

Gemeinsam für sozialen Strom in Neuperlach!

Werden Sie Teil der Energiegemeinschaft, in der NeuperlacherInnen die Energiewende selbst in die Hand nehmen.

Die erste Solaranlage auf dem Perlacher Herz ist bereits geplant und weitere sind in Vorbereitung. Als Teil der Energiegemeinschaft haben Sie die Möglichkeit, sich aktiv einzubringen – sei es durch finanzielle Investitionen, die Bereitstellung von Flächen für Photovoltaikanlagen oder durch Ihre aktive Mitarbeit. Jedes Mitglied erhält einen fairen Anteil, entweder in Form einer Dividende oder direkt in Strom. Dabei strebt die Energiegemeinschaft Offenheit für Alle, neue Technik und Teilhabe an. Derzeit bietet die Gründung Gelegenheit, konkrete Schritte der Energiegemeinschaft mitzugestalten und weitere Interessierte kennenzulernen.

Sie haben Interesse? Dann kommen Sie am Infoabend vorbei oder kontaktieren und besuchen Sie uns über unserer Webseite:




www.NEBourhoods.de
@NEBourhoods
NEBourhoods@munichen.de
+491525 680 86 34



„Creating NEBourhoods Together“ ist ein Vorhabenprojekt für das Neue Europäische Bauhaus (NEB) der Europäischen Union. Wir haben zum Ziel, gemeinsam mit BürgerInnen, Kreativen und ExpertInnen das Leben und Arbeiten in der Stadt zukunftsfähig, sozial gerecht und umweltfreundlich zu gestalten. Die PartnerInnen von „Creating NEBourhoods Together“ sind Münchner Institutionen, Vereine, aus der Wissenschaft und Verwaltung unter der Leitung der Landeshauptstadt München.

Finanziert von der Europäischen Union. Die Europäische Union trägt die Mehrheit der Kosten für dieses Projekt. Die Europäische Union trägt die Mehrheit der Kosten für dieses Projekt. Die Europäische Union trägt die Mehrheit der Kosten für dieses Projekt.

Finanziert von der Europäischen Union



+

Einladung zur Gründung und Mitgliedschaft in der

Energiegemeinschaft Neuperlach

wöchentliche Workshops hier im NEBourhoods Pavillon

Gemeinsam für sozialen Strom in Neuperlach!

Werden Sie Teil der Energiegemeinschaft, in der NeuperlacherInnen die Energiewende selbst in die Hand nehmen.

Die erste Solaranlage auf dem Perlacher Herz ist bereits geplant und weitere sind in Vorbereitung. Als Teil der Energiegemeinschaft haben Sie die Möglichkeit, sich aktiv einzubringen – sei es durch finanzielle Investitionen, die Bereitstellung von Flächen für Photovoltaikanlagen oder durch Ihre aktive Mitarbeit. Jedes Mitglied erhält einen fairen Anteil, entweder in Form einer Dividende oder direkt in Strom. Dabei strebt die Energiegemeinschaft soziale Integration, Transparenz und Innovation an. Derzeit bietet die Gründung Gelegenheit, konkrete Schritte der Energiegemeinschaft mitzugestalten und weitere Interessierte kennenzulernen.

Sie haben Interesse? Dann melden Sie sich über die Webseite unter:
www.energiegemeinschaften-neuperlach.klima.ed.tum.de an
oder mit einer Mail an: energiegemeinschaften@NEBourhoods.de




www.NEBourhoods.de
@NEBourhoods
NEBourhoods@munichen.de
+491525 680 86 34



„Creating NEBourhoods Together“ ist ein Vorhabenprojekt für das Neue Europäische Bauhaus (NEB) der Europäischen Union. Wir haben zum Ziel, gemeinsam mit BürgerInnen, Kreativen und ExpertInnen das Leben und Arbeiten in der Stadt zukunftsfähig, sozial gerecht und umweltfreundlich zu gestalten. Die PartnerInnen von „Creating NEBourhoods Together“ sind Münchner Institutionen, Vereine, aus der Wissenschaft und Verwaltung unter der Leitung der Landeshauptstadt München.

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Finanziert von der Europäischen Union

Figure 19 Poster einer Informationsveranstaltung und zur Gründung

The posters and flyers were used as promotional tools before an event, strategically placed and displayed at various locations within the project area. These locations were chosen based on the daily routines of the target audience, ensuring they would encounter these advertisements in familiar settings. The chosen sites for distribution include:

- Supermarkets
- Pharmacies
- Bakeries
- Cafés
- Banks
- Hair salons
- Beauty salons
- Doctors' offices
- Daycare centres/ Kindergarten
- Sports facilities
- Libraries
- Neighborhood office

These locations were used for advertising the energy community. There was a high willingness to display flyers and posters and considerable interest in the initiative. This led to the placing of flyers and posters in the project area, as shown in Figure 13.

LAGEPLAN

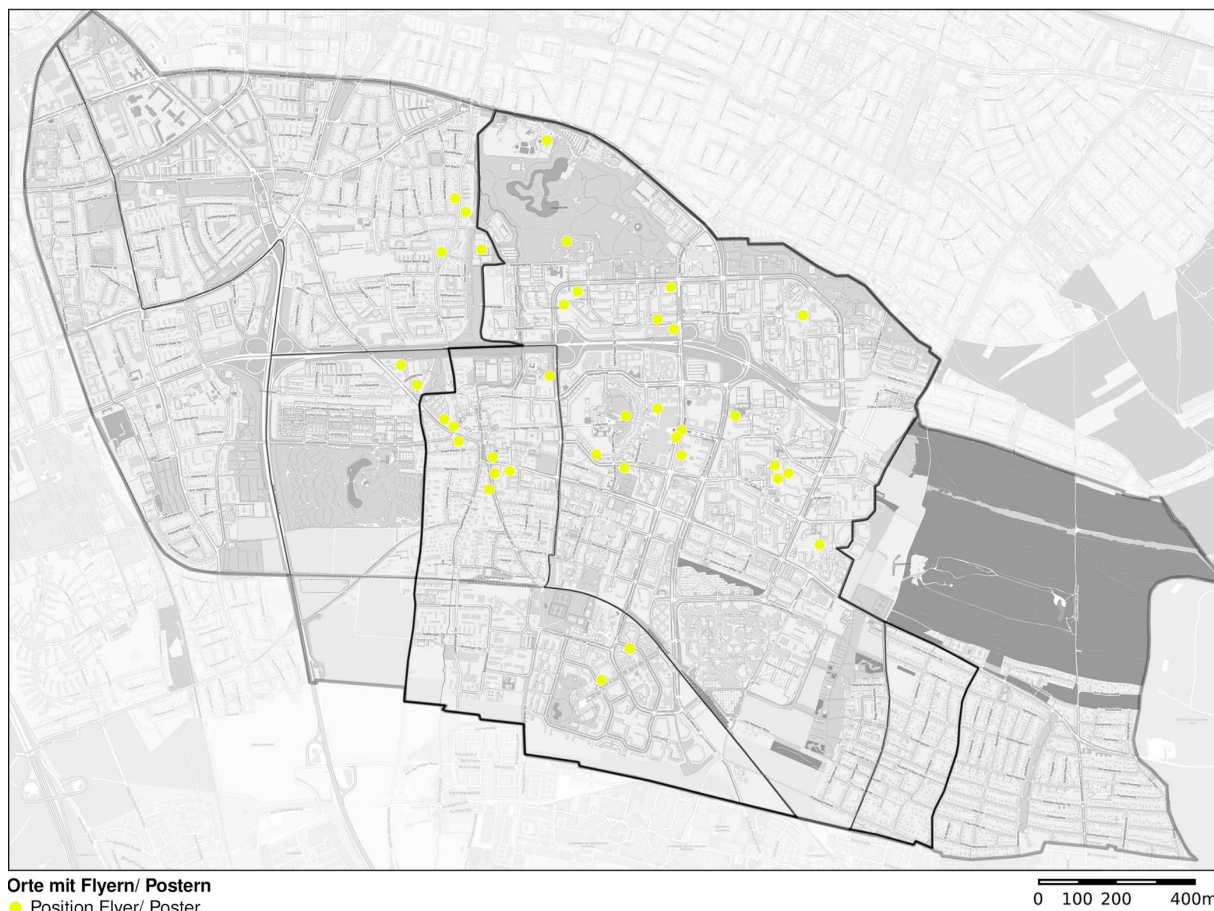


Figure 20 Orte mit ausgelegten Flyern und aufgehängten Postern im Projektgebiet

- ➔ There is a high willingness to display posters and distribute flyers
 - It is time-consuming
- ➔ Interest in the project during conversations is high
- ➔ Only a few attendees came to the event through the flyers and posters
 - Prompting the implementation of additional designs
 - Diversity in events, formats and time slots is to be increased
- ➔ The registration form proved helpful for planning and should be implemented early
- ➔ Flyers, posters and forms will be made available as templates for download on the website at the end of the project period

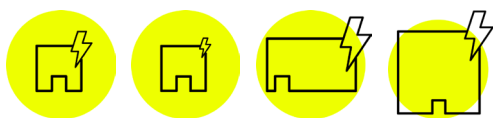
2.6 DIMENSIONING

Pilot projects have been defined for dimensioning and planning. These are surfaces offered by interested members for the energy community, potential surfaces and a surface from the project (NEB Action housing structures) due to the existing data basis. This area is representative of many existing buildings in Neuperlach and was included in the dimensioning to serve as a reference.



Figure 21 Localisation of the pilot projects used for dimensioning

The surfaces for pilot projects are divided into four categories that cover possible realisation scenarios by the existing buildings. The size of the surface area and the energy consumption of the building are decisive factors. This results in the following categories:



- Small area with high self-consumption
Building: Perlacher Herz
- Small area with low self-consumption
Building: Church Evangelisch-Freikirchliche Gemeinde
- Large area (commercial) with high self-consumption
Buildings: Gronard GmbH, SVN sports club, PEP shopping centre
- Large area (residential) with high self-consumption
Multi-family house of a housing association



Figure 22 Visit of the pilot projects for dimensioning

Pilot projects

As pilot projects, the Small area with high self-consumption (Building: Perlacher Herz) and Small area with low self-consumption (Building: Church Evangelisch-Freikirchliche Gemeinde) are dimensioned in detail. Data is incorporated into the energy community's calculations and design model. For this purpose, the projects have been inspected more closely through simulations of the PV systems using the Sunny Design software (SMA Solar Technology AG, n.d.), inspections and calculations.

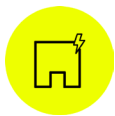


Building: Perlacher Herz

The simulation was optimised by inspecting the roof surface. During an inspection, precise measurements were taken and interfering areas were identified. The PV manufacturer (Emondo) also took pictures by drone (see Figure 18). Several interfering areas were identified that had not been noticed by aerial photographs. Seven PV modules had to be subsequently removed from the simulations. The roof area, final arrangement, and number of PV modules can be seen in Figure 18. The existing technology suitable for connecting a PV system was also analysed during the inspection. A disused chimney can route the cables from the roof's PV system to the basement's technical room. The existing Perlacher Herz building is suitable for retrofitting a PV system.



Figure 23 Building Perlacher Herz roof surface with interference factors and calculated PV system



Building: Church Evangelisch-Freikirchliche Gemeinde

The roof surface of the church building is a pitched roof with a slope. Therefore, the attachment and load-bearing capacity of the existing roof play a major role. The roof surface was inspected from the outside and inside. The attic and roof are easily accessible from the inside of the building. The roof was found to be very well preserved and robust due to the large cross-sections of the beams. Static calculations were carried out for the timber construction of the roof as part of a seminar paper at the Chair of Timber Construction and Building Design at TUM. The pre-dimensioning concludes that the construction of the collar beam roof has sufficient reserves to bear the additional weight of a retrofitted PV system (see Appendix). Attaching the system by anchoring it back to the wooden beams is possible. The installation must be carried out correctly to avoid leaks in the roof.



Figure 24 Building church wooden substructure



Figure 25 Building church roof surface and calculated PV system

The elements from the design of the energy community are incorporated into the financing model of the pilot projects. Figure 21 shows the financing model of the first project with the PV system on the Perlacher Herz with the initial costs from the foundation. Figure 22 shows the PV system's financing model on the church's roof of the Evangelisch-Freikirchliche Gemeinde, which can be followed up on the first project. The calculations consist of the cost

structure and the revenue stream enriched with values from the dimensioning. In addition, there are values from the business model defined in the Living Lab, such as the amount of a share, and values from the business model specified by law, such as the amount of reserves. In addition, there are other given values, such as the amount of possible subsidies and the feed-in tariff for surplus energy.

In the lower part of the diagram (Figure 21), the community comprises its revenue and costs. The money goes into the one-time costs of the foundation and the PV system for the Perlacher Herz. The income from the subsidy is added to external funding. The realised PV system then produces electricity that primarily covers consumption in the building and generates revenue from the consumed electricity. The surplus electricity is fed into the grid and the feed-in tariff supplements the income. These two sources of income flow into the community and pay the costs (lease, insurance, taxes, running costs), form part of the reserves, are reinvested into the next project and form part of the member's dividend.

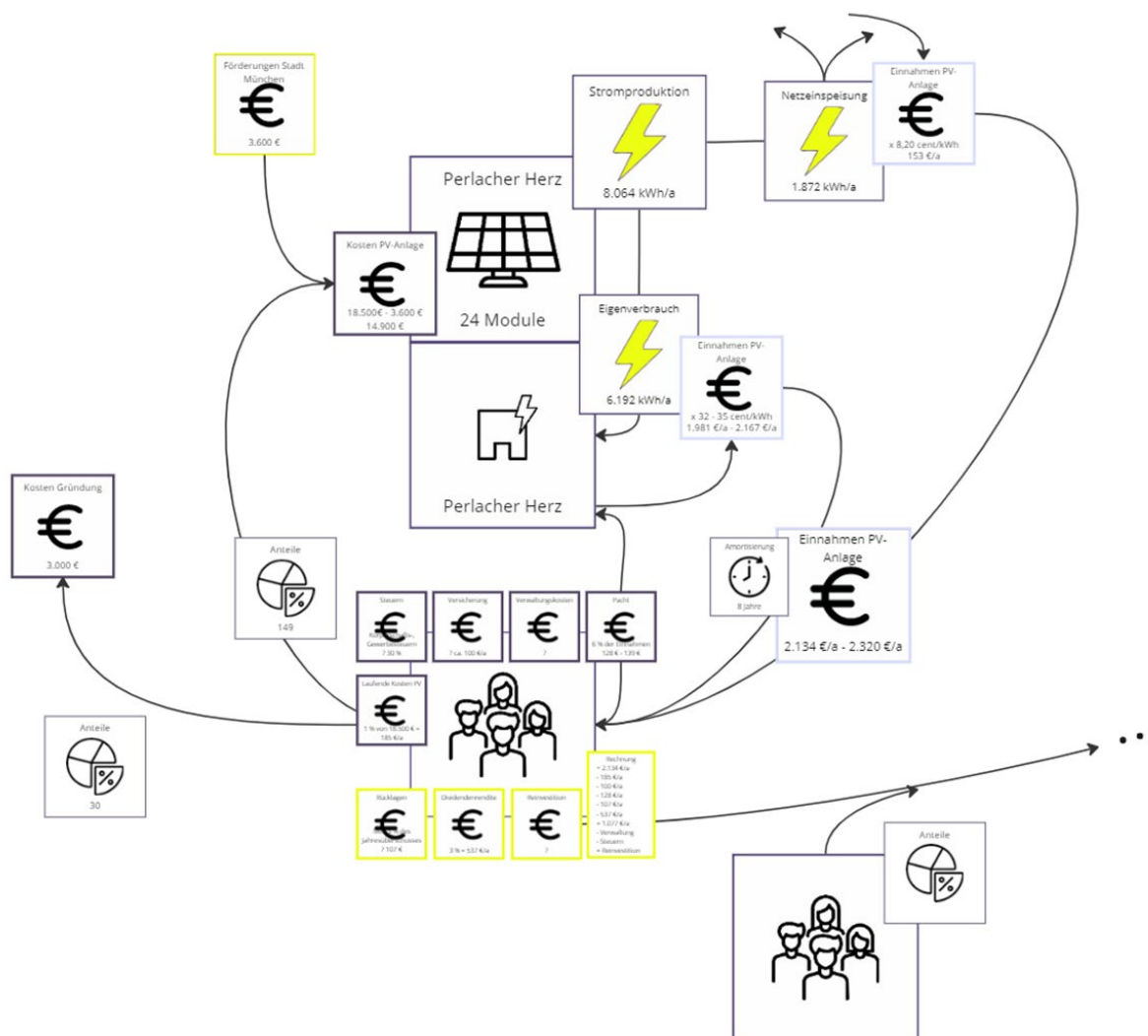


Figure 26 Financing model of the first PV project Perlacher Herz with foundation costs

The financing model of the pilot project church of the Evangelisch-Freikirchliche Gemeinde is identical to that of the Perlacher Herz project. Only the initial costs for setting up the energy community are removed. The financing model is shown in the diagram in Figure 22.

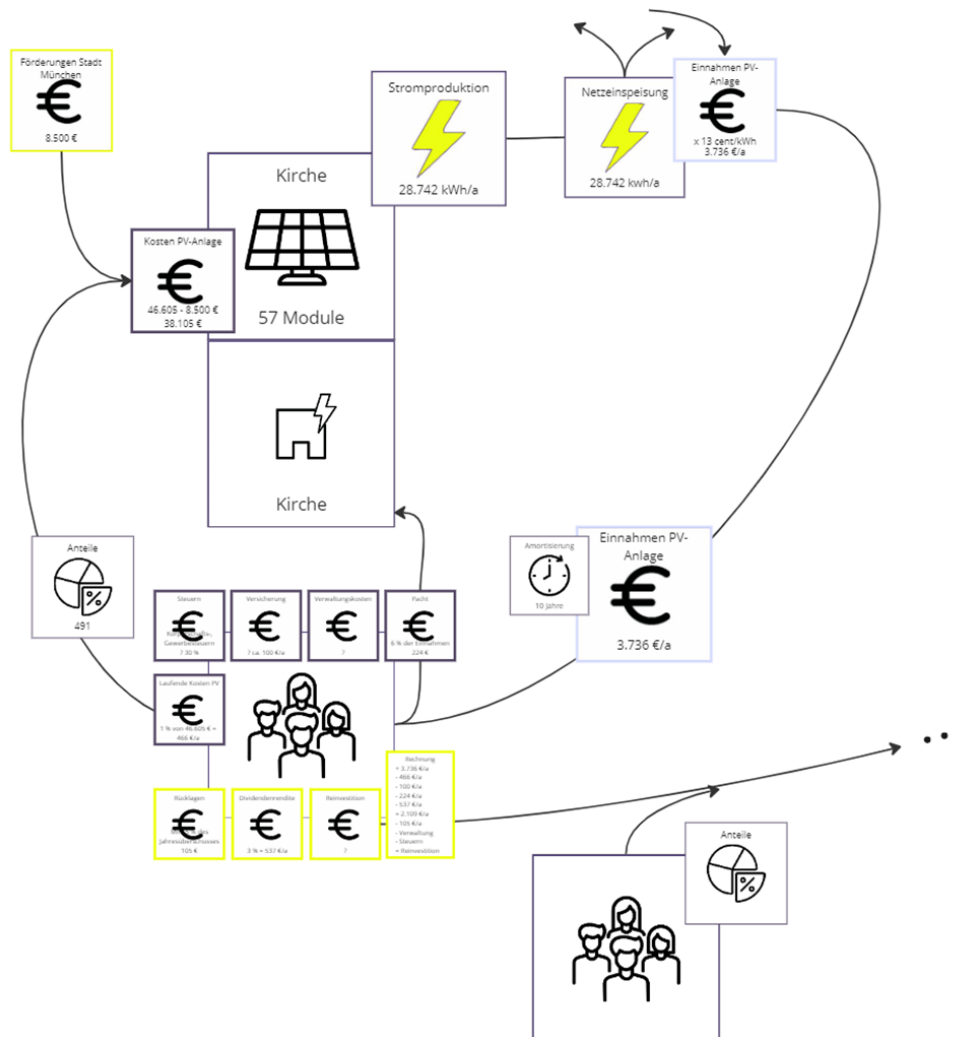


Figure 27 Financing model of the PV project Evangelische-Freikirchlichen Gemeinde Munich-Perlach

3 CONCLUSION

The design, governance, and business model developed for the energy community in Neuperlach, as presented here, includes a comprehensive framework to establish a sustainable, inclusive, and economically viable energy community. This deliverable, D5.2, has outlined the critical components necessary for the foundation and operation of the energy community, including analyses of local potential for renewable energy, stakeholder engagement, and the creation of innovative and socially inclusive business models. The implementation methodology involved modelling neighbourhood energy concepts to evaluate the solar energy potential. Simulations have quantified the potentials of energy production and management, aiding in the design of new business cases and organisational forms. The co-creation process with residents has ensured that the community's needs and feedback are integral to its design and operations, fostering a sense of ownership and participation.

Despite initial challenges, such as difficulties engaging people and maintaining active involvement, the NEB Action has made suitable adaptations and progress. Findings highlight the necessity of diversifying event formats and marketing strategies to enhance participation and the importance of clear communication and streamlined processes to effectively engage stakeholders. It became clear that practical prototypes are crucial for initiating discussions and maintaining participants' interest. The strategy was therefore adapted to narrow the focus on the foundation and realisation of the first prototype in the form of a photovoltaic roof system. The design, governance and business model development thus operates in parallel. The result is a flexible framework that is constantly evolving and adapting. Key risks of the NEBourhoods project identified include the potential for the project to remain academic and prototypical, regulatory and financial obstacles, and construction-related challenges. Mitigation strategies have been developed, including early implementation, transparent communication, and preparation for collaboration and replication to sustain the NEB Action beyond its initial period.

The subsequent deliverable, D5.7, will document the demonstration of the energy community, including detailed assessments of the implementation process, outcomes, and best practices. This will provide valuable insights and guidelines for other urban areas seeking to establish similar initiatives. This deliverable has outlined the regulatory and legal framework for energy communities as required by EU guidelines for member states. The possibilities in Germany become apparent during the implementation process and are to be reflected in the final recommendations for adaptation.

By addressing these challenges and leveraging the initial successes, the NEB Action aims to create a replicable model for energy communities that can be adapted to different geographic, technological, demographic, cultural, institutional, and regulatory contexts across Europe. This initiative contributes to the broader goals of the NEBourhoods project and the European Green Deal, promoting sustainable energy practices, enhancing social cohesion, and advancing the democratisation of the energy system.

3.1 KPIS ACHIEVED TO DATE

The KPIs (Key Performance Indicators) measure the progress and success of the NEBourhoods project, ensuring that the objectives of fostering sustainable energy practices, enhancing social cohesion, and achieving the goals set forth by the European Green Deal are met effectively. The key performance indicators of the NEBourhoods project and contributions achieved so far include:

Cultivate an inclusive, empowering and resilient urban innovation landscape:

KPI 1.1: Conducted 11 co-creation workshops of NEBourhoods for NPL.

KPI 1.2: Engaged between 4-19 stakeholders per workshop.

KPI 1.3: Collaborated with three creatives.

Involve entrepreneurship facilitation in urban development:

KPI 2.1: Through the TechChallenge format of UnternehmerTUM, 11 teams worked on sustainable business ideas, resulting in the founding of 1 start-up.

KPI 2.2: Matched one impact-driven start-up with the test bed in NPL/Perlach Süd.

Co-create diverse cutting-edge pilots in NPL:

KPI 3.1: 1 demonstrator is currently in development.

KPI 3.2: Created one of two planned design concepts, tools, or roadmaps for further development.

KPI 3.3: 1 Energy Community as a local community is in development.

Deliver NEBourhoods – inspiring and replicable practices for sustainable urban development:

KPI 4.1: Participated in 1 relevant event (Webforum at the Bauzentrum).

4 PERSPECTIVE

Looking ahead, the continued implementation and refinement of the energy community in Neuperlach will focus on addressing the identified challenges and leveraging the initial successes. The co-creative process will remain central to adapting the design, governance, and business models based on practical experiences and community feedback. This iterative approach ensures that the energy community evolves in response to changing conditions and emerging opportunities.

With the Living Lab of the energy community, co-creative workshops to further develop and adapt the design from this deliverable to the specific needs of Neuperlach are organised. The small founding group is expected to grow, and the foundational documents for the community's implementation are being prepared with external legal input. These documents will be enriched with explanations and made publicly available, along with contracts and other essential materials. This transparency is intended to offer opportunities for replication.

The foundation and testing of the energy community are projected to be completed by autumn this year, with the first pilot plant implemented by the end of the year. The goal is to establish the energy community by the end of the NEBourhoods project period, ensuring its sustainability and ability to continue operating independently. Concepts for cooperation and expansion are currently being tested to create a supportive structure.

By documenting and sharing experiences, developing adaptable frameworks, and engaging with stakeholders at all levels, this initiative aims to drive systemic change towards a more decentralised, democratised, and sustainable energy system. This NEB Action not only aims to transform Neuperlach but also to serve as a beacon for sustainable urban development, empowering communities to take an active role in the energy transition and fostering new climate-friendly routines in everyday life.



*Figure 28 NEBourhoods Pavilion in Neuperlach with a PV module inside
The location for workshops of the Energy Community.*

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6 APPENDIX

Subject fields with tasks of the organisational structure

Table 12 Subject fields with tasks of the organisational structure

1. Board Management & Organization	
Overarching Task Fields	Specific Tasks
<ul style="list-style-type: none"> • Financial Planning and Management • Administrative and Operational Coordination • Partnership and Stakeholder Relations 	<ul style="list-style-type: none"> • Internal and external accounting • Taxes • Budgeting and financial planning • Annual financial statements • Financing • Receivables management • Participation management • Management of member loans • Grant management • Member Administration • IT • Insurance • Fleet management • Coordination with other cooperatives and municipalities • Contract negotiations with landowners • Managing project lists • Lease agreement negotiations • Contract and interest database maintenance • Procurement and material management • Strategic development and medium-term investment planning • Personnel management • Safety and occupational health management
2. Board Marketing & Public Relations	
Overarching Task Fields	Specific Tasks
<ul style="list-style-type: none"> • Branding and Communication • Member Recruitment and Engagement • Public Outreach and Media 	<ul style="list-style-type: none"> • Corporate Design • Communication • Member Recruitment • Project Marketing • Internet Presence • Communications Strategy • Corporate Identity
3. Board Legal	
Overarching Task Fields	Specific Tasks
<ul style="list-style-type: none"> • Compliance and Risk Management • Contractual Agreements and Documentation • Regulatory and Legal Affairs 	<ul style="list-style-type: none"> • Compliance • Risk Management • Legal negotiations with authorities and associations • Legal aspects of lease and participation agreements • Data Protection • Quality Management • Construction Contracts • Distribution Agreements • Insurances

4. Board Engineering	
Overarching Task Fields	Specific Tasks
<ul style="list-style-type: none"> • System Design and Configuration • Construction and Installation • Maintenance and Safety 	<ul style="list-style-type: none"> • Dimensioning and Configuration • Installation • Maintenance • Safety • Conducting permitting procedures • Securing peripheral areas • Preparation for financing • Tendering and price inquiries • Construction supervision and upper management • Commissioning and acceptance
5. Board Development, Education & Research	
Overarching Task Fields	Specific Tasks
<ul style="list-style-type: none"> • Knowledge Transfer and Capacity Building • Research and Innovation • Strategic Development and Implementation 	<ul style="list-style-type: none"> • Teaching Concepts • Module Management • Program Implementation • Connection and Transfer • Call for Projects • Publications • Project Management • Fundamental questions • Strategic development • Medium-term success planning • Research and development for investments over a specified amount • Supervisory board and general assembly engagements