MASTERARBEIT | MASTER'S THESIS

Titel | Title

Exploring the role of energy cooperatives and energy communities in Austria: A qualitative analysis through the lens of Challenge-Oriented Regional Innovation Systems Theory

verfasst von | submitted by

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angestrebter akademischer Grad | in partial fulfilment of the requirements for the degree of

Master of Science (MSc)

Wien | Vienna, 2024

Studienkennzahl lt. Studienblatt | Degree programme code as it appears on the student record sheet:	UA 066 855
Studienrichtung lt. Studienblatt | Degree programme as it appears on the student record sheet:	Masterstudium Geography: Global Change and Sustainability
Betreut von | Supervisor:	Univ.-Prof. Mag. Dr. Michaela Trippl

Table of contents

List of figures

List of tables

List of abbreviations

APG	Austrian Power Grid AG
BMK	Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie (Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology)
CEC	Citizen energy community (Bürger:innen Energiegemeinschaft)
CEP	Clean Energy for all Europeans package
CoRIS	Challenge-oriented Regional Innovation System
EAG	Erneuerbaren Ausbau Gesetz (Renewable Energy Expansion Act)
EC	Energy community
EDA	Energy Data Exchange
EIWOG	Elektrizitätswirtschafts- und -organisationsgesetz (Electricity Act)
EMD	Internal Electricity Market Directive
EU	European Union
FFG	Österreichische Förderagentur für wirtschaftsnahe Forschung, Entwicklung und Innovation (Austrian Research Promotion Agency)
FPÖ	Freiheitliche Partei Österreichs (Freedom Party of Austria)
GEA	Gemeinschaftliche Erzeugungsanlage (Shared generation plants)
ÖNIP	Integrierter österreichischer Netzinfrastrukturplan (Austrian Integrated Network Infrastructure Plan)
RE	Renewable Energy
REC	Renewable energy community (Erneuerbare Energiegemeinschaft)
RED	Renewable Energy Directive
SCE	European Cooperative Society
TSO	Transmission System Operator (Übertragungsnetzbetreiber)

Abstract

The concept of energy cooperatives and energy communities aims to promote the energy transition in the sense of decentralisation and democratisation. Ecological and social goals clearly take priority over profit interests. While energy cooperatives in Austria have their origins in the 20th century, the concept of energy communities (EC) has only gained in importance with the EU directive Clean Energy for all Europeans Package in 2019. Austria is playing a pioneering role in transposing the EU directives into national law. The CoRIS framework (Challenge-oriented Regional Innovation System) provides a valuable analytical tool for evaluating initiatives that break away from the neoliberal paradigm and profit interests. This study applies the CoRIS framework to evaluate the Vienna-based energy cooperative OurPower, exploring how it functions and what challenges it faces as a CoRIS initiative. Data gathered through expert interviews and qualitative content analysis reveal that OurPower has successfully established an innovative regional peer-to-peer marketplace. However, the findings indicate that gaining prominence and decoupling from incumbent market pressures remains challenging, especially in times of crisis.

Kurzfassung

Das Konzept von Energiegenossenschaften und Energiegemeinschaften zielt darauf ab, die Energiewende im Sinne einer Dezentralisierung und Demokratisierung voranzutreiben, wobei ökologische und soziale Ziele klar vor Profitinteressen stehen. Während Energiegenossenschaften in Österreich ihren Ursprung bereits im 20. Jahrhundert haben, hat das Konzept der Energiegemeinschaften (EC) erst mit der EU-Richtlinie Clean Energy for all Europeans Package im Jahr 2019 an Bedeutung gewonnen. Österreich nimmt bei der Umsetzung der EU-Richtlinien in nationales Recht eine Vorreiterrolle ein. Das CoRIS Framework (Challenge-oriented Regional Innovation System) bietet ein wertvolles Analyseinstrument zur Bewertung von Initiativen, die sich vom neoliberalen Paradigma lösen. Die Anwendung des CoRIS Frameworks auf die Fallstudie der in Wien ansässigen Energiegenossenschaft OurPower verdeutlicht, wie diese als CoRIS-Initiative funktioniert und mit welchen Herausforderungen sie als solche konfrontiert ist. Expert*inneninterviews mit verschiedenen Akteuren der Energiegenossenschaft zeigen, dass es der Genossenschaft gelungen ist, einen innovativen regionalen Peer-to-Peer-Marktplatz aufzubauen. Die Ergebnisse deuten darauf hin, dass es eine Herausforderung bleibt, an Bekanntheit zu gewinnen und sich insbesondere in Krisenzeiten vom Druck des etablierten Marktes abzukoppeln.

1 Introduction

According to the International Energy Agency (cf. IEA 2024) more than three-quarters of total global greenhouse gas emissions (GHG) are estimated to be produced by the energy sector, predominantly from the burning of fossil fuels. In Austria over 50% of the total CO2 emissions come from oil and almost 30% come from natural gas (cf. IEA 2024a). This makes fossil energy a critical factor in efforts to reduce greenhouse gas emissions.

Measures to decarbonize the European energy system include efforts to decrease the overall demand and to integrate a substantial share of renewable energy sources (cf. EEA 2022: 9). At the same time, energy cooperatives and energy communities (ECs) are evolving as part of the large-scale energy transition. These new local initiatives facilitate decentralised and participative forms of energy production, empowering communities to produce, consume, and manage their own renewable energy. Since the introduction of the Clean Energy for all Europeans (CEP) package, in particular with the Renewable Energy Directive (RED II) and the Internal Electricity Market Directive (EMD), a legal basis for energy communities has been created at EU level (cf. EUR-LEX 2018, EUR-LEX 2019). In Austria, the EU requirements have largely been transposed into national law, positioning the country as a pioneering force in the advancement of community energy systems (cf. FINA and MONSBERGER 2023: 3).

The research within this master thesis builds on the recent framework from regional innovation studies, the Challenge-oriented Regional Innovation System (CoRIS) approach (cf. TRIPPL et al. 2023; TÖDTLING et al. 2021). The aim is to identify the challenges that community energy projects as a CoRIS initiative are facing in the Austrian landscape. For this purpose, the Vienna-based energy cooperative OurPower serves as a case study.

The thesis is structured as follows: Chapter 2 contains an overview of the Austrian energy landscape, highlighting the country's energy profile and its transformation efforts. Based on the concepts of energy citizenship and energy democracy, Chapter 3 presents alternative pathways for energy transition processes. Chapter 4 outlines the emergence of citizen energy projects in Austria emphasising the differences yet intersecting nature of energy cooperatives and energy communities under European law. In Chapter 5 the theoretical framework of the CoRIS approach is described, which provides the fundamental basis for the analysis of the case study presented in Chapter 6. The methodology for assessing the case study, as outlined in Chapter 6, is based on expert interviews with qualitative content analysis. The results are summarised in Chapter 7 with the aim of providing a coherent overview of the challenges faced by OurPower as a CoRIS initiative. In Chapter 8 the main findings are discussed, followed by a final conclusion.

2 Austrian Energy Landscape

2.1 Austrian Energy Country Profile

In terms of domestic energy production, the Austrian energy market is quite advanced in the use of renewable sources. Taking advantage of its geographical potential, Austria has historically built its main energy sources on large hydropower capacities along the Danube and on biogenic fuels, as depicted in *Figure 1* (cf. BRAZDA 2023: 93). According to the 2023 data, renewables account for 87,6% of the total domestic production. In the electricity sector alone, the share of renewables in electricity generation amounts to almost 78%, covered by hydropower, wind power and photovoltaics (cf. BMK 2024: 20).

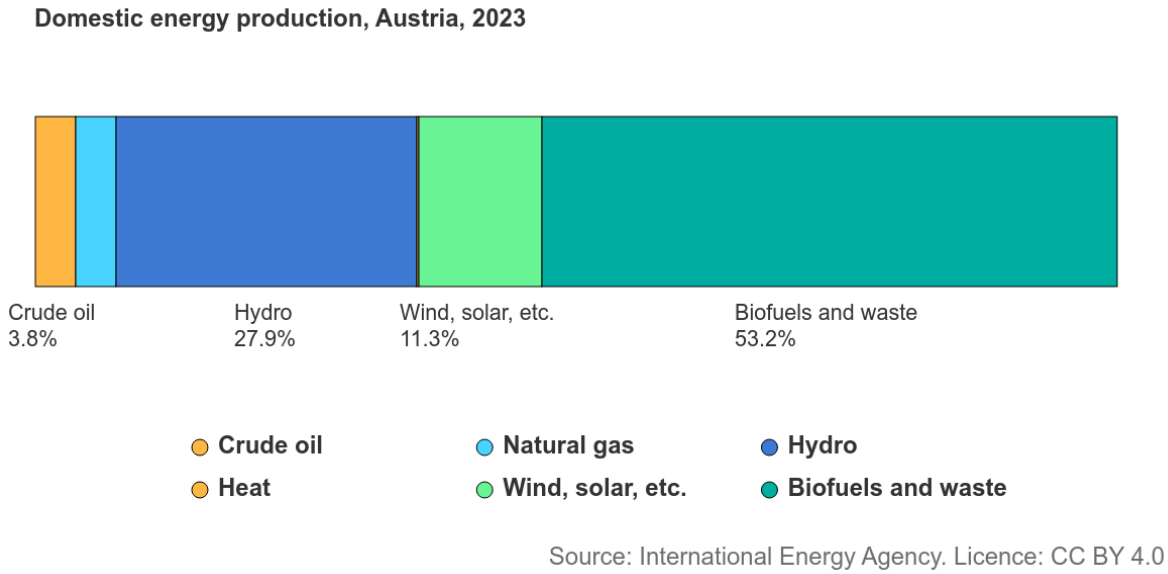

Figure 1: Domestic energy production[1] in Austria, 2023 (source: IEA 2024a)

However, the domestic deposits are not sufficient to meet the entire energy demand of the country. When taking a closer look at the total energy supply, which represents all the energy required to feed the Austrian end users, the picture of a sustainable energy landscape is overshadowed by the dominant imports of oil and gas products (cf. *Fig. 2*). In the year 2023, while around 35% of primary energy sources came from domestic generation, energy imports accounted for a considerable share of 65% with oil and gas being the main imports (cf. BMK 2024: 9).

[1] "*Energy production includes any fossil fuels drilled and mined, which can be burned to produce electricity or used as fuels, as well as energy produced by nuclear fission and renewable power sources such as hydro, wind and solar PV. Bioenergy - which here includes both modern and traditional sources, including the burning of municipal waste - is also an important domestic energy source in many countries" (IEA 2024a).*

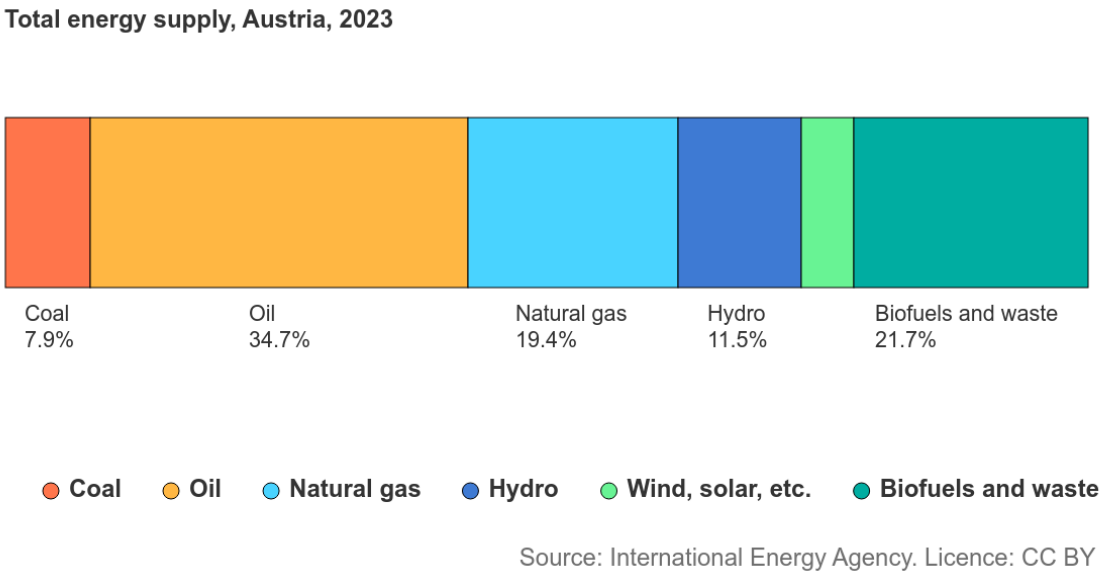

Figure 2: Total energy supply[2] in Austria, 2023 (source: IEA 2024a)

At this point the dependency on Russian gas must be highlighted. Austria's link to Russia is based on a history of long-term contracts, as it was the first country signing a gas contract with the Soviet Union in 1968 and since then has been heavily dependent on a strategic partnership (cf. COHEN 2023). Despite a temporary decline in gas imports during Russia's invasion of Ukraine and a general downward trend, Austria's share of Russian gas imports remains very high, with 83% of natural gas imports coming from Russia in July 2024 (cf. BMK 2024a).

Import dependency on fossil fuels poses national risks to a secure energy system and should therefore be viewed very critically. Relying heavily on imported energy sources makes a country vulnerable to geopolitical conflicts, affording costly crisis management and strategic reserves. Furthermore, import dependency can lead to volatile prices, as the last two years have shown, where fluctuations in the gas sector have also led to extreme increases in electricity prices. The price formation on the European spot market is predominantly based on the merit order principle. This refers to the order in which electricity producing power plants are activated on the spot market. Power plants are offered in the order of their marginal cost of production, from the cheapest to the most expensive one. The last activated plant with the highest marginal cost sets the price for all power plants. As the marginal production costs of gas plants are usually the most expensive, they set the price for electricity (cf. EPEXSPOT 2024). During the energy crisis followed by the Russian invasion of Ukraine, the economic effects of the merit order principle proved problematic

[2] *"Total energy supply (TES) includes all the energy produced in or imported to a country, minus that which is exported or stored. It represents all the energy required to supply end users in the country" (IEA n.d.).*

when gas became scarce for many European countries. Russia's cut in gas supplies has led to a sharp rise in gas prices since mid-2022 and, due to the merit order principle, also to an exorbitant rise in the electricity market (cf. ROEGER & WELFENS 2022: 645).

Concerns have been also raised about whether the political authorities in Vienna are working ambitious enough towards energy independence from Russia. Grzegorz Kuczynski, director of the Eurasia program at the Warsaw Institute states: “The political elite in Austria is, in my opinion, among the most sympathetic to Russia (...) Therefore, I think Vienna will try to influence a less confrontational E.U. policy toward Moscow” (COHEN 2023). According to Oxford Analytica (2024), Austria's economic ties with Russia are also likely to continue despite Western pressure to cut them in response to the war in Ukraine. This is also due to the significance of the right-wing party *Freiheitliche Partei (FPÖ)*, which is leading the polls in Austria and strongly sympathises with Russia.

Not only geopolitical aspects are critical for a sustainable energy system, but also the concentration of power within large firms. In Austria, the energy industry is by far dominated by the oil and gas producer OMV, who also maintains close ties to Gazprom (cf. STATISTA 2024a). OMV has been criticised not only for its significant environmental impact but also for its intransparent financial dealings (cf. SANKHOLKAR 2023). Last year, OMV reported a profit of 1.9 billion euros and additionally paid out a special dividend to its shareholders (cf. STATISTA 2024; AK Wien 2024). At the same time between 803,000 and 968,000 people in Austria could not afford their household energy, meaning they did not have the financial means to pay for sufficient electricity or to keep their homes adequately warm (cf. BMSGPK 2023: 32).

Austria's energy profile reveals that despite significant progress in renewable energy production, the country remains challenged by its dependence on fossil fuel imports. This underlines the need for a significant expansion of local renewable energy solutions to ensure cost-effectiveness, energy security and sustainability. With this in mind, the next chapter outlines the energy transition pathway for Austria.

2.2 Austrian Energy Outlook 2030 and 2040

In accordance with the Paris Agreement and the Sustainable Development Goals, the EU has set its main goal of greenhouse gas neutrality by 2050 as part of the European Green Deal in 2019 (cf. BRAZDA 2023: 94). At national level, the Austrian federal government committed to the plan to cover 100% of total national electricity consumption from renewable energy sources by 2030 and to achieve climate neutrality by 2040 (cf. RIS 2022: EAG §4).

In fact, Austria is already among the leading EU countries in terms of using renewable energy. In 2022, it ranked seventh in the EU for the share of renewable energy in gross final energy consumption, behind Sweden, Finland, Latvia, Denmark, Estonia, and Portugal (cf. BMK 2024a). However, meeting its future energy goals remains a challenging task and requires substantial political support, strategic planning and infrastructural investment:

The Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK), and the Environment Agency Austria regularly prepare scenarios on the possible development of Austrian greenhouse gas emissions (cf. BMK 2024b: 34ff.). Recently, the BMK published the "Integrierter österreichischer Netzinfrastrukturplan" (ÖNIP) (BMK 2024b), which serves as a planning basis for important infrastructural decisions to achieve climate-neutrality by 2040. The transit scenario assumes a major expansion of electricity generation from renewable energy sources, also due to limited availability of renewable gas. Since 2005, the consumption of electrical energy has been on the rise because of economic growth and population growth, alongside electrification trends across various sectors. Consequently, the electricity sector will play the central role in Austria's future energy landscape, particularly the generation of wind and PV power. Whereas gaseous energy sources in general will be reduced, biomethane and renewable hydrogen are being considered as substitutes for natural gas. (cf. BMK 2024b: 7, 15, 36, 53)

Experts from the energy sector in particular emphasise the importance of expanding the grid infrastructure in the upcoming years (cf. BMK 2024b: 162f.). The Austrian Power Grid (APG), the national transmission system operator (TSO), outlines that the existing electricity grid is not sufficiently designed for the high transport and distribution requirements that are already occurring today. In the course of the energy transition, the transport demand for electricity will continue to increase and additional structural congestion will arise, which can only be sustainably countered by expanding the transmission grid both nationally and in Europe (cf. APG 2023: 9f.). HAAS et al. (2006: 50) already warned in 2006 against the

problem of underinvestment highlighting the importance of ensuring adequate investment to meet future demands.

Moreover, there are high economic costs associated with redispatch. Redispatch refers to interventions in electricity flows by grid operators due to congestion and overloads. This already poses a significant economic burden, highlighting the urgent need for infrastructure upgrades to ensure a stable and cost-effective energy supply in accordance with the expansion of renewables (cf. APG 2023: 9f.).

This leads to the challenge of electricity balancing. For physical reasons, the supply of electricity must always equal demand. At all times of the day, as much electricity must be taken from the grid as is generated, otherwise the grid cannot be kept stable and power supply interruptions could occur. The task of APG as control area operator is to maintain this delicate balance in Austria. The grid frequency is used to measure this balance and must be kept as close as possible to 50 Hz consistently. Any imbalance between supply and demand will lead to fluctuations in the grid frequency and the risk of power supply interruptions (cf. APG n.d.).

The volatile nature of renewables can be challenging in this respect. Renewable electricity generation, like PV, is subject to strong seasonal fluctuations, with generation in the summer months significantly exceeding that in the winter months (cf. BMK 2024b: 20). Due to the irregularity of wind and PV generation, high local negative and positive residual loads are expected in the electricity system as early as 2030 and increasingly in 2040. To overcome these imbalances, hybrid solutions are being investigated for the coupling of energy sources, integrating electricity, gas and heat. By coupling electricity and gas networks, efficient technologies for dealing with positive and negative residual loads and seasonal storage can be integrated into planning (cf. BMK 2024b: 80).

These are just some of many challenges. Beyond the technical complexities introduced in this chapter, the energy transition also requires social considerations. Accordingly, the next chapter explores the critical role of citizens in driving and shaping the transition process.

3 Alternative pathways for the energy transition: Social acceptance, energy citizenship and energy democracy

The debate on sustainable energy transition processes has set in motion a reorientation of the role of citizens. The energy transition affects individual citizens in many ways, such as through changes to the landscape, high investment costs, falling property values and additional administrative work. Since those changes in infrastructural settings means an intervention in the usual living environment, the resulting resistance can vote parties out of office, prevent major energy projects or significantly delay the energy transition. (cf. BRAZDA 2023: 94)

The debate on onshore wind farms in many European countries is a perfect example of resistance at the local level. Major obstacles to new wind energy projects often arise because local communities perceive the projects as unfair, lack trust in local stakeholders or due to personal attitudes. Subsequently, wind farms are disputed because they don't look pretty on landscapes, make noise or would harm flora, fauna or even tourism (cf. MALEKI et al. 2020: 2f.). To overcome those barriers MALEKI et al. highlight the importance of integrating people into energy projects. According to them, local acceptance and opposition to wind energy are closely tied to direct community involvement. In their investigation of ten best practice case studies across six European countries, they identified key success factors that influence community acceptance of wind energy projects. Although the determinants vary from place to place, the findings show that acceptance is generally enhanced through transparent, open, and fair planning processes, alongside ensuring that local communities and citizens benefit from the projects. (cf. MALEKI et al. 2020: 19)

In the ongoing energy transition discourse, it is increasingly recognised that economic growth and technological innovation alone are not sufficient to address complex challenges like the climate crisis. A paradigm shift is underway, where social goals besides economic and technological advancement are gaining prominence. Citizens are perceived not only as energy consumers but also as active participants, namely so called "prosumers". These are individuals who produce and consume electricity. They generate some of the electricity needed to meet their own needs, mostly through PV, and they also take on the role of suppliers, as they can feed excess electricity into the grid at certain times (EEA 2022: 13). In recent EU policies, citizen energy producers gained significant recognition starting with the proposal of the *Clean Energy for all Europeans* package in 2016, followed by the *Internal Market in Electricity Directive* and *Renewable Energy Directive*. Key measures include the rights to self-consume renewable energy and participate in community energy projects. The role of prosumers was reinforced by the 2021 *Fit for 55* plan. In 2022 the most substantial

proposal for supporting prosumption at the EU level came with the introduction of the *REPowerEU* initiative. The plan was a response to the EU's dependence on Russian fossil fuels, exacerbated by the energy crisis that followed Russia's invasion of Ukraine. Building on the European Green Deal, it puts renewable energy at the heart of its efforts, with the aim of increasing the EU's share of renewable energy to 45% of total energy consumption by 2030. These measures have created a framework within which prosumers can be legally empowered and promoted. The extent to which the potential of prosumer empowerment is actually realised and actively supported depends on the respective implementation of national legislation in the Member States. (EEA 2022: 13, 44f.)

The empowering of citizens in the energy transition also highlights the importance of social innovation, defined by the European Commission as novel ideas or models that simultaneously address social needs and foster new social relationships or collaborations (THERACE et al. 2011: 10). In order to align societal goals with environmental benefits, community-based governance is the key direction for authorities to take instead of relying on a technocratic pathway. The concept of energy democracy represents this shift by integrating renewable technologies while also transforming societal governance in a more democratic way. It seeks to give citizens, as prosumers, more control over concentrated energy utilities, ensuring that “companies cannot make energy decisions on their own without the participation of citizens” (MARZBAN et al. 2023: 513). Consequently, community energy offers more than a solely technological solution towards the goal of decreasing carbon emissions.

For policy development this implies a transition of electricity systems from being assumed as commodities to being recognised as common goods. MARZBAN et al. (2023) investigate how electricity can be conceptualised as a common resource, moving beyond conventional economic sector frameworks. Renewable electricity as a common energy good implies that “[r]enewable energy resources (such as wind, solar, water ...) are some parts of natural resources which belong to all and all people should access to them equally” (527). The research proposes a practical framework for managing common energy goods emphasising the need for good governance, community involvement, and the use of emerging technologies to enhance sustainability and efficiency in energy systems. The findings of the study show that electricity, when generated through democratic and collaborative processes, can enhance efficiency, sustainability, and resilience.

4 Citizen-driven energy solutions in Austria

4.1 Reshaping the Austrian electricity market model

With electricity expected to become the dominant energy source and citizens gaining more prominence, the following chapters will take a closer look at the recent developments in the Austrian electricity market, particularly regarding citizen involvement.

The dominant model for energy infrastructure has historically been built in a centralised fashion. Most continental European countries started restructuring their electricity markets in the late 1990s from previously vertically integrated supply industries towards competitive markets. This transition was set in motion by the European Union's directive for a common electricity market (cf. EUR-LEX 1996) with the aim to foster competition, which in turn would lead to lower prices throughout Europe. With the liberalisation of the markets privatised and corporatized providers took over in a competitive environment (cf. MARZBAN et al. 2022: 510; BIRESSELIOGLU et al. 2021: 3f.). In 2001, as a reaction to the EU directive, the Austrian electricity market was also gradually liberalised. Since then, the market has become fully open and all customers in Austria are free to choose their energy provider (cf. HABERFELLNER et al. 2002: 2ff.; HAAS et al. 2006: 3). Today energy suppliers, which produce and sell electricity and use the grid, operate in a competitive market and charge their costs directly to consumers. The transportation of electricity is facilitated by the electricity grids, which are considered a natural monopoly. Therefore, this sector is regulated by Austria's national regulatory authority, E-Control**.** Grid costs are not charged directly to consumers but are instead covered by grid tariffs set by E-Control. Consequently, consumers pay for both the electricity they purchase and a tariff for using the grid. (cf. APG 2024)

Despite the efforts to foster competition, the electricity market in Austria is still dominated by a small number of large firms. While today there are around 150 electricity suppliers in total, offering varying services across different regions, the market is still primarily dominated by a few major companies. By 2022, *Verbund AG* was the leading electricity provider generating approximately €10.35 billion. This makes it the second-largest energy supplier overall, after *OMV AG.* Other big players in the electricity field are *Wien Energie GmbH*, *Energie Allianz Austria GmbH* and *EVN AG* (cf. STATISTA 2024a). However, depending on the location, one has the option to choose from around 20 different electricity suppliers. (cf. E-CONTROL 2024)

While choosing an energy supplier represents a more passive form of participating in the energy market, more active engagement emerged with the rise of solar power and prosumers as new market stakeholders. In line with the development of prosumers, the potential of community sharing has been recognised by the Austrian government with the introduction of the “Neue Ökostromnovelle” in 2017 (BMWFW 2017). It is since then that energy sharing has been legally possible with the implementation of shared generation plants, namely “Gemeinschaftliche Erzeugungsanlagen” (GEAs). A GEA is an energy generation system that is collectively used by so-called participating authorised parties within a property. The technologies that can be used include not only PV systems but also wind turbines or combined heat and power plants. Participants can be legal entities, natural persons or partnerships, and each party in a building with a GEA can decide whether to participate. Most commonly the participants are residents of multi-party houses becoming prosumers by obtaining electricity from their own roof and using it directly on site. The prosumers are connected via the main power line in the building and therefore the public grid is not used. However, the shared generation system exists in addition to the energy supply via the public grid. The basic concept is that the energy generated by the shared system is first proportionally distributed to the end-user systems in the building, and the surplus is then fed into the public grid. In Austria there already exists a notable number of over 1.000 active GEAs. (cf. KLIEN 2024, BMWFW 2017: 8ff., BRAZDA 2023: 96f.)

GEAs are therefore seen as an early form of community energy sharing and an important step towards citizen participation in a decentralised energy transition. The next section introduces more formalised structures, energy cooperatives and energy communities. These forms have further empowered citizens and facilitated greater cooperation in the production and distribution of renewable energy in Austria (cf. BRAZDA 2023).

4.2 Energy Cooperatives

4.2.1 The emergence of the cooperative model in renewable energy and its principles

While GEAs are government-enacted legal frameworks that focus on promoting energy sharing within multi-party houses, other forms of civic engagement in the energy sector aim at deeper systemic change. Energy cooperatives emerged from the grassroots and are citizen-led organisations that aim to democratically produce, manage and share energy resources. Historically cooperatives were mainly found within the working class with the aim of improving workers' opportunities and to counteract large monopolies. Despite the economic reasons, cooperatives were part of a wider social movement with political motivations to transform society. After the Second World War, the success of cooperatives declined, as many were unable to compete with established capital-intensive companies, and they themselves declined or became part of the mainstream. In recent years, however, cooperatives have enjoyed a revival. The cooperative model has been used in new areas to address current societal challenges and needs. These challenges include employment of low-skilled workers, access to housing or environmental protection such as renewable energy. New forms of multi-stakeholder cooperatives have emerged, bringing together different interest groups (cf. HUYBRECHTS and MERTENS 2014: 196f.).

The cooperative model in renewable energy emerged in the context of electricity market liberalisation. As already stated above, in many countries, liberalisation did not lead to sufficient competition and lower prices for end consumers, as the EU had intended. In addition, monopolies were only transformed into oligopolies. As a reaction, people started to form cooperatives to better control the source of energy and its prices. Personal and local production of energy should lead to a transparent pricing system (cf. HUYBRECHTS and MERTENS 2014: 203f.).

The cooperative business model indeed is very attractive for a just and ecological energy transition, as it is an organisational form in which citizens jointly own and democratically control a renewable energy company. BODDENBERG and KLEMISCH (2018: 273f.) describe cooperatives as democratic entities in which the members' opportunities for participation are more significant than in other organisations. This is due to how cooperatives are organised. They operate according to the principle of member value instead of shareholder value. This means that the business policy is designed in a manner that predominantly strives for solidarity and the promotion of the cooperative’s members. Every member has the equal voting rights, regardless of the amount of capital they have

invested. As such, cooperatives are considered as democratic organisations, where participants can manage themselves independently. Even though cooperatives still require capital, the democratic decision-making processes protects them from being controlled by capitalist interests.

4.2.2 Energy cooperatives in the European context

In response to the growing need for decentralised and democratic energy solutions, the European Union has also embraced the concept of citizen cooperatives and has continued to support them through various programmes. The European Commission defines energy cooperatives as follows:

> *"Energy cooperatives refer to a business model where citizens jointly own and participate in renewable energy (RES) or energy efficiency (EE) projects. In energy cooperatives citizens are involved in both the decision making and financial & economical participation. All citizens are eligible to participate. After purchasing a cooperative share and becoming a member or co-owner of local RES and EE projects, members share in the profits and often are given the opportunity to buy the electricity at a fair price. In addition, members can actively participate in the cooperative: they can decide in what and where the cooperative should invest, and are consulted when setting the energy price."* (EUROPEAN COMMISSION n.d.)

In 2003 another legal form was established, namely the "European Cooperative Society" (SCE). This is an optional legal form where cooperatives go into transnational partnerships. The structure requires that members reside in multiple EU countries, enabling cooperatives to operate across borders and foster collaboration among diverse member bases. (cf. EUROPEAN COMMISSION n.d.a)

An important development in the networking of European cooperatives was the creation of the REScoop.eu federation in 2013. This initiative, funded by the Intelligent Energy Europe program, aims to promote the development of citizen-led renewable energy projects throughout Europe. The formal creation of REScoop.eu in August 2013 was led by several key cooperatives, including *Ecopower* (Belgium), *De Windvogel* (Netherlands), *Enercoop* (France), and *Som Energia* (Spain). Over time, the initiative expanded to include cooperatives from across Europe. The REScoop platform now functions as a central network, offering knowledge-sharing, policy advocacy, and technical support to energy

cooperatives. It helps energy cooperatives engage with EU institutions and has been instrumental in promoting policies like the *Clean Energy for all Europeans* package, which further legitimised the role of energy communities (cf. REScoop.eu 2024). The role of energy communities is further explained in chapter 4.3.

4.2.3 Energy cooperatives in Austria

In Austria, citizen engagement through energy cooperatives has a long tradition in the commercial and agricultural sector. Initial forms can be traced back to the early 20th century, when electricity cooperatives were established in rural areas. Those early communities were more focused on supply and distribution rather than generation. After World War II, the role of cooperatives diminished due to the nationalisation of the electricity industry. However, this trend reversed with the Oil Crisis in 1970, which sparked renewed interest in alternative energy sources. Since then, a growing interest in energy cooperatives has been detected and citizens increasingly strive for alternative economic forms of energy production (cf. BRAZDA: 98).

As depicted in *Figure 3* energy cooperatives have been on the rise since the 1980s and 1990s in Austria. The environmental movements during this time helped drive a shift towards wind and solar energy, despite initial government reluctance. By the mid-1990s, community involvement had significantly increased Austria's wind power capacity, with citizen ownership playing a key role. However, wind energy remains a smaller portion of the renewable energy mix, with hydropower and biomass being the dominant sources. Biomass district heating, in particular, experienced significant growth between 1999 and 2010, thanks to cooperatives, especially those run by farmers, using residues from the wood industry. These cooperatives benefited from capital grants, soft loans, and favourable policies. More recently, solar PV has emerged as a new focus for energy cooperatives in Austria (cf. WIERLING et al. 2018: 19f.).

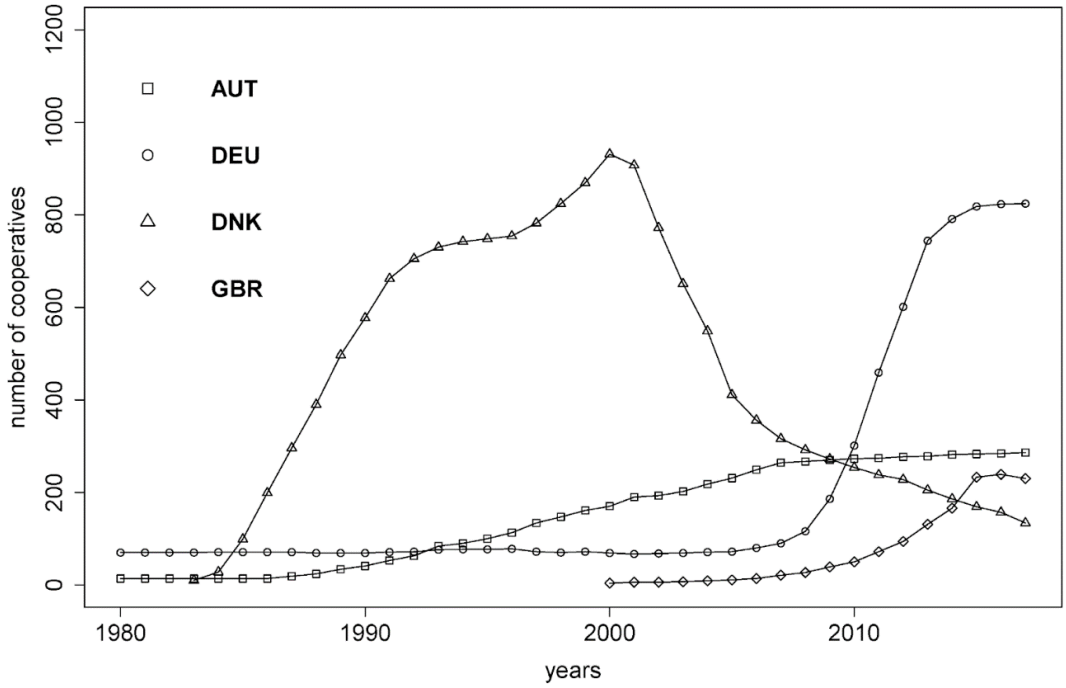

Figure 3: Number of energy cooperatives in Austria (AUT), Germany (DEU), Denmark (DNK) and Great Britain (GBR) for a given year (source: WIERLING et al. 2018: 6)

4.3 Energy Communities

4.3.1 Legal framework

More recently the EU has taken up the approach to actively integrate citizens into energy transition processes with the formation of energy communities (ECs). The legal backbone for the establishment of ECs in EU countries was laid by the EU through the Clean Energy for all Europeans package, adopted in 2019. More specifically with the Renewable Energy Directive (RED) and Internal Electricity Market Directive (EMD) (cf. EUROPEAN COMMISSION 2024).

Put simply, an energy community is an association of at least two participants for the joint production and use of energy. Whereas GEAs, for example, operate within properties, ECs can trade energy across households. This makes the sharing of energy more flexible beyond property boundaries (cf. BRAZDA 2023: 100). The EU directives "entitled consumers the rights of traditional market players in participating in the energy markets and eliminated all administrative, technical, and financial barriers to establishing collective energy initiatives" (BIRESSELIOGLU et al. 2021: 3). The EU directives define energy communities (ECs) as non-commercial entities that prioritise generating social and environmental benefits over financial profits. Revenues from ECs' economic activities are used to provide services or benefits to its members and the local community. This focus distinguishes ECs from traditional profit-driven organisations, emphasising their role in fostering community well-being and sustainability rather than maximising financial returns (cf. CARAMIZARU and UIHLEIN 2020: 7).

Member States are obliged to comply with the objectives of the Clean Energy for all Europeans Package. Accordingly, they should "provide an enabling framework to promote and facilitate the development of renewable energy communities" to put them "on an equal footing with other market participants". In addition, every member state should ensure that "participation in the renewable energy communities is accessible to all consumers, including those in low-income or vulnerable households" (cf. EUR-LEX 2018: RED II Art. 22).

So far, the realisation of the EU guidelines has been unfolding very differently in the respective nations in terms of content and how quickly the framework was translated into national law. The Austrian government realised the EU directive with the passing of the "Erneuerbaren Ausbau Gesetz" (EAG) and an amendment to the "Elektrizitätswirtschafts und Organisationsgesetz" (ElWOG) in 2021 (cf. RIS 2022, RIS 2021). This positions Austria as a pioneering force in the advancement of community energy.

According to BRAZDA (cf. 2023: 96) comparable legal bases for ECs have only been created in Portugal, Spain, Italy and France. By the end of June 2023, around 700 energy communities had been registered in Austria (cf. E-CONTROL 2023: 71f.). By February 2024, the number has almost doubled to 1.318 registered energy communities (cf. DVORAK 2024). According to an assessment of the REScoop.eu network, “Austria is perhaps one of the furthest along in the process of transposing EU rules on energy communities in a way that effectively operationalises the concept. Also, it has put in place detailed rules and regulations to enable energy sharing” (REScoop.eu 2024a).

One innovative support scheme introduced by the Austrian government was the establishment of the Austrian Coordination Office for Energy Communities (Österreichische Koordinationsstelle für Energiegemeinschaften) in Summer 2021. This institution was founded explicitly for the purpose of ECs and serves as a valuable tool for accessing information all around energy communities. An online platform provides support for how ECs can be easily set up and operated making “administrative procedures more efficient, faster and transparent” (REScoop.eu 2024a). It serves as a coordinator between the Ministry of Climate (BMK), the regulatory authority E-Control and the regional governments (Bundesländer). However, challenges remain, such as improving accessibility for low-income households and ensuring non-discriminatory treatment of all market participants, which need further development for full realisation of ECs in Austria. (cf. REScoop.eu 2024a)

4.3.2 Definition and types

With the Renewable Energy Directive (RED) and Internal Electricity Market Directive (EMD) two forms of ECs were introduced: Renewable energy communities (RECs) and Citizen energy communities (CECs) (cf. EUR-LEX 2018: RED II Art. 22, EUR-LEX 2019). These two different forms are more or less defined by the geographical scale on which they operate:

A renewable energy community (REC) is an association of at least two participants for the joint production of renewable energy. Members of RECs can be private or legal entities, small and medium-sized enterprises (SMEs), municipalities or local authorities. They can set up their REC in many different business models, from associations to corporations. However, the main purpose of ECs is not financial profit, and this must be stated in the articles of association or follow from the organisational form of the energy community. The

REC can produce, store, consume and sell electricity, but also heat or gas, from renewable sources across property boundaries. For this purpose, RECs are permitted to use the facilities of the grid operator, e.g. the electricity grid, and profit from reduced grid fees. However, they must always be located within the concession area[3] of a single grid operator. This means that the transmission of energy through the grids of other grid operators is not permitted and the members must all be located in the neighbourhood of the generation plant(s) (cf. KLIEN 2024a).

Compared to RECs, citizen energy communities (CECs) are geographically unrestricted within Austria. Generation plants and the participants can be connected via several grid areas. This means that people from all over Austria can take part in a CEC and the community is not limited to one concession area. For example, a REC would operate in the concession area of *Wiener Netze* in Vienna and its customers would only be people who produce and consume electricity in Vienna. A CEC, on the other hand, could be established in Vienna but also serve customers in Vorarlberg, Burgenland or Styria. However, CECs are limited to electricity only and the financial benefits of reduced grid costs as with RECs do not apply here. Like in RECs the members or shareholders of CECs can be private and/or legal entities, and the same applies to the fact that making a profit must not be the primary objective. However, in contrast to RECs, electricity companies, medium-sized and also large companies can participate, if they do not exercise control there. Control can mean, for example, that natural persons, local authorities and small companies have a majority in the general meeting and can decide on important changes to the articles of association (cf. KLIEN 2024b).

[3] *The concession area refers to the geographically defined area in which a grid operator operates the electricity grid. Within a concession area, the respective distribution grid operator is responsible for certain tasks, such as the operation, maintenance and expansion of the electricity grid. Only one distribution system operator is responsible for each licence area. Over 120 distribution system operators are active throughout Austria. The generation and consumption facilities of the members of renewable energy communities may only be connected in the concession area of one and the same grid operator. (cf. KLIEN 2024e).*

4.3.3 Business models and tariffs

Under EU law, energy communities can take on various legal forms, such as associations, cooperatives, partnerships, development trusts or private companies. Currently, cooperatives are the most common type, which have emerged since (cf. CARAMIZARU and UIHLEIN 2020: 5).

ECs have the flexibility to design their tariffs according to their specific goals and membership structure. In principle, there is a wide range of options and there are no direct legal requirements as to how the tariffs must be structured within an EC. Still, it is important that the tariff scale follows objective criteria and does not lead to unequal treatment of members. Additionally, the tariff structure of each energy community must be in line with the precondition that the main purpose of the EC must not be financial gain. Some take a market-based approach, focusing on the financial benefits for their participants. Consumers pay slightly less than on the open market, and producers are paid slightly more than on the open market. However, ECs have the potential to set almost market-independent tariffs. These tariffs are based on the actual cost of generation allowing for more predictable and stable pricing in the long term. This is particularly feasible in ECs that own their own plants or operate in non-profit-driven settings, such as municipalities. Since RECs benefit from reduced grid tariffs and levies, this can be also taken into account in the tariff design, resulting in lower prices (cf. KLIEN 2024c).

With the model of ECs it is even possible to donate electricity. The Austrian initiative “Robin Powerhood” addresses the above-mentioned challenge of integrating vulnerable groups into ECs by simply donating surplus energy. According to their website, renewable energy should be used to support lower-income households, ensuring that the benefits of energy communities extend beyond those who own energy generation systems. This also allows the value of the donated energy to be maximised simply by the act of donating it. Typically, those who generate electricity, such as through solar panels, receive a lower payment per kilowatt hour (kWh) when they sell this energy back to the grid, compared to the cost of purchasing the same amount of energy on the market. If a donor chooses to forgo payment for their excess energy and donate it instead, the recipient household benefits by only having to pay for grid access, but not for the energy itself (cf. ROBIN POWERHOOD n.d.).

4.3.4 Integrating ECs into the Austrian energy landscape

While energy donation may be the exception rather than the rule, energy communities have the potential to benefit the Austrian energy landscape. As a new form of collectively organised energy model outside the centralised established system, ECs are favourable settings for a sustainable path development. Whereas the prevailing system is characterised by a centralised, fossil fuel-based energy market controlled by a few large companies, ECs are considered as a means “to give power back to citizens, which had been gradually lost through the centralisation processes of energy” (OTAMENDI-IRIZAR et al. 2022: 1). ECs incorporate a social, ecological and economic transformative potential and are therefore recognized as disruptive boosters for the energy transition in the EU (cf. BRAZDA 2023: 99f.).

VOGLER and KUMP (2024) draw a more nuanced picture of how individual stakeholders within energy communities construct their roles. In their empirical study they challenge the assumption that EC stakeholders always play a transformative role in energy transition processes. Therefore, they reveal “differentiated motives (…) with system transformation not always being the most important goal” for actors engaging in energy communities (VOGLER and KUMP 2024: 701). Their study identifies four types of actors: grassroots, entrepreneurial, local hero, and techno-centric. While grassroots actors meet the expectations to drive social innovation, others prioritise different motives, showing less focus on disrupting the current energy regime. Still one important key takeaway remains: Although many EC stakeholders don’t primarily participate with the intention to transform the incumbent energy regime, they “can still contribute to mainstreaming RE and trigger regime change” (VOGLER and KUMP 2024: 711).

In addition to these socio-cultural considerations, there are also legal concerns that underdeveloped legal frameworks and organisational barriers in the process of setting up ECs are hindering widespread adoption. FINA and MONSBERGER (2023: 4) criticise that “ideas and concrete measures, how ECs could be efficiently integrated in the current energy landscape” are missing. Limited expertise about the functioning of energy systems would work as a barrier for ordinary citizens to take part in ECs. The authors advocate to make use of social norms and foster a sense of trust, so that citizens gain the confidence to get involved. One possible way to achieve this would be to connect ECs with incumbent actors who are well-known in the region. In doing so, the original aim of ECs “to give individuals an opportunity to actively participate in the energy transition” should not be hindered by already established energy suppliers playing a dominant role. However, it might be

necessary to link the stakeholder groups “as an attempt to familiarise citizens with ECs and to allow ECs to flourish” (FINA and MONSBERGER 2023: 4).

What remains also open is the economic impact of ECs. One has to differentiate between the impact on individual and system costs. As already stated above ECs indeed are advantageous for people being part of it. FINA et al. (2022: 9) investigate the large-scale impact of PV-based ECs in rural areas in Austria. Their study examines how widespread adoption of ECs would affect different stakeholders. In their scenario households being part of an EC would profit from reduced electricity bills. However, with the growth of RECs, grid operators are facing financial losses due to reduced grid tariffs. While RECs could theoretically reduce the grid burden, this remains uncertain. According to the current state, it is more probable that distributed renewable energy may actually increase the load on the grid, leading operators to shift the financial losses to non-EC participants through higher tariffs. When looking at it from a systemic view, it becomes clear that energy communities do not necessarily benefit everyone. CARAMIZARU and UIHLEIN (2020: 28f.) also assume that “the expected benefits of reduced grid fees due to the reduction in power flows from the main grid may only be beneficial for the members of the community”, since network losses would be compensated by increased tariffs for the remaining customers. This bears a paradoxical effect that “creates a social discrepancy between members of the community and non-members – the latter including those individuals that cannot afford to invest in renewables but indirectly supporting the former group by contributing to renewables support schemes (CARAMIZARU and UIHLEIN 2020: 31). Therefore, the impact of ECs on system costs needs to be further investigated.

4.4 Interim conclusion

As the previous chapters have demonstrated, community energy projects have been an integral part of the European energy landscape for many years, with the early models of European cooperatives. With the introduction of the EU's *Clean Energy for all Europeans* package in 2019, a clear legal framework for energy communities has been established, making it easier to set up and operate them. The legal recognition and support provided to ECs since 2019 have given them new opportunities and advantages (cf. EUR-LEX 2018: RED II Art. 22, EUR-LEX 2019).

However, the analysis raises the question of how to differentiate between the early forms of energy cooperatives and energy communities. In fact, there are many interfaces between energy communities and cooperatives, and they can even mean the same thing. They both support the implementation of a decentralised energy transition through the participation of local people, with positive effects on regional value creation. In addition, sustainability and locality are important values (cf. BRAZDA: 98). Therefore, the difference remains in their legal definition and contextual setting.

Energy communities, as defined by EU law, include renewable energy communities (RECs) under Article 22 of the RED II Directive and citizens energy communities (CECs). In comparison to the already existing energy cooperatives, ECs are broader in scope, encompassing a range of legal forms such as cooperatives, associations, or even informal groups. Therefore, energy cooperatives can be considered as a specific sub-category within the broader framework of energy communities but may also exist independently, particularly if established before 2019 regulations. As the REScoop platform notes, the EU’s CEP offers “the existing energy cooperatives not one, but 2 definitions” (REScoop.eu 2024) – one as an independent entity and one as part of the border EC framework.

5 Theoretical framework: A Challenge-Oriented Regional Innovation Systems Approach

The research for this thesis builds upon a recent theoretical framework for innovation studies. While community energy projects have a great potential to promote energy democratisation and decentralisation (cf. CARAMIZARU and UIHLEIN 2020: 7), there is a lack of a concrete analytical framework to assess the innovation dynamics they trigger at the regional level. The challenge-oriented Regional Innovation System (CoRIS), as developed by TÖDTLING et al. 2021, serves as a comprehensive approach to fill this research gap.

The CoRIS approach is a relatively new concept and emerged from the Regional Innovation System (RIS) approach. This is a widely used theoretical framework for examining innovation dynamics in regions and serves as a tool for designing policies to promote the innovation capacity of those. As innovation has historically been understood as a matter of technology and business, conventional RIS literature often deals with the design of “smart” strategies and the proposal of a proper set of tools. Consequently, RIS approaches primarily focus on improving competitiveness and economic growth in a region. (TÖDTLING et al. 2021: 5)

In the context of social inequalities and the climate crisis, such conventional concepts are insufficient, as they often fail to address societal problems. Following TÖDTLING et al. (2021) the concept of RIS needs to be developed further by a “broader understanding of innovation that includes social and institutional innovations besides those in technological and business fields” (2). Building on the existing framework, TÖDTLING et al. (2021) propose a challenge-oriented RIS (CoRIS).

The key differences between RIS and CoRIS, as depicted in *Table 1* can be summarised as follows: The CoRIS framework expands upon traditional Regional Innovation System (RIS) scholarship by incorporating alternative forms of innovation, such as social, user-driven, and institutional innovation, rather than focusing solely on economic competitiveness. As in the traditional RIS approach, the purpose of innovation is to promote economic competitiveness. By including other realms of innovation, CoRIS also addresses major societal challenges faced by a region. Additionally, CoRIS recognises the dark side of innovation, acknowledging that innovation can sometimes lead to negative effects, a concept known as "destructive creation" (TÖDTLING et al. 2021: 5). This means that innovation may create more problems than it solves if certain impacts are not carefully assessed. In terms of actors, networks and institutions, CoRIS scholars advocate “that the innovation and policy process should be more inclusive, participatory and open towards

various kinds of users and stakeholders such as affected interest groups and civil society organisations" (TÖDTLING et al. 2021: 5). This highlights the importance of opening the innovation process to a wide range of local actors instead of predominantly giving agency to companies and their interest groups. Finally, while RIS focuses primarily on the generation of innovation, mostly concentrated on the creation of "smart" strategies, CoRIS stresses the importance of its practical application, adoption, and upscaling within the region, ensuring that innovation is not only created but also effectively utilised by the end users. (cf. TÖDTLING et al. 2021).

Table 1: Conventional and challenge-oriented RISs: Key differences (source: TÖDTLING et al. 2021: 6)

	Conventional RIS approach	Challenge-oriented RIS approach
Type of innovation	Innovation in the regional corporate sector: technological, organizational, marketing innovation	Innovation in the regional corporate sector and in other realms (public sector, civil society, regional and urban communities: technological, user, social, institutional innovations)
Purpose of innovation	Economic growth and competitiveness of the regional economy	Grand societal challenges and problems faced by the region
Effects of innovation	Focus on positive effects (strong pro-innovation bias)	Focus on multi-dimensional effects of innovation: bright and dark sides
Actors, networks, institutions	Firms, universities, state, intermediaries knit together in stable (local and non-local) networks and embedded in a static multi-scalar institutional landscape	Conventional RIS actors and 'new' innovation agents (civil society, public sector actors, users, etc.) knit together in/influenced by dynamically developing networks and evolving institutional configurations at multiple scales
Production and application sides	Supply side (generation/production of innovation in the region)	Supply side and demand/application side (experimentation/diffusion/upscaling of innovation in the region)

5.1 Energy cooperatives and communities as CoRIS initiatives

Energy cooperatives and communities can be seen as a CoRIS initiative in many aspects:

CoRIS emphasises the importance of addressing societal challenges, such as climate change and energy transition, through innovation that goes beyond traditional technological and economic improvements. The European Commission's Joint Research Centre declares that ECs are designed by EU legislation with the primary purpose of creating social innovation and to "engage in economic activities other than for profit making" (CARAMIZARU and UIHLEIN 2020: 20). As such, ECs promote inclusive governance with an emphasis on participatory processes and the involvement of different stakeholders, including civil society, rather than focusing on businesses and big market players. In addition, community energy projects address both the supply and demand sides of innovation, highlighting the importance of user application. As such, innovation emerges from a citizen-driven, bottom-up movement that considers the local context. Through experimentation, feedback mechanisms, and adaptation, these community projects drive continuous improvement and innovation for the energy transition. This emphasis on learning and adaptation also highlights the dynamic nature of innovation within regional contexts and underscores the potential of those initiatives to serve as valuable catalysts for sustainable energy transitions. (cf. CARAMIZARU and UIHLEIN 2020: 7ff.)

5.2 The four core processes of CoRIS

As demonstrated in the previous chapters, the CoRIS framework provides a valuable analytical tool for evaluating initiatives that break away from the neoliberal paradigm of promoting economic growth. TRIPPL et al. (2023: 7-8) define four core processes through which a CoRIS initiative can be assessed:

I. Challenge-asset identification
II. Innovation development-diffusion
III. Unlocking-destabilisation
IV. Orchestration

These core processes highlight the mechanisms of how regional stakeholders collectively address a societal challenge, such as energy transition, by promoting inclusive and sustainable innovation. Therefore, CoRIS initiatives are based on these processes and respectively can be also analysed through them. The four CoRIS processes will serve as the basis for examining the case study in this research, which allows a comprehensive analysis of how an energy cooperative in Austria embodies these patterns, shedding light on its role in addressing grand societal challenges through innovation.

I. Challenge-asset identification: Framing the challenges

The first core process involves articulating the challenges that the region is seeking to address with the CoRIS-initiative. In the context of identifying goals, priorities set at a higher level, such as the SDGs, are relevant. They can serve as a framework for regions, which then contextualise these goals on the smaller scale. The preconditions given in the region, in form of assets, are of importance for this very first step. Research on green path development emphasises how regions can move towards sustainable development by modifying local capabilites. While traditional understandings prioritise technological or skill-based assets, more recent research places the focus on a broader range, including natural, infrastructural, industrial, human and institutional assets (cf. TRIPPL et al. 2020: 192).

However, how priorities are set and how different stakeholders agree on the goals to be addressed is important. It is therefore necessary to analyse who is involved in the process of the problem definition, how power is distributed among actors and how conflicting interests are managed. What are the individual agendas for change and does this fit with the overall vision of the initiative? Considering the goals and purpose to which the initiative is targeted is also referred to as directionality of the innovation process (cf. TÖDTLING et al. 2021: 3; TRIPPL et al. 2023: 7-8).

II. Innovation development-diffusion: Upscaling contextual solutions

The next step according to CoRIS theory includes the search for contextual solutions for the initially defined challenges. This includes innovation processes such as the development of new technologies but also non-technological solutions, since sustainability concerns require both. The available asset base identified in the first core process strongly affects the outcome of the contextual solutions. In addition, diffusion mechanisms such as testing and up-scaling of these novel solutions in the region are of importance. (cf. TRIPPL et al. 2023: 7-8)

III. Unlocking-destabilisation: Phasing out of unsustainable path dependencies

Another important core process within the CoRIS framework is the counter-movement to innovation, referred to as “exnovation”. Since innovation and diffusion processes alone may not be sufficient for transformative change, CoRIS advocates for the disengagement of incumbent market mechanisms that are still pursuing unsustainable practices. Deliberate destabilisation of such old path dependencies is important to give momentum to the CoRIS initiative. This can mean a gradual phasing out of unsustainable activities, practices, products, technologies, networks or institutional structures. In particular, crises and shocks can create a “window of opportunity” (TRIPPL ET AL. 2023: 7) for reorientation and destabilisation.

IV. Orchestration: Navigating a complex multi-level governance system

All of the above-mentioned steps are closely linked to the fourth core process, the orchestration and coordination of the overall pathway. This requires navigating a complex working process with many actors pursuing different interests and motivations. Therefore, the focus on the fourth core process is on mediating disagreement, aligning these actors around shared visions, and setting collective priorities to minimise conflict and trade-offs. (cf. TRIPPL et al. 2023: 7-8)

In summary, the core processes outlined within the CoRIS framework underscore the interplay between identifying and framing challenges, fostering innovation mechanisms and its diffusion, destabilising existing unsustainable structures, and orchestrating collaborative efforts. Overall, these steps are essential for guiding regional innovation systems towards addressing societal challenges effectively.

6 Methodology

6.1 Research design

The conceptual and theoretical knowledge which was collected through literature study in the previous chapters leads to the question how civic solutions like energy cooperatives in Austria function as a CoRIS initiative. The case study method was chosen as a valuable research strategy to apply the above discussed theoretical framework to a real-life context. The purpose of this is to gain an understanding of how a communally organised energy initiative functions as a regional sustainable innovation system. The energy cooperative OurPower, based in Vienna, was chosen for this purpose.

At this point, it is important to note that this single case is not representative of all energy cooperatives, as they are very different in their own way. The design of these initiatives varies considerably, influenced by their legal form and purpose (cf. CARAMIZARU and UIHLEIN 2020: 14f.). However, it is important to highlight that the case study still provides valuable insights for research on regional innovation systems. OurPower demonstrates how a specific energy cooperative can navigate legal frameworks, incorporate regional assets, and respond to societal challenges while fostering social innovation. Its unique model as the first European Cooperative Society (SCE) in Austria allows for an exploration of the four key processes of CoRIS. (cf. OurPower 2023: 8-9)

The following research question(s) were derived from CoRIS theory:

How does the energy cooperative OurPower work within the CoRIS framework and what are the challenges it faces as CoRIS initiatives?

I. Which primary challenges are prioritised within OurPower?
II. What innovative solutions are developed and implemented by OurPower?
III. What mechanisms are there to destabilise unsustainable structures?
IV. How does OurPower orchestrate collaborative efforts among its diverse stakeholders?

6.2 Case study

For selecting the case study, various energy communities and cooperatives were identified through internet research in the first step. The interactive map on the website of the Coordination Office for Energy Communities (Koordinationsstelle für Energiegemeinschaften) was particularly helpful in getting in contact with various projects, as it provides public information on the activities of energy communities and their contacts (cf. KLIEN 2024d). For the purpose of this research, it was a priority to select an energy initiative based in Vienna to ensure easier support on site. After reaching out to several contacts, the decision was made to collaborate with OurPower.

In 2018 OurPower was brought to life by 19 founders as the first European Cooperative Society (SCE) with the goal to foster a community-driven energy transition through decentralised and democratic practices. The cooperative is fully owned by its members and committed to serving the interests of its members. As a SCE, OurPower falls within the legal definition of an energy cooperative that was founded before the EAG came into play and is therefore different from the so defined energy communities. The prominence of OurPower before the Austrian legislative framework for energy sharing was fully established, makes it especially compelling as a case study for this research. (cf. OurPower 2022).

As legally defined, the cooperative is made up of the following bodies: The board of directors, the supervisory board and the members' general assembly (cf. OurPower 2022). By the end of 2023, around 833 cooperative members, 292 producers of green electricity (18,7 GWh/a) and 1100 consumers (5,4 GWh/a) were registered by OurPower (cf. OurPower 2024). One can support OurPower financially by becoming a full member and subscribing for shares. Therefore, OurPower offers various membership options, allowing people to invest in the cooperative with amounts starting from as little as 100 euros (cf. OurPower 2024c).

OurPower has built up its own marketplace, where everyone can actively take part. Private producers in Austria can easily sell their surplus electricity on the online platform, and customers can choose their producers with a few clicks, determining to whom their payments flow. In this way, citizens can enter into bilateral trade agreements that are independent of their current energy supplier or market prices. Private people, who produce electricity through their own PV-system and do not use it all by themselves, can get in contact with friends, neighbours or other interested parties throughout Austria in order to sell the rest to them. On the other side, anyone who wants to can buy electricity through the cooperative, of which 100% comes directly from regional renewable energy sources. In this

respect, OurPower works like any other energy supplier – with the difference that customers know exactly where their electricity comes from and that it is 100% regional and green. (cf. OurPower 2023)

The following example, depicted on the OurPower website, illustrates how the marketplace functions:
Simon wants to buy green, locally produced electricity and selects his energy sources on the OurPower platform. First, he chooses Marie, who produces more electricity than she needs from her rooftop PV system and who provides the surplus to OurPower. As the sun does not always shine, Simon additionally chooses another supplier, Johann, who operates a community wind farm. In order to purchase 100% green electricity, a solid mix of different renewable energy sources is needed. This is where Sandra comes in, running her own biogas plant, which converts agricultural waste. In total, Simon purchases 50% solar energy from Marie, 30% wind energy from Johann and 20% bioenergy from Sandra through the OurPower platform. This diverse mix ensures that Simon receives 100% locally produced renewable energy throughout the year (cf. OurPower 2024b).

6.3 Data collection

In the realms of this Master's thesis, the qualitative research is based on interviews with various key actors of the OurPower cooperative. The data gathered from the interviews was supplemented by literature review, including information from the OurPower website and public documents such as annual reports, contracts and the articles of association.

The method of conducting expert interviews was identified as the strategy that would provide the best in-depth insight into the functioning of an energy cooperative. When thinking of experts, they are considered as people who have specialised knowledge. According to GLÄSER & LAUDEL (2009: 11) there is a type of special knowledge that every person possesses. It is knowledge about the social contexts in which they operate, about the company or organisation in which they work, about their own work processes. Only those directly involved have this knowledge and everyone has a special perspective on the respective situation due to their individual position and personal experiences. As defined by GLÄSER & LAUDEL (2009: 12), the term "expert" describes the specific role of the interviewee as a source of specialised knowledge about the social issues being researched.

Expert interviews therefore are the method used to access this hidden knowledge, as the researcher usually is not part of the social context to be studied.

To ensure a comprehensive understanding of the various stakeholders within OurPower, the interviews were conducted with a diverse group of stakeholders, including members from the supervisory board, the office team, and the customer field. The stakeholders were contacted by email, in which they were requested to participate in this research. The resonance was very positive and the chosen participants were encouraged to cooperate. Ultimately, 6 interviews were conducted with the following parties:

Participant 1 (P1): Local producer, who sells and purchases electricity to/from OurPower
Participant 2 (P2): Member of the supervisory board
Participant 3 (P3): OurPower employee being part of the office team
Participant 4 (P4): Cooperative member, who purchases electricity and invests
Participant 5 (P5): Member of the supervisory board
Participant 6 (P6): Member of the supervisory board

A qualitative research method using a structured interview guide was chosen to collect the data. Accordingly, the interview was planned in advance with predefined questions based on the four core processes of CoRIS. The guide followed GLÄSER and LAUDEL'S (2009) approach for conducting expert interviews. The questions were designed in a way that they could be answered openly by the interviewee without providing possible answer options. In addition, optional questions were included to ensure that the interview was going in the right direction and to leave room for spontaneous follow-up questions. This is useful, for example, if the interviewee deviates from the topic in certain situations and a complete answer to the question can only be achieved by asking ad hoc follow-up questions (cf. GLÄSER & LAUDEL 2009: 42).

The main questions were systematically drawn from the four core processes within the CoRIS framework, as depicted in *Figure 4*. In particular, the role of the interviewer was to take on the role of a neutrally questioning, interested, pre-informed non-expert person who conducts a dialogue as naturally as possible.

Figure 4: The theoretical CoRIS framework for the study (source: own representation)

Some questions were adapted based on the expertise and role of the participants. For example, questions about operational processes were posed in more detail to the team office, which would have more insight into these. Questions were also designed according to the point of view, as a producer uses the OurPower marketplace in a different way than, for example, a consumer.

Before the interviews were conducted, a test with acquaintances was carried out to ensure that the questions were clear and that the time available for answering was realistic. The interviews were conducted online via Zoom, except for the one with the office team participant, which was held in person at the Vienna office. The interviews were recorded online directly via the Zoom platform and stored in the cloud at the University of Vienna. Voluntary participation and consent to the recording of the conversations was agreed on in advance through privacy policy templates.

6.4 Data analysis

For the analysis of the collected data a qualitative content analysis according to MAYRING (2022) was applied using a spreadsheet software. At the centre of the analysis is a deductive-inductive category formation. The procedure of the analysis is explained in the following steps:

A) Transcription: First, the audio files were transcribed using a software tool provided by the working group at the Faculty of Geography at the University of Vienna. In the next step, some adjustments and corrections were made manually. For this purpose, the documents were transcribed into standard German and slightly smoothed. Filler words such as “um” and slips of the tongue were excluded, as they have no relevant meaning in the course of the analysis.

B) Coding process: A deductive-inductive category formation was used for coding (cf. MAYRING 2022: 64-107). In order to stay as close to the original data as possible, the transcripts were coded in the original language, German, and only the categories and text passages used to illustrate the results were translated after coding. Since the interview guide was structured around the four core processes of CoRIS, the transcripts were already more or less ordered according to the research questions, which simplified approaching the documents.

For each research question, main categories were initially drafted deductively, drawing from CoRIS theory and the related interview guide questions. Subcategories were then developed inductively and matched to their respective main categories. Prior to starting with the coding process, the main categories were clearly defined to establish the criteria for assigning statements. Each transcript was reviewed line by line, with relevant text passages categorized accordingly. After analysing 30% of the material, the categories were revised, subcategories summarised and, where needed, new main categories created.

C) Category System: The following category system emerged from this mixed method:

Table 2: Category system according to the four core processes of CoRIS (own representation)

Research Questions	Main Categories (deductive and inductive)	Subcategories (inductive)
RQ1 Challenge-asset identification	Role within OurPower	-
	Channels through which the person has been mobilised	-
	Personal motivation	Social; Academic & Career; Environmental; Systemic
	Directionality	Common Codex; Individual interests
	Asset identification	Natural; Infrastructural; Institutional; Human; Financial
	Exogenous problem definition	Legal frameworks; Influence of national legislation (EAG)
RQ2 Innovation development and diffusion	Technical solutions	OurPower marketplace
	Non-technical solutions	Pricing mechanisms; Trading system; Social solutions
	Experimenting, development and diffusion	Research projects and international knowledge exchange; Challenges
	Challenges and barriers	Social barriers; Technical barriers
RQ3 Unlocking-destabilisation	Unlocking & Destabilisation	Resistance and Counter-action to existing structures; Destabilisation measures
	Dependencies on existing structures	Dependencies on market dynamics; Resistance against OurPower & Barriers to change
RQ4 Orchestration	Coordination & Communication	Formal; Informal; Conflict management; Challenges
	Possibilities to participate	Formal; Informal

In the final phase the collected data was structured based on the category system depicted in *Table 2*. The category system served as a guide allowing for a systematic and step-by-step summarization of the findings. This approach made it possible to examine the frequency of statements, which helped to identify which findings were most relevant to the analysis. For the purpose of transparency, less frequent or self-evaluative statements could as such be highlighted as less relevant or even excluded from the analysis. The findings resulting from this structured analysis are presented in the next chapter.

7 Results

7.1 Challenge-asset identification

In the context of CoRIS the initial step is about defining the overarching challenge that should be addressed by the initiative. In the case of OurPower, the central problem that motivated the founders to take action is clearly formulated in the preamble to the cooperative's articles of association:

> *"We are founding the 'OurPower Energy Cooperative SCE with limited liability' in the conviction that climate change and the energy transition are essential issues of fate for the habitability of planet Earth and that there is an urgent need for action." (OurPower 2022: 4)*

In this sense the cooperative sees itself as a response to the need for systemic change in energy production and consumption, which in turn is necessary for climate protection. With the foundation of the cooperative, OurPower aims to address this global challenge by mobilising localised action. As such, its mission is clearly defined as the purpose to meet the needs of its members while promoting economic and social activities, especially in the field of climate protection and energy. By doing so, OurPower aims to offer citizens a democratic basis for collective renewable energy sharing. (cf. OurPower 2022: 5)

Based on this OurPower defines its overall vision as follows:

> "*A world in which people use energy responsibly and obtain 100% of their electricity directly from regional renewable energy sources. We operate our marketplace with this goal in mind, that builds relationships around the topic of electricity. Between electricity sellers and buyers, investors and plant manufacturers. You and us. We can only achieve the energy transition and climate protection if we take responsibility together." (OurPower 2023: 2-3)*

In pursuing its goal as a CoRIS initiative, the definition of a common vision is crucial to align the efforts of the different stakeholders towards the same purpose. Therefore, the participants were asked about their personal backgrounds and motivations to find out whether – regardless of their role – they share the common vision or whether there are conflicting motives that hinder the innovation process.

As mentioned above, the participants are made up of various stakeholders within OurPower. They differ in terms of age and gender. Nevertheless, it is recognisable that all interviewees are interested in energy issues, either privately or through their careers. The respondents became aware of OurPower through different channels. However, more than half of them were acquired through personal contact with board members or members who

had previously been involved with OurPower. Another participant became interested through an event organised by the cooperative.

The conversations revealed that the motivations to take part in OurPower stem from predominantly social and environmental motives with the aim of promoting systemic change in the energy landscape through the empowerment of people. The idea of community in the sense of personal trade from peer to peer plays a central role for everyone. The transparency of the trading methods and the personal contact between producers and consumers were particularly highlighted. In general, it became clear from the discussions that the participants were all very environmentally aware people who recognised the urgency of the energy transition. A participant describes why he/she chose OurPower over other electricity producers who also offer green electricity:

> *“For me, it always has to have an ecological component (...) I still think it's quite crucial whether a company also offers green electricity, so to speak, or is a 100% green electricity provider. It's always a question of whether there's a bit of mislabelling going on. If I buy green electricity from Wien Energie – that doesn't mean that Wien Energie doesn't also have wind power and photovoltaics, they do – But at the end of the day, I am contributing to the preservation of a company that still generates the majority of its energy from fossil fuels. And for me, that's simply not the energy transition in the sense that it is for OurPower, for example.” (P5)*

All in all, systemic concerns about a centralised energy system with big energy giants, who “still are involved in coal, gas and nuclear power, and who have completely torpedoed efforts in the area of the energy transition” (P5) are being raised as a meta-problem. Therefore, all interviewees advocate for a decentralisation and democratisation of the energy system by being part of OurPower. Others even actively support the cooperative by investing in it. As already mentioned above, most of the interviewees have a basic interest or expertise in the energy sector, or even come from it. Therefore, being part of OurPower was also seen as a career step for some of the supervisory board members in terms of gaining experience.

When asked for the participants' assessment of whether their personal motivations matched those of other members and the overall purpose of OurPower, they all responded that there is definitely a common understanding and values that unite them. These include, in particular, the concept of community building stemming from the personal contact between the members and the empowerment of citizens. This confirms that the central objective of energy democratisation and decentralisation, as set out in the statutes, is accepted and pursued as such by the members.

Nonetheless, the participants all agreed that there indeed are different interests, depending on the role the person plays within OurPower. Shareholders in the form of a member, for instance, tend to be driven by idealistic motives, such as supporting the cooperative's mission of energy democratisation, rather than by financial gain. Similarly, members of the supervisory board, who serve voluntarily, also act without economic purpose. On the other hand, energy producers within the community may have a more practical motivation, as they aim to amortise their PV systems by selling electricity. Their financial incentives can fluctuate depending on market conditions, especially when feed-in tariffs on the open market exceed those they receive through the OurPower platform. For instance, during the energy price crisis following Russia's invasion of Ukraine, higher market prices made it more profitable for producers to sell their energy elsewhere. This also affected OurPower, as during the crisis many regional producers within OurPower found themselves in the contradictory situation of missing out on profits they could have made on the market. A member of the supervisory board describes the situation:

> *"I would say that the majority, if not all, of the producers at OurPower are definitely also motivated economically. Logically, as economically active players, price will always play a role. And I think you have to differentiate a bit here. One is the question: What do you need in order to achieve any financing plus a margin? (..) Then, of course, there's the question – and that's where I think it gets interesting: When you're in an environment like the one we've been in over the last two years, where we at OurPower simply offered significantly less than you would have got on the exchanges on a daily, weekly or monthly basis. (...) Some people have also contacted us and I would say that this was definitely one of the conflicting issues for producers to say: 'Of course we have this motivation in terms of prices. That's the reason why we are producers at OurPower. At the same time, it simply hurts to lose 10 cents, 15 cents per kilowatt hour.' (...) – I honestly don't know who really jumped ship, but it was very manageable, which for me means the reverse. Of course, the motivation to participate in the project was the most important thing." (P5)*

The 2022 business report and the interviewees' experiences experiences indicate that the satisfaction of the electricity sellers was indeed shaky during that time. Producers who had previously sold at 6 or 7 ct/kWh suddenly found offers of 30 and 40, and then even 50 ct/kWh. While demand from customers was relatively high, it was almost impossible to attract new producers in the year 2022. In response, OurPower developed a new pricing system through numerous discussions and dialogue events with its producers and users (cf. OurPower 2023a: 3). Despite these financial considerations during the energy crisis in 2022, the majority of producers remained committed to the OurPower project, prioritising its mission over short-term financial gains. Another member of the supervisory board also emphasises that financial motivation is not the dominant factor for most producers, pointing out that producers have chosen OurPower at times when the feed-in tariffs on the market have historically been quite good.

The above discussed example shows that although the different stakeholders have different motivations depending on their role and academic background, it is the general sense of being part of a community and working together towards the common goal of energy democracy and decentralisation that unites the participants. The discussions with the stakeholders have made this clear. Although individual interests, such as the economic motives of producers, are present, the focus is on reconciling these interests to align with the cooperative's overall mission, rather than prioritising them.

In the context of asset modification in green path development (cf. TRIPPL et al. 2020: 192), the first step of CoRIS also involves making use of a region's existing resources before embarking on innovation development. OurPower identifies several key local assets necessary for its mission of sustainable energy transformation. These include natural assets, such as the sun, wind and water resources and industrial assets in the form of PV systems installed by the respective households. Material endowments can be identified in the form of the use of existing buildings or rooftops for power generation, and infrastructural assets in the use of the national grid for energy distribution. Human resources are activated through the active participation of members, many of whom even come from the energy sector or are personally engaged with. Importantly, financial assets are also being leveraged, with OurPower securing nearly one million euros in funding from EU programmes and national grants from the FFG (Austrian Research Promotion Agency) in 2023. This funding not only supports the development of the technology behind the marketplace, but also strengthens the cooperative model and community-building initiatives (cf. OurPower 2024: 6). Finally, institutional capacity plays a role. This is mainly due to the fact that OurPower has been set up as an SCE, a framework that already existed as a result of the efforts of the European Union. (cf. OurPower 2023)

As the CoRIS framework shows, external influences at higher spatial levels, such as supranational regulations, provide essential guidance and a framework for initiatives such as OurPower (cf. TRIPPL et al. 2023: 7). In this case, in addition to EU support, national legislation such as the EAG also plays a role. What becomes clear from the interviews is that the differences between energy cooperatives and energy communities by EAG is not always clear and difficult to grasp. Many interviewees struggled to explain the specific impact the EAG has on the cooperative, highlighting confusion around the distinctions between energy cooperatives before the EAG and energy communities as outlined by the law. This indicates how legal definitions have grown increasingly complex over time, making it difficult for stakeholders to fully differentiate the framework.

A member of the supervisory board summarises the difference:

> *"OurPower already existed before and of course OurPower also likes to call itself an energy community, which is of course true in the broadest sense, because people are brought together to sell energy to each other. But if you now go by the terminology of the law, by the renewable energy communities and citizen energy communities in the EAG, then OurPower is a bit different, because they do have the status of an energy supplier. And it is precisely these renewable energy communities and citizen energy communities that are really also for the small citizen to build something of their own, to actively participate in the energy transition, without having to fulfil any great prerequisites, as would be required for energy supplier status. And that's the big difference." (P6)*

The key difference between the OurPower marketplace and an energy community lies in the operation and scope. While both models support regional and local energy generation, OurPower rather functions as an energy supplier by pooling energy from many local producers and ensuring a year-round renewable supply. If the community produces more energy than it needs, the surplus is sold on the market, and if production falls short, additional energy is bought on the market. This system allows OurPower to offer continuous renewable energy availability, positioning it more like a traditional energy supplier. In contrast, in energy communities, the simultaneity of energy production and consumption is crucial and only the energy generated and consumed at the same time within the community can be shared. As energy communities under the EAG law are legal entities designed to facilitate small and local energy sharing, they also benefit from lower local tariffs. (cf. FENZ 2021) However, the two concepts are not at odds with each other, and one can also think of combining both. An interviewee, who is involved in a small-scale energy community and OurPower, explains how he/she first uses a small-scale energy community locally and then sends any excess to the OurPower marketplace for sale:

> *"First, I use the electricity, when my washing machine is running or I'm cooking. Then, if someone needs it, the electricity goes to the energy community, the small regional community, and the rest of the electricity goes to the OurPower marketplace so that others can buy it there (...) the energy communities are there so that they can exchange electricity very regionally or locally, i.e. with neighbours. OurPower is not an energy community in the traditional sense. Although I would say it is something like an energy community in a figurative sense. That's how I would put it." (P1)*

At least from a legal point of view the EAG doesn't directly influence OurPower, as the cooperative was founded before. There rather is an indirect influence in the form of fostering the overall awareness raising for regional community energy projects. One participant points out that one could also imagine OurPower being challenged by the rise of energy communities by the EAG. In the past, individuals interested in this would have relied on platforms like OurPower to facilitate energy sharing, but now with the EAG and the legal

framework for energy communities, they can set up their own independent systems, bypassing OurPower. However, the impact of this consideration may be small and it is to point out that OurPower rather makes use of the EAG as an institutional asset. Therefore, it started integrating energy communities into their business plan by providing services and support for them, both for the establishment and ongoing management. This includes organising and setting up the right legal structure, designing the technical and economic concepts, and managing ongoing billing for energy usage within the community. The OurPower marketplace then serves as an option to purchase additional electricity and sell excess energy. (cf. OurPower 2023: 18-19)

Overall, the first CoRIS process applied to the case study of OurPower shows that the urgent need for climate action and systemic change in energy production serves as the basis for the initiative. Founded with a vision for responsible energy sharing from regional resources, the cooperative aims to create a marketplace that promotes energy democratisation and community building. The motivations of its diverse stakeholders range from idealistic values focused on social and environmental impact to more practical economic interests, particularly among energy producers. However, the collaborative approach aligns individual motivations with a shared mission to advance sustainable energy transformation. OurPower capitalises on key local assets, including natural resources, financial fundings and community engagement, while also incorporating the complexities of regulatory frameworks such as the EAG. Although OurPower rather operates as an energy supplier by pooling energy and ensuring year-round availability, it also integrates the recent institutional developments of energy communities into its model, providing support for their establishment and management.

7.2 Innovation development-diffusion

When examining the solutions which were and are constantly developed by OurPower in order to pursue their mission, one can detect technical as well as non-technical innovation patterns. A major technological solution mentioned by all participants is the development of the OurPower marketplace. The software, including the programming, was created by OurPower itself and is constantly being improved. The marketplace is not only relevant from a technical point of view, but also makes it possible to establish direct relationships with buyers and producers. From this point of view, the trading system that OurPower has created is itself innovative also from a social point of view, as one participant states:

> *"OurPower is not just an online platform, there are also these relationships in the sense of the OurPower slogan: 'Turn your electricity supply into a social relationship' because I can see who is producing my electricity. Or who buys my electricity. I can see that on my OurPower account. And then I can see the power plant, a hydroelectric power plant, the small hydroelectric power plant and this wind turbine where I use the electricity, which is located in Upper Austria, in Styria. I can understand that. And that's the difference or the innovative aspect compared to all the others." (P1)*

The core concept of the market model is centred on peer-to-peer energy trading, with OurPower taking a pioneering role in Austria. A key focus is on ensuring transparency, allowing customers to clearly identify the source of their electricity. Both producers and consumers can view who is generating or purchasing their electricity directly through their accounts. Furthermore, the model provides the ability to trace whether the electricity is sourced from hydropower, wind, or solar (PV). Entry barriers to the market are minimal or even nonexistent, as emphasised by one interviewee:

> *"The great thing about OurPower is that anyone who wants to can simply become a customer and thus part of this cooperative (...) in terms of prices, we are competitive. So, I don't think you have to be rich to buy electricity from OurPower." (P2)*

In this way, direct peer-to-peer trading allows for a fairer and more stable pricing system. One interviewee explains that when producers supply through a larger electricity company, the electricity goes into the grid without knowing where it ends up. Regional producers don't have a say in determining the price because the companies determine the price, and what the customer pays on the other side is usually a much larger share for the company that sits between the two. On the OurPower marketplace, the producers have a say in setting the price. Consumers can expect more stable prices, as flexible tariffs on the free market usually fluctuate depending on the developments on the stock market, as it was the case during the energy crisis (see merit order principle, Chapter 2.1). Besides, interviewees highlighted that OurPower supplies green regional electricity every day, every hour, all year

round. This is different from the energy communities that are now set up under the EAG, which only trade the surplus electricity produced every fifteen minutes, as described above.

In addition to its market model, OurPower has introduced various solutions that prioritise the community aspect of energy sharing. The latest development of OurPower is a new tariff called *Family and Friends* (cf. OurPower 2024a), which was mentioned by almost all participants as a key social innovation. This new development allows producers, when they supply to the OurPower marketplace, to set a second price for people they know, people they like, family members or basically to whom they want to give their electricity at a lower price. Some possible outcomes of the tariff are described by an interviewee:

> *"You can really do a lot with it, for example for the children when they have moved out, who you are supporting financially anyway. You can then sell them your own electricity for less. You can donate it or somehow distribute it in a spirit of solidarity. It's also very interesting for companies if they have a PV system and can make their employees a special offer, for example." (P3)*

The supporting role OurPower plays in integrating energy communities, which as such are considered as social innovation by the interviewees, also has to be mentioned in this respect. While energy communities enable local energy sharing and cooperation, OurPower provides the technical infrastructure needed to organise and monitor these energy flows. This includes services that help manage the distribution, billing and optimisation of energy among community members, ensuring that surplus energy can be effectively shared and tracked (cf. OurPower 2023: 18-19).

In line with the second CoRIS process, innovation involves ongoing experimentation and diffusion mechanisms of these continually evolving ideas. This component is clearly visible within OurPower. A lot is invested in research projects, and ideas from members are welcome. As part of an international network, OurPower actively engages with other energy cooperatives and community energy initiatives. For instance, the cooperative is involved in the European energy cooperative network, REScoop (see Chapter 4.2.3; REScoop.eu 2024b).

One project that is currently underway is the *PowerYouth* project which aims to mobilise and empower young people in community energy projects by providing them with tools and training. The campaign is part of an EU strategy and takes a participatory approach, creating dialogue between young people and local stakeholders. The project is implemented through pilots in five EU countries with the aim of replicating the approach across the EU (cf. EUROPEAN COMMISION 2023). As one of the five European pilot regions, OurPower is working on solutions to make it easier for young people to get involved in energy communities. The aim is to develop the OurPower marketplace further and make it easier

for a young person to participate in energy sharing models or even start their own projects. This is accompanied by local networking groups made up of young people, local decision-makers from politics and the energy industry and scientists to promote dialogue between the different stakeholders. The research project can be considered as an experimental space to innovate and improve OurPower's platform, especially in the field of attracting a more diverse target group. Since there are few existing models to follow, the goal is to test various methods over the next three years to engage young people in citizen energy (cf. FRIEDERICHSEN 2024).

Two other major campaigns that started in 2023 are the *DEDALUS* and *ENPOWER* projects of the Horizon Life programme. The projects will run for three years and are data-orientated. Both aim for the implementation of modern generation and consumption forecasts for customer groups in data management as well as the development and testing of specific offers for members and customers. The *Serve-U app* should also be mentioned in this context. This is a project funded by the FFG (Austrian Research Promotion Agency) with the goal to design an app, which provides members with energy forecasts from the community in order to make consumption more flexible and improve awareness of the energy requirements (cf. OurPower 2024: 6). The *Serve-U app* provides OurPower customers and producers with insights into their personal energy consumption and generation data, combined with weather forecasts to predict energy use for the following day. This forecast is made both for individual users and the entire community. Users receive a daily energy forecast along with tips on how to adjust their consumption based on energy availability, promoting collective energy-saving efforts (cf. OurPower 2023a: 5).

It can be concluded that the project business makes up a very large part of OurPower, which makes the business model itself extremely innovative. This is of great strategic importance to OurPower, as it is and wants to remain a pioneer in the research and development of energy communities and citizen power. In addition, the projects are regarded as a learning environment for young employees, where they can build up expertise (cf. OurPower 2024: 7). One of the interviewees supports this notion:

> *"We are also learning a lot ourselves about this form of organisation, about the motivation of customers. There are so many aspects in these subject areas that are now also covered in these research projects, including gender and diversity issues, i.e. vulnerable groups, the issue of energy poverty and so on. It's a very broad approach to this topic with many aspects" (P2).*

While OurPower is committed to sharing knowledge and promoting its latest innovations, the innovation process also faces challenges. A significant hurdle identified in the interviews is the problem of communicating these innovations in a simple, accessible way. As OurPower relies on its community and their active participation, simplifying its mission is critical to attract a wider audience. The complexities of the model, including the pricing mechanisms, require effective communication strategies to engage potential users who are not intimately familiar with energy systems. The employee of the office identifies communication and technical barriers that make it difficult to break down complex issues:

> *"I think what we are repeatedly confronted with is that it is simply not that easy to explain our model. The marketplace model and now, for example, 'Family and Friends' or something like that, or this idea that we need a community, that OurPower actually is this community, that's just not trivial to explain. But that's what it takes to get people excited about it. And that's actually a challenge that we have to face all the time. That we somehow have to be able to explain and present ourselves in a way that is easy for people to understand who are not yet so deeply involved in energy issues (...) The communication of this is somehow not easy and now with the 'Family and Friends' offer, we have another extra price and that makes the whole thing even more complicated. You have to manage that you communicate these innovations in such a way that they are somehow simple and that it is then just a click in the cockpit on the marketplace" (P3).*

However, this challenge is closely tied to the overarching issue of attracting new members, which was considered as a meta-problem by the interviewees linked to the general public's willingness to engage in energy projects. This will be discussed further in the final step of CoRIS, highlighting coordination and communication processes.

In conclusion, the second core process reveals that innovation within OurPower is both technological and social, embodied in its peer-to-peer energy marketplace and community-driven initiatives like the *Family and Friends* tariff or integrating energy communities in its business model. Diffusion mechanisms are also clearly visible in OurPower's involvement in research projects and active international exchange with other energy cooperatives. However, the effectiveness of these innovations depends on overcoming communication challenges. Engaging a wider and more diverse group of participants requires simplifying complex technical and market dynamics. Ensuring that innovations are accessible and comprehensible is critical to scaling the impact of its innovations and maintaining the commitment of its members.

7.3 Unlocking-destabilisation

This chapter deals with the influence of OurPower on the current energy regime. To this end, participants were asked to what extent OurPower already has a destabilising effect and what further measures would be necessary to compete with already established large energy companies.

An active destabilisation strategy in the sense of the CoRIS theory is not directly visible in this context. However, all participants emphasise that the mere existence of OurPower can be seen as an escape from old structures. Consequently, the following aspects were named as unique selling points compared to other energy providers:

- Organisational form as a cooperative
- Peer-to-peer trading, which involves a direct relationship between the producers and electricity purchasers with a focus on community welfare rather than profit
- Empowerment of citizens through bottom-up mechanisms
- 100% renewable and regionally produced electricity throughout the year
- Transparency of green electricity production
- Young, creative and committed team that utilises modern communication channels and marketing strategies

OurPower's pioneering role in the field of energy cooperatives is also highlighted by the participants, especially the fact that OurPower really did come up with the idea a few years ago of bringing citizens together to sell each other electricity. Through this a completely new trading hub has been created that operates independently of large energy companies or dynamics on the spot market.

However, this market is still very small. Its destabilising effect will therefore depend on the extent to which such co-operative forms can grow to replace centralised structures in the long run. In this context the most important and at the same time challenging task which was mentioned by the interviewees is the acquisition of more members.

It becomes clear that the primary strategy of OurPower is not to actively destabilise other players but to make OurPower as attractive as possible for customers so that more and more people become part of it, as the team member describes:

> *“That we become a relevant player. – That's actually the only thing it really needs. So destabilising means that somehow many, many people really do move away from the current energy companies that are in positions of power. Because that's also what gives them their base. And of course there are state subsidies and that sort of thing. But if you don't have someone who buys the electricity from you? – That's what you need as an energy supply company (...). So actually all our work is focussed on trying to get more members or more customers. And then there's the whole rat's tail of making sure that our product, i.e. the marketplace, is somehow accessible and easy to understand. We aim to build up communication in such a way that people want to join in. We also recognized to continue to work on the prices, for example, so that they are also interesting for other groups who are dependent on having a very favourable energy provider.” (P3)*

Marketing and attracting new members play an important role. One example cited by two interviewees was OurPower’s proactive response to a recent initiative by *Energie AG Oberösterreich*, an energy supplier in Upper Austria. The company announced that it would no longer accept photovoltaic feed-in from local producers. In a strategic move, OurPower publicly invited all PV operators in Upper Austria to join its marketplace. This proactive but effective action allows OurPower to position itself as a challenger in the market (cf. BEISER 2024). Another interviewee stressed that as the energy transition progresses, demand for alternative energy solutions will grow, especially among younger generations. Transparency in the face of greenwashing will play an increasing role. By focusing on authenticity, OurPower can benefit from the growing demand for real solutions in the energy sector.

It is striking that hardly any top-down measures were mentioned that would be necessary for the primary success of OurPower, which is probably also due to the fact that this is a very abstract topic. For example, one person points out that education or policy measures such as reducing working hours would play an important role. However, this is not specifically related to OurPower, but rather needs to be seen as an overarching meta-level measure to raise awareness of sustainability topics. Instead, while top-down measures are important, they seem less critical here, as a legal framework already exists, allowing the OurPower marketplace to function. The focus has now shifted to bottom-up growth, driven by community support rather than overarching policy, suggesting that the member engagement is key to future success.

The interviewed participants therefore emphasise the importance of creating an environment that encourages growth from the bottom-up:

> *"What you can do legally is make things like energy cooperatives more attractive and lower the hurdles for them, yes. But at the end of the day, I think it will be politically difficult to prescribe the form. And from that point of view: Of course, you can exert a massive influence on the choice of energy by imposing bans and subsidising alternatives. Yes, but at the end of the day, whoever offers them, whether it's the established players or players like OurPower, you can help incentivise those by somehow lowering the bureaucratic hurdles for energy communities, for example." (P5)*

Despite these endeavours, however, it must be noted that it is not yet possible to completely decouple from established market conditions. Exchanging electricity via a supra-regional grid and market model naturally requires certain ties to the existing structures. Pretty much all the interviewees agreed that overall market dynamics play a role for OurPower. This for instance is evident in how the cooperative remains tied to price fluctuations on the spot market. As electricity production and demand must be always perfectly balanced (see Chapter 2.2), OurPower is involved in external market transactions. The energy produced and consumed via the OurPower marketplace does not always match up perfectly in timing or quantity. Any surplus electricity is sold on the open market and residual electricity must be purchased if demand is higher than production. OurPower obtains these services through the energy supplier *aWATTar GmbH*, who trades energy on the spot market. OurPower is integrated into the balancing group[4] of the energy provider, which itself only trades and sells green electricity from Austria. According to their website 58,89% come from hydropower, 30,08% from wind energy, 8,79% from solar, 1,35% from biomass and 0,89% from other green energy sources within Austria (cf. AWATTAR.at 2024). Through collaborating with *aWATTar*, OurPower can ensure that any balancing energy purchased does not include fossil electricity from non-renewable sources.

However, since the cooperative is still relatively small, the amount of the surpluses OurPower sells and the missing quantities bought in are large in relation to the energy used internally. Consequently, fluctuations in the spot market, such as those experienced during the energy crisis, have a significant impact on the cooperative due to its reliance on stock exchange prices. Like other market participants, OurPower was compelled to reorganise its contracts and processes to accommodate price volatility in both directions (cf. FENZ 2022). These unforeseen developments heightened the risks and costs for energy providers.

[4] *A balancing group consolidates suppliers and consumers into a virtual group, within which electricity supply and demand must be balanced. In the case of unforeseen fluctuations in generation or forecast consumption, the control area manager must ensure that the energy balance in the grid is maintained by switching generation units on or off. The cost of these balancing measures is charged to the balancing group that caused the imbalance (cf. APG 2024).*

Consequently, uncertainty in the market resulted in high-risk premiums, as described by a member of the supervisory board:

> *“A challenge that was not unique to OurPower – and in principle it was the same for everyone who has also traded on the stock exchange – (...) was simply a consequence of the energy price crisis, that the collateral that OurPower had to deposit has risen exorbitantly and that was a fairly significant financial challenge. It was also reported by Wien Energie, which received a lot of media attention two years ago. That cost them billions. That was definitely a challenge, but for a relatively young organisation like OurPower, which simply doesn't have the financial resources and reserves available, it was an even bigger challenge than it was for large, established players.” (P5)*

In addition to the volatility on the spot market, the interviewees also cited general price incentives as influencing OurPower's operations. As economic agents, the behaviour of producers and customers will be naturally driven by price to a certain extent. This manifests itself in the fact that offers are compared with those of other energy suppliers on the market. As already mentioned above in times of the energy crisis, producers of OurPower were missing out on potential profits, as much higher prices were offered elsewhere than OurPower. On the other hand, in May and June of this year, there was a situation in which market prices for PV had plummeted to such an extent that electricity customers could have obtained a much cheaper contract elsewhere than OurPower. In order to keep people on board and prevent them from jumping ship, OurPower finds itself forced to a certain extent to respond to such market dynamics. In this sense, the cooperative operates like any other market participant competing with other companies.

The strong price fluctuations on the wholesale market have led the cooperative to enter into price dialogues with its producers and customers. The aim of these discussions was to find an agreement which fits best for the members. During the energy crisis the dissatisfaction of the producers did indeed result in a small price increase for OurPower’s customers. However, this was never as exorbitant as the market, but more of a compromise. A member of the supervisory board describes the outcome:

> *“So basically, there has been an adjustment, both an upward and now a downward adjustment. You simply cannot act fully independently of the market. Of course not to the same extent as the market, because there were days when electricity somehow cost 50 cents and more. We never went that far. But it was simply the case that consumers paid a surcharge of several cents, which was always fixed for a period of time and then evaluated. And this surcharge – minus increasing costs and risks, which arose at OurPower – was then also passed on to the producers. But as I said, it rarely, if ever, reflected the full dynamics of the market. But at least in part. Otherwise it won't work out, because no matter how idealistic the motivation, at some point they (the producers) say: ‘yes, sorry, if I just get five times as much on the stock market, then it just won't work out’ (P5).”*

Another interviewee notes that the electricity producers to some extent are also tied to the capital market and therefore might be dependent on other actors that come into play. For instance, if a producer has received investment or financing from a bank, there are also pressures that influence their decision to sell electricity to whomever offers better returns, especially in times of crisis.

One can observe that while OurPower operates as a decentralised and alternative energy market, it remains integrated within the broader economic system of the energy sector. Despite this observation, the interviews revealed that no specific actors are actively opposing the cooperative. Instead, potential challenges arise from more general, sector-wide issues associated with the energy transition, such as tank-top discussions or debates over the use of open spaces for renewable energy expansion, rather than opposition directed at OurPower itself. Still, the cooperation with network operators was frequently mentioned as a challenge, cited by more than half of the respondents. This perception apparently also emerged from telephone conversations between the OurPower team and producers. A major issue appears to be the registration process for PV installations, where many producers felt that grid operators were deliberately delaying progress. The installation of smart meters[5] – another area for which grid operators are responsible – was also cited as being delayed. These operational bottlenecks have caused frustration and are an obstacle to smoother integration of renewable energy systems.

Another interviewee, however, emphasises that this is more of a meta problem that does not necessarily have anything to do with OurPower. The increasing number of prosumers and the introduction of energy communities have placed a considerable additional workload on grid operators. For example, they have had to implement static and dynamic energy allocation mechanisms, programme them and ensure that they work properly. Grid operators are responsible for collecting accurate data through metering, as mentioned above, and distributing it to platforms such as the EDA[6]. So, it is no longer just about generation and consumption in general, but also about how much each consumer gets from

[5] *Smart meters are electronic electricity meters that measure household electricity consumption and send data to the grid operator via the electricity grid. Unlike traditional mechanical meters, they also track electricity fed into the grid by systems like photovoltaic (PV) installations or heat pumps. In the European Union, smart meters are being rolled out with a requirement that at least 95% of consumers have one by 2024. Austria is implementing this with a specific ordinance ensuring that 95% of Austrian households and companies are equipped with smart meters by the end of 2024. (cf. Wienernetze 2024).*

[6] *The Energy Data Exchange (EDA) in Austria is a standardised technological framework designed to facilitate the secure and efficient exchange of industry data between market participants in the energy sector. Launched in 2012, EDA supports the reliable transmission of critical information, such as meter data and supplier change details, while ensuring compliance with data security standards. This initiative not only increases operational efficiency, but also positions Austria as a leader in the management of sensitive energy data within the European market. (cf. EDA.at 2024).*

an energy community for instance and how much each consumer sells to an energy community, if they have a PV system. The challenge is to find out what the excess generation is and what the residual load is. These are all additional contracts with the grid operators, who according to the interviewee have really done the work in the end. The participant therefore does not see network operators as opposing or blameworthy actors, but rather the technical complexities they face as responsible for delays.

All in all, it becomes clear that while OurPower's community-based and sustainable approach is central to its mission, the cooperative cannot operate entirely independently from external pressures like fluctuations on the electricity exchange or external influences in times of crisis. The destabilising effect of OurPower as a CoRIS initiative therefore depends on attracting new members in order to grow and compete with larger players. Beyond the general challenges posed by the energy transition, no specific actors can be identified who would actively resist OurPower. Rather, these are challenges that need to be addressed at the meta-level in relation to the overall energy transition.

7.4 Orchestration

Formally, the internal organisation of OurPower is clearly defined by its legal definition as a cooperative. As such, OurPower consists of its members, the board of directors, the supervisory board and the team responsible for day-to-day operations. The team, including the board of directors, is employed, while the board of directors is voluntary. Each year, a general assembly is held, where all members are invited and can participate. During the assembly the board presents the annual report, which includes a financial balance sheet, and the members vote to accept or reject it. In addition, members can vote on the discharge of the board of directors and the supervisory board. The board of directors, made up of two co-founders of OurPower, serves as the management team, overseeing daily operations and new projects, while the supervisory board ensures that all actions align with the cooperative's statutes and long-term economic success. Regular supervisory board meetings are held to review and discuss ongoing and future initiatives (cf. OurPower 2022: 10ff.).

The organisational form and coordination between the stakeholders are therefore structured democratically from the ground up. As BODDENBERG and KLEMISCH (2018: 273f.) claim, cooperatives are generally based on solidarity and member support, prioritising member value over shareholder value. As members are both customers and owners, they can directly influence decisions through equal voting rights. From a legal point of view the roles are therefore clearly defined and there is little to be changed.

On an informal level, all interviewees, regardless of their role, agree that collaboration within OurPower is smooth and that a particularly personal relationship is maintained. The interviews suggest that there are no fundamental disagreements or conflicts that challenge the cooperation between the actors. This in turn confirms the initial observation that all members work together towards a common goal and share common values, even if their roles may be very different.

All respondents have the feeling that personal concerns, ideas and questions are considered and integrated into OurPower’s daily business, as one of OurPower's electricity producers explains:

> *“I do have the feeling that if you have a concern, an idea, a question, a piece of personal reference, I trust that I will get an answer or that my idea will be considered. Some ideas may be complete nonsense or may suggest something completely different. But I still trust that they will be read and heard” (P1).*

Coordination also seems to be running very harmoniously at supervisory board level:

> *“My impression is that the team works extremely well together. I find the cooperation on the supervisory board itself very pleasant, also with the directors. So, everything is very constructive, very transparent and precise (...) For me, it's all going wonderfully. But as I said, that's how I'm involved. My operational involvement is at a superficial level at most, and so my interface is the board meetings and the supervisory board meetings with the directors. This is extremely well organised and very fruitful and also interesting every time you learn something new” (P2)*

The interaction between the team and the management level responsible for the day-to-day business is also rated very positively by those interviewed. It is described as cooperative and personal. The only challenges mentioned are more typical for a young company that is still developing, such as work processes, feedback mechanisms, and determining the level of employee autonomy. Since OurPower has only existed for five years and many of the employees are new to the job, some work processes would still be evolving as the company grows.

Some interviewees particularly emphasise the conflict management culture that has emerged as a result of the coronavirus crisis or the energy crisis. As already mentioned in the previous chapters, dialogue formats were initiated by the management boards in response to the extreme developments on the market. The ability to coordinate different interests well and to manage crises is reflected in this. As summed up by one of the team members, the price dialogues work as follows:

> *“These price dialogues work in such a way that we, of course, here in the team and on the board, primarily develop a proposal – because not every producer has the energy technology know-how to propose a reasonable price. So that means that the OurPower team and the board then come up with an estimate of what is happening in the market and what we need as a cooperative to somehow make a living, so to speak. And then the producers are asked: What is a fair price from your point of view? And that's exactly what the Zoom session was like, where everyone who wanted to have their say came along. And that's when you have to find out whether the proposal is somehow accepted by OurPower or whether people are totally dissatisfied with it.” (P3)*

The example of pricing shows that although a formal framework is provided, manifested, for example, in the form of a price cap, room is left to also consider the needs of the different actors and ultimately to arrive at a compromise that suits everyone.

When asked about the possibilities to participate there is also the formal structure on the one hand and informal possibilities that need to be taken into account. On the formal level, the interviewees named the annual general meetings as a place where one can bring up topics and discuss them. Members can actively get in touch with their electricity producers,

the board and the OurPower team to give feedback. Besides these official rights, the regular dialogues formats and various events were highlighted as room for participation. In a broader sense, the possibility to choose one's own electricity buyer, including the power plant via the marketplace platform, was also mentioned as a participation option. This allows customers to have a direct influence on the OurPower market and the sources of their electricity.

The above-mentioned observations show that coordination between the different stakeholders within OurPower seems to work well. This is less surprising when looking at the membership structure. The discussions from the interviews reveal that it is mainly very committed and environmentally aware people who are part of the community, as one interviewee states:

> *“We are already a relatively large community in the sense that there are somehow people who are so engaged. But now compared to other energy providers (...) we are simply very small in terms of numbers. And you're right, we've also targeted a fairly homogeneous group so far. So, in terms of age and gender and income, it's probably not a super diverse group.” (P3)*

This is confirmed by the fact that the respondents of this research also represent a relatively homogeneous group in terms of either their interest in energy-related issues, their financial or material capacities, or even their professional background in the field.

Discussions with the interviewees made it apparent that mobilising a more diverse set of members for the OurPower initiative is a particular challenge. Several reasons were given, but above all the fact that the energy sector seems to be a very unpopular topic that many people do not want to deal with. This is partly due to the technical and economic complexity, which is difficult to grasp, but also to a lack of will among the population. The electricity switching rates in recent years illustrate this dynamic. In 2022 and 2023, only around 2.5 to 3.9 per cent of all household customers in Austria switched their electricity supplier (cf. E-CONTROL 2024a). Another interviewee also sees a lack of time in daily life as an important factor.

Accordingly, this would require policy measures such as a reduction in working hours to allow time for energy issues in everyday life:

> *“The other aspect is that people have so much to do, life is so stressful and they don't have time to deal with it. So, there's also a technical barrier. I know of friends who say: ‘No, my husband will take care of that’. But he doesn't have time because he has a 60-hour job. So, people are so wrapped up in it that they don't want to deal with it beyond the fact that the electricity comes out of the socket.” (P1)*

In fact, research shows that although support for local renewable energy generation is generally among the population, active participation in community-based energy projects is rather low. Insights into sociodemographic factors influencing citizens to participate in a prosumer community show that a “major factor influencing the willingness-to-participate is the social background of the respective citizens, as well as their economic interests” (FINA et al. 2022: 9-10). People with less education or financial resources are often less likely to participate in energy communities, even though they could benefit most from the social focus of those initiatives. According to the researchers it is therefore important to create favourable opportunities for participation, especially for those experiencing energy poverty, to ensure that these people can also benefit from lower energy prices (cf. FINA et al. 2022: 9-10).

The area of outreach, in particular attracting and involving under-represented groups in the initiative, seems to be one of the most challenging tasks within the fourth CoRIS process. While there are no major conflicts or coordination issues, the interviews underscore the importance of effective conflict management during crises and highlight the opportunities for member participation. The need for strategies to raise awareness about energy issues and enhance community involvement is a central theme, emphasising the critical role of coordination and communication in the success of OurPower's initiatives.

8 Discussion

This paper is based on the question of how the OurPower cooperative works within the CoRIS framework and what challenges it faces as a CoRIS initiative. Based on the interviews, it can be concluded that the OurPower initiative covers all four processes, and mechanisms that are in line with CoRIS can be identified at every point:

I) Based on the meta challenge of climate change and the energy transition, there is a clear vision defined by OurPower. As an initial step local assets have been identified in order to develop suitable solutions. The interviews revealed that there is a common direction in terms of values and goals that are being pursued. Even though individual interests differ, they can be coordinated in such a way that they can be balanced as best as possible.
II) The innovation efforts of OurPower are particularly noteworthy. As an energy cooperative that was founded before the EAG, OurPower plays a pioneering role in peer-to-peer trading also in the international field. There is a clear interest in further development and knowledge exchange, which is reflected in participation in international research projects. In the sense of CoRIS, this can be interpreted as experimentation with the aim of finding context-specific solutions, which can be upscaled and transferred to other regions. It should be emphasised that not only technical and economic solutions play a role within OurPower, but also social initiatives. **III)** In relation to the third core process, the findings indicate that OurPower cannot completely detach from existing market structures, particularly the dynamics of the spot market. While there are no active mechanisms disrupting these established structures, by creating a completely new electricity marketplace, an alternative to the centralised electricity market has been established. The destabilising effect is therefore dependent on the growth and expansion of the OurPower market from the bottom-up. **IV)** Finally, the research on coordination and communication mechanisms within the OurPower initiative, shows that different interests are perfectly aligned. This is particularly evident in times of the energy crisis, when the interests of consumers differed from those of electricity suppliers. Conflict management in the form of dialogues between the actors has proven to be particularly fruitful here. However, the main challenges remain in attracting and gaining more diverse members in order to upscale the OurPower initiative.

Nevertheless, the findings raise questions about how effectively challenges related to major societal complexities such as diversity and inclusion could be addressed within OurPower. This includes the inclusion of a more diverse set of actors. Even though this problem has already been clearly recognised by OurPower and included in the agenda, for example through the *PowerYouth* programme, it is not yet clear to what extent marginalised groups or households facing energy poverty could also benefit from the approach. With regards to grand societal challenges acknowledged by CoRIS theory, the interviews revealed little about how socially disadvantaged households are currently benefiting from the concept. It therefore remains questionable to what extent these groups could particularly be integrated into the innovation process. One interviewee suggests collaboration with institutions such as Caritas or other NGOs that have better access to these population groups. This would require certain legal adjustments to be able to enter into such corporations – this applies in particular to the establishment of energy communities under the EAG. The current rules for renewable energy communities exclude large companies, and while citizen energy communities allow them to participate, they are not allowed to exercise control there (cf. 2024d). This restriction was put in place to prevent large companies from dominating energy projects and making large profits. But the problem is that it also restricts non-profit organisations, such as social housing providers in Vienna, who don't want to make a profit and could help to involve disadvantaged groups. The interviewee suggests that non-profit organisations should be exempted from the rule, as their involvement could be beneficial without jeopardising the original intention of the law. The participant also identified property management companies as another key lever. As the only stakeholders with direct contact with all residents and property owners, they have potential influence. However, the interviewee sees a lack of incentives for them to take on this additional burden.

In this context, the *Family and Friends* tariff introduced by OurPower, should also be carefully considered. This latest development was mentioned by many interviewees as a social innovation that allows producers to offer discounted energy prices to people, they know, like or are connected to. However, from a critical perspective, this raises concerns about fairness and inclusivity. The ability to offer lower prices to a select group of people could work against the aim of attracting a more diverse group and could lead to a system where only those who have personal relationships with the producers benefit, and others in the wider community may be disadvantaged. As OurPower's membership structure already is not very diverse, this tariff could exacerbate existing inequalities. As suggested by the CoRIS theory, the negative effects that this innovation could exacerbate should also be considered and carefully assessed to avoid destructive creation (cf. TÖDTLING et al. 2021: 5). However, if put in the right place, it is conceivable that the innovation of the *Family and Friends* tariff could also have a positive impact on integration. For example, the tariffs could

be used in partnership with NGOs or other social organisations in order to transfer the reduced tariffs to socially vulnerable or low-income households that would otherwise not have access to the favourable prices. As already suggested by one interviewee, *Sozialbau Wien* or similar organisations could in general act as intermediaries, enabling residents to benefit from reduced energy costs.

Another critical factor that arises from the research within the third core process is that OurPower cannot yet fully decouple itself from existing structures and actively pursue exnovation mechanisms. Given the complexity and existing infrastructure of the electricity grid, this is also not very realistic. Therefore, operating within the existing system is not necessarily to be viewed as problematic as long as unsustainable structures do not influence the goals or direction of the CoRIS initiative. Rather, it is important that the OurPower initiative can maintain its values without them being overlaid by capital interests, as is the case on the spot market. The findings show that long-term independence relies therefore on solidarity-based growth and strengthening the cooperative energy sector.

9 Conclusion

What becomes clear from the research within this master's thesis is that the energy transition, with all its systemic components and different stakeholders, is a very complex and hard to understand topic. It is therefore not possible to give simple answers to energy questions in the context of social and environmental challenges. In other words, to give the right answers, one must maintain a holistic view. As highlighted in the initial chapters, the energy transition faces meta-problems ranging from technical and infrastructural to social and political complexities. With the decentralisation of the energy system and the rise of prosumers, citizens as end users of electricity systems are actively involved in the energy transition. While energy cooperatives have existed in Austria since the 20th century, the concept of energy communities (ECs) gained significant momentum only after the EU introduced the *Clean Energy for All Europeans* package in 2019. Austria has taken a leading role in transposing these EU directives into its national legal framework, thereby advancing the establishment and support of energy communities.

The energy cooperative OurPower in Austria plays a pioneering role and has created an entirely new local electricity market that operates as independently as possible from the centralised spot markets. As the results of the interviews show, the four core processes of CoRIS serve as a valuable tool to assess the innovative dynamics of the OurPower initiative. Based on this study, one can conclude that energy cooperatives, such as OurPower, offer a promising model for navigating the social and environmental complexities of the energy transition. While they face challenges, especially in maintaining autonomy within existing market structures and gaining prominence, their ability to foster innovation and solidarity-based growth is crucial. The CoRIS framework effectively highlights the interplay of these dynamics, particularly the tensions between maintaining a sustainable pathway and reacting to current pressures from established market players. The study also reveals that OurPower heavily depends on the active involvement of its community and is working towards including a more diverse set of stakeholders, which will be essential for the cooperative's growth and resilience.

Finally, it should be noted that the core of the OurPower initiative is its continuous development as a dynamic system that adapts and evolves through research and feedback to meet these challenges. One interviewee shared his/her insight into the future development of OurPower and its innovation process, which is quoted at this point as a conclusion and outlook to this paper and this research:

> *“What I find exciting about the whole thing is that we simply don't yet know exactly what the world of tomorrow that we are creating will look like, which logically goes far beyond energy. If we want to overcome the climate and natural crises, our society will change fundamentally. But a not insignificant part of this is energy production. In other words, there are of course many different ideas, but it is a learning process. We all somehow have ideas, but we are learning and trying things out all the time. And that's what I find so exciting about OurPower and what we're doing. Everyone would probably say to each other: Do we know exactly what it will look like in 20 years? And do we somehow have all the answers? - No, certainly not. But it is a very innovative system in the sense that you are somehow constantly learning and you are dealing with feedback loops, regardless of where they come from, and then you try to incorporate them somehow, to adapt, and that is dynamic to a relatively high degree, I would say. That is an exciting aspect of the whole thing.” (P5)*

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