Young Europeans: how to act on the Climate crisis?

Unlocking the potential of Renewable Energy Cooperatives.

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Abstract

The purpose of this research paper is to understand both the potential and the barriers to development of renewable energy cooperatives in Europe. The paper starts by offering theoretical framework regarding cooperation and cooperatives, including the core cooperative principles and by introducing the term "renewable energy cooperative", along with its classification. Alternative roles that citizens can play in the energy system are also discussed, along with the wider socio-economic and environmental potential of REScoops. Then case studies are provided – first on the state of renewable energy cooperatives in Germany and then in Poland. The final section discusses findings from the case studies in an attempt to understand the obstacles inhibiting the potential of REScoops.

Contents

1. Introduction

What does climate change mean for a person born in 2000? According to the Intergovernmental Panel on Climate Change, by 2050, she or he is likely to live, along with 8.4-11.3 billion other people, on a planet that is even 2.6°C warmer and with sea levels higher by 5-32 cm compared with 1990[1]. The impact of these changes will not be distributed evenly - lives of impoverished people will be threatened the most. Wealthier people, however, will also be affected, directly or indirectly, as climate change spreads to every place and to every aspect of our life, marking ecosystem functions, food production, our social and economic system[2].

Future risks associated with climate change depend primarily on decisions and policies reinforced today. The 2015 Paris Agreement, having collected up to this day 197 signatures, aims at keeping a global temperature rise this century well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase even further to 1.5°C. The Intergovernmental Panel on Climate Change has made clear in the Fifth Assessment Report (AR5) from 2014[3] that we urgently need to change how we generate, use and think about energy if we want to meet this target. Besides the need to mitigate climate change, increasing energy demands and energy security concerns also push us to move towards a decarbonised and more efficient energy system[4]. Therefore, the transition from fossil fuels to renewable energy sources is essential. However, even this might not be sufficient to limit global warming in due time and maintain it. Research has made clear that, in order to

[1] Intergovernmental Panel on Climate Change (IPCC). Technical summary. Climate change 2013: the physical science basis. Cambridge, UK, 2013.

[2] Intergovernmental Panel on Climate Change (IPPC). Climate change 2014 synthesis report: summary for policy makers. Geneva, Switzerland, 2014.

[3] Ibidem.

[4] J. Roberts, F. Bodman, R. Rybski. Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy. London, 2014. Available at: https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/model_legal_frameworks_2014.pdf

effectively tackle the challenges of climate change[5], we need to transform our socio-economic systems as they are the reason for today's crisis[6].

Many young climate activists are very much aware of that and they oppose current economic, social and environmental policies, practices or the whole system, believing that the solutions need to come from entirely different thinking about our role as humanity. The global youth is expressing dissent towards political business-as-usual approach toward climate change and its movement is growing rapidly. On the 20th of September 2019 over 4 million people in 185 countries took part in the Global Climate Strike organised by the youth to fight the fossil fuel industry and demand strong and immediate actions from world leaders[7]. However, youth climate activism has many facets, and goes far beyond going onto the streets and boycotting the status quo. Younger generation addresses climate change through political engagement, others by pursuing small, community-based activities, finally, many young people focus on individual, issue-specific actions e.g. following vegan diet or giving up flying. Clearly, different types of climate activism can vary greatly in their impacts. Individual actions are important, but only a collective action can turn people's energy into systemic change.

How can this be achieved? At best, our system should change from a competition-based approach towards a more cooperative economy and participatory civil society. One of the business models bridging the current free market system with cooperation and strong social values is a cooperative. The type of cooperative that further connects these aspects to climate change mitigation and getting off fossil fuels is a renewable energy cooperative (further: REScoop). Renewable energy sources themselves offer a transformative potential due to their capacity to produce energy at a local level. This allows citizens to develop local, bottom-up energy initiatives and establish some independence from their suppliers. Cooperatives tend to pose a natural legal form for such initiatives, because they combine public participation, social responsibility and flexibility. This combination makes ~~a~~ REScoop an ideal instrument for climate activists of all ages, who wish to boost their impact by reducing carbon emissions, developing an alternative business entity and building a

[5] J. Rockström [et al.], A roadmap for rapid decarbonization. Science 355:1269-1271, 2017.

[6] K. O'Brien, E. Selboe, B. M. Hayward. Exploring youth activism on climate change: dutiful, disruptive, and dangerous dissent. Ecology and Society 23(3), 2018.

[7] Tuazon J., Over 4 Million Join the Global Climate Strike, 2019, Retrieved from: https://350.org/over-4-million-join-the-global-climate-strike/.

community of like-minded people concerned about climate change.

2. Exploring the potential of renewable energy cooperatives.

2.1. Cooperation and cooperatives.

There are two major ways of achieving goals: competing and cooperating. The typical outcome of competition is the division of parties into winners and losers; needless to say, the winners are just a select few[8]. Competition means working separately for selfish benefit and "the survival of the fittest"[9]. Cooperation, on the other hand, is the practice of working together with mutually agreed-upon goals. In a cooperative environment, one's success is dependent upon the success of the other; therefore, individuals help and encourage each other to work harder[10]. Both paths are a natural form of interaction among living beings, which can be observed in all levels of the biological hierarchy. However, the modern world's economic and political systems are mainly based on competition, with cooperation being used as a tool to gain more power and influence, thus ultimately becoming even more competitive. The imbalance between competition and cooperation led humanity to many of today's problems, with climate change being the greatest of all. The quote from "the Biology of Globalization" by Dr. Sahtouris may serve as reference for this reflection: "one can discern in evolution a repeating pattern in which aggressive competition leads to a threat of extinction, which is then avoided by the formation of cooperative alliances"[11]. As the planet appears to be undergoing a mass extinction, it is high time to shift towards more cooperative ways of thinking and acting. A cooperative enterprise seems indeed to be the prime candidate for carrying out systemic change, as we will explore ahead. Lars Hillbom, the ex-president of International Cooperative Alliance (ICA), remarks that "people have grown tired of an egoistic approach and want to be responsible for shaping their own future"[12].

Naturally the fact that the current economic system is competition-oriented does not mean that cooperative action is non-existent. After all, human society would have never

[8] R. C. Williams, The cooperative movement: globalization from below. London, 2007.

[9] H. Spencer, Principles of biology. London, 1884.

[10] M. Deutsch, Cooperation and trust: Some theoretical notes, Nebraska Symposium on Motiviation, pp. 275–320, 1962.

[11] E. Sahtouris, The biology of globalization, World Futures, vol. 55, no. 2, pp. 105–127, 2000.

[12] R. C. Williams, The cooperative movement: globalization from below. London, 2007.

developed and persevered without simple economic cooperation[13]. However, the cooperative movement per se has evolved only over the last 200 years, with its roots dating from the beginning of the industrial revolution. Most scholars place the origin of the movement in 1844, when a group of 28 weavers formed a consumer cooperative in Rochdale, England, in response to increased pressure from the changing market system. The group created a set of cooperative principles to guide their work[14]. The updated version of these principles was adopted by the ICA in 1995 as part of the Statement on the Cooperative Identity[15]. The ICA is a non-governmental co-operative union, which was founded in 1895 and is representing the cooperative movement worldwide to this day.

In order to understand the potential of cooperatives, it is important to understand what exactly distinguishes them from other types of business models. Currently, cooperatives may be defined as autonomous associations, jointly owned and democratically controlled by people who voluntarily become members in order to meet their common economic, social and cultural needs. Therefore, the major difference between cooperatives and conventional corporate entities is that no outside investors are engaged. Cooperatives are also distinct from non-profit organisations – the latter are charitable by nature, while the former need to deliver goods or services to its members. Moreover, cooperative businesses carry with them underlying social values and ethical principles which are essential to their functioning. A cooperative must be based on the values of self-help, self-responsibility, democracy, equality, equity and solidarity. These values are put into practice by the seven principles adopted by the ICA. They provide that a true cooperative will:

1. offer voluntary and open membership;
2. govern by democratic member participation ("one member, one share, one vote");
3. operate by equal and "fair" economic participation of its members;
4. remain autonomous and independent of governments' or any other external power's intervention (e.g. corporations);
5. provide education and training for its members and inform them about the

[13] J. Curl, The Cooperative Movement in Century 21, Affin. A J. Radic. Theory, Cult. Action, vol. 4, no. 1, pp. 12–29, 2010.

[14] R. C. Williams, The cooperative movement: globalization from below. London, 2007.

[15] International Cooperative Alliance, Cooperative identity, values & principles, Retrieved from: https://www.ica.coop/en/cooperatives/cooperative-identity.

nature, principles, values, and benefits of the cooperative;

6. incentivise cooperation among cooperatives;
7. contribute to the sustainable development of the community.

The first rule means that cooperatives are open to all people regardless of their gender, race, religion, social status, political views, sexual orientation, disabilities, etc. The condition is that all members need to be able to use the services provided by the cooperative and accept responsibilities linked to their membership. The principle of "one member, one share, one vote" is particularly important in regard to the energy sector, where often one financially strong member holds the vast majority of shares and consequently the majority of votes. In a cooperative, members actively participate in decision-making processes; they also elect representatives that are accountable to their membership. The democratic governance of a cooperative is reflected not only in the voting rules, but also in the way the capital is controlled. Members contribute equitably to the capital which is, at least partly, the common property of the cooperative. If they wish to raise capital from external sources, they do so on terms that ensure the autonomy and independence of the cooperative enterprise, as it follows from the fourth principle. The fifth and sixth principles show that fostering active participation really lies at the heart of a cooperative: not only enhancing internal operations by educating its members, but also going beyond their inner circle and engaging with the general public as well as with other cooperatives.

These principles are strongly recommended by the ICA to all cooperatives around the world, though in practice many of them have found it necessary to modify some of them in order to fit local cultural or legal constraints. Additionally, it is much more difficult for some cooperatives to act in line with the seven principles due to unfavourable political systems that are at odds with cooperative values - in China, for the instance, only 1% of rural cooperatives would actually meet these principles[16]. This should not be the case within the European context though - it can be safely assumed that the seven principles remain in line with the values of the European Union as indicated in Article 2 of the Treaty on European Union[17].

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[16] E. T. Yeh, K. J. O'Brien, and J. Ye, Rural politics in contemporary China, J. Peasant Stud., vol. 40, no. 6, pp. 915–928, 2013.

[17] Article 2: "The Union is founded on the values of respect for human dignity, freedom, democracy, equality, the rule of law and respect for human rights, including the rights of persons belonging to minorities. These values are common to the Member States in a society in which pluralism, non-discrimination, tolerance, justice, solidarity and equality between women and men prevail".

When it comes to classifying cooperatives, and since they are people-centered organisations, the easiest way is to identify who qualifies for membership. Examples include consumer cooperatives, built by the people who use its services; housing cooperatives, managed by the people who live there; or worker cooperatives. Hybrid forms are, however, also possible. There are numerous types of cooperatives present in many sectors of the economy and it is important to keep this variety in mind since they may receive different treatment within their own national legal systems.

2.2. Renewable energy cooperatives.

As discussed above, cooperatives as such are a relatively new concept dating back only to the mid-19th century, though several sectorial cooperatives are already treated as a relic of the past in some countries[18]. Renewable energy cooperatives, however, have not yet deserved this title since they are a very recent type of cooperative enterprise. European REScoops started in the 1970s and 1980s with the promotion of community-owned wind energy projects, but with time they gained popularity and covered a wider range of technologies such as the photovoltaic (PV)[19]. Today, many cooperatives dealing with renewable energy can be found across Europe, most notably in Germany, Denmark and UK[20].

A renewable energy cooperative may conduct several activities along the energy value chain: provide technological services, produce renewable energy, distribute energy, operate the energy infrastructure, market and sell energy as well as offer renewable energy demand and supply services[21]. The production model, however, is the most frequent type of REScoop

[18] J. Blome-Drees, Zur Aktualität des genossenschaftlichen Geschäftsmodells, Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehm., vol. 35, no. 4, pp. 365–385, 2012.

[19] S. Agterbosch, W. Vermeulen, P. Glasbergen, Implementation of wind energy in the Netherlands: the importance of the social-institutional setting. Energy Policy, 32, 2004.

[20] A. Schreuer, D. Weismeier-Sammer, Energy cooperatives and local ownership in the field of renewable energy technologies: a literature review. Research Reports / RICC, 4. WU Vienna University of Economics and Business, Vienna, 2010.

[21] S. Debor, The socio-economic power of renewable energy production cooperatives in Germany: results of an empirical assessment, Wuppertal Papers, 187, 2014.

established in Europe[22]. This is understandable given that the primary motive to join such enterprises is the appropriation of energy production.

Taking into account this diversity of activities, how can a renewable energy cooperative be defined? According to REScoop.eu - the European federation for renewable energy cooperatives - it is "a business model where citizens jointly own and participate in renewable energy or energy efficiency projects"[23]. There is no official definition of a REScoop at the EU level, though the recently adopted Directive 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity[24] defines "citizen energy community" in Article 2.11. This may be perceived as an umbrella term for REScoops and similar initiatives.

Cooperatives are not the only possible form of citizens' participation in renewable energy projects. For example, a local community can be offered shares in a wind farm by an external investor who will develop the project[25]. This constitutes only a minimal level of participation if compared with a REScoop though - small shareholders have very limited control over how the energy is produced. Moreover, if we take into consideration that shares are offered by an external investor to the inhabitants of an area, often primary owners of the land, in a project that profits from a common good – wind - offering shares seems to be quite a disproportional trade-off for locals given the huge change their lands and environment will go through. Another major weakness of this scheme is that it does not ensure the approval of the project's development by local citizens and offering shares could almost be considered a "bribe"[26]. Renewable energy cooperatives and the principle of "one member, one share, one

[22] REScoop 20-20-20, Report on financial barriers and existing solutions, Available at: https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/rescoop_20-20-20_financial_barriers_and_existing_solutions_en.pdf

[23] REScoop.eu, What is a REScoop?, Retrieved from: https://www.rescoop.eu/the-rescoop-model

[24] Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU, OJ L 158, p. 125–199, 2019.

[25] J. Roberts, F. Bodman, R. Rybski. Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy. London, 2014. Available at: https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/model_legal_frameworks_2014.pdf

[26] Ibidem.

vote" ensure that the decision-making power does not belong to a single company, but to the broader community, which often results in the continued social approval of the project.

However, and in order not to demonise such partnerships, it is important to say that the situation set out above could look different if a bottom-up approach would be used. For example, individual local citizens could establish a limited partnership with a private limited company as a key partner, thus engaging it intentionally as their own communal choice and by their own initiative. Nonetheless, the partnership's governance would still highly depend on the value of each partner's stake in the enterprise, which in most cases would be the highest on the limited company's side.

Other formulas of participation can also include public authorities. For instance, local authorities and a community group can reach an agreement, in which the authorities make a roof of a public building available for installation of photovoltaic solar panels and the community group covers the costs of the project; the ownership of the installation may be split between both partners.

For the energy transition to succeed, it is crucial to enable many and diverse forms of local ownership and participation in renewable energy in national legislation. Individuals, but also non-governmental organisations, municipalities, as well as small and medium-sized enterprises should be able to utilise different models of collaboration on renewable energy projects. In order to provide a wide spectrum of possibilities, different combinations of ownership and participation models should be allowed and secured in national legislation as well. However, it is really important to safeguard the interest of individuals and community groups in each of these models. These groups are more vulnerable than legal persons (e.g. companies, municipalities) due to their more fragile organisational and financial structures. Therefore, it becomes easier to eclipse them once a partnership is established or an agreement is reached; for this reason, ensuring clear rules of transparency and accountability is essential at the initial stage of a project. A renewable energy cooperative is exposed to such risks to a far lesser degree, because of its different management rules and underlying ethical principles.

2.3. The socio-economic potential of renewable energy cooperatives.

In the 2016 CE Delft's report, it was estimated that about half of all EU households could be producing their own electricity by 2050, and meeting 45% of the EU's

energy demand[27]. This number is striking and, as stated in the report, it could potentially grow up to 187 million households (83% of the EU's households), making them active participants in the Community energy market.[28] This economic potential of citizens energy initiatives to take over shares of the EU energy market applies to renewable energy cooperatives, but not exclusively. What distinguishes a REScoop from other forms of community power is its social potential, resulting from the high level of engagement of its members.

In 2001 the United Nations General Assembly (UNGA) recognised that cooperatives "are becoming a major factor of economic and social development," and urged governments to promote their growth by "utilising and developing fully the potential and contribution of cooperatives for the attainment of social development goals, in particular the eradication of poverty, the generation of full and productive employment and the enhancement of social integration" and "by creating a supportive and enabling environment for the development of cooperatives by, inter alia, developing an effective partnership between governments and the cooperative movement"[29]. In its subsequent resolution 70/128 from 2015, the UNGA stated that "cooperatives, in their various forms, promoted the fullest possible participation in the economic and social development of all people, including women, youth, older persons, persons with disabilities and indigenous peoples[30]".

This also applies to the cooperatives specialised in generating renewable energy or delivering any other energy-related services. They do not only displace fossil fuel consumption by producing clean energy, but also carry with them a social element which may result in additional positive outcomes. Overall, REScoops are considered to have the potential to increase acceptance of renewable energy developments (1), raise awareness of sustainable energy and lifestyle (2), build social capital (3), create local jobs (4), boost

[27] B. Kampman, J. Blommerde, M. Afman, The potential of energy citizens in the European Union, Delft, CE Delft, 2016.

[28] Ibidem.

[29] Resolution 56/114, 56th session of the United Nations General Assembly, A/RES/56/114, agenda item 108, adopted on 19th December 2001.

[30] Resolution 70/128, 70th session of the United Nations General Assembly, agenda item 28(b), adopted on 17th of December 2015.

women's empowerment in the energy sector[31](5) and reduce energy poverty (6). Due to their structure and principles, renewable energy cooperatives also play a role in shaping more democratically controlled energy systems[32].

1. Renewable energy cooperatives are very often local initiatives (in which a municipality is a common member). Installing a renewable technology in a local context provides the inhabitants of the area – REScoops' members and members-to-be - with a visible demonstration; seeing such an installation actually functioning is very important in changing people's attitude towards renewables, as often "seeing means believing"[33]. A community-led renewable energy initiative is also more likely to deliver a more locally appropriate installation than an outside investor, as they potentially have the best knowledge about the local strengths and capitals which are the basis of place-based thinking. This local approach can lead to an increased acceptance and consequent spread of renewable technologies.

2. The direct engagement of REScoops' members in the installation and operation of renewable energy technologies leads to ongoing learning and can result in potentially long-lasting behaviour changes[34]. The educational aspect is also strongly supported by renewable energy cooperatives that often organise lectures and workshops on energy and climate related issues for its members and local community[35].

3. The people-centred approach within cooperatives can also foster the development of social capital and norms. According to Putnam, this is due to the fact that cooperatives and voluntary associations transfer to their members habits of cooperation, solidarity and public-spiritedness[36]. It is also related to the aforementioned local context, in which a cooperative is

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[31] J. Eichermüller, M. Furlan, K. Habersbrunner, Z. Kordić, Energy cooperatives. Comparative analysis in Eastern Partnership countries and Western Balkans, WECF, ZEZ, 2017.

[32] A. McCabe, D. Pojani, and A. Broese van Groenou, Social housing and renewable energy: Community energy in a supporting role, Energy Res. Soc. Sci., vol. 38, pp. 110–113, 2018.

[33] J. C. Rogers, E. A. Simmons, I. Convery, and A. Weatherall, Social impacts of community renewable energy projects: Findings from a woodfuel case study, Energy Policy, vol. 42, pp. 239–247, 2012.

[34] D. van der Horst, Social enterprise and renewable energy: emerging initiatives and communities of practice, Soc. Enterp. J., vol. 4, no. 3, pp. 171–185, 2008.

[35] See example: http://neue-energie-bendorf.de/umsetzung/bildung-fuer-den-klimaschutz.

[36] R. D. Putnam, Making democracy work: Civic traditions in modern Italy. 1993.

often established. The spatial closeness facilitates direct social interactions, since face-to-face communication is neither cost nor time consuming. This contributes to a higher degree of mutual trust and support within a community.

4. Without a doubt, the adoption of renewable energy technologies creates employment opportunities, often in rural areas with comparatively low economic development[37]. However, the local community will not always benefit from new jobs due to skill deficits. REScoops do not offer a supreme way out of this problem but they can ensure that the preference in awarding a contract will be given to their members and locals. Moreover, jobs in other sectors can be generated indirectly, due to reduced capital outflow which creates additional value.[38]

5. According to IRENA's 2019 Report on Renewable Energy and Jobs, the renewable energy field appeals to women in ways that the fossil fuel industry does not. Currently, women represent 32% of the renewable energy workforce.[39] REScoops following the seven cooperative principles are more likely to create a hospitable environment for women and integrate the gender equality dimension into their activities than profit-making renewable energy companies.

6. As regards energy poverty reduction, it is worth considering the origins of the cooperative movement. The first cooperatives were a response to low wages and financial insecurity at the beginning of the industrial revolution. Therefore, the cooperative movement started with the aim of safeguarding the well-being of vulnerable groups in society. The principle of equal and fair financial contribution allows for the participation of poorer citizens in energy production and consumption. Some REScoops reach out to low-income households and help them invest in energy efficiency measures or provide advice on how to reduce energy use and lower energy bills. According to the study "Exploring Local and Community Capacity to Reduce Fuel Poverty: The Case of Home Energy Advice Visits in the UK", long-term local professional initiatives appear to be most effective at reaching and providing

[37] IRENA, Renewable Energy and Jobs Annual Review 2019, International Renewable Energy Agency, Abu Dhabi, 2019. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jun/IRENA_RE_Jobs_2019-report.pdf

[38] B. Hirschl, Kommunale Wertschöpfung durch Erneuerbare Energien. Berlin, 2010.

[39] IRENA, Renewable Energy and Jobs Annual Review 2019, International Renewable Energy Agency, Abu Dhabi, 2019. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jun/IRENA_RE_Jobs_2019-report.pdf

support to fuel poor households across a local area[40], and a renewable energy cooperative meets all the requirements for it.

2.4. The environmental potential of renewable energy cooperatives.

Without detracting from the importance of the social and economic potential of renewable energy cooperatives, we now turn to the main reason why REScoops should be more widespread – their potential to contribute to the achievement of climate and energy objectives that already have been and will continue to be set at national, international and European levels[41].

In regard to climate change mitigation, the simplest way the influence of REScoops can be measured is the reduction of emissions and the increased volume of energy produced from renewable sources. The level of emission reduction achieved by these initiatives is caused by several factors. Firstly, the size of installation – larger scale operations lead to higher absolute reductions. Secondly, the share of renewable energy in the national energy mix – the lower it is, the higher the emission reduction achieved can be. Finally, the technology used is of high relevance[42]. Citizen-led initiatives that focus on generating electricity achieve a larger emission reduction per kilowatt hour than initiatives providing heat[43].

According to the study comparing the climate change mitigation potential of community-based initiatives in Europe among eight different activities across the transport, food, energy and waste domains, electricity generation and heat provision through renewable sources present the highest potential for emission reduction[44]. As the "Energy Atlas" reports,

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[40] A. Reeves, Exploring local and community capacity to reduce fuel poverty: The case of home energy advice visits in the UK, Energies, vol. 9, no. 4, 2016.

[41] For example: in the European Green Deal and Climate Law, preannounced in the Political Guidelines of Ursula von der Leyen for the next the next European Commission 2019-2024; available at:https://www.europarl.europa.eu/resources/library/media/20190716RES57231/20190716RES57231.pdf

[42] For example: a single wind turbine can generate the same amount of electricity as thousands of solar panels.

[43] D. M. Landholm [et al.], Climate change mitigation potential of community-based initiatives in Europe, Reg. Environ. Chang, vol. 19, no. 4, pp. 927–938, 2019.

[44] Ibidem.

European citizens (not only REScoops) may produce around 1,558 TWh of energy by 2050, twice as much as nuclear power plants generated in 2016 (840 TWh)[45].

Renewable energy cooperatives undoubtedly contribute to reducing carbon emissions by replacing energy that comes from fossil fuels, though the more long-lasting social impact of renewable energy cooperatives also plays an important role for the future. Many citizen-led initiatives, especially REScoops, engage in educational activities aiming for behavioural change in the energy use of the community. This includes changes in day-to-day behaviour, but also in long-term thinking, which ultimately leads to further emission reduction due to overall cutback in energy consumption. Moreover, the bottom-up approach of renewable energy cooperatives positively impacts the level of acceptance of the energy transition among citizens, which is a crucial element in the successful implementation of new climate policies[46].

Finally, REScoops carry potential for bringing environmental improvements. Kunze and Becker[47] point to an example of a town in Germany, where revenue from wind turbines is used to buy seeds. These are planted in order to provide a habitat for insects, e.g. pollinators[48], which contributes to local biodiversity preservation. Obviously, this is not a typical activity for a renewable energy cooperative, but this example proves that REScoops can develop diverse value-added services for the benefit of the environment.

3. Barriers to development of renewable energy cooperatives.

3.1. The Clean energy for all Europeans package.

Even though there are already thousands of renewable energy cooperatives registered across Europe, this movement still has a large untapped potential[49]. The existing REScoops are very unevenly distributed across the EU, dividing the continent into two parts which sadly

[45] M. Aryblia [et al.], Energy Atlas. Facts and figures about renewables in Europe 2018, Berlin-Brussels 2018, Available at: https://www.foeeurope.org/sites/default/files/renewable_energy/2018/energy_atlas.pdf

[46] P. C. Stern, Individual and household interactions with energy systems: toward integrated understanding, Energy Res. Soc. Sci., vol. 1, pp. 41–48, 2014.

[47] C. Kunze, S. Becker, Energy democracy in Europe: a survey and outlook. Brussels, 2014.

[48] See: http://www.wendenenergie.de/

[49] See: B. Kampman, J. Blommerde, M. Afman, The potential of energy citizens in the European Union, Delft, CE Delft, 2016.

correspond to the ones once split by the Iron Curtain.

There are, however, some positive signals coming mainly from the EU institutions when it comes to unlocking the potential of renewable energy communities in the upcoming years. In July 2019 Ursula von der Leyen was elected the new president of the European Commission. Before the vote had been executed, she announced a European Green Deal - a plan aiming at making Europe climate neutral by 2050. The Green Deal will include the Climate Law - a regulatory framework for the implementation of this target[50]. Additionally, the legal framework for the European Energy Union has been reshaped this year, following the formal adoption of the Clean Energy Package (CEP). CEP is a set of four directives and four regulations concerning i. a. the governance of the Energy Union, renewable energy, electricity market and energy efficiency.

The Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action[51] introduces the instrument of integrated 10-year national energy and climate plans (NECPs) for the period between 2021 to 2030, that Member States are required to deliver to the Commission by the end of 2019. The NECPs outline how EU countries will achieve their targets on all dimensions of the energy union, including a longer-term view towards 2050.

The Clean Energy Package also puts a strong focus on prosumers and, by setting a far-reaching legislation, it builds a solid foundation for national actions in this regard. As mentioned earlier, the term “citizen energy community” has been legally recognised in Article 2.11 of the Directive 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity[52]. According to this Directive, citizen energy community is a legal entity that (a) is based on voluntary and open participation and is effectively controlled by members or shareholders that are natural

[50] See: Political Guidelines of Ursula von der Leyen for the next the next European Commission 2019-2024; available at: https://www.europarl.europa.eu/resources/library/media/20190716RES57231/20190716RES57231.pdf

[51] Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, OJ L 328, 21.12.2018, p. 1–77.

[52] Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU,OJ L 158, 14.6.2019, p. 125–199.

persons, local authorities, including municipalities, or small enterprises; (b) has as its primary purpose to provide environmental, economic or social community benefits to its members or shareholders or to the local areas where it operates rather than to generate financial profits; and (c) may engage in generation, including from renewable sources, distribution, supply, consumption, aggregation, energy storage, energy efficiency services or charging services for electric vehicles or provide other energy services to its members or shareholders. Another important definition – renewable energy community - is contained in Article 2.16 of the Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources[53]. This directive sets a milestone for energy democracy in Europe because, pursuant to it, customers are given the right to invest in renewable energy projects, while maintaining their rights or obligations as final customers. This means that they can have several contracts with more energy providers, the right to accurate billing information and the right to switch a supplier. Both directives must be transposed into national law by the Member States by December 2020 (Electricity Directive) and by June 2021 (Renewable Energy Directive).

Attention should also be drawn to the fact that Member States will be required to remove all unjustified regulatory and administrative barriers to renewable energy communities and to ensure that the national rules regarding renewable energy projects are proportionate, necessary and contribute to the implementation of the energy efficiency's first principle. Dismantling the unnecessary procedural burden can significantly influence the number of citizen energy initiatives in the European Union.

3. 2. Introduction to case studies.

In order to better contextualise this subject at the national level, two specific examples will be presented in the subsequent sections. In the first example we will explore the current situation of renewable energy cooperatives in Germany - one of the European leaders when it comes to the volume of renewable energy generated by citizens. Poland serves as the second example due to a contrasting state of affairs, in which renewable energy communities are astonishingly undeveloped. Even though each Member State has singular characteristics to consider, the two entirely different perspectives presented here will hopefully provide a more

[53] Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources, OJ L 328, 21.12.2018, p. 82–209.

comprehensive overview of renewable energy communities in Europe, while touching upon common limitations and development barriers.

A. Case study: Germany.

The number of renewable energy cooperatives in Germany is exceptional in Europe - currently, it has around 183,000 members who hold shares worth a total of 714 million EUR. Overall, it has invested 2.7 billion EUR in renewable energy[54]. The last number proves that energy cooperatives, along with other citizen-led energy initiatives have been an essential building block of renewable energy development in Germany. What is more, REScoops are considered to play a crucial role in the social acceptance of the energy transition due to their bottom-up, engaging business model.

The vast majority of energy cooperatives in Germany is focused on renewable energy production. In 2019 the most popular area of activity among the German REScoops was photovoltaic solar energy production (73%). 37% of REScoops has been active in the field of energy delivery, and almost a quarter produce energy from wind. Although most renewable energy cooperatives focus on one energy resource – mostly solar – there are some cooperative enterprises with a more diverse portfolio.

The reasons for such a large number of renewable energy cooperatives in Germany can be sought i. a. in the legal instruments that provided community groups with financial support for their energy initiatives, like guaranteed feed-in tariffs or priority access to the grid. These regulations followed on from the general energy policy direction of the country, with Energiewende being its "flagship brand". Another reason that must not be overlooked is the long history of the cooperative movement in Germany which, over time, has become deeply rooted in society.

Unfortunately, as the DGRV survey reveals, the recent changes in energy law have become a threat to citizens' energy cooperatives. The successive amendments of the German Renewable Energy Sources Act led to a reduction in financial support and to the switch to auctions for licences for new capacity. These changes are strongly affecting REScoops and

[54] DGRV (German Cooperative and Raiffeisen Confederation). Energy Cooperatives: Findings of Survey Conducted by the DGRV and Its Member Associations. Berlin: DGRV, 2019. Available at: https://www.dgrv.de/weben.nsf/2a1a6cd05dbb01c0c1256e2f005612d1/baac6a28bc9bd7a9c125844100380e47/$FILE/Survey_Energy_Cooperations_2019.pdf.

other community energy initiatives. For example, according to DGRV, only 54% of cooperatives consider investing in roof-mounted solar power systems after the support for these installations was reduced[55].

a) Historical background.

Cooperatives have a long tradition in Germany – the country was one of the pioneers of the cooperative movement, with Friedrich Wilhelm Raiffeisen (1818-1888) and Hermann Schulze-Delitzsch (1808-1883) being the most significant figures. Raiffeisen founded the first cooperative lending bank that was thought as a mechanism of self-help for farmers who were too poor to seek credit from banks as individual landowners and had to resort to loan sharks. The vision that accompanied this project was based on the three "S" formula: self-help, self-governance and self-responsibility (in German: Selbsthilfe, Selbstverwaltung and Selbstverantwortung) and on the idea of creating value as a group ("What one person cannot do, a group can do together")[56].

This vision remains the foundation of the numerous German cooperatives to this day. It has often been invoked in the last fifteen years, since the cooperative idea has been experiencing a renaissance in Germany. Currently there are around 8000 cooperative enterprises registered in Germany with over 21 million members[57], with 2000 of them established only between 2007 and 2015[58]. The great number of cooperatives established in this period belongs to the energy sector - according to the DGRV survey from 2019[59], 869 energy cooperatives in Germany have been founded after the year 2006, which is considered to be the beginning of the big boom for REScoops.

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[55] Ibidem.

[56] J. Blome-Drees, Zur Aktualität des genossenschaftlichen Geschäftsmodells, Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehm., vol. 35, no. 4, pp. 365–385, 2012.

[57] Cooperatives Europe. The power of cooperation. Cooperatives Europe key figures 2015. Brussels, 2016. Available at: https://coopseurope.coop/sites/default/files/The%20power%20of%20Cooperation%20-%20Cooperatives%20Europe%20key%20statistics%202015.pdf

[58] S. Haunstein, M. Thürling, Aktueller Gründungsboom – Genossenschaften liegen im Trend', N aktuell 11, Leibniz-Institut für Länderkunde, 2017.

[59] DGRV (German Cooperative and Raiffeisen Confederation). Energy Cooperatives: Findings of Survey Conducted by the DGRV and Its Member Associations. Berlin: DGRV, 2019.

Interestingly the recent wave of energy cooperatives was not the first of its kind in Germany – the boom for "electricity cooperatives" also took place in the beginning of the 20th century. Some of the enterprises established in the 1920s are still operating today, such as Elektrizitäts-Genossenschaft Röthenbach eG[60].

b) Reasons for the boom of renewable energy cooperatives in Germany.

The dynamic growth of the number of energy cooperatives in Germany can be attributed to various factors. From a legal point of view, the amendment of the German Cooperative Societies Act (Genossenschaftsgesetz; GenG) in 2006 marked an important step in this regard by adjusting the law to the needs of new and small coops. The amendment involved:

1. reducing the minimum number of members from 7 to 3 (§3 GenG);
2. expanding the objectives of cooperatives by including the promotion of social and cultural aspirations of the members (§ par. 1 GenG);
3. allowing in-kind contributions which facilitates the establishment of new cooperatives (§7a par. 3 GenG);
4. allowing a cooperative of maximum 20 members not to require a supervisory organ and to have only one-person management, which reduced management costs (§§24 par. 2 and 9 par. 1 GenG);
5. introducing a simplified audit for smaller cooperatives up to a limited balance sheet and an annual turnover (§53 par. 2 GenG).[61]

The German Cooperative Societies Act dates back to 1889; under this act cooperatives can carry out a diverse number of activities (GenG does not include a catalogue) and an energy cooperative is not explicitly defined in cooperative law.

Energy cooperatives also fall under the term "citizens' energy company" (in German: Bürgerenergiegesellschaft), which is defined in the §3 Nr 15 of the German Renewable Energy Sources Act, as amended in 2017. According to this act, "citizens' energy company" shall mean every company: (a) which consists of at least ten natural persons who are members eligible to vote or shareholders eligible to vote; (b) in which at least 51 percent of

[60] See: https://eg-roethenbach.de

[61] D. Cracogna, A. Fici, H. Henrÿ (eds.), International handbook of cooperative law. Heidelberg, 2013.

the voting rights are held by natural persons (…); (c) in which no member or shareholder of the undertaking holds more than 10 percent of the voting rights of the undertaking (…).

Another trigger for this big boom was a shift to a low-carbon and environmentally-sound energy supply in the country. First, in the year 2000, the intention to phase out nuclear energy was announced by the German cabinet led by Gerhard Schröder; in the same year, feed-in tariffs in support of renewable energy were introduced in the newly enacted Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz - EEG). After the disaster in Fukushima in the year 2011 the intention turned into a decision, according to which nuclear power shall be phased out in Germany by 2022. Shortly before that, in late 2010, legislative support for the low carbon energy transition, i.e. Energiewende, was passed.

The Renewable Energy Sources Act introducing the German Feed-In Tariff system of incentivising RE as well as the priority access to the grid given to renewable energy[62] enabled "alternative" energy sources to compete with fossil fuels; this mechanism also had a positive effect on other support facilities such as loans and grants that could be obtained at better conditions, which facilitated investment in citizen energy initiatives. These financial support mechanisms have proven to be one of the most important factors for the dynamic growth of energy cooperatives in Germany and beyond, as they allowed almost immediate returns on investment. A recent study shows that withdrawing these support schemes resulted in a decline in the number of newly registered REScoops[63]. This holds true for Germany, but also for Denmark and the United Kingdom. Nevertheless, the engagement of already existing German REScoops has not shown a downward trend: the number of members and shares is increasing, although at a slower pace.

c) Amendments to the German Renewable Energy Sources Act and their consequences.

In Germany, changes in financial support schemes have been introduced in the amendments to the Renewable Energy Sources Act in 2012, 2014 and 2017. At first, a cap was introduced for the prioritised feed-in tariff from renewables from 2012 onwards. Then,

[62] Plants for the generation of electricity from renewable sources shall be connected to the grid as a priority, i.e. prior to plants that generate electricity from traditional sources ("principle of priority", § 8 par. 1 EEG 2017).

[63] A. Wierling, V. Schwanitz, J. Gregg, J. Zeiss, C. Bout, C. Candelise, W. Gilcrease. Statistical Evidence on the Role of Energy Cooperatives for the Energy Transition in European Countries. Sustainability. 2018.

the EEG from 2014 marked a departure from an earlier version of this act. It initiated the gradual replacement of specified feed-in tariffs by a tendering system and introduced the market premium scheme, which has become the main support scheme for electricity from renewables. This scheme requires most operators of a new RES installation to directly sell the electricity; instead of an explicit feed-in tariff, they are getting an additional market premium payment for their output.

According to the 2017 review, the premium tariff has to be determined through a tender – although this rule does not apply to all technologies and projects of all sizes. This means that there still remain new projects entitled to a "classical" Feed-In Premium. Moreover, according to §36 of the EEG 2017, citizen energy companies enjoy special auctioning rules, though the analysis of the tender results from May 2017 to May 2018[64] shows that the energy cooperatives (eG) were only marginally involved in the tender procedure. Jan Dobertin, Managing Director of the NRW Renewable Energy Association (LEE NRW), says: "Two things make life difficult for the community wind investors: the risky auctions and the increasingly restrictive approval procedures". "This shift is a fatal flaw, because community power plays a central role in the acceptance of the energy transition" - he continues[65]. Stefan Gsänger, Secretary General of the World Wind Energy Association thinks that "considering the recent ruling of the European Court of Justice that the promotion of renewable energy as per the old German feed-in legislation does not constitute state aid[66], the German government should consider whether a return to a system without auctions would be the most sensible solution". He also adds: "What's so frustrating is that our members tell us that today's competition isn't over capital, it's over opportunities. The system ensures that only the larger investors can participate in the renewable energy

[64] See:https://www.bundesnetzagentur.de/DE/Sachgebiete/ElektrizitaetundGas/Unternehmen_Institutionen/Ausschreibungen/Wind_Onshore/BeendeteAusschreibungen/BeendeteAusschreibungen_node.html

[65] World Wind Energy Association, New study proves: community power is increasingly marginalized, 2019, Retrieved from: https://wwindea.org/blog/2019/05/27/new-study-proves-community-power-is-increasingly-being-marginalised/

[66] Court of Justice of the European Union, Judgement of 29 March 2019, Germany v Commission, C-405/16 P, ECLI:EU:C:2019:268.

expansion. It's permitting, not costs that are the issue".[67] Indeed, according to IRENA's study from May 2019[68], renewables are the cheapest energy option almost anywhere in the world and especially in Germany. Thus, it can be concluded that the main barrier for the further development of renewable energy cooperatives in Germany is the legal constraints rather than social or economic ones.

B. Case study: Poland.

The situation of REScoops in Poland is significantly different than the one in Germany. As opposed to Germany, renewable energy cooperatives in Poland have not had ups and downs because they have never really germinated there. At the moment only one such initiative has been registered in 2014; additionally, three housing cooperatives have recently decided to install photovoltaic solar panels on the rooftops of their members' houses, though energy-related activities remain only a side aspect of their functioning.

The difference in the number of REScoops in Germany and Poland is striking. The main reasons for this could likely be Poland's faint social capital, the general lack of political and financial support for the transition to renewables, and its chaotic energy legislation. Despite the fact that energy cooperatives have been defined in the 2015 Polish Renewable Energy Sources Act, only a very recent amendment to this law (August 2019) has introduced provisions going beyond its mere definition and implementing some incentives.

At the same time, Poland's dependency on coal is unprecedented in the European Union and its energy-related greenhouse gases emissions have not declined in two decades. However, the authorities still do not take action to reduce this amount. Given such a context, the role of Polish citizens is crucial for the national energy transition. If energy production in Poland would gradually become decentralised, it would be much more visible and relevant to citizens. This favourable shift in public opinion towards renewable energy could then positively impact the approach of political leaders and law-makers.

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[67] World Wind Energy Association, New study proves: community power is increasingly marginalized, 2019, Retrieved from: https://wwindea.org/blog/2019/05/27/new-study-proves-community-power-is-increasingly-being-marginalised/

[68] IRENA, Renewable Power Generation Costs in 2018, International Renewable Energy Agency, Abu Dhabi, 2019, Available at: https://www.irena.org/publications/2019/May/Renewable-power-generation-costs-in-2018

a) Cooperative movement in Poland in recent years.

As the German cooperatives were booming, the Polish cooperative movement was in crisis. The share of all cooperatives in the Polish GDP amounted to less than 1% in 2011, far below the European average (about 6%)[69]. Compared to the first years of the new millennium, the number of employees in cooperatives significantly decreased, which was caused by the reduction of the number of cooperatives. Some of the reasons for this downturn may be the lack of social capital and the negative connotation associated to the term "cooperative" due to the country's communist past. The cooperatives in communist Poland were cooperatives only by name. The authors of the paper "Building and Destroying Social Capital: The Case of Cooperative Movements in Denmark and Poland"[70] write: "overall, the communist regime restricted voluntary cooperation, similarly as they restricted the church and religious movement, in order to avoid any rise of potential political opposition. In this way, they purposely destroyed valuable social capital within the voluntary sector. The cooperative (collective) farms that existed during the communist regime in Poland (…), were not based on any principles of voluntarism, they were an extended hand from the state"[71].

After the regime change, the first fully free elections were held in Poland in 1991. This means that Polish democracy is still quite young and the regime's democratisation process needs time to be consolidated in society. This fragile political state of affairs certainly influences the way people approach each other and their perception of cooperation in a negative light. As the Polish cooperative activist, Romuald Mielczarski (1871-1926) once wrote: "the weakness of our cooperation[72] is the responsibility of the system (…). The cooperation (…) is one of the most effective and durable means of democratization, but it can also truly develop only in an independent democratic country"[73].

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[69] B. Wyrzykowska, Polski sektor spółdzielczy w latach 2001-2011, Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego. Ekonomika i Organizacja Gospodarki Żywnościowej, Nr 105, 2014.

[70] J. Chloupkova, G. L. H. Svendsen, G. T. Svendsen, Building and destroying social capital: the case of cooperative movements in Denmark and Poland, Agric. Human Values, vol. 20, no. 3, pp. 241–252, 2003.

[71] Ibidem.

[72] Meaning: our cooperative movement.

[73] R. Mielczarski, Razem! Czyli Społem. Łódź-Sopot-Warszawa, 2010.

b) Polish cooperative law.

The Polish law on cooperatives resembles the German Cooperative Societies Act, therefore the cooperative principles establishing the foundations of German coops are more or less followed. The members of a cooperative may include both natural and legal persons (just as in Germany), hence for example municipalities can also form part of it. Article 6§2 of the Polish Cooperative Law Act, adopted in 1982[74], states that the number of founders cannot be lower than ten when a cooperative is formed by natural persons, and three when a cooperative is formed by legal persons. In agricultural production cooperatives, the number of founders who are natural persons cannot be lower than five.

According to Article 1§1 of the same act, a cooperative is a voluntary association of an unlimited number of persons, with variable membership and variable members' share fund, pursuing joint economic activity in the interest of its members. A cooperative may be involved in social, educational, and cultural activities for the benefit of its members and their communities (Article 1§2). Similarly to Germany, the scope of activities that a cooperative can carry out is not legally limited.

Polish law does specify the term "renewable energy cooperative" but its definition is contained in another regulation, namely the Polish Renewable Energy Sources Act. Such choice by lawmakers explicitly assigns this type of enterprise to the renewable energy sector. It has to be assumed, though, that theoretically, according to the Polish Cooperative Law Act, energy cooperatives producing electricity from different sources could also be registered.

At this point it is worth mentioning that the RES Act introduces another legal formation that shares some similarities with energy cooperatives – an energy cluster. It allows natural and legal persons, municipalities and academic entities to generate energy from renewable sources. Energy clusters can cover an area up to one county or five municipalities. The differences between these two instruments can be found in their legal form and objective. The legal form of a cluster is a civil agreement, hence a cluster does not constitute a legal person as it is the case with energy cooperatives. Furthermore, the objective of a cluster aims at securing energy supply for specific areas as well as bringing profits; energy cooperatives go beyond this approach.

[74] Ustawa z dnia 16 września 1982 r. Prawo spółdzielcze, Dz. U. 1982 Nr 30 poz. 210 z późn. Zm. (The Cooperative Law Act from 16 September 1982, Dz. U. 1982 Nr 30 with subsequent amendments).

Another type of cooperative that has been distinguished in a separate legal act is the housing cooperative. According to Article 1§1 of the Housing Cooperatives Act adopted in December 2000, the objective of a housing cooperative shall be to meet the housing and other needs of its members and their families by providing them with dwellings. Paragraph six of the same article states that a housing cooperative may also conduct another business activity as long as it is directly linked to the objective defined in paragraph one.

c) Renewables and citizens' energy initiatives – the situation in Poland.

The Polish law for regulating the renewable energy industry is the Renewable Energy Sources Act, adopted in February 2015[75] - fifteen years after the analogous German legislation. The objective of this act was to enable renewable energy production in the most cost-effective way in order to take a step towards meeting Poland's commitments under the climate-energy EU policy. The primary regulation included, i.a., provisions on: granting renewable energy with priority access to the grid, establishing several support mechanisms for prosumers, including the implementation of net-metering system for prosumers, and implementing guaranteed feed-in tariffs for biogas plants.

Poland had committed to the target of 15% share of renewables in the country's total gross energy consumption by 2020. This threshold had previously seemed realistic, but it may yet be missed. Back in 2013 this share amounted to 11.4%. However, in 2016, despite the new RES Act, the share of RE in Poland's total energy balance was decreasing instead of increasing[76]. Under current projections there will be a shortfall of just over 1% in meeting obligations[77].

Moreover, the coal energy price has recently spiked in Poland. In order to tackle high energy prices and help achieve or at least move closer to the 15% target (and avoid dire financial consequences), the government has decided to further engage businesses and individuals. New measures and regulations have been implemented following the amendment

[75] Ustawa z dnia 20 lutego 2015 r. o odnawialnych źródłach energii, Dz. U. 2015 poz. 478 z późn. zm. (The Renewable Energy Sources Act from February 20, 2015, Dz. U. 2015 pos. 478 with subsequent amendments).

[76] M. Olszewski, Dirty future: Poland does not manage to switch to renewables, 2019, Retrieved from: https://energytransition.org/2019/02/renewable-energy-sources-not-working-in-poland/

[77] B. Derski, R. Zasuń, Porażka z zieloną energią. Rząd przyznaje: Polska nie osiągnie celu OZE na 2020 rok, 2019, Retrieved from: https://oko.press/porazka-z-zielona-energia/.

of the Polish RES Act. It is to be noted that the Amendment Act came into force very recently, on the 29th of August 2019, so the effects of these new changes cannot yet be properly evaluated.

Newly introduced changes include the auction budgets for the upcoming 2019 RES auctions and provide for certain changes to an auction-based support scheme, but, more importantly, they also include the so called "prosumer's package". The definition of a prosumer has been expanded and clarified, now also including small and medium enterprises (SMEs) that are not "professional" energy producers. Consequently, entrepreneurs will be able to mount a micro installation on the land where they carry out their business activities, as long as the energy production is not a dominant object of their company's activity (Article 2 point 27a). The new provisions have also enabled the establishment of energy cooperatives in the rural and rural-urban areas (Article 2 point 33a).

Along with legal changes, the government adopted a "My Electricity" program that will provide individuals with a PV installation purchase subsidy. Up to one billion PLN will be earmarked for executing the program. This financial support mechanism will likely result in increased popularity of household PV installations. This way, enterprises, cooperatives and individuals may take over the burden of bringing Poland closer to meeting the RES energy generation quota set by the EU for 2020.

It should be noted that, despite lacking financial and legal supporting mechanisms, some citizens have managed to start generating their own electricity. For example, the number of new PV installations in 2018 has doubled in comparison to 2017 - there are around 50,000 solar collectors and PV cells across the country[78]. This figure is negligible if compared with over three million installations in Germany, despite them being supported by the guaranteed feed-in tariffs. Unfortunately, the current Polish government considers the photovoltaic to be a mature and highly-stable technology that does not need to be supported by the state. Therefore, the chances of implementing feed-in tariffs for PV in Poland are slim to none.

Several prosumers' collective investments have also been undertaken. Poland's first and so far only energy cooperative was established in June 2014 as an initiative of the private

[78] M. Olszewski, Poland may miss its 2020 targets for renewable energy – unless offshore wind develops fast, 2019, Retrieved from: https://energytransition.org/2019/06/poland-may-miss-its-2020-targets/.

energy company BioPower, in collaboration with another ESCO and four local municipalities in the eastern region of Lubelskie voivodeship. The cooperative is called "Nasza Energia" (Our Energy) and uses biogas as its energy source. The plan is to build many small energy and heat producing installations in all the municipalities (about 0.5 MW and PLN 7.5 mln each) and connect them in a network that will constitute a separate mini-energy system[79]. The project has mainly been financed by long-term loans. In 2016, Arnold Rabiega, one of the co-founders, said that they also considered applying for EU funds but that should they succeed in obtaining them, the sale price of energy on auctions would need to be lowered according to the regulations[80]. The main idea behind the project is building prosperity in rural areas by creating a market for agricultural production and ensuring the availability of locally produced, cheap and clean energy to the local communities. "Nasza Energia" follows the key cooperative principles: cooperative membership is open to every individual and company in the country, and every member has one vote at the General Assembly regardless of the share value. The use of biogas is not the most popular way of generating energy. The founders intended to invest in a more stable way of producing energy than wind or solar power. "Agricultural land covers 80% of the area of the municipalities. In order to secure energy supply for the members, we need to use about 4% of the area"- claims one of the representatives of the cooperative "Nasza Energia"[81].

Another community energy initiative appeared in the year 2017 - the housing cooperative "Wrocław-Południe" in Wrocław has mounted PV micro installations on the rooftops of its thirty five buildings. However, this project was financially supported (with a subsidy and a soft loan) by the National Fund for Environmental Protection and Water Management. For legal reasons (see the section on housing cooperatives), these PV installations provide power for the common parts of the buildings, such as staircases and

[79]A. Rabiega [interview], A. Rabiega, Spółdzielnia Nasza Energia: skierowane są na nas oczy całej branży OZE, 2014, Retrieved from: https://gramwzielone.pl/bioenergia/12051/a-rabiega-spoldzielnia-nasza-energia-skierowane-sa-na-nas-oczy-calej-branzy-oze-wywiad

[80] Teraz Środowisko, Powstaną pierwsze biogazownie w nowatorskiej formule spółdzielczej, 2016, Retrieved from: https://www.teraz-srodowisko.pl/aktualnosci/Dwie-pierwsze-biogazownie-w-nowatorskiej-formule-spoldzielczej-1749.html

[81] Centrum Informacji o Rynku Energii, Spółdzielnia Nasza Energia projektuje pierwszą biogazownię, 2014, Retrieved from: https://www.cire.pl/item,106859,1,0,0,0,0,0,spoldzielnia-nasza-energia-projektuje-pierwsza-biogazownie.html

elevators. Similar examples can be found in Cracow (the housing cooperative “Czyżyny”) and Warsaw (the housing cooperative “Zachód”), where the installation process took place only this year.

Hopefully, the recent changes in law as well as the new energy initiatives started by housing cooperatives will be the beginning of a boom. The fact that the trail has already been blazed by the launch of pilot investments (of the housing coop ‘Wroclaw-Poludnie’ and the energy coop ‘Nasza Energia’) is a positive sign.

d) Barriers and limitations.

One of the main barriers (that will hopefully be reduced thanks to the ‘My Electricity’ program) preventing the wider implementation of PV installations in Poland is the lack of financial support that could cover some of the initial investment costs. Capital expenditures are quite high when it comes to the installation of solar cells and wind turbines, and the payback is lengthy, though it will always pay back on the long-term thanks.

For this reason, the ever-changing energy regulations are also considered a great problem in this regard since big long-term investments need to be based on a stable and long-lasting legal framework. Additionally, the existing legislation on renewable energy in Poland is not tailored to the condition of the energy network and technical feasibility of the drafted solutions. In order to effectively integrate renewable energy into the country’s energy system and meet the growing energy demand, the energy network needs to be modernised.

Another big issue is that a financial mechanism aimed at supporting collective renewable energy prosumer initiatives has never existed in Poland and it is not likely to be established in the nearest future. The scarce awareness of energy issues and climate change among Polish citizens also plays a big role in the lack of community renewable energy initiatives.

One of the potential solutions for these problems could be to have a financial support mechanism provided at the local level, dedicated to housing cooperatives and associations. Local energy initiatives should engage local stakeholders and local land use, but also local financial resources in order to reduce the energy dependency of cities and regions, and promote a truly bottom-up approach. Such solution would also bring a positive outcome in raising awareness of the energy issue in local communities.

3.3. Barriers – conclusions.

The case study of Germany and Poland outlines the range of factors that could act as obstacles for the development of renewable energy cooperatives. Three main types of barriers can be identified: financial, legal and social. They are strongly interlinked and often overlapping, therefore the following breakdown is flexible.

A. Financial barriers.

Renewable energy projects entail high capital expenditure and the return on investment, although guaranteed in the long-term due to non-existent fuel costs[82], can be a lengthy process. This means that investors need to take the risk in advance, before the energy starts flowing. In renewable energy cooperatives, where the investment capital is collected from a number of members, this can be a major obstacle.

Despite the fact that costs for renewable technologies are reaching new lows every year and becoming more and more accessible (solar PV modules' prices have fallen by around 80% since the end of 2009[83]), the amount of money that must be spent is still considerable for an individual. Hence one of the most relevant solutions, as the German example illustrated, is to provide a financial mechanism aimed at supporting collective renewable energy initiatives. The system of feed-in tariffs proved to be the most effective. The financial certainty it ensures has a positive influence on the perception of REScoops by the traditional banking sector, which makes it easier for smaller citizens' initiatives to secure loans and grants.

B. Regulatory barriers.

A stable regulatory framework is necessary to launch the long-term project that is a renewable energy cooperative, and the uncertainty of national regulations can definitely pose a barrier to their development. The law is crucial to unlock the foundation of new and the continued success of existing energy cooperatives. The legal and administrative facilities in cooperative law resulted in an increase of the registration of new cooperatives in Germany. The recent amendment to the Polish Renewable Energy Sources Act that introduced new

[82] Apart from biomass.

[83] See: https://www.irena.org/costs

prosumer-friendly provisions is also expected to boost the number of citizens and SMEs producing energy from renewable sources. On the contrary, the switch to capacity auctions in Germany has been negatively perceived by the community-owned wind farm sector, because it provides additional risk and increases complexity in the development phase. Again, feed-in tariffs would be preferred, since they are considered to be a less risky, simpler and non-discriminatory instrument.

When it comes to the legal framework, it is also essential to ensure that it does not entail unnecessary and highly complex administrative rules, but instead provides access to information and financing, clearly indicates the registration and operation procedures, and allows various types of citizens' energy initiatives. As the Poland's example of housing cooperatives has shown, countries can come up with diverse ideas to achieve similar objectives.

C. Social barriers.

A cooperative is a democratically governed organisation, therefore it is at its best when the political structure of the state aligns with cooperative values. The findings of the experts' consultation held by the ICA in 1977 have shown that the political climate within a country frequently prevented cooperatives from reaching their full potential since cooperative principles were not implemented[84]; these ended up being a caricature of a cooperative. As regards renewable energy cooperatives specifically, it is important that governments strongly support renewable energy and progressive environmental policies, as it was the case in Germany. It not only affects the level of awareness of these issues among citizens, but also assures them in the decision to undertake a long-term investment.

Additionally, Poland's example indicates that lack of social capital might be an obstacle for development of cooperative behaviours and cooperative enterprises. However, it works as a feedback loop – social capital reinforces cooperation, and cooperation builds social capital[85].

[84] International Cooperative Alliance (ICA), Cooperatives and the poor. Report of the Experts' Consultations, 1977.

[85] T. Bauwens, J. Defourny, Social capital and mutual versus public benefit: the case of renewable energy cooperatives, Ann. Public Coop. Econ., vol. 88, pp. 203–232, 2017.

4. Summary

Renewable energy cooperatives represent a synthesis of technological and social change. In view of its complex nature and in order to better understand both their potential and the barriers for their development, it is necessary to analyse the issue from multiple disciplinary perspectives. This paper has aimed to respond to this task by assessing considerations of legal, economic and social nature, and by presenting case studies of two countries with entirely different profiles.

As a result of this overview, the potential of renewable energy cooperatives has been demonstrated. They promote an array of benefits including carbon emissions reduction, increased acceptance of renewable energy technologies and the shift towards a more democratically controlled energy system. Additionally, they can positively impact local communities by diminishing energy poverty, creating employment opportunities and building social capital. Engaging in citizens' energy initiatives also makes individuals more conscious of their energy use, which contributes to the decrease of energy demand.

Based on the example of Germany where REScoops have been an important building block of the energy transition, and Poland which is still at an impasse in this regard, this paper has found that the challenges yet to be overcome involve a variety of interlinked factors. Regulatory uncertainty and the withdrawal (or lack) of financial support schemes particularly undermine the development of the REScoops' movement. Structures and practices from centralised energy systems, especially complicated administrative procedures, are also considered to be a major stumbling block at present. Another finding of this paper is that the historic background, social capital and political climate of each country can also strongly influence the popularity of this type of business model.

Although REScoops do face problems on many levels, new technical and legal developments (in particular the implementation of the EU Clean Energy Package) are expected to boost citizens' energy initiatives in the upcoming years. Renewable energy cooperatives should serve as a fundamental tool to transform the European energy system, as they can help reach the EU decarbonisation targets while promoting democratic values, providing prosperity and increasing local activism.

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