SCORE

Co-own. Prosume. Renew.

Supporting Consumer Ownership in Renewable Energies

Mapping Policy Options for Renewable Energy Communities in Europe

Background Paper

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 784960

Disclaimer

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 784960.

Table of Contents

1. INTRODUCTION 6

2. THE EU REGULATORY FRAMEWORK FOR RENEWABLE ENERGY COMMUNITIES 9

3. THE CHALLENGES FOR RENEWABLE ENERGY COMMUNITIES 13

3.1. National bottlenecks faced by Renewable Energy Communities 13

3.1.1. Different national legal frameworks for the promotion of RES 14

3.1.2. Information Gaps 16

3.1.3. Access to Finance 17

3.1.4. Grid Regulations 18

3.1.5. Inconsistency with national social policies 20

3.2. EU-wide challenges to the development of renewable energy communities in Europe 21

4. SCORE PILOT COUNTRIES 23

4.1. Susa Valley (Italy) 23

4.2. Litoměřice (Czech Republic) 25

4.3. Essen (Germany) 28

5. POLICY RECOMMENDATIONS 32

Imprint 36

List of Figures

Figure 1. Consumer Stock Ownership Plan applied to a Renewable Energy Community 9
Figure 2. Main features of the RED II and the IEMD regarding RECs 12

List of Tables

Table 1. The new governance model for energy communities under RED II 10
Table 2. Overview of RES Legal conditions in the pilot countries 14
Table 3. Existing incentives measures (as of October 2020) 18

List of Boxes

Box 1: RES legal Environment in Czech Republic 15
Box 2: Stop-and-go Policy and Unstable Regulatory Framework in Italy and Czech Republic 15
Box 3: Energy cooperatives in Italy and micro-grids 19
Box 4: Supplier licence in Germany 19
Box 5: The Blockchain Village 31
Box 6: The Mülheim district: RES complementarity 31
Box 7: The housing cooperative Neues Berlin and the Berliner Stadtwerke 31
Box 8: Renovation of the former Nymphenburg sparkling wine cellar 31

Abbreviations

AC	Alternating Current
CO_2	Carbon Dioxide
CZK	Czech Crown
CSOP	Consumer Stock Ownership Plan
DHW	Domestic Hot Water
DC	Direct Current
EE	Energy Efficiency
EUR	Euro
IEMD	Internal Electricity Market Directive
IEMR	Internal Electricity Market Regulation
IROP	Integrated Regional Operational Program
IRR	Internal Rate of Return
KPI	Key Performance Indicator
MCA	Multi-Criteria Analysis
NPV	Net Present Value
nZEB	Nearly Zero Energy Building
PBP	Payback Period
PLN	Polish Zloty
PV	Photovoltaic
RE	Renewable Energy
REC	Renewable Energy Communities
RED II	Recast of the Renewable Energy Directive 2018
RES	Renewable Energy Sources
ROI	Return on Investment
SMEs	Small and Medium-sized Enterprises
TPBA	Towarzystwo Pomocy im. św Brata Alberta (Holy Brother Albert Aid Society in Słupsk)

1. Introduction

Consumer (co-)ownership in renewable energy (RE) is an essential ingredient of the overall success of Energy Transition. When consumers acquire ownership in renewable energy projects, they can become prosumers generating a part of the energy they consume and thus reduce the overall costs, while at the same time they could also generate additional income coming from the sale of excess production. On the other hand, becoming a prosumer requires also availability of or access to substantial upfront investment, as well as access to information and knowledge about possible options. This creates burdens for many of the EU citizens, especially for vulnerable groups, e.g. low-income, energy poor, low educated, as well as women, who are underrepresented in the tech-savvy domains. However, both the advancement and the barriers toward acquiring (co)ownership in RE are directly related to the existence and effective implementation of relevant national and local policies.

The new Renewable Energy Directive II (RED II) adopted in 2018 as part of the Clean Energy Package marks a turning point for energy communities in the EU and paves a way for more decentralised and citizen-oriented forms of energy transition in Europe. A **major novelty therein is the new right for communities, cooperatives and individuals to produce, consume, store and sell their own renewable energy, without facing excessive charges or administrative barriers**. This new milestone in EU legislation could be considered a great victory for energy democracy and a culmination of all grassroot initiatives led by citizens and cities, as citizen energy has won important recognition in the new RED II. Before this moment, consumers could hardly rely on support at EU-level and were dependent on local or national regulations that differed among Member States or were subjected to frequent changes. Energy citizens, whether individual prosumers, cooperatives, communities or small-scale ecopreneurs, still have a long way to go before establishing their role as fully-fledged participants in the Just Transition process. Especially in Central and Eastern Europe the benefits of these ownership forms are less known and hard to achieve due to structural deficiencies. Energy policies there have been largely shaped by power elites strongly linked to existing business schemes blocking the entry of new players on the market[1]. Energy transition scenarios in Central and Eastern Europe are often associated with expensive energy prices, against a background of widespread energy poverty[2], and preferential energy subsidies for

[1] CSD (2019) Policy Brief No. 88: Energy Transition Governance for Better Energy Security in Europe, https://csd.bg/publications/publication/policy-brief-no-88-energy-transition-governance-for-better-energy-security-in-europe/
Stefanov, R. & M. Vladimirov (2014). Bulgaria and the South Stream Pipeline Project: At the Crossroad of Energy Security and State Capture Risks. In: Suedosteuropa Mitteilungen, vol. 5-6,

[2] Bouzarovski, S. & H. Thomson (2020) Towards an inclusive energy transition in the European Union: Confronting energy poverty amidst a global crisis. Third pan-EU energy poverty report of the EU Energy Poverty Obser-

large, politically backed-up fossil-fuel dependent energy sectors, which has stifled the market for renewable energy communities[3]. The transposition of the REDII guidelines, the enhanced climate conditionality of the next Multiannual Financial Framework (2021-2027) and the 2018 regulation on EU funding mechanisms[4] in its part on community-led local development provide new avenues for the creation and strengthening of energy communities and a shift towards more decentralised and prosumer-oriented ownership models. The benefits of citizen-owned renewable energy projects could be numerous: revitalising local economies and increasing social capital, increasing public acceptance of energy transition alternatives, promoting regional cooperation and local partnerships, building community resilience, lowering energy bills, tackling energy poverty, financial empowerment of vulnerable consumers, as well as fostering technological innovation.

Building upon the findings and conclusions form recent research on economic, social, technological and governance enabling conditions and barriers for promoting prosumership and RE communities in Europe (ENABLE.EU[5], REINVENT[6], NEWCOMERS[7] and PROSEU[8]), the international team of researchers and practitioners of SCORE (Supporting Co-Ownership of Renewable Energies)[9] endeavours to facilitate the co-ownership of renewable energy, piloting a new financial model, called "Consumer Stock Ownership Plan". The SocialRES project[10] aims at closing non-technological research gaps that impede the widespread uptake of social innovation business and service models in the European energy sector, as well as at fostering new cooperation patterns among the key enabling actors for energy democracy: coopera-

---

vatory, https://www.energypoverty.eu/sites/default/files/downloads/observatorydocuments/20-06/epov_third_report_final_v2_compressed.pdf

[3] Walsh, M. (2018) Many Drops Make a River. In: Energy Atlas 2018: Facts and Figures about Renewables in Europe. Heinrich Boell Foundation/Friends of the Earth Europe/EREF/ GEF, https://www.boell.de/sites/default/files/energyatlas2018_facts-and-figures-renewables-europe.pdf.pdf

[4] European Commission (2018) Proposition for a Regulation of The European Parliament And Of The Council laying down common provisions on the European Regional Development Fund, the European Social Fund Plus, the Cohesion Fund, and the European Maritime and Fisheries Fund and financial rules for those and for the Asylum and Migration Fund, the Internal Security Fund and the Border Management and Visa Instrument. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2018%3A375%3AFIN

[5] ENABLE.EU Project (2019), Written synthesis of ENABLE.EU's findings. Available at: http://www.enable-eu.com/wp-content/uploads/2019/07/ENABLE.EU_D8.5.pdf

[6] REINVENT EU Website: https://www.reinvent-project.eu

[7] New Clean Energy Communities in a Changing European Energy System (NEWCOMERS), (2020) Description of polycentric settings in the partner countries. Available at: https://www.newcomersh2020.eu/upload/files/D3_1_Newcomers_Description_of_polycentric_settings_in_the_partner_countries.pdf

[8] PROSEU Project (2019), Transposition Guidance for citizen energy policies. Available at: https://proseu.eu/sites/default/files/Resources/PROSEU_Transposition%20Guidance%20for%20REDII%20and%20EMD.pdf

[9] SCORE Website: Consortium Partners: https://www.score-h2020.eu/about-us/score-consortium/

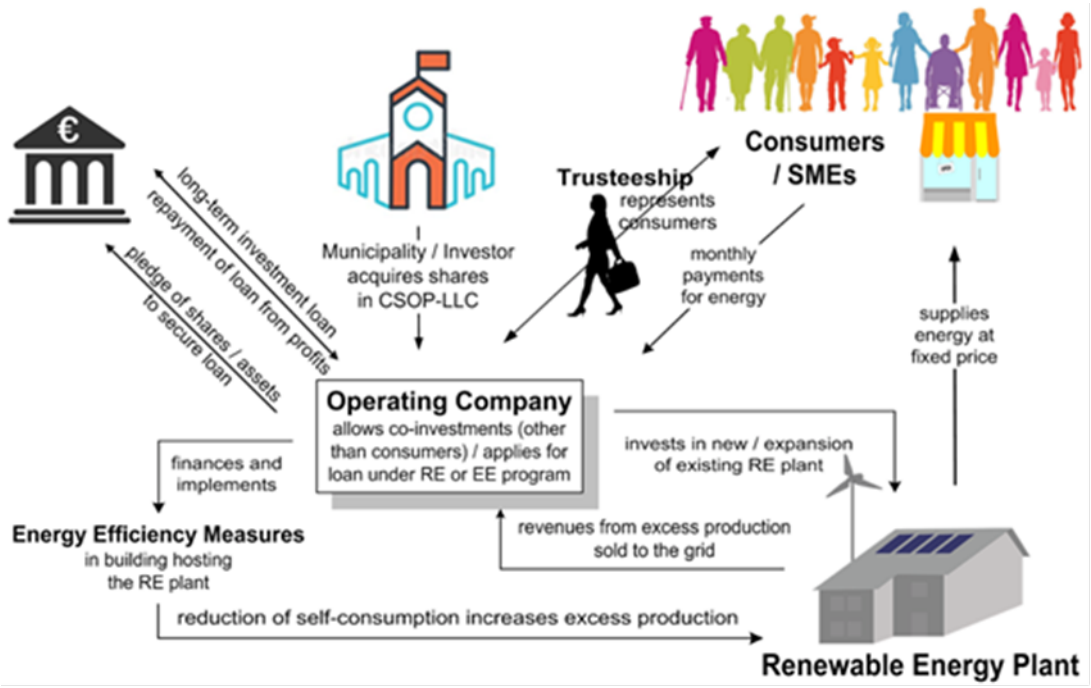
[10] Iban Lizarralde, Audrey Abi Akle, Mikhail Hamwi (2020), Database of driving factors in social innovations in the energy sector, SocialRES project. Available at : https://socialres.eu/wp-content/uploads/2020/02/D2.1-Driving-factors-social-innovations-energy-sector.pdf

tives, energy aggregators and crowdfunding platforms. COMETS also aims to fill in the knowledge gaps in studying the motives, potential, objectives and barriers for collective action initiatives (e.g. energy communities, cooperatives, purchasing groups) in the energy system[11]. The NEWCOMER project[12] promotes the social innovation of clean energy communities or "newcomers". It delivers practical recommendations about how the European Union as well as national and local governments can support new clean energy communities to help them flourish and unfold their potential benefits for citizens and the Energy Union. The SCORE project builds upon this research base and tries to facilitate the co-ownership of renewable energy for consumers in three pilot regions in Italy, Czech Republic and Germany and in other follower cities across Europe. In doing so, significant attention is given to the analysis of the best conditions and strategies for renewable energy communities, that could be applied in their national and local environments in order to provide incentives to follower cities to initiate similar projects, and thus foster decentralisation and citizen participation in the energy transition process.

As a financial instrument, the Consumer Stock Ownership Plan (CSOP) brings several advantages with regard to the set-up of **Renewable Energy Communities** while providing consumers with flexible participation, external financing, long-term loan repayment and thereby the engagement of low-income households. The CSOP foresees the creation of an operating company that allows individual consumers to pool their investments together. External financing is used to avoid the recourse to micro-credits for each consumer and raise financial leverage while consumers are able to repay their share of the loan from the future earnings of the investment i.e. the sale of the excess of electricity production (see Figure 1). The CSOP ensures the representation of the consumers in the operating company through a trusteeship (individual person or fiduciary entity) that advises them while simplifying daily operations and introducing professional management, and thus both removing the main barrier for attracting external business investments and ensuring flexibility regarding the entry and exit of consumers into a CSOP. Once the loan has been paid, the revenue of the RES installation can be distributed to the consumers, providing an additional source of income.

[11] COMETS website: http://www.comets-project.eu/CONTENTS/ProjectMaterials/one%20pager%20(draft%20for%20review)%20v1.pdf
[12] *Ibid.*

Figure 1: Consumer Stock Ownership Plan applied to a Renewable Energy Community



Source: J Lowitzsch 2019 IOP Conf. Ser.: Earth Environ. Sci. 290 012051

2. The EU Regulatory Framework for Renewable Energy Communities

In June 2018, the EU agreed on the major climate and energy framework for 2030 as part of the CEP, which included an overall binding renewables target of 32% (though less than the Parliament's proposition of 35%) and an indicative energy efficiency target of 32.5%. The RED II[13] and the new Internal Electricity Market Directive (IEMD[14]) were game-changers. For the first time, EU law acknowledges the role energy communities play in the energy transition, facilitating the development of renewable energy projects by citizens, authorising them to share energy/electricity over the public grid and putting safeguards in place to protect them from the market dominance of major power companies. In terms of consumers' rights, the new RED II contains the following key provisions:

- The new legislation reinforces the right of European citizens, local authorities, small businesses and cooperatives to produce, consume, store and sell their own renewable

[13] 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

[14] 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 (Text with EEA relevance.)

energy, without being subject to punitive taxes or excessive bureaucracy. These activities could be done either individually, that is, as households and non-energy small and medium-sized enterprises (SMEs) (Art. 21 RED II), or (ii) as part of Renewable Energy Communities (RECs) organised as independent legal entities (Art. 22 RED II).

- Citizens can also get involved by acting jointly in a building, for example in tenant electricity projects: the directive recognises that for the over 40% of Europeans living in apartment blocks, collective action to install renewable technology may be the best way to benefit from renewable energy
- Citizens could also get represented through aggregators, a market participant that can pool smaller independent producers together and help them with the optimisation of the use of their installations, as well as provide assistance, consulting and advice on the production, sale and storage of the electricity generated
- The new regulatory framework also allows consumers to trade renewable energy among themselves without an intermediary (peer-to-peer trading)
- As part of the transposition of the RED II, Member States have to adopt an enabling framework for prosumership and in particular for defining renewable energy communities (RECs). The new directive defines citizen's rights and duties and thus links prosumership to the fulfilment of other environmental, technical and social goals such as fighting energy poverty, increasing acceptance, fostering local development and incentivising demand-flexibility[15].

Table 1: The new governance model for energy communities under RED II

Criteria	Renewable Energy Communities pursuant to Art. 2 (16) RED II
Eligibility	・Natural persons ・Small and medium sized enterprises ・Local authorities, incl. municipalities
Primary Purpose	"Environmental, economic or social community benefits for its shareholders and members or for local areas where it operates, rather than financial profits"
Membership	Voluntary participation open to all potential local members based on non-discriminatory criteria
Ownership and Control	・Effectively controlled by shareholders or members that are located in the proximity of the RE projects that are owned and developed by the REC ・Is autonomous (no individual shareholder may own more than 33% of the stock)

Source: adapted from J. Lowitsch, Hoicka, and Van Tulder, 2020

[15] Lowitzsch, J. (2020) Investing in a Renewable Future – Renewable Energy Communities, Consumer (Co-)Ownership and Energy Sharing in the Clean Energy Package, European Energy & Climate Journal, vol. 9

The transposition of these comprehensive rules in the MSs national legislations – in particular those on energy communities – requires developing, implementing and scaling up investment models that pool the capital participation of consumers in all 28 Member States. The major challenge in this process is the inclusion of local governments and/or commercial investors like SMEs and move to economies of scale while retaining the benefits of individual consumer participation[16].

The CEP particularly provides a **legal definition of REC** as *legal entities which are optional, member-controlled organisations proximate to Renewable Energy Projects that they own or operate*[17].

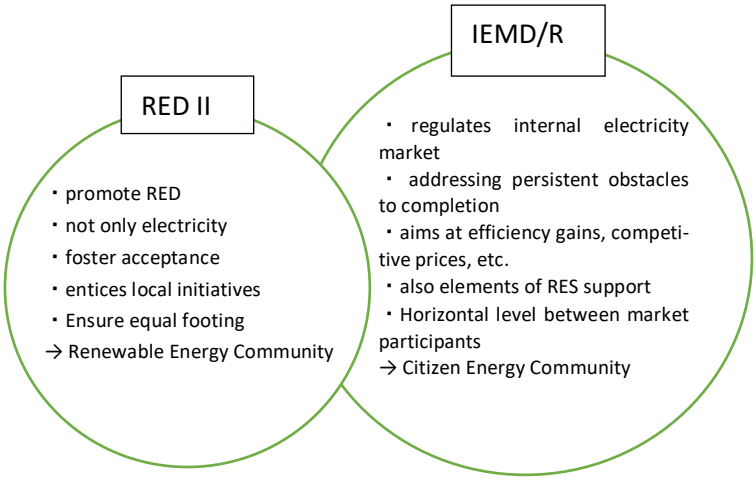
Energy communities are mentioned and defined in both the RED II and the IEMD. Both directives place the consumer "at the heart of the energy markets" defining him or her – individually or jointly – as "Active Consumer" (IEMD) and as "Renewable Self-consumer" (RED II). As far as energy communities are concerned, the IEMD mainly covers the horizontal level, that is, their rights and obligations towards public authorities, other electricity enterprises and consumers[18]. The Directive provides energy communities with a level playing field vis-a-vis other market participants. RED II on the other hand is complemented by a vertical dimension that ensures that RECs can compete for support "on an equal footing with other market participants' and urges Member States to "take into account specificities of renewable energy communities when designing support schemes".

[16] Lowitzsch, J., 2019. Consumer Stock Ownership Plans (CSOPs)—The Prototype Business Model for Renewable Energy Communities. Energies 13, 118. https://doi.org/10.3390/en13010118

[17] Official Journal of the European Union (2018). Directive (EU) 2018/2001 of the European Parliament and the Council on the promotion of the use of energy from renewable sources. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001&from=EN

[18] Lowitzsch, J. (2020) Investing in a Renewable Future – Renewable Energy Communities, Consumer (Co-)Ownership and Energy Sharing in the Clean Energy Package, European Energy & Climate Journal, vol. 9

Figure 2. Main features of the RED II and the IEMD regarding RECs



Source: Lowitzsch, J. (2020) Investing in a Renewable Future – Renewable Energy Communities, Consumer (Co-)Ownership and Energy Sharing in the Clean Energy Package[19]

The RED II also envisions the **inclusion of low-income and vulnerable households** and defines "jointly acting renewable self-consumers" as consumers living in the same building engaging into self-consumption. The Directive defines the role of aggregators as new market participants that can pool smaller independent producers together in order to enhance the use of the installations, while providing assistance, consulting and advice on the production, sale and storage of the electricity generated. Finally, the REDII addresses peer-to-peer trading, which allows trade between market participants without an intermediary and thereby ensuring both efficiency and quicker financial returns, thus addressing a major barrier existing in the legislation of all MSs .

The transposition of the RED II raises the question what form and status energy communities have. Since European energy law does not rule out other private law initiatives, RECs are not considered as the only form of 'energy communities'[20]. To qualify as an REC, new governance criteria have to be set up. At the same time public authorities need other partners as 100% municipal projects would violate the autonomy criterion of the REC (i.e., no single member may have more than 33% of the voting rights) and thus not qualify as RECs[21]. Therefore, in order **to benefit from the enabling framework and the opportunities to enter into energy sharing agreements, heterogeneity of co-investors becomes a prerequisite**.

[19]Available at: https://www.score-h2020.eu/fileadmin/score/documents/Investing_in_a_Renewable_Future_-_Lowitzsch_RELP_updated_VI_2020.pdf

[20] Mikołaj Jasiak 'Energy Communities in the Clean Energy Package' (2018) 8 European Energy Journal 29.

[21] PROSEU, Community Power, SCORE, Renewables Networking Platform, EREF 2020: Transposition Guidance for citizen energy policies. Recommendations to strengthen prosumers and energy communities when transposing the Clean Energy Package (RED II, IEMD).

3. The Challenges for Renewable Energy Communities

The transposition of the RED II must be accompanied by measures that ensure that stakeholders have enough information about the opportunities of RECs, financing opportunities and earmarked capital. Proved also in the piloting of CSOPs, this seems to be a **common challenge** in many Member States that could be overcome with a uniform **improvement of the administrative capacity, financial incentives** and altogether better governance of the energy system.

The challenges for the development of renewable energy sources need to be addressed at the right level of intervention, particularly the obstacles related to the empowerment of vulnerable consumers. This sections sheds light on the pre-conditions of an effective transposition of the REDII and highlights different legal, administrative, financial and political challenges that have been derived from the application of the SCORE project in the project's pilot cities, as well as from interviews with local experts, stakeholders and representatives of energy cooperatives.

While some bottlenecks are rooted in the transposition of the Clean Energy Package, other obstacles are often linked to specific national contexts (e.g. administrative bottlenecks present in some member-states and absent in others). Although the RED II has provided Member states with an enabling framework for RECs, the latter needs to incorporate a broader definition that covers the wide spectrum of different RECs and in particular RES clusters.[22]

3.1. National bottlenecks faced by Renewable Energy Communities

The legal and business uncertainty linked to frequent changes in regulations, support schemes and financing opportunities at national level have been highlighted as the key challenges for the development of RECs in the different Member States. The retroactive policies and the fluctuating government support in countries like the Czech Republic, Poland, Hungary, Spain and Bulgaria, including the renewed state support for traditional energy players (including fossil fuels), have been identified as major barriers blocking the formation and further development of RES communities on the ground. In many Eastern European coun-

[22] Lowitzsch, J., Hoicka, C.E., van Tulder, F.J. (2020). Renewable energy communities under the 2019 European Clean Energy Package – Governance model for the energy clusters of the future? Renewable and Sustainable Energy Reviews.

tries, the lack of knowledge and facts-based dialogue on the topic, as well as the dissemination of counter-narratives in the traditional and social media have also contributed to the weak local support for such policies. Last but not least, important financial and administrative barriers still remain in place that are slowing down the speed of project development, or in the worst case the very possibility to establish Renewable Energy Communities in EU Member States[23].

3.1.1. Different national legal frameworks for the promotion of RES

The legal framework at the national level, as well as national and regional contexts (e.g. the development of regional energy cooperatives in Italy) have shaped to a great extent the development of renewable energy communities across countries[24]. The frequent changes in the national legislation and the retroactive policies on RES support schemes have had negative impact on the raising of private capital and weakened the RES investing environment (e.g. withdrawal of national incentives for solar and wind energy in the Czech Republic)[25].

Table 2: Overview of RES Legal conditions in the pilot countries

<table>
<tr><th rowspan="2"></th><th colspan="2">Support Scheme - Electricity</th><th rowspan="2">Support Scheme - Heating & Cooling</th><th rowspan="2">Policies</th></tr>
<tr><th>Solar</th><th>Biomass</th></tr>
<tr><td rowspan="8">DE</td><td colspan="3">- Special schemes for electricity intensive enterprises;
- Special schemes for self-consumption;
- Compensation for electricity not fed into the grid due to grid-related bottlenecks;</td><td>German Renewable Energy Sources Act (Erneuerbare Energien Gesetz);
Renewable Energies Heat Act (Erneuerbare-Energien-Wärmegesetz);
Tenant Electricity Act (Mieterstromgesetz);
Local support programs of individual federal states, districts or communities</td></tr>
<tr><td>Feed-in tariff</td><td>Tendering</td><td rowspan="3">Subsidies</td><td>Training programmes</td></tr>
<tr><td>Low-interest loans</td><td rowspan="2">Flexibility surcharge</td><td>Certification Programmes for RES installations</td></tr>
<tr><td>Supports for the usage of stationary battery storage systems, related to a PV installation</td><td>Exemplary role of public authorities</td></tr>
<tr><td>Market Premium Tariff</td><td rowspan="3">Flexibility premium</td><td rowspan="3">Loans</td><td>Renewable Energy Standard programme supporting networks and accumulators</td></tr>
<tr><td>Tenant electricity surcharge</td><td>RES-H building obligations</td></tr>
<tr><td>Tendering: solar projects starting from 750</td><td>Support of RES-H infrastructure</td></tr>
</table>

[23] Renewable Global Status Report, REN21, 2016. Available at: https://www.ren21.net/gsr-2016/chapter07.php
[24] For an overview of the different RES support schemes and legal conditions, please have a look at table 2
[25] Lowitzsch, Jens. *Energy Transition Financing Consumer Co-Ownership in Renewables*. Palgrave Macmillan, 2019. P. 130.

	kW		
IT	Net-metering (scambio sul posto)	Price-based scheme	Training programmes
			Standards and certificate of compliance
	Reduction in VAT and real estate tax		All new buildings and all buildings undergoing major refurbishment are obliged to integrate RES-E and RES-H
	Regional renewable energy programmes	Tax regulation scheme	Guarantee fund supporting DHN
	Premium tariff (ritiro dedicato)		
CZ	Exemption from Real Estate tax /Discounted Investment loans	Subsidies (Operational Programme)	Renewable energy use assessment.
	Subsidies (Operational Programme "Environment")	Exemption from Real Estate Tax	Certification programme for installers

Box 2 : RES Legal Environment in Czech Republic[26]

In the Czech Republic, the lack of support mechanisms (e.g. feed-in tariff mechanisms) and the unclear legislative framework have acted as a barrier for the deployment of RES installations. The National Support Scheme for PV installations was suspended 6 years ago, which impeded significantly the proliferation of RES in the country, as well as the development of prosumership patterns. Amendments to the current legislation are presently being drafted, which are meant to transpose the RED II. However, no operational support scheme for PV technology is currently envisioned, which was considered by experts as a major bottleneck for RECs.

In cases of small and medium-size installations that engage in self-consumption, PV technology is supported by investment schemes and should remain so in the foreseeable future. In addition, the amendments also propose that a larger installation should also profit from investment support schemes under the EU Modernisation Fund and the ETS Scheme. This could benefit RECs and facilitate such small-scale investments, but the major difference between RECs and prosumership also lies in the capacity threshold for the use of the grid: since an energy supplier licence is needed for PV capacity exceeding 10 kw, grid costs would still be financially unbearable for citizens willing to set up a Renewable Energy Community, even if they receive some type of investment support.

Box 3: Stop-and-go Policy and Unstable Regulatory Framework in Italy and Czech Republic

Concerning RES-E support mechanisms in Italy, the *premium tariff (ritiro dedicato) and net-metering* (scambio sul posto) have been strong incentives that unfortunately were not successful in fostering the collaborative enterprises but only supported commercial PV and wind projects. Such support mechanisms have led to unforeseen problems, such as the development of PV installations on agricultural lands because of the profit

[26] *SCORE interviews with local experts in the field of Renewable Energy, Energy Cooperative and Renewable Energy Communities in Czech Republic, Germany and Italy*

character of the schemes applied across many regions in Italy. This required the intervention of the parliament to be stopped[27].

In Czech Republic, renewable energy was supported through feed-in tariffs and green bonus until January 2014 when the previous support schemes for RES-E installations were phased out (with the exception of small hydro power plants). Furthermore, the conditions for the remaining RES (e.g. biomass, geothermal) are much stricter (in particular capacity, permit and licencing requirements for the construction, including building permit and date of commissioning), which makes them unattractive for potential investors.

In terms of the transposition of RED II Directive, the progress there is also uneven. While some countries such as Germany, France, Slovenia and Greece have started the transposition of the RED II, others are yet to develop a regulatory framework for Renewable Energy Communities (e.g. Luxembourg, Poland and Portugal). The different pace of transposition and the discretion left to the Member States in doing so prevents the harmonisation and creates a web of complex legal practices in the EU, with a high heterogeneity in national legislations. On this point, the legal standing for RECs is considered a major factor that could either limit or create favourable the conditions of creation and operation of RECs. Although the Member States have started amending their national law, the **transposition of RED II must be further detailed and address the most central national problems** impeding the spread of Renewable Energy Communities mentioned above. So far, only the technical and economic features of REC are specified. There is a **general lack of vision about what legal form would be best suited for an REC**. Furthermore, grid regulations should be adjusted to the emergence of RECs with exemptions for small and local community projects or local grid tariffs (e.g. in Austria and France).

3.1.2. Information Gaps

The limited and inconsistent information about opportunities to develop RES ownership models renders the access to reliable information extremely difficult. The frequent changes in the legislation, along with the substantial technical and legal knowledge that is required to invest in renewable energy creates a problem of access to information. Investment schemes and opportunities to develop more decentralised RES projects are often rather confusing for the consumers to decipher and understand. Moreover, the information and possible incentives for potential investors (either companies and SMEs, municipalities or consumers) are scattered through different jurisdictions, institutions and sites, which hardly simplifies the knowledge about different RES-E technologies and funding schemes. This requires solutions both aiming at gathering all information in one place (e.g. one stop shops) but also consoli-

[27] *Id.*

dating information from different ministries, energy agencies, grid operators, but also investment planning) into merged packages.

Furthermore, the inconsistent national competences regarding RES incentives and investment support schemes across different Member States hinders the emergence of transnational networks of expertise. While RECs have sufficient financial resources at their disposal from different sources, either directly (investment support, bank loans) or indirectly (e.g. through energy efficiency schemes), there is still a lack of knowledge and awareness on how to tap into these resources and benefit from them.

3.1.3. Access to Finance

Financing barriers remain one of the main bottlenecks across Europe, especially in case of vulnerable consumers and in countries or regions with higher energy poverty, e.g. in SEE. RES up-front cost makes it very hard for consumers to invest. Additionally, the lack of proper information and one-stop-shop structures to advise these consumers increase a false perception of the risks and impede the overcoming of administrative barriers. The access to finance further remains a problem for most countries, either because of the nature of tax incentives or financial support (e.g. reimbursement for installations instead of downward payment) or because of a complex regulatory framework that discourages potential investors.

The funds and supports available for Renewable Energy Communities are scattered around many regional, national and European schemes, requiring much knowledge (not only related to energy but, for example, languages), thereby creating additional difficulties for unexperienced consumers and investors, on top of the bureaucratic obstacles previously mentioned. In country with strong monopolies, the energy markets do not provide enough for smaller bottom-up initiatives. Even in Member States providing state supports for RES-E, the access to funding (either through grants, auction mechanisms or loans) can represent an enormous obstacle for local communities.

In the Czech Republic for example, where subsidies exist for domestic energy refurbishment, consumers cannot benefit from the relevant technical advice and must cover all expenses from the beginning[28]. This partially explains why few people apply for such financial schemes in many countries. Furthermore, financial instruments such as the European Investment Bank do not cover single investments which are too small for such institutions' standards. The lack of expertise on complex financing mechanisms (such as the piloted CSOP), the nec-

[28] Nová Zelená Úsporám website: https://www.novazelenausporam.cz

essary steps and procedures remains a problem for consumers and investors on the way to setting up RES installations.

Table 3: Existing incentives measures (as of October 2020)

	Type of intervention	Recipient of incentives	Method of remuneration	Energy domain
DE	Energy efficiency	All users	Tax deduction – discounted investment loans	Electricity, Thermal power
	Energy management optimisation	All users	Tax deduction – discounted investment loans	Electricity, Thermal power
	RES	All users	Premium tariffs / Tax deduction	Electricity
	Energy efficiency + RES	Citizens	Premium tariffs / Reimbursement of investment	Electricity, Thermal power
		Business	Tax deduction	Thermal power
IT	Energy efficiency	All users	Bond issue	Electricity, Thermal power
	Energy management optimisation	All users	Reimbursement of investment	Electricity
	RES	All users	Premium tariffs / Minimum guaranteed prices	Electricity, Thermal power
	Energy efficiency + RES	Citizens, Municipalities	Tax deduction – tax break / Reimbursement of project's investment	Electricity, Thermal power
	RES + Energy management optimisation	All users	Discount on one or more tariff components that make up the bill	Electricity
	Energy efficiency + Energy management optimisation + RES	All users	Tax deduction – tax break / Reimbursement of investment / Premium tariffs / Reimbursement of project's investment	Electricity, Thermal power
CZ	RES	All users	Tax deduction – discounted investment loans	Electricity
	Energy management optimisation	Business	Tax deduction – discounted investment loans	Electricity
	Energy efficiency + RES	Citizens	Tax deduction – discounted investment loans	Electricity, Thermal power

Source: Based on detailed classification of incentive measures, developed by Mutani, G., S. Santantonio, J. Lowitzsch, L. Roth, & P. Slevec. (forthcoming) Economic incentives for energy efficiency measures and low-emissions technologies.

3.1.4. Grid Regulations

One of the most central challenges for RECs lies in the grid connection and the use of the public grid. The administrative and legal process, including the permit application process, can be exceedingly long, unpredictable and costly. Since RECs act as producers and de facto suppliers at the same time (through supply contracts or through local sharing and self-consumption), they can take on many forms and perform different services (e.g. service pro-

vider, retailer, energy supplier, balancing service provider or even distribution system operator) that vary from one Member State to the other.

Box 4: Energy cooperatives in Italy and micro-grids

Energy cooperatives in Northern Italy (Lombardia, Veneto and Piemonte) stand out as a particular example since they own the grids they use and have the corresponding obligation to operate and maintain them. In the rest of Italy, cooperatives partially engage in self-consumption and energy selling into the public grid, thereby bearing an obligation to pay for connection costs.

Securing access to the public grid is vital for RECs, so that they can sell the surplus of electricity, and therefore be financially sustainable. In addition, connections to the grid can sometimes be refused or substantially delayed because of technical reasons, without justification or the possibility to contest the decisions, thus increasing business risks.

In addition to the costs, the necessary **permits and licensing administrative procedures** are still very cumbersome in most EU countries. This includes not only the number of permits, but also the length of the process, the high-costs and technicalities linked to licensing. Permits for grid connection are mandatory in most member-states and obtaining them often requires expensive and time-consuming procedures, with limited information available about the necessary steps, existing guarantees or fast track procedures. Finally, additional permits such as construction and environmental permits are often required, which makes the whole procedure quite burdensome. Although private grids can provide a solution to this problem (despite the significant costs they represent), the development of a private infrastructure also requires permits and even more complex administrative procedures[29]. This obstacle, in addition to the lack of incentives, explains why most self-consumption projects of the kind are still not implemented in the Czech Republic[30].

Box 5: Supplier licence in Germany

In Germany, prosumers can apply for a supplier permit but these are highly regulated and too expensive for small-scale electricity producers[31]. In Germany, for instance, access to the energy market

[29] *SCORE interviews with local experts in the field of Renewable Energy, Energy Cooperative and Renewable Energy Communities in Czech Republic, Germany and Italy*
[30] *Id.*
[31] Campos, I. et al. (2020). Regulatory challenges and opportunities for collective renewable energy prosumers in the EU. Energy Policy. Available at: https://www.sciencedirect.com/science/article/pii/S0301421519307943

requires to be registered as energy suppliers and obtain a supplier permit, which comes with a very high regulatory burden and is considered by interviewees as cost-prohibitive[32]. The simplification of such procedures must also consider the financial and social idiosyncrasies of the communities involved[33].

In Italy, new legislation entering into force in March 2020[34], partially transposed the RED II. It defines RECs as installations with a capacity lower than 200kW (only relatively medium-scale installations). These conditions narrow down significantly the scope of communities.[35] In addition, some of the most fundamental aspects of the RED II directive that have to be implemented in national legislation are not being addressed in the new law[36].

The Directive was transposed in such a way in the Italian legislation that establishing a **renewable energy community** and self-consumption are considered as two separate activities with a different legal definition. The definition of RECs does not emphasise enough the prosuming elements, as well as the self-organisation of communities among citizens that are not aiming for financial profit. The new law authorizes consumers to aggregate small-scale installations and benefit only from a discount on the utility bills but the installation in this case remains under the ownership of the majority investors.

Although RECs of diverse legal forms in Europe are merging into a myriad of possible participation models, many of the remaining challenges that persist are often the result of an incoherent policy framework. RECs need to be integrated across all levels of governance. Capacity and expertise of local communities and consumers have to be enhanced to take advantage of the new opportunities of co-ownership.

3.1.5. Inconsistency with national social policies

Moreover, in many countries, social policy still poses some incompatibility with RECs, which calls for an additional focus on the legal implication of participating in a REC for vulnerable consumers (e.g. compatibility with social transfers). The different national social policies defined at national level make the inclusion of vulnerable consumers, as envisioned by RED II, and reinforcing their rights challenging. The inclusion of low-income consumers in the provi-

[32] *Id.*
[33] *Id.*
[34] Decree law of 30 December 2019, no. 162, title III, newly introduced art. 42 bis "Self-consumption from RES."
[35] For details see Borroni, A., Lowitzsch, J., Tartaglia, A. 2020. Introduzione alle comunità energetiche – quadro normativo di riferimento, misure di attuazione e incentivi. Tutela e Sicurezza del Lavoro, Università degli studi di Milano – Bicocca
[36] *SCORE interviews with local experts in the field of Renewable Energy, Energy Cooperative and Renewable Energy Communities in Czech Republic, Germany and Italy*

sion on RECs could create conflicts with existing national legislation on social transfer and welfare.[37]

3.2. EU-wide challenges to the development of renewable energy communities in Europe

Some of the challenges RECs are facing are rooted in the general framework conditions and the status quo of the electricity system of the past, including network regulations and market access requirements that have favoured large, centralised monopolistic utilities and increased complexity and costs of small-scale producers of RES, thus slowing down the energy transition. Therefore, these joint challenges have to be addressed at an EU-level through an enabling supporting mechanism that will guarantee that small RES prosumers could compete on an equal footing with big businesses.

Unequal access to ancillary services and capacity markets seems to be a major barrier for small-scale RES producers. Current grid regulation in most European countries works in favour of centralised generation assets by keeping certain connection, testing and metering provisions, availability requirements, high administrative costs and minimum size thresholds[38]. These thresholds and procedures already penalise aggregators of small, distributed assets and make it difficult for these pioneers on the ground to compete on an equal basis. Many incumbent generators and grid companies are resisting the liberalisation of regulatory measures towards opening up energy markets to more decentralised ownership[39]. Moreover, the loopholes in national legislation and the strong incumbents' lobby are used by energy companies to impede the new-entrants and thus - distort the social elements of an REC. **More inclusive approaches to governance are needed** to make room for the new actors and facilitate a shift from top-down decision making in the energy sector to a more participatory approach with a clear understanding on the role, responsibilities and duty of each actor.

The other **challenge is related to the different legal forms that RECs can take**, which creates disparities among Member States. According to art. 71 of the RED II the legal status of RECs is defined at the national level and Member States are free to choose any form of entity for renewable energy communities. RECs are usually perceived as local non-profit enterprises producing energy and services at the best market price, which fulfil broader social and envi-

[37] Lowitzsch, J., Hanke, F., 2019. Consumer (Co-)ownership in Renewables, Energy Efficiency and the Fight Against Energy Poverty – a Dilemma of Energy Transitions. RELP Volume 9, pp. 5–21

[38] Easton (2019) Outdated grid regulation slowing Europe's energy transition: https://www.eaton.com/gb/en-gb/company/news-insights/news-releases/2019/outdated-grid-regulation-slowing-europe-energy-transition.html

[39] Burke, Matthew J., and Jennie C. Stephens. 2018. 'Political Power and Renewable Energy Futures: A Critical Review'. *Energy Research & Social Science* 35.

ronmental goals. This type of definition has not been so far incorporated in national legislations.

European energy legislation, in particular RED II, does not emphasise the need for the complementarity of RES[40]. The main technological challenge to the exploitation of RES is that of balancing geographically dispersed, intermittent RES with demand. Complementarity[41] is an optimal technical and economic solution for the integration of RES onto the grid[42]. Its many benefits include improved grid stability[43], increased network capacity to integrate variable renewable power[44], and reduced system costs for energy storage[45]. Prioritising complementarity services are key to decreasing not only required RE generation capacity, but also storage and backup requirements.

With an expanding number of small units owned by individuals, governance, control and predictability of the energy markets -where balancing supply and demand and security of supply are crucial- become increasingly complex and thus problematic[46]. The transaction costs associated with integrating new, small or medium sized actors accompanied by complex regulations is another major challenge for vulnerable consumers. The exemptions from fees and levies for some consumers leads in many countries to higher end-prices for the remaining that could have an impact on the acceptance of RES projects. A consequential risk of RED II is that well-off households are more likely to get off the grid and become energy self-sufficient. This will leave poorer communities with a disproportionate burden of paying for the centralised electricity infrastructure. Therefore, poorer households should be enabled to participate in and benefit from projects, not only the consumers with higher socio-economic status[47]. Moreover, social welfare legislation across the EU Member States, including in Italy, Czech Republic and Germany, creates a 'welfare dilemma' as they require social

[40] Christina E. Hoicka, Jens Lowitzsch, Marie Claire Brisbois, Ankit Kumar, Luis Ramirez Camargo (2021 forthcoming): Implementing a just renewable energy transition: Policy advice for transposing the new European rules for Renewable Energy Communities. In: Energy Policy.
[41] Complementarity among different RES technologies, both over time and spatially, aims to address RES intermittency and flexibility issues with a synergetic approach. For example, PV systems and hydroelectric power could be complementary (PV system used to pump water into reservoirs when demand is low and electricity is cheap in order to store the energy).
[42] Hoicka, Christina E., and Ian H. Rowlands. 2011. 'Solar and Wind Resource Complementarity: Advancing Options for Renewable Electricity Integration in Ontario, Canada'. *Renewable Energy* 36
[43] Xinshuo Zhang et al. 2018. 'Short-Term Optimal Operation of a Wind-PV-Hydro Complementary Installation: Yalong River, Sichuan Province, China'. *Energies* 11.
[44] Sun, Wei, and Gareth P. Harrison. 2019. « Wind-Solar Complementarity and Effective Use of Distribution Network Capacity ». *Applied Energy* 247.
[45] Ramirez Camargo, Luis, Felix Nitsch, et al. 2019. 'Potential Analysis of Hybrid Renewable Energy Systems for Self-Sufficient Residential Use in Germany and the Czech Republic'. *Energies.*
[46] Ibid.
[47] Ibid.

benefit recipients to have no asset ownership or income to be eligible for social transfers, effectively prohibiting their participation in (co-)ownership of RE installations.[48]

4. Score Pilot Countries

4.1. Susa Valley (Italy)

Italy possesses an extensive track-record of longstanding historical cooperation in the electrical sectors, with cooperatives that are more than 100 years old and are still expanding. Most of these "energy communities" are found in the Northern part of Italy, in an area called the "Arco Alpino" (stretching from Liguria to Friuli) and have emerged as a result of direct citizen investment in hydroelectric power projects[49]. These initiatives are considered as the closest model to what has been envisioned in the RED II regarding RECs.

In the Italian constitution the competence for the production, transmission and distribution of electricity are shared between the state and the regions, which resulted in a fragmented regulatory framework. The Electricity Market Operator (Gestore dei Mercati Energetici) and the Electricity Services Manager (Gestore Servizi Energetici) promote sustainability incentives and encourage renewable electricity generation (henceforth "RES-E" [50]). The rules concerning the generation, storage, consumption and selling of renewable energy are the same for RECs and self-consumers and the legal framework does not allow for the share of electricity between the members of a cooperative (e.g. enostra): the energy must first be fed in the grid before being redistributed to the members. Cooperatives can fall under the category of energy suppliers in case they sell a part of their production to third parties. All prosumers must have their own single meter, which limit the activities of Renewable Energy Communities and the collective self-consumption. The frequent changes in the Italian regulations create uncertainty for potential prosumers.

There are two specific forms of renewable energy communities in Italy:

- **The historical energy cooperatives**, which legal framework was established in the 1960s. Some communities co-managed local plants (mainly, hydro plants) and developed a local grid, with a point of connection to the national grid

[48] See Hanke, F., Lowitzsch, J., 2020. Empowering Vulnerable Consumers to Join Renewable Energy Communities—Towards an Inclusive Design of the Clean Energy Package. Energies 13, 1615. https://doi.org/10.3390/en13071615.

[49] *SCORE interviews with local experts in the field of Renewable Energy, Energy Cooperative and Renewable Energy Communities in Czech Republic, Germany and Italy*

[50] Schwarz, J. (2019). Italy: Summary. Legal sources on renewable energy. RES LEGAL Europe. Available at: http://www.res-legal.eu/search-by-country/italy/summary/c/italy/s/res-e/sum/152/lpid/151/

- **'Utility Efficient System' (Sistema Efficiente di Utenza)** that applies to installed capacities of up to 20 MW that can consume their produced electricity or sell such electricity to a single local consumer. This type of installation could be used by large commercial or industrial consumers.

The Piedmont Region was the first Italian region to promote RECs with a regional Law[51]. In the Susa Valley, the SCORE project has mainly tried to implement biomass installation with District Heating Network in about 21 different municipalities, with the help of the CSOP model. The investment plans are based on substituting existing heating facilities running on diesel oil and natural gas with new ones using local biomass (wood chips) as a heating source. The users/clients of the public infrastructure become co-owners of the biomass plant, now as prosumers consuming the energy when using the building. The energy savings result from a learning effect: as co-owners of the RE installation, the users have an incentive to use less to be able to sell more excess production. This in turn increases funds available for the infrastructure. In addition, a negotiation is underway between SCORE partners and the regional public municipal sewage and waste company (owned by 37 local municipalities) to get them onboard and set up an energy community under a CSOP.

After municipal elections in Italy (May 2019) there was a change of political support for pilot projects in many municipalities involved in the project, which acted as a barrier slowing down the further development and expansion of RECs in Italy. The circulation of "not-in-my-backyard narratives" (NIMBY) and the lack of information on this topic has also contributed to local resistance to the spread of renewable energy cooperatives. Since 2004, the NIMBY forum has been analysing the evolution of the 'Not-in-my-Backyard' attitudes, while developing an impressive database of energy infrastructure and projects that are being contested across Italy. The XIII edition of the NIMBY forum reported that 317 infrastructures were subject to disapproval in the period from 2017 to 2018[52]. Among the trends, the think-tank reports a decrease of the new RES plants that coincides with a period of substantial decline of new investments and projects in Italy over the period. The strongest opposition is observed in the northern regions of Italy, while Lombardy remains the region with the highest number of contested installations, followed by Tuscany and Lazio. The backlash in the North can be explained with the higher degree of industrialisation and population density, which naturally requires more installations and energy infrastructures of all sorts. The disapproval was justified as "negative externalities on the quality of life", followed by "negative externalities for

[51] Regional Law of Piedmont Region, n. 12 August 3rd 2018: Constitution of energy communities, presented on 24th July 2017 and approved on July 25th 2018 (Istituzione delle comunità energetiche).
[52] "l'era del dissenso", Osservatorio Nimby Forum, XIII edition, 2018, https://www.nimbyforum.it/wp-content/uploads/2019/04/Nimby_forum_2018_doppia.pdf

the environment" (in the case of biomass installations) and the lack of inclusion in the decision-making, which confirmed the previous trend concerning the lack of inclusion of the citizens and a limited dialogue between citizens and the municipalities interested in new energy installations.

The replication of an assisted-CSOP (as planned in Slupsk, Poland, before the municipality decided to withdraw from the project) will be implemented by the AMICO cooperative (also member of SCORE). This will support the vulnerable members of the cooperative that are often facing long-term unemployment.

4.2. Litoměřice (Czech Republic)

The regulatory framework in the Czech Republic is rather under-developed and, in most case, municipalities are the most active actors in investing and owning RES installations (mostly Wind turbines, Photovoltaics, District Heating Networks with company under municipality's control). Yet, projects involving citizens, businesses and municipalities in a model that would fit the RED II definition of **Renewable Energy Community** have not been implemented so far in Czechia[53]. This can be partly explained by the local context: in Czechia, the main driver for consumers to invest in RES is the financial gain, either through the benefit of additional income or through cheaper electricity prices. Only a small part of the population justifies their prosumer choices with environmental concerns. Furthermore, when considering the potential that RECs holds for vulnerable consumers, energy poverty in the country is below EU average[54]This, in addition to a very limited information ecosystem about RES opportunities, limits the incentive for projects which primary goal is the reduction of energy poverty. The legal framework in the Czech Republic at the present time does not offer enough stability. The weak renewable energy ambition in its NECP and the lack of incentives for green technologies do not provide favourable regulatory environment for a more decentralised energy transition. The country should be supporting more actively the deployment of RES and establish stronger targets to break with incoherent national policy-making. Finally, the Czech Republic should also focus on countering local decarbonisation narratives that are not supportive of RES opportunities at the national level.

The Czech Republic doubled its RES capacity between 2004 and 2013, after which all support for RES was discontinued, which hampered the development of small-scale RES projects in

[53] *SCORE interviews with local experts in the field of Renewable Energy, Energy Cooperative and Renewable Energy Communities in Czech Republic, Germany and Italy*

[54] Member State Report (2020), the European Energy Poverty Observatory. Available at: https://www.energypoverty.eu/sites/default/files/downloads/observatory-documents/20-06/extended_member_state_report_-_czechia.pdf

the country. Since 2014-2015, there is no feed-in tariff support in the Czech Republic. Concerning small-scale energy projects, the only support scheme is investment support that can be obtained through a state contribution for building a small-scale domestic installation. This is mainly used by family houses and covers one to two thousand installations per year. The scheme foresees upfront payments by the households, which can be reimbursed at a later stage, making it difficult for low-income consumers to use such incentives.

The complex administrative process for RES deployment, including requirements for different permits and licenses, is another bottleneck for the development of community-owned RES sources. At this stage, the Czech NECP has not fully re-elected the goals and principles of REDII and does not foresee the setup of an effective framework for RECs before 2021.

In the past years, the Czech Republic has only installed 25 MW of PV installations, mostly concerning self-consumption projects[55]. The city of Hostětín in Moravia has been using forest biomass (woodchip) for district heating, supplying all households in the village. Hostětín was awarded several prizes for its use of RES.

The awarding of special bank loans backed by a government program for promoting the development of photovoltaics at favourable interest rates could provide a good solution to remove this important investment barrier for vulnerable consumers[56]. Moreover, the split incentive remains a further issue: most tenants with low-income do not own the house. For these reasons, the main beneficiaries of RES projects involving vulnerable consumers are generally municipal buildings, in which the municipality can cover the upfront investments costs to install RES-E in order to provide electricity to the tenants at a cheaper price. Even in such cases, the need for a direct connection to the grid can still pose a major barrier, since every flat has a "consumer's point" along with an electricity meter. Since the public grid operator owns all the connections, it is virtually impossible to connect the RES installation to this connection point without refurbishing the entire building and making a new connection from the roof to every flat. Even if this is possible in theory, the financial and administrative costs are overwhelming and make such co-ownership form practically impossible. Therefore, short connections should be granted the right to use the public grid in order to reap the benefits of locally owned resources.

The Czech capital the city of Prague is currently finalising its Climate Plan, which major aim is to reduce greenhouse gas emissions by 45% by 2030. The development of community renewables is also one of the priorities in the climate plan. Prague, with its population of 1.3 million, plans to produce more than 8% of total energy consumption from renewable

[55] *SCORE interviews with local experts in the field of Renewable Energy, Energy Cooperative and Renewable Energy Communities in Czech Republic, Germany and Italy*
[56] *Id.*

sources by the end of 2030. In the coming years, it is expected to increase the installed capacity on all long-term city property (municipal and city buildings, apartment buildings, local entrepreneurs, etc.) with a total production of energy from renewable sources of approximately 2.1 GWh per year. Excess energy will be used for public, office and private buildings and energy savings from changes in consumption behaviour are expected to reach up to 10%. Through SCORE a pilot CSOP project will be implemented in the period 2021-2022 with photovoltaic panels with an output of 2-3 MWp installed on municipal and mostly school buildings.

An example of a community-led RES project in the Czech Republic a local district heating installation built by the municipality of Kněžice in the central part of Bohemia that has been providing the inhabitants with heat generated from local biomass (municipal and agricultural waste). The Mayor Milan Kàzda has been trying to develop RES-E initiatives but was not successful due to numerous legal limitations, such as the need for a direct connection between the installations and the consumers.

The SCORE consortium has been working closely with the municipality of Litoměřice on RES-E roof PV projects in order to implement CSOPs in a Day Care Centre for Handicapped Children, a shelter for people in precarious situations, and in a residential building. The project's activities in Litoměřice also envisioned the conversion of former military barracks into the first "energy active public building" to accommodate six flats for young families in the city. The total number of people included in the CSOP is estimated at 125 inhabitants.

The project faced many obstacles from the very beginning because of the general lack of support for PV technology in the Czech Republic and the negative reputation of this technology in the country as a result of corruption schemes related to its exploitation at national level in 2015. As a result, the project was given lower priority compared to other ongoing municipal projects. Moreover, the municipal participation in RES CSOP projects raised the issue about the eligibility for the needed social transfers as well as the lack of access to the necessary external financing, which led to freezing support for the project.

Therefore, a new SCORE pilot has been launched in the Czech capital. The city of Prague has a population of 1.3 million and is currently finalizing the Climate Plan with the aim of reducing greenhouse gas emissions by 45% by 2030, where, among other things, one of the important priorities is the development of community renewables. Prague plans to produce more than 8% of total energy consumption from renewable sources by the end of 2030. In the coming years, it is expected to increase the installed capacity on all long-term city property (municipal and city buildings, apartment buildings, local entrepreneurs, etc.) with a total production of energy from renewable sources of approximately 2.1 GWh per year. Excess

energy will be used for public, office and private buildings and energy savings from changes in consumption behavior are expected to reach up to 10%. Thanks to support from the SCORE project the pilot project will be implemented in the period 2021-2022 when photovoltaic panels with an output of 2-3 MWp are to be installed on city and mostly school buildings.

4.3. Essen (Germany)

Germany is a pioneer in the spread of renewable energy communities in Europe and one of the countries with the highest citizen participation that emerged as a grassroots movement. This has led to a structural shift in the ownership models on the German electricity market and the energy consumption patterns of the citizens. Despite the existence of various ownership models, only 5% of the installed RES capacity is owned by large centralised energy utilities[57].

In Germany the central legislation addressing prosuming is the *Renewable Energy Sources Act* (Erneuerbare-Energien-Gesetz, hereinafter EEG, adopted in 2000 and amended several times), which defines the term as *'self-consumption'*. The legislation covers only the term "citizen energy" ("Bürgerenergie") encompassing the EU legal definition of an "energy community"[58] and characteristics of RECs. This definition refers to a community consisting of at least ten natural persons who hold at least 51% of voting rights collectively and in which not more than 10% of voting rights are held individually.

Energy communities in Germany can take various legal forms (such as cooperatives, associations, LLCs, etc). In Germany, the legal definition of "citizen energy companies" could serve as a basis for the definition of REC[59]. It would require modifications concerning the spatial delimitation of generation and shared use, such as the connection between rural regions and urban centres with high consumption levels or close spatial connection between generation and consumption for the joint regional use of electricity by the members of the community. Although REC members are allowed to receive return on investments, the REC is conceived to provide ecological, economic or social benefits in a given area and to not have a profit-oriented character.

As the RED II has not been transposed yet, the only existing incentive to consume renewable energy is self-consumption. The right to energy-sharing that is enshrined in RED II still needs to be introduced in Germany. When electricity is supplied to end consumers, there are al-

[57] Energy Atlas 2018: Figures and Facts about Renewables in Europe, Heinrich Boll Stiftung, 2018.
[58] Campos, Inês et. al. (2020).'Regulatory challenges and opportunities for collective renewable energy prosumers in the EU'. In: *Energy Policy*, Volume 138.
[59] Huneke, Fabian and Nitzsche, Sara. (2020) Impulspapier Energy Sharing, Berlin: Energy Brainpool.

ways obligations under the energy law, even when supplying neighbours. The payment of the EEG surcharge (renewable surcharge)[60], accounting and contract drafting are hurdles that further complicate energy sharing. Furthermore, the direct selling of electricity from EEG systems is subject to certain technical conditions according to the EEG, which are difficult to meet for small systems. Finally, low-income households face financial barriers for participating in an REC. Low minimum deposits or options to pay in instalments should be developed as solutions for such vulnerable investors[61].

The new amendments to the existing EEG legislation should come into force in January 2021. Despite previous consultations with stakeholders, a limited number of improvements have been foreseen so far. The major changes include new connection regulations for the post-EEG systems and the design of tenders for PV roof systems. The legal framework of PV system is furthermore adapted to allow the sale of solar power to the grid operators for the market price minus marketing costs of 0,2 ct/kWh for a transitional period.

Most importantly, no suspension of the EEG surcharge on PV self-consumption is envisioned in the document (as required in REDII). The goal of the German federal government is to promote a market-driven expansion of RES across the country and to integrate the objectives of the Climate Protection Program 2030 in the amendments. To do so, the draft law foresees specific expansions paths for all technologies: PV should be increased to 100GW (twice the current national installed capacity) and 91 GW for wind power (onshore and offshore). Certain technologies will be promoted in tenders up to 2028.

The government envisions the introduction of tenders for PV systems from 2021 until 2028, with an increase in quantities from 2015. The tenders foresee the installation of 200 MW of rooftop PV systems in 2021. This volume should then increase in the following years to reach 1.2GW in 2028. Some of the EU requirements regarding the removal of disproportionate and discriminatory charges, which would imply the exemption from taxes and surcharges, have not been fully reflected in the amendments. For example, the PV tenant electricity scheme should include remuneration for large PV tenant electricity projects. The current draft legislation foresees a surcharge of 1.42 cents/kWh for systems up to 750kW and 2.66 cents/kWh for small projects (<10kW).

[60] Under the Renewable Energy Sources Act (in German), the remuneration rates that German power plants receive from producing RES power and feeding it into the grid are set for 20 years. EEG surcharge refers to the difference between the specified feed-in tariffs paid under the **EEG** and the sale of the RE at the EEX energy exchange by the grid operators (see State-imposed components of the electricity price, Federal Ministry for Economic Affairs and Energy)

[61] https://www.pv-magazine.de/2020/10/12/rechtsgutachten-geplante-eeg-novelle-verstoesst-bei-photovoltaik-eigenverbrauch-gegen-europarecht/

Thus, the amendments will support only companies with new PV systems that successfully participated in an auction and will no longer consume a proportion of their solar energy themselves. The current draft is not expected to alleviate administrative burdens and legal uncertainty in RES development but create even new bottlenecks. For example, the planned introduction of tenders for rooftop systems is not in line with the right of prosumers to be granted non-discriminatory access to existing funding schemes as enshrined in RED II.

The current regulatory environment in Germany is supportive of self-consumption and individual prosumers but does not facilitate renewable energy communities in particular. Despite this there are some good examples of community projects that have spread in the country and showcase innovative financial and technical solutions for collective self-consumption, some of which also involved vulnerable consumers.

The city of Essen plans to apply the CSOP model on the campus of the Franz Sales Haus and the adjacent vocational college east. Three types of stakeholders are involved in this project: the municipality of Essen; the sponsoring association of the Franz Sales Haus; and the sport club on campus. A total of around EUR 340,000 is to be invested in rooftop photovoltaic systems, mainly on the vocational college east (approx. 225 kWp) and on three buildings on the campus of the Franz Sales House (approx. 140 kWp). About 30% of the investment should be financed from own resources (including funds from ReInvest) and 70% could be financed by loans. The exact distribution of the investment shares among the anchor shareholders depends on the benefits and obligations in the project and can still be variably determined. Two scenarios are foreseen for the repayment period: seven years in the best-case scenario and ten years in the second scenario. The amortisation of the entire investment will take from eleven to sixteen years.

The vocational college east has very suitable roof areas ensuring maximum capacity of more than 300kWp, while the Franz Sales Haus has an area network with a total of 15 connected buildings and a commercial load profile with an enormous capacity to absorb additional electricity. However, the investment and operating costs per kWp are higher due to the small and poorly suitable roof areas. This complementarity enables the building of a larger system that allows for 100% self-consumption. The Franz Sales Haus owns its own microgrid, which in this case avoids the corresponding costs and surcharges that would be due if the energy would be shared via the public grid.

Box 5: The Blockchain Village

The village of Wildpoldsried stands as a great example of the German energy transition. The Bavarian community of about 2600 inhabitants has an installed solar PV capacity of 5.3MW and solar-thermal systems covering a total area of 2,300m², with the addition of 18 MW wind turbines, various biogas and biomass power plants and two small hydroelectric powerplants. Over time, the municipality has come to generate nearly seven times more renewable energy than it consumes, a major challenge for the local power grid. To resolve this issue, a consortium of four companies and two universities has equipped the municipality with a microgrid control system. In March 2018 local researchers initiated the Pebbles projects, aiming at piloting peer-to-peer energy trading based on the blockchain technology, allowing neighbours to sell the excess of energy directly to other neighbours through the microgrid. The blockchain technology enables anonymous, forgery-proof transactions and is the basis for accurate billing of shared kilowatt-hours and their equivalent in euros. The aim of the pro-

ject, which will run until 2021, is to develop a trading platform for local green power with a virtual power plant and its own electricity exchange[62].

Box 6: The Mülheim district: RES complementarity

In the city of Cologne, seventeen four-storey apartment buildings were renovated between 2015 and 2019 in the Mülheim district in order to insulate the facades and windows and to install PV roof systems with a total output of 1,085kW peak. Various battery storage applications were installed to ensure that the electricity generated on site is consumed locally, including by heat pumps to heat the apartment and by charging stations for electric vehicles. As part of the renovation work, the local energy supplier Rhein Energie commissioned Greencom Networks to equip the estate with an intelligent energy management system, comprising its own Energy Information Brokerage Platform – an IoT platform that can optimise the flow of electricity, allowing the balance of supply and demand on site while integrating the entire settlement into a virtual power plant. Residents can use the app to view a real-time visualisation of the energy flows along with historical statistics on generation and consumption. The new systems were able to reduce emissions by around 60%.

Box 7: The housing cooperative Neues Berlin and the Berliner Stadtwerke

The housing cooperative Neues Berlin and the Berliner Stadtwerke expanded their cooperation with six PV systems spread over a total of 23 buildings to create a vast joint tenant electricity project. Five PV systems corresponding to 224 kWp were already installed in the Malchower Aue residential complex in the Hohenschönhausen district. In addition, the Berliner Stadtwerke converted an existing solar system on the Degnerbogen new Berlin building into an intelligent tenant power system. With the new tenant electricity project, 500kWp will be built across 23 six-storey buildings, benefitting 1,100 apartments. The plants are expected to generate about 420,000 kWh of electricity per year and save around 235 tons of CO2[63].

Box 8: Renovation of the former Nymphenburg sparkling wine cellar

The site of the former Nymphenburg sparkling wine cellar in Munich has been converted into a modern commercial area over the past two years. According to the Munich municipal utilities, the core of the energetic renovation is a 10,000 square meter photovoltaic system on the area now known as “Centro Tesoro”. The system has a total of 433 kWp and will generate about 433,000 kWh of solar power per year, which will be made available directly to the users of the area via a tenant electricity model. However this model posed legal obstacles and is perceived as economically unsustainable. This is because the so-called self-consumption privilege does not apply as is the case with individual prosumers who are also owners of the property. Furthermore, surcharges render the operation much more expensive. The Munich city council has spoken out in favour of equipping the entire residential building stock of the municipal housing associations GWG Munich and GEWOFAG with photovoltaics by 2030. According to the concept, photovoltaic systems are to be installed on the

[62] “the Blockchain Village” PV Magazine Global Issue 11/2019

[63] https://www.pv-magazine.de/2020/10/13/berliner-wohnanlage-bekommen-photovoltaik-mieterstromprojekt-mit-500-kilowatt/

roofs of all new buildings and ten percent of the existing buildings are to be retrofitted every year. Tenants should preferably be given the opportunity to draw tenant electricity from their building[64].

5. Policy recommendations

To tackle many of the political, administrative, financial, technical and disinformation challenges solutions at both national and EU-level are needed. The new RED II guarantees EU energy citizens a certain set of rights. However, its transposition into national legal frameworks could both enable and burden the process. In order to reap the social and economic benefits of Renewable Energy Communities, a specific strategy must be deployed aiming at understanding the needs of the local communities, identifying the stakeholders and the social barriers (i.e. level of education, low-interest for green initiatives, NIMBY attitudes, etc), as well as defining what will be the best way to reach out to vulnerable consumers and engage them.

Recommendations for the transposition of RED II[65]

- Legislators should define various categories of proximity depending on the spatial organisation of an REC and local needs, while taking into account geographies of energy supply and demand, urbanisation trends, demographics of investment and heterogeneity of REC membership.
- Lawmakers should specifically support business models like CSOPs that make renewable investments compatible for municipalities and local SMEs at the same time allowing strategic partnerships with commercial investments that can scale RECs while limiting incumbent control.
- To provide access for RECs to funding under the general EU financing sources, it is crucial to now include them in the operational programmes defining their requisites for participation; this will also safeguard a policy dialogue on key issues of programme implementation and performance.

[64] https://www.pv-magazine.de/2020/08/10/stadtwerke-muenchen-haben-photovoltaik-mieterstromprojekt-in-betrieb/

[65] Most of the recommendations for the transposition of the RED II Directive are based on the transposition guidelines formulated in: PROSEU, Community Power, SCORE, Renewables Networking Platform, EREF 2020 : Transposition Guidance for citizen energy policies – Recommendations to strengthen prosumers and energy communities when transposing the Clean Energy Package (RED II, IEMD); See also Christina E. Hoicka, Jens Lowitzsch, Marie Claire Brisbois, Ankit Kumar, Luis Ramirez Camargo (2021 forthcoming): Implementing a just renewable energy transition: Policy advice for transposing the new European rules for Renewable Energy Communities; Energy Policy

- The upcoming MFF and Next Generation EU funding mechanism shall consider including stronger target support measures for citizen-led energy projects and a requirement for national governments to set up a certain ratio for micro grants and decentralised citizens 'projects. National governments should be required to enable and facilitate such citizen-led projects in line with Article 25 of the proposal for a Regulation laying down common provisions on the ERDF, ESF + and EMFF.
- Measures in the National Recovery and Resilience Plans (NRRs) should prioritise green and sustainable investments (e.g., the Italian "ECO Bonus 110%" of the Decreto Rilancio of 15 May 2020) which can become an important complementary financing source.

Recommendations for national policy-makers

- National policymakers have to adopt specific measures to ensure that all consumers, including those in low-income or vulnerable households or in social housing could participate in renewable energy communities.
- In view of the new EU Strategy called "*A renovation wave for Europe*" as part of the *European Green Deal*, national governments shall propose specific measures to promote the role of energy communities in the implementation of energy efficiency policies and measures, such as the energy efficiency obligation schemes and alternative measures under Article 7 of the EED, the long-term strategy for the renovation of public and private residential and commercial buildings, as well as the promotion of energy services in the public sector.
- Community-based criteria should be further clarified in the procurement of energy services by local authorities and community projects should benefit from targeted support schemes:
    - National governments should consider designing electricity sharing schemes tailored to the needs of households in order to facilitate joint household renewable energy projects.
    - Procedures for introducing net-metering possibilities for small-scale RES should be simplified and regulation should prevent DSOs from arbitrary changes to the administrative procedures for trading excess electricity with the grid.

- Expanding the focus of the RES policies from electricity-only to heating and cooling as well – with the proper incentives for end-users to consider such options.
- MSs should encourage RE "clusters" that support complementarity between RES amongst a range of actors in order to minimize costs and maximize benefits of RES integration.
- Special attention should be paid to Art.18 of the RED II Directive on information and training, which is a key component for enabling citizens and communities to become active players on the energy markets. National policy-makers and implementing agencies shall develop plans for wide and targeted communication activities and capacity building programmes to increase the awareness of the citizens on these opportunities.
- The installation of small RES at end-consumers' locations should be promoted through one-stop shops at municipalities and administrative burdens should be reduced.
- Energy poverty should be prioritised in the policy frameworks of the energy and environment ministries, in close cooperation with the social policy ministries at national level.
- MSs should implement a framework for vulnerable households in the process of transposition of RED II. Actions to address energy poverty and vulnerability should include incentives for affected citizens to participate.
- National governments need to design a concrete action plan for jumpstarting investments in small-scale renewable energy plants that includes a piloting phase for a new support scheme in several municipalities to be followed up by a nation-wide program.
- The relevant national ministries and agencies shall consider relationships between the spatial distribution of RES potential, community density and demand, and demographics with the aim to maximise both social acceptance and investments in RECs.

General Data	
Acronym	SCORE
Project title	Supporting Consumer Co-Ownership in Renewables
Grant Agreement N°	784960
Call identifier	H2020-EE-2016-2017
Topic identifier	Engaging private consumers towards sustainable energy
Funding scheme	Coordination and Support Action
Start Date	1 April 2018
Duration	36 months
Deliverable Document Sheet	
Deliverable	**D5.2 Mapping Policy Options for Renewable Energy Communities in Europe: Background Paper**
Lead beneficiary	Center for the Study of Democracy
Work package	WP5
WP-leader	POLITO
Submission due	November 2020
Submission date	4 January 2021
Dissemination type	Report
Dissemination level	Public
Document properties	
Author(s)	Christopher Rolland, Radostina Primova (CSD)
Reviewer(s)	Jens Lowitzsch, Felicia van Tulder, Florian Hanke (EUV)

SCORE

Imprint

SCORE facilitates consumers to become (co-)owners of RE in three pilot regions and in cities across Europe following these pilot projects. SCORE applies Consumer Stock Ownership Plans (CSOPs) utilising established best practice updated by inclusive financing techniques. Vulnerable groups affected by fuel poverty – as a rule excluded from RE investments – are in the focus of the project.

Project Coordinator
European University Viadrina Frankfurt (Oder)
Prof. Dr iur. Jens Lowitzsch
Kelso Professorship of Comparative Law, East European Business Law and European Legal Policy, Faculty of Business Administration and Economics

Director of the Inter-University Centre
EUROPA-UNIVERSITÄT VIADRINA FRANKFURT (ODER) | FREIE UNIVERSITÄT BERLIN|SVEUČILIŠTEUSPLITU| UNIVERSITÉ PARIS 1 PANTHÉON-SORBONNE
Postal address: Große Scharrnstraße 59, 15230 Frankfurt (Oder) Germany
T +49 (0) 335 5534 2566
F +49 (0) 335 5534 72566
E kelso-professorship@europa-uni.de

SCORE Consortium
Centre for the Study of Democracy | Město Litoměřice | Miasto Słupsk | Climate Alliance | co2online | Consorzio Forestale, Regione Polveriera | Cooperativa La Foresta | Cooperativa Sociale Amico | Deutscher Caritas Verband (in coop. with Energiereferat Frankfurt/Main) | Europa Universität Viadrina, Frankfurt (Oder) | Federacja Konsumentów | Instytut Energetyki Odnawialnej | Politecnico di Torino | Porsenna.

Advisory Board
Thomas Engelke, VZBV | Patricia Hetter-Kelso, Kelso Institute | Jean-François Renault, Projektträger Jülich | Lutz Ribbe, EESC | Pia Saraceno, REF-4E think tank | Dirk Vansintjan, REScoop | Günther Verheugen, Former Vice-President of the European Commission.