Wissenschaftliche Untersuchung der Rahmenbedingungen für Bürgerenergie in Ländern Mittel- und Osteuropas

Endbericht an die

Deutsche Bundesstiftung Umwelt (DBU)

Kurztitel: Bürgerenergie in MOE

Universität für Bodenkultur Wien, ILEN

Dr. Gesa Geißler (g.geissler@boku.ac.at)
Dr. Tamara Mitrofanenko (tamara.mitrofanenko@boku.ac.at)

Technische Universität Berlin, Fachgebiet Umweltprüfung und Umweltplanung

Prof. Dr. Johann Köppel (johann.koeppel@tu-berlin.de)

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1 Hintergrund

Bürgerenergie wird im nationalen und internationalen Kontext unterschiedlich bezeichnet und definiert. Oft wird dabei das Konzept des „Prosumers“ genutzt, um auszudrücken, dass Energieerzeugende (Producers) gleichzeitig auch Energienutzende (consumers) sind. Eine einheitlich akzeptierte Definition scheint es bislang zwar nicht zu geben, allerdings bestimmte Kriterien, die bei fast allen Charakterisierungen relevant sind. Dazu gehört die Teilhabe/Partizipation von Bürger*innen bei der Energiewende und dezentrale Strukturen der Energiewirtschaft.

Im europäischen Kontext wurde durch die Erneuerbare-Energien-Richtline (RED II) von 2018 und die EU-Elektrizitätsbinnenmarktrichtlinie (Richtlinie 2019/944) der Begriff „energy communities“ definiert. Mit diesen Richtlinien wurden Vorgaben für „citizen energy communities“ und „renewable energy communities“ geschaffen (Caramizaru and Uihlein 2020)[1]. Daneben wird in den beiden Richtlinien aber auch eingeräumt, dass noch weitere Formen von Bürgerenergiegemeinschaften möglich sind. Laut den EU-Vorgaben sollen diese Bürgerenergiegesellschaften dabei helfen, private finanzielle Mittel zu mobilisieren, Opposition gegen den Ausbau erneuerbarer Energie zu verringern und auch die Flexibilität der Märkte zu erhöhen (BRIDGE 2019). Die Europäischen Richtlinien vereinfachen für die Bürger*innen die Erzeugung, die Speicherung und den Verkauf von selbsterzeugter Energie. Die rechtliche Verankerung dieser Rechte von Bürgerenergieerzeugenden wird von entsprechenden Akteuren im Bereich Bürgerenergie als positiv gesehen (vgl. z.B. Friends of the Earth 2019[2]).

Es gibt unterschiedliche rechtliche Rahmenbedingungen die genutzt werden, um Bürgerenergieprojekte zu fördern. Neben „net-metering“ (wie z.B. in Polen seit 2015 oder auch in Moldawien seit 2016 gemäß UNECE 2017[3]) oder „smart metering“ (Stromerzeugung und -verbrauch werden dabei miteinander verrechnet) sind dies auch Einspeisevergütungen (feed-in tariffs) oder die Zahlung von Prämien (premiums) oder Steuererleichterungen. In Albanien beispielsweise gibt es eine Einspeisevergütung für kleine Wasserkraftwerke mit einer Leistung von bis zu 10 MW (UNECE 2017) oder auch in Moldawien, dort trat 2016 eine Regelung zur Einspeisevergütung in Kraft (ebd.).

2 Vorgehensweise und Methode zur Charakterisierung von Bürgerenergie in MOE-Staaten und zur Unterstützung der Etablierung des DBU-Förderthemas „Bürgerenergie“

Die erste Phase diente einerseits der Konzeptionierung des Themas Bürgerenergie in Staaten Mittel- und Osteuropas sowie andererseits einer grundlegenden Charakterisierung der 19 Nationen in Bezug auf Aktivitäten und Potenziale für Bürgerenergie basierend auf einer Literatur- und Dokumentenauswertung. Dies beinhaltete eine grundlegende Recherche zu rechtlichen Vorgaben für die Erzeugung von Energie aus erneuerbaren Quellen wie zu Einspeisevergütungen, Regelungen zum Netzzugang etc. Auch sind politische

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1 *Caramizaru, A. and Uihlein, A. 2020. Energy communities: an overview of energy and social innovation, EUR 30083 EN, Publications Office of the European Union, Luxembourg, doi:10.2760/180576, JRC119433.*

2 *Friends of the Earth 2019. Europa Entfesselt. Die Energiewende in Bürgerhand. https://www.bund.net/service/publikationen/detail/publication/europa-entfesselt-die-energiewende-in-buergerhand/.*

3 *UNECE 2017. Renewable Energy Status Report. https://www.ren21.net/wp-content/uploads/2019/05/REN21_UNECE_Renewable_Energy_Status_Report_2017_Report_FINAL.pdf*

Ziele wie in den EU-weit vorgeschriebenen Nationalen Energie und Klima Plänen (NECPs) oder nationalen Energiekonzepten und -strategien festgelegt und deren Relevanz für die Entwicklung von Bürgerenergieprojekten untersucht worden. Hier wurde auch auf Einschätzungen und Analysen wie z.B. von Roberts und Gauthier (2019)[4] zum Thema Bürgerenergie in den NECPs der Länder aufgebaut. Weiterhin wurden auch übergreifende Informationen inklusive anderer als der MOE-Zielstaaten genutzt, wie etwa aus dem COMPILE-Projekt „Collective self-consumption and energy communities …" (Frieden et al. 2020)[5]. Dabei spielte auch der unterschiedliche Status der Länder im Bezug zur EU und die Verbindlichkeit von EU-Vorgaben (z.B. EU-Richtlinien) eine Rolle. In der Gruppe der Zielländer finden sich neben EU-Mitgliedsländern (Bulgarien, Estland, Kroatien, Lettland, Litauen, Polen, Rumänien, Slowakei, Slowenien, Tschechien, Ungarn) einige Staaten, die offizielle Kandidaten der EU und „Contracting Party of the Energy Community" (Albanien, Nord Mazedonien, Montenegro, Serbien) sind. Darüber hinaus gibt es Länder, die potenzielle Kandidatenstaaten der EU sind (Bosnien und Herzegowina, Kosovo) bzw. die wie die Ukraine keinen formalen Prozess in Richtung EU-Beitritt gestartet haben. Während in den EU-Mitgliedsländern klare Vorgaben greifen und umgesetzt werden müssen, ist dies bei Kandidatenstaaten bzw. potentiellen Kandidaten nicht so eindeutig und die nationale Umsetzung europäischer Vorgaben unterschiedlich ausgeprägt. Dies wurde recherchiert und in Steckbriefen zu den einzelnen Ländern festgehalten.

In dieser ersten Projekt-Phase wurden auch bestehende Aktivitäten und Projekte sowie übergeordnete Akteure in den 19 MOE-Staaten identifiziert. Letztere konnten fördernde übergeordnete Institutionen wie die EU-Kommission, UNDP, GIZ, KfW etc. sein, oder lokale Akteure in den einzelnen Ländern. Prominent vertreten waren auch Projekte und Aktivitäten der Europäischen Klimainitiative des BMUV (EUKI), wie insbesondere das Projekt „Community Energy" [6]. Um diese Akteure in den Ländern zu identifizieren, wurden einerseits Netzwerke und Zusammenschlüsse von Aktiven wie beispielsweise das Netzwerk „EnergyCities"[7], das Europäische Netzwerk von Bürgerenergieinitiativen „REScoop.eu"[8] oder auch "EUCENA", die Europäische Bürgerenergie Akademie[9] genutzt und ausgewertet. Auch wurde über eine Auswertung der wissenschaftlichen Aktivitäten zum Thema Bürgerenergie Akteure aus der Wissenschaft (Universitäten, außeruniversitäre Forschungseinrichtungen etc.) identifiziert. Diese sind im Sinne transdisziplinärer Vorhaben von Bedeutung. Weiterhin konnten in dieser Phase Kontakte über das DBU-Alumni-Netzwerk sowie die DBU Sonderbeauftragten (für Mittel- und Osteuropa Claudia Domel und Romana Cermanová) genutzt werden, um weitere Kontakte und Informationen zu erhalten.

Dabei wurden in diesem ersten Schritt auch laufende und abgeschlossene Forschungs- und Entwicklungsprojekte im Themenfeld Bürgerenergie in den 19 MOE-Ländern identifiziert. Dies umfasste sowohl konkrete Bürgerenergieprojekte, wie auch Projekte zur Optimierung der Rahmenbedingungen für Bürgerenergie oder solche zur Öffentlichkeitsarbeit. Letzteres war beispielsweise in Bosnien und Herzegowina bereits

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4 *Roberts, J. und Gauthier, C. (2019). Energy communities in the draft National Energy and Climate Plans: encouraging but room for improvements. https://www.rescoop.eu/uploads/rescoop/downloads/Briefing-NECPs-and-energy-communities.pdf*

5 *Frieden, D., Tuerk, A., Neumann, C., d'Herbemont, S., Roberts, J. (2020). Collective self-consumption and energy communities: Trends and challenges in the transposition of the EU framework. Working Paper. https://www.rescoop.eu/uploads/rescoop/downloads/Collective-self-consumption-and-energy-communities.-Trends-and-challenges-in-the-transposition-of-the-EU-framework.pdf*

6 *(https://www.euki.de/euki-projects/buergerenergie/*

7 *https://energy-cities.eu/ .*

8 *https://www.rescoop.eu/ .*

9 *eine Inititative der EUKI: https://www.euki.de/euki-projects/eucena-akademie/ .*

ein Fokus gewesen, u.a. die Erstellung von Fernseh-/youtube-Videos zum Thema Bürgerenergie. Dieser Schritt sollte auch dazu dienen, im weiteren Verlauf des Projekts potenzielle Lücken bzw. sinnvolle Ergänzung zu bereits bestehenden Projekten für die DBU-Förderstrategie zu identifizieren oder begründet zu verwerfen. In diesem Arbeitsschritt wurden die konkreten Bürgerenergie-Projekte charakterisiert in Bezug auf ihre Ziele, ihren regionalen Fokus, technologischen Fokus und weitere relevante Aspekte.

Aufbauend auf der Charakterisierung und Typologisierung von Bürgerenergie in den 19 MOE-Staaten wurde dann versucht, regionale oder typologische Cluster abzuleiten. Für eine vertiefte Untersuchung einzelner dieser Cluster und Regionen wurden dann Einzelstudien (pre-studies) vergeben (vgl. Kapitel 6). Das Verfahren zur Entwicklung der Einzelstudien wird in den folgenden Unterkapiteln genauer ausgeführt. Um die Arbeit in den Einzelstudien vergleichbar und zielgerichtet auf eine spätere Zusammenführung und Bündelung zu gestalten, wurde im Vorhaben ein strukturiertes Raster (Fragestellungen und Berichts-Template) für die Arbeit in den vertiefenden Einzelstudien entwickelt. Dieses Raster wurde basierend auf der oben beschriebenen Literatur- und Dokumentenauswertung erstellt. In der Analyse in den Einzelstudien sollten somit in möglichst vergleichbarer Weise auch potentiell fördernde und hemmende Faktoren für die Umsetzung von Bürgerenergieprojekten identifiziert werden.

2.1 Stakeholder-Interviews

Aufbauend auf der Dokumenten- und Online-Recherche wurden qualitative, semi-strukturierte Experteninterviews mit Akteur*innen in den Zielländern durchgeführt. Dabei wurde mit einem Fragebogen mit Leitfragen gearbeitet, die für die einzelnen Interviews und in Bezug auf die Interviewpartner*innen individuell angepasst wurde. Beispielsweise wurden Fragen zu bestimmten Aktivitäten der Interviewpartner*innen, die zuvor recherchiert worden waren aufgenommen. Die Leitfragen sind in Box 1 dargestellt.

Box 1. Set von Leitfragen für die Stakeholder-Interviews (individuell angepasst in den Interviews)

Could you briefly introduce your work and potential linkages to the topic “energy communities”/”community energy”?

Can you outline the situation in your country regarding community energy/prosumerism?

How do you see the role of the government? Are governmental policies supportive of citizen energy initiatives? How are the EU definitions of “Citizen Energy Communities” and “Renewable Energy Communities” transposed in national laws? Do you perceive this as helpful?

What would you say needs to change in [country] in order to make citizen/community energy projects attractive and viable? (Regulation, financing (government support for RE, access to loans, …), information/knowledge, grid access, culture…)

Where do you see the major obstacles to success of community energy in your country?

Which ongoing projects or initiatives do you regard as relevant for supporting community energy in [country]?

Are there best practice exmples of community energy projects that you know of in your country?

Can you point to certain *individuals* or *groups of actors* with which we might get in contact for an interview?

Who can you think of could be interested in the option of receiving further information about the options of project support (grants, fellowships etc.) by DBU?

Is there anything else you would like to share with us?

Für die Interviews wurden vor allem Akteure kontaktiert, die bereits im Kontext mit Bürgerenergie bzw. Energiewende aktiv waren, beispielsweise in Forschungsprojekten (Horizon 2020, EUKI o.ä.) bzw. in Netzwerken wie ReScoop gelistet waren. Die Akteure wurden per E-Mail angeschrieben und über die Ziele des Projekts und der Interviews informiert. Dabei wurde auch eine kurze Definition bzw. ein Verständnis zum Thema Bürgerenergie bzw. „energy communities/community energy" mitgeschickt. Von den ersten durchgeführten Interviews ausgehend wurden dann im Sinne der Schneeballmethode weitere Kontakte identifiziert. Die folgende Tabelle 1 gibt einen Überblick über die durchgeführten Interviews.

Die Interviews wurden per Zoom durchgeführt, fanden meist auf Englisch statt, bei einzelnen Akteuren auch auf Deutsch und dauerten im Schnitt ca. 45 Minuten. Durchgeführt wurden die Interviews von den Projektbearbeiterinnen und wurden durch eine Mitschrift dokumentiert. Nur in Einzelfällen wurden die Interviews aufgezeichnet.

*Tabelle 1: Interviewpartner*innen*

Name	Institution
Bulgaria	
Teodora Stoyanova	European Climate Foundation
Croatia	
Vjeran Pirsic	Eko Kvarner, Energy Manager Island Krk
Vedran Horvat	IPE
Czech Republic	
Marie Kleeschulte	Climate Alliance; Partner of SCORE-Project
Jaroslav Klusák	Semmo, Prague
Hungary	
Bence Kovács	Friends of the Earth Hungary /Europe
Márton Fabók	Community Energy Service Company (CESCO)
Kata Konstantin	DBU Fellow, Master on renewable energy conditions
Kosovo	
Egzona Shala	EcoZ
Liburn Aliu	Ministry of Environment, Spatial Planning and Infrastructure Kosovo

Name	Institution
Agim Mazreku	Head of Cabinet of the Ministry of Economy of Kosovo
Selimi Pranvera	DBU Fellow Wuppertal Institut
Rinora Gojani	Balkan Green Foundation
Milot Morina	Germanwatch
Poland	
Marco Gütle	RENALDO Projekt
Pior Lidzbarski	Slubsk Energy Cluster
Prof. Żmijewski	Efficiency Association
Prof. Piotr Banaszuk	Bialystok University of Technology
Prof. Szymański, Prof. Ryszawska, Ms. Rozwadowska,	Wroclaw University of Economics and Business, EC² - Energy Citizenship and Energy Communities for a Clean Energy Transition
Romania	
Sorin Cebotari	InfoClima.ro founder, PhD in community energy in Romania, Uni Babeș-Bolyai, Cluj-Napoca
Mihai Dragomir	Romanian Energy Cooperative Member
Jacob Bußman	Trier University of Applied Sciences, project Interaktives Coaching zur Entwicklung von drei resilienten Dörfern in Rumänien auf Basis von erneuerbaren Energien unter Berücksichtigung von Biomassepotenzialen einer biodiversen Kulturlandschaft in Siebenbürgen.
Serbia	
Jasminka Young	RES Foundation
Slovakia	
Juraj Melichar	Priatelia Zeme-CEPA (FoE Slovakia)
Jan Karaba	SAPI
Jakub Csabay	Roma Environmental Sustainability and Development Initiative, Comenius University in Bratislava
Ukraine	
Maryana Melnikovych	Social Innovation, Science for the Carpathians Network
Andrij Zinkenko	“Greencubator” cooperative co-founder
Anna Zhovtenko	UNDP
Overarching	
Project team EC² Horizon 2020 project	Dr. Judith Feichtinger, ZSI Wien, Austria Piotr Szymański; Prof. Dr. Bozena Ryszawska; Magdalena Rozwadowska – Poland Dr. Karen Hamann – Uni Leipzig, Germany Tom Feeney - GEN Europe Dr. Lise Jans - Uni Groningen, Netherlands

Name	Institution
	Prof. Katja Corcoran, Uni Graz, Austria
Michael Krug	FFU Berlin
Karen Hamann	EC² Horizon 2020, Universität Leipzig
Kathleen Pauleweit, Anika Nicolaas Ponder	IKEM, ENGAGE - Energiewende-O-Mat

2.2 Stakeholder-Workshops

2.2.1 Vorbereitung und Durchführung der Workshops

Im Rahmen des Projekts wurden zwei Stakeholder-Workshops durchgeführt. Aufgrund der Unsicherheiten im Zusammenhang mit der Corona-Lage wurden die Workshops online per Zoom durchgeführt. Ziel der Workshops war es, eine Vernetzung von Akteuren aus den 19 Zielländern zu erreichen und gleichzeitig die DBU vorzustellen und über deren Fördermöglichkeiten zu informieren. Die Workshops wurden als Halbtagesveranstaltungen geplant und durch das Projektteam in Abstimmung mit der DBU vorbereitet und durchgeführt.

Die Einladung zum 1. Workshop am 10.5.2022 wurde per E-Mail am 1.4.2022 an die vorab identifizierten Akteure versandt. Eine Erinnerung per E-Mail erfolgte am 11.4.2022. Darüber hinaus wurde die Einladung von einigen Akteuren über bestehende Verteiler weitergeleitet, dazu gehört z.B. der Verteiler der EUCENA Summer School. Auch über die Verteiler der DBU wurde die Einladung weiterverteilt. Bis zum 26.4.2022 gingen 58 Anmeldungen aus 16 Ländern ein. Die Teilnehmer*innenliste für den Workshop ist im Anhang (A.3) verfügbar.

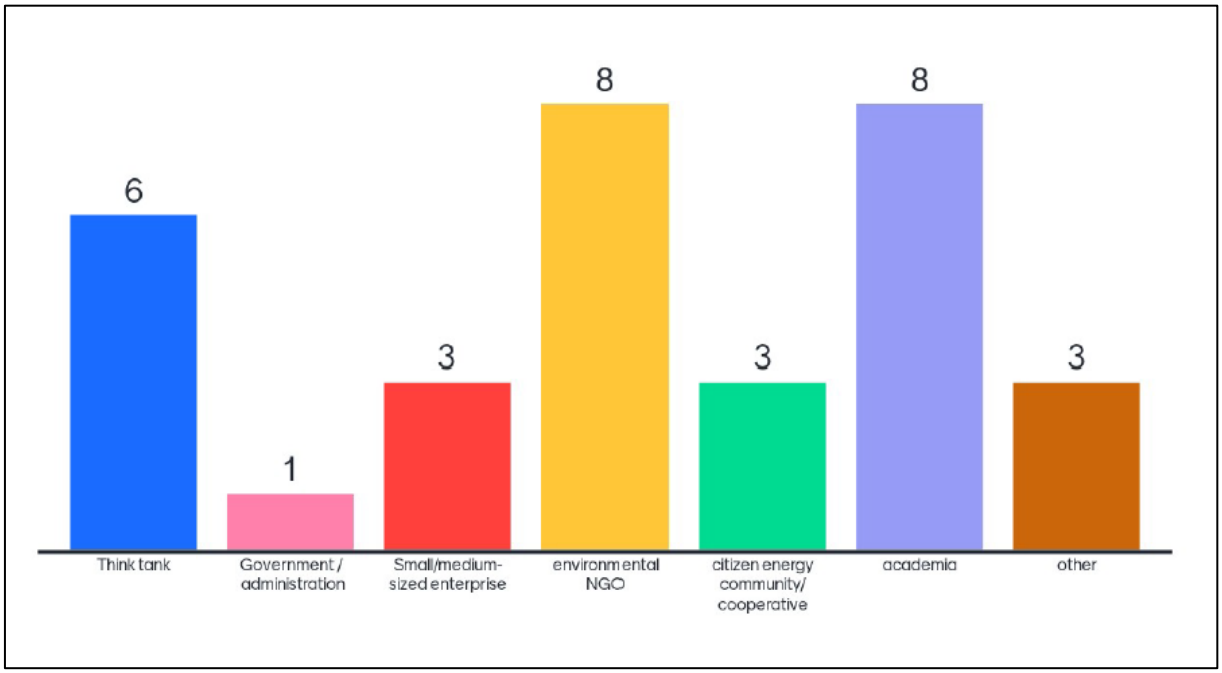
Der 2. Workshop wurde speziell für Stakeholder aus den Baltischen Ländern durchgeführt, da es von den Anmeldezahlen für den ersten Workshop so aussah, als dass die Gruppe zu groß würde. Der 2. Workshop wurde für den 18.5.2022 angesetzt und die Einladung wurde per E-Mail an die von Herrn Dr. Krug und Herrn Dr. Sieckmann-Joucken im Rahmen der Kurzstudie identifizierten Stakeholder versandt. Bis zum 18.5.2022 gingen 15 Anmeldungen ein. Die Teilnehmer*innenliste für den Workshop ist im Anhang (A.4) verfügbar.

Im Vorfeld der Workshops wurden über eine kurze Online-Umfrage die Erwartungen der Teilnehmenden an den Workshops abgefragt.

Während der beiden Workshops wurden nach einer Begrüßung die DBU und die Fördermöglichkeiten von Herrn Dr. Wachendörfer vorgestellt (vgl. Agenda der Workshops im Anhang – A.5). Während der Begrüßung wurde per Mentimeter abgefragt welche Länder die Teilnehmenden repräsentieren und bei welcher Art von Organisationen sie arbeiten. Die Ergebnisse der Umfrage sind in den Abbildung 1 dargestellt.

Abbildung 1: Ergebnis der Mentimenter-Umfrage zur Frage: Which country/countries do you represent today? im ersten Stakeholder-Workshop.

Abbildung 2. Ergebnis der Mentimenter-Umfrage zur Frage: What kind of organisation do you work or volunteer at? im ersten Stakeholder-Workshop.



Eine Aufzeichnung der Präsentation wurde erstellt und den Teilnehmenden im Anschluss an die Workshops verfügbar gemacht. Daran anschließend wurde im 1. Workshop in kleinen Gruppen zu Erfahrungen und Erwartungen der Teilnehmenden zum Thema Bürgerenergieprojekte diskutiert. Dabei wurden die Teilnehmenden regional zusammengefasst, die Gruppeneinteilung ist in Tabelle 2erkennbar.

Tabelle 2. Gruppeneinteilung

Gruppe	Länder
Gruppe 1	North Macedonia, Montenegro, Bosnia and Hercegovina, Serbia
Gruppe 2	Bulgaria, Romania, (Greece)
Gruppe 3	Croatia, Ukraine, Czech Republic
Gruppe 4	Poland, Hungary
Gruppe 5	Kosovo, Albania

In jeder Kleingruppe war ein*e Moderator*in von Seiten der DBU und eine weitere Person aus dem Projektkontext zur Unterstützung und Dokumentation der Diskussion anwesend. Die Dokumentation erfolgt in einem Padlet. Die folgende Abbildung 3 stellt einen Auszug aus der Padletseite zur ersten Diskussion zum 1. Workshop dar. Nach einer Pause wurde in einer 2. Diskussionsrunde in zwei Gruppen über konkrete Ideen für einerseits Kurz-Studien sowie andererseits Projektideen für Vollanträge und die jeweiligen Förderbedingungen und -voraussetzungen diskutiert. Zum Abschluss des Workshops wurde für die Optionen, Einreichung einer Projektidee für einen Vollantrag sowie einer Kurz-Studie noch die vorgeschlagenen Zeitpläne vorgestellt und nach letzten Fragen die Veranstaltung beendet. Eine Feedback-Umfrage per Mentimeter erzielte leider nur wenig Rückmeldungen, die sich zusammenfassen lassen als

Abbildung 3: Auszug aus Padlet-Website zur Diskussion im 1. Workshop.

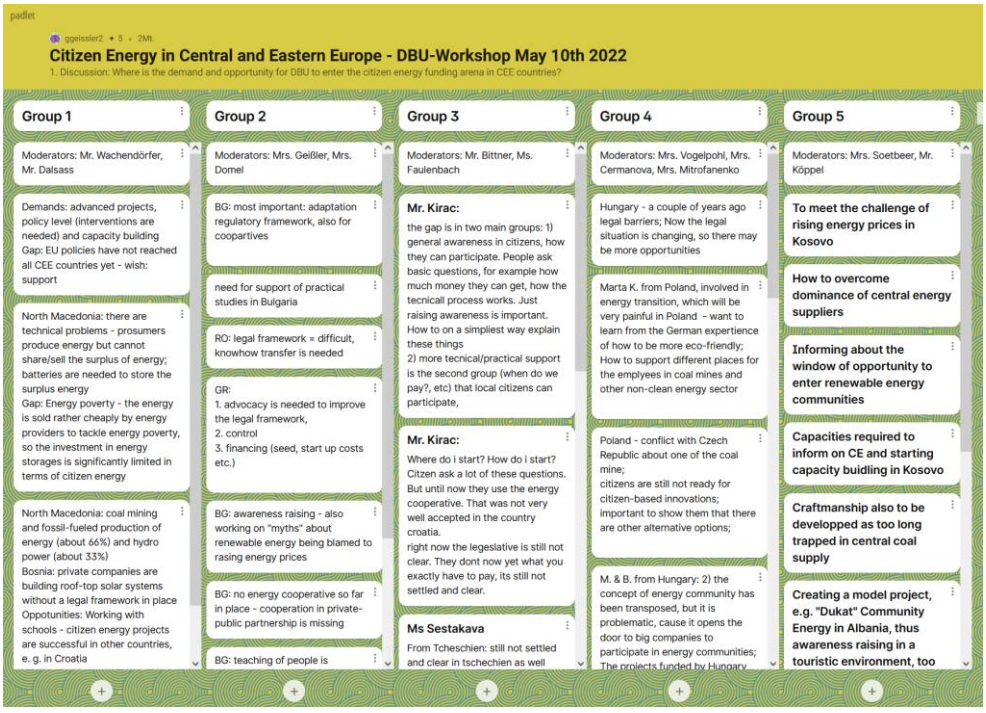
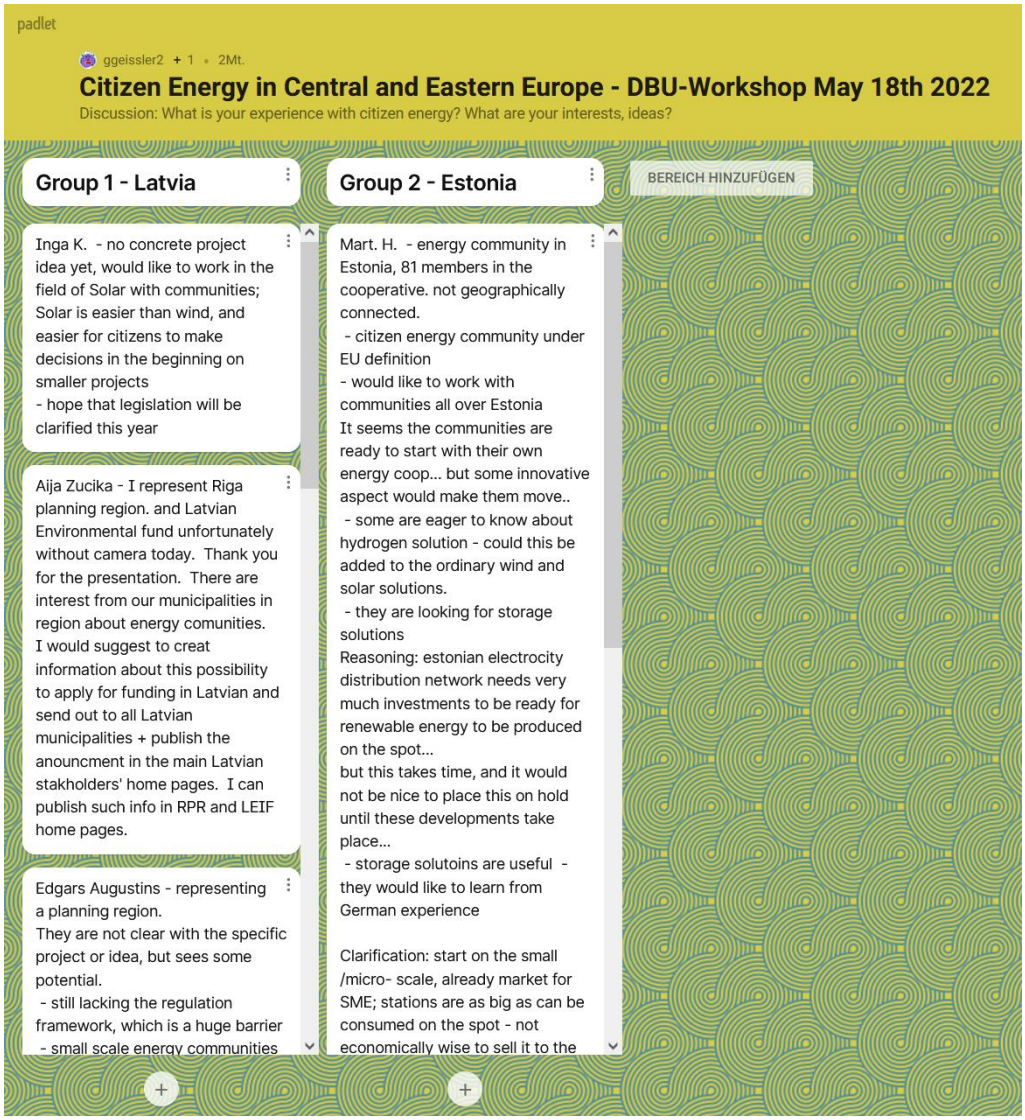


Abbildung 4. Auszug aus Padlet-Website zur Diskussion im 2. Workshop.



2.3 Teilnahme der Projektbearbeiterinnen an Workshops und anderen Veranstaltungen

Im Rahmen des Projektes nahmen die Projektbearbeiterinnen an diversen themenbezogenen Veranstaltungen teil, um in der ersten Phase des Projektes Kontakte zu knüpfen und weitere Akteure zu identifizieren (vgl. Tabelle 3). Im weiteren Projektverlauf wurde vor allem auch das Ziel verfolgt auf die Fördermöglichkeiten der DBU aufmerksam zu machen und das Förderthema “Bürgerenergie” zu platzieren.

Tabelle 3. Übersicht über Veranstaltungen

Titel	Organisator	Datum	Thema
From setting up an energy community to making it thrive: what are the tools available?	Eight projects, funded by Horizon 2020, working on the topic of energy communities: The EC², BECoop, DECIDE, eCREW, UPSTAIRS, COMERES, NEWCOMERS, W4RES and POWERPOOR	26. April 2022	Exchange between several projects about the tools they are developing and best practices, 15 tools to help those who are setting up, managing, or growing their energy communities
REScoop.eu conference 2022 - Energy communities empowering our future!	REScoop.eu	20-21. April 2022	Energy cooperatives across Europe exchanged ideas about the development of the movement and the challenges and opportunities ahead. Special focus on how energy communities empower our future. Citizen energy cooperatives are the best positioned to lead the energy transition to energy democracy.
Right to energy forum 2022. Workshop "Power to the people: delivering energy justice through community energy";	Right to Energy coalition	24-28. Januar 2022	Delivering energy justice through community energy
Konferenz Energiegemeinschaften 2023, Wien	Österreichische Koordinationstelle für Energiegemeinschaften	09. März 2023	Energy Communities in Austria, developments to-date and outlook
6th Meeting Of The Working Group On Sustainable Agriculture And Rural Development	Carpathian Convention, Ministry of Agriculture of Romania, Ministry of Environment of Romania	26-27. April 2023	Main activities and priorities for the WG on SARD of the Carpathian Convention. Presentation was made about the funding by the German Federal Foundation for the Environment (DBU) for Citizen Energy initiatives in the Carpathian Countries by the Convention Secretariat

Darüber hinaus fanden mehrere Treffen mit dem Sekretariat der Karpatenkonvention (Carpathian Convention) und dem Exekutivkomitee des Netzwerks "Science for the Carpathians" (S4C) statt, um sie über die Aktivitäten und die Unterstützung der DBU zu informieren. Die Karpatenregion wird von 7 Ländern

geteilt, die alle vom DBU-Engagement in Mittel- und (Süd-)Osteuropa (CEE) abgedeckt werden, darunter: Tschechische Republik, Ungarn, Polen, Rumänien, Slowakei, Serbien und Ukraine. Alle diese Länder sind Vertragsparteien der Karpatenkonvention, die darauf abzielt, ihre Zusammenarbeit zum Schutz und zur nachhaltigen Entwicklung der Ökoregion Karpaten zu unterstützen. Die Konvention enthält viele thematische Artikel, darunter "Artikel 10 - Industrie und Energie" ("Article 10 - Industry and energy"). Daher wurde die DBU-Präsentation, wie oben beschrieben, in die Sitzung der Arbeitsgruppe aufgenommen. Außerdem wurde das Thema Bürgerenergie in der S4C Research Agenda 2030 aufgegriffen.

3 Übergeordnete rechtliche Vorgaben und Forschungsaktivitäten in Mittel- und Osteuropa zum Them Bürgerenergie

Als gemeinsamer Ausgangspunkt für die Beschreibung und Analyse der Situation beim Thema Bürgerenergie in den einzelnen Staaten in Mittel- und Osteuropa, wurde der übergeordnete Rahmen als relevant eingestuft und analysiert. Dabei wurden einerseits übergeordnete rechtliche Vorgaben, hier vorallem der Europäischen Union und ebenso übergeordnete Forschungs- und Vernetzungsaktivitäten ausgewertet. Diese werden im Folgenden dargelegt.

3.1 Rechtliche Vorgaben der EU zum Thema Bürgerenergie

Während für lange Zeit Bürgerenergie als Thema nur durch national Vorgaben in einigen Ländern Europas explizit geregelt bzw. anerkannt war, hat sich diese Situation mit dem Engagement der Europäischen Union beim Thema Bürgerenergie seit 2018 deutlich verändert.

Durch die Aufnahmen von Regelungen zu Bürgerenergie mit dem "Clean Energy Package"[10] in die Erneuerbare Energien Richtline der EU (Renewable Energy Directive, RED II)[11] im Jahr 2018 und in die Elektrizitätsbinnenmarkt-Richtline (Electricity Market Design Directive, EMD)[12] im Jahr 2019, hat das Thema in allen Mitgliedsstaaten und auch in Ländern mit Interesse an einem EU-Beitritt an Relevanz gewonnen.

Frieden et al. (2021)[13] vergleichen in ihrer Arbeit die Definitionen in den beiden EU Richtlinien und analysieren die Unterschiede und Gemeinsamkeiten der Konzepte, die festgelegt warden. Während in der RED II-Richtline die sogenannten "Renewable Energy Communities" (REC) bzw. "Erneuerbare-Energie-Gemeinschaften" definiert und geregelt werden, legt die Elektrizitätsbinnenmarktrichtline Vorgaben für die sogenannten "Citizen Energy Communities" (CEC) bzw. "Bürgerenergiegemeinschaften" fest. Abbildung 5 stellt die Definitionen der beiden Konzepte vergleichend dar.

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10 https://energy.ec.europa.eu/topics/energy-strategy/clean-energy-all-europeans-package_en

11 *RICHTLINIE (EU) 2018/2001 DES EUROPÄISCHEN PARLAMENTS UND DES RATES vom 11. Dezember 2018 zur Förderung der Nutzung von Energie aus erneuerbaren Quellen, https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:32018L2001*

12 *RICHTLINIE (EU) 2019/944 DES EUROPÄISCHEN PARLAMENTS UND DES RATES vom 5. Juni 2019 mit gemeinsamen Vorschriften für den Elektrizitätsbinnenmarkt und zur Änderung der Richtlinie 2012/27/EU, https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:32019L0944*

13 *Frieden, Dorian; Tuerk, Andreas; Antunes, Ana Rita; Athanasios, Vasilakis; Chronis, Alexandros-Georgios; d'Herbemont, Stanislas et al. (2021): Are We on the Right Track? Collective Self-Consumption and Energy Communities in the European Union. In: Sustainability 13 (22), S. 12494. DOI: 10.3390/su132212494.*

Die Vorgaben der beiden Richtlinie fordern explizit, dass dezentrale Energieversorgung und Energieverbrauch durch private Personen ermöglicht und gefördert werden soll. Dabei fordern die Richtlinie auch "Energie Sharing", also das Teilen von selbst erzeugtem Strom mit zum Beispiel Nachbar*innen rechtlich und regulatorisch zu ermöglichen. Dies wird als ein zentraler Baustein bei der Förderung und Attraktivitätssteigerung von Bürgerenergiekonzepten angesehen (dena 2022)[14].

Abbildung 5. Vergleich der Definitionen von "Renewable Energy Communities" und "Citizen Energy Communities" (Frieden et al. 2021, S. 6).

Table 2. Comparison of the "renewable energy community" and "citizen energy community" concepts according to the REDII and the recast of the EMD [19].

Article 2(16) Recast Renewable Energy Directive "Renewable Energy Community"	**Article 2(11) Recast Electricity Market Directive "Citizen Energy Community"**
A legal entity:	A legal entity that:
(1) Which, in accordance with the applicable national law, is based on open and voluntary participation, is autonomous, and is effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects that are owned and developed by that legal entity;	is based on voluntary and open participation and is effectively controlled by members or shareholders that are natural persons, local authorities, including municipalities, or small enterprises;
(2) The shareholders or members of which are natural persons, SMEs or local authorities, including municipalities;	has for its primary purpose to provide environmental, economic or social community benefits to its members or shareholders or to the local areas where it operates rather than to generate financial profits; and
(3) The primary purpose of which is to provide environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates, rather than financial profits.	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.
The REDII further states that RECs shall be entitled to produce, consume, store and sell renewable energy, including through renewables power purchase agreements.	

Aus dem Vergleich der Definitionen in Abbildung 5 wird zunächst einmal deutlich, dass die "Erneuerbare-Energie-Gemeinschaften" eben wie im Namen schon angelegt beschränkt sind auf Gemeinschaften, die aus erneuerbaren Quellen Energie erzeugen. Bei den "Bürgerenergiegemeinschaften" gibt es diese Einschränkung so nicht, so dass bei diesem Konzept im Prinzip auch konventionelle Energieerzeugung aus fossilen Energiequellen möglich ist. Im Detail beinhalten die beiden Konzepte weitere Unterschiede, aber auch Gemeinsamkeiten, die von Frieden et al. (2021) detalliert herausgearbeitet wurden. Abbildung 6 zeigt tabellarisch auf, welche Aktivitäten im Rahmen der beiden Bürgerenergie-Konzepte möglich sind bzw. nicht erlaubt sind. Frieden et al. (2021) stützen sich bei Ihren Zusammenfassungen hier auf Analysen, die

[14] *Deutsche Energie-Agentur (Hrsg.) (dena, 2022) „Energy Communities: Beschleuniger der dezentralen Energiewende", https://www.dena.de/fileadmin/dena/Publikationen/PDFs/2022/dena-ANALYSE_Energy_Communities_Beschleuniger_der_dezentralen_Energiewende.pdf*

im Rahmen eines EU-geförderten Forschungsprojekts (COMPILE)[15] entstanden sind und eine Analyse der nationalen Umsetzung der EU-Vorgaben beinhaltete (Frieden et al. 2020).

Abbildung 6. Vergleich der möglichen Aktivitäten im Rahmen von "Renewable Energy Communities" und "Citizen Energy Communities" (Frieden et al. 2021, S. 6 & 7). Erläuterung der Abkürzungen: CSC = collective self-consumption", REC = renewable energy community, CEC = citizen energy community.

Table 3. Activities and actors foreseen for CSC and energy communities (based on [19]).

	REDII		EMD
Activities	**CSC**	**REC**	**CEC**
Production (REDII: renewables)/Generation (EMD: electricity)	√	√	√
Consumption	√	√	√
Storage	√	√	√
Sale (CSC: excess electricity), e.g. via:	√	√	(√)
- Renewables PPAs	√	√	(√)
- Electricity suppliers	√	√	(√)
- Peer-to-peer trading	√	(√)	(√)

Table 3. *Cont.*

	REDII		EMD
Activities	**CSC**	**REC**	**CEC**
Sharing	√	√	√
Supply		√ +	√
Aggregation (RSC: "through aggregators")	(√)	√ +	√
Energy Efficiency Services			√
EV charging services			√
Other energy services (RED: "commercial")		√ +	√
Shareholders or members			
Natural persons	n.a.	√	√
Small and Medium Enterprises (SMEs)	n.a.	√	√
Large enterprises	n.a.	X	√
Local authorities incl. municipalities	n.a.	√	√
Effective control (RED: proximity requirement, **EMD: membership in general is restricted, energy** sector no primary area of economic activity)			
Natural persons	n.a.	√	√
Micro enterprises	n.a.	√	√
Small enterprises	n.a.	√	√
Medium enterprises	n.a.	√	X §
Large enterprises	n.a.	X	X
Local authorities incl. municipalities	n.a.	√	√

+ Reference to "*the provisions relevant for such activities*" (√) Not explicitly stated but assumed to apply § However, the CEC as such can be organised as an SME (EMD, recital 44).

15 *Frieden, D., Tuerk, A., Neumann, C., d'Herbemont, S., Roberts, J. (2020). Collective self-consumption and energy communities: Trends and challenges in the transposition of the EU framework. Working Paper. https://www.rescoop.eu/uploads/rescoop/downloads/Collective-self-consumption-and-energy-communities.-Trends-and-challenges-in-the-transposition-of-the-EU-framework.pdf*

Die beiden genannten EU-Richtlinie und die dort enthaltenen Regelungen zu “Erneuerbare-Energie-Gemeinschaften“und “Bürgerenergiegemeinschaften” erzeugten in den Mitgliedsstaaten der EU eine verstärkte Auseinandersetzung mit dem Thema Bürgerenergie. Da die EU-Mitgliedsstaaten bis zum Sommer 2021 aufgefordert waren, die Vorgaben der beiden EU-Richtlinie in nationales Recht umzusetzen, war eine Auseinandersetzung auf politischer und gesetzgeberischer Seite nötig und wurde in vielen Ländern von vielfältigen gesellschaftlichen Gruppen begleitet und beeinflusst. Besonders aktiv auf übergeordneter Ebene war dabei das Netzwerk ReScoop, welches die Implementierung der EU-Vorgaben in den Mitgliedsstaaten beobachtete und regelmäßig evaluierte. Diese Arbeit mündete in den sogenannten “Transposition Tracker”[16] welcher auf der Webseite von ReScoop die Umsetzung der EU-Vorgaben in allem EU-Mitgliedsstaaten nach einheitlichen Bewertungskriterien aufzeigt.

Wie unterschiedlich die Umsetzung in den Ländern erfolgte und wie unterschiedlich die Vorgaben der EU zum Teil interpretiert wurden, zeigt auch die Analyse bei Frieden et al. (2021) zu einer Auswahl von Ländern im Bezug auf die räumlichen Grenzen für “Erneuerbare-Energie-Gemeinschaften“ und “Bürgerenergiegemeinschaften” wie sie in den nationalen Gesetzen vorgesehen sind (vgl. Abbildung 7).

Abbildung 7. Vergleich der räumlichen Grenzen von “Erneuerbare-Energie-Gemeinschaften“ und “Bürgerenergiegemeinschaften” in ausgewählten Ländern (Frieden et al. 2021, S. 15).

Table 4. Overview of spatial boundaries for RECs and CSC schemes in selected EU Member States (own assessment, [19]).

Country	Approach to Physical Boundaries
Austria	LV/MV
Belgium/Wallonia	LV/MV and distance
Belgium/Flanders	LV/MV and activity
Hungary	MV/HV
Slovenia	LV
Italy	LV /MV
Ireland	LV/MV
Croatia	Municipality, LV
Lithuania	Municipality
Poland	Municipality
Greece	Regional or system-related, depending on location.
France	Distance (up to 20 km) (only CSC)
Spain	LV, cadastral area, distance (500 m) (only CSC)
Portugal	System-related, individual decisions (RECs and CSC)

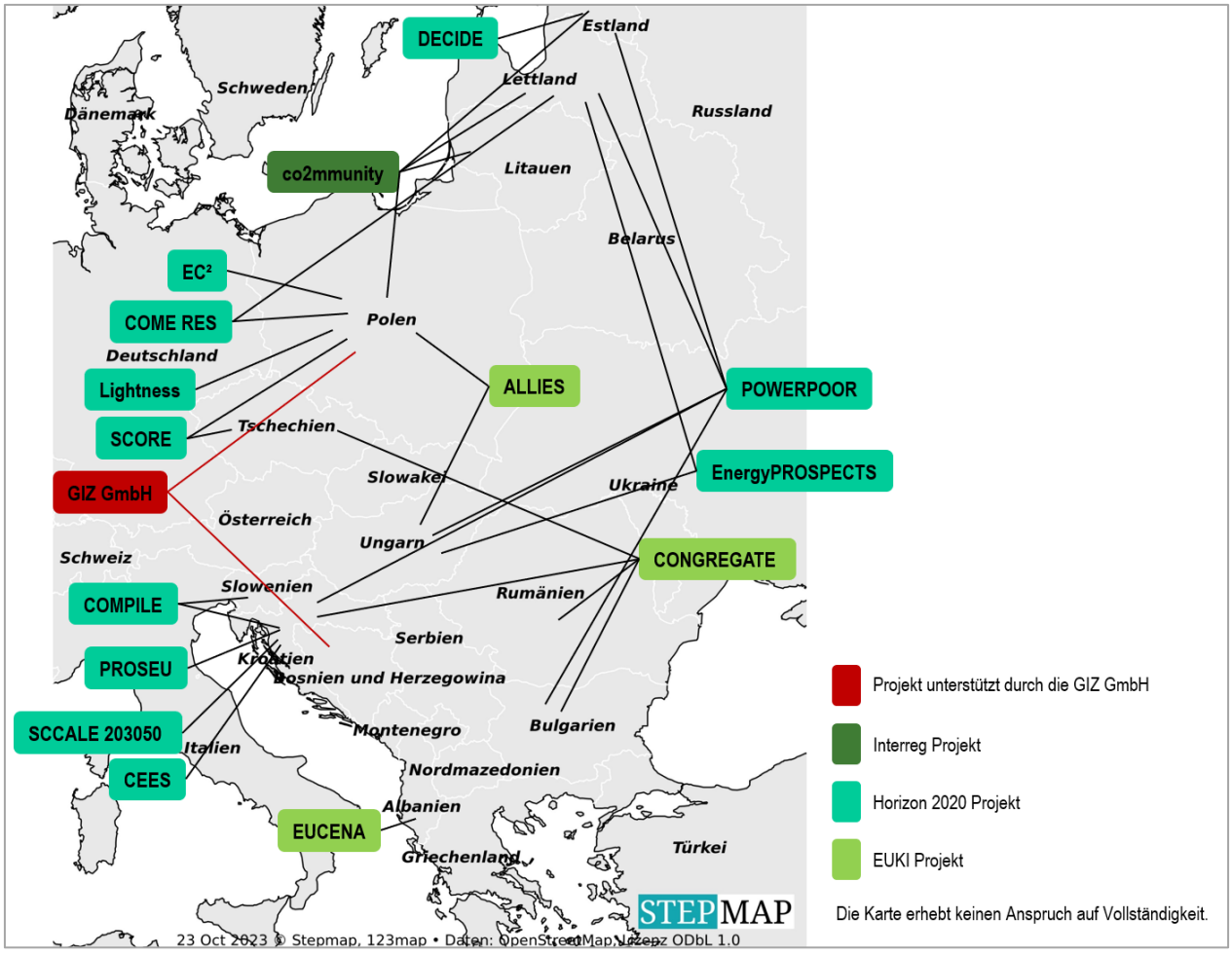
In den hier mit untersuchten Fallstudien aus Mittel- und Osteuropa, Ungarn, Slovenien, Kroatien, Litauen und Polen werden einerseits Begrenzungen entlang von Stromnetzcharakteristika genutzt, also Umkreise um Niederspannungs- (LV), Mittelspannungs- (MV) bzw. Hochspannungs-Transformatorstationen (HV). In anderen Ländern werden dagegen administrative Grenzen von Gemeinden genutzt. Diese Unterschiede in der Umsetzung der EU-Vorgaben im Bereich Bürgererenergie zeigen exemplarisch schon auf, dass die nationale Interpretation und Umsetzung zu sehr unterschiedlichen Rahmenbedingungen in Mittel- und Osteuropäischen Ländern führt.

[16] https://www.rescoop.eu/policy#transposition-tracker

3.2 Multi-nationale Forschungsaktivitäten zu Bürgerenergie

Mit der Verabschiedung des Clean Energy Package der EU im Jahr 2019 kam gezielte Forschung zu Bürgerenergie und auch der Umsetzung der Europäischen Vorgaben stärker in den Fokus multi-nationaler Forschungsprojekte. Insbesondere durch das europäische Rahmen-Förderprogramm "Horizon 2020" wurden vielfältige Forschungsaktivitäten gefördert. Durch eine systematische Abfrage auf der EU CORDIS Plattform[17] wurden Forschungsprojekte identifiziert, die einen thematischen Bezug zum Thema Bürgerenergie und zu den Ländern Mittel- und Osteuropas ausweisen. Ergänzend wurde über eine stichwort-geleitete Internetrecherche nach weiteren Forschungsprojekten anderer Mittelgeber gesucht und auch die ReScoop-Webseite dahingehend ausgewertet. Die Darstellung in Abbildung 8 gibt einen räumlichen Überblick über die Verbindung identifizierter Forschungsprojekte im Themenfeld Bürgerenergie zu den Ländern Mittel- und Osteuropas.

Abbildung 8. Übersicht über multi-nationale Forschungsprojekte mit Bezug zum Themenfeld Bürgerenergie und Beteiligung von Ländern in Mittel- und Osteuropa ohne Anspruch auf Vollständigkeit (Stand März 2022). Dargestellt sind nur die Projektpartner in Ost- und Mitteleuropäischen Ländern. Erläuterung der Farben: rot = Förderung durch die GIZ GmbH, türkis = Horizon2020, hellgrün = EUKI, dunkelgrün = Interreg.



[17] https://cordis.europa.eu/

Die Darstellung in Abbildung 8 verdeutlicht, dass die Länder Mittel- und Osteuropas nicht gleichmäßig in multi-nationale Forschungsaktivitäten eingebunden sind. Für Länder wie Polen, Kroatien und Lettland konnten 4 oder mehr Verbindungen identifiziert werden. Bei den Ländern Estland und Ungarn sind es 3 Projekte. Deutlich wird auch, dass insbesondere Länder in Süd-Osteuropa kaum oder gar nicht in den recherchierten Projekten repräsentiert sind und bisher weniger von der Vernetzung durch solche Projekte und den Informations- und Erfahrungsaustausch profitieren können. Die Analyse zeigt auch, dass in einigen Projekten mehrere Länder aus Mittel- und Osteuropa beteiligt sind und dort ein Austausch zwischen MOE-Ländern auf der Ebene der Forschung im Bereich Bürgerenergie schon stattfindet. Die folgende Tabelle 4 stellt die grundlegenden Informationen zu einer Auswahl der identifizierten Forschungsprojekte dar. Weitere Informationen zu den Projekten sind auch in den Länder-Steckbriefen im Anhang enthalten. Wichtig ist zu berücksichtigen, dass die Übersicht über die Forschungsprojekte nur den Zeitpunkt der Recherchen (1. Quartal 2022) darstellt und in der Zwischenzeit ggf. weitere Forschungsaktivitäten initiiert worden sind.

Tabelle 4. Überblick über identifizierte multi-nationale Forschungsprojekte mit Relevanz für das Thema Bürgerenergie und unter Beteiligung von MOE-Ländern.

Projekt	**Förderprogramm**	**Projektbeteiligte** (fett = MOE)	**Beteiligte Länder** (fett = MOE)	**Ziele**	**Webseite**
SCCALE 203050 - Sustainable Collective Citizen Action for a Local Europe	Horizon 2020	REScoop.eu TU Delft (the Netherlands) Energy Cities Enercoop (France) Ecopower (Belgium) City of Leuven (Belgium) Energie Samen (the Netherlands) **City of Porec-Parenzo (Croatia)** **Green Energy Cooperative (Croatia)** Electra Energy (Greece)	France Belgium Netherlands **Croatia** Greece	• to build at least 26 energy communities • trigger the creation of 34 community projects • develop a comprehensive methodology for the creation of energy communities • test and validate methodology in 5 pilot communities	https://www.sccale203050.eu/
PROSEU - PROSumers for the Energy Union	Horizon 2020	Associação para a Investigação e Desenvolvimento de Ciências (Portugal) University of Porto (Portugal) ICLEI - Local Governments for Sustainability ClientEarth DRIFT **University of Zagreb (Croatia)** Leuphana University of Lüneburg (Germany) Eco-union Institut für ökologische Wirtschaftsforschung (Germany) CE Delft (the Netherlands) University of Leeds (UK)	Croatia, Portugal Germany UK the Netherlands	• enable the mainstreaming of the Renewable Energy (RE) prosumer phenomenon into the European Energy Union • investigate new business models, market regulations, infrastructural integration, technology scenarios and energy policies across Europe • setting up renewable energy living labs to support innovation (e.g. in **Croatia: Zadruga za etičko financiranje, ZEF (Cooperative for ethical financing), Island of Silba - Pokret Otoka (Island Movement)**	https://proseu.eu/

Projekt	**Förderpro-gramm**	**Projektbeteiligte** (fett = MOE)	**Beteiligte Länder** (fett = MOE)	**Ziele**	**Webseite**
Compile - Integrating community power in energy islands	Horizon 2020	**Inovacijsko-razvojni institut Univerze v Ljubljani (Slovenia)** CHINA UNIVERSITY OF MINING AND TECHNOLOGY – BEIJING (China) INSTITUTE OF RURAL MANAGEMENT ANAND (India) ETRA INVESTIGACION Y DESARROLLO SA (Spain) JOANNEUM RESEARCH FORSCHUNGSGESELLSCHAFT MBH (Austria) EREVNITIKO PANEPISTIMIAKO INSTITOUTO SYSTIMATON EPIKOINONION KAI YPOLOGISTON (Greece) **PETROL SLOVENSKA ENERGETSKA DRUZBA DD LJUBLJANA (Slovenia)** **ETREL SVETOVANJE IN DRUGE STORITVE DOO (Slovenia)** RESCOOP EU ASBL (Belgium) DISTRIBUIDORA ELECTRICA DE CREVILLENT S.L.U (Spain) **IDEAZ STORITVE DOO (Slovenia**) COOPERNICO - COOPERATIVA DE DESENVOLVIMENTO SUSTENTAVEL CRL (Portugal) DIMOS RAFINAS-PIKERMIOU (Greece) **ZELENA ENERGETSKA ZADRUGA ZA USLUGE (Croatia)**	**Slovenia** **Croatia** Austria Spain Portugal Greece (China) (India)	• activate and use Local Energy Systems in order to support the fast growth of energy production from RES in constrained networks, • foster the transition from centralized system with passive users into a flexible network of active users featuring energy communities • enhance RES integration and increase the security of supply, without traditional network reinforcement • better understand the way emerging decentralized solutions and the existing centralized infrastructure operate together in an economically efficient way • demonstration cases in Spain, Portugal, Greece, **Slovenia (Luče), Croatia (Križevci)**	https://www.compile-project.eu/

Projekt	**Förderprogramm**	**Projektbeteiligte** (fett = MOE)	**Beteiligte Länder** (fett = MOE)	**Ziele**	**Webseite**
EC² - Energy Citizenship and Energy Communities for a Clean-Energy Transition	Horizon 2020	Center for Social Innovation ZSI (Austria) Universität Graz (Austria) Universität Leipzig (Germany) **Uniwersytet Ekonomiczny we Wrocławiu (Poland)** Rijksuniversiteit Groningen (Netherlands) Groningen Municipality (Netherlands) Comune di Scalenghe (Italy) **Gmina Prusice (Poland)** Buurkracht Projecten B.V. (Netherlands) Ture Nirvane Societa' Cooperativa Sociale di Comunita' (Italy) Arterra Bizimodu (Spain) **Housing Cooperative Wrocław South (HCWS, Poland)** Global Ecovillage Network of Europe (Germany) ICLEI - Local Governments for Sustainability (Germany)	Austria Poland Germany the Netherlands Italy Spain	• Provide evidence-based tools and a digital training progam to scale-up energy citizenship and energy communities • Develop actionable policy recommendations and briefs for policymakers by connecting project findings to policy and practice • Supply tested tools to upport energy citizenship and energy communities • Foster inclusivity of energy citizenship and energy communities • Deepen our understanding of energy citizenship and how to empower citizens to become energy citizens. • Identify legal and economic conditions supporting or hindering energy citizenship • Understand how energy citizenship shapes and influences the energy sector, the energy transition, and the achievment of EU decarbonisation goals	https://ec2project.eu/

Projekt	**Förderprogramm**	**Projektbeteiligte** (fett = MOE)	**Beteiligte Länder** (fett = MOE)	**Ziele**	**Webseite**
DECIDE - Developing Energy Communities through Informative anD collEctive actions	Horizon 2020	Th!nk E (Belgium) JOANNEUM RESEARCH Forschungsgesellschaft mbH (Austria) B.A.U.M. Consult GmbH (Germany) Prospex Institute (Belgium) ThermoVault BVBA (Belgium) Enbro **TREA (Estonia)** OurPower Die Energiecooperative (Austria) HERON (Greece) DomX (Greece) Uni Mannheim (Germany) ICLEI - Local Governments for Sustainability Elektrizitätswerke Hindelang e.G. (EWH) (Germany) University Schloss Seeburg (Austria)	Belgium Austria Germany **Estonia** Greece	• To be a gamechanger in accelerating collective energy actions and engaging European end consumers more actively in the energy market. • To deepen the social science expertise on end-consumer segmentation and group dynamics towards more effective and impactful communication, dissemination & engagement for energy communities, active end-consumers and renewable energy & energy services. • To actively transfer the expertise, before the supporting material, to the diverse emerging and already operational initiatives. • To contribute to an increased uptake of 12 different energy services, measures and products that can be applied within or outside of an energy community • To extend and further professionalise the EU-wide taskforce on Renewable and Citizen Energy Communities tackling overall feasibility, regulatory barriers and contractual conditions. • To engage over 628 000 end consumers in 9 pilots in 7 member states to save over 16 GWh and 11 kton CO2 annually. Additionally, nearly 6 MWp of renewable energy – including electricity generation and heat supply – will be installed.	https://decide4energy.eu/

4 Typologie von Bürgerenergieprojekten

Für eine Einordnung von Bürgerenergie-Optionen und Projekten bieten sich eine Reihe immanenter Typologien an. Eine Typologisierung wurde angestrebt, um das jeweilige Übertragungspotential differenzierter beschreiben zu können, aber auch hinsichtlich der Reichweite jeweiliger Initiativen. Die Typologisierung wurde einerseits hinsichtlich der Rahmenbedingungen für Bürgerenergievorhaben in Ländern und Regionen und andererseits für die Charakterisierung von einzelnen Bürgerenergie-Projekten erstellt.

4.1 Kriterien für die Typologisierung von Rahmenbedingungen für Bürgerenergieprojekte

Als Kriterien für die Kategorisierung der Rahmenbedingungen bzw. der Kontextfaktoren in Ländern bzw. Regionen bezüglich der Bürgerenergie wurden die folgenden Kriterien abgeleitet. Die beschriebenen Kriterien wurden bei der Erstellung der Steckbriefe (vgl. Kapitel 5) berücksichtigt.

Regulatorische Rahmenbedingungen
Die regulatorischen Rahmenbedingungen in den MOE-Staaten sind durchaus unterschiedlich. Sei es zur Etablierung und ggf. Förderung erneuerbarer Energien insgesamt, zum Strommarkt, zum Zustand der Stromnetze und zum Netzausbau, Energierecht, einschließlich betreffender Barrieren. Dies schließt beispielsweise auch planungsrechtliche Vorgaben mit ein, wie in Polen, wo gegenüber der Windenergie an Land eine sehr restriktive Haltung bestand in der Vergangenheit (quasi Adaption des bayerischen 10H-Abstands-Modells)[18]. Weiterhin werden beispielsweise Informationen über Einspeisevergütungen (feed-in-tariffs) berücksichtigt, die in einigen MOE-Ländern existieren, wie z.B. in Bulgarien für EE-Projekte kleiner als 1 MW oder in Ungarn für Projekte bis 500kW. In diesem Kontext werden aber auch kompetitive Ausschreibungsverfahren (wie z.B. in der Slowakei seit 2018 für PV-Anlagen) berücksichtigt. Dabei sind beispielsweise nationale Ziele zum Ausbau Erneuerbarer Energieerzeugung und Potentiale unterschiedlicher Energieträger (Wind, Solar/PV, Biomasse, Geothermie, Wasserkraft) in den 19 Staaten relevant sowie auch regionale Schwerpunkte z.B. bei der Förderung von EE in geografisch abgelegenen Regionen oder Insellagen (z.B. die kroatische Strategie zur Fokussierung auf den Ausbau von EE auf den kroatischen Inseln). Auch Klimaschutzziele bzw. Ziele zum Erreichen der Treibhausgasneutralität können von Bedeutung sein, zumal diese recht unterschiedliche Zeiträume beinhalten. Weiterhin eine Rolle spielen Energiepreise für die Verbraucher, Energieknappheit (wie beispielsweise in Rumänien ein Thema wo die Nationale Energiestrategie bis 2030 Ziele enthält, um die Energiearmut zu verringern), ob Staaten auf Energieimporte angewiesen sind (wie z.B. Moldawien) oder Energieexporteure sind (z.B. Bosnien und Herzegowina). Beachtlich können Regelungen zum Netzzugang von EE-Anlagen sein sowie die Umsetzung der EU Erneuerbare-Energien-Richtline (RED II) und der EU Elektrizitätsbinnenmarktrichtlinie und die betreffenden rechtlichen Vorgaben z.B. zur Gründung von Energiegenossenschaften. Interessant können auch jüngere nationale ‚Policies' oder deren Ankündigungen sein, sei es zur Anerkennung von Bürgerenergie in nationalen Energiestrategien wie der Kroatiens von 2020[19].

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[18] *Paulina Marzoch (2018): Tilting at Windmills: Changes in Polish Wind Energy Policy in the Light of the EU 2020 Climate & Energy Package. Masterarbeit am Fachgebiet Umweltprüfung und Umweltplanung, TU Berlin.*

[19] *Energy strategy of the Republic of Croatia until 2030 with the outlook on year 2050 https://narodne-novine.nn.hr/clanci/sluzbeni/full/2020_03_25_602.html ; as of 2020, recognizes the importance of private sector, recognizes the potential for citizen energy.*

Organisationsform und Finanzierung von Bürgerenergiegemeinschaften

Bei der Organisationsform und Finanzierung sind beispielsweise Informationen zu (steuer-)rechtlicher Behandlung von EE-Anlagen und selbstproduzierter Energie relevant. Die Beteiligung an Bürgerenergiegemeinschaften kann sowohl aktiv wie auch passiv organisiert sein und Projekte sowohl on- oder off-grid realisiert werden. Unsicherheiten bezüglich der steuerlichen Behandlung von Mitgliedern von Bürgerenergiegenossenschaften erscheinen in mehreren MOE-Ländern ein Hindernis, so beispielsweise in Bulgarien, wo dies als eine zentrale Herausforderung beschrieben wurde[20]. Dies umfasst aktive, anteilige Bürgerfinanzierungen an solchen Vorhaben oder mitgestaltende und -produzierende, wie in Deutschland als eG (Genossenschaft), also Formen von ‚cooperatives'. So wurden in Polen wohl erste Genossenschaften gegründet[21]. Es können Ausschüttungen oder auch nicht zurückzuzahlende Spenden oder Mikro-Kredite von Bürger*innen zum Einsatz kommen. Ein Beispiel ist das Projekt „Technological Park, Križevci" in Kroatien, bei dem 53 Bürger*innen als externe Investoren Mikrokredite für die Installation einer PV-Anlage für den Technologie Park zur Verfügung stellten. Die Bürger*innen waren in diesem Fall keine Mitglieder einer Genossenschaft [22].

Passive Bürgerenergie umfasst z.B. die Erzielung von Pachteinnahmen (etwa für einen Windenergie-Standort), direkt vermarkteten Strom oder eine Beteiligung der Allgemeinheit z.B. insofern, dass die Kommune als Betreiber einer Anlage auftritt, oder etwa eine Stiftung als Träger. Entsprechende Business Pläne werden zumindest in komplexeren Vorhaben notwendig.

Technologische Formen

Eine Charakterisierung kann weiterhin nach den technologischen Formen von Bürgerenergie-Vorhaben erfolgen. Dabei kann in einem umfassenden Ansatz unterschieden werden in Bürgerenergie-Vorhaben zu Stromerzeugung und -vertrieb, Stromnetzbetrieb, oder auch Elektrolyse/Wasserstofferzeugung; als Wärmerzeugung, wie Solarthermie, Biomasseheizwerk, Wärmepumpen/Geothermie, auch Nahwärmenetzbetrieb, Wärmespeicher sowie womöglich im Verkehrsbereich (Ladesäulen für E-Mobilität etc.) und auch Dienstleistungen wie Wärme- oder Beleuchtungs-Contracting. Es ist anzunehmen, dass in den Ländern Mittel- und Osteuropas und den bisherigen Bürgerenergie-Initiativen nicht all diese Optionen bereits in der Praxis etabliert sind.

Gemeinwohl-Orientierung

Eine Unterscheidung kann auch im Sinne der sozialen Ziele und der Gemeinwohl-Orientierung von Bürgerenergieprojekten denkbar sein. Dies kann z. B. gemäß der EU Bridge[23] Kriterien bedeuten, situationsangepasst zu differenzieren bezüglich des Grades der Ambition der Vorhaben, aber auch die Bürger*innen-Kontrolle an Projekten zu sichern (‚to avoid elite capture'), an Energiearmut leidenden Haushalten Vorteile zu gewähren, bis hin zu einem zumutbaren bürokratischen Aufwand, entsprechende Anlagen genehmigt zu bekommen.

Akteure und Stakeholder

Natürlich kommt die Typologie der **Akteure und Stakeholder** hinzu, von individuellem, sodann zivilgesellschaftlichem, kommunalen, maßvoll erwerbsorientiertem privatwirtschaftlichen Engagement (etwa als in

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20 https://www.e3analytics.eu/wp-content/uploads/2021/06/E3A_Bulgaria_Analysis_of_Distributed_PV_ENG_FINAL.pdf

21 https://www.gramwzielone.pl/trendy/105848/tak-powstaje-pierwsza-spoldzielnia-energetyczna-w-polsce-rozmowa .

22 https://citizenergy.eu/project/101.

23 https://www.h2020-bridge.eu/wp-content/uploads/2020/01/D3.12.d_BRIDGE_Energy-Communities-in-the-EU-2.pdf; *Energy Communities in the EU Task Force Energy Communities.*

den Anteilen kontrollierten Teilhabern oder als Windenergie-Entwickler, die einzelne Anlagen Bürgerenergie-Engagement zur Verfügung stellen) und einigen Hybridformen. Dabei offenbaren sich auch international vernetzte Engagements, wie bei ‚Friends of the Earth', die wiederum wissen, Förderinstrumente wie EUKI für betreffende Pilotstudien im Zuge der Verbändeförderung zu nutzen. Gleichzeitig wird auch der staatliche Sektor dabei nicht unberücksichtigt bleiben können, allein schon aufgrund der Strommarkt-Regularien, sowie des jeweiligen Instrumentariums erneuerbarer Energien. Auch Einzelsituationen mögen von Interesse sein, ob es etwa ‚kompensatorische' Initiativen im Kontext lokalen oder überregionalen Widerstands gegen Wasserkraftwerke gibt[24]?

Abschließend erscheint interessant und relevant, dass eine regional differenzierende Clusterungen von **Bürgerenergie**(stadt)**landschaften** sinnvoll sein kann. Darauf gehen Weinand et al. (2018)[25] ein und gehen von Kategorien wie ‚rural community', ‚small towns' etc. aus. Diese sind durch relevante Faktoren gekennzeichnet wie Demographie, Haushaltseinkommen und Beschäftigungsrate, Art des Gebäudebestandes (bzgl. Wärmeversorgung), klimatische Faktoren (bzgl. Heizperiode), Fahrzeugbestand sowie bestimmenden Faktoren wie verfügbare hydrothermale Temperaturen und notwendige Bohrtiefen zur Erschließung von Geothermie, Solar- und Windpotential, Anteile an land- und forstwirtschaftlichen Flächen etc.

4.2 Typologisierung von bestehenden Bürgerenergie-Initiativen in MOE

[24] *In Albanien im Kontext des Vjosa river, vgl. https://balkanrivers.net/en/vjosanationalparknow .*

[25] *Weinand JM, McKenna R, Fichtner W (2019): Developing a municipality typology for modelling decentralised energy systems. Utilities Policy 57: 75-96. https://www.sciencedirect.com/science/article/abs/pii/S095717871930013X*

Die folgende Übersicht listet aus der Literatur abgeleitete Kriterien für die Charakterisierung von einzelnen Bürgerenergieprojekten und baut dabei auf die Ergebnisse von Gui und MacGill (2018)[26], Couture et al. (2021)[27], Weinand et al. (2019)[28], Caramizaru und Uihlein (2020)[29] auf.

Goals/motivation/ drivers	**Activity**	**Energy technology[30]**	**Types of actors**	**Role of CE members**	**Organizational structure**	**Geographic scope/ location**	**Legal entity**	**Business model**	**Energy grid**
- Climate contributions, developing clean energy options - Developing an option for post-coal/lignite energy generation, revitalizing the local economy - Health benefits of clean energy generation - Energy autonomy/independence (e.g., also in island situations or very remote regions) - Fighting energy poverty and lack of electricity supply - Fighting high energy prices	- Energy generation - self-consumption and sharing - distribution - energy services - electro-mobility - energy efficiency - other activities	- Roof-top PV - Freestanding PV (floating PV) - solar heat - wind - biomass (for heat or electricity)/waste - geothermal - hydropower - energy efficiency measures - etc.	- NGOs (environmental/ social/ health…) - municipality (government) - individual citizens - utilities - technology provider	- energy producer - energy consumer - energy prosumer - investors - asset owners - or a combination of the above roles	- centralized - decentralized - distributed	Scope - local - regional - nationwide Location - rural community - urban (small towns/large cities) - sub-urban	- Cooperative - (limited) Partnership - Community trusts or foundations, NGOs - Community choice aggregators (CCAs) - Housing associations - Non-profit customer-owned enterprises - Public-private partnerships - Public utility company - Consumer society - Limited liability company	- crowdfunding (micro-credits, donations) - public loans - private loans (via banks) - feed-in tariffs etc. - EU or international development cooperation funds - Consumer stock ownership plans (CSOPs)	- off-grid - on-grid - within a building (multifamily house) - sharing with neighbors/crossing property boundaries - distributed energy community

[26] *Gui, Emi Minghui; MacGill, Iain (2018): Typology of future clean energy communities: An exploratory structure, opportunities, and challenges. In: Energy Research & Social Science 35, S. 94–107. DOI: 10.1016/j.erss.2017.10.019*

[27] *Couture, Toby D.; Stoyanova, Teodora; Pavlov, Toma (2021): Scaling-up Energy Communities in Bulgaria. Hg. v. E3 Analytics. Berlin. Online verfügbar unter https://www.e3analytics.eu/wp-content/uploads/2021/06/E3A_Bulgaria_Analysis_of_Energy_Communities_EN_FINAL.pdf*

[28] *Weinand, J. M.; McKenna, R.; Fichtner, W. (2019): Developing a municipality typology for modelling decentralised energy systems. In: Utilities Policy 57, S. 75–96. DOI: 10.1016/j.jup.2019.02.003*

[29] *Caramizaru, Ana; Uihlein, Andreas (2020): Energy communities: an overview of energy and social innovation. Publications Office of the European Union. Luxembourg. Online verfügbar unter https://publications.jrc.ec.europa.eu/repository/bitstream/JRC119433/energy_communities_report_final.pdf*

[30] *Regarding the possible technologies it is important that these aim at sustainable solutions balancing diverse goals and targets, e.g., climate change mitigation and biodiversity conservation. For example, in the case of hydropower development, only projects avoiding and minimizing negative impacts on fauna and biodiversity and respecting internationally agreed standards for good practice would be desirable.*

Mithilfe der oben beschriebenen Kriterien bzw. Charakteristika von Bürgerenergieprojekten wurden bestehende Bürgerenergie-Initiativen in den Ländern Mittel- und Osteuropas, die aus der Literatur und Dokumenten identifiziert werden konnten, kategorisiert. Die Kategorisierung stellt dabei eine mögliche Kategorisierung dar und ist nicht frei von Überschneidungen/Überlappungen zwischen den Typen. Auch konnten nicht in allen Fällen alle Kriterien angewandt werden, da keine entsprechenden Informationen vorlagen. Die folgende Liste erhebt dabei keinen Anspruch auf Vollständigkeit, es kann durchaus sein, dass weitere Bürgerenergieprojekte in MOE existieren, die durch den gewählten Rechercheansatz allerdings nicht identifiziert wurden.

Tabelle 5.

TYPE	MAIN CHARACTERISTICS	EXAMPLES FROM CEE COUNTRIES
TYPE A.1 RURAL CE PROJECT – NGO DRIVEN	CE project in rural, remote (bad/no grid access), rather mountainous regions, characterized by energy poverty (high energy costs, unavailable energy), rather economically weak population, possibly marginalized/minority population; good PV potential, possibly wood and small hydropower ***Strong/active NGOs*** Motivation for CE from protest against centralized hydropower project (larger topic beyond local community)	*Village of Kutë, Albania* - 'Solar in Kutë' campaign[31], initiative of EcoAlbania, EuroNatur and Riverwatch – protecting the Vjosa River and its capacity to produce solar energy on the roofs of buildings without the need to destroy the Vjosa river (threat of Poçem hydropower plant to be build) - Aim to make the community energy self-sufficient - Collecting funds via crowdfunding (Go Fund Me platform and at the EcoAlbania website); received donation from Swiss government - Have produced campaign-videos available on YouTube
TYPE A.2: RURAL CE PROJECT – BOTTOM-UP CITIZENS-DRIVEN	agriculturally used lands, rather flat topography, possibly marginalized/minority population	*Smalininkai's village association, Lithuania*[33]

[31] https://www.ecoalbania.org/en/solar-in-kute/

[33] http://co2mmunity.eu/wp-content/uploads/2018/10/Factsheet-smalininkai.pdf, *Ruggiero, Salvatore; Busch, Henner; Isakovic, Aljosa; Hansen, Teis (2021): Community Energy in the Eastern Baltic Sea Region: From Standstill to First Steps. In: Coenen, Frans H. J. M. und Thomas Hoppe (Hg.): Renewable Energy Communities and the Low Carbon Energy Transition in Europe. 1st ed. 2021. Cham: Springer International Publishing; Imprint Palgrave Macmillan (Springer eBook Collection), S. 49–74.*

TYPE	MAIN CHARACTERISTICS	EXAMPLES FROM CEE COUNTRIES
	on-grid project, wind power, ***village association (not-for-profit organization)***, ***individuals promoting the projects***, active involvement of citizens/support by local citizens, bank loan, feed-in-tariff, focus on community benefits and interests of the local people[32]	„In 2009, the Smalininkai's village association opened the first wind power plant ever owned by a local community in Lithuania. (…) The power plant consisted of a 250 kW wind turbine that was expected to generate power for the grid. The wind turbine was purchased from a German company that had its manufacturing plant based in India. Over the years, the wind turbine had various problems that could not be fixed and, therefore, only produced half of the expected electricity. Consequently, in 2017 the village association decided to sell the power plant to a private investor.“[34]
	strong ties amongst the community members, minority group of Seto people relevant in community sense, ***individual citizens in the region promoting CE***	*"Kagu Energiaühistu" (Kagu energy cooperative), Estonia* "Kagu Energiaühistu is a unique model of a non-profit organisation operating in the South-eastern region of Estonia known as Setomaa. This region is a culturally distinct and rich region inhabited by the Seto people. Kagu Energiaühistu is not yet involved with any renewable energy projects but is completing a feasibility study for two solar farms in the town of Värska."[35]
TYPE A.3: RURAL CE PROJECT – BOTTOM-UP PUBLIC COMPANY DRIVEN	***publicly owned agency/company is driver***, leadership and coordination through public company; biomass/waste to energy focus; combining electricity, heat and biofuels; local companies part of the initiative	*"Słupsk Bioenergy Cluster", Poland*[36] • Cluster is the brainchild of Słupsk Waterworks (Wodociągi Słupsk), the publicly owned agency that operates the Słupsk Wastewater Treatment Plant (WWTP) • Słupsk Waterworks providing leadership, sees itself as regional hub for innovation • Cluster connects energy users with energy suppliers; WWTP receives waste water and biomass waste and generates electricity and heat • Linking to circular economy

32 http://co2mmunity.eu/wp-content/uploads/2018/10/Factsheet-smalininkai.pdf

34 http://co2mmunity.eu/wp-content/uploads/2018/10/Factsheet-smalininkai.pdf

35 *Ruggiero et al. 2021. Context and agency in urban community energy initiatives: An analysis of six case studies from the Baltic Sea Region. Energy Policy 148, 111956*

36 https://www.bonusreturn.eu/policy-briefs/policy-brief-slupsk-bioenergy-cluster-a-new-paradigm-for-a-local-circular-economy-in-renewable-energy-and-waste-recycling-in-poland/, https://www.score-h2020.eu/fileadmin/score/documents/AW-Slupska_WB_-_EN_24_III_2021.pdf

TYPE	MAIN CHARACTERISTICS	EXAMPLES FROM CEE COUNTRIES
TYPE A.4: CE IN THE CONTEXT OF JUST TRANSFORMATION AND ENVIRONMENTAL CLEAN-UP[37]	Motivation from post-coal/post-lignite/oil shale situation[38], context of just transition discussions, economic potential of CE relevant	Possibly municipalities in the Donesk region, Ukraine could be examples here[39]
TYPE A.5: CE IN RURAL, REMOTE TOURISM DESTINATIONS[40]	Motivation from carbon-neutral tourism labelling Often municipalities and SMEs (hotels, restaurants etc.) involved Sector coupling a topic, linking energy generation (PV etc.) with e-mobility (car/bike charging stations)	*Otok Krk, Croatia*[41] - Croatia's first energy cooperative founded in 2012 on island of Krk[42] - provides assistance and support to residents interested in producing green energy - "Cooperative members – Krk town, all municipalities, NGOs, citizens; 300 members interested to join with first projects funded" [43] *SustainCamp cooperative, Croatia* [44] - Organized by ZEZ - popularize the use of sustainability measures in campsites on islands in Croatia - includes aspects such as solar water heating, PV installation, biomass usage, water and energy savings and LED lighting

37 *Could be linked to model CE projects in Greece which are known in Western Balkan; exchange exists e.g., with Bulgaria*

38 *Could be linked to Initiative for coal regions in transition in the Western Balkans and Ukraine, https://www.energy-community.org/regionalinitiatives/Transition/coal.html*

39 *https://justtransition.org.ua/en/main-en/#focus*

40 *Could be linked to e.g., Austrian experiences with CE in tourist destinations (contact to Österreichischer Koordinationsstelle Energiegenossenschaften)*

41 *https://www.linkedin.com/in/energetska-zadruga-otok-krk-69a2391b5/?originalSubdomain=hr*

42 *https://balkangreenenergynews.com/energy-transition-in-croatia-five-examples-of-good-practice/*

43 *https://www.energy-community.org/dam/jcr:dc5d5066-909f-4174-8baa-ac0ce9bb4740/WSRES032016_ZEZ.%20Energy.pdf*

44 *https://www.zez.coop/en/sustaincamp/*

TYPE	MAIN CHARACTERISTICS	EXAMPLES FROM CEE COUNTRIES
TYPE B.1: URBAN HOUSING COOPERATIVES DEVELOPING CE	High share of multi-family buildings, often energy efficiency a topic, climate protection possible context, possibly high energy prices one issue, grid-connection given, existing housing cooperatives in many CEE countries	*Housing Cooperative Wrocław South (HCWS), Poland* - operates on basis of Polish Housing Cooperatives Act - HCWS dates back to 1946 - HCWS which manages 102 buildings and almost 11,000 apartments with approximately 30,000 homeowners - HCWS runs Wroclaw Solar Power Plant (WSPP) project, largest rooftop photovoltaic system in Poland - solar power plant developed using co-creation strategy engaging inhabitants - PV farm since 2017 is in operational phase; total of 2,771 solar panels installed on rooftops of 35 buildings; generates almost 0.75 MW of electricity, production of electricity saves 614 tons of CO2 emissions per year"[45] *"The Pszczelna Solar Housing Community", Poland* - "the first community in Szczecin, Poland, to install a PV system"[46] - "the solar PV installation only provides electricity for the common parts of the building (staircase lights, elevators, parking space lights, etc.). Surpluses from the solar PV system are sold to the network operator."[47] - key actors were two ambitious and progressive project managers who had close contact with the housing community residents. [48] - important actor was energy advisor from the National Fund for Environmental Protection and Water Management in Szczecin, provided the two project managers with information and advice, specifically regarding the legal, financial, and organisational aspects of the "Prosument Grant Programme".[49] - "project managers organised several information sessions in order to address citizens' worries and knowledge gaps regarding the solar project. In addition,

[45] https://www.zsi.at/de/object/partner/5892

[46] *Ruggiero et al. 2021. Context and agency in urban community energy initiatives: An analysis of six case studies from the Baltic Sea Region. Energy Policy 148, 111956*

[47] *Ruggiero et al. 2021. Context and agency in urban community energy initiatives: An analysis of six case studies from the Baltic Sea Region. Energy Policy 148, 111956*

[48] http://co2mmunity.eu/wp-content/uploads/2019/02/Factsheet-Szczecin.pdf

[49] http://co2mmunity.eu/wp-content/uploads/2019/02/Factsheet-Szczecin.pdf

TYPE	MAIN CHARACTERISTICS	EXAMPLES FROM CEE COUNTRIES

they had the determination **to capitalise on the enthusiasm and environmental awareness of the younger apartment owners who were interested in reducing their carbon footprint**. One key socio-economic obstacle was **energy poverty**, which typically influences the decision of Polish citizens to not switch fuel sources. For this reason, the project managers utilized the "Prosument Grant Programme", knowing that financing would not originate from the citizens themselves."[50]

- the municipality of Szczecin created a local funding scheme under a national grant program to support "prosumption" in multi-apartment buildings."[51]

Housing Association Vilde 70 in Tallinn, Estonia[52]

- housing association Vilde 70 carried out renovation project to ensure a healthy indoor climate and better energy efficiency, conducted in 2014/2015
- included the following tasks: insulation of the facade and the roof, closing of the open entryways running on the ground floors, installation of triple glazed windows, replacement of the heating system, building of a ventilation heat recovery system with heat pumps, and replacement of elevators.
- In addition, a 15 kW PV system was installed on the roof to increase the level of energy efficiency. The solar PV was designed to supply electricity for the communal spaces and sell the surplus electricity to the grid. The total sum invested was 1,424,637 €.
- All the decisions were made by the members of the housing association."
- Both the energy savings achieved through renovation and income from the surplus electricity generated by the solar PV system are redistributed to the apartment owners based on the number of square meters they own.
- monthly payments to repay the loan is 1,25 €/m² which represent a very small increase in monthly payments that each apartment owner pays to the housing association. The project is economically viable because it generates savings on the building's heating costs."

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50 http://co2mmunity.eu/wp-content/uploads/2019/02/Factsheet-Szczecin.pdf

51 http://co2mmunity.eu/wp-content/uploads/2019/02/Factsheet-Szczecin.pdf

52 *Ruggiero 2018: The Housing Association Vilde 70 in Tallinn, Estonia carries out an energy efficiency renovation including a solar PV installation. Case Story Factsheet. Interreg Co2mmunity.*

TYPE	MAIN CHARACTERISTICS	EXAMPLES FROM CEE COUNTRIES
		- "The investment was financed 60% with a 20-year bank loan and 40% (564,445 €) by the Kredex renovation grant." - "Some of the main obstacles faced by the renovation project were fear to renovate, declining costs of district heating, old age of the apartment owners, diffidence in the Russian-speaking minority towards the subsidies offered by the Estonian government, bureaucracy, difficulty in understanding the importance of the project to all the apartment owners, and people's unease with collective solutions."
TYPE B.2: MUNICIPAL INITIATIVE, CONTEXT OF GREEN, CARBON NEUTRAL CITIES	owned and operated by the municipality, no direct influence and involvement of citizens, bioenergy for heating, grid-connected, context of energy independence and reduction of greenhouse gas emissions	*Kněžice, Czech Republic* • is a village and municipality in the middle of the Czech Republic. It is also the first Czech "Energy Independent" municipality. It is a living testimony to how community energy can lower consumer bills, promote local businesses and reduce environmental impacts. (…) The Kněžice Bioenergy System: • Heats nearly all homes and produces more electricity than the village uses • A biogas plant and a biomass plant sources various forms of local waste and biomass • Annually saves more than 8.000 tons of CO2 • Is fully operated by the municipality and employs 6 villagers But the project faces numerous legislative challenges. Instead of selling electricity directly to their inhabitants, the municipality must sell to the grid - from where villagers then have to buy it at five times the price the municipality is paid. This hinders other villages from developing similar local energy systems, and has also stopped Kněžice from going further – they want to install PVs on municipal buildings, but it is not possible under the current legislation.[53]

[53] https://friendsoftheearth.eu/wp-content/uploads/2020/01/community_energy_in_hungary_and_czechia_briefing.pdf

TYPE	MAIN CHARACTERISTICS	EXAMPLES FROM CEE COUNTRIES
	Crowd-funded, municipality led, citizen influence limited to not existing, roof-top PV technology Motivation: linked to climate neutrality, Covenant of Majors membership	*Village of Křizevci, Croatia*[54] - energy cooperative Zelena Energetska Zadruga (ZEZ, or Green Energy Cooperative) – idea and project leader - crowdfunded renewable energy project (solar power plant) since 2018; 30,000€ raised from residents (ten-year loan, 4.5% interest rate), after 10 years power plant owned by municipality - on the roof of the city's business centre, 50kW capacity - energy used for business center, surplus fed into municipal grid - 2019 second project – solar power plant on library roof - Křizevci also active in fighting energy poverty, energy efficiency, also looking into geothermal use - Member of the Covenant of Mayors since 2012, has an energy management office and mayor meets weekly with citizens on energy topics
TYPE C.1 **CAPACITY-BUILDING AND INFORMATION CAMPAIGN**		*DBU-project "Information dissemination and qualification on citizen energy in Germany and the Czech Republic"*[55] - *German and Czech NGOs (Bündnis Bürgerenergie, Friends of the Earth Hnuti DUHA, and Calla) working together in developing information material and campaigns on citizen energy to inform Czech majors and other local actors on CE options* *Prague, Czech Republic* - Developing a website/platform on CE projects in the city, providing FAQs for interested citizens and linking citizens to CE (rooftop PV) projects[56]

54 https://municipalpower.org/articles/how-krizevcis-residents-created-croatias-first-crowdfunded-solar-power-plant/
55 https://www.buendnis-buergerenergie.de/buendnis/foerderprojekte
56 https://www.pripojdum.cz/

5 Bürgerenergie in Ländern Mittel- und Osteuropas

Aus den Literatur- und Dokumentenrecherche und den Interviews wurden im Projekt Beschreibungen für alle im Projekt im Fokus stehenden Länder erstellt. Dabei wurde ein einheitliches Format gewählt, um die Informationen vergleichbar strukturiert aufzubereiten. Die erstellten Steckbriefe wurden für eine Veröffentlichung auf der Website der DBU optimiert und in Englischer Sprache verfasst. In Ländern, in denen Einzelstudien (vgl. Kapitel 6.1) erstellt wurden, wurden die Steckbriefe der entsprechenden Länder durch die Autor*innen der Einzelstudien geprüft und ggf. ergänzt oder geändert. Die Steckbriefe sind auf der Website der DBU veröffentlicht und im Anhang A.6 angefügt.

6 Project ideas developed in the context of the project

In the following sections the pre-studies (section 6.1) and full project proposals (section 6.2) developed as a result of the networking and information activities carried out are briefly described and clustered according to the stated project objectives (section 6.4)

6.1 Pre-studies

As a result of the workshops and of stakeholder interviews several proposals for pre-studies were discussed and submitted to the DBU. In the process of developing pre-studies, several meetings with interested stakeholders took place and were supported by the project team. Table 1 provides an overview of the meetings. With the two first pre-studies on Estonia and Latvia (cf. Box 2) respectively North Macedonia, Montenegro, Serbia and Bosnia-Hercegovina (cf. Box 3) regular meetings were carried out to discuss project advancement and interim results.

Table 1. Meetings related to the development of pre-studies

Land	**Stakeholder**	**Date**	**Pre-Study or Project Proposal submitted**
BiH	BiH Majda Ibrakovic, Dragan Ostic (Energy and Climate Change program, Center for Environment Banja Luka)	02.08.2022, Zoom	--
KOS	Egzona Shala (EkoZ), Urim Xharavina (Lets do it, Peja!)	15.06.2022, Zoom	Pre-Study conducted
MAZ	Sreten Koceski (CDI)	08.06.2022, Zoom	Pre-Study conducted; Full Proposal approved
LET, EST	Dr. Michael Krug, Dr. Gilbert Sieckmann-Joucken	14.03.2022, Zoom	Pre-Study conducted
MAZ	Srgjan Vidoeski	16.12.2021, Zoom	Pre-Study conducted

ALB	Katharina Habersbrunner (Women Engage for a Common Future), Valbona Mazereku (Milieukontakt)	27.10.2022, Zoom	Full-Proposal under development
EST	Bewohner und Akteure aus Umbusi Village, Dr. Gilbert Sieckmann-Joucken	16.5.2023, Zoom	Full-Proposal under development

In the following boxes the approved pre-studies are described in a comparable way and results outlined. The information is based on the pre-study applications and the final reports with were submitted to the DBU. The reports were submitted in a comparable format based on a template provided by the project and included in the annex. For a detailed account on the studies and the results we refer to the project reports of the respective pre-studies.

Box 2. Summary for the Pre-Study on Estonia and Latvia

"Community energy initiatives in Estonia and Latvia – brief study on framework conditions, emerging initiatives and project ideas"	
Contractor(s)	Dr. Gilbert Sieckmann-Joucken (MAFO Consult) Dr. Michael Krug (Freie Universität Berlin)
Duration	May-August 2022
Budget	11,100 €
Countries in the focus	Estonia and Latvia
Objective(s) of the study	• Identify and connect with stakeholders in Estonia and Latvia • Update the country profiles (Steckbriefe) for Estonia and Latvia • Support, if possible, the development of project proposals to be submitted to the DBU
Main conclusions	
Full proposals or pre-studies developed as a result of this pre-study • Full proposal for a project in Estonia under development	

Box 3. Summary for the Pre-Study on North Macedonia, Serbia, Montenegro, Bosnia and Herzegovina

"Citizen Energy Initiatives and Potential for Energy Communities in the Western Balkans (North Macedonia, Serbia, Montenegro, Bosnia and Herzegovina)"

Contractor(s)	Srgjan Vidoeski, North Macedonia Melina Kalem, Bosnia and Herzegovina
Duration	May-August 2022
Budget	6,732 €
Countries in the focus	North Macedonia, Serbia, Montenegro, Bosnia and Herzegovina
Objective(s) of the study	• Identify and connect with stakeholders in North Macedonia, Serbia, Montenegro, Bosnia and Herzegovina • Update the country profiles (Steckbriefe) for North Macedonia, Serbia, Montenegro, Bosnia and Herzegovina • Support, if possible, the development of project proposals to be submitted to the DBU
Main conclusions Main need for action to facilitate citizen energy in each of the countries have been identified. Sharing and promoting information about citizen energy, and capacity building for the stakeholders seemed a common need, in addition to "Work on visibility and promotion of the legal changes that allow development of CE projects, and increased collaboration between local authorities and other actors for smoother permitting process."	
Full proposals or pre-studies developed as a result of this pre-study • Pre-Study carried out by Sreten Koceski (CDI), North Macedonia (cf. Box 6 below) • Pre-Study carried out by ZIP (cf. Box 7 below) • Full-project submitted and granted by Sreten Koceski (CDI), North Macedonia • Full-project submitted by ZIP, North Macedonia	

Box 4. Summary for the Pre-Study on Croatia

"SOLAR ARCHIPELAGOS MANIFESTO - IN ACTION !"	
Contractor(s)	Vedran Horvat, Institute for Political Ecology (IPE), Croatia
Duration	July-September 2022
Budget	3,600 €
Countries in the focus	Croatia, Adriatic coast – 7 locations (Pula, Krk, Lošinj, Šibenik, Split, Korčula, Dubrovnik)
Objective(s) of the study	• Prepare the basis for a full project proposal to DBU • Explore how tourism driven energy needs can be linked to accelerated transition to renewables • explore the current state of art in relation to citizen engagement and interest into transition to renewables; primarily solar energy in 7 locations in Croatia

	• establish contacts to potential partners for a full project proposal
Main conclusions	
Full proposals or pre-studies developed as a result of this pre-study --	

Box 5. Summary for the Pre-Study on Hungary

"COMMUNITY ENERGY DEVELOPMENT AGENCY IN HUNGARY. A CONCEPT FOR FACILITATING COMMUNITY ENERGY"	
Contractor(s)	the Solidarity Economy Center
Duration	July – November 2022
Budget	5.825 €
Countries in the focus	Hungary
Objective(s) of the study	• to assess the potential and challenges of community energy in Hungary • to synthesize international best practices of facilitating cooperative initiatives and energy communities. • to develop a concept of community energy development agency
Main conclusions The pre-study highlighted the following challenges for community energy in Hungary: Corporate interference in definition and funding schemes; Grid access for renewables effectively banned, both for wind and solar; No legal framework and business models for collective self-consumption and energy sharing; Lack of capabilities and capacities of citizens, nonprofit organisations and municipalities; Burdensome legal-financial framework for cooperatives. The "Community Development Agency (CDA)" was explored and suggested as a suitable concept for supporting energy communities in Hungary, adaptive to the country context. An organizational concept for the *Community Energy Development Agency in Hungary* was proposed, including the following activities: *Capacity-building, Network-building, Advocacy, Communication.*	
Full proposals or pre-studies developed as a result of this pre-study • "Bürgerenergie MOE: HU-GE TRANSFORMATOR 1.0 HUngarian-GErman Cooperation for TRANSFORMing Community Energy 1.0"	

Box 6. Summary for the Pre-Study on North Macedonia (CDI)

"Energy Cooperatives Macedonia. Encouraging Development of Citizen Energy Cooperatives in Macedonia"	
Contractor(s)	Community Development Institute Macedonia - CDI
Duration	July – October 2022
Budget	7.900 €
Countries in the focus	North Macedonia
Objective(s) of the study	• aims to determine the conditions and opportunities for encouraging the development of citizen energy cooperatives in Macedonia
Full proposals or pre-studies developed as a result of this pre-study • Full-project submitted and granted by Sreten Koceski (CDI), North Macedonia	

Box 7. Summary for the Pre-Study on North Macedonia (ZIP)

"Can energy communities empower energy vulnerable citizens?"	
Contractor(s)	ZIP Institute
Duration	October – December 2022
Budget	4.980 €
Countries in the focus	North Macedonia
Objective(s) of the study	• explore the potential for energy communities in a rural municipality in North Macedonia populated by a dominant ethnic Albanian minority and affected by high shares of energy poverty • pre-study objectives: • prepare the ground for the project implementation, including strengthening the implementation cooperation, and the main data collection methods
Full proposals or pre-studies developed as a result of this pre-study • Full-project submitted by ZIP, North Macedonia	

Box 8. Summary for the Pre-Study on Kosovo

"Citizen Energy in Kosovo"	
Contractor(s)	EcoZ (Youth Ecological and Security Zone), Municipality of Peja, Let's Do It Peja (LDIP)

Duration	September – December 2022
Budget	7.000 €
Countries in the focus	Kosovo
Objective(s) of the study	• Mapping the current situation regarding citizens in energy transition on Municipality of Peja and assessing the potential for establishing energy communities
Full proposals or pre-studies developed as a result of this pre-study --	

Box 9. Summary for the Pre-Study on Latvia

"ENCOURAGING ENERGY COMMUNITY DEVELOPMENT IN RURAL AREAS OF LATVIA"	
Contractor(s)	Latvian Rural Forum (LRF)
Duration	2022
Budget	10.050 €
Countries in the focus	Latvia
Objective(s) of the study	• to raise awareness about the potential of energy communities in Latvia and to create a platform for the development of energy community pilot projects enhancing energy independence in rural areas
Full proposals or pre-studies developed as a result of this pre-study • Full-project submitted by Böll-Stiftung Schleswig-Holstein	

Box 10. Summary for the Pre-Study on Bulgaria

"Citizen energy communities in Bulgaria"	
Contractor(s)	Akademie der Wissenschaften, Institute of Philosophy and Sociology
Duration	September – December 2022
Budget	8.581 €
Countries in the focus	Latvia
Objective(s) of the study	• how to identify and mobilize local communities/ cooperatives or citizen initiatives in urban and/ or rural areas with the potential to become Citizen energy communities/cooperatives (CECs)

	• shall identify similar niche developments in local communities that could be scaled up and accelerated (in a follow-up project)
Full proposals or pre-studies developed as a result of this pre-study --	

Box 11. Summary for the Pre-Study on Poland

"Collective prosumer Prospects for energy communities in Poland"	
Contractor(s)	Enercode, CoopTech Hub, MSM Energetyka
Duration	October 2022 – March 2023
Budget	37.500 €
Countries in the focus	Poland
Objective(s) of the study	• develop comprehensive guidelines for collective prosumers in Poland • the project is expected to end with the detailed plan of establishing the first Polish collective prosumer by MSM Energetyka
Full proposals or pre-studies developed as a result of this pre-study --	

6.2 Full projects (as of July 2023)

6.2.1 North Macedonia

"Nostra Nova Domus - Forging more effective partnership and capacity building for efficient use and management of solar energy"	
Lead applicant	Solare Zukunft e.V., Freiburg im Breisgau
Partner(s)	Community Development Institute Macedonia (CDI), Tetovo, North Macedonia
Status	Project granted
Duration	09.12.2022 – 09.03.2024
Countries in the focus	North Macedonia
Objective(s) of the study	• Empowering Citizens in the Energy Transition: Energy Cooperatives and Solar Renewables via the development of citizen energy cooperatives in Macedonia.

6.2.2 Czech Republic

"CommUnion - Community Energy Unions in Czech Republic and Germany"	
Lead applicant	Bündnis Bürgerenergie e.V., Berlin
Partner(s)	Hnuti DUHA - Friends of the Earth, Brno, Czech Republic
Status	Project granted
Duration	29.11.2022 - 29.11.2025
Countries in the focus	Czech Republic
Objective(s) of the study	• create a strong and viable market environment for the small-scale community-led projects in Czechia • strengthen the role of the newly established Union of Community Energy (UKEN); develop its membership base and activities • various barriers of community energy development will be overcome and interest of the public will increase, motivating municipalities, households and SMEs to form and take part in community energy

"Feasibility study: Community energy in the City of Zidlochovice, Czech Republic"	
Lead applicant	Jihomoravská agentura pro verejné inovace JINAG, Brno, Czech Republic
Status	Project granted
Duration	30.11.2022 - 30.6.2023
Countries in the focus	Czech Republic
Objective(s) of the study	• Prepare and assess complex community energy concept to further enabling prosumers by producing a feasibility study for the city of Židlochovice including the Chytre Lichy district. • Analyse and design of energy management models (e.g energy co-operative, microgrid) and target groups (e.g citizens, investors) to develop solutions and recommendations for energy community (EC) concept in the district of Chytré Líchy. • Enable the district of Chytre Lichy via the implementation of pilot CE network to reach climate goals for 2030 (saving 55% CO2 by 2030).

6.2.3 Slovakia

"Dekarbonized energy System and possibilities of Community energy for the new district Mayer Malacky (Slovak Republic) - Feasibility Study"	
Lead applicant	Priatelia Zeme-CEPA - Friends of the Earth-CEPA, Poniky, Slowakia
Status	Project granted

Duration	30.11.2022 - 30.5.2023
Countries in the focus	Slovakia
Objective(s) of the study	• to prepare Guidelines for an independent and self-sustainable energy community/multi apartment building

Main conclusions

The study highlighted the barriers multi-apartment buildings face to become self-efficient energy self-consumers, which include: 1) high financial burden of renewable energy devices and installation, 2) Split incentives and challenges for the private rented sector, 3) difficulty in accessing smart meters, 4) lack of consumer access to information, advice and installation, 5) Regulatory framework for photovoltaics installations, administrative procedures and access to the grid and 6) Lack of consumers rights and benefits for prosumers and members of energy communities . The study also provided practical solutions to national stakeholders and local authorities on how to overcome these hurdles and engage a larger number of consumers living in multi-apartment buildings in the energy transition.

The main results of the study include:

- Green Sunflower – an example for multi apartment buildings thinking "out of box" (guidelines)
- Administrative, technical and financial barriers of multi apartment buildings face on their way to renewables (analyses and recommendations for stakeholders))
- Multiapartment buildings as possible energy communities (evaluation)
- Identification of actors and possibly favorable constellations for citizen energy projects

6.2.4 Hungary

"Bürgerenergie MOE: HU-GE TRANSFORMATOR 1.0 HUngarian-GErman Cooperation for TRANSFORMing Community Energy 1.0"	
Lead applicant	Bündnis Bürgerenergie e.V., Berlin
Partner	Solidarity Econ Center – SEC, Budapest Alliance for Collaborative Real Estate Development (ACRED), Budapest
Status	Project granted
Duration	24.11.2022 - 24.11.2024
Countries in the focus	Hungary
Objective(s) of the study	• support the transformative process with free transboundary flow of in-depth experience and knowledge transfer, and develop community energy facilitating models between German and Hungary. • Achieve cooperation between the just starting Hungarian energy • community scene and the three decade old, established German community energy. • Cooperation is the drive behind building up long-term organisational partnerships.

6.3 Full proposals under development (as of July 2023)

6.3.1 Albania

"Dukat" Community Energy"	
Lead applicant	Organic Agriculture Association, Lavdosh Ferruni
Partner(s)	
Status	Proposal under development
Countries in the focus	Albania
Objective(s) of the study	• build up a real model of community energy base on photovoltaics in a very highly visited area • lobbing to the government to quickly provide adequate policies and measures to expand the community energy all over the country • promotion of the model at the national scale and broader

"Gender and social just energy communities in Albania"	
Lead applicant	Women Engage for a Common Future (WECF), Katharina Habersbrunner
Partner(s)	Milieukontakt, Valbona Mazreku
Status	Proposal under development
Countries in the focus	Albania
Objective(s) of the study	• enable female entrepreneurs, low-income households and young people to grasp the opportunities and the potential that own-consumption and energy communities overall can represent and guide them towards engagement and joining in such models • build awareness and capacities and provide guidelines for local authorities and policy makers to initiate and unlock regulatory frameworks and programs to enable ECs development • create cooperation and mutual learning and support between local actors, policy makers and other relevant energy stakeholders, ensuring lasting experience sharing of successes, challenges, solutions and lessons learnt

6.3.2 North Macedonia

"Can energy communities empower energy vulnerable citizens"	
Lead applicant	Nexus GmbH, Prof. Ludger Dienel
Partner(s)	ZIP Institute, Agim Selami
Status	Proposal under development

Countries in the focus	North Macedonia
Objective(s) of the study	• explore the potential of energy communities to empower vulnerable citizens through the realization of Citizens Assemblies. • overall project objective: explore the potential for energy communities in a rural municipality in North Macedonia populated by a dominant ethnic Albanian minority and affected by high shares of energy poverty

6.3.3 Greece/North Macedonia

"Solar community garden" - The First Community-Led Agrivoltaic Project in Greece"	
Lead applicant	Electra Energy
Partner(s)	CommonEn community; ASSED SUNRISE
Status	Proposal under development
Countries in the focus	Greece, North Macedonia
Objective(s) of the study	• examine potential business models for a collective agri-photovoltaic project, installed within a (peri)urban area • develop and test a replicable model of a collective agri-photovoltaic

6.4 Clustering of full project proposals

The pre-studies mostly fall in the category of exploratory and capacity building projects. Some were more feasibility studies with specific case study contexts and local alignment but in all cases providing basic information and identifying potential actors and project partners was in the focus.

The full projects and project proposals were clustered in four typologies which are explained in the following, however, acknowledging that a certain degree of overlap of the categories can be seen.

Type 1: developing specific, local pilot community energy projects

The projects in Greece/North Macedonia and North Macedonia (CDI) aim at developing specific pilot community energy projects. Objectives of these projects are to establish pilot projects and from this to expand knowledge of the concept of citizen energy within the country. In the project in Greece/North Macedonia a first community-led agri-photovoltaic project shall be developed. This very specific project objective is aiming to link energy transitioning and food production and is focusing on the social benefits of localized energy and food production. The applicants are well connected to the European exchange on community energy (e.g., via the Rescoop) network and can use and contribute back to knowledge exchange in the western Balkan region. In the project by CDI and Solare Zukunft e.V. in North Macedonia, the development of a photovoltaic installation in the city of Tetovo is planned. Based on the experiences with this specific local project training sessions and material will be developed to spread the knowledge of the topic within North Macedonia and to enable other local actors in using solar energy for local electricity production.

Type 2: Empowering Marginalized and Underrepresented Citizens

The proposed projects in Albania (WECF & Milieukontakt) and North Macedonia (ZIP Institute) aim to empower marginalized and/or underrepresented citizens in the face of energy challenges and the transition to renewable sources. In the Albanian project a focus is on supporting gender-just energy communities. Here recommendation, policy advise, and material in supporting the development of just energy communities and for highlighting the relevance of gender issues and women's rights and relevance of younger people are planned. The project proposed for North Macedonia seeks to develop and test methods for engaging and empowering marginalized and minority populations in the local development of community energy projects. With a regional focus on Saraj, the method of "citizen assembly" shall be used and explored to achieve a meaningful integration of minority groups in decision-making on local energy policies.

Thus, both projects have a strong focus on the social side of community energy projects and on inclusive and just community energy concepts. For the region of central and eastern Europe this is a relevant focus with the potential of transferring results and experiences also to other countries and contexts in the region.

Type 3. Feasibility Studies for Integrating Energy Communities in Neighborhood Development

The projects in Slovakia (in the district of Mayer Malacky) and Czechia (in the city of Židlochovice) both are feasibility studies on how to link the community energy concept with the development of new housing areas and neighborhoods. In both cases the goal of realizing low/zero-carbon neighborhoods have been regarded as a reason for engaging with the concept of community energy. In the case of the Mayer Malacky district in Slovakia, an alternative supply of heating and electricity for the new neighborhood is being explored and the potential of citizen engagement in this. In the Czech Republic, the project in the city of Židlochovice conducts a feasibility study for an energy community integrated into the development of a planned zero-energy district. Both projects aim at generalizing from their findings in the feasibility studies and develop recommendations for comparable settings.

Also, these projects bear the potential for transferring results to other counties and regions in CEE as development of new neighborhoods is a topic in almost every country in the focus of this study and ideas for how to establish citizen-led energy generation and enhancing community buy-in and interest can be a relevant topic in several locations.

Type 4: Institutionalizing Community Energy Capacities and Knowledge Exchange

The two projects in Hungary (SEC and BBEn) and Czechia (Hnuti Duha and BBEn) have very similar goals in institutionalizing community energy capacities and developing for a for knowledge exchange in the se countries. Both work with the German partner BBEn and aim at seizing from BBEns experience in being a central actor in Germany in bundling community energy initiatives and competence. The Czech project is building here on experience from a first project in which first steps in making the concept known locally in municipalities have been completed and an organization on the national scale has already been founded. This Union of Community Energy shall now be established as a central hub providing information about e.g., model community energy projects, financing opportunities, and manuals on how to set up community energy projects.

The findings and experiences on success factors in these two projects appear very relevant in discussing different potential pathways for countries in establishing national capacities on community energy also in

a broader European and potentially international context. Here exchange and comparison with the approach implemented in Austria, where a government funded central organization is providing knowledge and capacities and the German approach of an NGO-based information hub might be very rewarding and potentially leading to generalizable results.

7 Schlussfolgerungen

Ein Ziel des Vorhabens war es, Akteure zum Thema Bürgerenergie in den Ländern Mittel- und Osteuropas zu identifizieren und diese einerseits zu ihren Erfahrungen zu interviewen und andererseits über die DBU-Fördermöglichkeiten zu informieren und zur Antragsentwicklung und -einreichung bei der DBU zu motivieren. Dazu wurde als primäre Strategie wie im Kapitel 2 dargelegt auf die Recherche von Akteuren online und aus der Literatur gesetzt. Außerdem wurden Bearbeitende von thematisch relevanten abgeschlossenen und laufenden Forschungsvorhaben anderer Institutionen identifiziert und kontaktiert.

Dieser Ansatz und die geführten Interviews waren sehr hilfreich, um Informationen zum Stand der Beschäftigung mit dem Thema Bürgerenergie und relevanter Kontextfaktoren in den Ländern zu gewinnen. Das Vorgehen hat weiterhin über ein Schneeballverfahren zu weiteren Kontakten geführt.

Eine Einschränkung, die dabei sehr deutlich wurde, war, dass wenige Akteure identifiziert werden konnten, die nicht schon in der Literatur, in Forschungsvorhaben oder anderer digitaler Berichterstattung aufgetaucht waren. Damit wurden viele Vertreter*innen von übergeordneten Nicht-Regierungsorganisationen interviewt und weniger von lokal aktiven, kleineren Verbänden und kaum einzelne Bürger und Bürgerinnen. Auch wenig repräsentiert waren Vertreter*innen von Gemeinden oder KMUs. Für diese Akteure zeigte sich, dass die gewählte Methode der Onlinerecherche und vor allem bezogen auf englisch-sprachig publizierte Informationen weniger zielführend war.

In den zwei Kurz-Studien zu Estland und Litauen bzw. zum südlichen Balkan (Nord Mazedonien, Montenegro, Serbien, Bosnien-Herzegowina) wurden durch die lokale Kenntnis der Auftragnehmer*innen und die Kenntnis der Landesprachen sehr gute Ergebnisse bei der Aktivierung zusätzlichen Akteure erzielt. Im Fall von Nord Mazedonien führte dies u.a. zur Beauftragung einer weiteren Kurz-Studie und schließlich zur Bewilligung eines Projektes mit einem lokalen Partner, der vorher in den übergeordneten Recherchen nicht identifiziert worden war. Auch für Estland wurden lokale Akteure identifiziert, die tatsächlich als engagierte Bürger*innen und lokale Gemeinschaft derzeit mit der Entwicklung eines Projektantrages beschäftigt sind. Der Kontakt zu diesen Akteuren, die nun tatsächlich bottom-up agieren, wäre ohne die durchgeführten Kurz-Studien und allein durch die übergeordneten Rechercheansätze nicht zustande gekommen. Auch bestehende Kontakte zu Personen, die in den untersuchten Ländern lokal vernetzt sind waren sehr hilfreich und haben zum Teil zu aussichtsreichen Entwicklungen geführt. Hier sei insbesondere die Vermittlung von Lulzim Bauman im Kosovo und in Albanien genannt.

Im Hinblick auf das Ziel, den Stand der Etablierung des Bürgerenergie-Ansatzes in den Ländern Mittel- und Osteuropas zu identifizieren und relevante Kontextfaktoren zu beschreiben, kann festgehalten werden, dass sich diese sehr unterschiedlich darstellen in der Region. Weiterhin war eine große Dynamik während der Phase der Projektbearbeitung zu beobachten durch die Pflicht das EU Energy-Package und die entspre-

chenden Vorgaben zu Bürgerenergie national umzusetzen. Damit ergaben sich vielfach im Laufe des Projektes stark veränderte Rahmenbedingungen durch die Verabschiedung neuer Gesetze und untergesetzlicher Vorgaben. Auch der Krieg in der Ukraine seit Februar 2022 war mit seinen Auswirkungen in Bezug auf Energiepreise und die Diskussion über Versorgungssicherheit stark spürbar in den Interviews und wurde zum Teil als mögliche Argumentationslinie für einen verstärkten Fokus auf eine dezentrale und durch Bürger*innen getriebene Energiewende gesehen. Langfristige Effekte konnte im Projektverlauf allerdings nicht ausgemacht werden, diese zeigen sich vermutlich erst mittel- bis langfristig. Zusammenfassend kann festgehalten werden, dass in den untersuchten Ländern noch diverse Hindernisse bzw. Herausforderungen bei der Etablierung von Bürgerenergie-Initiativen vorliegen:

- Mangel an Vertrauen unter den Bürger*innen, Mangel an Vertrauen in die Regierung und Verwaltung, aber teilweise auch in NGOs (Interviews Kosovo, Rumänien, Ungarn)
- Mangel an Orts- und Gemeinschaftsgefühl – auf dem Land und in kleinen Dörfern besser als in großen Städten (Interviews Kosovo, Rumänien, Ungarn, Ukraine)
- Regulierte und somit geringe Energiepreise (Ungarn)
- Mangel an unterstützenden gesetzlichen und untergesetzlichen Vorgaben für Bürgerenergieprojekten und herausfordernde Bürokratie für die Genehmigung von EE-Anlagen (Interviews Ungarn, Rumänien, Ukraine)
- Kein oder wenig verfügbares Einkommen; Abneigung gegen langfristige Investitionen und Risikobereitschaft (Interviews Kosovo, Rumänien, Ungarn)
- Energieeffizienz in armen Haushalten ist ein drängenderes Problem, ein langer Weg zu bottom-up Energieinitiativen in gefährdeten Gebieten (Interviews Ungarn, Kosovo)
- Energieunternehmen versuchen, von den Bürgerenergie-Regulierungen zu profitieren, z.B. von entsprechenden Förderprogrammen und können in manchen Regionen Teil von Bürgerenergiegemeinschaften werden und entsprechenden Einfluss nehmen mit wenig Fokus auf sozialem Wandel, sondern fokussiert auf Profit für das Unternehmen (Interviews Ungarn, Kroatien)

Gleichzeitig zeigen sich aber auch viele Chancen und vielversprechende Kontextfaktoren und Entwicklungen die für die Etablierung von Bürgerenergie-Ansätzen positive wirken (können) und die in den untersuchten Ländern durchaus thematisiert und zum Teil auch bereits aktiv genutzt bzw. gefördert werden:

- Anstieg der Energiepreise in den letzten Jahren – Momentum und „Windos of opportunity“ für Bürger*innen, sich mit Energiethemen zu befassen (Interviews Kosovo, Bulgarien, Rumänien)
- die junge Generation ist gut vernetzt mit der Welt (Internet, soziale Medien, Studium/Arbeit im Ausland), dies führt zur Verbreitung von Ideen und z.T. zu einer Rückkehr von Personen mit Erfahrungen im Bereich Energiewende aus anderen Regionen in ihre Heimatländer (Interview Kosovo)
- Existenz engagierter Organisationen in fast jedem Land, die führend bei Kapazitätsaufbau und Lobbyarbeit sein können bzw. bereits sind
- die Bildung eines Netzwerks mit Austausch unter MOE-Staaten und mit westeuropäischen Ländern zum Thema Bürgerenergie (Austausch bewährter Verfahren usw.)
- Regierungen versuchen das Thema aufzugreifen und zu stärken, in vielen Ländern förderliche Gesetzgebung in Entwicklung

Als ein klarer Schwerpunkt im Bezug auf notwendige Aktivitäten zur Unterstützung der Etablierung des Themas “Bürgerenergie” wurde in den untersuchten Länder in Mittel- und Osteuropa die Lobbyarbeit, Kapazitätsaufbau und finanzielle Unterstützung von Bürger-Initiativen sowie Know-how, Etablierung und Austausch von Pilotprojekten und Erfahrungen mit bewährten Verfahren gesehen. Hier setzen auch die von der DBU nun im Förderschwerpunkt “Bürgerenergie” unterstützten Projekte an, mit unterschiedlichen Fokussierungen. Ein Austausch und eine Zusammenführung der dort generierten Ergebnisse und Erfahrungen kann in den Ländern Mittel- und Osteuropas die Verankerung der Idee von Bürgerenergiegemeinschaften sicherlich befördern und sollte unterstützt werden.

Anhang

A.1 Template for Proposal for Pre-Study

Short pre-studies for the implementation of a funding program "citizen energy" in CEE countries within the DBU international funding scheme

What we expect from the study:

1. Identification of actors and possibly favorable constellations for citizen energy projects

Conduct an actor analysis

Relevant actors would be those who might be able to initiate or implement or support citizen/ community energy projects on the ground. This could be individuals, NGOs, local stakeholders, municipal administrators, local energy advisors, small and medium sized enterprises, housing cooperatives, agricultural cooperatives, individual citizens, activists, entrepreneurs, unions etc.

- Please provide brief descriptions and, if possible, contact information for the actors;
- If certain locations or regions might stand out as potentially feasible for citizen energy projects, please describe these and the respective conditions;
- If actors are already involved in related projects or initiatives, please provide information about these, and suggest potential supportive or complementary actions (see point 2.);
- Document the actor analysis in a short report providing adequate references.
- If possible, graphic, or written description of the qualities of the relationships between the actors (if possible, also description of common positions, potential conflicts with each other, already successful cooperation in the past etc.)

2. Review the country "Steckbriefe" and complement them, if needed

Review the information which the BOKU team has compiled in the "Steckbriefe" for the respective countries and if needed revise or complement the information. Based on your knowledge, critically review the "Evaluation of the situation in the countries regarding citizen energy" and, if needed, amend this providing references.

3. If possible, suggest potential citizen energy initiatives

If ever feasible, make suggestions of potential citizen energy projects and initiatives, which might be suitable and successful in the respective countries based on your knowledge and the actor analysis. Please, relate your suggestions to the suggested typology of projects we provide and on the phase in which such a project might be. Projects could be well advanced in planning and conceptualization or just at the beginning of developing an idea for example and requiring different support. If feasible, estimate the main barriers/challenges the project is facing, the potential of the projects regarding their innovativeness, their transferability, and support in further pushing the concept of community energy in the countries. Innovativeness of course then needs to be considered in the country-context and different project types as initially outlined in the typology of projects could be appropriate. Please, if possible, provide comments on the provided typology, i.e., in case an additional type of a project or initiative should be introduced.

The BOKU-team will provide the "Steckbriefe", project typologies, and an overview of interviews conducted in the region so far.

Final product: short report, English language

Time Frame: approximately 3 months, starting in June 2022

Please provide us with a brief project proposal for this short pre-study along the following structure:

1. Country/Countries in the focus

2. Content of the study/steps

- Outline steps and approach
- Describe deliverable(s)
- Use the provided template for the list of actors

Table 1: Template for the List of actors/potential initiatives

Actor	Region	Experience/ involvement in previous community energy projects	Emerging community energy initiatives, potential project proposals, project ideas	Potential project partners	Potential funding sources	Relationship to other listed actors: Common positions, Co-operation, Competition, Conflicts	Contact information

3. Contractor and possible partners, if applicable

- Briefly state your expertise and provide key references

4. Time plan

5. Costs (incl. value added tax[57])

a. personnel
b. material
c. travel & accommodation

[57] *Within the EU taxes might not apply according to de minimis regulation; outside of the EU country-specific taxes might apply.*

d. third-party services

Alternative: flat daily rates, country-specific

Invoices to the DBU Secretariat shall be issued in German or English.

A.2 Template final report DBU citizen energy short studies

1. Introduction to framework conditions and current situation of citizen energy in focus countries ("Country background")

Review the information which the BOKU team has compiled in the "Steckbriefe" for the respective countries and if needed revise or complement the information.

2. Description of relevant actors and institutions

Relevant actors would be those who might be able to initiate or implement or support citizen/ community energy projects on the ground. This could be individuals, NGOs, local stakeholders, municipal administrators, local energy advisors, small and medium sized enterprises, housing cooperatives, agricultural cooperatives, individual citizens, activists, entrepreneurs, unions etc. In the case that the purpose of your short study is to develop a specific project ides/proposal focus on the actors/stakeholder you have identified while developing your proposal, e.g., project partners, practice partners, etc.

Table 1: Template for the List of actors/potential initiatives

Actor	**Region**	**Experience/ involvement in previous community energy projects**	**Emerging community energy initiatives, potential project proposals, project ideas**	**Potential project partners**	**Potential funding sources**	**Relationship to other listed actors: Common positions, Co-operation, Competition, Conflicts**	**Contact information**

3. Identification of need for action to facilitate citizen energy in the focus country

Based on your knowledge, provide conclusions on need for action in terms of supporting citizen energy development in the focus country.

4. Description of potentially relevant project proposals/ideas (if applicable)

Please describe the project proposal/project idea you have developed if that was the purpose of your short study. Make sure to include a discussion of potential risks and challenges for your project idea.

A.5 Agenden der Workshops am 10. und 18. Mai 2022

Planning a citizen energy project? – DBU workshop on funding options

10. May 2022

Zoom: https://bokuvienna.zoom.us/j/94757058315

12:30 (CEST)	Sign in (Zoom room opens, https://bokuvienna.zoom.us/j/94757058315)	
13:00	Welcome	• Agenda and Introduction
13:15	Introduction of the DBU	• Presentation of goals, tasks & funding options
13:40	Discussion Where is the demand and opportunity for DBU to enter the citizen energy funding arena in CEE countries?	• Discussion in breakout sessions
14:30	*Coffee Break (15 min)*	
14:45	Discussion What could be favorable project settings and what might be your ideas for first citizen energy projects?	• Discussion in breakout sessions
15:30	Summary, Outlook and Goodbye	• Next steps and follow-up
16:00	Sign out	

Planning a citizen energy project? – DBU workshop on funding options

18. May 2022

Zoom: https://bokuvienna.zoom.us/j/96902525235

9:30 (CEST)	Sign in (Zoom room opens, https://bokuvienna.zoom.us/j/96902525235)	
10:00	Welcome	• Agenda and Introduction
10:15	Introduction of the DBU	• Presentation of goals, tasks & funding options
10:40	Discussion of experience and interest in citizen energy	• Networking and discussion in breakout sessions
11:30	*Coffee Break (15 min)*	
11:45	Discussion of open questions	• Discussion in breakout sessions
12:30	Summary, Outlook and Goodbye	• Next steps and follow-up
13:00	Sign out	

A.6 Steckbriefe für die Zielländer

Albanien

	State	**Republic of Albania**
General information	**Status EU membership**	Candidate country (since June 2014), since 2020 accession negotiations opened, Contracting Party of the Energy Community Treaty[i]
	Population	2.9 million (2020)[ii]
	Land area (km²)	28,750 km²[iii]
	Urban population (%)	61.23% (2019)[iv]
Socio-economic situation	**GDP (current US$ billion)**	15.3 (2020)[v]
	GDP per capita (EURO)	4,610 (2020)[vi]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	n.a.
	Median hourly earnings (EURO)	1.73 (2018)[vii]
	World Bank economic classification (2021)	Upper-middle-income country[viii]
	Unemployment (% of total labor force)	11.7% (2020)[ix]
Energy situation in general	**Current energy sources**	Total energy supply in 2019: Oil (50%), Renewables (43%), Coal (4%), Natural gas (3%)[x] From the 43% renewable energy supply in 2019 61% were from hydro, 36% from bioenergy and 2% from solar[xi]

	Electricity generation in 2020 consisted of: ○ Non-renewable 0 GWh (0%) ○ Renewable 5 313 GWh (100%), of which: • Hydro: 5 281 GWh (99%) • Solar: 32 GWh (1%) • Wind: 0 GWh • Bioenergy: 0 GWh • Geothermal: 0 GWh[xii] Most of the hydropower is coming from large hydropower plants >10 MW[xiii] *An Overview of Albania's energy system by fuel and sector is available in the International Energy Agency Albania 2022 Energy Policy Review 2020.[xiv]
Climate protection targets	INDC: reduce CO_2 emissions until 2030 by 11.5% compared to baseline (708kT CO_2 reduction)[xv]
Renewable energy targets	The National Renewable Energy Action Plan (NREAP) states that 7 MW hydropower, 490 MW of solar PV and 50 MW of wind and 41 MW of waste-to-power by 2020 shall be added (has not been reached)[xvi] NREAP goal by 2020 production of 38% of total gross energy consumption from renewable sources[xvii]
Renewable energy potential	Abundant solar and wind resources, so far mostly untapped[xviii] The distribution of Solar and Wind and Biomass potential are visualized in the IRENA Country Profile Albania.[xix]
Renewable energy support regime	Small hydropower plants (below 15 MW), solar plants up to 2 MW, and wind plants up to 3 MW benefit from 15-year Power-Purchase-Agreement and feed-in-tariffs (FiTs) via obligatory purchase of energy by the distribution system operator (DSO)[xx] [xxi] Net-metering for small to medium-size solar and wind systems up to 500 kW[xxii]

Legal and political framework for citizen energy

Relevant laws, policies, and plans[xxiii]

- National Energy and Climate Plan (NECP) under development[xxiv] but analyses of the draft plan show need for improvement (e.g. operationalization of policy measures missing, concerns about social and environmental issues and public involvement in decision making)[xxv]
- Albania First Solar PV Auction (July 2018)[xxvi]
- National Energy Sector Strategy (2018)
- Albania National Action Plan on Renewable Energy 2018-2020 (published 2018)[xxvii], also National Renewable Energy Action Plan (NREAP)
- National Action Plan for Renewable Energy Resources in Albania 2015-2020 (passed 2016)
- National Energy Policy 2013
- Law on creating facilitating conditions for the construction of new sources of electricity generation (Law No. 8987)
- Law No. 24/2023 on "Promotion of the use of energy from renewable sources" (adopted April 14, 2023), outlines FiTs (compare above), FiTs given to small-scale renewable energy projects[xxviii]

A comprehensive overview of the legal regulations is been provided by the 2021 report by Milieukontakt.[xxix]

Regulatory framework for citizen energy

- EU Renewable Energy Directive has been partially transposed by Albanian government via the Law on Renewable Energy Sources (Law no.7/2017)
- Net metering is allowed for small/medium enterprises and individual consumers, allows to install up to 500kW for RE production for own use, surplus can be fed into the grid

Evaluation of the legal framework

Rather hindering legal framework, main issues are:

- concept of “energy communities” is currently missing in national legislation (Vaso 2021)
- no financial incentives or regulations to support energy communities (Vaso 2021); no tax incentives
- lack of a “energy community strategy”[xxx]

*Energy Community provides an assessment of implementation performance and key energy sector data, including in the field of renewable energy and energy efficiency[xxxi].

Ex-ist- Village of Kutë

Citizen energy projects	- 'Solar in Kutë' campaign[xxxii], initiative of EcoAlbania, EuroNatur and Riverwatch – protecting the Vjosa River and its capacity to produce solar energy on the roofs of buildings without the need to destroy the Vjosa river (threat of Poçem hydropower plant to be build) - Aim to make the community energy self-sufficient - Collecting funds via crowdfunding (Go Fund Me platform and at the EcoAlbania website) - Have produced campaign-videos available on youtube
	Municipality of Tirana – Directorate of Co-owned Buildings - Projects in format of a Community Fund Initiative; mostly energy conservation and thermal insulation/renovation projects
Research and capacity building activities	EUKI-project: "**EUCENA – European Citizen Energy Academy**"[xxxiii] (10/2020-09/2022), Albania, Germany, Greece; partner: REScoop.eu, Women Engage for a Common Future e.V. (WECF), Bündnis Bürgerenergie e.V., ELECTRA Energy – Social Cooperative, Milieukontakt Albania - Focus on knowledge creation and transfer - Workshops and coaching sessions in Albania, Germany, Greece - 2 summer schools – fostering cooperation between Southeast Europe and Central Europe Report published from the project: "**Regulatory framework citizens energy community in Albania**":[xxxiv] - emphasizing concept of energy community not well-known in Albania - concept of "energy communities" is currently missing in national legislation - energy sector legislation does know the concept of "prosumers" - no financial incentives or regulations to support energy communities Summary steps: - Create a community energy cooperatives (CEC) NGO Forum in Albania to design platform for CE projects - Draft a policy paper – directions of work for the future: include CEC in legal and regulatory documents; create business plans and funds for CEC start-ups etc. - Create a list of contacts - Develop a CEC Academy – conduct summer schools and develop curricula for technical schools[xxxv] The project included a presentation at a **national meeting** on June 9, 2021, with several stakeholders from Albania participating (e.g.,

		representatives of the Ministry of Infrastructure and Energy, the National Agency for Natural Resources, the Energy Efficiency Agency, representatives of the municipality of Tirana and Shkodra, NGOs and experts)[xxxvi]
Relevant actors and stakeholders	**NGOs**	Milieukontakt Albania[xxxvii] - non-profit, non-governmental organization founded in 2000 - goal "develop a strong and democratically organized environmental NGO movement" - Partner in EUKI-funded project "EUCENA – European Citizen Energy Academy"
		Center for Protection of the Natural Ecosystems in Albania (**EcoAlbania**)[xxxviii] - non-profit, non-governmental organization created in 2014 - work is mainly focused within the Albanian territory, but it can be expanded in the neighboring countries to implement cross-bordering projects

	- 'Solar in Kutë' campaign, initiative of EcoAlbania, EuroNatur and Riverwatch – protecting the Vjosa River and its capacity to produce solar energy on the roofs of buildings without the need to destroy the Vjosa river (threat of Poçem hydropower plant to be build)
	Regional Education and Information Centre for Sustainable Development in SEE (REIC)[xxxix] - non-profit, non-governmental organization founded in 2005, located in Sarajevo - its operational span covers region of Southeast Europe – SEE (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, FYR Macedonia, Montenegro, Romania, Serbia) - main objective is to identify environmental problems and needs, along with enhancement of educational initiatives - co-author of Position Papier „Energy and Climate Planning Albania 2030"[xl]
Governmental bodies	Ministry of Infrastructure and Energy (MIE)
	Albanian Energy Regulatory Authority (ERE)
	Energy Efficiency Agency (EEA)
Local governments	Municipality of Tirana, Directorate of Co-owned Buildings
	Municipality of Shkodra
	Village of Kutë
Private actors	ELECTRA Energy – Social Cooperative[xli] - Greece cooperative supporting community energy projects in Greece and Europe
International/ supra-national actors	Heinrich Böll Stiftung Regionalbüro Sarajevo - Position Papier „Energy and Climate Planning Albania 2030"[xlii] published in 2020
Academia	University "Ismail Qemali" Vlore
Others	Albanian Centre for Energy Regulation and Conservation (ACERC)[xliii]
	Albanian Renewable Energy Association (AREA)

Summarizing evaluation

Fields of Action	The conclusions are mainly built upon the analysis by Milieukontakt[xliv]:

	- Complete transposition of EU legal framework for community energy in national laws is needed - implement measures to improve knowledge on the concept of community energy options in the country, e.g. create a community energy cooperatives (CEC) NGO Forum in Albania, organize summer schools and a CEC Academy - addressing perceived negative connotations of cooperatives, no strong tradition of social enterprises and community ownership - organize stakeholder forums and/or focus group meetings - evaluate potential of community energy to provide for just transition - strengthen capacity building on community energy and cooperate with other countries - provide local authorities with knowledge around community energy; staff needs to be literate around challenges and chances of community energy - promote and replicate successful community energy initiatives; raise project's visibility - evaluate the reasons of people and communities not participating in energy community projects - simplify permitting procedures for community energy projects - develop business models for community energy projects

State Bosnia and Herzegovina

Genera information	**Status EU membership**	potential candidate for EU membership, Stabilization and Association Agreement was signed in 2008[xlv]
	Population	3.28 million (2020)[xlvi]
	Land area (km²)	51,200 km² (2020)[xlvii]
	Urban population (%)	49 % (2020)[xlviii]
Socio-economic situation	**GDP (current US$ billion)**	19.79 (2020)[xlix]
	GDP per capita (EURO)	5,177 (2020)[l]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	Not available
	Median hourly earnings (EURO)	Not available
	Average Monthly Wage (EURO)	893.87 (2022)[li]
	World Bank economic classification (2021)	Upper middle income country[lii]
	Unemployment (% of total labor force)	15.2 % (2021)[liii]
Energy situation in general	**Current energy sources**	- **Hydro power and coal** (119 small hydropower plants + 5 lignite power plants) with electricity generation capacity in dry years – coal 2/3 vs hydro 1/3 of total amount of energy production.[liv lv lvi] - Gross electricity production in 2019 amounted to 9,664 GWh, of which 5,070 GWh or 52.5% was produced in **thermal power plants**, 4,060 GWh or 42.0% in **hydropower plants**, in industrial energy 347 GWh or 3.6%; **in wind farms** - 166 GWh or 1.7%, **solar** energy - 21 GWh or 0.2%.[lvii] - As of 2020 around 2076 MW net **installed** hydropower capacity larger than 10 MW, 2156 MW of lignite, 172 MW of small hydropower, 87 MW wind power, and 35 MW solar.[lviii] - Electricity generation in 2020 constituted[lix]: o Non-renewable sources: 11 974 GWh (71%)

	○ Renewable 4 900 GWh (29%), of which: ▪ Hydro and marine 4 580 GWh (27%) ▪ Solar 45 GWh ▪ Wind 262 GWh (2%) ▪ Bioenergy GWh 13 - **Overreliance on wood and coal for heating** (both central and household); district heating systems (electrical and thermal energy) - **No natural gas extraction**, receives gas from Russia over Ukraine, Hungary, and Serbia; gas use limited due to small distribution network (only in some cities)[lx] - Adriatic oil pipeline JANAF – transportation and storage of crude oil and petroleum (24 MTG for B&H)[lxi] - **Net exporter of electricity** in Western Balkans (WB); highest energy intensity in WB[lxii]
Climate protection targets	- Ratified the **Paris Agreement** in March 2017[lxiii] and the **Kyoto protocol** in April 2007[lxiv] - **Climate Change Adaptation and Low Emission Development Strategy** for BiH 2020 - 2030[lxv] - Presented its **Updated NDC** to the UNFCCC in April 2021 and published its Third National Communication (NC3) and Second Biennial Update Report on GHG in 2016.[lxvi] - **2030 targets** - 36.8% below 1990 levels conditional GHG emissions reduction target and GHGE 33.2% below 1990 levels unconditional[lxvii] - **2050 targets** - 61.7% (unconditional) and 65.6% (conditional) below 1990 levels GHG emissions reduction target - Economic growth aligned with adaptation and actions priorities[lxviii] - **National energy and climate plan (NECP)** should contain goals to decarbonize energy sector and *Elektroprivreda BiH* (EPBiH - state power utility) until 2040; introduction of EU ETS as part of the NECP[lxix] - Development of the **Integrated Energy and Climate Plan of BiH for the period 2021-2030**[lxx] - **Sarajevo** selected for **EU's 100 climate-neutral and smart cities program**[lxxi]
Renewable energy targets	- **Action plan on RES FBIH:** The share of renewable energy sources in 2020 in the electricity sector will be 44 percent, in the energy sector for heating and cooling 49 percent and in transport ten percent[lxxii] - **2020 RES target** was 40% but in 2019 it reached 37.6[lxxiii] - **2030 target**: 56% share of renewables in gross final energy consumption[lxxiv]
Renewable energy potential	- Significant renewable energy potential, particularly in **hydropower and wind power** capacity [lxxv], biomass, solar[lxxvi] - Wind potential is estimated at more than 6.2 MW per square kilometer[lxxvii]; only 40% of hydro power potential used [lxxviii] - **IRENA 2020 potential assessment**: solar PV 1363 MW and wind 1033 MW[lxxix]

	- **REmap 2030 scenario**: solar PV 1811 GWh and wind 2952 GWh[lxxx] - **Residential sector high potential for improvements** (highest energy consumption) - **238 plants** with a **total** installed capacity of **106.7 MW**, of which hydro leads with 84% of the installed capacity, followed by solar with 14%, biogas 0.9%, biomass 0.2%, wind 0.3%, and other plants with 0, 4%[lxxxi]
Renewable energy support regime	- **Feed-in tariffs** (as of June 2022 no feed-in for small hydro power) - **Internal carbon pricing from Jan 2021** introduced by the State power utility[lxxxii] + special fund up to 10mil euros for RES investment; 95% of CO2 emissions taxed internally[lxxxiii] - "Bosnia and Herzegovina **has abolished the capacity limits for connecting wind farms and solar power plants to the grid** regarding frequency control. Initially, the limit was set at 460 MW for wind and 400 MW for solar."[lxxxiv] - The **state electricity transmission company** (**Elektroprijenos** BiH) manages the transmission infrastructure, and the **Independent System Operator (ISOBiH)** manages the operation of the system. - USAID & GIZ Guidelines for investing in electricity sector BIH from 2018[lxxxv] - Green for Growth Fund (GGF) loans through micro-finance and banks[lxxxvi][lxxxvii] - Foreign private investors BUT this energy is mostly intended for EU market[lxxxviii] - Wind connections capped at 840 MW and solar 825 MW (NOSBIH)[lxxxix], even lower earlier not to overburden the grid[xc] - RES Not systematically promoted, lack of political support
Legal and political framework for citizen energy	**Relevant laws, policies, and plans** **some are specific to the separate entities of BiH, The Federation of Bosnia and Herzegovina (FBiH) or Republika Srpska and* - Law on Electricity in The Federation of Bosnia and Herzegovina - Draft Law on the Use of Renewable Energy Sources and Efficient Cogeneration in FBiH - Law on Energy of the Republic of Srpska - Law on Electricity of Republic of Srpska - Law on the Use of Renewable Energy Sources of Republic of Srpska - Framework Energy Strategy until 2035 (FES) - National energy and climate plan (NECP) – <u>under development</u> - The Council of Ministers of BiH adopted strategic documents:[xci] a) National emission reduction plan of BiH, adopted in 2015 (Nacionalni plan smanjenja emisija za BiH) b) Action plan for using renewable energy in BiH, adopted in 2016 (Akcioni plan za korištenje obnovljive energije u BiH)

c) Action plan for energy efficiency in BiH for period 2016-2018, adopted in 2017 (Akcioni plan za energetsku efikasnost u BiH za period 2016-2018)
d) Energy framework strategy of BiH until 2035, adopted in 2018 (Okvirna energetska strategija BiH do 2035. godine)

- **Amendments to the Law on Electricity** 7/7/2022 bans the construction of small hydropower plants up to and including 10 MW capacity in **the FBIH**.[xcii]
- **"**The Government of the **Republic of Srpska** said it passed the **Draft Law on Amendments and Supplements to the Law on Energy** with the aim to align it with newer laws and the Energy Development Strategy, set the legal basis for the adoption of Srpska's energy and climate plan and for defining its content.[xciii]
- With the amendments to its **Law on Renewable Energy Sources, the Republic of Srpska** scrapped incentives for small hydropower plants but has not yet banned their construction.[xciv]

Regulatory framework for citizen energy

- "In BIH cooperatives have a long tradition, at the **state level of BIH**, there is a **General Law on Cooperatives**, which defines the cooperative as a form of organization of voluntarily affiliated members. The cooperative can be established as either general or specialized. At least five physical and / or legal persons can establish a cooperative in BIH.[xcv]
- **Cooperatives handbook developed by ENZA** (Energy Cooperatives in Bosnia and Herzegovina) in 2016, and financed by Heinrich Boell Stiftung[xcvi]
- **Aarhus Convention ratified in 2008**; Aarhus centres/Eco hubs across country[xcvii]
- The Government of the Federation of BiH has adopted the **draft law on the use of renewable energy sources and efficient cogeneration**[xcviii]

Evaluation of the legal framework

- Implementation and coming into force rather slow
- Institutional and legal hindrance
- Political capture and corruption

*Energy Community provides an assessment of implementation performance and key energy sector data, including in the field of renewable energy and energy efficiency[xcix].

Existing citizen energy	**Citizen energy projects**	- crowdfunding campaign "**Solarna Pecka**" aiming to bring a clean and sustainable solar energy to Pecka village through a citizen's community direct engagement and financing model"[c] [ci]
		- **Energy Cooperatives in BiH** publication (Energetske zadruge u BiH – **ENZA**)[cii]
	Research and capacity building activities	- Regional education and information center (REIC) - Center for Environment protection Banja Luka (CZZS) - University of Tuzla, FBiH
Relevant	**NGOs**	- REIC[ciii], Brave women of Kruščica[civ], The Center for Ecology and Energy Tuzla[cv]

Governmental bodies	
Local governments	
Private actors	**Heinrich Böll Foundation** work on RES (consulting, financing, networking, capacity-building and awareness raising)[cvi]
International/ supra-national actors	Friends of the Earth International[cvii] Energy cities, REIC, ZEZ[cviii] **Foreign investors** that get concessions for RES.[cix]
Academia	University of Tuzla University of Sarajevo
Others	Association 'Dinarica' WWF Adria; Association 'Eco center Čajniče'; **Association of citizens 'Korjeni' Ugljevik;** 'Greenways' Organization to support Sustainable Development; Citizen association "Nešto više; Geopa; Center for Environment (CZZS); Center for Ecology and Energy; Centre for Economic and Rural Development (CERD); ,,EcoTOUR" Stolac; Association for development, environment and culture EKO ZH); **Ecological association "Hrabre žene Kruščice" (Brave women of Kruščica;** Association Centre for Development and Support Tuzla

Summarizing evaluation

Fields of Action

Measures or projects, which would be a good fit to further advance the topic of citizen energy (CE) (can be policy-related, regarding the legal framework, concrete pilot projects, information, awareness raising, feasibility studies, capacity building, networking, etc.).

- Implement a campaign for legal and policy changes
  - Greater **scrutiny on government decisions** needs to be exerted by BIH's parliaments. Support and guidance can be provided by independent experts where parliamentarians lack expertise."[cx]
- **Increase public dialogue on the energy transition** to increase public understanding of, and involvement in, the process[65]
- Develop and implement **educational programs**: increase CE awareness and know-how, communicate national and international success stories, inspiring bottom-up action (why RES are necessary, how local actors can benefit);
- Support capacity building of actors interested or/and already involved in the CE projects
  - Identify or develop national expertise
  - Explain administrative and legal procedures

- Provide a networking hub – connect organizations/people expressing interest
- **Donor support** and external/supranational partners are **very much needed**
- Promote intergenerational respect, participation and inclusion (youth, women, minorities)

	State	Bulgaria
General information	**Status EU membership**	Member state since 1 January 2007[cxi] Participant of Energy Community since 1 January 2007[cxii]
	Population	6,519,789 (2021)[cxiii]
	Land area (km²)	110, 993.6 km^2 [cxiv]
	Urban population (%)	73.3 % (2021)[cxv]
Socio-economic situation	**GDP (current US$ billion)**	69.11 (2020)[cxvi]
	GDP per capita (EURO)	8,840 (2020)[cxvii]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)[cxviii]	6,385.89 (2020)[cxix]
	Median hourly earnings (EURO)	Males: 2.44 (2018) Females: 2.38 (2018)[cxx]
	World Bank economic classification (2021)	Upper-middle-income country[cxxi]
	Unemployment (% of total labor force)	5.7 % (2020)[cxxii]
Energy situation in general	**Current energy sources**	- Electricity generation in 2020 consisted of[cxxiii]: o Non-renewable 33 289 GWh (82%) o Renewable 7 478 GWh (18%) o Hydro and marine 2 820 GWh (7%) o Solar 1 481 GWh (4%) o Wind 1 477 GWh (4%) o Bioenergy 1 699 GWh (4%) - The gross electricity generation in 2021 was 47.6 TWh, 16.7% more than the electricity generated in 2020. There was an increase in the generation of energy by thermal power plants (+36.7%), renewable energy sources (+28.9%), factory power plants (+8.7%) and heat production or supply power plants (+5.7%). There was a decrease in gross

	electricity generation by the NPP units (-0.8%) and pumped storage hydropower plants (-0.5%) in 2021 compared to 2020. - The structure of electricity generation is dominated by thermal power plants using coal, followed by the Kozloduy NPP. Major sources for the electricity generation are local coal and nuclear fuel.[cxxiv] - Bulgaria currently has the lowest household electricity prices in the EU, with households paying approximately EUR 0,10/kWh. However, prices have increased by 17% between 2009 and 2019, and it is expected that retail prices for households will continue to rise in the years ahead[cxxv] - Bulgaria suffers from high amounts of energy poverty: approximately 40% of households in Bulgaria struggle to pay their energy (electricity/heating) bills;[cxxvi] natural gas prices in the country have continuously grown[cxxvii]
Climate protection targets	- Strategic Vision for the Development of the Power Sector in Bulgaria over the 2023-2053 was approved in January 2023. It envisages continued operation of coal-fired power plants until 2030, as well as developments in the field of nuclear energy, photovoltaic and wind energy, the use of geothermal energy for local heating systems and batteries for storage of electricity[cxxviii,cxxix]. - Bulgaria's government might need to renegotiate the National Recovery and Resilience Plan (NRRP)[cxxx], which includes "tripling power generation from renewables by 2026, cutting greenhouse gas emissions of the power sector by 40% by 2025 and setting out a framework for a coal phaseout"[cxxxi]. - Bulgaria's 2030 target for greenhouse gas (GHG) emissions not covered by the EU Emissions Trading System (non-ETS) is -0% compared to 2005[cxxxii] - Bulgaria proposes a share of 25% of energy from renewable sources in gross final consumption of energy in 2030 as contribution to the EU renewable energy target for 2030[cxxxiii] - Priorities of the Environmental Ministry include: Reducing the adverse impacts of climate change on human health, ecosystems and the national economy; Establishing a comprehensive, systematic and integrated strategic framework for the development and implementation of environmental policy for the period up to 2030.[cxxxiv]
Renewable energy targets	The consumption of energy from renewable sources has increased significantly in the last years, reaching in 2018 a share of 20.53% in the energy consumption in the country, exceeding the mandatory national target for renewable energy in the National Action Plan - 16% by 2020.[cxxxv] The NCEP sets a target for the share of renewable energy in the electricity sector at 30% by 2030 - a 7% increase from the current level. The latest plan indicates a target of roughly 2.000MW of new solar PV by 2030[cxxxvi]

Renewable energy potential	- "In the period 2020-2030, gross electricity generation from RES will increase by more than 33%, due to a threefold increase in electricity generated by PV plants and a 41% increase in generation from wind power. An increase of 46% is also expected in biomass-fired power generation, where the use of biodegradable waste should increase from 14 GWh in 2020 to 115 GWh in 2030."[cxxxvii] - The potential for solar energy is very high, mainly due to the favourable conditions of location, high efficiency, lower costs, and availability of various technical solutions. This makes the technology very attractive for small investors, both individuals and energy communities.[cxxxviii] - Wind energy potential of Bulgaria is not great. It is estimated that an area of about 1,400 km^2 has an average annual wind speed of over 6.5 m/s, which is a threshold for the economic feasibility of a wind energy project. Thus, only some areas in the mountainous areas and the northern coast are appropriate for this purpose.[cxxxix] - In the period 2017 - 2018 installed capacity for the production of electricity from biomass (transition of existing power plants to conventional biomass fuels) increased almost 4 times, it reached 195 MW in 2018.[cxl] - Bulgaria has low-potential geothermal deposits. Over 840 studied localities with temperatures up to 103°C are located in about 140 sites. A total of 136 hot mineral springs with different flow and temperature are registered.[cxli]
Renewable energy support regime	**Bulgarian Energy Efficiency Fund -** relevant for the heating and cooling sector, financial grants for improvements of energy efficiency[cxlii] **National recovery and resilience plan (NRRP)**[cxliii] with various support schemes: - National Decarbonisation Fund - Energy Financing Mechanism - Grant for RES construction **Modernisation Fund** **Cohesion policy** with so called Operative programs (2021-2027)[cxliv] **Just Transition Mechanism; Just Transition Fund; InvestEU** **Connecting Europe Facility; LIFE; The Innovation Fund; Horizon 2020 and Horizon Europe[cxlv]** - All producers of energy from renewable sources with an installed capacity of more than 1MW are supported by premiums; - Preferential prices are offered for new PV projects at an installed capacity of up to 30 KW; - Producers must conclude agreements with the Electricity System Security Fund (EUSF);[cxlvi]

	- A Bulgarian household needs about 20–25 weeks and 170 h to install a single RE system, followed by an equally complex operation of the facility and trading with the final supplier, which in many cases is part of the same company, which owns the network operator[cxlvii] - With the latest legislative changes from June 2022 the administrative burdens for RES installation are eased. The Parliament amended the procedures for the construction of small photovoltaic plants and solar hot water collectors in residential buildings for own use. This will be done without a building permit for installations up to 20 kW.[cxlviii]
Legal and political framework for citizen energy	**Relevant laws, policies, and plans** - Bulgarian National Climate and Energy Plan (NCEP): - Integrated National Plan "Energy and Climate" (INPEC) - offers the most detailed information regarding policies and measures to support the establishment and functioning of energy communities, which will be implemented in the period up to 2030. o The role of energy communities in the development of the internal energy market is set out in the general framework of the plan, which provides for "stimulating the creation of energy communities for the production and consumption of renewable energy and stimulating a more active role of consumers" (p. 19).“[cxlix] o While INPEC provides support for citizen energy communities, no measurable targets or specific measures are foreseen[cl] - Strategy for Sustainable Energy Development of the Republic of Bulgaria until 2030 with a horizon until 2050 o Follows the logic on INPEC but lesser references to energy communities. The energy market in Bulgaria is still not fully liberalized”[cli]

Legal and political framework for citizen energy	**Regulatory framework for citizen energy**	- **The European Renewable Energy Directive** (REDII) has yet to be transposed, and Bulgaria should do so by 30 June 2021[clii] - The ***National Programme for Energy Efficiency of Multifamily Residential Building*** is aimed at renovating multifamily residential buildings through implementation of energy efficiency measures through establishing of homeowners' associations acting as energy communities."[cliii] - Amendments to the **Spatial Development Act in 2019** removed the requirement for solar PV systems with a total installed capacity of up to 1 MW mounted on rooftops and façades to have an approved investment plan in order to obtain a building permit for the installation. o Systems up to 1MW that are not connected to grid do not require formal commissioning, which enables them to avoid some administrative hurdles and delays. o Producers with installations that are connected to the grid after 2021 and do not receive feed-in tariffs are no longer be required to pay a 5% levy on their revenues that was introduced on FIT projects in 2015 as a measure to fund the Energy System Security Fund.[cliv]
	Evaluation of the legal framework	- The current legislation lacks provisions on the establishment and functioning of energy communities. Administrative barriers remain high; the political will is lacking. - A number of strategic documents, including INPEC, encourage the entry of energy communities and their active participation in the energy market by prescribing legislative measures."[clv] *An updated assessment is available in the REScoop Transposition Tracker.[clvi]
		- The main problems include: the lack of legal framework targeting local communities and their projects, unfavourable and unstable legal and administrative framework[clvii], the low level of awareness across citizens about the energy cooperatives, the lack of a politically agreed model for energy efficiency projects is an obstacle for the development of a new innovative instrument combining grants and market-oriented financing.[clviii] - Energy communities are not well known in Bulgaria.[clix] The socialist regime has also left a mark in Eastern Europeans' understanding of the terms "community energy" and "cooperative", as they are often associated with the word "communism".[clx] Especially among the poorer sections of the population, suspicions of "another fraud" are expected.[clxi] - Other barriers for the development of RECs in Bulgaria include: a ***shortage of engineers*** (due to demotivation caused by low-paid engineering jobs) and ***a lack of sufficient knowledge and expertise among architects and technicians*** "on every level"[clxii]
Existing citizen energy projects and/or	**Citizen energy projects**	- **An apartment complex in Sofia's "Hristo Smirnenski" district** "One example that is similar to an energy community is a 117-unit apartment complex in the "Hristo Smirnenski" district of the capital Sofia, the owners of which have pooled their resources to install a 28kW rooftop PV installation on their building. Organized via the property owners' association (a legal entity requited by law for every condominium building in the country), it took the entity 3 years (from 2010 to 2013) to successfully complete the project.26

The community-owned PV installation brings a regular monthly income to the entity which is used to pay common bills and building expenses. All of the electricity produced is sold back to the grid under the country's feedin tariff policy."[clxiii]

- **Burgas Municipality -** a pioneer among municipalities[clxiv]

  In 2019, the municipality building renovation included the installation of a 30 kWp rooftop solar PV system configured for self-consumption, as part of an EU co-funded energy efficiency project. 65% of the cost (BGN 2.28 million /EUR 1.16 million) came from EU's Regional Development Fund (ERDF), and the remaining 35 - rom the municipality's own budget.

  In addition, five kindergartens across the city were equipped with rooftop solar PV installations entirely for self-consumption. Residential buildings have also benefited from municipality-led projects promoting energy efficiency that includes renewables.

  A ***significant obstacle*** is that the installation of any rooftop system requires the ***consent of all apartment owners***.[clxv,clxvi]

- **Straldzha Municipality** taking advantage of geothermal energy

  "In 2016, the Municipality started a project "Utilization of the local potential of geothermal energy in heating installations for schools and kindergartens in the town of Straldzha".1 The grant financing is 772 109,23 BGN (€394 773.18). The project is funded by the BG04 Energy Efficiency and Renewable Energy Program as part of the Financial Mechanism of the European Economic Area (EEAFM). The project was completed in 2016.

  Additionally, in 2018 the municipality installed a system of streetlights that runs entirely on renewable energy. Currently, the municipality continues to work on building on and expanding its portfolio of renewable energy projects. Municipalities like Straldzha could provide a template that other municipalities in the country could follow."[clxvii]

- Currently no known RECs exist in Bulgaria, based on their description in Art. 22 of the RED II[clxviii,clxix]
- At the moment, the homeowners' associations are acting as energy communities with the goal to achieve substantial energy savings through participation in renovation programmes. There are few examples of motivated property owners who have established owner partnerships in private multifamily buildings and have implemented solar heating and electricity generating measures.[clxx]
- Some public-private partnerships (PPP) between municipalities and energy suppliers ("EVN Bulgaria", "CEZ", "ENERGO-PRO") exist, e.g: one of the public kindergartens ("Valentina Tereshkova") in the city of Pazardzhik where "EVN Bulgaria" installed a photovoltaic power plant, for production of electricity for own needs and generation of excess energy in the network with installed ca-

	pacity: 29.76 kW and is worth BGN 44,777. It consists of 96 photovoltaic modules installed on the roof of the building. The estimated amount of electricity produced is 37,05 MWh per year."[clxxi]); - "Energo-Pro", an energy supplier, invested in the renovation of the street lighting of Dobrich municipality on one of the main boulevards in the city, and the whole street lighting system in Opaka municipality.[clxxii] - The Municipality of Bansko build a biomass utility company in 2006 as a public-private partnership. All municipal buildings are heated by the biomass thermal plant; In 2020 the Municipality of Bansko acquires full ownership of the utility company with installed capacity of 10 MW.[clxxiii]
	IZGREI[clxxiv] - REScoop member, the website indicates that it is the first energy community in Bulgaria
Research and capacity building activities	Two webinars in 2021 conducted by the Center for the Study of Democracy: - June 2021: Innovative Financial Schemes for Supporting Citizen-Driven Decentralised RES Projects in Europe – presenting experiences from the H2020 project SCORE[clxxv] - November 2021: The Challenges in Financing Energy Communities in Bulgaria in the Low Carbon Economy Transition[clxxvi]
	Solutions to Tackle Energy Poverty (STEP)[clxxvii] -Horizon2020 funding -is a project to develop a simple, innovative and replicable model of measures to address energy poverty -disseminate best practices and policy choices that can alleviate energy poverty and promote their replication in other EU countries
	SCORE project - Center for the Study of Democracy part of the consortium
	COALESCCE - Community owned and led energy for security climate change and employment, Interreg project[clxxviii] - To i***ncrease the capacity for community-based approaches*** to local renewable energy provision across Europe in order to reduce carbon emissions, increase energy security and ***tackle energy poverty*** whilst driving 'Green Growth'. - 2017-2021, Final conference in 06/2021 - Bulgarian part: Operational programme "Regions in Growth" (2014-2020) - Bulgarian partner: EPF Euro Perspectives Foundation

EUKI-project: CONGREGATE – Gebäudesanierung und Energiegenossenschaften[clxxix]

- Promotion of cooperatives for building renovation and renewable energies in Southern and Eastern Europe through targeted public relations work and awareness raising.
- Countries: Bulgaria, Croatia, Czech Republic, Greece, Romania
- 10/20-03/23
- Lead: Stiftung Zentrum für Energie-Effizienz EnEffect, Bulgaria
- Partner: Center for the Study of Democracy
- An information campaign will be designed for the national building renovation strategies in Bulgaria, Croatia and Romania.

The project promotes the establishment of public-private renewable energy cooperatives in Bulgaria, Greece and the Czech Republic. Three case studies are conducted per country and feasibility studies are supported in the participating municipalities.

Relevant actors and stakeholders

NGOs

Greenpeace Bulgaria

- In 2020, Greenpeace Bulgaria published the first legal analysis of RECs and the possibilities for their development in Bulgaria.[clxxx]

EPF Euro Perspectives Foundation[clxxxi]

- Part of the COALESCCE Project - Community owned and led energy for security climate change and employment, Interreg project.[clxxxii]

Center for the Study of Democracy[clxxxiii]

- Involved in EUKI project CONGREGATE
- organized a round table discussing the challenges in financing energy communities in Bulgaria in the just transition[clxxxiv] in 11/2021
- "The online event gathered participants from across Bulgaria and from different types of institutions, including representatives of local authorities such as the **Mayor of Gabrovo city**, Energy Security expert in the **municipality of Dobrich**, and **a** chief expert in the International Cooperation and Integrated Territorial Investments Unit in the **municipality of Burgas**. The financial institutions were represented by the **Bulgarian Development Bank** by the head of Strategic Analysis and Development, the director of the **Fund of Funds** unit for Project Information and Funding, as well as senior expert in **Fond FLAG** unit for Finances."
- Recording of the conference available (in Bulgarian)[clxxxv]

- **European Climate Foundation**[clxxxvi] co-author of report "Scaling up Energy Communities in Bulgaria", 2021

Stiftung Zentrum für Energie-Effizienz EnEffect, Bulgaria

E3 Analytics (Berlin)

	- report “Scaling up Energy Communities in Bulgaria”, 2021
	BNAAC – Bulgarian National Consumer Association[clxxxvii] [clxxxviii] - Independent NGO which protects Bulgarian consumer interests - Partner in STEP project
	APSTE[clxxxix]
	Public Environmental Center for Sustainable Development, Varna: https://ecovarna.info/en/
	Center for Energy Solutions: https://cer.bg/en/
	European Council on Foreign Relations, Office Sofia - International think-tank conducting research on EU policies - Decarbonization of the Bulgarian business, project funded by the European Climate Foundation (2022)
Governmental bodies	**Ministry of Energy**[cxc]
	Ministry of Environment and Water[cxci]
	Ministry of Regional Development and Public Works[cxcii]
	Advisory Council on the European Green Deal (to the Bulgarian Government) with 8 committees: 1. Energy Transition Committee; 2. Sustainable Mobility Committee; 3. Energy Efficiency and Tackling Energy Poverty Committee; 4. Committee on Taxonomy and Sustainable Finance; 5. Committee on Development and Implementation of Innovation and Circular and Eco-Based Economy; 6. Committee on Adaptation to Climate Change, Conservation and Restoration of Biodiversity and Integration of Nature-based Solutions; 7. Committee on publicity and communication of green transition, decarbonisation, Green Deal and climate change messages; 8. A committee to present and discuss national negotiating positions on the EC's 'Ready for Goal 55' legislative package.[cxciii]
Local governments	Mayor of Gabrovo city
	Energy Security expert in the municipality of Dobrich

	Chief expert in the International Cooperation and Integrated Territorial Investments Unit in the municipality of Burgas
	Municipality of Bansko
	Municipality of Koprivishtitsa
Private actors	**Local businesses in Bansko and Koprivshtitsa**
International/ supra-national actors	**ECFR** (see above)
Academia	**Bulgarian Academy of Sciences** with the various Institutes. A meeting with the President of the Academy was held on 23.01.2023 to present the perspectives of energy communities in Bulgaria.
Others	

Summarizing evaluation

Fields of Action

- Setting up a coalition in favor of the promotion of the energy communities
- **Information,** Education and awareness-raiding measures need include:
  - raising the awareness across citizens and communities about the possibilities of the energy cooperatives
  - improving the knowledge about the business models of the EC
  - exchange knowledge/expertise among technicians / engineers / architects
  - facilitating stronger attention to citizen energy among policymakers or stakeholders.
  - trust building activities and soft skills measures
  - Professionalising start-up cooperatives[cxciv]
  - Easy to access information about open calls;
- There is a need for newer study of the geothermal potential
- There is a need to evaluate the framework for grid access and propose amendments in favor of accelerating the process

Based on barriers identified by Couture et al. 2021[cxcv]:

- The many administrative barriers to energy communities need to be removed, and **a policy and regulatory environment that will enable municipalities and local citizens to participate in the energy transition** should be created
- Long-term efforts and support and a clear policy framework to drive change are needed
- ***Net Metering, or Virtual Net Metering*** policy is needed
- ***Access to affordable financing*** to small scale distributed PV/RES and community energy projects in Bulgaria should be improved.
- A clear legal definition and specific legal provisions regarding energy communities both at national and municipal levels in Bulgaria are

	needed. This lack of regulation, rules governing tax rates, and systematic approach discourages potential investors. Owners of renewable energy installations are subject to numerous taxes, fees, and administrative charges - ***Establishing a series of "solar gardens" nationwide*** in partnership with municipalities, on municipally-owned land - ***A more tailored method of creating awareness about the benefits of community energy should be developed and implemented*** on both the EU level and national levels;

	State	**Czech Republic**
General information	**Status EU membership**	Member state since 1 May 2004[cxcvi] Party to the Energy Community Treaty[cxcvii]
	Population	10.7 million (2020)[cxcviii]
	Land area (km²)	77,200 km² (2020)[cxcix] 78,868 km² (2015)[cc]
	Urban population (%)	74 % (2020)[cci]
Socio-economic situation	**GDP (current US$ billion)**	245.35 (2020)[ccii]
	GDP per capita (EURO)	20,120 (2020)[cciii]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	11,420.10 (2020)[cciv]
	Median hourly earnings (EURO)	Males: 6.65 (2018) Females: 5.67 (2018)[ccv]
	World Bank economic classification (2021)	High income country[ccvi]
	Unemployment (% of total labor force)	2.9 % (2020)[ccvii]
Energy situation in general	**Current energy sources**	**Total energy supply (TES)** (2020): 40.1 Mtoe (coal 30.3%, oil 21.1%, nuclear 19.5%, natural gas 18.1%, bioenergy and waste 11.9%, solar 0.5%, hydro 0.5%, wind 0.1%, electricity exports -2%). **Energy production** (2020): 23.6 Mtoe (coal 43.1%, nuclear 33.3%, bioenergy and waste 20.5%, solar 0.9%, oil 0.6%, natural gas 0.7%, hydro 0.8%, wind 0.3%, heat 0.3%). **Total final consumption (TFC)** (2019): 27.0 Mtoe (oil 34.1%, natural gas 19.6%, electricity 18.6%, bioenergy and waste 12.3%, coal 7.8%, district heat 7.5%, other renewables 0.1%).[ccviii]

	Renewables in total final energy consumption (TFEC) (2019): 3.8 Mtoe/15.8% of TFEC (bioenergy 3.5 Mtoe, solar 0.2 Mtoe, hydro 0.1 Mtoe, wind 0.04 Mtoe)[ccix] **Nuclear**: 6 power reactors – electricity generation (2020) 30.04 TWh; 19.5% of TES, 37.5% of electricity generation.[ccx] **Electricity Generation in 2020** consisted of[ccxi]: ○ Non-renewable sources: 71 172 GWh (87%) ○ Renewable sources: 10 345 GWh (13%), of which: ▪ Hydro: 2114 GWh (3%) ▪ Solar: 2 287 GWh (3%) ▪ Wind: 699 GWh (1%) ▪ Bioenergy: 5215 GWh (6%) 25 MW of PV installations installed in the past years (mostly self-consumption projects).[ccxii]
Climate protection targets	State Energy Policy (SEP), 2015, is guiding Energy policy. Key targets include: reduction of energy consumption, improvement of energy intensity of the economy and expansion of nuclear power by 2030-35.[ccxiii] The Climate Protection Policy (CPP), 2017, submitted to the UNFCCC in 2018, is the key strategic document focussing on climate change mitigation. An update if foreseen by the end of 2023. The CRR outlines general GHG reduction targets: ● 2030 44 Mt CO2-eq 30%, compared to 2005 ● 2040 78 Mt CO2-eq 53% ● 2050 109 Mt CO2-eq 80%, compared to 1990.[ccxiv] The National Energy and Climate Plan (NECP) was approved in 2020. The share of renewables shall increase to 22% of gross final consumption by 2030, and annual energy savings of 8.4 petajoules (PJ) would need to be achieved by 2023. "The NECP does not set any quantitative targets for reducing emissions in the transport and buildings sectors by 2030."[ccxv]
Renewable energy targets	The NECP defines targets for the development of renewable energies for 2030: 22% in gross final energy consumption, 17% in electricity, 14% in transport, as well as heating and cooling (an annual increase of 1 percentage point).[ccxvi] **Prague** has the plan to produce more than 8% (approximately 2.1 GWh per year) of its total energy consumption from renewable sources by end of 2030, by increasing the installed capacity on all its properties

	(municipal buildings and city districts, apartment buildings, municipal enterprises, etc.)[ccxvii]
Renewable energy potential	Estimated total potential of rooftop solar is about 11.8 GW.[ccxviii] Studies estimate a potential of ca. 7 GW of solar photovoltaic capacity by 2030 and 1.6 GW of wind power.[ccxix]
Renewable energy support regime	"The promotion of electricity production is based on the following main regulatory instruments: investment support, subsidies, purchase prices in the form of feed-in tariffs (FiT), green premium payment, which is paid on top of the market price, and tax regulation. RES generation is also exempt from real estate tax. "[ccxx] Between 2004 and 2013 Czechia has doubled its RES capacity. In 2013 support for RES was discontinued (with exception of small hydro power plants), hampering development of small-scale RES projects as well as the development of prosumership initiatives. "**Since 2014-2015, there is no feed-in tariff support in the Czech Republic**." Conditions for other RES (e.g. biomass, geothermal) are strict and making them unattractive.[ccxxi] The lack of support mechanisms and an unclear legislative framework constitutes a barrier. Amendments to the legislation are being developed and foreseen to transpose the RED II. Still, a support scheme for PV technology is not planned. ● For small and medium-size installations which include self-consumption, PV technology is supported. ● Furthermore, it is proposed to have larger installations profiting from investment support schemes under EU Modernisation Fund ● However, an energy supplier licence is needed for PV installations with a capacity exceeding 10 kw and the costs for the grid would likely be financially unbearable for citizens. [ccxxii] **Modernisation Fund** is aimed to "advance the transformation of the energy sector in Central European countries, where coal still plays an important role." The Czech government "plans to allocate significant amounts to energy efficiency and renewable energy projects, including for the modernisation of heating systems, which is an ongoing and successful policy."[ccxxiii]Among relevant support programmes are: ● RES+ New Renewable Energy Sources: supporting new non-fuel renewable energy sources; ● KOMUENERG – Community energy: supporting open energy societies established for the purpose of satisfying their own energy needs (the main purpose is not to generate profit).[ccxxiv]

Relevant laws, policies, and plans

- State Energy Policy (SEP) of the Czech Republic (2014, approved 2015)[ccxxv]
- "The National Energy and Climate Plan of the Czech Republic (Nov. 2019) for the period 2021–2030 with a view to 2050."[ccxxvi]
- Update to the 2019 National Emission Reduction Programme of the Czech Republic. plays the role of the National Air Pollution Control Programme, a strategic document, required by the EU Directive 2016/2284.[ccxxvii]
- The Climate Protection Policy of the Czech Republic was adopted by the Government resolution No. 207 of 22nd March 2017.[ccxxviii]
- Act on Supported Energy Sources (Act no. 165/2012)[ccxxix]
- Energy Management Act (Act no. 406/2000 Coll., on Energy Management as of 25 October 2000)
- Czech Energy Act (Act no. 458/2000 on Business Conditions and on the Exercise of State Administration in the Energy Sectors and on the Amendment to Certain Acts, the Amendment to the Energy Act by Act no. 131/2015 Coll)[ccxxx].

Regulatory framework for citizen energy

The regulatory framework is **rather under-developed**. Municipalities are the most active actors in investing and owning RES installations. **No support scheme for PV installations is currently planned**, considered by experts as a major bottleneck for RECs.[ccxxxi]

Energy-producing companies with an installed capacity higher than 10 kW are required to have a license. Micro-generation units with self-consumption of up to 10 kW do not require a license or permit in case electricity is not fed into the grid.[ccxxxii]

The Ministry of Industry and Trade has been preparing an amendment to Act no. 165/2012 and an amendment to the Energy Act, which **should set new rules for developing RES and anchor energy storage systems in the Czech legislation**[ccxxxiii].

The **main driver for consumers to invest in RES is financial gain**, either through the benefit of additional income or through cheaper electricity prices. **Energy poverty in the country is below EU average**.

The complex administrative process for RES deployment, including requirements for different permits and licenses, is a bottleneck for the development of community-owned RES sources.

Legal and political framework for citizen energy		The current legal framework does not offer enough stability. The Czech NECP has not fully integrated the REDII goals and principles and does not foresee the setup of an effective framework for RECs before 2021. Despite increasing interest from citizens, wind turbines are not allowed in proximity to military facilities nor villages in certain regions. The new Czech energy act (Czech Ministry of Industry and Trade, 2020) provides the basic framework for energy communities in the Czech Republic. It also transposes other requirements of the Clean Energy Package such as the concept of the active consumer. The draft legislation foresees a general basic definition that would be common to citizen energy communities and renewable energy communities. The law therefore uses the common term "energy community" for both types of communities. The common concepts of citizen energy communities and renewable energy communities is that: ● it is a legal entity within the meaning of the Czech Civil Code; ● the main purpose is not to make a profit, but to provide environmental, economic or social benefits to its shareholders or members or to the local areas where they operate; ● participation is based on a voluntary basis. The law, thereby, adopts a minimum set of definitions in line with both the REDII and the EMD. The new legislation proposes to leave it to the founders, shareholders or members, which specific legal form they adopt. However, not all legal entities in the Czech Republic fulfil the features of an energy community in line with the EU framework."[ccxxxiv] **Evaluation of the legal framework** **Constraints include[ccxxxv]:** ● Retroactive policies and the fluctuating government support ● Lack of knowledge and facts-based dialogue on the topic, as well as dissemination of counter-narratives in the traditional and social media. ● Financial and administrative barriers *An updated assessment is available at the REScoop Transposition Tracker, currently stating: **"***There is no legislation that touched upon energy communities already published in the Czech Republic. Draft legislation is being developed.* [ccxxxvi]
Existing citizen energy	**Citizen energy projects**	Community energy in the Czech Republic is limited to a number of municipalities run renewable energy projects, which were mostly developed before support for renewables was cut in 2013. **There are currently no renewable projects governed directly by citizens.**[ccxxxvii]

Existing citizen energy projects and/or research initiatives

Overall, 130 municipalities own and operate electricity generation plants with a total output of 23.5 MW. Rooftop solar or PV accounts for the largest share of municipal RES. In addition, 34 municipal biomass heating plants and five municipal biogas heating plants operate in the Czech Republic[ccxxxviii].

There are examples of apartment owners in the same building jointly purchasing photovoltaic panels. Since 2023, it has been possible for residents in one residential building to share electricity generated from photovoltaic panels installed on that building. Many flats are owned by the consortium of owners. Energy efficiency projects for such flats might be seen as community power projects. [ccxxxix]

Even very small municipalities in the Czech Republic have full legal status, own land and premises and democratically elect their local representatives – they might thus qualify as community energy organizations.[ccxl]

The number of municipal RES projects was stagnating in 2019 for lack of government support.[ccxli]

Prague Renewable Energy Community,[ccxlii]a municipal organization, was founded a result of the Horizon 2020 project **SCORE** (Supporting Consumer Ownership in Renewable Energies), see below.

Kněžice, a village located in the Central Bohemian region, in the Nymburk District, with less than 500 inhabitants. Kněžice energy technology complex constitutes a complex biogas-and-biomass heating and electricity generating system, based on a combined heat and power (CHP) unit, which:

- Heats nearly all homes and produces more electricity than the village uses
- A biogas plant and a biomass plant sources various forms of local waste and biomass
- Annually saves more than 8.000 tons of CO2
- Is fully operated by the municipality and employs 6 villagers

The biogas station is operated by the municipal ESCo Energetika Kněžice, s.r.o. (Ltd.), which is 100% owned by the municipality and managed by the municipal Energy Service Company. [ccxliii]

However, the project faces numerous legislative challenges: Instead of selling electricity directly to inhabitants, the municipality must sell to

		the grid, and the villagers have to buy it at five times the price the municipality is paid. This hinders other villages from developing similar local energy systems and has also stopped Kněžice from going further.[ccxliv]
Existing citizen energy projects and/or research initiatives		The village of **Měňany**, located in the Central Bohemian region, around 300 inhabitants. A municipal hot water biomass heating plant with a heat distribution project for the whole village was initiated in 2003 with participation of most of the community residents and has been in operation since 2008. The ownership and management structures are solely dependent on the municipality[ccxlv]
		The village of **Hostětín**, located in the White Carpathians in the Zlín region, with approximately 240 inhabitants. It contains: a municipal biomass heating plant, a public lighting system, the Veronica Centre building passive house. Solar thermal collectors are located at the local juice plant and Veronica center building, and several PV systems are installed at the juice plant, next to the biomass plant, and at nine family houses. The municipal biomass heating plant supplies heat almost to the entire village of Hostětín (83% of the households). The plant is burning wood chips and waste from sawmills and forests. The municipality is the technology complex owner, responsible for operational and management services. The biomass heating plant is community-owned, as well as 1/4 of the PV panels at the heating plant. Initially only 50% of inhabitants supported these endeavours. Based on a unique partnership of the municipality and the NPO Veronica Hostětín, seminars were organized to raise awareness, information campaigns were conducted, and best practice examples were explained. [ccxlvi]
	Research and capacity building activities	**DBU-project "Feasibility study: Community energy in the City of Židlochovice, Czech Republic"** ● Partners: Jihomoravská agentura pro veřejné inovace JINAG, spolek ● Aim: prepare and assess a complex community energy concept in the new positive energy district Chytre Lichy and further enabling prosumers to participate by joining the future community energy network in the City of Zidlochovice.

Existing citizen energy projects and/or research initiatives		**DBU-project "Informationsvermittlung und Qualifizierung zur Bürgerenergie in Deutschland und der Tschechischen Republik"** ● Partners: Bündnis Bürgerenergie, Friends of the Earth Hnuti DUHA und Calla (Verein für die Rettung der Umwelt) ● Aim: Communicate and disseminate conceptual and practical knowledge about the citizen energy model, with a focus on citizen energy cooperatives.[ccxlvii]
		enkocz (funding from The Technology Agency of the Czech Republic) ● Comprehensive setting of conditions for the establishment and operation of energy communities in the conditions of the Czech Republic, including pilot projects ● The main goal of the project is to research the conditions for the establishment and functioning of civic energy communities or communities for renewable resources within local, community and municipal energy
		SCORE (Supporting Consumer Ownership in Renewable Energies)[ccxlviii] ● Funding from the European Union's Horizon 2020 research and innovation programme (784960) ● Coordinated by the European University Viadrina Frankfurt (Oder) and backed by the SCORE consortium, e.g. Porsenna (CZ), ● "The aim of SCORE is to **facilitate co-ownership of RE for consumers** first in three pilot regions in Italy, **Czech Republic** and Poland - and later also in various other follower cities across Europe. SCORE hereby particularly highlights the potential this democratic participation model holds for the inclusion of women and low-income households."[ccxlix] ● Pilot city: Prague: "In 2021 and 2022, photovoltaic panels with an output of 2-3 MWp will be installed on city properties (mostly on school buildings). Up to 250 households can thus become co-owners and investors in community renewable energy sources. The expected annual energy yield will likely exceed the demand of these households three times."[ccl] ● Follower city: Doubrava[ccli]; city of Orlova
Relevant actors and stakeholders	**NGOs**	SEMMO, the Association of Energy Managers of Towns and Municipalities[cclii] - involved in development and translation of the Community Energy handbook from Friends of the Earth, Rescoop.eu and Energy Cities[ccliii]
		UKEN (Community Energy Union) - national stakeholder coalition fostering the decentralisation and democratisation of the

	energy sector by promoting the implementation of the community concept to Czech republic.[cccliv]
	JINAG (South Moravian Agency for public innovations) - enabling inovations in public sector, with focus on energy (effectivity and renewables) and climate changes[ccclv]
	SME (Svaz moderní energetiky) - platform that fosters innovation and collaboration among professional associations in modern energy, driving growth in the Czech economy.[ccclvi]
	Friends of the Earth Hnuti DUHA;
	Calla (Verein für die Rettung der Umwelt)
	Porsenna - a non-profit organization that provides services for municipalities, enterprisers and general public in the field of energy management, sustainable construction, renewable energy use, passive houses, energy efficiency and energy consultancy (Involved in SCORE project, see above)[ccclvii]
	NPO Center Veronica Hostětín (ZO ČSOP Veronica)
Governmental bodies	Energy Regulatory Office (ERO)[ccclviii]
	Ministry of Environment
	Chamber of Renewable Energy Sources
	Ministry of Industry and Trade
Local governments	City of Prague ● Pilot in the SCORE project[ccclix,ccclx] ● Hosted international conference "Energy Communities" in October 2021[ccclxi,ccclxii] ● Prague Renewable Energy Community established (**contact: Commission of the Council of Prague for sustainable energy and climate)**[ccclxiii] ● 2021 presentation SCORE final conference "Photovoltaics in Prague"[ccclxiv]
	Doubrava- a follower city in the SCORE project[ccclxv]
	City of Orlova - a follower city in the SCORE project

Relevant actors and stakeholders

	Private actors	
	International/ supra-national actors	Bündnis Bürgerenergie
	Academia	Czech Technical University in Prague, Czechia Brno University of Technology, Brno, Czechia Tomas Bata University in Zlín, Zlín, Czechia
	Others	Czech Community Coalition for promoting RES[cclxvi]

Summarizing evaluation

Fields of Action	*Recommendations proposed by Pechancová et al. 2022*[cclxvii]: ● Central and Eastern European countries, including Czechia, which focus on municipal-led RE projects, have different needs compared to countries with strong grassroots' RE cooperative bases such as Germany; ● The Czech definition of community RE should take the national specifics into account, and digital platforms of communities (private and publicly financed) should be envisaged; ● Organizational support provided to municipalities, which need more time to prepare a project, and they do not dispose of risk management expertise developed over the years; ● Municipalities often own brownfields and other non-agricultural areas suitable for building renewable electricity generating plants. PV power plants built on these sites could be an important source of finance for the municipal budget (municipal power plants); ● A multisectoral partnership might be supported, where the municipal authority could use or rent the area or a roof (e.g., a the school building), and the citizens are offered a project share, such as civil power plants; ● Efforts should be made toward CRE awareness-raising with information campaigns. *Recommendations mentioned in the SCORE project Background Paper*[cclxviii]: ● More active support is needed to the deployment of RES; ● Stronger targets should be established to break with incoherent national policy-making; ● Czech Republic should also focus on countering local decarbonisation narratives that are not supportive of RES opportunities at the national level.

State Croatia

General information	**Status EU membership**	Member State since 1 July 2013[cclxix] Schengen: member since 1 January 2023
	Population	4,047,200 (2020) 3,853.20 (2023)[cclxx]
	Land area (km²)	56,590 km² (2020)[cclxxi]
	Urban population (%)	59 % (2023)[cclxxii]
Socio-economic situation	**GDP (current US$ billion)**	82.69 (2023)[cclxxiii]
	GDP per capita (US$)	21,500 (estimated, 2023)[cclxxiv]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	12,330 (2023)[cclxxv]
	Median hourly earnings (EURO)	Males: 5.54 (2018) Females: 5.15 (2018)[cclxxvi]
	World Bank economic classification (2021)	High-income country[cclxxvii]
	Unemployment (% of total labor force)	6.1 % (2023)[cclxxviii]
Energy situation in general	**Current energy sources**	The overall energy mix in Croatia in 2021 shows that most energy comes from oil (34.6 %), natural gas (29.5 %), biofuels and waste (20.3 %), and hydroelectric power (7.4 %), with a small share of hard coal (5.0 %) and renewables (3.1 %, mainly wind and solar). Domestically, biofuels and waste are the most relevant sources (46 per cent), followed by crude oil, natural gas, hydro, and wind and solar, with shares of 16 per cent, 15.8 %, 15.6 %, and 6.5 % respectively. The gross primary energy consumed totals 9.61 TWh, with 31.33 per cent of renewables in the total energy mix and 53 per cent of electricity. However, it imports 54 % of its energy needs, with natural gas (26.7 %), oil (42.1

	%), and all the hard fossil fuels (100 %) needed because it has other dependences as the Krsko nuclear reactor in Slovenia. Croatia is also quickly expanding the RES sector, with a number of wind and solar power projects in the pipeline, including a 300MW offshore wind farm in the Northern Adriatic Sea. In the first half of 2023, solar power capacity rose from 224 MW to 306 MW. Yet, Croatia had one of the lowest photovoltaic capacities per capita in Europe (in 2016, only Bulgaria had a lower concentration of solar power stations per capita). Geothermal energy also holds promise, with six active projects in central and eastern Croatia, regions with a geothermal gradient three times higher than the European average. Croatia also developed an LNG terminal on the island of Krk and replaced 60 % of the gas previously supplied by Russia's Gazprom. By 2025, it wants to double its capacity and send LNG abroad to help other countries with energy independence. It's also expanding pipeline infrastructure to start exporting gas to neighbouring countries. To raise the share of renewable energy to 36.4% in 2030 and up to 65.6% by 2050, Croatian Energy Strategy is supported with $1.4 billion investments for grid modernization aimed at improving connections between sources of renewable energy. Croatia's electricity mix in 2023 included different types of resources as detailed below: wind (16%), solar (1%) and bioenergy (6.5%). Hydropower dominated it with a share of 38%. While gas accounted for 25%, coal contributed only 11%. In terms of final energy consumption, residential uses are the largest contributor at approximately one third, followed by transport accounting for around thirty percent and lastly industry which takes about sixteen percent respectively.[cclxxix cclxxx cclxxxi]
Climate protection targets	Croatia is committed to decarbonization by significantly reducing greenhouse gas (GHG) emissions and increasing the use of renewable energy sources (RES). Croatia is also member of European Union; hence it has to in line with global policies like UN Sustainable Development Agenda as well as Paris Agreement that was signed in 2017. The EU, for example, wants to cut its GHG emissions by at least 40% below 1990 levels by 2030; therefore, this is also true for Croatia. Croatia aims to slash emissions by 43% in EU Emissions Trading System sectors by 2030, compared to 2005. For areas outside this system - like road transport small energy plants, homes, and farms - the country shoots for a 30% cut, with a specific 7% drop for Croatia. The nation also has its sights set on net removals of -593 ktCO2 in land use and forestry by 2030. This ambitious plan shows Croatia's commitment to

tackling climate change across various sectors. The country's strategy involves a mix of targets balancing reductions in different areas to achieve its overall environmental goals.

Key legislative initiatives include the European Green Deal (2019), which aims for climate neutrality by 2050, and the European Climate Law (2021), mandating a 55% reduction in net GHG emissions by 2030 compared to 1990. The 'Fit for 55% by 2030' package revises climate, energy, and transport laws to achieve this target.

The EU ETS reform has set a new target for 2030 with emissions reduced by 62% in comparison to 2005. The annual reduction rates should be 4.3% from 2024 to 2027 and 4.4% from 2028 to 2030. Also, it takes into account the CO2 released from the maritime industry, abolishes cost-free air traffic allowances by 2026, and introduces road transport and building carbon pricing systems by 2027 or 2028. The Carbon Border Adjustment Mechanism (CBAM) will apply from 2026 onwards and will concern such materials as iron, steel or cement in order to motivate third world countries to be more eco-friendly.

For non-ETS emissions, the revised Effort Sharing Regulation (ESR) raises the 2030 emission reduction target from 30% to 40% compared to 2005 levels, with Croatia aiming for a 16.7% reduction.

As a remedy for the impact of climate change, the Republic of Croatia has put together the Climate Change Adaptation Strategy[cclxxxii] that includes lowering the climate-resilience vulnerability of the people to the climate impact, increasing the recovery capacity, and using the potential positive effects to their good. The listed strategy is a part of the National Development Strategy until the year 2030, which is mainly concerned with the environmental and energy transitions for climate neutrality. The Low-Carbon Development Strategy until 2030, with a view to 2050, will be used to lessen GHG emissions, raise energy security, and boost resource efficiency not only the energy sector, but also industry, transportation, agriculture, forestry, and waste management.

In the building sector, Croatia targets an 80% reduction in CO2 emissions by 2050. The transport sector focuses on promoting electric and hydrogen vehicles and establishing alternative fuel infrastructure. Agriculture encourages low-emission production and improved agrotechnology, while forestry manages 49.3% of Croatia's land as carbon sinks, contributing to 23.7% of national emissions reduction. [cclxxxiii]

Renewable energy targets

Croatia aims to increasing its renewable energy targets from 2021 to 2030, aiming for significant growth of various RES technologies to its overall energy consumption. The country plans to enhance its gross final RES consumption from approximately 26.8 TWh (terawatt-hours) in 2021 to around 34.4 TWh by 2030. This growth will be driven by substantial increases in solar energy, which is expected to rise from 199 GWh (gigawatt-hours) to 446 GWh, and geothermal energy, projected to grow from 58 GWh to 274 GWh over the same period.

In the electricity sector, RES are anticipated to contribute increasingly, with gross final RES electricity consumption projected to rise from about 10.8 TWh in 2021 to 16.1 TWh by 2030. This increase will come mainly from wind energy, expected to grow from 2.1 TWh to 6.2 TWh, and solar PV, set to expand from 149 GWh to 1 TWh. Hydropower will continue to play a major role, although its contribution will slightly decrease from 6.6 TWh to 6.5 TWh.

For heating and cooling sector, the gross final RES consumption is expected to rise from approximately 14.9 TWh in 2021 to 16.4 TWh by 2030. This will include notable increases in solar energy, solid biomass, and geothermal energy. Additionally, hydrogen is set to become a more significant contributor, growing from no contribution in 2021 to around 617 GWh by 2030. In the transport sector, RES consumption is projected to grow from about 1.2 TWh in 2021 to 1.5 TWh by 2030, with electricity from RES increasing from 142 GWh to 469 GWh.

To support these targets, Croatia plans significant expansions in power plant capacities. By 2030, the total capacity is expected to reach 7,824 MW, up from 5,232 MW in 2021. This includes growth in hydro (2,393 MW), wind (2,562 MW), and solar power (960 MW integrated, 384 MW non-integrated). By 2050, the total capacity is projected to rise further to 18,362 MW, with wind power reaching 8,519 MW and solar power achieving 3,188 MW.

Solar power is a key focus, with about 60% of the planned solar power plants expected to be roof-installed for self-supply. The total quota for all solar power plants is set at 1,075 MW. Hydropower remains crucial, with a current capacity of around 2,200 MW, including large, small, and pumped-storage plants.

Regulatory measures support these ambitious targets. The Regulation on quotas for encouraging RES production and the New Council Regulation (EU) 2022/2577 aim to accelerate RES projects, particularly

	small integrated solar projects. The Clean Energy for EU Islands Declaration underscores the importance of energy transition on islands, promoting self-supply and innovative clean energy solutions.[cclxxxiv]
Renewable energy potential	Croatia has potential for offshore renewable energy, with up to 25 GW of offshore wind capacity identified in the Adriatic Sea. This potential could transform the country's renewable energy landscape, surpassing its current onshore capacity and aligning with Europe's overall offshore wind capacity. Key areas for development include over 29,000 km² of offshore zones suitable for both wind and photovoltaic power plants. The expansion of offshore renewables could boost the national economy, particularly through the involvement of the shipbuilding industry. Further steps include developing a national maritime spatial plan, simplifying regulatory processes, and engaging with local stakeholders.[cclxxxv] Croatia is leveraging its agrisolar (also known as agrivoltaic) potential to achieve significant renewable energy gains. Installing agrisolar power plants on just 1% (1,000 hectares) of Croatia's agricultural land could generate 1,000 GWh of green electricity annually, covering over 6% of the country's electricity consumption. Croatia is one of ten EU countries adopting agrisolar technology, which integrates solar power plants on agricultural land. This multiuse approach brings added benefits in crop lands and in fish farming. Additionally, there is an exploration of floating solar power plants in freshwater aquaculture. Simplified regulatory frameworks facilitate agrisolar development, removing the need for public calls for energy approvals. Continuous monitoring systems should ensure environmental impacts (on soil and microclimate) are managed effectively.[cclxxxvi]
Renewable energy support regime	Croatia is advancing its renewable energy sector with a comprehensive support regime designed to modernize and expand its electricity system. The country aims to efficiently integrate increasing amounts of electricity from RES while ensuring stability and security. Central to this effort is the modernization and digitization of the electricity grid, along with significant investments to enhance the powerline infrastructure and storage capabilities. To improve the transmission and distribution networks, financial commitments are outlined. These include EUR 213 million for high-voltage grid improvements and an additional EUR 667 million investment by the Croatian Transmission System Operator (CTSO / HOPS) by 2026. The HEP-DSO (Hrvatska elektroprivreda – Distribution System Operator) plans to invest EUR 1.27 billion over the next decade to modernize

the distribution system, install smart meters, and enhance connectivity between the north and south of Croatia, as well as to other EU countries and islands.

A large focus is also on increasing energy efficiency and maintaining high security standards to prevent cyberattacks. This involves revitalizing powerlines, connecting new renewable energy production capacities, and preparing for extreme weather risks linked to climate change.

For the heating sector, Croatia is prioritizing the improvement of district heating systems to boost energy efficiency and reduce heat losses. This includes replacing outdated fuel oil boilers with biomass boilers and heat pumps, as well as high-efficiency cogeneration units utilizing RES such as geothermal energy. These upgrades aim to decarbonize the heating sector and integrate renewable energy sources into the heating grid.

Funding for these initiatives comes from various sources (especially tapping into EU funds), including the Modernisation Fund, the Operational Programme Competitiveness and Cohesion (OPCC), and potential structural and investment funds. The National Recovery and Resilience Plan has secured EUR 29 million for geothermal projects (1.4 billion euros specifically for the energy sector), with additional support from the EEA Financial Mechanism.

A significant emphasis is placed on research and development to foster the adoption of renewable energy technologies. This includes mapping waste heat sources and conducting feasibility studies for using waste heat in centralized heating systems, which could also be used for cooling via absorption heat pumps.[cclxxxvii]

Croatia is also focused on making it easier to get permits for investments and integrating wind, solar, geothermal, and bioenergy into the national grid. Integrated solar power plants on rooftops and near buildings, as well as large hydropower plants, can play a crucial role in increasing renewable energy's share in the total energy mix.[cclxxxviii]

The Croatian government, through the Ministry of Environment and Sustainable Development (MESD), is promoting energy sharing and the formation of energy communities to boost the use of RES as detailed in the draft National Energy and Climate Plan 2023. Support for energy communities includes capacity building, co-financing RES technologies, and simplifying administrative procedures. Funding comes from budgetary resources, the Cohesion Fund, the Modernization

Fund, the Recovery and Resilience Plan, and other financial mechanisms.

Key legislative and regulatory updates are being overseen by MESD, the Croatian Energy Regulatory Agency (CERA), and Distribution System Operators (DSOs). These include updating electricity network access rules, enhancing information exchange procedures, and ensuring non-discriminatory grid access.

The effectiveness of these measures will be monitored by MESD and CERA, focusing on the number of established energy communities and installed RES capacities.[cclxxxix]

Overall, Croatia's renewable energy support regime is a complex strategy aimed at modernizing infrastructure, increasing energy efficiency, securing substantial financial investments, and promoting the integration of renewable energy sources into the national grid and heating systems.

Relevant laws, policies, and plans

- **Energy Act** (OG 120/12, 14/14, 95/15, 102/15, 68/18) - The Energy Act governs the energy sector in Croatia and declares the use of RES as a national interest. To support this, **the Ordinance on permits for performing energy activities** (OG 44/22) was established, recognizing new activities such as energy aggregation and storage. Additionally, a **system of guarantees of energy origin** was elaborated by **Regulation** (OG 28/23), extending the forms of energy for which CEMO (Croatian Energy Market Operator – state owned company) issues guarantees, thus promoting transparency and credibility in renewable energy use.
- **the Electricity Market Act** (OG 121/21) - The Electricity Market Act in Croatia transposes Directive (EU) 2019/944 and includes methodologies for tariffs and fees. It establishes the **Ordinance on general conditions for network use** (OG 100/22), the Methodology for connection fees (OG 84/22), and the Rules on supplier and aggregator changes (OG 84/22). Additionally, it ensures high electricity supply standards through the **Ordinance on electricity supply quality** (OG 84/22) and promotes market efficiency with CEMO's rules on wholesale market organization.
- **the Thermal Energy Market Act** (OG 80/13 and 14/14)
- **the Renewable Energy Sources and High-Efficiency Cogeneration Act** (OG 138/2021) **Law on Renewable Energy** - encourages the use of renewable energy and high-efficiency cogeneration. It includes the Regulation on the Share in Net Supplied Electricity (OG 156/22), the Regulation on the Use of Renewable Energy Sources and High-Efficiency Cogeneration (OG 28/33), the Decision on the Fee for Renewable Energy Sources (OG 31/23), and the Regulation on the Criteria for Payment of Reduced Fee (OG 31/23). from January 2016 has a positive transformation (i.e., net metering scheme).
- **The Biofuels for Transport Act** (OG 145/10, 26/11, 144/12, 14/14, 94/18 and 52/21) regulates the use of RES in transport.
- **Spatial Planning Act** (OG 153/13, 65/17, 114/18, 39/1, 98/19) - Relevant for spatial planning and construction of RES projects.
- **Construction Act** (OG 153/13, 20/17, 39/19, 125/19) - construction regulations related to RES projects.
- **Environmental Protection Act** (OG 80/13, 153/13, 78/15, 12/18, 118/18) - crucial for environmental impact assessments.
- **Nature Protection Act** (OG 80/13, 15/18, 14/19, 127/19) - Crucial for nature impact assessments.
- **Water Act** (OG 66/19, 84/21) - provides for permits for floating solar power plants on public water surfaces, regulated by the **Ordinance on the Issuance of Water Rights Acts** (OG 9/20).
- **The Energy Development Strategy** of the Republic of Croatia until 2030 with an outlook to 2050.[ccxc]
- **National Low-carbon Strategy**: 2030 and Outlook to 2050; developed in 2017; "It underlines the importance of active citizen involvement and the development of innovative financing models for locally initiated RE projects."[ccxci]
- **National Development Strategy 2030** which is an action plan for 2018 to 2030 aims to support the dual digital and green transitions of Croatia[ccxcii]

- **Climate Change Adaptation Strategy** in the republic of Croatia for the period until 2040 with a view to 2070.[ccxciii]

Regulatory framework for citizen energy

Croatia has established legal provisions for Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs). These are included in the Law on Renewable Energy Sources and Highly Efficient Cogeneration and the Law on the Electricity Market, respectively. Additional regulations can be found in the Rulebook on General Conditions for Network Use and Electricity Supply and the Rulebook on Permits for Energy Activities.

The Croatian Energy Regulatory Agency has the task to adopt the Rulebook on general conditions for network use and electricity supply. This rulebook outlines the contractual relationships between energy entities and network users, covering aspects such as network use, electricity supply, aggregation, flexibility services, and energy sharing. Key definitions include users of metering data, existing and new energy communities, and electricity sharing schemes within these communities. The rulebook was adopted in August 2022.

The Rulebook provides explicit guidelines on participation in community energy, clearly defining the associated rights and obligations. Similarly, the termination of a participation contract in community energy should be clearly defined and published on the community energy's website. The participation in the community energy has to be transparent in terms of payment, contracting, calculating services according to the electricity market law. It also outlines the duties of state agencies, including their responsibility to monitor and eliminate unfair barriers or discriminatory conditions to electricity production by energy communities.

Renewable Energy Communities (RECs): are legal entities with open, voluntary participation and autonomous control by members near renewable energy projects. Members include individuals, SMEs, and local/regional authorities. It aims to provide environmental, economic, or social benefits, not financial profit.

Citizen Energy Communities (CECs): are legal entities based on voluntary, open participation and control by members. Members include individuals, local authorities, or small businesses. Engage in various energy activities, including renewable energy production, energy supply, and electric vehicle charging. Regulated by the Law on the Electricity Market and must be registered with the Croatian Energy Regulatory Agency.

RECs (rights and obligations): Right to produce, consume, store, and sell renewable energy. Can share renewable energy within the community. Access to energy markets directly or through aggregation.

CECs (rights and obligations): Participate in electricity production, supply, consumption management, aggregation, and energy services. Operate under non-discriminatory and proportionate rules for all electricity markets.

RECs and **CECs** (administrative and legal requirements): RECs and CECs must register with the Croatian Energy Regulatory Agency. Must comply with national laws on financial operations and non-profit organization accounting.

Obligations of Distribution System Operator (DSO): Deliver and calculate electricity data as per sharing schemes. Enter into agreements with energy communities for data exchange and mutual relations.[ccxciv]

Evaluation of the legal framework

- Croatia has integrated provisions for RECs and CECs into its national legislation and established rules for their registration. However, the government has not yet assessed the barriers or potential for REC development, nor detailed the specific elements of an enabling framework. Some legal provisions, especially those related to geographic restrictions, membership, and the registration and licensing process, are excessively hard, creating significant obstacles for energy communities. Additionally, no support schemes have been designed, and despite some development of energy sharing rules, there are no incentives, making energy communitites currently unfeasible.
- The Croatian government is required by national law to assess obstacles and potentials for developing renewable energy communities (RECs), but this has not yet been done. The current Energy Law imposes significant barriers, including geographic restrictions and complex registration procedures, making it difficult to establish energy communities. Distribution System Operators (DSOs) are required to facilitate energy sharing and validate production data. However, the regulatory framework is unclear, with high costs and extensive requirements for licensing. Additionally, no special incentives, support schemes, or tools for finance and information access have been developed, and the needs of low-income and vulnerable households are not addressed. The government plans to include elements of the enabling framework in NECP progress reports, but concrete measures are still missing.[ccxcv]

Existing citizen energy projects and/or research initiatives

Citizen energy projects	**KRIŽEVCI SOLAR ROOFS / "Sunčani krovovi"** The Križevci Solar Roofs project, initiated by the Green Energy Cooperative (ZEZ) and the City of Križevci, is Croatia's first community energy initiative and crowdinvesting venture. Launched in 2018 and 2019, it funded two 30 kW solar power plants on public buildings through citizen microloans. Investors were repaid over 10 years with interest. These projects not only cover the buildings' electricity needs but also positioned Križevci as a pioneer in community-driven renewable energy. The success led to the establishment of KLIK, managing the city's Energy and Climate Office.[ccxcvi] **KLIK: Laboratory for Climate Innovation in Križevci** Established in 2020 by twelve citizens, KLIK serves as an information hub for energy and climate issues, winning the European Sustainable Energy award in 2023. Originating from the successful "Sunčani krovovi" project, KLIK supports renewable energy projects, offering training and showcasing green technologies. It recently launched the "crOss renoHome" project to guide citizens in energy redevelopments. KLIK works independently but collaborates with Križevci municipality, advocating for better regulations and developing a new photovoltaic power plant project.[ccxcvii] **Otok Krk** Croatia's first energy cooperative founded in 2012 on island of Krk.[ccxcviii] Provides assistance and support to residents interested in producing green energy. "Cooperative members – Krk town, all municipalities, NGOs, citizens; 300 members interested to join with first projects funded"[ccxcix]. "Ostrvo Krk Energy (a firm founded by the island) has developed a solar power plant with an installed capacity of 5 MW and offered local residents and businesses to become co-owners. The solar panels were installed on about 10 public buildings."[ccc ccci]
Research and capacity building activities	**LIFE LOOP project** - The LIFE LOOP project, spearheaded by ZEZ, aims to unite local governments, citizens, and SMEs to advance solar energy efficiency and community involvement. This three-year initiative focuses on creating energy communities in pilot areas like Zagreb (Croatia), Crete (Greece), and Bistrita (Romania), with plans for replication in other regions. Supported by various European energy cooperatives and local authorities, the project fosters collaboration and energy justice, empowering citizens to drive local energy transitions. Funded by the EU's LIFE program, LIFE LOOP is dedicated to building sustainable and equitable energy solutions across Europe.[cccii] **COMPILE project** - The project concluded on October 31, 2022, achieving significant milestones across five pilot sites in Slovenia, Spain, Croatia, Portugal, and Greece. For Croatia, key accomplishments include the installation of PV systems in Križevci, and the development of four

technical tools and two support tools, such as GridRule and COOLkit. The project produced 51 deliverables and hosted over 120 events. It also created the Maturity Scale Framework to support energy community leaders and disseminated materials like brochures and videos. The initiative was funded by Horizon 2020.[ccciii]

Access to Capital for Community Energy (ACCE) project - The ACCE project aims to develop and scale Community Energy Financing Schemes (CEFS) across Europe, addressing financial barriers for energy communities. It plans to establish five new CEFS in Belgium, Germany, Croatia, Romania, and Spain, expand existing ones in the Netherlands and France, and set up a European intermediary for better access to EU funds. The project seeks to commit €20 million and trigger €90 million in citizen investments for sustainable energy projects. Funded by the EU's LIFE Programme, it promotes environmental, economic, and social benefits over financial profits.[ccciv]

MESTRI-CE Project - The MESTRI-CE project aims to finance climate-neutral buildings in Central Europe through a new investment model. It will develop data tools and green standards and establish five counselling centres. Running from April 2023 to March 2026, it involves Croatia, Poland, Italy, Austria, and Germany. ZEZ contributes by developing financing models, creating communication content, managing the Croatian counselling centre, and collaborating on project activities. Funded by Interreg Central Europe, partners include regional energy agencies and financial advisory firms.[cccv]

SustainCamp - SustainCamp promotes sustainability in island camp sites, focusing on solar energy, waste, and wastewater management, biomass, and composting. Building on a successful 2015 project co-funded by the Environmental Protection and Energy Efficiency Fund, it developed technical documentation for ten camps, educated owners and campers, and connected camps with experts for safe project implementation. The project ran from 2014 to 2015.[cccvi]

CONGREGATE project - The project promotes building renovation and renewable energy cooperatives in Southern and Eastern Europe through targeted communication and awareness campaigns. Running from November 2020 to March 2023, it focuses on Bulgaria, Croatia, Czech Republic, Greece, and Romania. It aims to enhance national building renovation strategies and establish public-private energy cooperatives. The project organizes events, conducts case studies, and supports feasibility studies to boost civic engagement and investment in sustainable energy solutions. Funded with €878,855, it involves multiple national and regional partners.[cccvii]

SCCALE 20-30-50 project - The SCCALE 20-30-50 project aims to empower EU citizens to produce electricity by 2050 through innovative and sustainable energy efficiency models. It involves pilot projects and the development of the SCCALE Toolkit, supporting the creation and growth of energy communities. Key activities include developing

guides, monitoring tools, financing models, and supporting policy development. The project, funded by Horizon 2020, aims to establish 26 energy communities during the project and support 130 more within five years. It started on June 1, 2021, and will last 42 months. Partners include REScoop.eu, Ecopower, Enercoop, EnergieSamen, and others.[cccviii]

CEES project - The CEES (Community Energy for Energy Solidarity) project addresses energy poverty in the EU by supporting over 17,000 energy-poor consumers and investing nearly €2 million in sustainable energy solutions. Funded by Horizon 2020, it aims to reduce emissions by over 7.5 GWh/year through energy solidarity mechanisms. Key activities include surveying current support methods, piloting promising approaches, and developing an Energy Solidarity Toolkit. The project involves seven partners and is led by the University of Birmingham, focusing on incorporating energy justice in all EU energy initiatives.[cccix]

NUDGE project - The NUDGE project aims to enhance energy efficiency through behavioural science, encouraging consumers to adopt habits that reduce energy consumption. It utilizes digital tools like smart meters to help consumers monitor and manage their energy use effectively. Running from September 2020 for three years, the project involves ten partners from seven European countries, testing behavioural interventions at five demo sites. Funded by the EU's Horizon 2020 program, it seeks to support public policies and promote sustainable energy behaviours.[cccx]

ReRURAL project - The project aims to tackle energy poverty in rural areas of South-East Europe through energy efficiency and renewable energy solutions. Running from November 2023 to January 2026, it targets Bosnia and Herzegovina, Croatia, Kosovo, and Slovenia. The project promotes Energy Communities (ECs) and organizes local meetings, workshops, and summer schools to build awareness and capacity. It supports establishing one EC in each country and develops a prefeasibility tool for planning energy efficiency measures. Funded with €499,757.50, the project is led by the SDEWES Centre and involves several regional partners.[cccxi]

Solar Adria project - The Solar Adria project promoted solar energy in Croatia, Montenegro, and Slovenia through participatory planning and capacity building. Running from October 2020 to September 2022 with €348,563 funding, it targeted local governments, the private sector, consumers, and NGOs. The project developed tools and guidelines to support solar energy projects, analyzed solar potential in Koper and Starigrad, and created an online platform for calculating solar production potential and facilitating stakeholder collaboration. It was implemented by the Energy Institute Hrvoje Požar (EIHP) with several partners.[cccxii]

mPOWER project - The project, funded by Horizon 2020, aims to foster fair, clean, and democratic energy transitions at the municipal level

		across Europe. Running from May 2018 for four years, it involves seven partner organizations. The project facilitates knowledge-sharing and collaboration among municipalities, developing best practice guides and policy recommendations to support local energy initiatives. It emphasizes democratizing governance, citizen participation, and public authority leadership in achieving post-carbon energy transitions. Key outputs include webinars, manuals, and policy briefings to aid municipal energy planning.[cccxiii]
Relevant actors and stakeholders	NGOs	**Zelena Energetska Zadruga, or Green Energy Cooperative (ZEZ)** - Its mission is to help citizens develop, invest in, and use renewable energy sources. ZEZ promotes social entrepreneurship, environmental protection, and community development through innovative economic models tailored to local needs. The cooperative consists of 18 members and employees with extensive experience in energy projects in Croatia and beyond. ZEZ operates independently, encouraging citizen involvement in energy transition processes. - Board member of REScoop.eu, European federation of energy cooperatives. Involved in several Horizon2020 projects. - Co-founder and co-leader of Cooperative for Ethical Financing.[cccxiv]
		Institute for Political Ecology (IPE) - The Institute for Political Ecology (IPE) is a research and educational organization in Zagreb focused on alternative development models and democratic transformations. It addresses ecological changes as social phenomena, conducting transdisciplinary research and educational programs. IPE collaborates with domestic and international partners, providing expert analysis and platforms for discussions on sustainability, justice, and democracy. It engages in projects related to ecological transitions, climate justice, and social inequalities, and offers resources for initiatives and movements across Croatia and Europe. - Involved in mpower project[cccxv], funded by H2020, focusing on municipal energy transitions - Working on DBU short study on „SOLAR ARCHIPELAGOS MANIFESTO - IN ACTION!“
		Zadruga za etično financiranje or Cooperative for Ethical Financing (ZEF) - Founded in 2014, ZEF is Croatia's largest cooperative with over 1200 members. It promotes a democratic, transparent, and socially responsible economy. Key initiatives include Croatia's first ethical bank and green electricity supply. Members, who are co-owners, access an internal market, business consulting, and EU project support. Annual income exceeds €250 million.[cccxvi]

	Eko Kvarner Ngo
Governmental bodies	- The Ministry of the Economy and Sustainable Development (MESD) - The Ministry of Environmental Protection and Energy - Croatian Energy Regulatory Agency (CERA/HERA) - The Ministry of Physical Planning, Construction and State Assets - The Ministry of the Sea, Transport and Infrastructure - The Hydrocarbon Agency - The Croatian Energy Market Operator (CEMO) - The transmission/distribution system operators (CTSO/HEP-DSO)
Local governments	Village of Křizevci
	Energy cooperative KLIK (Križevci Climate Innovation Laboratory)[cccxvii] [cccxviii]
	Island Krk - Energy Manager Island Krk (presentation at SCORE final conference 2021 "Assessment of the IEMD / RED II Transposition in Croatia")[cccxix]
Private actors	European Asbestos Risks Association[cccxx]
International/ supra-national actors	- United Nations Development Program (UNDP) in Croatia - the European Climate Initiative (EUKI) - the European federation of citizen energy cooperatives (RESCoop) - European Union LIFE Programme - Friedrich Ebert Stiftung Zagreb - presentation at SCORE final conference 2021 "Assessment of the IEMD / RED II Transposition in Croatia"[cccxxi]
Academia	
Others	

Summarizing evaluation

Fields of Action

Measures to advance the energy transition and community energy in Croatia

Strengthening regulatory framework and simplify regulations:

- Simplify the current complex registration procedures for Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs) to facilitate easier establishment and operation.
- Remove excessive geographic restrictions and reduce bureaucratic barriers to promote more community energy projects.
- Introduce special incentives and support schemes for RECs and CECs, including financial tools, grants, and subsidies to make energy sharing more feasible.
- Create tax incentives and financial support for citizens and businesses investing in renewable energy projects.
- Provide clear guidelines and standardize terms for energy sharing within communities to promote transparency and ease of implementation.
- Ensure non-discriminatory access to the grid and fair pricing for shared energy among community members.

Enhance grid modernization and connectivity:

- Invest in the modernization and digitization of the electricity grid to integrate increasing amounts of renewable energy efficiently.
- Improve connectivity between northern and southern Croatia, as well as with other EU countries, to enhance energy distribution and stability.

Expand renewable energy capacity:

- Accelerate the development of solar, wind, and geothermal energy projects to increase the share of renewable energy in the national energy mix.
- Prioritize the construction of offshore RES projects, such as wind farms in the Adriatic Sea, to utilize Croatia's vast offshore wind capacity without compromising marine biodiversity.
- Leverage agrisolar (agrivoltaic) potential by installing solar power plants on low-productivity agricultural land to achieve multi-use benefits in energy and agriculture.
- Explore the development of floating solar power plants in aquaculture facilities.
- Support the development of energy-autonomous islands via RES solutions.

Support community energy initiatives:

- Foster the establishment and growth of community energy projects, such as rooftop solar installations, through capacity-building programs and co-financing.
- Promote the involvement of local authorities, SMEs, and citizens in the planning and development of renewable energy projects.

Upgrade district heating systems:

- Improve district heating systems by replacing outdated fuel oil boilers with biomass boilers, heat pumps, and high-efficiency cogeneration units utilizing RES.
- Reduce heat losses and enhance energy efficiency in the heating sector.

Increase energy resilience:

- Enhance measures to protect energy infrastructure from cyberattacks and extreme weather events linked to climate change.
- Implement timely and effectively the Climate Change Adaptation Strategy to increase the resilience of energy systems to climate impacts.

Promote energy efficiency:

- Encourage energy efficiency measures in residential, transport, and industrial sectors through awareness campaigns and financial incentives.
- Support the adoption of electric vehicles and the establishment of alternative fuel infrastructure.

Foster stakeholders' collaboration:

- Enhance cooperation between local governments, citizens, and private entities to drive the transition to renewable energy.
- Engage regional and international partners in knowledge sharing and joint projects to promote community energy initiatives.

Educational programs and empowerment:

- Conduct training sessions, workshops, and educational programs to raise awareness and build skills related to renewable energy and community energy projects.
- Create and replicate information hubs, like the Climate Energy Office in Križevci, to provide citizens with access to resources and support for energy projects.
- Make use of civil society and academia resources in evaluating challenges and solutions for Croatia's energy transition.

Monitoring and evaluation:

- Establish a robust monitoring and evaluation framework to track the progress of renewable energy projects and community energy initiatives.
- Regularly assess the effectiveness of regulatory frameworks and support schemes, making necessary adjustments to enhance their impact.

By addressing these actions, Croatia can advance its renewable energy goals, promote community energy projects, and enhance its energy independence and sustainability.

State Estonia

General information	**Status EU membership**	EU member state since 1 May 2004[cccxxii]
	Population	1,331,060 (2020)[cccxxiii]
	Land area (km²)	43,470 km² (2020)[cccxxiv] 45,227 km² (2015)[cccxxv]
	Urban population (%)	69 % (2020)[cccxxvi]
Socio-economic situation	**GDP (current US$ billion)**	30.65 (2020)[cccxxvii]
	GDP per capita (EURO)	20,190 (2020)[cccxxviii]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	14,047.91 (2020)[cccxxix]
	Median hourly earnings (EURO)	Males: 7.3 (2018) Females: 5.95 (2018)[cccxxx]
	World Bank economic classification (2021)	High-income country[cccxxxi]
	Unemployment (% of total labor force)	6.5 % (2020)[cccxxxii]
Energy situation in general	**Current energy sources**	- Highly carbon-intensive oil shale based energy system.[cccxxxiii] - In 2018, oil shale accounted for 72% of Estonia's total domestic energy production, 73% of total primary energy supply and 76% of electricity generation, however, its share has been dropping.[cccxxxiv] - From 2019 Estonia has shifted from net exporter to net importer of electricity.[cccxxxv] - The share of renewables in the Estonian electricity generation has been steadily rising, reaching 2848 GWh (48%) in 2020. The largest share (31%) belongs to bioenergy, followed by wind (14%) and solar (2%).[cccxxxvi]

Climate protection targets	Plan to reduce the emission of greenhouse gases by about 70% by 2030; by 72% by 2040 and by 80% by 2050 in comparison with 1990.[cccxxxvii]
Renewable energy targets	Estonia plans to generate 100% electricity from renewable sources by 2030. This goal is to be achieved by: - Construction of new onshore and offshore wind farms, - Reduction of bureaucracy for entrepreneurs, - Strengthening of the grid from the mainland for decentralized generation, - Investing in new radar systems to avoid compromising national defense and energy security, - Financial participation of residents in wind turbines and solar parks.[cccxxxviii]
Renewable energy potential	- Potential of wind and solar resources in Estonia is below world average.[cccxxxix] - better wind potential offshore - by the end of the decade 1,000-3,000MW offshore wind capacity could be realized and about 1,000MW of onshore wind.[cccxl] - Combined heat and power plants fired with biomass - In small towns there is potential for small, combined heat and power plants with an output of 1.5 - 3 MW_{el} - Production of biomethane for the transport sector[cccxli]
Renewable energy support regime	Renewable energy feed-in tariff is offered by the Estonian government, but, in comparison to other countries, is comparably low.[cccxlii] Estonia's National Recovery and Resilience Plan[cccxliii] includes the following objectives: - Reduce greenhouse gas emissions; Support the development and deployment of innovative clean technologies - Support the deployment of clean energy, in particular through renewable energy, smart grids and storage infrastructure - Improve the energy efficiency of houses - and the following sectoral reforms: - Promoting energy efficiency and comprehensive reconstruction - Boosting the green transition in the energy economy The Green Fund will contribute to the development of green technologies

Relevant laws, policies, and plans

- Estonia's 2030 National Energy and Climate Plan (NECP 2030)[cccxliv]
- New target to generate 100% electricity from renewable sources by 2030[cccxlv].
- Electricity Market Act[30]

- 2021-27 Strategic Plans: Audits on GHG emissions for large farms; Energy Efficiency of Residential Buildings; Environmentally friendly energy solutions on small islands; Environmentally friendly transport (rail); Estonian Hydrogen Roadmap.[cccxlvi]

Legal and political framework for citizen energy

Regulatory framework for citizen energy

- Estonian legislation supports energy self-consumption[cccxlvii]
- The concept of energy associations provided for since 2013, is providing a basis for renewable energy communities[cccxlviii]
- Energy association can generate, distribute, or sell electrical energy and heat to its members[cccxlix]
- The electricity produced can be either consumed on-site or injected into the grid. The law does **not allow selling energy directly to the members of an association** without first feeding into the grid for which then fees and taxes may apply making it less attractive to members to purchase from the energy association[cccl]
- The only funding instrument for an association (energy community) is the feed-in tariff[cccli]
- High potential to create **heating associations**[ccclii]
- A draft amendment proposed to the Electricity Market Act in May 2020, which "promotes the creation of energy communities, obliges network operators to purchase flexibility services from the market and regulates the ownership relations of distribution network operators and electric car charging infrastructure."[ccccliii]

Evaluation of the legal framework and context

- Regulatory framework is still rather hindering solar energy cooperatives in Estonia
- Grid connection is extremely expensive,[ccccliv] controlled by power plant owners and needs upgrading in certain areas[ccclv]
- Small energy producers cannot sell electricity directly to their neighbors[ccclvi]
- Lack of investment support for energy cooperatives,[ccclvii] although the framework conditions for investors have been significantly improved through changes in the Electricity Market Act and the introduction of tenders and the promotion of projects[ccclviii]

* An updated assessment is available at the REScoop Transposition Tracker[ccclix]

Existing citizen energy projects and/or research initiatives

Citizen energy projects

Kagu Energiaühistu (Kagu energy cooperative)

- Operating in the South-eastern region of Estonia known as Setomaa, a culturally distinct and rich region inhabited by the Seto people. Kagu Energiaühistu is a unique model of a non-profit organization. It is in the process of completing a feasibility study for two solar farms in the town of Värska.[ccclx]
- Model case study in the Interreg project "Co2mmunity"

Housing Association Vilde 70 in Tallinn[ccclxi]

- Conducted a renovation project in 2014/2015 to improve indoor climate and energy efficiency,
- The project included a 15 kW PV system installed on the roof to increase the level of energy efficiency[ccclxii]. The solar PV was

	designed to supply electricity for the communal spaces and sell the surplus electricity to the grid. - The resulting energy savings and the income generated from the surplus electricity generated by the solar PV system are re-distributed to the apartment owners based on the number of square meters they own[cccLxiii]. - model case study in the Interreg project "Co2mmunity"
	City of Tartu[cccLxiv] - Is a pilot in the Interreg project "Co2mmunity"; thus shall be developed in the course of the project, the Tartu Region Energy Agency (TREA) is partner in the Interreg project - Is in planning stages to install PV on roofs to develop a citizen-owned PV park; citizen shall be active shareholders and form an energy community; shall be model for other future activities - Pilot project will be a Kindergarden - Is partnering with Finland in the Interreg project
	Umbusi village - Eight solar parks in the range of 10-15kW have been built in the village of Umbusi on the initiative of the residents.
Research and capacity building activities	**Co2mmunity[cccLxv]** - 10/2017-09/2020 - co-funded under the INTERREG programme - a network of organisations across eight different countries in the BSR with a mission to facilitate community energy (CE) project development as part of a transition to renewable energy sources through: creating local partnerships for energy project development, providing knowledge, developing tools, and organising stakeholder meetings[cccLxvi]
	Energize Co2mmunity[cccLxvii] - extension project of the original Co2mmunity project - 10/2020-09/2021 - Aim: Real-life implementation of renewable community energy projects. - Lead Partner: Kiel University, Working Group Economic Geography; Tartu Regional Energy Agency, Estonia
	PowerPoor - Empowering Energy Poor Citizens through Joint Energy Initiatives[cccLxviii] - Horizon 2020 project - Partners are: Estonia, Latvia, Hungary, Croatia, Bulgaria, Greece, Spain and Portugal

		- Aim is "to support programmes/ schemes for energy poor citizens and encourage the use of alternative financing schemes (e.g. establishing energy communities / cooperatives, crowd funding)"[cccIxix] - The project will facilitate learning and knowledge sharing and is providing trainings; for Estonia 3 trainings involving 132 people have been conducted (certified POWERPOOR Energy supporters or mentors); in Tallinn an energy poverty alleviation office has been established[cccIxx] - Moreover the "Energy Poverty Mitigation Toolkit" has been developed[cccIxxi] - Estonian partner: Estonian Union of Co-operative Housing Associations (EKYL)
Relevant actors and stakeholders	**NGOs**	- Estonian Union of Co-operative Housing Associations (EKYL)[cccIxxii] - NGO Green Tiger[cccIxxiii] - FOE Estonia
	Governmental bodies	- Estonian Statistical Office - Ministry of Economic Affairs - Ministry of Environment
	Local governments	- Cities of Tartu, Voru, Rakvere, Haapsalu, Rae, Pärnu, Kanepi, - Counties: Antsla, Järva, Viimsi, Elva, Lääne-Viru, Polva
	Private actors	- Utilitas - Enefit Green, a subsidiary of Eesti Energia, - AHK Balt (German-Baltic Chamber of Commerce) - Transport Agency - District heating Kuressaare - Eesti Energia - EAS Entreprise Estonia - Tartu Regional Energy Agency
	International actors	-
	Academia	- University of Tartu - Estonian University of Life Sciences - PAKRI Science - University Tallinn
	Others	- Windpower association, Tallinn - Estonian Renewable Energy Association - Energy Association - Viljandimaa Adevelopment Centre - Environment Investment Centre - Baltic Environmental Forum - Estonian Union of Co-operative Housing ass.

Summarizing evaluation

Fields of Action	- Feasibility studies - Implementation of citizen energy in the NECP - Developing and promoting best practice - Strengthening of multilateral cooperation, including at non-governmental level - More feedback with the representatives in the Committee of the Regions - Promotion of citizen energy projects - Highlighting the advantages such as energy independence and regional added value - Complete implementation of RED II into national law, creation of an appropriate regulatory framework - Development of a PV roof cadaster - Municipal heat planning - Creation of a clearing office for citizen energy projects and provision of contacts in the local authorities

State Hungary

General information	**Status EU membership**	Member state since 1 May 2004[ccclxxiv] Participant of Energy Community since Nov. 2007[ccclxxv]
	Population	9,709,886 (2021)[ccclxxvi]
	Land area (km²)	91,260 km² (2020)[ccclxxvii]
	Urban population (%)	72 % (2021)[ccclxxviii]
Socio-economic situation	**GDP (current US$ billion)**	182.28 (2021)[ccclxxix]
	GDP per capita (EURO)	14,010 (provisional, 2020)[ccclxxx]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	9,488.13 (2020)[ccclxxxi]
	Median hourly earnings (EURO)	Males: 4.52 (2020) Females: 4.24 (2018)[ccclxxxii]
	World Bank economic classification (2021)	High-income country[ccclxxxiii]
	Unemployment (% of total labor force)	4.3 % (2020)[ccclxxxiv]

Energy situation in general	**Current energy sources**	• In 2020, 68% of Hungary's energy supply came from Fossil Fuels, composed of: 33% natural gas, 27% oil and 7% coal.
		• Nuclear energy is the main non-fossil energy source (16% of total supply), bioenergy and waste (10%); electricity imports (4%); other renewables - hydro, wind, geothermal and solar (2%).[ccclxxxv]
		• Electricity generation in 2020 consisted of[ccclxxxvi]:
		  ○ Non-renewable 29 401 GWh (84%)
		  ○ Renewable 5 529 GWh (16%), of which:
		  • Hydro: 244 GWh (1%)
		  • Solar 2 459: GWh (7%)
		  • Wind: 655 GWh (2%)
		  • Bioenergy: 2 155 GWh (6%)
		  • Geothermal: 16 GWh

	*An Overview of Hungary's energy system by fuel and sector is available in the International Energy Agency Hungary 2022 Energy Policy Review 2020.[cccIxxxvii]
Climate protection targets	The National Energy and Climate Plan (NECP) and the National Energy Strategy (NES) 2030 set the following targets[cccIxxxviii]: • reduce emissions by 40% in 2030 compared to 1990 levels • cap total final consumption at 785 PJ (2005 levels) by 2030 • reduce non-ETS (Emissions Trading Scheme) GHG emissions by 7% by 2030 compared to 2005 levels. • produce 90% of domestic electricity from carbon-neutral sources, phasing out coal Hungary adopted a low GHG emissions "National Clean Development Strategy" (NCDS) in May 2021 to achieve net-zero emissions by 2050.[cccIxxxix]
Renewable energy targets	Hungary's targets are mainly driven by obligations under the EU's Renewable Energy Directive (RED) for the period to 2020 and by RED II through the NECP for the period to 2030[cccxc]. The National Energy and Climate Plan (NECP) and the National Energy Strategy (NES) 2030 set the following targets[cccxci]: • install 6.5 GW of solar PV capacity by 2030 and 12 GW by 2040 • install at least 200 000 household roof-top solar panels (average output of 4 kilowatts [kW]) • renewables to account for at least 21% of gross final energy consumption • source final energy consumption above 2005 levels from carbon-neutral sources in 2030. Renewable energy strategies do not include wind power in the future electricity generation mix beyond the existing capacities.[cccxcii]
Renewable energy potential	• Experts estimated the technical potential for installation of solar photovoltaic power in the country could amount to over 7 GW[cccxciii]. • Large potential for scaling up renewable energy remains, for instance in geothermal energy or wind power.[cccxciv] • The potential for geothermal energy is estimated at 30-65 PJ/year. [cccxcv] • The potential for deep geothermal to contribute to district heating is estimated to be between 30 PJ and 65 PJ per year, notable considering the current use of about 9.3 PJ per year.[cccxcvi]

The distribution of Solar and Wind and Biomass potential are visualized in the IRENA Country Profile Hungary.[cccxcvii]

Renewable energy support regime

Renewable energy support scheme (METÁR), 2017[cccxcviii]

- Feed-in tariff available for small-scale renewable installations (50-500 kW)
- "Green premium" granted for small- to medium- (0.3-1 MW) and large-scale renewable power plants (1-20 MW) through tendering.
- All renewable technologies are eligible under the support scheme (solar energy, geothermal energy, biogas, hydropower, biomass, wind energy)

A "brown premium" support scheme for solid biomass and biogas plants, which are no longer eligible for the feed-in tariff or the green premium, to ensure their continued operation.[cccxcix]

In 2021 a coordinated grid connection capacity allocation introduced to facilitate renewable electricity generation to be fed into the grid.[cd]

Hungarian Ministry for Innovation and Technology launched a series of tenders to support investments in clean energy solutions and transition to a carbon-neutral economy. A national tender was published in 2020, aiming to create more pilot energy communities[cdi].

Legal and political framework for citizen energy

Relevant laws, policies, and plans

- Climate and Nature Protection Action Plan - E-AUTO-2021
- Renewable Energy Support Scheme (METAR) - 2017
- 2050 climate neutrality law – 2020
- Climate and Nature Protection Action Plan

Regulatory framework for citizen energy

- Potential support for the energy community first appeared in government strategies already in the mid-2000s via the Ministry of National Development: Energy and Climate Awareness Raising Plan.[cdii]
- The draft Hungarian Operational Programmes (OPs) include Renewable Energy Communities, and will provide financial support for the installation of community-owned renewable energy projects and lay the foundation of new communities[cdiii]
- "Energy community" as a legal opportunity was transposed to Hungarian legislation in December 2020.
- A law implemented in January 2021, providing the framework for prosumers, flexible pricing, aggregators and (renewable) energy communities. The law defines a renewable energy community as an energy community that produces, consumes, stores or sells electricity from a renewable energy source.[cdiv]
- A three-step community integration was included into the Hungarian National Energy and Climate Plan to support the goals of climate neutrality by the end 2050.[cdv]

Evaluation of the legal framework

- Legislation still under development; Administrative, legal, social, financial and technical challenges. Legislation hindering innovative financing schemes [cdvi]
- Potential of energy communities as major actors in the energy transition is not acknowledged, insufficient funding is allocated to support citizen energy[cdvii]
- Lack of limitations for for-profit corporate interference

*An updated assessment is available at the REScoop Transposition Tracker[cdviii].

Existing citizen energy projects and/or research initiatives

Citizen energy projects

Kazán Community Center solar rooftop project - The 36 kWp solar rooftop was installed at a communally operated community centre, with the aim to set up a community energy fund from the solar revenues to finance energy efficiency improvements in the building. The Kazán Community Center, located in the 8th district in Budapest, hosts a dozen social initiatives: NGOs, a communal kindergarten, a boxing club, etc. The energy community organizational structure has been set up, but the community does not aim to be formally registered at the moment.[cdix]

Community-energy support programme of FoE Hungary from 2013.[cdx]

The Community Energy Service Company (CESCO) project is the only **NGO-led project** funded by the Hungarian government as a pilot. The project aims to set up 6-7 community solar projects across the country, mostly on the rooftops of municipal-owned cultural and educational institutions. Led by FoE Hungary, with the aim to set up CESCO to be registered as an energy community.[cdxi]

Municipal-lead projects include rooftop solar investments on municipal buildings, funded by EU grants in villages and small towns, in some cases, coupled with other energy developments. The **brownfield PV park in the city of Miskolc** provides electricity for 7 municipal institutions. The **Pornóapáti biomass heating plant**, established in 2003, is an example of a municipal renewable heat project.[cdxii]

Energiahatékony Wekerle (Energy Efficient Wekerle) group.[cdxiii]

- promotes building energy efficiency at the suburban Budapest neighbourhood Wekerle.
- completed window insulation projects in at least 30-40, promotes community planning and offers free heat camera lending[cdxiv]

Municipality of the 7th District, Budapest aims at creating an energy community in which rooftop solar panels would provide electricity to the community's members. As part of the pilot projects also legal barriers would be analysed.

Research and capacity building activities

With the **CO-POWER project**, public campaigns will be organized in 5 Hungarian regions to facilitate the birth of much more community energy initiatives and projects[cdxv].

Interreg project: **Collaboration between public bodies and citizen energy groups in implementing local energy strategies in Central Europe**, Period: 2014-2020[cdxvi]

Bringing Germany's Bürgerenergie to New Regions in Europe - aims to ensure implementation of the European Clean Energy Package's new provisions in support of community energy, promote public renewable energy initiatives in Hungary and Spain.[cdxvii] As part of the project, a handbook "Community Energy – A practical guide to reclaiming Power" was published.[cdxviii]

		An **exchange event** took place in Budapest, Hungary in 2019 to highlight the growing importance of community energy and to make this approach more prominent in the CEE region.[cdxix]
Relevant actors and stakeholders	**NGOs**	Friends of the Earth Hungary
		Energiaklub[cdxx]
		Environmental Management and Law Association (EMLA)[cdxxi]
		Autonómia, Badur, Igazgyöngy – promoted communal production of bio-briquette in 2000s
	Governmental bodies	Ministry of Innovation and Technology
		Hungarian Energy and Utilities Regulatory Authority (HEA),
		Ministry of Interior
	Local governments	Municipality of the 7th District, Budapest
	Private actors	Dutch-based solar project developer Photon Energy.[cdxxii]
		PV-Invest Magyarország
		ALTEO Energiaszolgáltató Nyrt.[cdxxiii]
		PV companies: Danubia, Dél-Nyugat, PV Napenergia
		Energy, IT hardware and software companies: Elektroprofi, Delta Systems, ON-Energy, Reliable Energy
	International/ supra-national actors	-
	Academia	Pannon University; Centre for Energy Research;
	Others	Energiahatékony Wekerle (Energy Efficient Wekerle) group[cdxxiv]
		Kazán Community Centre[cdxxv]
		Solidarity Economy Center (SEC)

The Association of Hungarian Conservationists (MTVSZ)[cdxxvi]

Summarizing evaluation

Fields of Action

Legal and administrative

- Conducting an official assessment of energy communities as a basis for creating a suitable legal and policy framework, followed by independent assessment reports;
- Revision of the transposition following the guidelines of the European Directives[cdxxvii] to expand the renewable energy capabilities of communities, limit corporate takeover, providing legal basis for participation of non-profit civic organizations, formation of energy cooperatives;
- Providing easier administration and advantageous taxation /other financial incentives for collective prosumption;
- Advocacy for better legislation the accurate implementation of CEC and REC according to the RED II guidelines and for an easier permitting process, for monitoring and reporting, for collective prosumer solutions;
- Direct legal and administrative support to prospective energy communities.
- Implementing specific legal provisions for metering, settlement, and accountability of collective prosumption;
- Designing business and operational models for collective prosumption;
- Investment in grid infrastructures and facilitating innovations for self-sufficient collective energy solutions.

Financial

- Establishment of targeted loan structures for energy communities paired with a partial self-finance structure (debt to equity);
- Removing legal hindrances from the way of crowd investments;
- Introducing suitable financing instruments for energy communities, such as separate auctions by METÁR and grant schemes suitable for citizen initiatives;
- Providing direct support in administration, financial planning and loan negotiations to prospective energy communities.

Socioeconomic

- Targeting groups living in energy poverty with the legal framework, awareness-raising and capacity-building activities;
- Building an organization equipped with knowledge and skills in consulting prospective energy communities, which can provide them with legal, administrative, and financial support;
- Providing support services to municipality-based energy community projects;
- Communication campaign for changing attitudes towards energy communities.

Kaliningrad

Im Verlauf des Projektes wurde Anfang 2022 entschieden, dass eine Recherche zu Kaliningrad derzeit nicht sinnvoll erscheint aufgrund der politischen Lage.

State Republic of Kosovo

General Information	**Status EU membership**	Potential candidate country; Stabilization and Association Agreement between EU and Kosovo since 2016[cdxxviii]; Member of the European Energy Community (EnC) since 2006[cdxxix];
	Population	1,786,038 (2021)[cdxxx]
	Land area (km²)	10,887.0 km² (2017)[cdxxxi]
	Urban population (%)	38% (2011)[cdxxxii]
Socio-economic situation	**GDP (current US$ billion)**	9,412,034 (millions) (2021)[cdxxxiii]
	GDP per capita (EURO)	
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	7 224 € (2020)[cdxxxiv]
	Median hourly earnings (EURO)	Not available
	World Bank economic classification (2021)	Upper-middle-income economy[cdxxxv]
	Unemployment (% of total labor force, persons 15-74 years)	29.4% (2018); highest rate in EU candidate and potential candidate countries[cdxxxvi]
Energy situation in general	**Current energy sources**	- 90% of installed capacity of energy generation facilities (2019) is from ***coal*** (majority lignite), 4.5% small hydropower (<= 10MW), 2.4% large hydropower, 2.4% wind, 0.7% solar.[cdxxxvii] - In 2020: 74 MW of small hydropower, in addition to 32 MW of large hydropower, 34 MW of wind and 10 MW of solar.[cdxxxviii] - 25,69% of renewable energy in 2019 (total final energy consumption not just electricity).

	- Electricity Generation in 2020 constituted[cdxxxix]:
	  o Coal: 6333 GWh (94%)
	  o Oil: 15 GWh
	  o Hydro: 263 GWh (3.9%)
	  o Wind: 90 GWh
	  o Solar: 10 GWh

Climate protection targets	- Kosovo* is ***not a party*** of the United Nations Framework Convention on Climate Change (UNFCCC).[cdxl] - Kosovo has signed the Sofia Declaration in November 2020, which includes a commitment to adopt the EU's Climate Law.[cdxli] - No targets are set for 2030 - Kosovo*'s legislation and policy framework is being aligned with the EU climate acquis. The Government approved the ***2019 – 2028 National Strategy and Action Plan on Climate Change*** and a ***climate change concept paper*** in December 2020.[cdxlii] - The Ministry of Economic Development (MED) produces long-term and mid-term renewable energy plans, in accordance with obligations from the Energy Community Treaty.[cdxliii]
Renewable energy targets	The 2020 target of 25% of renewable energy was met
Renewable energy potential	- Solar resource quality (insolation): 1,400 – 1,500 kWh/m2/year; higher than most EU countries[cdxliv] - Cost-competitive solar potential could reach close to 600 MW in 2030 in Kosovo, as estimated by IRENA (2017)[cdxlv] - "**distributed PV could play a significant role in decreasing the electricity demand"**[cdxlvi] - Plans for a new coal power plant were cancelled in March 2020; a large hydropower plant Zhur will not be realized, so other sources gain relevance. Continuous political will is needed to break dependency on coal.[cdxlvii]
Renewable energy support regime	- The Kosovo government is re-designing a ***feed-in tariff*** regime for renewables.[cdxlviii] - Since December 2020 the allocation of feed-in tariffs has been suspended.[cdxlix] - Kosovo has introduced ***Net Metering***, any positive imbalance is credited with electricity via per-kWh bill credits; Customers need to be connected to the grid at 0.4kV voltage levels, in order to be eligible. This ***restricts this opportunity to households and very small companies***.[cdl]

Legal and political framework for citizen energy

Relevant laws, policies, and plans

- Kosovo has adopted the '20-20-200 EU directive (Ibrahimi et al. 2019)[cdli]
- Draft National Energy and Climate Plan (NECP) 2021-2030
- 2018 Law on Energy Efficiency
- National Energy Efficiency Action Plan (NEEAP) 2019 – 2021 was submitted to the Secretariat in December 2020[cdlii]
- 2019 – 2028 National Strategy and Action Plan on Climate Change
- A law on climate change is envisaged to be adopted during 2023[cdliii]
- Kosovo has not signed the Aarhus Convention and access to environmental information (incl. EIAs) is not necessarily given, transparency is a big issue[cdliv]

Legal and political framework for citizen energy

Regulatory framework for citizen energy

- Electricity customers connected to the low voltage distribution network with installed capacity not higher than 100 kW can apply to suppliers to obtain the status of a ***self-consumer*** using a net billing scheme. This seems to function well - ***56 self-consumers are connected,*** and many new applications are in the pipeline.[cdlv]
- Application process for becoming prosumer involves: 1) application to Energy Regulatory Office (ERO) and 2) apply to KEDS, details to be found in a guideline[cdlvi]
- From 2017 until the beginning of 2020, an estimated 20 permits to construct solar PV projects configured for self-consumption were issued.[cdlvii]

Evaluation of the legal framework

- While the primary legal framework aligns with the EU package, the absence of secondary legislation and regulations is hindering its full implementation in Kosovo.

*An updated evaluation is available in the Energy Community Kosovo Page[cdlviii]

Existing citizen energy projects and/or research initiatives

Citizen energy projects	-
Research and capacity building activities	Green Rural Deal Project[cdlix] - „A bottom-up co-creational process to develop capacities for a transition to a zero-carbon economy in Greece, Kosovo, and Serbia" - "supporting *local processes with co-creational workshops for regional stakeholders as a catalyst for transformative projects and policies"* - EUKI funding - five project partners: Wuppertal Institute, Germanwatch, Balkan Green Foundation, RES Foundation as well as a Local Government Association of Western Macedonia

		- Municipality of Kamenica involved as case study; wind energy farms with a capacity of 34.8 MW in place in the municipality; but the municipality lacks green energy prioritization policies as well as a specific department dealing with energy. Kosovo Energy Project[cdlx] - GIZ, 2021-2023 - Improving Energy Efficiency and integration of renewable energy in buildings - supports the Ministry of Economy/the Kosovo Energy Efficiency Agency and the Ministry of Environment, Spatial Planning, and Infrastructure - A special focus is on improving energy efficiency and increasing the ***use of renewable energy sources for self-consumption*** - Contribution to get ***Municipal Energy and Climate Plans (MECPs)*** in line with the National Energy and Climate Plan (NECP)
Relevant actors and stakeholders	**NGOs/Civil Society**	Kosovo Civil Society's Consortium for Sustainable Development (KOSID)[cdlxi]
		Green Energy Kosova (GEK)[cdlxii]
		Kosovo Renewable Energy Association[cdlxiii]
		Association of Kosovo Municipalities[cdlxiv]
		Institute for Policy Development (INDEP)[cdlxv] - a think tank and an advocacy centre that provides independent research-based policy solutions. INDEP has a special focus on strengthening democratic governance and plays the role of public policy watchdog[cdlxvi]
		EcoZ [cdlxvii]
		Balkan Green Foundation[cdlxviii]
	Governmental bodies	Kosovo Energy Regulatory Office (ERO)[cdlxix] - duty to regulate activities in the energy sector in Kosovo, including electricity, district heating and gas, in accordance with the obligations arising from the Energy Community Treaty - Providing regulations for self-generation of electricity
		Ministry of Economic Development (MED) - Drafts long-term and mid-term renewable energy plans - responsible for setting up renewable energy - targets, for monitoring of implementation and annual reporting on achievement of targets

	Kosovo Energy Efficiency Fund [cdlxx]
	Ministry of Environment, Spatial Planning and Infrastructure (MESPI)
	Kosovo Investment and Enterprise Support Agency (KIESA)[cdlxxi]
	Kosovo Agency for Energy Efficiency (KAEE)[cdlxxii]
	Kosovo Chamber of Commerce (KCC)[cdlxxiii]
Local governments	Two municipalities are signatories to the Covenant of Mayors (Gjilan & Podujevo)
	Kamenica municipality - Located in the Gjilan District in the east of Kosovo, bordering Serbia in the north and east, in the west border with Pristina, town of Kamenica has 7,331 inhabitants, municipality 36,085 inhabitants (2011), 56 villages in the municipality[cdlxxiv] - Wind energy farm (KITKA wind farm) with a capacity of 34.8 MW in the municipality[cdlxxv]; first wind farm in Kosovo in operation since 2019, supported by EBRD[cdlxxvi] - In December 2020 agreement signed by grid operator Kostt with developer Air Energy 2 for two wind farms and a solar plant in the Kamenica municipality with a combined capacity of 99.6MW, which are expected to come online in 2024[cdlxxvii] - "Opportunities mainly lie in its geographical position (capacity for wind and solar exploitations), the EU and other international support, i.e. donor programs for cross-border cooperation."[cdlxxviii] - The municipality is in the focus of the "The Green Rural Deal project" (EUKI funded) by Wuppertal Institute, Germanwatch, Balkan Green Foundation, RES Foundation as well as a Local Government Association of Western Macedonia[cdlxxix] - Workshop held 31 March 2021 with local stakeholders as part of Green Rural Deal project[cdlxxx]
Private actors	GET (Green Energy Technologies)[cdlxxxi] - providing solutions and consultancy in the usage of renewable energy devices, also increasing the energy efficiency - more than 160 solar projects all around Kosovo; residential, governmental, framing & industry sector - founded in 2010, located in Pristina

	JAHA Solar - Established in 2016 - PV panel producer situated in Prishtina (Kosovo) - providing knowledge and technology for solar energy development in the country; have already implemented several projects in Kosovo, both roof-top and ground-mounted PV systems; provides on and off-grid systems[cdlxxxii] - member of the JAHA Group with contact to Germany[cdlxxxiii]
	Electricity Distribution Services in Kosovo J.s.c (KEDS)[cdlxxxiv] - owned by Turkish companies Çalik Holding and Limak - operational since 2013 - KEDS distributes, maintains and repairs a stable electrical network for approximately 600,000 thousand customers spread throughout Kosovo - has exclusivity of electricity distribution throughout the territory of Kosovo - KEDS includes all medium voltage, low voltage power lines and relevant substations with accompanying facilities - Provides information on prosumers and self-consumption generators, including a video and guide of how to apply for becoming prosumer[cdlxxxv]
	Kosovo Sustainable Energy Projects (KoSEP)[cdlxxxvi] - Implemented by Stantec – global firm, office in Brussles - developed by the European Bank for Reconstruction and Development - support energy efficiency investments and renewable energy development in the residential, commercial, industrial, and agricultural sectors by providing tailor-made loan products, free of charge technical assistance, and investment grants.
International/ supra-national actors	Germanwatch
	USAID - Supported development of video on Becoming a Prosumer[cdlxxxvii]
	GIZ
Academia	-
Others	Kosovo Credit Guarantee Fund[cdlxxxviii] - created to help meet the need for increased access to finance for micro, small and medium enterprises in Kosovo; enhance financing opportunities for small and medium enterprises

TEB Bank in cooperation with EBRD offers “Green Loans” for investments including investments for distributed PV.[cdlxxxix]

ProCredit Bank offers “Loans for Eco Investments” including investments for distributed PV.[cdxc]

Summarizing evaluation

Fields of Action

- Public dialogue on energy transition, public awareness raising, also on options of public participation in transition
- Energy savings measures are much needed and should be a focus; energy efficiency is key, including incentives for energy efficiency in residential and private sectors;
- Advocating for implementing the Third Energy Package, development of additional regulations for effective implementation of the national legislation and empowering energy consumers;
- Strengthen and enforce legislation on building energy certification
- Enhancing financing of measures, outlining option for support and funding
    - Development of grant schemes to encourage women's entrepreneurship in RES;
    - Enhance capacities for project development and donor coordination to securing external funding
- Providing financial support through public-private partnerships, external partners, donors, and co-financing for RES-based citizen energy projects;
- Local authorities need to be encouraged to take a lead on energy efficiency and renewable energy installations
- Further research is needed to fully assess the potential of RES. Kosovo has implemented legislation for the energy sector, including RES, aligned with EU standards;
- Building capacity of public institutions, citizens, businesses, energy auditors and energy sector professionals;
- Development of dedicated formal and informal educational programs in RES;
- Implement pilot projects to raise awareness and demonstrate the success of citizen energy;
- Expanding networks of actors involved in and interested in citizen energy;
    - Encouraging youth, women, and minorities to participate and get involved in the energy sector.

State Lithuania

General information	**Status EU membership**	Member state since 1 May 2004[cdxci] Participant of the Energy Community since 16 October 2015[cdxcii]
	Population	2,794,700 (2020)[cdxciii]
	Land area (km²)	62,630 (2020)[cdxciv]
	Urban population (%)	68 % (2020)[cdxcv]
Socio-economic situation	**GDP (current US$ billion)**	70.97 (2022)[cdxcvi]
	GDP per capita (EURO)	25,065 (2022)[cdxcvii]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	8,445 (2023)[cdxcviii]
	Median hourly earnings (EURO)	Males: 4.64 (2018) Females: 4.26 (2018)[cdxcix] Hier: Median hourly earnings, all employees (excluding apprentices) by sex
	World Bank economic classification (2021)	High-income country[d]
	Unemployment (% of total labor force)	6.5 % (2023)[di]
Energy situation in general	**Current energy sources**	The total energy mix in Lithuania for 2022 consists of 46% oil, 22% natural gas, 26% biofuels and waste, 3% coal, and nearly 1% from hydropower plants.[dii] With regard to electricity, Lithuania currently is heavily dependent on imports mainly from Sweden and Poland.[diii] The Lithuanian electricity generation share by source in 2023 is 45.5 % wind energy, nearly 12% solar energy, 11% bioenergy, 8.3 % hydro energy, and 11.3 % from gas and 12.2 % coming from other fossil fuels energy production.[div]

	Mentioning the past, Lithuania was in the past was focusing mainly on one self-sufficient source among the few EU links, which were established to Latvia. To change this energy panorama, Lithuania completed several key projects, including the Klaipeda LNG (Liquefied natural gas) terminal in 2014 and the construction of electricity links with Sweden (NordBalt) and Poland (LitPol Link) in 2015. In 2009 after closing the Ignalina Nuclear Power Plant, Lithuania became an importer of electricity instead of an exporter. In 2022, as a reaction to the Ukraine war, Lithuania prohibited the import of Russian natural gas and electricity. Lithuania plans to get 80% of the electricity from renewable sources and specifically from solar, wind, hydropower, and biomass, by 2025. The main directions to achieve this are upgrading the electricity grids and connecting the Baltic Grid with the Continental power system, decommissioning Ignalina nuclear power plant, and developing more renewable energy sources. The Balticconnector Gas Pipeline, connecting Poland and Lithuania, was put into operation in 2022. A more liberalised electricity market has allowed consumers to choose suppliers and buy electricity at market rates, although high prices in 2022 delayed the final phase of transitioning from regulated tariffs to competitive supply.[dv] In 2023, Lithuania´s 70% electricity output was produced from RES.[dvi] Lithuania has surpassed its renewable energy targets, particularly in solar PV, with a total installed solar capacity of 1.2 GW, exceeding the goal set for 2025. This is shown by data in February 2024 where more than 61000 prosumers have generated solar electricity with a capacity of 800 MW.[dvii]
Climate protection targets	Lithuania submitted the draft update of the National Energy and Climate Plan of 2021 – 2030 (NECP) to the European Commission in July 2023. The country is committed to reaching the most climate protection objectives with reductions of greenhouse gas emissions and the subsequent achieving of carbon neutrality. The country is expected to decrease GHG's by 2030 and to reach 30% of the 2005's GHG levels as the baseline for more ambitious objectives and on to carbon neutrality by 2050. Lithuania is stepping into fourth-generation (4G) district heating systems to the heating and cooling sector (use low-temperature, renewable sources to reduce carbon emissions), integrating solar power plants, and the use of excess and waste heat for heating buildings is being provided with it. Energy efficiency is another key area. By 2030, Lithuania aims to reduce primary and final energy intensity to 1.5 times lower than 2017 levels, and by 2050, to 2.4 times lower. A significant amount of funding has been set aside for the renovation of about 5000 multi-apartment buildings and individual houses to have an energy savings of at least 11-12

	TWh by 2030. The ultimate goal is to ensure all public and private buildings are fully decarbonized by 2050. Lithuania introduced policies to foster research, innovation, and competitiveness in the energy sector. The country has the objective to transition from being an importer to a developer and exporter of energy technologies, focusing on areas such as hydrogen energy, carbon capture and storage, and renewable energy technologies. By 2030, R&D investment is targeted to increase to 2.2% of GDP, reaching 4% by 2040. The development of a national scheme for biomass fuel sustainability and the integration of clean energy technologies into the industrial sector are also key priorities. In a nutshell, Lithuania's approach to climate protection includes ambitious targets for GHG reduction, significant improvements in energy efficiency, robust support for research and innovation, enhanced energy security, all supported by a strong legislative framework.[dviii]
Renewable energy targets	Lithuania has set clear and ambitious renewable energy targets to enhance RES utilisation cross various sectors. By 2030, the country aims to have 45% (55% as mentioned in the draft Update Lithuanian NECP) of its gross final energy consumption derived from RES, with a long-term goal of achieving 100% RES total electricity consumption by 2050. The government has raised its solar PV (photovoltaic) ambitions, setting a target of 2 GW by 2030 and by 2050 aiming for a 500% increase to reach 5.1 GW. As for the electricity sector, Lithuania aims to achieve 100% renewable electricity consumption by 2030, with wind energy expected to contribute at least 60%, solar energy 19%, biofuels 6%, hydropower 7%, and biogas 3%.[dix] In the transport sector, Lithuania is working towards increasing the use of bioethanol, biodiesel, biogas, and renewable electricity. Specific targets include growing the use of bioethanol from 15.7 ktoe (kilotonnes of oil equivalent) in 2020 to 24.4 ktoe by 2030, and biodiesel from 87.2 ktoe to 195 ktoe in the same period. The biogas contribution is expected to rise from zero to 81 ktoe, while electricity from RES should increase from 1.2 ktoe to 105 ktoe. By 2030, RES in transport is projected to reach 411 ktoe. In the heating and cooling sector, the share of RES is targeted to reach 90% by 2030, with a significant contribution from local biofuels (biomass). District heating systems in Lithuania, which serve a large portion of the population, are being optimised to enhance efficiency and integrate renewable energy technologies. The biofuels market is undergoing changes to meet sustainability requirements and diversify RES sources. The introduction of the Biofuel Unit at the Vilnius CHP (Combined Heat and Power Plant) plant will increase demand for biofuels, and various measures are being implemented to ensure a stable supply of raw materials for biofuel production. [dx]

Renewable energy potential	According to studies, Lithuania has the potential to meet its entire electricity demand with RES by 2030. There are significant capacities for solar and wind power, with projected solar capacities ranging from 2.5 GW to 5.1 GW and land-based wind capacities between 3.5 GW and 5 GW. Additionally, offshore wind is expected to contribute 1.4 GW across all scenarios, bringing the combined renewable energy capacity to a total between 7.4 GW and 11.5 GW. Lithuania aims to install 1.5 GW offshore wind capacity in the Baltic Sea and two offshore wind farm tenders are being organized, each with a maximum permitted generation capacity of 700 MW.[dxi] The technical potential for onshore wind power is estimated at 37 GW, while ground-mounted solar PV technical potential is around 560 GW. These capacities suggest that renewable energy can fully meet Lithuania's annual electricity demand. Another impact will have hydrogen production on electricity demand, predicted to be a significant factor by 2030. Moreover, planned energy storage solutions, including an additional 110-MW pumped hydro unit and substantial battery storage, will support this transition.[dxii]
Renewable energy support regime	Lithuania is experiencing an improvement in renewable energy deployment. The energy crisis led to the launch of the "breakthrough package" in July 2022, easing regulations for wind and solar projects by recognizing renewables as a high public interest and simplifying procedures. For solar energy, planning requirements and most environmental assessments were removed (no requirement to change the purpose of land), enabling rapid construction of solar parks and allowing consumers to install private solar plants – a multi-megawatt solar park can go into operation in the short period of 12 months. Onshore wind energy development has also been accelerated by eliminating sanitary protection zones and allowing construction on agricultural land. Offshore wind targets 1.5 GW by 2030, with auctions and infrastructure in progress. Hybrid power plants combining different energy sources are improving grid efficiency. Additionally, Lithuania is installing modern power storage facilities and liberalizing the electricity market, encouraging private investment. These changes have attracted significant interest from investors in renewable energy sector.[dxiii] In 2023, the Lithuanian government, regulators, and energy companies developed a robust legal framework aimed at expanding renewable energy sources. This new framework, part of the National Energy Independence Strategy, included various legal acts to enhance conditions for renewable energy development. The government also implemented a methodology for a revenue cap on electricity generated using inframarginal technologies (energy generation methods that operate at a lower cost than the marginal cost of

	producing electricity that can supply base-load power reliably e.g., hydro), following European Commission recommendations, providing financial stability and predictability for renewable energy projects.[dxiv]

Relevant laws, policies, and plans

- **the Law of the Republic of Lithuania on Renewable Energy.** Amendments to the Law were adopted in May 2022.
-
- **Law on Electricity.** Latest amendments to Law entered into force in May 2022.[dxv]

- **RES2-E** (existing)**: Renewable Energy Development in the Baltic Sea**. In November 2018, evaluations began to explore the development and operation of renewable energy power plants in the Baltic Sea and to determine their installed capacity.

- **RES17-E: Promote the use of RES in district heating (using solar technologies, heat pumps and/or heat storage).**
- **RES23-E: Installation of heat pumps to optimise the performance of heat production systems by increasing the operational efficiency of heat production.**

- **RES38-P** (planned): **Modernisation or replacement of depreciated biofuel boilers with other RES-using technologies.**
- **Lithuania's Climate and Energy Strategy** focuses on enhancing energy efficiency, promoting RES, and ensuring energy independence. The Lithuanian parliament approved amendments to the law on renewable energy sources in March 2022 to prioritize the deployment of more RES. The National Energy Independence Strategy (2018) aims to reduce energy intensity significantly by 2050 through low-energy-intensive industries and building renovations. The Fourth Generation (4G) District Heating plan seeks to modernize heating systems by integrating renewable technologies and using waste heat.

- **The Long-Term Renovation Strategy (2021-2050)** targets decarbonizing all buildings by 2050, with annual renovation goals to improve energy efficiency. To diversify and sustain the biofuel market, Lithuania has implemented policies mandating sustainability requirements for biomass fuels and increasing the supply of indigenous wood fuels.

- **The Energy Efficiency Directive** (Article 8) establishes a binding end-use energy savings target of 39.3 TWh by 2030, emphasizing improvements in buildings, transport, and industry.

- **The Lithuanian Heat Suppliers Association** supports sustainable district heating. The State Energy Regulatory Council regulates energy markets and ensures compliance with sustainability standards. The Klaipėda Liquefied Natural Gas Terminal diversifies gas supplies, enhancing energy security. The National Energy and Climate Plan (NECP) integrates these efforts, aligning national actions with EU climate targets. [dxvi]

- **The "New Generation Lithuania" Plan** includes substantial investments aimed at advancing RES. In 2023, the Lithuanian government revised the plan, significantly increasing its scope to a total of €3.85 billion. A significant portion of this funding,

amounting to €550 million, is dedicated specifically to the production of electricity RES. Furthermore, the plan incorporates the European Commission's "REPowerEU" initiative, which has allocated €198.4 million to Lithuania, emphasizing the country's commitment to expanding its renewable energy capabilities and reducing reliance on fossil fuels. These investments are expected to support Lithuania's goal of enhancing energy security and becoming a more self-sufficient energy producer.[dxvii]

- **Baltic Energy Market Interconnection Plan -** On January 19, 2023, a non-binding agreement was signed under the Baltic Energy Market Interconnection Plan (BEMIP Sea) involving Latvia, Estonia, Finland, Sweden, Poland, and Germany. This agreement sets targets for offshore renewable energy production by 2050, with interim milestones for 2040 and 2030.

- **The National Energy Independence Strategy** adopted in 2018.

Regulatory framework for citizen energy

- Lithuania has started encouraging more energy prosumerism with a regulatory framework focused on market integration, affordability, transparency, and active consumer participation. According to governmental targets expressed in its updated NCEP document, key legislative initiatives and instrument include:
- RES1-E: Financial support for prosumers, with a target of 30% of consumers becoming prosumers by 2030, supported by over EUR 160 million in EU and national grants.
- RES3-E: Utilization of Renewable Energy in Public and Residential Buildings. Climate Change Programs Section A: The grant program encourages the adoption of renewable energy sources (such as solar, wind, geothermal energy, and biofuels) in both public and residential buildings, targeting individuals from various social groups. (2021-2030).
- RES4-E: Encourages legal entities and communities to invest in onshore solar and wind power plants, focusing on self-consumption from 2020 to 2026.
- RES5-E: Promotes household electricity storage with EUR 3.291 million in grants for 20 MWh of storage from 2023 to 2029.
- RES29-P: Creates renewable energy communities in municipalities to aid energy-poor residents, with EUR 78.5 million in grants and EUR 95.9 million in loans planned from 2024 to 2029.
- RES30-P: Educates consumers about green energy choices to increase RES consumption from 2024 to 2026.
- RES31-P: Develops renewable and citizen energy communities by identifying and overcoming regulatory barriers from 2024 to 2025.
- RES32-P: Promotes RES education for pupils and students through initiatives like energy ambassador programs starting from 2025.[dxviii]
- Besides setting a target for energy prosumers, Lithuania has also introduced a net metering scheme to support residential and commercial electricity production by solar PV.[dxix]
- In Lithuania, according to the law on renewable energy, members of energy communities include residents, municipal institutions, and small and medium-sized businesses. At least five members or shareholders have to be natural persons with

voting right. Natural persons also have to hold at least 51% of all votes and have to live in the municipality of the production plant or a neighboring municipality. A member or shareholder cannot have more than 20% of the votes in another energy producing company. If a Renewable energy community (REC) is founded by already existing legal persons, the above-mentioned preconditions have to be met by at least 51% of the members of these legal bodies. REC will be able to design and manage power plants, and to produce, consume, store, and sell the generated energy. The new law fosters the establishment of renewable energy communities by introducing a beneficial framework simplifying the purchase and sale agreements. In addition, prosumers with an independent electricity supplier will be reimbursed for excess energy. RES producers within RECs will further be exempt from the obligation to have a license as an independent electricity supplier and will be compensated if there is an interruption in electricity transmission for more than 336 hours in two years. Moreover, the spatial planning process is simplified for renewable energy plants below 500 kW [dxx]

- the role of CE is recognized in the government's energy independence strategy (Government of Lithuania, 2018).[dxxi]

Evaluation of the (legal) framework (rather enabling, neutral, rather hindering)

While recent policy efforts are encouraging, CE initiatives in Lithuania still encounter several challenges. It's often hard to find information about technical solutions and legal forms. Low-income levels and banks' unwillingness to give good loans make financial challenges common. Finally, the country's Soviet heritage creates a

further cultural barrier. In addition, the oftentimes negative experience of forced collectivization of farms during communist times has created a level of distrust towards cooperatives in general, including CE initiatives.[dxxii]

The current legal framework in Lithuania, although showing some progress in defining Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs), falls short in creating an enabling environment for their market participation. The Law on Renewable Energy specifies rights for RECs in the electricity and heat sectors but does not comprehensively address potential and barriers for REC development. Essential elements of an enabling framework remain unspecified.

There is a positive note with the allocation of 2 GW production potential for prosumers and RECs, indicating governmental support. However, significant gaps persist. While RECs are exempt from balancing responsibilities and mandatory production contributions, they must comply with all rules to become suppliers. Cooperation with Distribution System Operators (DSOs) is mandated to be non-discriminatory, but provisions for energy sharing are lacking.

Specific grid capacity is reserved for RECs and CECs under certain conditions, simplifying registration and licensing processes. However, the framework does not address incentives connected to network tariffs, non-discriminatory market treatment, or comprehensive support for low-income and vulnerable households.

The Lithuanian National Recovery and Resilience Plan and the REPowerEU initiative provide significant funding to support RECs, focusing on reducing energy poverty. Recommendations and information on land availability are provided by the Lithuanian Energy Agency and municipalities. Nonetheless, aspects such as regulatory capacity building and NECP reporting on enabling frameworks are not addressed.

The Lithuanian National Recovery and Resilience Plan, supported by €2.22 billion in grants, allocates 37.8% to climate objectives and 31.5% to digital transition, explicitly financing energy communities to boost renewable energy under pillar 2. Open calls for community solar and wind project funding have been published by the Lithuanian Energy Agency which is a very positive development.

Lithuania's 2021-2027 Operational Programme prioritizes funding for individual prosumers over energy communities, which will be financed through the Recovery and Resilience Fund.

Energy communities are not mentioned in Lithuania's Modernisation Fund. However, the REPowerEU chapter emphasizes EC as a solution to energy poverty, targeting 0.473% of total energy production by 2030 and allocating EUR 78.5 million for their support. Additionally, EUR 95.9 million is planned for subsidized loans and EUR 36.6 million for VAT subsidies, aimed at municipalities to develop energy poverty reduction projects. The drafting process of this chapter was transparent, involving civil society, and excludes investments in fossil fuels.[dxxiii]

On the one hand, civil society organizations have praised the inclusion of stakeholders in drafting energy plans, highlighting transparency and collaboration in the decision-making process. Legislative reforms through the "breakthrough package" aim to eliminate bureaucratic hurdles, creating a supportive environment for rapid

		prosumer growth. Additionally, Lithuania's revised NECP draft introduces an innovative scheme to support renewable energy communities and combat energy poverty at the city level, including funding for multi-apartment buildings to install communal rooftop solar plants. On the other hand, despite regulations for solar PV installation, resistance from the Ministry of Environment to solar mandates in building codes could impede adoption. Decreasing subsidies might slow solar energy uptake, and administrative hurdles for grid approval could deter commercial investments. Limited legal frameworks restrict energy sharing scalability, and obtaining energy community status remains burdensome despite favourable legislation.[dxxiv] In conclusion, despite recent policy efforts, Citizen Energy (CE) initiatives in Lithuania face significant barriers, including limited access to information, financial challenges, and cultural distrust rooted in Soviet history. The legal framework, while defining Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs), falls short in enabling their market participation. Key support elements are missing, and despite some governmental support, comprehensive incentives and assistance for low-income households remain inadequate. Significant funding through national plans aims to help, but more robust regulatory measures are needed to create an enabling environment.
Existing citizen energy projects and/or research initiatives	**Citizen energy projects**	**Smalininkai Community** In 2009, the Smalininkai's village association opened the first wind power plant ever owned by a local community in Lithuania. When the project started it was considered as an example of good practice and received praise from the Minister of the Interior. The power plant consisted of a 250-kW wind turbine that was expected to generate power for the grid. The wind turbine was purchased from a German company that had its manufacturing plant based in India. Over the years, the wind turbine had various problems that could not be fixed and, therefore, only produced half of the expected electricity. Consequently, in 2017 the village association decided to sell the power plant to a private investor. The project is reported as an "unsuccessful" CE project and the media coverage on the failure of the project was said to have reduced the confidence in CE in Lithuania The village association existed already since 2003, and with the wind turbine wanted to generate benefits, inter alia street lighting in the village The case study has been analyzed in the Interreg project Co2mmunity[dxxv]

		Saulės bendruomenė community energy project Lithuania's "Solar Community" project, known as "Saulės bendruomenė," is a government-led initiative allowing citizens to buy or rent remote solar panels via an online platform. This project empowers individuals to become both producers and consumers ("prosumers"), providing sustainable energy at low cost and supporting climate change mitigation at the household level. The initiative, supported by government incentives and subsidies, promotes collaboration between governments, organizations, and private consumers. It offers financial compensation for remote solar panel purchases and facilitates net-metering, enabling energy production in one location and consumption in another. The project aims to increase the adoption of solar energy, reduce energy costs, and support Lithuania's goal of producing 30-45% of its energy from renewables by 2030. [dxxvi]
	Research and capacity building activities	Interreg project Co2mmunity / RENCOP (Renewable ENergy Cooperative Partnership)
Relevant actors and stakeholders	**NGOs**	
	Governmental bodies	- Ministry of the Environment - Lithuanian Ministry of Energy - Kaunas Regional Energy Agency (KREA) - The Lithuanian Energy Institute (LEI) - National Energy Regulatory Council
	Local governments	- Covenant of Mayors for Climate and Energy
	Private actors	
	International/ supra-national actors	
	Academia	- The Lithuanian Scientific Council
	Others	

Summarizing evaluation

Fields of Action	Measures to advance RES deployment and the establishment of community energy initiatives in Lithuania **Enhance Energy Independence:**

- Further diversify energy sources and improve infrastructure to reduce reliance on imports.
- Strengthen connections with other EU countries and develop local renewable energy sources.

Accelerate renewable energy adoption:

- Continue scaling up solar and wind energy capacities.
- Promote citizen energy initiatives and support prosumer participation.

Strengthen climate protection measures:

- Implement robust policies to achieve GHG reduction and carbon neutrality targets.
- Enhance energy efficiency across all sectors, especially in building renovations.

Foster innovation and R&D:

- Increase investments in research and development for renewable technologies. Develop and support local innovation in energy technologies.

Improve regulatory framework:

- Simplify regulations to accelerate renewable energy project approvals.
- Address gaps in the legal framework to fully support renewable energy communities and citizen energy initiatives.

Support energy communities:

- Provide targeted financial and technical support to overcome barriers for energy communities.
- Foster public trust and participation in renewable energy projects through education and transparency.

	State	Latvia
General information	**Status EU membership**	Member country since 1 May 2004[dxxvii] Participant of Energy Community since 23 September 2014[dxxviii]
	Population	1.875, 757 (2022)[dxxix]
	Land area (km²)	62,230 km^2 (2020)[dxxx] Total area 64,594 km^2 (2023)[dxxxi]
	Urban population (%)	68 % (2021)[dxxxii]
Socio-economic situation	**GDP (current US$ billion)**	38.87 (2021)[dxxxiii]
	GDP per capita (EURO)	26,030 (2021)[dxxxiv]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	11,225.50 (2021)[dxxxv]
	Median hourly earnings (EURO)	Males: 5.43 (2018) Females: 4.48 (2018)[dxxxvi]
	World Bank economic classification (2021)	High-income country[dxxxvii]
	Unemployment (% of total labor force)	7.6 % (2021)[dxxxviii]
Energy situation	**Current energy sources**	- Third highest share of renewable energy (42.13 % in gross final energy in 2020[dxxxix]) in energy consumption in the European Union[dxl]. ○ gross consumption of RES amounted to 74.2 petajoules (PJ) in 2020 and 78 PJ in 2021[dxli]

  - the share of fuelwood in the total RES consumption was 78.6 % in 2020 and 80.1% in 2021[dxlii]
- In 2020, 3650 GWh out of 5725 GWh (64 %) electricity generated in Latvia was renewable; compared to 2019, the volume generated from RES increased by 14.3 % (by 457 GWh)[dxliii]
- In 2021, 3718 GWh out of 5846 GWh (64 %) electricity generated in Latvia was renewable; compared to 2020, the volume generated from RES increased by 1.9% (by 68 GWh)[dxliv]
  - wind power plants produced 177 GWh in 2020 (3,1 %) and 141 GWh in 2021 (2,4 %). Average annual production during last 5 years (2017-2021) is 149 GWh[dxlv]. Total capacity of wind power plants 78 MW.
  - solar power plants produced 5 GWh in 2020 (0,09 %) and 7 GWh in 2021 (0,1 %) (133% (4 GWh) increase from 2019)[dxlvi]. Boom of solar PV capacities in 2022, the connected total capacity to the power distribution system has reached 85 MW in October 2022[dxlvii], compared to 7 MW in 2021.
  - electricity generation from Hydro and marine constituted 2 603 GWh in 2020 (45%)[dxlviii] and 2636 GWh (45.1%) in 2021[dxlix].
  - bioenergy constituted 865 GWh (15%) in 2020.[dl]

- Substantial hydropower generation capacity[dli] - 1559 MW of the Daugava river cascade (large hydro power plants) and 28 MW of small hydro power plants[dlii],
- Latvia has been dependent on natural gas imported from the Russian Federation via pipelines. At the same the already operating LNG terminal in Klaipeda (Lithuania), start of operation of new LNG terminal in Finland and the opening of Poland-Lithuania natural gas networks connection contribute in eliminating this dependency. In addition, Latvian government has assessed the Skulte location as appropriate for LNG terminal in Latvia and the developer has “green light” to further develop the project. The Baltic states has a well-developed natural gas networks connection and region-scale underground storage in Inčukalns in Latvija.
- Amendments (adopted 14th July 2022) to the Energy Law states that natural gas import from Russian Federation is prohibited from the 01.01.2023[dliii].
- On June 28, 2018, a political decision was made on the synchronization of the Baltic States power system with Continental Europe and disconnection (desynchronization) from the electricity systems of Russia and Belarus until the end of 2025, but due to the complicated existing geopolitical situation in the world and the war in Ukraine, desynchronisation in emergency conditions from the electricity systems of Russia and Belarus could happen even sooner[dliv].

Climate protection targets	- Latvia's emissions of greenhouse gases are one of the lowest in Europe both in total emissions and emissions per capita[dlv]. Total emissions (without LULUCF) in 2020 have decreased by almost 60% compared to 1990[dlvi]. - Latvia aims to achieve climate neutrality by 2050.[dlvii] - Latvia's national target in ESR sector, planned to be stated according to the EU "Fit for 55 package", is 17% GHG emissions reduction in 2030 compared to 2005.
Renewable energy targets	- According to EU policy Latvia must increase the share of renewable energy in its final energy consumption[dlviii]; The Latvia's National Energy and Climate Plan for 2021-2030 (NECP2030) envisions the share of RES to be 50% by 2030[dlix]: o the indicative share of renewable energy in electricity production should reach at least 60 %, particularly by increasing installed capacity of wind and solar photovoltaic, expanding biomass and biogas capacities is not planned, o the share of RES in heating and cooling sector should increase by at least 0.55 % per year to reach indicatively 57.59%, by expanding biomass utilisation, use of heat pumps and solar heat collectors, o increasing the share of renewable energy in transport (e.g. by promoting production of biomethane, railway electrification, electrical mobility, etc.). The particular numbers will be updated in 2023 during the re-cast of the NECP2030 to fit the actual state of the EU climate targets and EU "Fit for 55 package".
Renewable energy potential	- Currently the situation is changing. - The Baltic coast and the inland have wind conditions suitable for wind parks, both onshore and offshore. A recently adopted (29th September 2022[dlx]) law provides for a simplified procedure for the construction of wind power plants (WPP) with a total capacity of at least 50 MW, as well as for solar PV ground-mounted parks of a total capacity of at least 10 MW, and the necessary infrastructure, until the total capacity of WPP within the scope of this law reaches 1000 MW. - The state-owned electricity utility company Latvenergo and Latvian State Forests have established in July 2022 the joint Ltd "Latvia's Wind Parks" ("*Latvijas vēja parki*") and are planning a joint investment[dlxi]. The companies plan to set up 100 to 120 wind turbines with the total capacity of 800 MW, which means an annual production of 2.4 terawatt hours (TWh) of electricity. This equals around 30% of electricity consumed in Latvia in 2021.[dlxii] - the development process of Latvian-Estonian off-shore wind part ELWIND has started, the planned Latvia's assigned capacity is 500 MW in 2030, if project will be implemented in full scale. - Large-capacity electricity generation from solar energy has so far not been developed in Latvia, although Latvia might have a similar poten-

	tial as other European countries, where such production has developed. For instance, the project developer European Energy has recently announced plans to build a 110 MW solar farm in Latvia.[dlxiii] - In general, one can be the huge interest for the development of RES capacities in Latvia. On the middle 2022 the total reserved capacity by RES (both wind and solar) projects' developers was more than 4 GW[dlxiv] (of course cannot be expected that all proposed projects will be implemented) - Currently, the Latvian electricity transmission system is able to accept up to 800 MW of additional new RE capacity (about a third of the total electrical capacity currently installed in Latvia).[dlxv]
Renewable energy support regime	- There has been a lack of effective support schemes for the use of RES in the electricity sector. Hence, neither feed-in premiums nor competitive bidding/auctions are currently applied for RES electricity producers in Latvia. A poorly designed RES-support programme in the form of feed-in tariffs in the past led to a bad image of renewable energy projects in Latvian society. - The legislative provisions are adopted to ensure a controlled closure of the existing FIT scheme. From 26th May 2011 the new RES-electricity producers and from 10th September 2012 the new RES-CHP producers have no rights to qualify for the FIT. On 1st November 2022, still around 90 MW (total) of RES capacity continued to participate in the FIT scheme[dlxvi]. - Since 1 January 2014, there is a net-metering scheme for PV installations in households.[dlxvii]. Amendments to the net metering system were adopted in 2020 and made microgeneration from PV economically more feasible for households. - In 2022, the government introduced a new financial support scheme[dlxviii] for private homeowners who can apply for investment co-financing (grant) for RES utilizing micro-technologies both for electricity and/or heat production[dlxix]. The total assigned financial aid volume is 30 MEUR. The solar PV projects clearly dominate (about 90% of the total number of projects) within the implemented technologies[dlxx]. The support for solar PV technologies is up to €4,000. - This led to a boom in terms of new PV installations.[dlxxi] The total number of solar PV microgenerators has reached in 2022 10 thousand ones expected to be doubled in 2023. - The recently adopted amendments to the Electricity Market Act from July 2022 introduce in addition to the net metering scheme a net accounting scheme. Furthermore, both natural persons (households) and legal persons shall be eligible for net metering/accounting., but also legal persons. - In its turn, based on the agreement with the electricity (retail) trader, energy communities are entitled to share electricity and sold to the trader surplus (non-shared) electricity on agreed price. - There is no effective support mechanism for energy communities in place. However, the recent amendments to the Energy Law envisage that the Ministry of Economics elaborates financial support programmes for RECs. Few possible financial support programs are noted

in which the REC might be the beneficiary (see below), however no one of them for the time being is developed in the details.

Legal and political framework for citizen energy

Relevant laws, policies, and plans

- Energy Law (Enerģētikas likums)[dlxxii]
- Electricity Market Law (Elektroenerģijas tirgus likums)[dlxxiii]
- Law on the Simplified Procedures for the Construction of Energy Supply Structures Necessary for the Promotion of Energy Security and Independence (Enerģētiskās drošības un neatkarības veicināšanai nepieciešamās atvieglotās energobūvju būvniecības kārtības likums)[dlxxiv]
- Latvia's National Energy and Climate Plan 2021–2030[dlxxv]
- Access of renewable energy plants to the grid is subject to the general legislation on energy.[dlxxvi]

Regulatory framework for citizen energy

- Despite the transposition deadlines of the "Energy for all Europeans" legislative package of 2020, renewable energy communities (RECs) and citizen energy communities (CECs) have only recently been introduced into the Latvian legal framework by the amendments to the Energy Law [dlxxvii] and the Electricity Market Law[dlxxviii] adopted by the Parliament (Saeima) on 14 July 2022. The provisions of both amendments will come into force on 1 January 2023.
- The amendments to the Energy Law provide the general framework for energy communities. They introduced a legal definition for an "energy community" concept, the amendments provide further specifications for RECs and 'electricity energy communities' (Latvian equivalent for CEC)[dlxxix] and state that the legal forms of an energy community (including REC) can be: association, foundation[dlxxx], cooperative society[dlxxxi], commercial company – partnership or capital company, or other civil liability society.[dlxxxii]
- The amendments to the Electricity Market Act specify the activities, rights, and duties of both jointly acting self-consumers (at building or block level) and energy communities in the electricity sector. The amendments to the Act also provide for an expansion of the net-metering system (see above), which can now be used by both individuals and legal entities[dlxxxiii].

Legal and political framework for citi-

- By 30 June 2023, the Ministry of Economy, in co-operation with the Ministry of Environmental Protection and Regional Development, shall elaborate and publish the 'Guidelines for the Formation of Energy Communities', including the recommendations for public persons (public authorities) regarding the provision of public support for energy communities and their participation in energy communities.

- Latvia's EU Cohesion Policy Programme for 2021-2027[dlxxxiv] includes the specific support objective No 2.1.4 to promote solar PV systems (including storage equipment for produced electricity). Beneficiaries of this programme are planned the commercial sector, municipal capital companies, cooperatives, energy communities and households.[dlxxxv] ERDF co-financing is planned in the amount of 20 million € in total for all groups of beneficiaries, however the details of the programme are not yet elaborated.
- Another source could be the Latvia's Modernisation Fund, The draft of the priority directions for the 2023-2025 period states as one of the priority directions the support for energy communities[dlxxxvi].
- Latvia's Plan of the Recovery and Resilience Facility[dlxxxvii] does not address energy communities.
- Public involvement in energy production using zero-emission technologies is generally categorised as low and most potential self-consumers still do not have access to incentive mechanisms
- At the same time new (2022) financial support programme for homeowners' energy self-production (described in the section "Renewable energy support regime" above) seems rather effective as it results in boom of solar PV technologies.
- There are no quantified targets for RES community energy development stated in the Latvian NECP 2020-2030.[dlxxxviii]

Evaluation of the legal framework

An assessment is provided in the publication "Comparative Assessment of Enabling Frameworks for RECs and Support Scheme Designs." [dlxxxix]

- Several key elements are missing in the legal and regulatory framework. The removal of barriers and the development of an effective enabling framework is particularly important.

- Existing support instruments are not sufficient. Financial support instruments are needed, accompanied by a differentiation of distribution system services' tariffs and in combining information, capacity development with economic incentives[dxc]

* An updated assessment is available at the REScoop Transposition Tracker[dxci].

Existing citizen energy projects and/or research initiatives

Citizen energy projects

Mārupe - Pilot project in the EU Interreg programme Co2mmunity project[dxcii]

"Analysis performed addresses the possibilities to develop renewable energy community projects in Mārupe municipality. The study assesses community formation opportunities in the municipality for the production of electricity and / or heat using renewable energy sources, as well as outlines possible solutions for existing resident communities."[dxciii]

Pilot projects, within the extension project Energize Co2mmunity (see below) are sited (solar technologies installed in 2020) in the two sites: (1) the multi-apartment building (solar heat collectors for pre-heating of water for heating and solar PV panels to supply common premises)

	and (2) the row-houses building (6 sections-apartments, solar PV rooftop panels on the rooftop section with individual inverters for each section).[dxciv]
Research and capacity building activities	**EnergyPROSPECTS** - PROactive Strategies and Policies for Energy Citizenship Transformation (Horizon2020 programme project)[dxcv], - Time: May 2021 – April 2024 - 9 partners from nine countries - Partner in Latvia: University of Latvia (Faculty of Geography and Earth Sciences), - Lead partner: National University of Ireland Galway
	COME RES: Community Energy for the uptake of RES in the electricity sector. Connecting long-term visions with short term actions (Horizon 2020 programme project)[dxcvi] - Time: September 2020 – February 2023 - 16 partners from nine countries - Latvian Stakeholder Desk founded, in January 2021 the first stakeholder workshop hold[dxcvii] - Partners in Latvia: Latvian Environmental Investment Fund, Institute of Physical Energetics - Lead partner: Free University Belin (Germany)
	Co2mmunity[dxcviii] - co-funded under the INTERREG programme - project partners consortium consisted of 8 organisations including government, energy agencies, a municipal utility, and universities from eight different countries within the Baltic Sea Region - Riga Planning Region project partner in the first project mission had been to facilitate community energy (CE) project development as part of a transition to RES via creating local partnerships for energy project development, providing knowledge, developing tools, and organising stakeholder meetings - Latvian Handbook for Community Renewable Energy Project Development developed in the project - The study "Assessment of the Technical, Financial and Legal Aspects of the Implementation of Community Energy Projects" includes an analytical overview of the feasibility and constraints of implementing specific types of renewable energy community projects.[dxcix]
	Energize Co2mmunity[dc] - extension project of the original Co2mmunity project - 10/2020-09/2021 - Aim: Real-life implementation of renewable community energy projects.

		Lead Partner: Kiel University, Working Group Economic Geography
		Power Poor: Empowering Energy Poor Citizens through Joint Energy Initiatives (Horizon 2020 programme project)[dci] - Time: September 2020 – August 2023 - 15 partners from eleven countries - Partner in Latvia: Zemgale Regional Energy Agency - Lead partner: National Technical University of Athens
Relevant actors and stakeholders	**NGOs**	- Green Liberty - Baltic Environmental Forum - Pilsēta cilvēkiem (City for People) - Latvian Association of Solar Energy
	Governmental bodies	- Ministry of Economics - Ministry of Environmental Protection and Regional Development - A new Ministry of Climate and Energy (started 01.01.2023) - The State Construction Control Bureau of Latvia (authority responsible for registration of energy communities) - the Public Utilities Commission (Regulator) - Latvenergo AS (state owned electric utility company) - Distribution System Operator (DSO) *Sadales tīkli AS*[dcii] *(subsidiary of Latvenergo AS, covering 99% of the Latvian territory)*
	Local governments	- Latvian Association of Local and Regional Governments - Municipalities of Rīga Mārupe, Rēzekne etc. - Riga city Energy Agency
	Planning regions[dciii]	- Riga Planning Region - Vidzeme Planning Region
	Private actors	- Ltd. “Ekodoma” -
	International/ supranational actors	
	Academia	- Riga Technical University: Institute of Power Engineering, Institute of Energy Systems and Environment - Institute of Physical Energetics - University of Latvia
	Others	- Zemgale Regional Energy Agency - Latvian Environmental Investment Fund - Latvian Rural Forum[dciv] - Association “Green and Smart Technology Cluster”[dcv]

Summarizing evaluation

Fields of Action	- Launch targeted information campaigns demonstrating feasibility, principles, functioning mechanisms, benefits, drawbacks and support for collective citizen and community energy projects - Disseminate good practice examples from Latvia and the neighbouring countries Estonia and Lithuania, as well as other countries - Promote the development of pilot projects of energy communities in the rural areas of Latvia - Fully transpose the recast Renewable Energy Directive (REDII) and Electricity Market Directives and develop secondary legislation specifying the needed details including proximity rules and rules for electricity sharing - Provide an effective enabling framework for renewable energy communities pursuant to the provisions laid down in Article 22(4) of RED II. - Establish effective support schemes for RES in general and for energy communities in particular. Support schemes for renewable energy communities should cover the different phases of a community energy project providing pre-investment, investment and operational support. - Encourage energy sharing and collective self-consumption in multi-family apartment buildings and consider introducing differentiated distribution system service tariffs. - Assess the solar PV potential of public/municipal roofs including sport facilities, schools, kindergartens etc. and the extent to which citizens might be involved in the utilization of solar PV technologies and benefit directly or indirectly via co-ownership, energy sharing etc. - Assess the suitability of public/municipal land for the development of community wind farms or community solar PV farms (ground-mounted) - Inform municipalities of the benefits of community energy and provide capacity building, training and networking; encourage the participation of public / local authorities in community energy projects - Establish single contact points providing information and support for municipalities, citizens and SMEs on existing initiatives, good practices, availability of financial support, administrative procedures etc.

State Montenegro

General information	**Status EU membership**	Aspiring EU membership signatory of the Energy Community Treaty, day of accession 1 January 2007[dcvi]
	Population	621,306 (2020)[dcvii]
	Land area (km²)	13,450 km² (2020)[dcviii]
	Urban population (%)	67 % (2020)[dcix]
Socio-economic situation	**GDP (current US$ billion)**	4.77 (2020)[dcx]
	GDP per capita (EURO)	6,740 (2020)[dcxi]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	3,960 (2019)[dcxii]
	Median hourly earnings (EURO)	Males: 3.39 (2014) Females: 3.45 (2014)[dcxiii]
	World Bank economic classification (2021)	Upper-middle-income country[dcxiv]
	Unemployment (% of total labor force)	15.9 % (2020)[dcxv]

Energy situation in general	**Current energy sources**	- **Installed capacity** of electricity generation facilities (2019): coal 21.9%, large hydropower 63.1%, small hydropower 3.4%, wind 11.5%, solar 0.2%[dcxvi]
		- **Electricity Generation in 2020** consisted of[dcxvii]:
		  ○ Non-renewable 1 615 GWh (48%)
		  ○ Renewable 1 771 GWh (52%), of which:
		  ▪ Hydro and marine 1 448 GWh (43%)
		  ▪ Solar 8 GWh
		  ▪ Wind 315 GWh (9%)
		- 50% of gross energy production is from hydropower [dcxviii]
		- **Two existing wind farms**, Krnovo (72 MW) and Možura (46 MW) [dcxix]

	- **Slow in developing solar**, by end of 2019 only 2MW installed, launched a huge 262 MW solar project at Briska Gora near Ulcinj[dcxx] - **Heating:** most common forms for residential buildings are heated with wood, electricity and coal, no district heating systems; plans for biomass district heating development in several towns, such as Nikšić, Rožaje, Bijelo Polje, Kolašin and Žabljak[dcxxi] - 100% import of oil and its derivates + natural gas[dcxxii] - In 2021 exploratory drilling for oil and gas in the Adriatic started[11] - No gas import network - Unsustainable exploitation of forest[dcxxiii]
Climate protection targets	- Has to achieve **decarbonization by 2050** (for EU membership) [dcxxiv] - Signatory to the Green Agenda for the Western Balkans (November 2020) [dcxxv] - Nationally Determined Contributions submitted to the UNFCCC (06/2021), with a target of **35% GHG emission reduction by 2030 compared to 1990**[dcxxvi] - **National Energy and Climate Plan (NECP**) under development but no draft presented to the public as of March 2022[dcxxvii] - Has not set a coal or fossil fuel phase-out date, but Montenegro has **joined the Powering Past Coal Alliance** and committed to **stop using coal by 2035** at the latest.[dcxxviii] - Notion that commitments are not taken seriously[dcxxix]
Renewable energy targets	- 35.9%[dcxxx] share of renewable energy in the total final energy consumption in Montenegro by 2020, met in 2018 & 2019[dcxxxi] - In 2019, Montenegro registered a 37,37% share of renewable energy, exceeding its overall 2020 target[dcxxxii] - The share of renewables in transport below 1 in 2020[dcxxxiii] - 44.8% of RES in end-consumption **in 2030**[dcxxxiv] - 10% of RES share in transport for **2030**[dcxxxv]
Renewable energy potential	- Government announced in 2020 that it would ban small new hydropower plants and review all existing concession agreements.[dcxxxvi] - Predominantly **hydro and wind** (85% and 15%, respectively, in renewable capacity in 2020), solar 1% in 2020.[dcxxxvii] - 50 MW Mozura wind farm;[dcxxxviii] 72 MW Krnovo windpark[dcxxxix]100 MW Brajici wind farm to be built;[dcxl] 262 MW Briska Gora PV plant to be built.[dcxli] - In May 24- June 2, 2019, Montenegro for the first time produced enough energy from renewable sources to meet all its needs.[dcxlii] - **A significant small hydropower plant lobby** (from 2008) presented as a development chance for MNE and considered within the national targets for RE (Concessions = auctions system + energy permits later); investors gained numerous benefits such as RE subsidies (non-systematic and ad hoc).[dcxliii]

	- 70% of MNE territory covered in **forests**; no state entity undertakes actions of cutting, extracting and selling wood; concessions favor financially stronger investors over local producers.[dcxliv] - Montenegro's main seaport, the Port of Bar, has signed a memorandum of understanding with Singapore-based LNG Alliance on the **construction of a liquefied natural gas (LNG) terminal and a 100 MW gas-fired power plant**.[dcxlv]
Renewable energy support regime	- As of Jan 1, 2020, the government started **reducing feed-in tariff** for renewable energy[dcxlvi] - A RES support scheme was part of the final electricity price until mid-2019. A RES fee is now paid by end-users for every kWh above 300kWh consumed monthly, the report underlines.[dcxlvii] - **August 2021**: The Investment and Development Fund (IDF) and Environmental Protection Fund (Eco Fund) of Montenegro launched a credit line for companies, entrepreneurs, and farmers for the installation of solar power units with a possibility of subsidizing the loans with grants. The documentation indicates grants available for rooftop solar power systems of at least 3 kW.[dcxlviii] - Selected for the **Cities mission EU climate-neutral and smart cities program**[dcxlix] (funded by Horizon Europe). - **CO2 taxation** introduced **in 2020** in line with the EU ETS rules.[dcl] - Renewable energy producers enjoy **priority dispatching.**[dcli] - A **netting scheme** for self-consumption is indicated in the supply contract, obliging suppliers to purchase the surplus of electricity produced after the annual settlement at the price of energy. It resulted in nine self-consumers by September 2021. [dclii] - „**Privileged Producer**" to sign a contract with the Montenegrin Energy Market Operator (COTEE) in order to receive a fixed price per kWh for the supplied electricity[dcliii] - **April 2022:** Montenegro's new government sees green energy as main economic driver.[dcliv]

Relevant laws, policies, and plans

- Energy policies are in limbo
- **2016 Law on Energy** (2017 and 2020 amendments)[dclv]
- **2020 Energy Strategy** – retention of big hydropower and thermal plants – to lower energy dependence to 25% in 2030[dclvi]
- A cap-and-trade scheme introduced for major CO^2 emitters in February 2020[dclvii]
- **National action plan for the use of renewable energy** until 2020 – target of 33% share of renewable energy by 2020
- Tariff System Decree
- No RE law per se

Legal and political framework for citizen energy

Regulatory framework for citizen energy

- The power supplier, national energy giant EPCG, is obligated to purchase surplus electricity from owners of photovoltaic units.[dclviii]
- **The Law on Energy**, allows all consumers to install units of a maximum of 50 kW and send excess power into the grid.[dclix]
- in (June) 2020 the government made changes to the Law on Energy, among other, with the aim of making it easier for prosumers to connect to the grid. [dclx;dclxi]
- The Ministry of Economy in 2020 has provided funds in the budget for subsidies for loans for installing PV systems; citizens shall be able to receive interest-free loans from private banks.[dclxii]
- The procedure for connecting to the grid has been shortened from 7 to 3 steps.[dclxiii]

Evaluation of the legal framework

- Overall seen as good in transposing EU directives but not good in implementing them[dclxiv];
- In 2020 top-scoring country in the Energy Community's implementation report and considered among the more progressive countries in the region concerning energy[dclxv]
- Decentralization aspect of energy transition has been largely neglected, except for highly controversial small hydropower plants. [dclxvi]
- State institutions are not adequately prepared for managing the transition process.[dclxvii]

*Energy Community provides an updated assessment of implementation performance and key energy sector data, including in the field of renewable energy and energy efficiency[dclxviii]

Existing citizen energy projects

Citizen energy projects

Solari 3000+ and Solari 500+ (11/2021-ongoing), EPCG and Eco fund funding

As of Nov 1, 2020, EPCG, MNE energy utility and ECO fund (1/5 of funds) issued a call for **Solari 3000+** (citizens, 3,5,7 or 10kW integrated for individual objects and 30kw for citizens and companies) and **Solari 500+**

		(companies) projects. It was a public call for subsidies (20%) in installing solar panels on individual households.[dclxix] Consultations, technical and logistics support are envisioned for the project users.[dclxx]
	Research and capacity building activities	**Solar Adria (10/2020-09/2022), EUKI funding** - Lead: Energy institute Hrvoje Požar, Kroatien - fosters the participatory planning of solar energy utilization - provides local decision makers with a "How To" guide and with access to a SOLAR ADRIA platform - workshops in Croatia and Slovenia, a seminar in Montenegro, and a regional final conference[dclxxi]
Relevant actors and stakeholders	**NGOs**	- Eco Team[dclxxii] - The Nature Conservancy (TNC), Bankwatch - Think – thank LEAN
	Governmental bodies	**Ministry of Ecology, Spatial Planning and Urbanism** - Running an Eco Fund for energy efficiency measures[dclxxiii] **Ministry of capital investments** - wants to play a role in RES[dclxxiv] **State-owned power utility Elektroprivreda Crne Gore (EPCG)** [dclxxv]
	Local governments	**Podgorica** - on the way to completely cover public lighting with LED technology - The local authority is preparing energy efficiency measures for several buildings in cooperation with international partners[dclxxvi]
	Private actors	**KOD Podgorica** - Research papers on natural goods, small hydropower plants, woods, and biomass - Alliance from Podgorica (the status of a 'privileged producer of energy' in the next 12 years[dclxxvii] - **Elektroprivreda Crne Gore (EPCG**)[dclxxviii] - Green Home **Podgorica** - Youth Network of Montenegro
	International/ supra-national actors	-

	Academia	Faculty of Mechanical Engineering
	Others	Vice President of the Parliament of Montenegro

Summarizing evaluation

Fields of Action	- Raise awareness on the importance of RES, CE and Energy Cooperatives for individual households / buildings / public institutions - Promote ***public dialogue about energy transition and in particular the role of citizen energy and opportunities for energy savings***. [dclxxix] - Government needs to show greater willingness to drive this transition, ***NGOs and independent experts can play a strong role in ensuring this happens, communicating with the public*** and building partnerships. [dclxxx] - Give particular emphasis to ***energy efficiency*** (e.g. reducing distribution losses, insulating houses, installing heat pumps instead of old-style electric heating) and consider links to ***energy poverty***. [dclxxxi] - **Build capacity** of non-state actors expressing interest or already involved in CE, designate clear roles to actors, promote **and enable networking,** expertise/knowledge/practices sharing - Promote a more decentralized, bottom-up, diverse and inclusive approach to CE

	State	**Republic of North Macedonia**
General information	**Status EU membership**	Candidate for accession since 2005, Accession Negotiations opened in July 2022[dclxxxii]
	Population	2,081,104 (2022)[dclxxxiii]
	Land area (km²)	25,713 (2022)[dclxxxiv]
	Urban population (%)	58% (2022)[dclxxxv]
Socio-economic situation	**GDP (current US$)**	13.889 million (2021)[dclxxxvi]
	GDP per capita (US$))	6,720.9 (2021)[dclxxxvii]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	5,847.84 (2022)[dclxxxviii]
	Median hourly earnings (EURO)	2.59 (2018)[dclxxxix]
	World Bank economic classification (2021)	Upper middle-income economy[dcxc]
	Unemployment (% of total labor force)	15.8% (2022)[dcxci]
Energy situation in general	**Current energy sources**	- Main electricity generation capacity consists of coal-fired thermal power plants and hydropower plants. The total installed capacity is 2.09 GW with 49.5 % thermal power plants (coal), around 33.4 % large and small hydropower plants, 13.8 % gas combined heat and power plants and 3.2 % other renewables.[dcxcii] - Electricity mix – total gross electricity production in September 2022 (preliminary data): 48.9% thermal power plants, 30.4% CHP plants; 18.4% hydro power plants; 1.6% wind power; 0.4% solar power; and 0.3% biogas plants.[dcxciii] - North Macedonia has one of the highest shares of import of electricity among the countries in the region; the share fell from 33.5 % in 2015 to 24.4 % in 2019. [dcxciv] - In case of electricity generation in 2020, 1 475 GWh (28 %) is generated from renewable sources[dcxcv], from them: o Hydro and marine: 1 277 GWh (24 %) o Solar 24 GWh

	○ Wind 117 GWh (2%) ○ Bioenergy 57 GWh (1%)[dcxcvi] - Renewables installation has grown very slowly but is expected to speed up. [dcxcvii] - The share of renewable energy in gross final energy consumption (calculated with actual values) in 2020 is 17.7%[dcxcviii] - Share of households in the total number of households by primary energy commodity used for heating in 2019: 49.18% fuelwood; 31.30% electricity; 10.25% district heating; 8.49% pellets; 0.51% heating oil; 0.17% coal; and 0.10% LPG[dcxcix] - In 2021, the installed capacity of PV is 45 MW[dcc]
Climate protection targets	- Second Nationally Determined Contribution (NDC) adopted, with a target of 51 % GHG emission reductions by 2030 compared to 1990 levels. [dcci] - North Macedonia intends to decrease the GHG emissions by 82% compared to 1992, by promoting the transition of the energy sector to low carbon technologies. Key goals include: gradual closure of the only coal-fired power plants TPP Oslomej and TPP Bitola by 2027, and the acceleration of the use of renewables for electricity production in combination with energy efficiency measures in all sectors. - A CO_2 tax will be introduced, to accelerate the phasing out of conventional fuels and stimulate investment in renewables and energy efficiency.[dccii] - According to the Energy Strategy, coal phase-out is planned by 2025[dcciii]
Renewable energy targets	- In 2019, renewable energy sources accounted for 16.8 % of gross final energy consumption, lower than in previous years, due to poor hydrological conditions.[dcciv] - The country has not reached its estimated share of renewables of 23% in the final energy consumption by 2020[dccv]. - The draft NECP states a target of "38 % share of renewable sources in gross final energy consumption by 2030". [dccvi] - The share of renewables in electricity is set at 46 % by 2025, with an intermediate target of 34 % for 2022, and 37 % for 2023.[dccvii] - According to the draft national energy and climate plan (NECP), the objective is to install up to 400 MW in PV rooftop systems by 2040 – either by the prosumers or systems from which the overall produced electricity will be used for self-consumption.[dccviii]
Renewable energy potential	- According to IRENA, the renewable energy potential includes around 65% of land area for the annual generation per unit of installed PV capacity (KWh/kWp/y) of 1200-1400; around 85% of land area for wind power density at 100m height (W/m) of below 260; and average net primary production of biomass (tC/ha/yr) of 5.5[dccix] - 79 242 households in 2019 had installed solar collectors, out of which 78 093 were in use[dccx] - Potential of solar and wind is underused.[dccxi]

		- Estimated moderate potential for wind power throughout the country, on patches of lands mostly located in some of its larger valleys and plateaus.[dccxii] - "Large and small hydropower plants, solar power plants, and those fueled by biogas and biomass, with a combined capacity of 795 MW, together produced 1,662 GWh in 2021, or 31.4% of the country's total electricity output. Large hydropower plants accounted for most of the output, or 68%, followed by small hydropower plants, 19%, and wind farms, 6%. The biggest drivers of the green energy growth in 2021 were large hydropower plants, with an increase in production of over 10%, and photovoltaic power plants, whose output rose 38%, from 37 GWh in 2020 to 51 GWh."[dccxiii]
	Renewable energy support regime	- A more updated renewables incentives scheme compared to its neighbours, - Expensive and damaging feed-in tariff scheme in place for small hydropower, giving it an advantage over other less damaging sources of energy. [dccxiv] - Will continue its current support mechanisms for renewables electricity generation via feed-in tariffs and feed-in premia with auctions (granted in a tendering procedure). - Will promote further utilization of RES in the electricity sector (without incentives), but also in the other sectors through the introduction of the 'prosumer' concept, as well as by increasing the biofuels consumption in the transport sector."[dccxv]
	Relevant laws, policies, and plans	
		- The Energy Law, adopted in 2018, transposed the Third Energy Package in the electricity and natural gas sector, introduced a new renewable energy support system. [dccxvi] - The **Energy Efficiency Law** adopted in February 2020, with the relevant by-laws, transposes the EU Energy Efficiency Directive 2012/27/EU, Energy Performance of Buildings Directive 2010/31/EC and a package of regulations for energy efficient products (labelling and eco-design). [dccxvii] - "An **Energy Strategy** was adopted in December 2019. The Energy Strategy depicts three scenarios – Reference, Moderate Transition and Green – which reflect different dynamics of energy transition."[dccxviii] - "Development of a **Long-term Strategy** and a **Law on Climate Action** is underway as of May 2021." [dccxix] - The National Energy and Climate Plan (NECP) adopted in 2022, covering the period from 2021 to 2030.[dccxx] NECP envisages savings of 20.8% for the consumption of final energy and 34.5% for primary energy compared to the business-as-usual scenario."[dccxxi] - In July 2022 households were grouped into 4 blocks based on their energy consumption (210 kWh; 211-630 kWh; 631-1050 kWh; and above 1050 kWh) which correspond to a block tariff with a corresponding price – respectively (4,3484 denar/kWh; 4,7017 denar/kWh; 5,2877 denar/kWh, and 14,1025 kWh)[dccxxii]
Legal and po-	**Regulatory framework for citizen energy**	

- With the new Law on Energy from 2018 **consumers can become active actors in the electricity market** and start producing electricity for their own needs, and when they have a surplus of their production, to **transfer that surplus to the electricity network**.[dccxxiii]
- The terms "prosumers" or "citizen energy" have not been officially used until recently. The new **National Energy and Climate Plan** submitted to the Energy Community in its final draft in early October 2020, provides for about 400MW of solar energy to be generated by households PVs and included into the country's energy mix. This provision is opening a pathway for citizen energy, energy communities and prosumers; the Ministry of Economy used the term during an official press."[dccxxiv]
- "In accordance with the **Law on Energy from 2019**, prosumers have been introduced as power market participants in North Macedonia. In June 2022, the Minister of Economy presented the changes in the rulebook on renewable energy sources, to enable citizens and companies to produce electricity on their roofs and sell it to a buyer or the power distribution company. The amendments came into force in July 2022.[dccxxv]
- The electricity market liberalization process in the country decreased prices for small commercial customers by about 32 per cent in 2019 as a result." [dccxxvi]
- New supportive regulations for energy prosumers introduced in July 2022[dccxxvii]
- Program for Promotion of Renewable Energy and Support of Energy Efficiency in Households for 2021.[dccxxviii] It aims to co-finance solar collectors, windows, pellet stoves and PVs. Certain measures address vulnerable consumers.
- Program for Protection of Energy Vulnerable Consumers for 2022[dccxxix] (less about citizen energy, but still of relevance)
- The most important development is the introduction of the possibility of natural persons since July 2022 to sell the excess electricity from PV to the grid.[dccxxx] However, there has been reports about many administrative obstacles and no official reports about the implementation of this measure in practice despite reports about citizens' interest

Evaluation of the legal framework

The report "The Political Economy of Energy Transition in Southeast Europe – Barriers and Obstacles" [dccxxxi] provides some insights:

- The **political will** for energy transition seems to exist, but there is **lack of capacity and professional staff at the local and national level**, and financial resources are insufficient to implement existing legislation. [dccxxxii]
- **Cooperation and coordination** between central government institutions, as well as between government and municipalities is weak; local government measures are often not in line with national policies and plans. [dccxxxiii]
- Energy poverty in households needs a systematic approach that reaches also the most marginalized groups. [dccxxxiv]
- Explicit links between energy poverty and energy/climate policies (NECP, Energy Strategy, Energy Law, Renewable Energy Strategy, Household Support Program).[dccxxxv] Overall issue is the lack of implementation of policies due to lack of funds and human capacities

*Energy Community provides an updated assessment of implementation performance and key energy sector data, including in the field of renewable energy and energy efficiency[dccxxxvi]

Existing citizen energy projects and/or research initiatives	**Citizen energy projects**	
	Research and capacity building activities	A description of potentially favorable conditions and likely supportive NGOs is provided by Srgjan Vidoeski (2021) in a Policy Brief by the Heinrich Böll Stiftung in Sarajevo [dccxxxvii]
		"Transformation Towards Energy Democracy" events in 2020 and 2021, webinars organized by Green European Foundation and Sunrise[dccxxxviii]
Relevant actors and stakeholders	**NGOs**	- Center for Climate Change
		- Macedonian Solar Association
		- Macedonian Academy of Sciences
		- Youth Eco-Activism | Education for Climate Change | Social Inclusion for Green Economy
		- SUNRISE (Association for Sustainable Social and Economic Development- ASSED) from the civil sector [dccxxxix], [dccxl]
		- Association for Education Development EKVALIS in Skopje, North Macedonia[dccxli]
		- Community Development Institute
		- Center for environmental research and information Eko-svest
		- Macedonian Ecological Society
	Governmental bodies	- Ministry of Economy of North Macedonia
		- Ministry of Transport and Communication
		- Regulatory Commission for Energy of North Macedonia
		- Municipality of Brvenica
		- Municipality of Karposh, Skopje

	Local governments	- Municipality of Centar, Skopje
	Private actors	
	International/ supra-national actors	- UNDP Macedonia - Heinrich Böll Stiftung – Regional Office Sarajevo - Friedrich-Ebert-Stiftung Skopje Office
	Academia	- Central European University - EHT Zürich
	Others	- Association for Education Development EKVALIS in Skopje, North Macedonia, one of the co-founders authored the Policy Brief (2021) for Heinrich Böll Stiftung Sarajevo on "North Macedonia: Energy Transition and Democracy"; Activist and co-founder of - Centre for Social Sciences, Hungary / Analytica, North Macedonia / ZIP Institute, North Macedonia - Bidi Zelen, North Macedonia

Summarizing evaluation

Fields of Action	- Needs include: **Legislative changes**; **Simplification of the procedure for installing solar photovoltaics** on households and connecting them to the distribution network; **changes in the implementing legislation for the Energy Law** and enabling consumers who are supplied by the universal supplier to be able to become prosumers and build photovoltaic power plants on their roofs.[dccxlii] - Further promotion of RES, education, awareness raising, capacity building is needed, increased public participation by networking between relevant stakeholders - Energy poverty, energy efficiency and renewable energy remain topics rarely mentioned by national media.[dccxliii] Journalists' expertise on the topic should be developed. - "Local authorities need to adapt their plans to the national ones as well as proposing national-level measures. They need to support the measures with additional local funds and to implement the schemes, if necessary, pro-actively seeking international funds for more complex projects." [dccxliv] - Lobbying to increase governmental financial support for CE projects, or on municipal level, and educating interested parties on other ways to finance their CE projects in development - Further promotion of the possibilities for connecting own produced electricity and supporting the NGOs in their efforts and background work, while engaging the local communities to give their support as well - Collaboration and exchange of experiences, both on local and national level, and internationally through partnerships from the region and EU - Further work in supporting the several initiatives eager to officially form energy cooperatives, further support of researchers engaging the actors and creating networks - Work on visibility and promotion of the legal changes that allow development of CE projects, and increased collaboration between local authorities and other actors for smoother and fasted permitting process.

	State	Poland
General information	**Status EU membership**	Member State since 1 May 2004[dccxlv] Participant of Energy Community since 6 October 2011[dccxlvi]
	Population	37,950,802 (2020)[dccxlvii]
	Land area (km²)	306,170 km² (2020)[dccxlviii]
	Urban population (%)	60 % (2020)[dccxlix]
Socio-economic situation	**GDP (current US$ billion)**	679,444 (2021)[dccl]
	GDP per capita (EURO)	13,750 (2021)[dccli]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	5,504.27 (2021)[dcclii]
	Median hourly earnings (EURO)	Males: 5.17 (2018) Females: 4.72 (2018)[dccliii]
	World Bank economic classification (2021)	High - income economy[dccliv]
	Unemployment (% of total labor force)	3.4% (2021)[dcclv]
Energy situation in general	**Current energy sources**	Oil – 1,28 PJ, Biofuels and Waste – 0,49 PJ, Gas – 0,76 PJ, Coal – 1,89 PJ (2021)[dcclvi] Electricity Generation in 2020 constituted the following[dcclvii]: ○ Non-renewable (mostly fossil fuels): 129 816 GWh (82%) ○ Renewable: 28 260 GWh (18%), out of which ○ Hydro and marine 2 118 GWh ○ Solar 1 958 GWh (1%) ○ Wind 15 800 GWh (10%) ○ Bioenergy 8 384 GWh (5%)

Climate protection targets

- Poland's energy policy up to 2040, approved in February 2021, sets a target of at least a 23% RES share by 2030.
- In electricity generation, the 2030 RES share should reach at least 32% while the share of coal should not exceed 56 %.
- Offshore wind capacity should reach 5.9 gigawatts (GW) in 2030, and PV - 7GW.
- The heating sector should reach a RES share of 28 %, and the transport sector 14%, with a strong contribution from electromobility. Nevertheless, in its NECP assessment, the Commission finds Poland's 2030 RES target to be unambitious[dcclviii].

Renewable energy targets

21-23% of RES share in gross final energy consumption by 2030 (total consumption in electricity, heating and cooling as well as for transport purposes)

Renewable energy potential

Type of renewable energy source	Real economic potential - final energy	Utilization of economic potential in 2020 (real market potential)	
	[TJ]	[TJ]	[%]
Biomass:	**600167.8**	**533117.5**	**88.8**
solid dry waste	*165930.8*	*149337.7*	*90.0*
biogas (liquid waste)	*123066.3*	*72609.1*	*59.0*
wood (forests)	*24451.8*	*24451.8*	*100.0*
Energy crops	*286718.9*	*286718.9*	*100.0*
Wind energy	**444647.6**	**119913.3**	**27.0**
Solar energy:	**83312.2**	**19422.2**	**23.3**
thermal	*83152.9*	*19262.9*	*23.2*
photovoltaic	*159.3*	*159.3*	*100.0*
Hydropower	**17.9744**	**11.144,2**	**62.0**

2020, IEO[dcclix]

Renewable energy support regime

- Until mid-2016 green certificate program
- Since 2016 and still today "the main incentive for renewable energy use in Poland are tenders" (auctions); these are a "technology-neutral tool for promotion of RES"[dcclx]
- Owners of small biogas and hydro plants are eligible for a Feed-in tariff (up to 500 kW) or a FIP (0.5-1 MW).[dcclxi]
- As of April 2022[dcclxii], a support system based on the net-billing system is in place for RES micro-installations: surplus energy produced by the prosumer is sold at the market price[dcclxiii]. From the accumulated surplus, the prosumer can cover the cost of electricity, the unused middles are partially forfeited after a year and partially (20%) can be paid out.

- With the change of the electricity prosumption support system to net-billing, the definition of a collective prosumer (a group of end users/prosumers limited to one multi-apartment building) and the definition of a virtual prosumer (the installation does not have to be connected to an energy consumption site) were introduced into law. The latter will take effect in July 2024.
- Since 2019, new legal provisions dedicated to energy cooperatives enable using the discount scheme previously intended only for prosumers, however, the ratio of the energy fed into the grid and the energy that can be collected later for the energy cooperative is slightly less favourable (1 to 0.6).[dcclxiv]
- Energy cooperatives obtained several other privileges under the new regulations: Electricity collected by an energy cooperative as part of the settlement with the obligated seller is not subject to charges for the distribution service; The amount of energy generated and directly consumed by the members of the cooperative does not include the RES fee, the cogeneration fee and the capacity fee; The obligations to redeem certain energy certificates of origin do not apply; The energy received as part of the discount will not be subject to excise tax if the total capacity of the RES installation does not exceed 1 MW.[dcclxv]
- "Producers of electricity from renewable sources are exempt from the tax on the sale and consumption of electricity."[dcclxvi]
- In 2023, energy prices for residential customers up to certain consumption limits (2,000 kWh / 2,600 kWh / 3,000 kWh) were frozen at the level of tariffs for trading companies from January 2022. For energy consumption above these volumes, the energy seller will not be able to charge a price higher than PLN 0.693/kWh. Distribution charge rates for household customers have also been frozen to the aforementioned consumption limits[dcclxvii].

Legal and political framework for citizen energy	**Relevant laws, policies, and plans**
	- National Energy and Climate Plan for the years 2021 – 2030
	- Renewable Energy Sources Act (of 20 February 2015) (revised in 2016, 2017, and 2019)[dcclxviii]
	
	Regulatory framework for citizen energy
	- Renewable Energy Sources Act (RES Law)
	  - Includes energy clusters, energy cooperatives, support for prosumers and a range of rules and conditions for conducting activity in the field of electricity generation, agricultural biogas, heat and bioliquids; defines terms such as: renewable energy prosumer, micro installation, small installation, energy cluster and energy cooperative.
	  - Defines **'energy clusters'** as civic-law agreements with diverse parties including natural persons, legal persons, scientific units, research institutes and local-government units.[dcclxix]
	  - "The concept of energy clusters was introduced for the first time in 2016 with the definition of energy clusters in the Amendment to the RES Act."[dcclxx]

Legal and political framework for citizen energy

- An **energy cooperative** is a form of assembly available for people who want to produce energy from renewables. According to the RES Act's definition, an energy cooperative is an administrative unit whose legal personality is stipulated in the Cooperative Law.[dcclxxi]
- An energy cooperative may be:
  - "in the territory of a rural or urban-rural municipality or in no more than three such municipalities directly adjacent to each other"
  - based on "the generation of electricity or biogas, or heat in RES systems", "the balancing of the demand for the auxiliaries of the energy cooperative and its members"
- "The difference between energy cooperatives and energy clusters is that cooperatives have a legal entity. This impacts how agreements are made – energy cooperatives may sign them on their own, whereas a cluster can sign them only through its coordinator."[dcclxxii]

- A new net-billing mechanism for renewable energy prosumers was introduced in April 2022.
  - Two new definitions of prosumption were implemented into the law:
    - virtual prosumption ("dedicated for installations that are not physically connected with the owners (energy consumers). A similar model as introduced in Lithuania. In this model prosumer will be using a part of privileges that regular prosumers have (e.g. net-metering scheme)")
    - collective prosumption (dedicated for multi-family buildings)[dcclxxiii]
- The May 2021 draft UC74[dcclxxiv] amendments to the RES Act propose to introduce the following definitions derived from European legislation:
  - contract with dynamic price (allows to respond to market signals) and active customer;
  - definition of energy aggregator and aggregator;
  - direct line;
  - definition of flexibility services;
  - definition of citizen energy community;

  However, these changes have not been implemented into law.
- The February 2022 draft UC99[dcclxxv] amendments to the RES Act propose to introduce the following definitions derived from European legislation:
  - partnership trading of energy from renewable sources (P2P)
  - proposed support system for energy clusters

  These changes have not been implemented into law.
- **Establishing CECs in the cities is not allowed**[dcclxxvi] - this makes housing cooperatives relevant in developing citizen energy projects
- **National Fund for Environmental Protection and Water Management** provides grants in the "Prosument Programme"[dcclxxvii]

Evaluation of the legal framework

- The RED II requirements are not fully implemented yet, but the ministries are working on changing the regulations.
- There is a lack of regulations that would enable any business models for community energy, which would ensure competitiveness in the energy market.[dcclxxviii]
- The energy cooperatives model is not very popular, because cooperatives do not generate profit. [dcclxxix]
- The current Polish energy regulation makes self-consumption in multi-apartment buildings possible, but Cultural socio-economic barriers remain. "Cultural barriers refer to the distrust felt by Polish citizens towards cooperative and collective models of social organisation. This is since cooperatives are negatively associated with state socialism"[dcclxxx]

*An updated assessment is available at the REScoop Transposition Tracker[dcclxxxi]

Existing citizen energy projects and/or research initiatives

Citizen energy projects

The Pszczelna Solar Housing Community is the first community in Szczecin, Poland, to install a PV system.[dcclxxxii]

- the municipality of Szczecin created a local funding scheme under a national grant program to support "prosumption" in multi-apartment buildings.
- "the solar PV installation provides electricity for the common parts of the building (staircase lights, elevators, parking space lights, etc.). Surpluses from the solar PV system are sold to the network operator."[dcclxxxiii]
- The key actors were two ambitious and progressive project managers who had close contact with the housing community residents. Another important actor was an energy advisor from the National Fund for Environmental Protection and Water Management in Szczecin. He provided the two project managers with information and advice, specifically regarding the legal, financial, and organisational aspects of the "Prosument Grant Programme"[dcclxxxiv].
- The managers dealt with obstacles by organising several information sessions to address citizens' worries and knowledge gaps regarding the solar project. In addition, they **capitalised on the enthusiasm and environmental awareness of the younger apartment owners who were interested in reducing their carbon footprint**.

- Zgorzelecki Energy Cluster
- Żywiecki Klaster Energii

Housing Cooperative Wrocław South (HCWS) - one of the largest housing cooperatives in Wroclaw.

HCWS operates on the basis of Polish Housing Cooperatives Act. The history of HCWS dates back to 1946 when the Wroclaw Housing Cooperative was established as the main housing cooperative in the city. After 1989, the Wroclaw Housing Cooperative was divided into five

	smaller housing co-ops, including the HCWS which manages 102 buildings and almost 11,000 apartments with approximately 30,000 homeowners. The HCWS runs the Wroclaw Solar Power Plant (WSPP) project, which is the largest rooftop photovoltaic system in Poland. The solar power plant was developed using the co-creation strategy that engages the inhabitants. The PV farm since 2017 is in operational phase. A total of 2,771 solar panels were installed on rooftops of 35 buildings. The plant generates almost 0.75 MW of electricity, and its solar panels cover an area of 0.5 hectares of roofs. The production of electricity saves 614 tons of CO2 emissions per year.[dcclxxxv] [dcclxxxvi] [dcclxxxvii]
Research and capacity building activities	Research project **Development of distributed energy in energy clusters (KlastER)**, 2019-2021 - Ministry of State Assets (formerly the Ministry of Energy), as part of the MENAG scientific consortium together with the AGH University of Science and Technology and the National Centre for Nuclear Research) - main goal is to develop a "Strategy for the development of energy clusters in Poland" - develop viable business models for community energy
	COME RES: Community Energy for the uptake of RES in the electricity sector. Connecting long-term visions with short term actions (Horizon 2020 programme project)[dcclxxxviii] - Time: September 2020 – February 2023 - 16 partners from nine countries - 27th of January 2021 online National Desk kick-off event („Conditions for development of community energy in Poland"); 85 participants[dcclxxxix] - Lead partner: Free University Belin (Germany)
	RENALDO[dccxc] - Rural Development through Renewable Energy Sources **EUKI funding** (LÄNDLICHE ENTWICKLUNG DURCH ERNEUERBARE ENERGIEN[dccxci]) 10/2020-01/2023 **Target groups:** Cities, towns and municipalities, Governments, Regional governments **Implementing organisation**: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH **Donors:** EU funding – SRSP and EUKI-co-financing)

Partners: 100 Percent Renewable Foundation, ACTIVUS Foundation, KPODR - Kujawsko-Pomorski Ośrodek Doradztwa Rolniczego

- As a first step, the project ***develops a handbook on setting up and operating energy cooperatives*** and will be tested in two ***pilot communities*** in the provinces *Podlaskie* and *Kuyavian-Pomeranian*
- A second step aims at further refining the intervention and ***implementing additional energy cooperatives in four other communities in Podlaskie and Kuyavian-Pomeranian***. In parallel, RENALDO supports the selected communities in the ***development of business plans*** ensuring the profitability of an energy cooperatives.
- Third, a ***session with the relevant stakeholders*** serves to analyse the lessons learned from setting-up energy cooperatives. The findings support adjustments of the regulatory and institutional setting and good practices disseminated to other Polish regions.
- Finally, several events ensure the ***dissemination of the project results*** to political decision-makers from other Polish regions and interested communities.

EC² - Energy Citizenship and Energy Communities

for a Clean-Energy Transition (Horizon 2020)[dccxcii]
(ZSI Centre for Social Innovation Vienna and other partners)

(05/2021-04/2024)

- Aims to gather empirical evidence on how the framework and the set-up of energy communities foster or hinder energy citizenship and under which circumstances energy communities and energy citizens benefit most from each other.
- In-depth study Poland (amongst others)

SCORE (Supporting Consumer Ownership in Renewable Energies)[dccxciii]

- funding from the European Union's Horizon 2020 research and innovation programme (784960)
- coordinated by the European University Viadrina Frankfurt (Oder) and backed by the SCORE consortium – e.g. Federacja Konsumentów (PL), City of Litoměřice
- The aim of SCORE is to **facilitate co-ownership of RE for consumers** first in three pilot regions in Italy, Czech Republic, and **Poland** - and later also in various other follower cities across Europe. SCORE hereby particularly highlights the potential this democratic participation model holds for the inclusion of women and low-income households.[dccxciv]

		Lightness[dccxcv] - The Lightness project aims to empower citizens to generate, share and sell renewable energy and thereby contribute to making the European energy sector more sustainable and democratic. - pilot project in Poland: 2 apartment blocks in Warsaw, installation of solar power[dccxcvi]
Relevant actors and stakeholders	**NGOs**	Federacja Konsumentów[dccxcvii] - a nationwide consumer organisation in Poland established in 1981. Its core activity is free advocacy and legal assistance (more then 65,000 advice per year) provided by over 30 regional branches. The FK promotes regulations and market tools that guarantee the safety and satisfaction of consumers.[dccxcviii] - Partner in the SCORE project
		- Association of Municipalities Friendly to Renewable Energy
		Polish Green Network (Polska Zielona Siec) - an association of leading regional environmental NGOs in Poland. The network carries out awareness raising campaigns and policy work aimed at promoting sustainable development. - Main areas of activity include: monitoring the use of public funds, influencing trade and corporate practice through consumer choices, support for sustainable development and civil society of the Global South and Eastern Europe, campaigns related to climate change. - consists of regional centres in major Polish cities. These coordinate projects and campaigns and establish contacts with national and international authorities. There are currently eight such centres in Warsaw, Lodz, Szczecin, Torun, Bialystok, Poznan, Lublin, and Wroclaw."[dccxcix dccc] - Supported translation of the handbook "Community Energy: A practical guide to reclaiming power" from Friends of the Earth, Rescoop.eu and Energy Cities[dccci]
		- Polish Smog Alarms - Polish Ecological Club - GlobEnergia - Energie Cites - ClientEarth - Business Association Leviatan Many local and small organizations
	Governmental bodies	Ministry of Climate and Environment - responsible for establishing an enabling framework for RES community energy on the national level

	- involved in research project (cf. above)
	Ministry of Development, Labour, and Technology - working on a proposal for a framework for collective prosumers (cf. above) - Director of the Low-Emission Economy Department
	Energy Regulatory Office (ERO)
	National Centre for Nuclear Research/Interdisciplinary Division for Energy Analysis PhD Karol Wawrzyniak
Local governments	Warmian-Masurian Voivodeshi - target region in COME RES project
	Zalewo, municipal office
	Spółdzielnia Mieszkaniowa Wrocław-Południe
	Gmina Prusice
	Słupsk - Follower city in the SCORE project[dcccii dccciii] - Bioenergy cluster
	Energy advisors in every voivodeship in Poland within Regional Funds for Environmental Protection and Water Management
	- Apartments in Wrocław (part of Lightness project)
Distribution Network Operators	There are four state-owned, vertically integrated energy companies, acting as distribution network operators. - Tauron Capital Group is the market leader in terms of the number of customers and the volume of distributed electricity, with 35 per cent of the market share. - The largest retailer is the PGE Group with 33 per cent of the market share (Tauron Polska keeps 25 per cent. share and takes second place). - The other two groups, Enea and Energa (PKN Orlen) hold 15 per cent each.
Private actors	Five the biggest PV projects in Poland (as of end of 2022)

Actor	**Capacity**	**Year of commencement**	**Location**
Stigma Sp. z o.o.	204 MW	2022	Zwartowo
ZE PAK	70 MW	2021	gm. Brudzew
Altemus Energy Group	65 MW	2021	gm. Witnica

Better Energy	30 MW	2022	Żydowo/Polanów
Better Energy	30 MW	2021	Postomino

Source: Official information on the results of the RES auction[dccciv]

International/ supra-national actors	- European Commission - GIZ GmbH - IRENA - EBRD/World Bank
Academia	Warsaw University of Life Sciences
	Silesia University
	Institute of Rural and Agricultural Development, Polish Academy of Sciences
	Collegium of Economic Analysis, Warsaw School of Economics
	Faculty of Electrical Engineering, Czestochowa University of Technology
	Wroclaw University of Business and Economics Partner in the EC² project[dcccv]
	AGH University of Science and Technology in Krakow
Others	Polish PV Association
	Polish Wind Energy Association
	The Polish Chamber of Biomass
	Polish National Energy Conservation Agency (KAPE) - Organized event on National Desk kick-off (COME RES project)
	Polish National Desk - Created under COME RES project
	The National Chamber of Energy Clusters

Summarizing evaluation

Fields of Action	**Supporting the development stage of Energy communities by setting up center for excellence** - It is highly unlikely that a large amount of energy communities will form without external support under current support schemes. The

current support for development of Energy Cooperatives is limited, communities need experts and lawyers that will guide them through the whole process.
- The assistance needs to contain legal help, technical solutions support and community-building.
- Supporting energy communities (cooperatives, collective prosumers, energy clusters) within the framework of planned and launched support programs (Grant OZE, Energy for agriculture, KPO).

Piloting energy community projects

- Identification 1-3 community projects, supporting implementation by providing technical assistance (information, templates, co-organizing and taking part in meetings)

Publication of documents, guides, and good practices

Energy citizen Observatory

- Observation of proposed prosumer legislative changes. The Ministry of Development has announced the introduction of a new definition - the tenant prosumer. As part of the amendment to the windmill law, the Ministry of Climate and Environment announced the introduction of a virtual prosumer mechanism (as a requirement for the construction of new wind installations).

	State	Romania
General information	**Status EU membership**	Member state since 1 January 2007[dcccvi] Participant of Energy Community since 1 January 2007[dcccvii].
	Population	19 051 562 (2023)[dcccviii]
	Land area (km²)	234,270 km² (2022)[dcccix]
	Urban population (%)	52.5 % (2023)[dcccx]
Socio-economic situation	**GDP (current US$ billion)**	300.3 US$ billion (2023)[dcccxi]
	GDP per capita (US$)	15,076.5 US$ (provisional, 2023)[dcccxii]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	5,829.89 (2023)[dcccxiii]
	Median hourly earnings (EURO)	Males: 3.79 (2018) Females: 3.68 (2018)[dcccxiv]
	World Bank economic classification (2021)	High-income country[dcccxv]
	Unemployment (% of total labor force)	4.8 % (2020)[dcccxvi] 5,6 % (2023)[dcccxvii]
Energy situation in general	**Current energy sources**	Total energy demand in Romania was 47% lower in 2019 than in 1990, with especially steep declines seen in coal and natural gas demand (both -68%). This was partially displaced by the introduction of nuclear power, which in 2019 made up 9% of total supply, while supply from renewable sources, particularly biomass (+573%), increased substantially, to make up 18% compared to just 3% in 1990. The decline of Romania's industry sector, which saw a 74% reduction in energy demand, is the primary cause of the overall drop in natural gas consumption, as it fell 87% in industry 1990-2019. Declining gas demand also occurred

in the power sector over this time (-60%), while oil use has almost been phased out by 2019 after being 18% of supply in 1990.[dcccxviii]

Romania's primary electricity generation facilities include the state-owned Cernavodă Nuclear Power Plant, 208 hydropower stations, and six coal-fired plants. As of August 2023, Romania's electricity production capacities consisted of the following energy sources: 35.1% hydropower, 18.1% coal, 15.9% wind, 15.1% hydrocarbons, 7.5% nuclear, 7.5% solar, and 0.8% biomass. In June 2023, the country produced 4.412 TWh of electricity. In early 2023, Romania's electricity consumption decreased by 7.5% compared to 2022. This decline includes a 5% drop in economic sector usage, a 20.4% reduction in public lighting, and a 13.6% fall in residential consumption.

Romania's energy sector is characterised by a mix of sources, which include traditional and renewable forms of energy:

Natural Gas: Romania, the second-largest natural gas producer in the EU, is tapping into large Black Sea reserves via the Neptun Deep project, which is set to provide gas by 2027. The country produced 106,380 GWh of primary energy in the first half of 2023, up 3.7% year-over-year, while imports decreased by 6.2%.

Nuclear Energy: The Cernavodă Nuclear Power Plant contributes significantly, with two operational reactors and two more planned. In 2022, nuclear power provided a substantial portion of Romania's 53.5 TWh energy production.

Coal: The coal sector is shrinking due to the National Recovery and Resilience Plan (NRRP), which seeks to phase out coal by 2032. Coal production is expected to drop by 12.5% in 2023.

Renewable Energy: Romania aims to add 7 GW (wind and solar) of new renewable capacity by 2030. Wind and solar currently supply over 12% of the energy mix, while hydropower exceeds 27%.[dcccxix]

Prosumers - Romania has witnessed a remarkable increase in prosumers – households, businesses, and institutions that generate their own electricity. As of November 2023, there are over 100,000 prosumer installations, with a total capacity exceeding 1,400 MW representing a surge of 308%. This capacity rivals that of the Cernavodă nuclear power plant (1,300 MW).[dcccxx]

In Romania, the electricity transmission system and interconnection with neighbouring countries is managed and operated from Transelectrica SA, the state-controlled Romanian Transmission System Operator (TSO). The access to the public power grid is regulated by The National

	Regulatory Authority for Energy (ANRE). Their responsibilities include market operation, grid and infrastructure development, and ensuring the security of the national energy transmission system.[dcccxxi]
Climate protection targets	Romania's draft updated National Energy and Climate Plan indicates that Romania intends to cut its greenhouse gas emissions significantly; the submission is for 2023 and covers NECP from 2021-2030. The Romanian target in GHG emissions reduction for 2003 is 78% when compared with the levels of 1990 while the country has already reached up to 79% as at 2019 and is predicted to go down even further up to 94% by 2025. Their long-term goal involves almost zero emissions by 2050. In order to meet these goals, Romania has set out specific cuts for different economic areas by 2030: The leading one being the energy sector which is targeting 87% emissions' decrease through closure of coal-fired plants as well as expansion into renewables such as wind turbines or solar; transportation marks strategic peak aimed at limiting rise in GHG emissions up to 41% through more usage of hybrid or electric cars. In the building sector, efforts are directed towards achieving a 2% reduction in emissions, focusing on enhancing building efficiency and expanding the use of technologies like heat pumps and solar thermal systems. The industrial sector is targeting a 77% decrease in emissions by moving away from fossil fuels towards electricity and renewable sources, complemented by advancements in technology efficiency. The agricultural sector is aiming for a 47% reduction in emissions by improving livestock diet and feed management. Meanwhile, the land use and forestry sector is working towards a 17% increase in GHG removal capabilities, with a particular focus on better forest fire management. Lastly, the waste management sector intends to cut emissions by 30% by enhancing practices around waste reduction, reuse, and recycling, contributing to a comprehensive national effort to mitigate climate impact.[dcccxxii]
Renewable energy targets	Romania is setting ambitious goals to green its energy consumption. By 2030, the country aims to ensure that at least 34% (increased to 36.2% in 2023) of its energy comes from renewable sources. By 2025, Romania is on track to hit a renewable energy milestone of 32%, due to the increased deployment of wind and solar power and the adoption of heat pumps for heating and cooling. In the transport sector, Romania is steering towards a future where nearly 30% of the energy will be renewable by 2030, largely driven by

	a shift towards electric vehicles. For the electricity sector, the forecast is even more optimistic, with renewable energy expected to make up over half - 55.8% - of the sector's energy use by 2030, mainly through new wind and solar projects. However, the journey in the heating and cooling sector will be more gradual, with only a slight increase in renewable energy use anticipated. This is due to a move away from biomass, which, despite being renewable, has been problematic because of its impact on both land use and air quality. Instead, cleaner technologies like heat pumps are becoming the preferred option, aligning with both environmental needs and modern energy practices."[dcccxxiii]
Renewable energy potential	Currently, Romania is seeking to derive more of its energy needs from renewable sources. Romania is seen as a fast-growing market for wind energy in the Southeast European region, with installed wind generation capacity increasing at pace. In the period 2009-2014, Romania attracted investments of over EUR 4.5 billion in the wind energy sector. In 2021, the country had about 3 GW, which covered about 10% of electricity consumption. Wind projects with an installed capacity of 307 MW had grid connection contracts with Romania's transmission system operator Transelectrica. In addition to the 307 MW with connection contracts, another 460 MW obtained technical approvals for connection.[dcccxxiv] Renewable Energy Sources in Romania have significant potential for growth over the coming decade, driven by several key factors: - Geographical and natural resources: Romania is rich with diverse natural resources conducive to renewable energy production. It has considerable potential for wind energy, particularly in the Dobrogea region measured at 10 m height, which is among the best in Europe for wind power.[dcccxxv] - Moreover, the offshore wind energy in the Black Sea has also great potentials (76 GW wind installed capacity) with no operating offshore wind energy currently.[dcccxxvi] - The country also has substantial solar energy potential, particularly in the southern regions, which receive high levels of sunlight.[dcccxxvii] Several large projects are underway, including the construction of one of Europe's largest solar parks in Arad County, which will have a capacity of 1,044 MW with an estimated cost of €800 million. Another massive park in Dolj County expected to reach up to 1,500 MW.[dcccxxviii]

- Hydroelectric power is already well-developed as the largest source of renewables (33.9% of the total energy mix in 2020), and there are opportunities for further expansion, especially in small and medium-sized hydroelectric projects.[dcccxxix]

Government initiatives and EU influence: Romania, as an EU member state, is subject to the ambitious targets for renewable energy and greenhouse gas emissions reductions. The European Green Deal and other policies encourage investment in renewables. The Romanian government has been supportive through various incentives, including feed-in tariffs and green certificates, although the regulatory framework has seen changes that have sometimes been perceived as unstable.

Economic and investment climate: The economic environment in Romania is increasingly conducive to investment in renewable energies. There is growing interest from both domestic and international investors. The decreasing cost of technologies like solar PV and wind turbines also makes investments more attractive and feasible.[dcccxxx]

Energy security and independence: Like many other countries, Romania views renewable energy as a means to enhance its energy security and reduce its dependence on imported fossil fuels, especially from Russia. This strategic consideration is likely to drive further investments in RES.[dcccxxxi]

Public support and awareness: There is growing public awareness and support for renewable energy in Romania, which is crucial for the expansion of RES. This societal shift is likely to influence policy and market dynamics favourably.[dcccxxxii]

Romania is planning to install an additional 1.4 GW of wind farms over the next five years, marking a second significant wave of investment estimated at around €2 billion. Currently, the country has about 3 GW of wind power, which accounts for approximately 10% of its electricity consumption. In the solar energy sector, Romania boasts about 1.52 GW of installed capacity as of August 2023 and aims to become an important player for wind and solar power within the EU.
Moreover, based on studies done, biomass has the potential to contribute 65% to Romania's green energy production. Romania biomass energy potential, can be distributed across eight distinct regions: the Danube Delta (a Biosphere Reserve), Dobrogea, Moldavia, the Carpathian Mountains (including the Eastern, Southern, and Western-Apuseni ranges), the Transylvanian Plateau, the Western Plain, and the Carpathian Hills. The potential for biomass RES energy is supplemented by

	wind (17%), solar (12%), micro-hydropower (4%), and geothermal (2%).[dcccxxxiii] Given these factors, the next decade could see substantial growth in RES in Romania, with solar and wind energy leading the renewable expansion.
Renewable energy support regime	In Romania RES projects are eligible to receive EU funds under various schemes, including the Recovery and Resilience Plan. The Romanian government is working on establishing a Contracts for Difference (CfD) scheme. Although still in development, this scheme is expected to provide a more structured financial support mechanism for renewable energy projects and is anticipated to be operational within the year. The development of these frameworks is aimed at boosting the renewable sector in line with Romania's commitment to increasing its share of renewable energy in the energy mix. The power Purchase Agreements (PPAs) are allowed again in the whole-sale market since 2021 after banned in 2012.[dcccxxxiv] Under the Modernisation Fund, a European Union programme supporting 13 member States to meet energy targets by helping them modernise their energy system, the Ministry of Economy, Entrepreneurship, and Tourism started injecting 457.7 million Euro for clean energy sources as well as upgrading grid capacities countrywide. This fund will focus on the procurement of new renewable sources; cheaper when you consider the specific rebates attached to certain solar and wind projects: they range between €0.425 million and €1.3 million per MW as installed costs, respectively. Additionally, RES is supported through green certificates. The National Regulatory Authority for Energy (ANRE) has established a mandatory annual quota for the purchase of these certificates and has formulated new regulations to streamline the marketing of electricity from renewable plants with capacities up to 400 KW per place of consumption."[dcccxxxv] The grid operator (Romanian TSO) is obliged to connect renewable energy plants to their grids without discriminating against certain plant operators. They are also obliged to transmit electricity from renewable sources as a priority. In general, the TSO is obliged to develop its grids on the request of a plant operator, if the connection of a plant to the grid requires the grid to be developed. Furthermore, there are policies in place to promote training programmes for RES installers.[dcccxxxvi] As of April-May 2023, Transelectrica, reported over 49 GW of wind and solar projects in development. These projects, including those by prosumers (energy communities), range

from a few megawatts to around one thousand megawatts in planned installed capacity. Romania has eight Distribution System Operators (DSOs), with one operator holding exclusive rights to operate the distribution grid in one of the eight areas. Therefore, distributions tariffs can differ.

Securing land for permanent structures such as RES projects involves obtaining ownership or superficies rights. Superficies rights, which allow use of the land and ownership of structures on it, are preferred due to lower costs, transfer restrictions on agricultural land, and the option to terminate the project if it becomes non-viable. The permitting process for renewable power projects involves obtaining various permits and authorizations, often including an environmental impact assessment. Typically, a project application is submitted to the relevant environmental authority, which then determines if an environmental impact assessment is required. Once the project is up and running, the developer usually partners with different service providers for operation and maintenance (O&M) tasks. Electricity storage isn't mandatory for projects in Romania, but new regulations are emerging. ANRE recently advised renewable energy investors to include storage for at least 20% of their generation capacity.[dcccxxxvii]

In late spring 2024, the Romanian minster of energy announced that 0.5-billion-euro battery energy storage systems (BESS) tender will be held in autumn of the same year as part of the Modernisation Fund.[dcccxxxviii]

Relevant laws, policies, and plans

- (I**NECP**) Integrated National Energy and Climate Plan- 2021-2030 Update, November 2023[dcccxxxix]
- Law no. 237/2023 Hydrogen law, from June 2023
- **GOVERNMENT EMERGENCY ORDINANCE No. 108/2022** on the decarbonisation of the energy sector, from June 30, 2022
- **GOVERNMENT EMERGENCY ORDINANCE No. 186/2022** on implementing measures of the Regulation (EU) 2022/1854 regarding an emergency intervention to address the problem of high energy prices from December 28, 2022
- **GOVERNMENT EMERGENCY ORDINANCE GEO 163/2022** for supplementing the legal framework on the promotion of the use of energy from renewable sources and for amending and supplementing certain regulatory acts, from 6 December 2022.
- **GOVERNMENT EMERGENCY ORDINANCE no. 143/2021** for the amendment and completion of the Electricity and Natural Gas Law no. 123/2012, as well as for the modification of some normative acts, from December 2021.[dcccxl]
- **Law No. 226/2021** on establishing social protection measures for the vulnerable energy consumers from September 16, 2021[dcccxli]
- **Law No. 220/2008** for establishing the system to promote the production of energy from renewable energy sources[dcccxlii]
- **Law no. 184/2018**: The Law updates renewable energy Law No. 220/2008 by introducing the term "prosumer" and setting legal provisions for acquiring green certificates.[dcccxliii]
- **Law No. 123/2012** of electricity and natural gas - governs the electricity and natural gas markets in Romania, ensuring regulatory oversight, market transparency, and consumer protection in the energy sector (Energy Law)[dcccxliv]
- **Romania's Energy Strategy**. The Romanian Government is soon to approve the country's 2019 – 2030 (with a 2050 perspective) Energy Strategy, which will then be adopted by law by the Romanian Parliament. Renewable energy sits at the core of the new Energy Strategy, amongst the six priority investments deemed critical for attaining the fundamental objectives of the Strategy. [dcccxlv]
- **The Offshore Wind Law**. Romania's newly passed offshore wind energy law in early 2024 sets the stage for the country's first wind installations by 2032. This legislation requires the government to finalize regulations and start concession tenders by mid-2025. It aims to bolster Romania's energy independence and foster investments in renewable energy, particularly in producing green hydrogen and ammonia, capitalizing on a potential 76 GW of offshore wind capacity. The law is currently awaiting the President's signature to come into effect."[dcccxlvi]

Regulatory framework for citizen energy

Romania's legislation for Renewable Energy Communities (RECs) was introduced through emergency ordinance 163/2022 on December 6, 2022, while Citizen Energy Communities (CECs) were established via ordinance 143/2021, amending the Electricity and Natural Gas Law no. 123/2012. The National Regulatory Authority (ANRE) is tasked with developing frameworks for these energy communities.

- **Law No. 184/2018** introduces the term prosumers in Romania's energy system. This law provided a clearer definition of "prosumer," simplified authorisation procedures, introduced tax reliefs, and offered promotion options for RES production (Romanian government 2018). Law No. 184/2018 clarifies the role of prosumers, defining them as consumers who also generate electricity but whose main business isn't electricity production. Prosumers can use, store, and sell renewable energy produced at their homes, apartment buildings, or business locations. They benefit from exemptions on green certificate purchases and related taxes. Initially capped at 27 kW, the allowable capacity for renewable energy units was increased to 100 kW per site in 2020. Prosumers can sell their surplus electricity to suppliers with whom they have contracts. (Romanian government 2018, Romanian government 2020). Law No. 184/2018 introduced also the net-metering - a billing mechanism that allows prosumers—individuals or entities that both produce and consume electricity—to offset their energy consumption with the electricity they generate from renewable sources.[dcccxlvii]
- **GOVERNMENT EMERGENCY ORDINANCE No. 108/2022.** The legislation promotes among other the participation of the citizens in energy production. It supports Energy Communities where it includes different measures (e.g. legal and administrative support, financial mechanisms, capacity building and awareness raising programmes) to facilitate the creation and operation of energy communities, enabling groups of citizens, businesses, and local authorities to collaborate on energy projects.
- **GOVERNMENT EMERGENCY ORDINANCE GEO 163/2022**. The legislation defines RECs as legal entities that must meet several conditions, including open and voluntary participation, autonomy, and effective control by shareholders or members located near renewable energy projects. Shareholders or members can be natural persons, SMEs, or local authorities. The ordinance specifies the rights of end-customers to participate in RECs, the right of RECs to produce, consume, store, and sell energy from renewable sources, and access to all appropriate energy markets. It also outlines the obligations of RECs to contribute fairly to the total costs of the energy system and ensures non-discriminatory treatment in their activities.[dcccxlviii]
- **GOVERNMENT EMERGENCY ORDINANCE no. 143/2021** for the amendment and completion of the Electricity and Natural Gas Law no. 123/2012, as well as for the modification of some normative acts, from December 2021. It introduces provisions for Citizen Energy Communities (CECs) in Electricity and Natural Gas Law no. 123/2012. CECs are defined as legal entities that must meet several conditions, including voluntary and open participation, effective control by members or shareholders, and the main objective of providing environmental, economic, or social benefits rather than generating financial profits. CECs can engage in various energy sector activities, including production, distribution, supply, consumption, aggregation, energy storage, energy efficiency services, and electric vehicle charging services. The ordinance specifies that CECs have the right to access all electricity markets, are treated in a non-discriminatory manner, and have the financial responsibility for imbalances they cause in the energy system. It also allows CECs to manage distribution networks autonomously, subject to relevant national legislation and ANRE regulations.[dcccxlix]

Evaluation of the legal framework

Romania's legal framework for renewable energy deployment and specifically for energy communities has some helpful elements but also significant obstacles that make it hard to fully achieve renewable energy and climate goals.

As of March 2024, the delay in adopting Romania's NECP raises concerns about the country's ability to meet its renewable energy and broader climate targets. The NCEP is unlikely to be approved by the government by the expected deadline of 30 June, as mandated by the Energy Union Governance Regulation. This delay is partly due to the challenges in aligning the plan with the European Commission's recommendations, which have criticized the plan for not being ambitious enough – Romanian officials are looking at ways to revise the plan based on recommendations from the Commission.

This situation underscores the challenges Romania faces in meeting its climate protection commitments, potentially affecting the progress outlined in the previously mentioned sector-specific GHG reduction goals.

The European Commission has expressed concerns over the lack of detailed measures on renewable energy and insufficient plans for the climate and energy transition, as well as inadequate funding sources. Despite setting a target of 36.2% renewable energy by 2030 in the draft NCEP, this falls short of the Commission’s expectation of 41%. Even the 36.2% target is viewed as overly ambitious by other Romanian ministries. The ongoing revisions to the plan are based on feedback from the Commission, aiming to enhance the country's commitment to decarbonization using all available resources, including gas.[dcccl]

With regard to legislation directly related to energy communities in Romania the key points are:

The legal definitions of Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs) are provided by different ordinances. RECs are defined by emergency ordinance 163/2022, and CECs by ordinance 143/2021. ANRE, the national energy regulator, is expected to develop detailed regulations and implement at national level. Currently, Romania relies on the EU's definition of CECs, which lacks legal clarity and needs further precision for stakeholders to use effectively. ANRE doesn't have specific duties to ensure compliance with these definitions, and it's crucial to provide the necessary resources to manage these responsibilities effectively and prevent corporate influence.

Both RECs and CECs are granted rights such as the ability to produce, consume, store, and sell renewable energy. They must also follow certain obligations, such as ensuring non-discriminatory practices and being financially responsible for energy imbalances.

The national legislation requires the competent Ministry to evaluate existing obstacles and the development potential of renewable energy communities.

The legislation mandates the creation of a favourable framework for RECs, ensuring the removal of unjustified regulatory barriers, providing non-discriminatory treatment, and

facilitating access to finance and information. The legislation emphasizes the need to consider the specificities of RECs when designing support schemes to allow them to compete on an equal footing with other market participants. Additional provisions include guidelines on the calculation of energy consumption from renewable sources and simplified authorization procedures for decentralized installations.

Overall, while the national legislation establishes an enabling framework for energy communities, detailed implementation and support measures are still required to fully realize their potential. Until clearer guidelines and procedures are established, setting up an energy community in Romania remains uncertain and legally unclear.[dcccli] [dccclii]

As of May 2024, Romania developed legislation to support energy communities, allowing citizens to access lower-cost renewable electricity. Minister of Energy Sebastian Burduja announced a working group to create this framework, aiming to reduce reliance on traditional energy sources and combat energy poverty.

The ministry highlights Romania's significant solar potential, particularly in Bucharest. However, balancing supply with demand and ensuring network stability are challenges. The Association of Prosumers and Energy Communities in Romania (APCE) calls for clear government policies on prosumers and investment in energy storage. The need for Romania to commit to green energy and meet EU decarbonisation targets to maintain access to European funds is stressed too.[dccliii]

Existing citizen energy projects and/or research initiatives	**Citizen energy projects**	Cooperativa de Energie – first community energy in Romania - "Cooperativa de Energie is Romania's pioneering energy community that provides green energy certified by origin. Since its inception in 2018 with 15 members, it has expanded to over 970 members across the country. The Cooperative aims to drive Romania's shift to a fully renewable energy market, enabling citizens to engage as both consumers and investors in sustainable energy. - In May 2021, the Cooperative acquired an existing energy company, marking its entry as Romania's first fully green energy producer and supplier. An 80-day campaign saw more than 100 members invest a total of 400,000 Euros, facilitating this market entry. - Future plans include launching investment programs in renewable energy projects, particularly photovoltaic, utilizing member contributions to create or acquire new production capacities. Additionally, a Collective Purchase system will allow members to purchase products such as solar panels and electric vehicles at reduced prices. - Supported by the European Commission, the Cooperative is a leading example of decentralized renewable energy and local economic development. It is part of REScoop, the European Federation of Renewable Energy Cooperatives, and operates a governance model where each member has one vote. - By producing green electricity and enabling member investments in solar and wind projects, the Cooperative demonstrates a successful citizen-led energy initiative, contributing to national and regional climate neutrality objectives."[dcccliv]
	Research and capacity building activities	- Crearea unor condiții operaționale adecvate pentru energia regenerabilă în Regiunea Dunării (Creating appropriate operational conditions for renewable energy in the Danube Region) – NRGCOM The NRGCOM project aims to create an enabling environment in the Danube region, among other Romania, to support the development and expansion of renewable energy communities (RECs). Running from January 1, 2024, to June 30, 2026, with a budget of €175,987.72 funded by the Danube Transnational Programme 2021-2027, it seeks to improve energy efficiency, support decarbonization, and enhance energy security. NRGCOM aims to fostering an environment conducive to the growth of RECs. The project involves 13 main partners and 14 strategic partners from 12 countries, including governmental bodies, energy agencies, academic institutions, and renewable energy service providers.

Key activities include reviewing legal frameworks, analysing the operations of existing RECs, and gathering best practices to develop policy recommendations. These efforts will lead to a comprehensive strategy for establishing RECs in the region.

The project will produce guidelines to facilitate REC creation, management, and operation, considering legal, social, infrastructural, economic, and sustainability factors.[dccclv]

- MENERGERS – Energy Managers' Services in Municipalities
  The MENERGERS project aims to improve the skills of municipal energy managers in Bulgaria and Romania by sharing effective EU practices. Running from November 2022 to April 2025 with a budget of €469,794.74, it is led by the National Trust EcoFund (NTEF) and various partners.
  Local authorities are crucial for the EU's climate-neutrality goal by 2050, but Bulgaria and Romania lack sufficient training in energy management. MENERGERS addresses this gap by researching best practices, legislation, and training programs. It promotes knowledge exchange through workshops and consultations with national authorities and environmental experts.
  The project will develop a comprehensive training program for Bulgarian energy managers and establish renewable energy criteria in Romania. It also aims to update policy frameworks and increase awareness of energy-saving measures through reports, trainings, and study visits.[dccclvi]
- The NECPlatform project aims to enhance multilevel governance in national energy and climate policies across Europe, focusing on the involvement of local and regional authorities. Running in Bulgaria, Croatia, France, Italy, Portugal, and Romania, the project establishes Climate and Energy Dialogue (CED) Platforms to integrate local perspectives into national policies. These platforms will hold roundtable discussions with representatives from various sectors to collaboratively design, implement, and monitor energy and climate policies. The goal is to improve the quality and coherence of National Energy and Climate Plans (NECPs) by ensuring they reflect local capacities and promote equitable ecological transitions. Recommendations to the European Commission include emphasizing the importance of Article 11, enhancing dialogue quality, and encouraging long-term advisory groups for future energy and climate strategies. Draft NECPs were due in June 2023, with final versions by June 2024.[dccclvii]

		- Sustainable Building Renovation – Forming the Future (SURF project) is an initiative designed to enable municipal leaders to champion and execute sustainable building renovation efforts. This project, which operates in Germany, Hungary, and Romania from December 2022 to November 2024, has a budget of €485,720.04. It targets local governments and the private sector, with Deutsche Umwelthilfe (DUH) e.V. leading the implementation in collaboration with Energiaklub and Ae3R Ploiesti-Prahova. The SURF project will be encouraging extensive, sustainable renovations at the municipal level. It focuses on those managing municipal buildings, who are pivotal in initiating a grassroots shift in energy renovation practices. The project organizes transnational workshops to facilitate the exchange of successful practices and concepts among leading municipalities in Germany, Hungary, and Romania. SURF also provides training on circular building practices, guidelines for sustainable public procurement, a renovation sustainability checklist, and various online resources. Furthermore, it connects municipalities with architects, industry professionals, homeowners' associations, and housing companies through informal "renovation lunches" and a policy conference, creating a network dedicated to sustainable renovation efforts aimed at achieving a climate-neutral building stock.[dccclviii] - Interreg Project COALESCCE - Community owned and led energy for security climate change and employment. The project operated from January 2017 to June 2021. It advocated for integrated regional low-carbon strategies that prioritize community energy investments. The project sought to increase investment in local community energy investment via support from Structural Fund and ETC (European Territorial Cooperation) programmes. Its objectives included reducing carbon emissions, enhancing energy security, addressing fuel poverty, and promoting 'Green Growth'.[dccclix]
Relevant actors and stakeholders	**NGOs**	- Ae3R Ploiesti-Prahova - Energy Efficiency and Renewable Energy Agency Ploiesti-Prahova, also called Ae3R Ploiesti-Prahova, is a Romanian non-profit agency that promotes energy efficiency and the use of renewable energy sources, with a special focus on the possibilities offered by new technologies.[dccclx] The NGO is Involved in Interreg Project COALESCCE and the currently running SURF project.

	- OER – Orașe Energie Romania is a non-governmental organization that unites local authorities in Romania to focus on energy efficiency, renewable energy, and sustainable urban mobility. Founded in 1995 through the PHARE Program and supported by Energy Cities, OER aims to lead the energy transition and achieve climate neutrality. Since 2009, it has supported Romanian cities in the Covenant of Mayors initiative. OER's main goals are to empower local administrations to create and implement effective energy policies, facilitate dialogue between local and national authorities, and guide communities towards low emissions. The NGO is involved in The NECPlatform, MENERGERS and NRGCOM projects.
Governmental bodies	**Ministry of Energy**[dccclxi]
	Ministry of Environment, Waters and Forests[dccclxii]
	National Energy Regulatory Authority (ANRE)[dccclxiii]
	Ministry of Regional Development and Public Administration[dccclxiv]
Local governments	**Bistrita Municipality**[dccclxv] **Bucharest Municipality**[dccclxvi] **Brasov Municipality**[dccclxvii] **Timișoara Municipality**[dccclxviii]
Private actors	
International/ supra-national actors	- Energi Cities[dccclxix] - The European Climate Initiative - EUKI[dccclxx]
Academia	
Others	

Summarizing evaluation

Fields of Action	Measures to advance community energy in Romania **Policy-relevant measures:** - Strengthening legal frameworks: Ensure clarity and support from ANRE while implementing and improving rules to support Citizen Energy Communities (CECs) and Renewable Energy Communities (RECs). Create comprehensive national regulations.

- Policy alignment: To meet EU climate and renewable energy targets, make sure the Integrated National Energy and Climate Plan (INECP) is adopted and implemented on schedule.

Pilot projects and concrete initiatives:

- Solar and wind projects: Create new wind and solar pilot plants, especially in areas with a lot of promise, like the southern and Dobrogea regions for solar energy. Additionally, there is a lot of opportunity for further development of biomass energy.
- Prosumers programs: Expand support for prosumers by increasing the capacity limits for renewable energy units and promoting net metering. Facilitate the role of prosumers.

Information and awareness raising:

- Public campaigns: To increase understanding and awareness of the advantages and prospects of community energy initiatives, there ought to be national campaigns.
- Educational programs: Provide informational materials and workshops on energy efficiency and renewable energy to the public, businesses, and local government agencies. To increase the number of skilled personnel, encourage and give RES installers additional training possibilities; this is clearly supported by current national policies.

Feasibility studies:

- Assess the potential of renewable energy: Conduct feasibility studies to identify the most fitting locations for renewable energy projects.
- Economic viability: Evaluate the economic viability of various RES, focusing on long-term benefits and cost reductions.

Capacity building:

- Training initiatives: To improve municipal energy managers' and local authorities' abilities to oversee and carry out community energy projects, training initiatives should be established.
- Workshops and seminars: Organise workshops and seminars to share best practices and innovations in community energy.

Networking and collaboration:

- Climate and energy dialogue: Establish ongoing, multilevel debate forums with participants from different industries to guarantee the execution of policies that make sense.
- International and regional cooperation: Encourage the sharing of resources and information between academic institutions, NGOs, local governments, and partners in the commercial sector.

Research initiatives:

	- Policy recommendations: To promote community energy programs at the national and regional levels, develop thorough policy recommendations based on research and best practices. These measures can further support the deployment of community energy initiatives in Romania, contributing to its renewable energy targets and climate neutrality goals.

	State	Serbia
General information	**Status EU membership**	EU Candidate since March 2012[dccclxxi]. Contracting Party to the Energy Community[dccclxxii] since 1 July 2006[dccclxxiii]
	Population	6,844,078 (2022)[dccclxxiv]
	Land area (km²)	87,460 km² (2020)[dccclxxv]
	Urban population (%)	57 % (2022)[dccclxxvi]
Socio-economic situation	**GDP (current US$ billion)**	65.08 (2022)[dccclxxvii]
	GDP per capita (US$)	9,215 (2022)[dccclxxviii]
	Average annual net earnings (RSD/EUR)	890,016 RSD (2022)[dccclxxix] / 7,579.17 EUR (1 EUR = 117.4292 RSD, 31/07/2022 rate[dccclxxx])
	Average Monthly Earnings (RSD/EUR)	74,168 RSD (2022)[dccclxxxi]/ 631.59 EUR (1 EUR = 117.4292 RSD, 31/07/2022 rate[dccclxxxii])
	Median net Monthly earnings (RSD/EUR)	56,582 RSD (May 2022)[dccclxxxiii] / 481.83 EUR
	World Bank economic classification (2021)	Upper-middle-income economy[dccclxxxiv]
	Unemployment (% of total labor force)	10,01% (2022)[dccclxxxv]
Energy situation in general	**Current energy sources**	- In 2022 the primary fuel mix of Serbia consisted of: 65.7% Solid Fossil Fuels, 8.4 % of Oil and petroleum products, 7% Hydro, 3% Natural Gas and 15 % Other renewables[dccclxxxvi]. - Electricity Generation in 2020 consisted of[dccclxxxvii]: o Non-renewable 27 741 GWh (73%) o Renewable 10 216 GWh (27%), of which: ▪ Hydro: 9 034 GWh (24%) ▪ Solar: 13 GWh ▪ Wind: 976 GWh (3%)

	▪ Bioenergy: 192 GWh (1%) *__Updated data__ on Serbia' implementation performance and key energy sector is available at the **Energy Community Serbia** page.[dccclxxxviii] - Serbia's electricity production mostly relies on coal and, to a lesser extent, hydropower. - Serbia produces some oil and gas, but remains highly dependent on imports, especially of gas from Russia. The "Turk Stream 2" project connects Serbia with Bulgaria, but breaches European rules.[dccclxxxix]
Climate protection targets	- Ratified the Paris Agreement in July 2017[dcccxc] - The target of 9.8% reduction in GHG emissions by 2030 compared to 1990, according to the first Nationally determined contribution (NDC1, 2017).[dcccxci] NDC2 should have been submitted by the end of 2021[dcccxcii]. - Preparation of the Integrated National Energy and Climate Plan of the Republic of Serbia from 2021 to 2030 with the vision until 2050 (INECP) is underway, within the IPA project "Further Development of Energy Planning Capacity".[dcccxciii] - Law on Climate Change, passed into law in mid-March 2021, envisions that within the next two years the authorities will adopt a national, low-carbon development strategy, including a ten-year action plan. The law will create a legislative framework that sets climate change development goals[dcccxciv].
Renewable energy targets	- With 21,44% of renewable energy sources, Serbia was still far from its overall indicative trajectory of 25,6% in 2019 and 27% in 2020. None of the indicative sectorial targets have been reached in 2019 (IR2021, p.10) [dcccxcv]. - The share of renewable energy sources in transport remained barely above 1%, while the target for 2020 is 10% (IR2021, p.10) [dcccxcvi].
Renewable energy potential	- Total capacities of renewable energy in 2021: 3524 MW, with the highest share from Large Hydropower (2355 MW), followed by Pumped Storage (614 MW) and Wind (398 MW)[dcccxcvii]. *__Updated data__ is available at the **Energy Community Serbia** page[dcccxcviii].
Renewable energy support regime	- **The Law on Renewable Energy Sources** allows the state to launch tender processes for strategic investor partnerships in green energy; introduces auctions to allocate renewable energy support; and allows citizens and companies to produce energy for their own consumption. It also bans construction of all hydropower plants in protected areas[dcccxcix].

- **Guaranteed and priority access to the network** for electricity produced from renewable energy sources is provided. Based on the methodology adopted by the regulator, system operators adopt acts on the amount of connection costs for all producers including renewable (IR2021, p.10)[cm].
- **No progress has been made to simplify administrative procedures** and establish a one-stop shop in the reporting period. An electronic system for issuing, transfer, and cancellation of guarantees of origin is functional (IR2021, p.10) [cmi].
- Renewable energy projects with capacity of less than 500 kW and 3 MW for wind are entitled to **feed-in tariffs** (FiT), while auctions based on a **feed-in premium** (FiP) will be held for other projects based on quotas, which are yet to be defined. Currently, renewable energy producers are not responsible for imbalances. However, the Law anticipates the **conversion to full balancing responsibility** once the intraday market is liquid (IR2021, p.10)[17].
- Once the regulator announces that the intraday market is liquid, large (above 500 kW and 3 MW for wind) renewable energy producers will have to arrange their balance responsibility in accordance with the relevant legislation (Energy Law and Market Rules). This is in line with the Guidelines on State Aid for Environmental Protection and Energy. (IR2021, p.10)[cmii].

Legal and political framework for citizen energy

Relevant laws, policies, and plans

- **Law on the Use of Renewable Energy Sources**, adopted in April 2021 and ratified by the parliament in May 2021[cmiii].
- A **decree on self-consumption**, adopted in August 2021, enables a net metering scheme for households or housing communities and a net billing scheme for all other self-consumers[cmiv].
- The **Law on Climate Change** was adopted in March 2021. It prescribes the adoption of the Low Carbon Development Strategy with an Action Plan within two years from the adoption of the Law. A set of bylaws is currently being drafted.[cmv]
- The priority for Serbia is the adoption of the necessary secondary legislation to enable implementation of the Law on the Use of Renewable Energy Sources (IR2021, p.11)[cmvi].

Regulatory framework for citizen energy

- The **Law on the Use of Renewable Energy Sources** enabled self-consumption, including jointly acting self-consumption, as well as energy communities (IR2021, p.10) [cmvii].
- A **decree on self-consumption**, adopted in August 2021.

Legal and political framework for citizen energy

- In September 2021, the Ministry of Mining and Energy published a **call for the programme to subsidize households** to install solar panels and become self-consumers (IR2021, p.11) [cmviii].
- Net metering still lacking, return on investment is too slow[cmix]
- Citizens who decide to become prosumers will be entitled to net metering[cmx]. A prosumer can draw both electricity from own production and electricity provided by state power utility Elektroprivreda Srbije (EPS) as a supplier.
- If a prosumer's output exceeds consumption, however, the prosumer does not get any compensation. [cmxi]
- As of July 2022, the procedure for acquiring a permit was simplified significantly.

Evaluation of the legal framework

- Enabling, with the institutions being rather supportive and motivating, however, citizen interest to participate in the process was still limited as of July 2022

*Energy Community provides an updated assessment of implementation performance and recommendations, including in the field of renewable energy and energy efficiency[cmxii].

Existing citizen energy projects and/or research initiatives

Citizen energy projects	Two energy cooperatives registered in Serbia:[cmxiii] **Elektropionir:** energy community established in December 2019; aim to empower citizens to actively participate in the energy transition in Serbia; looking for locations for first solar PV project; involved in advocacy activities[cmxiv]
	Energy Cooperative "Sunčani krovovi" (Sunny Roofs) from Šabac, first renewable energy cooperative in Serbia in the municipality of Šabac[cmxv]
Research and capacity building activities	**Green Rural Deal Project**[cmxvi]**,** funded by EUKI: - aimed at developing capacities for a transition to a zero-carbon economy in Greece, Kosovo, and Serbia (Municipality of Priboj) - Project partners: Wuppertal Institute, Germanwatch, Balkan Green Foundation, RES Foundation as well as a Local Government Association of Western Macedonia - Municipality of Priboj shows political commitment to climate and energy policies; transition to locally available biomass in the district heating system, "Priboj's opportunities lie on the promises for expanded usage of locally available wood biomass as well as the institutional and technical potential for local energy community projects, i.e. energy cooperatives or crowdfunding.

		Horizon 2020 project mPOWER (Municipal Action, Public Engagement and Routes TowardsEnergy Transition)[cmxvii,cmxviii] - Energy Cities and RES Foundation hosted an mPower webinar to help municipalities and communities across the Balkans harvesting renewables together through cooperatives or energy communities. The event included the Serbian Roadshow supported by the European Climate Foundation, with input from RESCoop and Friends of the Earth Europe The Elektropionir cooperative organized its **first seminar on prosumers for ordinary citizens**, which showed that there is a strong interest among citizens as well as the need to learn more about what it means to be a prosumer[cmxix]. **Panel Discussion on citizen energy** (in Serbian)[cmxx]
Relevant actors and stakeholders	**NGOs**	- Institute Veolia - Germanwatch
	Governmental bodies	- Energy Agency of the Republic of Serbia (AERS) - Serbian Environmental Protection Agency - Ministry of Mining and Energy
	Local governments	- Municipality of Šabac[cmxxi] - Municipality of Priboj - The City of Čačak, member of Energy Cities since 2006 - Municipality of Niš, member of Energy Cities since 2003
	Private actors	- Energy Cooperatives: Elektropionir, Solar Roofs - RES Foundation[cmxxii] - CONSEKO, Solar energy company - ENERGIA, Energia Gas and Power, the second supplier of electricity in Serbia[cmxxiii] - insurer DDOR Osiguranje is offering insurance for rooftop solar systems
	International/ supra-national actors	Energy Cities, The European association of cities in energy transition[cmxxiv] UNDP Serbia, GIZ Serbia Heinrich Boell Stiftung Belgrade
	Academia	
	Others	

Summarizing evaluation

Fields of Action	- **More information should be made available** on the possibilities of citizen energy (CE) and the legal framework for CE, while educating the interested parties how to go through the permitting procedure. - **Providing education and capacity building** for the potential investors and actors developing citizen energy project ideas with **business modeling logic** and educating them on how to organize **co-investing and crowd-funding.** - **NGOs should be supported and provided funds to take a more active role** in the process of citizen energy projects' development, to develop their own projects, provide education, or participate in lobbying. - **Legal changes** that allow development of CE projects should be **made more visible and promoted** - **Collaboration between local authorities and other actors should be enhanced** for smoother permitting process.

	State	Slovakia
General information	**Status EU membership**	Member state since 1 May 2004[cmxxv] Participant of Energy Community since 17 November 2006[cmxxvi]
	Population	5,460,185 (2022)[cmxxvii]
	Land area (km²)	48,080 km² (2020)[cmxxviii] 49,035 km² (2015)[cmxxix]
	Urban population (%)	54 % (2021)[cmxxx]
Socio-economic situation	**GDP (current US$ billion)**	116.53 (2021)[cmxxxi]
	GDP per capita (US$)	21,391.9 (2021)[cmxxxii]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	10,984.68 (2021)[cmxxxiii]
	Median hourly earnings (EURO)	Males: 6.17 (2018) Females: 5.15 (2018)[cmxxxiv]
	World Bank economic classification (2021)	High-income country[cmxxxv]
	Unemployment (% of total labor force)	6.7 % (2021)[cmxxxvi]
Energy situation in general	**Current energy sources**	- Domestic energy production: dominated by nuclear power- almost 53% of the total energy production in 2021, down from 60% in 2017, (mainly as a result of increased domestic production of natural gas (15.40%) and hydropower (15.40%)). Coal used to dominate domestic production but has been declining to 3.92 % in total energy production in 2021.[cmxxxvii] - Energy demand: Oil is the dominating fuel in transport; natural gas and electricity account for the largest share of Total Final Consumption (TFC) in other sectors.[cmxxxviii]

	- Total Energy Supply in 2019 constituted of: 24% Nuclear, 24% Gas, 21% Oil, 18% Coal+ Others, 13% Renewables. The Renewable supply mainly constituted of Bioenergy (79%), Hydro/Marine (18%), Solar (3%)[cmxxxix] - From 2007 to 2021, the share of renewable energy in total primary energy supply (TPES) increased from 5.3% to 9.82 % and its share in electricity generation increased from 17.7% to 22.24%.[cmxl] - Nuclear energy still generates more than 52% of all the electricity consumed in Slovakia.[cmxli] - Electricity Generation in 2020 consisted of[cmxlii]: o Non-renewable sources: 21 981 GWh (76%) o Renewable sources: 6 857 GWh (24%), of which: ▪ Hydro: 4 517 GWh (16%) ▪ Solar: 663 GWh (2%) ▪ Wind: 4 GWh ▪ Bioenergy: 1 673 GWh (6%)
Climate protection targets	The main quantified NECP target is to reduce greenhouse gas emissions for sectors not involved in emissions trading (non-ETS) by 20% by 2030 (the share has been increased from the originally declared 12%).[cmxliii]
Renewable energy targets	- 40% of the Slovak territory is covered by forests, which renders biofuels and waste a strategic priority for the government to achieve its renewables' targets.[cmxliv] - The RES share target in final energy consumption has been set at 19.2% for 2030, including the required target of 14% of RES in transport. In the electricity generation from RES sector, the NECP from 2019 set a target of 25% for 2030, which is at the limit of the technical possibilities of the Slovak electricity system. - One way to increase the overall share of RES in 2030 from 19.2% to 20% is via heat generation - greater use of biomass, including the production of biogas and biomethane[cmxlv], heat pumps, solar panels, and geothermal energy. The high level of gasification (over 90% of the population has access to natural gas), acts against increasing RES in the heat sector.[cmxlvi]
Renewable energy potential	- Hydropower potential in Slovakia is estimated on level of 6700 GWh per annum, where 70.6% of total potential (4732 GWh/year) was already in use in 2017 and 29.4% (1968 GWh / year) remained unexploited.[cmxlvii] - In 2014 **biomass** was considered to have the largest renewable energy potential, with a theoretical capacity of 120 petajoules, or 2.9 Mtoe.[cmxlviii] - Installed **solar** capacity totaled 533 MW at the end of 2013 and has stayed flat since then until 2018. **Wind** resource potential is low to moderate in most of the country. Twenty-seven **geothermal** areas (around 34% of the country's territory), have been identified as potential areas for exploitable geothermal resources.[cmxlix] - Renewable Capacity in 2021 constituted: 68% Hydro, 23% Solar, 9% Bioenergy.[cml]

	- IRENA provides estimation of potentials for Solar, Wind and Biomass in its Energy Profile for Slovakia.[cmli]
Renewable energy support regime	- In Slovakia, clean energy installations are not able to compete with conventual power plants without support schemes. Electricity production from RES was supported by the feed-in tariff scheme (RES producers sell electricity for fixed prices that are higher than those for conventionally produced electricity). This support scheme has increased electricity prices for all end users. The feed-in tariff rates are set on an annual basis by the Slovak Regulatory Office for Network Industries. The level of feed-in tariff depends on the year in which the project was put into operation and is guaranteed for a fixed number of years set out in law[cmlii]. - In theory, all producers of electricity from RES in Slovakia are entitled to take advantage of preferential access to the distribution system, transmission, distribution, and supply. However, **in recent years, distribution companies have been very reluctant to connect new installations (especially solar) arguing that the national grid does not have sufficient capacity. (…)** - On 1 January 2020, an amendment to Act no. 309 / 2009 Coll., the Renewable Energy Sources Act (on the promotion of renewable energy sources and high efficiency cogeneration) was adopted - intended to lead to extensive reform in supporting electricity production from RES. - **The new feed-in premium tariff guarantees a premium above the market price through green auctions for solar installations above 100kW and other installations above 500kW. For smaller installation, the previous feed in tariff will be still available, but not as generous as in 2009-2010 when most of the new solar plants were installed.** The amendment has also introduced a local source up to 500kW and **obligation of the distribution companies to connect these sources to the national grid on the condition that 90% of electricity is consumed at the place of installation**.[cmliii] - The amendment also transferred obligation to pay the tariffs from the distribution companies to a state-owned entity, Short-term Electricity Market Operator (OKTE) and ***imposed new limitations for electricity production from biomass or biogas*** due to greenhouse gas emissions.[cmliv] - To reduce the support paid through the feed-in-tariff scheme and entering the "system operation tariff", at the end of 2020 the Regulatory Office for Network Industries announced a "pilot regime of repowering", with the aim to extend the period of support beyond 15 years.[cmlv] - Supported RES technologies include: "hydropower with installed capacity of up to 500 kW, geothermal energy, combustion of landfill gas or gas from wastewater treatment plants with installed capacity of up to 500 kW, combustion of biogas produced by anaerobic fermen-

tation with total capacity of up to 500 kW, combustion of high-efficiency cogeneration of biogas produced by anaerobic fermentation with total capacity above 250 kW and up to 500 kW".[cmlvi]

- Another draft amendment to Act No. 309/2009 Coll., approved in 2021, introduced a mandatory extension of support for electricity from existing renewable energy sources[cmlvii].
- "**Slovak Innovation and Energy Agency (SIEA)** has launched a pilot project called **'Green to the Households' in 2015**, giving Slovakia's households the opportunity to apply for grants to buy and install sources of renewable energy. Since its launch, the project has provided over EUR 30 million in total, resulting in over 18 000 installations of new renewable energy sources. These include more than 5 000 solar collectors, 3 500 heat pumps, 1 500 biomass boilers and 3 000+ photovoltaic systems."[cmlviii] These results led to next rounds of grant applications intended for the installation of new photovoltaic panels, heat pumps, biomass boilers and solar collectors outside the Bratislava region. Project had many barriers and after calls from NGOs, the system of applications was changed in June 2022 to be more transparent and available to all consumers.
- "The Operational Programme Quality of Environment (OP KŽP) allocates investment grants from the European Regional Development Fund (ERDF) for natural and legal persons, associations, or non-profit organisations. Renewable energy projects are eligible under Priority Axis 4 'Energy-efficient low-carbon economy in all sectors', namely Investment Priority 4.1 'Promoting the production and distribution of energy derived from renewable sources' (…). Specific Target 4.1.1 'Increasing the share of RES in gross final energy consumption of the SR' (as well as Specific Target 4.1.2 'Increasing the performance of small installations for the use of RES in the Bratislava Self-Governing Region') is aimed at supporting the generation of heat and electricity from renewable energy sources (RES), thereby contributing to the achievement of the planned share of RES in gross final energy consumption until 2020. **Eligible activities under the electricity sector include the installation of small photovoltaic installations and wind turbines up to a total installed capacity of 10 kW in family houses and apartment buildings** (2.4.2.2 OP KŽP). The deployment of renewable energy sources is also supported through further investment priorities under Priority Axis 4".[cmlix]

Relevant laws, policies, and plans

- Integrated National Energy and Climate Plan for 2021 to 2030, December 2019[cmlx]
- Act no. 309/2009 Coll. on the promotion of renewable energy sources and high-efficiency cogeneration and on the amendment of certain laws as amended
- Act no. 251/2012 Coll. on Energy and on Amendments to Certain Acts, as amended
- Act no. 250/2012 Coll. on regulation in network industries, as amended[cmlxi]
- National Policy Framework for the Development of the Alternative Fuels Market (Government Resolution No 504/2016)
- Action Plan for the Development of Electromobility in the Slovak Republic (Government Resolution No 110/2019)
- "The Slovak government has already adopted a new energy law. The law amending the energy law of 2012 should have a strong focus on deregulation, but will also include the concepts of active consumers, energy communities, and will provide for a better market access for aggregators. The law came into force 1.1.2023."[cmlxii]

Regulatory framework for citizen energy

- "The Slovak Republic **has implemented legislation promoting self-consumption of electricity by introducing the "local source" concept** through an amendment to the act on the promotion of renewable energy sources and high-efficiency cogeneration (Act No 309/2018) that **became effective as of 2020**. The amendment defines that local renewable energy sources with an installed capacity of up to 500 kW can be used for local consumption. **Such sources shall have preferential access to the distribution network and may deliver surplus energy to other market participants (from up to 10% of the total installed capacity)**, but **shall not receive any feed-in-premium or feed-in-tariff**. In addition, a producer of electricity from a local source is exempt from paying a tariff for the operation of the system for all the electricity produced that he consumes himself."[cmlxiii]
- "In its National Energy and Climate Plan (Slovakian government 2019) **Slovakia presents basic ideas for renewables self-consumers and renewable energy communities focusing on renewable heat**. Renewables self-consumers and renewable energy communities will be entitled to install their own equipment to produce heat from RES to provide heat for their own consumption, enable the storage of heat produced from RES and the sale of excess production. They will be subject to nondiscriminatory fees and payments to participate in the fixed costs associated with the operation of the district heating system including storage. **The right of renewables self-consumers and RECs to set up a heat generation plant in a building to cover their own heat consumption, to use energy storage, and to sell excess heat will only be exercised at the level of the whole building** (Slovakian government 2019)."[cmlxiv]

Legal and political framework for citizen energy		- "In its National Energy and Climate Plan (Slovakian government 2019) **Slovakia presents basic ideas for renewables self-consumers and renewable energy communities focusing on renewable heat**. Renewables self-consumers and renewable energy communities will be entitled to install their own equipment to produce heat from RES to provide heat for their own consumption, enable the storage of heat produced from RES and the sale of excess production. They will be subject to nondiscriminatory fees and payments to participate in the fixed costs associated with the operation of the district heating system including storage. **The right of renewables self-consumers and RECs to set up a heat generation plant in a building to cover their own heat consumption, to use energy storage, and to sell excess heat will only be exercised at the level of the whole building** (Slovakian government 2019)."[cmlxv] - On 19 October 2022, delayed transposition of 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 was finally done by the amendment to Act no. 309/2009 Coll., on the promotion of renewable energy sources and high efficiency cogeneration (the Renewable Energy Sources Act). - In 2022 several amendments of Energy Act no. 251/2012 Coll. were adopted by which the transposition of main Energy Directives was done (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 and 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). These main changes in energy law introduced new concepts and terms in energy sector as energy communities, contracts with dynamic prices, collective switches of suppliers, aggregates and others which can be very helpful in energy transition and market competition.
	Evaluation of the legal framework	Although energy communities can already be legally established, real activities are not possible since the Energy Data Centre has not yet been built. Transposition Tracker[cmlxvi]
Existing citizen energy projects and/or research initiatives	**Citizen energy projects**	**STEP – Solution to tackle energy poverty** project - developed a simple, innovative, and replicable models of measures to address energy poverty. The project covered some of the countries with the highest rates of energy poverty in Europe. These are Bulgaria, Cyprus, Czech Republic, Latvia, Lithuania, Poland, Portugal, Slovakia, and the United Kingdom. More info on https://www.stepenergy.eu/. **CLEAR-X - CLEAR-X stands for "Consumers Leading the EU's Energy Ambition Response, Expansion" -** The overall objective of the project is to **enable consumers to lead the energy transition by investing in renewable energy sources (RES) and energy-efficient (EE) technologies**. It aims to facilitate consumers' access to household renewables at

	an affordable price, through the provision of trusted information, collective purchase schemes, and an improved regulatory framework. More info on https://www.clear-x.eu. **Energy Community in Liptov -** Local Action Group Dolný Liptov coordinates municipalities in Liptov, that want to join with companies and residents to redistribute electricity that, for example, schools or offices produce on weekends, but do not need. They will then share this energy between these entities.[cmlxvii] **Cluster - Community Energy Group** - Its main objective is to support the creation of energy communities in Slovakia. One of the founders of the cluster is the Slovak Smart City Cluster with other long-term cooperating entities.[cmlxviii] **ATELIER is an AmsTErdam and BiLbao cItizen drivEn smaRt cities project -** funded by the Smart Cities and Communities call. Coordinated by the City of Amsterdam, the project combines the expertise and the commitment of 30 partners from 11 countries. ATELIER focuses on developing citizen-driven Positive Energy Districts (PEDs) in the two Lighthouse Cities Amsterdam (Netherlands) and Bilbao (Spain). Their successful implementations will then be replicated and tested for feasibility in the six Fellow Cities Bratislava (Slovak Republic), Budapest (Hungary), Copenhagen (Denmark), Krakow (Poland), Matosinhos (Portugal), and Riga (Latvia).[cmlxix]
Research and capacity building activities	Analysis and proposals for the definition of energy poverty - the study will be prepared by the Prognostic Institute of the Centre of Social and Psychological Sciences of the Slovak Academy of Sciences, which will process anonymised data on household energy consumption. Community energy is one of the solutions to energy poverty in Slovakia. The SAV study is being developed with the institutional support of the Ministry of Economy of the Slovak Republic.[cmlxx] Concept for the protection of consumers meeting the conditions of energy poverty - The Government of the Slovak Republic on 25.01.2023 at its meeting approved the draft Concept for the protection of consumers meeting the conditions of energy poverty, which was developed by Slovak Regulatory Office for Network Industries (ÚRSO). The approved draft Concept is a set of recommendations that should significantly increase the level of long-term sustainable access to energy and drinking water for socially vulnerable households in the Slovak Republic in the medium term. One of these solutions is the development of community energy. The supra-ministerial working group will further detail the material and propose concrete legislative measures.[cmlxxi] **#ConsumerDebates | Energy communities: How can we better protect consumers? -** With rapidly rising energy prices and a desire to move away from Russian fossil fuels, interest in energy communities has been increasing across Europe, as more and more consumers want

to take their energy into their own hands through citizen-driven energy generation projects. With this rise in popularity, BEUC (the European Consumer Organisation), has conducted research into how consumer rights might be impacted by entering into various forms of energy community. The recording is available in Endnotes[cmlxxii].

A how-to guide to ensure consumers reap the full benefits of energy communities - Interest in energy communities has soared in recent times, and it's easy to see why. They can be a great way to allow consumers to become self-sufficient in renewable energy and to actively participate in the energy transition. However, there are certain aspects that could be improved to enable these communities to go mainstream, according to a new BEUC report published in February 2023.[cmlxxiii]

Geothermal sond is a risk for municipalities, it should be covered by the state - In Slovak city Kežmarok they will heat with geothermal energy, saving up to 90% of gas consumption. They will be able to guarantee a low price of heat even in the current energy crisis, but local governments will not go into the development of boreholes if the state does not help them with the investment risk.[cmlxxiv]

Kežmarok plánuje na všetkých školách aj verejných budovách fotovoltické panely / Kežmarok plans photovoltaic panels on all schools and public buildings - The City of Kežmarok, in an effort to mitigate the impact of rising energy prices on its expenses, plans to install photovoltaic cells on all schools, kindergartens and public buildings. The first object that the city wants to tackle is the winter stadium, which is the most energy-demanding. This investment will require approximately 300,000 euros for panels, a battery, energy storage and its use.[cmlxxv]

Zelená domácnostiam/Green to households - state support scheme coordinated by Slovak innovative and energy agency to promote the use of renewable energy sources for households. Financial support provided for photovoltaic panels, solar collectors, heat pumps, biomass boilers and wind turbines. Still very strict and complicated criteria, which makes is unavailable for many consumers.[cmlxxvi]

Obnov dom – Renovate your house - a state programme funded by the Slovak Republic's Recovery and Resilience Plan, which aims to support up to 30,000 older homes with a home renovation grant by 2026. Reducing the energy consumption of houses is expected to have a positive impact on households' economic performance and reduce CO2 emissions, thereby contributing to improving the quality of the environment and the health of the Slovak population. Still very strict and complicated criteria, which makes is unavailable for many consumers[cmlxxvii].

Skupinové nákupy fotovoltiky a tepelných čerpadiel v rámci projektu CLEAR-X – Group purchases of photovoltaics and heat pumps in the

framework of the CLEAR-X project - Consumer Association Spoločnosť ochrany spotrebiteľov organized a campaign for registration for the group purchase of photovoltaics with installation for single-family homes at the turn of 2022/2023. 2,820 consumers registered and a total amount of 450 households expressed their interest in the two discounted offers from suppliers. The process of inspections, contract signing, and installation is currently underway. In May 2023, the association plans to organize a second campaign for single-family houses to purchase and install air-to-water heat pumps. In both group purchases, only products that have been tested and have received good ratings in independent laboratories are promoted.[cmlxxviii]

Mystery Shopping of Heat Pumps - main objective of this project is that consumers have easy and timely access to reliable heat pump installers, who provide them with trustworthy, informed advice tailored to their energy needs. Specific objectives are that consumer organisations have better market evidence to support their advocacy activities aimed to increase availability to consumers of trustworthy heat pump installers, consumer organisations shape EU and national laws with the goal to increase availability to consumers of trustworthy heat pump installers and tools advising consumers on how to choose a trustworthy heat pump installer are available to them.

Regionálne centrá udržateľnej energetiky - Regional Sustainable Energy Centres - The proposed system is intended to create the necessary capacities, collect quality data, introduce modern regional and local energy planning, quality uniform monitoring and evaluation of the effectiveness of the measures taken, important feedback for the development of support schemes for increasing energy efficiency and the use of RES financed from public funds, support the implementation of innovative energy plans tailored to local needs and significantly strengthen the transfer of knowledge, good practice and information between regions. In addition to stabilising the economy of the regions, it should contribute to the fulfilment of Slovakia's national energy and climate commitments[cmlxxix].

Štátny fond rozvoja bývania/State Housing Development Fund - finances renewable energy sources in multi-apartment buildings. The price for the construction of technical equipment that will use renewable energy sources or equipment for mechanical ventilation with heat recovery system can be included in the acquisition cost of the insulation of the apartment building or the replacement of common gas, electricity, sewerage, water, air conditioning and heat distribution systems in the apartment building. Still very strict and complicated criteria, which makes is unavailable for many multi apartment buildings[cmlxxx].

Solutions to Energy Poverty: Comprehensive Renovation of Buildings, Renewables and Self-generation of Energy - Spoločnosť ochrany spotrebiteľov has produced a study for the CEE Bankwatch Network enti-

		tled Solutions to Energy Poverty: Comprehensive Renovation of Buildings, Renewables and Self-generation of Energy, which explains why reducing the energy demand and consumption of buildings through comprehensive renovation should be a priority and a key policy objective in Slovakia[cmlxxxi]. Other research can be found in the Endnotes[cmlxxxii]
Relevant actors and stakeholders	**NGOs**	- Consumer organisations: (https://www.sospotrebitelov.sk/, https://ombudspot.sk/, https://mediacnecentrum.com/) - Environmental organisations: (https://www.greenpeace.org/slovakia/, https://bpb.sk/, https://cepa.priateliazeme.sk/, https://klimatickakoalicia.sk/)
	Governmental bodies	- Ministry of economy – responsible for the implementation of EU energy legislation and national legal framework, prepare measures for different categories of energy subscribers, https://www.mhsr.sk/ - Ministry of finance – responsible for budgeting of the accepted measures, supporting schemes and social support, https://www.mfsr.sk/sk/ - Ministry of environmental protection – responsible for keeping the Slovak and EU targets for emission levels, renewable sources of energy and green transition, define and coordinates one of the state schemes – Obnov dom/Renovate your house, https://www.minzp.sk/kontakty/ - Ministry of investment, regional development and informatisation – responsible for framework of EU financial funds and resources and its effective spending, https://www.mirri.gov.sk/ - Regulatory Office for Network Industries – national regulator of energy market, https://www.urso.gov.sk/zakladne-informacie/ - Energy Ombudsman – online advice centre for consumers dealing with problem with energy suppliers, https://www.urso.gov.sk/urso-ombudsman-kto-je-to-co-robi-a-ako-pomaha/ - Slovak agency of environmental protection - state agency, which coordinates the state support scheme Obnov dom/Renovate your house, https://www.sazp.sk/ - Slovak innovative and energy agency - state agency, which coordinates the state scheme Zelená domácnostiam/Green for households, https://www.siea.sk/ - Institute of environmental policy – an analytical unit of the ministry of the environment, with mission to provide high quality and reliable environmental analysis and forecasts for the Slovak government and the public, he outputs do not necessarily reflect the official views of the ministry, aims to stimulate and improve the professional and public debate on topical issues, https://iep.sk/
	Local governments	- Municipalities, www.poprad.sk - Regional governments of eights Slovak counties

	- Union of Slovak cities, https://www.uniamiest.sk/ - Association of Towns and Municipalities of Slovakia, https://www.zmos.sk/
Private actors	- RES associations (SAPI), https://www.sapi.sk/ - Photovoltaic suppliers/installers, heat pump distributors/installers - European heat pump association, https://www.ehpa.org/
International/ supra-national actors	- **European consumer organisation BEUC** - the umbrella group for 46 independent consumer organisations from 32 countries, which main role is to represent them to the EU institutions and defend the interests of European consumers in areas of competition, consumer rights, digital rights, energy, redress and enforcement, financial services, food, health, safety, sustainability and trade policy, https://www.beuc.eu/ - **International Consumer Research & Testing (ICRT) -** a global consortium of consumer organisations that collaborate on research and testing of consumer products and consumer services, not-for-profit organisation fully owned by its members, so it is independent of product manufacturers, and act exclusively in the interest of consumers, https://www.international-testing.org/ - **European Climate Foundation** - s a major philanthropic initiative working to help tackle the climate crisis by fostering the development of a net-zero emission society at the national, European, and global level, https://europeanclimate.org
Academia	- **Prognoses Institute of Slovak Academy of science** - the strategic objective of the Institute is to conduct basic and applied research to understand and manage global and local economic, social and environmental issues[cmlxxxiii] - **Presov University**[cmlxxxiv]
Others	

Summarizing evaluation	
Fields of Action:	In order to achieve the goal of energy self-sufficiency and to reduce the costs of heat and hot water supply by building its own RES heat source, the Slnečnica multi apartment building and all apartment buildings in Slovakia must resolve issues and overcome numerous legislative and technical obstacles in the following fields of action: 1. The administrative process of terminating the heat supply from the central supplier needs to be unified and simplified, and the costs associated with this termination should be shared fairly between the apartment building and the remaining customers.

2. The decision-making processes for obtaining the consent of the owners in the apartment building, when terminating the contract with the heat supplier, need to be standardised, simplified and motivating for both sides.

3. The issue of what options the older multi apartment buildings have with heat pumps, when they do not own the necessary land, but need to obtain the right to an adjacent property to conduct a survey for the location of a water-to-water heat pump needs to be addressed.

4. Adjusting the legislative options for apartment buildings to locate a heat pump on adjacent land.

5. Establish network of contact advice centres to make multi apartment buildings‘ managers aware of the possibilities of placing photovoltaic panels on their apartment buildings and the available state assistance and financial support.

6. Elimination of technical problems with grid capacity and significant speeding up and simplification of the process of obtaining the approval of the distribution company for the construction of a local source for the generation of electricity from renewable energy sources. Motivate prosumers by net-metering and payments for extra renewable energy sent back to the grid.

7. Examine the positives/negatives/potential of residential buildings in Slovakia for the use of photovoltaics and/or solar collectors on the roofs, on the balconies. Investigate the potential of solar parks in the sector of multiapartment buildings.

8. Consumer awareness - will all households in the multi apartment building agree to invest to photovoltaic or/and heat pumps? How and why to motivate tenants, landlords or poor?

9. Currently there are no financial instruments or help available for multi apartment buildings with savings willing to disconnect from central heating and partially or fully transfer to renewables. How to improve three current schemes and what other tools can be created?

Slowenien

	State	Slovenia
General information	**Status EU membership**	Member state since 1 May 2004[cmlxxxv] Participant of Energy Community since 17 November 2006[cmlxxxvi]
	Population	2,123,949 (2024)[cmlxxxvii]
	Land area (km²)	20,273 km² (2022)[cmlxxxviii]
	Urban population (%)	55.75 % (2022)[cmlxxxix]
Socio-economic situation	**GDP (current US$ billion)**	72.1 (2024)[cmxc]
	GDP per capita (EURO)	29,801 (2023)[cmxci]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	10,025.07 (2023)[cmxcii]
	Median hourly earnings (EURO)	Males: 8.24 (2018) Females: 7.77 (2018)[cmxciii]
	World Bank economic classification (2024)	High-income country[cmxciv]
	Unemployment (% of total labor force)	3.5 % (2023)[cmxcv]
Energy situation in general	**Current energy sources**	**Total energy supply (TES)** in 2022: Oil (38%), Renewables (16.6%), Coal (12%), Natural gas (10.6%), Nuclear (22.8%)[cmxcvi] TES in 2020: Oil (32%), Renewables (16%), Coal (15%), Natural gas (11%), Nuclear (25%)[cmxcvii] Of the 16% renewable energy supply in 2020, 36% was from hydro/marine, 58% from bioenergy, 4% from solar, and 1% from geothermal[cmxcviii]

	Domestic energy production in2022 129,545 TJ: Coal (20.89%), Natural gas (0.12%), Nuclear (47.20%), Hydro (8.75%), Wind, solar, etc.(2.51%), Biofuels and waste (20.52%)[cmxcix] **Net energy imports of 2022 total energy supply:** 54.2%[m] **Total final consumption (TFC)** in 2021 203,751 TJ: Coal (0.57%), Oil products (44.55%), Natural gas (12.79%), Biofuels and waste (14.04%), Electricity (23.78%), heat (3.83%), other renewables (0.43%)[mi] Electricity generation in 2022 consisted of: Non-renewable 9,325 GWh (68.5%), of which: • Coal: 3,234 GWh (23.7%) • Oil: 48 GWh (0.4%) • Natural gas: 438 GWh (3.2%) • Nuclear: 5,605 GWh (41.1%) Renewable 4,297 GWh (31.5%), of which: • Hydro: 3,401 GWh (25%) • Solar: 644 GWh (4.7%) • Wind: 5 GWh (0%) • Bioenergy: 239 GWh (1.8%) • Waste: 8 GWh (0.1%)[mii]
Climate protection targets	**Overall Emissions:** Reduce overall emissions by 15% compared to 2005 levels by 2030. **Non-ETS Emissions:** Reduce non-ETS emissions by 27% compared to 2005 levels by 2030.[miii] **Net-Zero Emissions by 2050:** Plan targets, policies, and measures for 2030 to achieve net-zero GHG emissions at the EU level by 2050. **GHG Emissions Reduction:** Reduce total GHG emissions by at least 55% by 2033 compared to 2005. **Slovenia's Burden Sharing Targets by 2030:** Reduce GHG emissions by 28-31% compared to 2005, with sectoral targets: • Wide use: -74% • Agriculture: -1% • Waste Management: -67% • Industry (non-ETS): -55% • Energy (non-ETS): -48% **Buildings Sector:** Reduce GHG emissions in buildings by at least 70% by 2030 compared to 2005.[miv] Reduce emissions in the buildings sector by

	85-95% by 2040 and aim for minimal possible emissions by 2050, compared to 2005 levels. **Transport Sector:** Reduce emissions from the transport sector by 55-65% by 2040 and by 90-99% by 2050, compared to 2005 levels.[mv] **LULUCF Sector:** Ensure LULUCF emissions do not exceed sinks from 2021 to 2025 and achieve a sink of at least -146 kt CO_2 eq by 2030.[mvi] **Coal Consumption:** Reduce coal consumption by 30% by 2030 and phase out coal entirely by 2033[mvii]. **Climate Adaptation:** Reduce Slovenia's vulnerability to climate change impacts and increase resilience and adaptive capacity. **Climate Justice:** Ensure climate justice. **Low-Carbon Circular Economy:** Promote sustainable consumption and production to transition to a low-carbon circular economy. **Decarbonization of Industries:** Provide financial incentives for green technologies, green gases (including hydrogen), green fuels, and CO2 capture and storage. **Human Resources:** Increase investment in training and skills needed for the transition to a climate-neutral society and to reduce implementation gaps.[mviii]
Renewable energy targets	**Renewable Energy Sources (RES):** Achieve at least a 30-35% share of RES in final energy use by 2030. • **Buildings:** At least 66% of energy use in buildings from RES (excluding electricity and district heat); prohibit sale and installation of new fuel oil boilers after 2022. • **Industry:** At least 30% share of RES (including waste heat) in industrial energy use. • **District Heating/Cooling:** Annual increase of 2-3% in the share of RES and waste heat/cold, achieving 25-40% by 2030. • **Electricity Generation:** At least 52% share of RES. • **Heating and Cooling:** At least 41% share of RES. • **Transport:** At least 26% share of RES. **Energy Activities:** Rapid expansion to install electricity-generating installations from solar or wind in multi-use spaces (agricultural, road, water, etc.). **Natura 2000 Sites:** Allow renewable energy installations in these protected areas. **Public Sector:** Accelerate solar panel installation on public sector roofs.[mix]

Renewable energy potential	**Solar Resource Potential:** Over 80% of the country's land area has low solar energy potential, falling into the lowest class (class 1 out of 7 on a global scale), with an annual generation of less than 1.2 MWh per kWp of installed PV capacity. **Onshore Wind Potential:** Nearly 80% of the country's land area has low wind energy potential, classified in the lowest category (class 1 out of 7 on a global scale), with a wind power density below 260 W/m² at a height of 100 meters. **Biomass Potential:** The country has high biomass potential, with an average net primary production (NPP) of 5.5 tC/ha/yr, higher than the global average of 3-4 tC/ha/yr.[mx] **Technical Potential for Installed Renewable Electricity Capacity in MW:** Biomass(700), Solar PV (19,200), Wind (600), Small Hydro(300)[mxi]
Renewable energy support regime	**European Commission Aid Scheme:** • The European Commission approved a €150 million state aid scheme for renewable energy and energy storage. • Grants can reach up to €25 million per beneficiary under the State Aid Temporary Crisis and Transition Framework. • Aimed at accelerating investments in renewable energy production and energy storage to achieve a net-zero economy transition, including heat. • Funds must be allocated by December 31, 2025. **Current Projects in Slovenia:** • Several grid-scale battery storage projects are underway, including 60MW units with a hydroelectric plant and a new pumped hydroenergy storage system. • Slovenia is conducting a cross-border grid synchronization project with Croatia, incorporating 50MWh of battery storage, partly funded by the EU.[mxii] **Based on the European Commission Aid Scheme (EUR 150 million):** • The Slovenian government has adopted a decree on investment aid to promote the deployment of energy from renewable sources. This scheme provides direct grants of up to EUR 25 million per beneficiary, targeting legal entities, cooperatives, individuals engaged in business activities, and local authorities. • Eligible projects include the installation of photovoltaic, solar, geothermal, and hydropower plants, as well as wind energy installations and cogeneration facilities using biomass, biogas, landfill gas, and sewage gas.

- Aid can cover up to 45% of the total project cost, with additional increases (up to 20% for small enterprises and 10% for medium-sized enterprises).[mxiii]

Relevant laws, policies, and plans

Slovenia's renewable energy regulations:

- Slovenia adopted a bylaw on self-supply with electricity from renewable energy sources in May 2019.
- The regulation allows for two forms of collective self-consumption (CSC):
  a) In multi-apartment buildings
  b) In "RES communities" formed by customers in various types of dwellings
- Key provisions for collective schemes include:
  - Single metering points can't belong to multiple schemes
  - Multiple schemes can exist in the same LV grid
  - Third-party owners can't market excess energy
  - Contracts must specify relationships and energy division among members
  - Capacity limits are set for RES production units
  - No balancing requirements for individual self-supply
  - Annual capacity limitations were abolished
- Net-metering systems continue with a one-year accounting interval.
- The government plans to introduce new support schemes (2021-2023) for RES communities and is considering local flexibility markets.
- A draft electricity law in November 2020 introduced Citizen Energy Communities, to be established as cooperatives.

This framework aims to stimulate private investments in renewable energy generation and is a step towards transposing the EU's Clean Energy Package.[mxiv]

Regulatory framework for citizen energy

EU Directive Implementation for Energy Communities

Slovenia implemented EU directives on renewables and electricity markets in July and October 2021 through Acts No. 2570 (ZSROVE) and No. 3349 (ZOEE). These Acts include provisions for energy communities of citizens (ECCs), allowing participation in most markets and activities, except ownership or management of distribution networks. Implementing rules for collective self-consumption within ECCs were defined in March 2022. However, detailed national measures for ECCs in the renewable energy support scheme are yet to be introduced, and further elaboration is needed on certain criteria derived from EU directives.[mxv]

Evaluation of the legal framework

Slovenia has set up basic rules for citizen energy projects in line with EU Directives. However, these rules need improvement with more specific support and fewer obstacles to help energy communities grow. The current legal framework doesn't clearly mention important aspects like citizen participation or a designated authority to oversee these projects.[mxvi]

Regarding self-supplying with electricity from renewable sources, the existing rules are just a starting point. The roles and operations of the Distribution System Operator (DSO) within energy communities need to be standardized and officially regulated, rather than relying on temporary solutions. Additionally, regulatory sandboxes in Slovenia should be more flexible to meet all the needs of implementing energy communities.[mxvii]

existing citizen energy projects and/or research initiatives

Citizen energy projects

Empowering Renewable and Citizen Energy Communities (POWER-E-COM)

- **Funding:** European Commission, LIFE
- **Timeframe:** 2023 - 2026
- **Budget:** 21.4 M€
- **Coordinator:** WIP, Germany
- **Partners:** ESCAN (Spain), EWO (Germany), ESV (Austria), ENERGAP (Slovenia), BSERC (Bulgaria), Ayto Rivas (Spain), **Obcina Selnica (Slovenia)**, TUS (Ireland), TEA (Ireland), Community Power (Ireland), Municipality of Gabrovo (Bulgaria)

Description:

- Aims to establish energy communities across six European countries **including Slovenia**, fostering cooperation between local authorities and citizens in the energy transition.

Objectives:

- Develop adaptable models for energy community creation.
- Provide training and capacity building for citizens and officials.
- Facilitate knowledge exchange to enhance community energy development.

Target Groups:

- Existing renewable energy communities, active citizens, and municipal decision-makers.[mxviii]

COMPILE (Integrating Community Power in Energy Islands)(https://www.compile-project.eu/)

- **Overview:**
  - Demonstrates energy self-sufficiency in Luče, Slovenia, using renewable sources despite weak grid connections.(https://main.compile-project.eu/sites/pilot-site-luce/)

- Innovates large-scale PV installation and community energy management in rural areas.
- **Objectives:**
  - Empower rural communities globally to adopt sustainable local energy systems.
  - Develop toolsets for energy community establishment and management.
- **Impact:**
  - Shortlisted for the EU Sustainable Energy Awards 2021, showcasing its role in the EU's 2030 climate goals.
  - Piloted in Portugal, Spain, Greece, and Croatia, proving scalability and replicability.
- **Partnership:**
  - Led by the University of Ljubljana, with 12 European partners.
  - Funded by EU Horizon 2020 with a budget of €6.42 million.[mxix]

ENERGISE Project

- **Issue:**
  - Energy policy often prioritizes short-term efficiency without considering long-term sustainability in existing energy cultures, potentially leading to increased consumption over time.
- **Research Strategy – Living Labs Approach:**
  - **Approach:** Uses Living Labs to observe real-world energy cultures and test household and community-level energy reduction initiatives.
  - **Scope:** Reviews energy initiatives from 30 European countries to establish prototype ENERGISE Living Labs. Data from 16 labs across eight countries informs future energy strategies.
- **Objectives:**
  - **Innovation:** Develops a new framework merging social practice and energy cultures for sustainable consumption research.
  - **Impact Assessment:** Evaluates European energy consumption reduction efforts.
  - **Community Focus:** Advances Living Lab approaches to transform community energy cultures and understand routine impacts on sustainability.
  - **Insights:** Generates insights on societal norms and disruptions in promoting sustainable energy use.
  - **Engagement:** Promotes stakeholder involvement and shares ENERGISE findings to support the European Energy Union.[mxx]

Other Projects:

		Zadruga Sončnih Elektrarn Slovenije (ZSES): • Established in Ptuj in 2014, ZSES supplies and installs solar power plants across Slovenia. Members collectively operate solar capacity exceeding 6.3 MW and have successfully raised capital for solar projects.[mxxi] **Lesna Zadruga Loški Potok:** • Founded in 2016, operates a local biomass district heating system in Loški Potok, serving 13 customers. Completed a 33 kW solar PV installation in 2020 and is developing a community wind turbine project.[mxxii] **Zeleni Hrastnik:** • Developing Slovenia's largest cooperative solar power plant, a 300 kW array on a local primary school roof in Hrastnik.[mxxiii] **Sočna Zadruga:** • Implemented five biomass-based microheat network projects using cooperative principles.[mxxiv] **Ajdovščina Municipality:** • Implemented a pilot community solar PV project using a public facility roof to supply electricity to seven households. **Solar Energy Cooperative in Sv. Anton:** • Established through the ENES-CE Interreg Central Europe project near Koper. **Krajcarca Hydro Power Plant:** • Established in 1992 as a small cooperative hydropower plant.[mxxv]
	Research and capacity building activities	- Cuneo, A., Quellec, P. J. L., Choné, T., Comodi, G., Valalaki, K., Samari, K., & Medved, T. (2021). ***Energy Communities: How Tools Can Facilitate Their Enhancement***. Environmental Sciences Proceedings, 11(1), 13.[mxxvi] - Tuerk, A., Neumann, C., & Gubina, A. F. (2022). ***Overview of international approaches for local energy systems and energy communities***. In *COMPILE Working Paper*.[mxxvii] - Frieden, D., Tuerk, A., Antunes, A. R., Athanasios, V., Chronis, A. G., d'Herbemont, S., ... & Gubina, A. F. (2021). ***Are we on the right track? Collective self-consumption and energy communities in the European Union***. *Sustainability*, *13*(22), 12494.[mxxviii]
Relevant actors and	**NGOs**	- Focus (https://focus.si/): ENERGISE project partner [mxxix] - Thriving Communities (https://thriving-communities.org/)
	Governmental bodies	The Ministry of the Economy (www.mgrt.gov.si/en/): - Shapes the overall national policy and strategy in the energy sector

	Energy Agency Slovenia (www.agen-rs.si/en/): - Energy market regulator, responsible for licensing in the energy sector - Responsible for granting feed-in tariff and premium
	BORZEN (www.borzen.si/): - Power Market Operator provides and facilitates coordinated operation of the Slovenian electricity system - Via the internal centre for RES/CHP it operates the support scheme for the generation of energy from RES
	ELES (www.investslovenia.org/): - State-owned Transmission System Operator responsible for electricity transmission and management of the national grid
	Invest Slovenia (www.investslovenia.org/): - As part of the Slovenian Public Agency for Entrepreneurship, Innovation, Development, Investment and Tourism Investment Agency, responsible to attract, consult and facilitate potential investors[mxxx]
Local governments	Municipality of Selnica ob Dravi
	Municipality of Luče
Private actors	- WIP (https://www.wip-munich.de/welcome/home/)
International/ supra-national actors	- European Commission - LIFE
Academia	University of Ljubljana Prof. Andrej Gubina, PhD Mr. Tomi Medved[mxxxi]
Others	Eko sklad (www.ekosklad.si/): The Environmental Fund of the Republic of Slovenia awards low-interest loans to renewable energy projects through a tendering process.[mxxxii]

Summarizing evaluation

Fields of Action

- Expanded collective self-consumption (CSC) system currently limited to low voltage (LV) transformer level in Slovenia

- LV communities combined with reduced grid fees could incentivize setup
- Need for multiple LV communities to cover villages like Luče
- Public buildings are ideal for new photovoltaics (PV) installations but are not always connected to the same transformer
- Expansion of localization criterion for energy communities proposed for broader implementation
- Standardization needed for DSO (Distribution System Operator) activities in sharing and metering
- Legal/regulatory clarification required for DSO's role in local microgrid operations[mxxxiii]
- Decarbonizing districts and cities will require a significant share of decentralized renewable energies, posing challenges for local electric grids.
- Local Energy Communities (LECs) can significantly contribute to decarbonization efforts and address technical and societal challenges.
- Need for high flexibility in future smart energy systems to manage uncertain renewable energy production.
- Flexibility can be achieved through sector integration, citizen involvement in flexibility programs, and aggregation.
- Empowering citizens to participate in these programs is crucial, requiring a focus on social aspects alongside technical solutions.
- Future energy systems must be designed with planning tools that incorporate emerging technologies like energy storage and electric vehicles.
- New architectures and control mechanisms may be necessary to achieve decarbonization goals effectively.[mxxxiv]

	State	Ukraine
General information	**Status EU membership**	Signed EU accession Agreement in June 2014; Party to the Energy Community since 1 February 2011[mxxxv]
	Population	36,666,975 (2023) [mxxxvi] 43,792,855 (2021)[mxxxvii]
	Land area (km²)	579,400 km² (2020)[mxxxviii]
	Urban population (%)	70 (2021)[mxxxix]
Socio-economic situation	**GDP (current US$ billion)**	200.09 (2021)[mxl]
	GDP per capita (EURO)	4,130 (2022)[mxli]
	Monthly net earnings (USD) **Average Monthly Salary (EURO)**	521 (2022)[mxlii] 455,1 (2022)[mxliii]
	Average hourly earnings (UAH/EUR) **Average Monthly wage by sex (UAH/EUR)** *Gender pay gap in Ukraine stands at 18,6% compared to 13% in the European Union (2023)[mxliv]	103,95 UAH (2021)[mxlv] / 2.57 EUR (rate 02.16.2023) Men 16912 UAH (2021)[mxlvi] / 417,37 EUR (rate 02.16.2023) Women 13802 UAH (2021) [mxlvii] / 340,62 EUR (rate 02.16.2023)
	World Bank economic classification (2021)	Lower-middle income economy[mxlviii]
	Unemployment (% of total labor force)	9.8 (2021)[mxlix]

Energy situation in general	**Current energy sources**	Produces significant volumes of natural gas, but still dependent on gas (and oil) imports and is a major transit route for Russian gas exports towards Europe. Following the Russian invasion of Ukraine, emergency synchronization of the power systems of Ukraine and Moldova with Continental Europe took place on 16 March 2022[ml]. Primary fuel mix of Ukraine in 2020 (57,121 ktoe) consisted of[mli]: • 35,69% Nuclear • 28,19% Natural Gas • 22.56% Solid fossil fuels • 7.86% Renewables (excluding hydro) • 4.4% Oil and petroleum products • 1.2% Hydro Electricity Generation in 2020 consisted of 89% (132,654 GWh) non-renewables and 11 % (17,136 GWh) renewables, including [mlii]: • Hydro and Marine 5 729 GWh (4%) • Solar 7 141 GWh (5%) • Wind 3511 GWh (2%) • Bioenergy 755 GWh (1%)
	Climate protection targets	Ratified the Paris Agreement in September 2016[mliii] Submitted its updated NDC to the UNFCCC in July 2021, Ukraine, including the target of a 65% reduction below 1990 levels by 2030 including land use, land-use change and forestry (LULUCF)[mliv]. Climate Action Tracker (CAT) suspended updates on the progress by Ukraine due to the Russian invasion of Ukraine[mlv] The previous CAT rating of Ukraine's target was "Highly insufficient" indicating inconsistency of Ukraine's climate policies and commitments with the Paris Agreement's 1.5°C temperature limit[mlvi]
	Renewable energy targets	In 2020, the share of renewable energy in Ukraine reached only 9,19%, below the target of 11%.[mlvii] In 2021, Ukraine set a goal of reaching a share of 25 percent of renewables in its total energy mix by 2035.[mlviii]
	Renewable energy potential	In 2017 IRENA estimated cost-competitive wind potential Ukraine of up to 119.2 GW, including further potential for wind (up to 200 GW)

	and solar PV (up to 70 GW), which could be provided for by with more stable frameworks 2030.[mlix] Renewable capacity in 2021 comprised 14305 MW[mlx], including: • Solar: 5,363 MW • Large hydropower: 4,444 MW • Pumped Storage: 1,488 MW • Wind:1,111 MW • Small Hydropower: 192 MW • Biomass: 200 MW • Biogas: 124 MW "Most areas of high potential for wind and solar generation are in occupied or contested regions of Ukraine"[mlxi].
Renewable energy support regime	"From 2020, only wind projects with installed capacity up to 5 MW and other technologies up to 1 MW are granted administratively set feed-in tariffs (FiTs)". [mlxii] A new draft law introducing a contract for difference mechanism was published for public consultation in August 2021.[mlxiii] "In July 2022, the Parliament adopted amendments where renewable producers were allowed to sell electricity directly at the day-ahead, intraday, bilateral and balancing markets".[mlxiv] "Guaranteed access to the transmission and distribution networks for electricity produced from renewable energy sources is provided". [mlxv]

Relevant laws, policies, and plans

- Since the Russian invasion of Ukraine in 02.2022 martial law is applied, potentially affecting energy-related legislation.[mlxvi]
- The *National Energy and Utilities Regulatory Commission of Ukraine (NEURC)* is set up as a 'central executive body' established by the Cabinet of Ministers[mlxvii].
- On 5 August 2022, the Ministry of Energy published the updated version of the draft **law on Projects of National Interest in Energy**, which transposes Regulation (EU) 347/2013, for public consultation[mlxviii].
- **Energy Efficiency Law** was adopted in October 2021, including specific targets and policy measures facilitating compliance with the Energy Efficiency Directive[mlxix].
- "The draft **climate law** is being developed with external support… expected to transpose the climate related elements of the Governance Regulation.
- The draft NECP should be revised in light of the mounting rebuilding efforts to put Ukraine on a path of low-carbon development"[mlxx].
- The **Law on the Principles of Monitoring, Reporting and Verification (MRV) of GHG emissions**, together with secondary legislation have been adopted. However, the system is still not fully operational as the launch of the MRV electronic registry (data management system) is missing.
- In March 2021 the **"National Economic Strategy until 2030"** was approved, outlining how climate neutrality is to be achieved by 2060[mlxxi].
- **Draft Law No. 9011-d** on Amendments to Certain Laws of Ukraine Regarding the Restoration and Green Transformation of the Energy System of Ukraine introduces amendments to several laws governing guarantees of origin, self-consumption and support schemes for electricity from renewable sources, most importantly, **Law on Alternative Energy Sources and the Law on the Electricity Energy Market**. It partially transposes the Renewable Energy Directive (REDII) and other elements of the Clean Energy Package, but does not ensure full transposition[mlxxii].

Regulatory framework for citizen energy

- Recent amendments to the Law on Alternative Energy Sources have introduced the term "energy cooperative" into Ukrainian law[mlxxiii].
    - Article 9-3. Incentives for electricity producers from alternative energy sources who have acquired the right to support as a result of the auction[mlxxiv]
- The Law on Amendments to Certain Laws of Ukraine on Stimulating the Production of Electricity from Alternative Energy Sources on a Market Basis, introduces a contract for difference mechanism for auctions, was published for consultation in August 2021, but was not adopted as of 2022[mlxxv].
- "All customers in the retail market are free to choose their supplier. Universal service suppliers are obliged to supply electricity to households under regulated tariffs, which are not cost-reflective".[mlxxvi]
- "Guaranteed access to the transmission and distribution network for electricity produced from renewable energy sources is provided".[mlxxvii]
- As of 2020, a legal framework and financial instruments for community-based renewables projects were lacking[mlxxviii]

- In 2020, the Ministry of Energy and Environmental Protection of Ukraine presented a draft ***concept of Green Energy Transition of Ukraine until 2050***, developed in line with global energy tendencies with focus on climate change[mlxxix], including provisions recognising the importance of energy cooperatives.
- The Law on the Promotion of the Use of Energy from Renewable Sources enabled households to install up to 30 kW of wind and solar capacities for own consumption[mlxxx].

Legal and political framework for citizen energy

- "The draft Law of Ukraine "On Amendments to Certain Laws of Ukraine Regarding the Restoration and Green Transformation of the Energy System of Ukraine" partially transposes provisions from the Electricity Directive, in particular with regard to active customers, energy communities and aggregation, etc"[mlxxxi]
- "From 2020, only wind projects with installed capacity of up to 5 MW and other technologies of up to 1 MW are granted administratively set feed-in tariffs (FiTs)."[mlxxxii]
- "In July 2022, the Parliament adopted amendments where renewable producers were allowed to sell electricity directly at the day-ahead, intraday, bilateral and balancing markets." [mlxxxiii]

Energy Cooperatives Booklet (2019) describes the potential Legal basis[mlxxxiv]

- Energy cooperatives can be established on the basis of the Law of Ukraine (Law on Cooperation, Law on Consumer Cooperation or Law on Limited and Additional Liability Companies. The choice of model depends on the planned activities and members[mlxxxv].
- The participation of local self-government bodies in cooperatives is regulated by the current legislation of Ukraine, in particular, the Civil Code of Ukraine and the Commercial Code of Ukraine.
- The Civil Code of Ukraine stipulates that cooperatives may, in addition to their main activity, engage in entrepreneurial activity…However, the mechanism of profit distribution is not defined by law.

Evaluation of the legal framework

- "Today, the only obstacle to the creation of energy cooperatives is low awareness and lack of trust between people." (NGO Ecoclub, 2019)[mlxxxvi]
- "Ukrainian legislation has a number of problems that create restrictions on the development of energy cooperatives, but today the opportunities for the application of the cooperative model in the energy sector are impressive"[mlxxxvii].

The overall performance of the Energy Sector implementation of Ukraine is provided by the Energy Community[mlxxxviii].

Existing citizen energy projects and/or research initiatives

Citizen energy projects	**Municipal energy cooperative "Sunny City" is the first cooperative in Ukraine[mlxxxix],** founded in 2018, at the joint initiative of Slavutych City Council and NGO "Greencubator".
	- This project brought together the resources of the city, local community, and members of the cooperative on a crowdfunding basis to create a solar power plant located on the roofs of three municipal buildings on a lease.
	- The Slavutych city residents could join the cooperative community. The main activity of the cooperative "Sunny City" is the construction and operation of solar power plants and selling electricity at a "green" tariff[mxc].
	  - The members of the cooperative are private individuals and the Regional Development Agency of Slavutych. Legal form of a cooperative: consumer society[mxci].
	  - The network of the city of Slavutych is part of the UES (United Energy System of Ukraine)

	An Energy Cooperative was founded in 2018 in Berezdivska OTG (Khmelnytsky Region). The founders were: private individuals, NGO "Ecoclub" and KP "Berezdiv". Legal form of a cooperative: limited liability company. - The cooperative will produce fuel briquettes from straw bought from local farmers. Prior to the establishment of the cooperative, negotiations were held with local farms and an agreement was reached on the purchase of straw residues that had previously remained in the fields. The farmers are members of the cooperative. - In the first stage, the briquettes will be used to heat one of the schools of the united territorial community. - Participants of the Berezdovsky Energy Cooperative can be individuals and legal entities who are willing to contribute to the authorized capital of the company in the amount equivalent to at least 500 €, or securities, real estate or other property worth at least 15 000,00 UAH. - All members of the cooperative, regardless of contribution, have only one vote in accordance with the statute. In this case, they will receive a profit depending on the share of the contribution.
Research and capacity building activities	**A brochure on energy cooperatives** was created as part of the project "Turning Local Resource Potential into the 100% RES Process" with the financial support of the Representative Office of the Foundation Heinrich Böll in Ukraine[mxcii]
	Initiative "Promoting Energy Sustainability at the Local Level by Implementing Community Energy Initiatives" aims to help Ukrainian communities to develop cooperative tools and become more energy

		sustainable by sharing the best international and Ukrainian experience of energy cooperatives and involving industry experts to help launch energy cooperatives in Ukraine[mxciii]. - Supported by **the USAID Energy Security Project (PEB)** and implemented by **Greencubator** together with **Lviv Business School (LvBS) of the Ukrainian Catholic University** in partnership with **Open Maidan University (VUM) and Veteran Hub** - Target groups: community leaders, entrepreneurs, and the public sector. The initiative team is working to transfer and disseminate this knowledge to Ukrainian communities using the following tools: - School of Energy Cooperation: The training is open to participants from all over the country, lasts 2 months, and aims to provide practical knowledge on the establishment of energy cooperatives[mxciv] - Energy Accelerator of Communities: a 4-month mentoring program for teams that have decided to create their own energy cooperatives. During the Accelerator, experienced specialists in the field of cooperation, energy and finance help teams to go from the previous business plan to the beginning of attracting investment.
		Publication on experience of Energy Communities in Austria and Germany (2016)[mxcv], produced by the Office of Financial and Economic Analysis in the Verkhovna Rada of Ukraine Legal Department
Relevant actors and stakeholders	**NGOs**	Greencubator (Slavutych, cooperative "Sunny City") [mxcvi]
		Ecoclub (page and brochure re energy communities)[mxcvii]
		Center for Environmental Initiatives "Ecoaction"
	Governmental bodies	The Ministry of Energy and Coal Industry
		National Energy and Utilities Regulatory Commission of Ukraine (NEURC)
		National Commission for Energy Regulation
		National Commission for Regulation of Economic Competition
		The State Agency for Energy Efficiency and Energy Saving of Ukraine (SAEE)

		Energoatom; Centerenergo - state-owned power generation companies
		Ukrenergo, national transmission system operator
	Local governments	Slavutych City Council (cooperative "Sunny City") [mxcviii]
		Regional Development Agency of Slavutych
	Private actors	https://solartown.com.ua/people/ https://www.var.energy/about
	International/ supra-national actors	USAID Energy Security Project (PEB)
		Heinrich-Böll-Stiftung
		UNDP
	Academia	Lviv Business School (LvBS) of the Ukrainian Catholic University Open Maidan University (VUM)[mxcix]
	Others	Ukrainian Association of Renewable Energy
Summarizing evaluation		
Fields of Action		**Evaluation by the Energy Community**[mc], as of 07.2023, states: Even during the Russian war, Ukraine managed to advance acquis implementation in several areas including electricity, energy efficiency, environment and renewables. The biggest breakthrough was the synchronization of the electricity network of Ukraine with the Continental European power system, partially made possible by the country's progress in electricity acquis implementation before the start of the war. **Recommendations from the Energy Community**[mci] re Renewable Energy include: - "Ukraine should keep its efforts to stay on the path of electricity market reform and prevent back-sliding from what was achieved before the invasion" - "The utmost priority for Ukraine remains the implementation of a functional market-based support scheme and financial stabilization of the guaranteed buyer… - The Government should provide support to help producers restoring damaged electricity equipment…

- Ukraine should as soon as possible designate an issuing body for guarantees of origin, sign a direct agreement with the service provider and start using the national electronic registry developed during the regional project."

In addition, there is a need to build awareness about- and trust among the population in energy cooperatives.

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[iv] https://www.statista.com/statistics/444566/urbanization-in-albania/
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[viii] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
[ix] https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS
[x] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Albania_Europe_RE_SP.pdf
[xi] Ibid.
[xii] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Albania_Europe_RE_SP.pdf
[xiii] https://www.energy-community.org/implementation/report/Albania.html
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[xv] https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Albania%20First/Albania%20First.pdf
[xvi] https://unece.org/sites/default/files/2021-07/UNECE-RE_Uptake_Factsheet_Albania.pdf
[xvii] https://www.fao.org/faolex/results/details/en/c/LEX-FAOC181524/
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[xxi] https://unece.org/sites/default/files/2021-07/UNECE-RE_Uptake_Factsheet_Albania.pdf
[xxii] Ibid.
[xxiii] Good overview provided in: Heinrich Böll Stiftung Sarajevo (hg.) 2021: POSITION PAPER ENERGY AND CLIMATE PLANNING ALBANIA 2030. https://ba.boell.org/sites/default/files/2021-01/Position-paper.pdf
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[xxvi] https://www.iea.org/countries/Albania
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[xxix] https://milieukontakt.org/project/eucena-european-citizen-energy-academy/?lang=en
[xxx] https://milieukontakt.org/project/eucena-european-citizen-energy-academy/?lang=en
[xxxi] https://www.energy-community.org/implementation/report/Albania.html
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[xxxvi] https://www.rescoop.eu/news-and-events/news/pioneering-community-energy-in-albania
[xxxvii] https://milieukontakt.org/?lang=en
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[ccc]xciii https://renewablemarketwatch.com/news-analysis/403-hungary-renewable-energy-transition-presents-new-excellent-opportunities-for-investors-and-developers-in-solar-photovoltaic-pv-and-wind-power-projects
[ccc]xciv https://iea.blob.core.windows.net/assets/9f137e48-13e4-4aab-b13a-dcc90adf7e38/Hungary2022.pdf
[ccc]xcv Ibid.
[ccc]xcvi Ibid.
[ccc]xcvii https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Hungary_Europe_RE_SP.pdf
[ccc]xcviii https://iea.blob.core.windows.net/assets/9f137e48-13e4-4aab-b13a-dcc90adf7e38/Hungary2022.pdf (p. 71)
[ccc]xcix https://iea.blob.core.windows.net/assets/9f137e48-13e4-4aab-b13a-dcc90adf7e38/Hungary2022.pdf
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[cdi] Frieden et al. 2020. Collective self-consumption and energy communities: Trends and challenges in the transposition of the EU framework. Working Paper Compile project.
[cdii] Ministry of National Development: Energy and Climate Awareness Raising Plan (Energia- és Klímatudatossági Szemléletformálási Cselekvési Terv). Available in Hungarian on https://2010-2014.kormany.hu/en (26/10/2022)
[cdiii]https://www.cashawards.eu/2021/03/29/light-at-the-end-of-the-tunnel-for-renewable-energy-communities-in-hungary/
[cdiv] https://iea.blob.core.windows.net/assets/9f137e48-13e4-4aab-b13a-dcc90adf7e38/Hungary2022.pdf
[cdv] "A main priority is to extend net metering (or an equivalent incentive programme) to apartment blocks. Laying the groundwork for establishing communities within the transformer zones is a second-level goal. The option of managing "village heating plants" as energy communities is mentioned as a third step. As regards the establishment of renewable energy communities, the question of vulnerable consumers and the security of supply is assigned a priority"
Frieden et al. 2020.(p. 24, see above)
[cdvi] Examples:1) Failure of the greenfield project, Napenergiaklub (Solar Energy Club), which aimed to collect community funding to invest in a greenfield 500 kV solar project in the feed-in-tariff scheme, due to the legal gaps; 2) Failure of the project by PV-Invest Magyarország, which planned to form a community solar park in cooperation with Energiaklub NGO in 2017, due to obstacles within the Hungarian Electricity Act and the Act on Credit Institutions and Financial Enterprises.
SEC [Solidarity Economy Center]. 2022 Community energy development agency in Hungary. A concept for facilitating community energy. Pre-study for the Deutsche Bundesstiftung Umwelt
[cdvii] https://euagenda.eu/upload/publications/2021-04-29-hungary-rrf-assessment-final.pdf
[cdviii] https://www.rescoop.eu/policy/hungary-rec-cec-definitions
[cdix] SEC [Solidarity Economy Center] 2022 (see above).
[cdx] https://mtvsz.hu/kozossegi-energia (26/10/2022)
[cdxi] SEC [Solidarity Economy Center] 2022.
[cdxii] http://www.pornoapatitavho.hu/ (26/10/2022)
[cdxiii] https://www.facebook.com/profile.php?id=100064349063329 (26/10/2022)
[cdxiv] SEC [Solidarity Economy Center] 2022.
[cdxv] https://www.communitypower.eu/en/hungary.html
[cdxvi] https://keep.eu/projects/21495/Collaboration-between-publi-EN/
[cdxvii] https://www.euki.de/en/euki-projects/buergerenergie/
[cdxviii] https://www.euki.de/en/euki-publications/community-energy-guide/
[cdxix] https://www.euki.de/en/news/unleashing-community-energy/
[cdxx] https://energiaklub.hu
[cdxxi] http://www.justiceandenvironment.org/earl/team/environmental-management-and-law-association-hungary/
[cdxxii] Developed a 1.3 MW solar power plant in Tolna, in central Hungary (https://iea.blob.core.windows.net/assets/9f137e48-13e4-4aab-b13a-dcc90adf7e38/Hungary2022.pdf)
[cdxxiii] https://rekk.hu/downloads/events/Summary_New_actors_on_the_energy_market.pdf
[cdxxiv] One of the very few genuine citizen energy initiatives in the country, although not expected to reach the organizational development to be registered formally as an energy community https://www.facebook.com/profile.php?id=100064349063329 (26/10/2022)
[cdxxv] Located in the 8th district in Budapest, the communally operated community centre hosts a dozen social initiatives, including NGOs, a communal kindergarten and a boxing club. The 36 kWp solar rooftop solar project was installed with the help of the Solidarity Economy Center. The aim is to set up a community energy fund from the solar revenues to finance energy efficiency improvements in the building.
[cdxxvi] https://mtvsz.hu/magunkrol

[cdxxvii] Internal Electricity Market Directive (IEMD) for citizen energy communities (CEC) and Recast Renewable Energy Directive (RED II) for "renewable energy community" (REC) definitions
[cdxxviii] https://ec.europa.eu/environment/enlarg/candidates.htm
[cdxxix] https://www.energy-community.org/implementation/Kosovo.html
[cdxxx] https://data.worldbank.org/indicator/SP.POP.TOTL?locations=XK
[cdxxxi] https://data.worldbank.org/indicator/AG.LND.TOTL.K2?view=chart
[cdxxxii] https://ask.rks-gov.net/media/2075/final-results_eng.pdf
[cdxxxiii] https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=XK
[cdxxxiv] https://rm.coe.int/kosovo-20210630-deliverable-2/1680a5fdf0
[cdxxxv] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
[cdxxxvi] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Enlargement_countries_-_labour_market_statistics#Employment_rates
[cdxxxvii] http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[cdxxxviii] https://www.energy-community.org/dam/jcr:dbe6d342-ea7d-4677-9a9b-e18f22a1cfad/IR2021_Kosovo.pdf
[cdxxxix] https://www.iea.org/countries/kosovo
[cdxl] Ibid.
[cdxli]https://www.rcc.int/download/docs/Leaders%20Declaration%20on%20the%20Green%20Agenda%20for%20the%20WB.pdf/196c92cf0534f629d43c460079809b20.pdf
[cdxlii] https://www.energy-community.org/dam/jcr:dbe6d342-ea7d-4677-9a9b-e18f22a1cfad/IR2021_Kosovo.pdf
[cdxliii] https://www.e3analytics.eu/wp-content/uploads/2020/11/E3A_Country-Report_Kosovo.pdf
[cdxliv] Ibid.
[cdxlv] Ibid.
[cdxlvi] Ibid.
[cdxlvii] http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[cdxlviii] "In 2016, Kosovo described the feed-in tariffs as 12-year contracts for wind power (85 €/MWh) and solar PV (136 €/MWh). Individual projects were capped at 3 MW for solar PV and 35 MW for wind power. However, no projects have been completed under the regime, even though preliminary authorisation of the wind feed-in tariffs took place in 2013, and of the solar tariffs in 2015." https://germanwatch.org/sites/default/files/2018-09/Study%20Phasing%20in%20Renewables.pdf
[cdxlix] https://www.energy-community.org/dam/jcr:dbe6d342-ea7d-4677-9a9b-e18f22a1cfad/IR2021_Kosovo.pdf
[cdl] https://www.e3analytics.eu/wp-content/uploads/2020/11/E3A_Country-Report_Kosovo.pdf
[cdli] doi:10.3390/en12244753
[cdlii] https://www.energy-community.org/dam/jcr:dbe6d342-ea7d-4677-9a9b-e18f22a1cfad/IR2021_Kosovo.pdf
[cdliii] Ibid.
[cdliv] http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[cdlv] https://www.energy-community.org/dam/jcr:dbe6d342-ea7d-4677-9a9b-e18f22a1cfad/IR2021_Kosovo.pdf
[cdlvi] https://www.keds-energy.com/Uploads/Data/Docs/GuidelineforbecomingaprosumerVXwMvXJzbY.pdf
[cdlvii] https://www.e3analytics.eu/wp-content/uploads/2020/11/E3A_Country-Report_Kosovo.pdf
[cdlviii] https://www.energy-community.org/implementation/report/Kosovo.html
[cdlix] https://germanwatch.org/fr/node/20187
[cdlx] https://www.giz.de/en/worldwide/98668.html
[cdlxi] https://www.facebook.com/KOSID.Kosovo/
[cdlxii] https://www.facebook.com/gek.kosova/
[cdlxiii] https://www.facebook.com/people/Shoqata-për-Energji-të-Ripërtëritshme-e-Kosovës/100064729716943/
[cdlxiv] https://komunat-ks.net/?lang=sq
[cdlxv] https://indep.info/en/
[cdlxvi] https://www.devex.com/organizations/institute-for-development-policy-indep-100816
[cdlxvii] https://www.facebook.com/Yecozone/
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[cdlxix] https://www.ero-ks.org/zrre/en/konsumatoret-shtepiak/energjia-elektrike/vet-gjenerimi-i-energjise-elektrike
[cdlxx] https://fkee-rks.net/en/news/
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[cdlxxv] https://germanwatch.org/fr/node/20187
[cdlxxvi] https://www.ebrd.com/work-with-us/projects/psd/kitka-wind.html
[cdlxxvii] https://www.argusmedia.com/en/news/2171377-kosovo-signs-agreements-for-100mw-of-wind-solar
[cdlxxviii] https://germanwatch.org/fr/node/20187
[cdlxxix] Ibid.

[cdlxxx] https://www.balkangreenfoundation.org/en-us/press/320/bgf-gathers-local-stakeholders-of-the-municipality-of-kamenica-for-advancement-towards-a-zero-carbon-economy/?beta=1
[cdlxxxi] http://get-ks.com/
[cdlxxxii] https://www.jahasolar.com/projects.html
[cdlxxxiii] http://www.jahagroup.eu/who-we-are/
[cdlxxxiv] https://www.keds-energy.com/eng/about-us/keds-profile/
[cdlxxxv] https://www.keds-energy.com/eng/services/prosumer/
[cdlxxxvi] https://www.stantec.com/en/projects/belgium-projects/kosovo-sustainable-energy-projects
[cdlxxxvii] https://youtu.be/2M_SuUZxsA8
[cdlxxxviii] https://www.e3analytics.eu/wp-content/uploads/2020/11/E3A_Country-Report_Kosovo.pdf
[cdlxxxix] Ibid.
[cdxc] Ibid.
[cdxci] https://european-union.europa.eu/principles-countries-history/country-profiles/lithuania_en
[cdxcii] https://www.energy-community.org/aboutus/whoweare.html
[cdxciii] https://data.worldbank.org/indicator/SP.POP.TOTL?view=chart&locations=LT
[cdxciv] https://data.worldbank.org/indicator/AG.LND.TOTL.K2?view=chart
[cdxcv] https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?view=chart
[cdxcvi] https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?view=chart
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[cdxcviii] https://ec.europa.eu/eurostat/databrowser/view/earn_nt_net/default/table?lang=en
[cdxcix] https://ec.europa.eu/eurostat/databrowser/view/earn_ses_pub2s/default/table?lang=en
[d] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
[di] https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS
[dii] https://www.iea.org/countries/lithuania
[diii] Ruggiero, Salvatore; Busch, Henner; Isakovic, Aljosa; Hansen, Teis (2021): Community Energy in the Eastern Baltic Sea Region: From Standstill to First Steps. In: Coenen, Frans H. J. M. und Thomas Hoppe (Hg.): Renewable Energy Communities and the Low Carbon Energy Transition in Europe. 1st ed. 2021. Cham: Springer International Publishing; Imprint Palgrave Macmillan (Springer eBook Collection), S. 49–74.
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[dv] https://www.trade.gov/country-commercial-guides/lithuania-energy
[dvi] https://investlithuania.com/reports-and-insights/
[dvii] https://caneurope.org/content/uploads/2024/04/Lithuania-Residental-Rooftop-Solar-Country-Profile.pdf
[dviii] https://commission.europa.eu/document/download/cd246df6-377e-4db3-bb48-8475c80aa43c_en?file-name=LITHUANIA%20DRAFT%20UPDATED%20NECP%20EN.pdf
[dix] https://caneurope.org/content/uploads/2024/04/Lithuania-Residental-Rooftop-Solar-Country-Profile.pdf
[dx] https://commission.europa.eu/document/download/cd246df6-377e-4db3-bb48-8475c80aa43c_en?file-name=LITHUANIA%20DRAFT%20UPDATED%20NECP%20EN.pdf
[dxi] https://ceelegalmatters.com/magazine-articles/8907-issue-10-2/22990-lithuania-a-breakthrough-period-in-renewable-energy
[dxii] https://www.nrel.gov/docs/fy24osti/89564.pdf
[dxiii] https://ceelegalmatters.com/magazine-articles/8907-issue-10-2/22990-lithuania-a-breakthrough-period-in-renewable-en-ergy
[dxiv] https://www.worldenergy.org/assets/downloads/Issues_Monitor_2024_Lithuania_commentary.pdf
[dxv] https://www.vert.lt/SiteAssets/dujos/2023-10/NERC%20Annual%20report%202022%20EN%20sk.pdf
[dxvi] https://commission.europa.eu/document/download/cd246df6-377e-4db3-bb48-8475c80aa43c_en?file-name=LITHUANIA%20DRAFT%20UPDATED%20NECP%20EN.pdf
[dxvii] https://finmin.lrv.lt/lt/es-ir-kitos-investicijos/naujos-kartos-lietuva/
[dxviii] https://commission.europa.eu/document/download/cd246df6-377e-4db3-bb48-8475c80aa43c_en?file-name=LITHUANIA%20DRAFT%20UPDATED%20NECP%20EN.pdf
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Low Carbon Energy Transition in Europe. 1st ed. 2021. Cham: Springer International Publishing; Imprint Palgrave Macmillan (Springer eBook Collection), S. 49–74.

[dxxiii] https://www.rescoop.eu/policy/transposition-tracker/enabling-frameworks-support-schemes/lithuania-2

[dxxiv] https://caneurope.org/content/uploads/2024/04/Lithuania-Residental-Rooftop-Solar-Country-Profile.pdf

[dxxv] http://co2mmunity.eu/wp-content/uploads/2018/10/Factsheet-smalininkai.pdf

[dxxvi] https://d3n8a8pro7vhmx.cloudfront.net/eurodad/pages/2581/attachments/original/1633508346/case-study-lithuania-FINAL.pdf?1633508346

[dxxvii] https://european-union.europa.eu/principles-countries-history/country-profiles/latvia_en

[dxxviii] https://www.energy-community.org/aboutus/whoweare.html

[dxxix] https://ec.europa.eu/eurostat/databrowser/view/tps00001/default/table?lang=en

[dxxx] https://data.worldbank.org/indicator/AG.LND.TOTL.K2?view=chart

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[dxxxii] https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?view=chart

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[dxxxv] https://ec.europa.eu/eurostat/databrowser/view/earn_nt_net/default/table?lang=en

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[dxxxvii] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

[dxxxviii] https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS

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[dxl] https://eng.lsm.lv/article/society/environment/latvia-third-in-eu-for-renewable-energy-use.a420046/

[dxli] Central Statistical Bureau of Latvia: https://data.stat.gov.lv/pxweb/lv/OSP_PUB/START__NOZ__EN__ENB/ENB060

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[dxlvii] https://kursors.lv/2022/09/29/sadales-tikls-augusta-sanemis-rekordlielu-elektrostacijas-pieslegsanas-pieteikumu-skaitu/

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[dl] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Latvia_Europe_RE_SP.pdf

[dli] https://www.trade.gov/country-commercial-guides/latvia-renewable-energy-equipment

[dlii] Central Statistical Bureau of Latvia: https://data.stat.gov.lv/pxweb/lv/OSP_PUB/START__NOZ__EN__ENA/ENA040

[dliii] https://likumi.lv/ta/id/334350

[dliv] Annual Statement of Latvia's Transmission System Operator for the year 2021, https://ast.lv/sites/default/files/editor/AST_PSO_zinojums_2022_EN%20v2.pdf

[dlv] https://www.liaa.gov.lv/en/trade/industries/environment-and-renewable-energy?utm_source=https%3A%2F%2Fwww.google.com%2F

[dlvi] UNFCCC. National inventories submissions 2022: Latvia CRF Table: https://unfccc.int/documents/461910

[dlvii] https://ec.europa.eu/energy/sites/ener/files/documents/staff_working_document_assessment_necp_latvia.pdf

[dlviii] https://www.trade.gov/country-commercial-guides/latvia-renewable-energy-equipment

[dlix] https://energy.ec.europa.eu/system/files/2020-04/lv_final_necp_main_en_0.pdf

[dlx] https://likumi.lv/ta/id/336089

[dlxi] The planned investment will be one of the largest in Latvia's history and is expected to reach one billion euros.

[dlxii] https://eng.lsm.lv/article/economy/economy/latvenergo-and-latvian-state-forests-plan-joint-wind-parks.a468465/

[dlxiii] The project is planned in in Tārgale, in the Ventspils region and will be the largest solar farm in Latvia. Grid connection is expected in 2024. European Energy has a development pipeline of more than 1GW in Latvia, including both solar and wind projects; Source: https://europeanenergy.com/2022/06/16/european-energy-announces-its-plans-to-build-latvias-largest-solar-park-to-date/

[dlxiv] https://uzladets.lv/iecieretajam-elektrostacijam-rezerveto-jaudu-apjoms-sadales-tikla-parsniedzis-1-gw/

[dlxv] https://ec.europa.eu/energy/sites/ener/files/documents/lv_final_necp_main_en.pdf

[dlxvi] https://www.bvkb.gov.lv/lv/elektroenergijas-obligata-iepirkuma-mehanisma-uzraudziba-un-kontrole, see; Lēmumu saraksts

[dlxvii] Net metering clients use the generated electricity primarily for self-consumption, but if the electricity generated by solar panels exceed the power consumption of electric appliances in the building it will be automatically transferred to the overall power transmission network. The size of the installation must not exceed 11,1 kW. However, the scheme turned out to be not very effective.

[dlxviii] https://www.varam.gov.lv/lv/atbalsta-programma-atjaunojamo-energoresursu-izmantosanai-majsaimniecibas

[dlxix] https://likumi.lv/ta/id/330568

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[dlxxii] https://likumi.lv/ta/en/en/id/49833-energy-law
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[dlxxvi] http://www.res-legal.eu/en/search-by-country/latvia/
[dlxxvii] https://likumi.lv/ta/id/334150 (in Latvian).
[dlxxviii]https://likumi.lv/ta/id/334153 (in Latvian). Among others, such new terms as the 'Active Customer', 'Jointly acting renewable electricity active customers', 'Electricity Sharing' or 'Flexibility Services' were introduced. The law specifies the activities, rights and duties of energy communities in the electricity sector.
[dlxxix] An energy community can equal to either type or simultaneously both types.
[dlxxx] According to Associations and Foundations Law, https://likumi.lv/ta/id/81050
[dlxxxi] Cooperative Societies Law, https://likumi.lv/ta/id/298656 Pursuant to the amendments to the Energy Act, the following entities may be members of a REC: physical persons, SMEs and municipalities. In addition, the members resp. shareholders of CEC can be also other public persons.
Community energy concepts are a novelty in the Latvian context.
[dlxxxii] Civil Law, https://likumi.lv/ta/id/225418
[dlxxxiii] The net metering system is going to be complemented by a net accounting system that will not only account for the amount of electricity produced and consumed from RES, but that will also determine the value of the electricity. Surplus energy will be monetised and credited to the next billing period. Source: https://lvportals.lv/skaidrojumi/343368-nosaka-principus-energokopienu-darbibai-2022
[dlxxxiv] *Eiropas Savienības kohēzijas politikas programma 2021-2027.gadam,* approved by the Cabinet of Ministers on 16 November 2021, re-casted 2 November 2022, see page 55: https://esfondi.lv/planosana-1**.**
[dlxxxv] https://www.altum.lv/en/ It is planned to establish a financial instrument, which will be administered by the state-owned development financing institution "ALTUM"
[dlxxxvi] https://tapportals.mk.gov.lv/structuralizer/data/nodes/25bd102d-a757-4211-8286-210e3a41ffb8/preview
[dlxxxvii] https://www.esfondi.lv/upload/anm/01_anm_plans_04062021.pdf
[dlxxxviii] Standal & Aakre 2021. D2.1: ASSESSMENT REPORT ON TECHNICAL, LEGAL, INSTITUTIONAL AND POLICY CONDITIONS. COME RES project
[dlxxxix] https://tapportals.mk.gov.lv/structuralizer/data/nodes/25bd102d-a757-4211-8286-210e3a41ffb8/preview
[dxc] Krug, M. et al. (2022): Comparative Assessment of Enabling Frameworks for RECs and Support Scheme Designs. COME RES Deliverable 7.1. 3.August 2022. (https://come-res.eu/fileadmin/user_upload/Resources/Deliverables/COME_RES_Deliverable_7.1_Comparative_assessment_report.pdf/)
[dxci] https://www.rescoop.eu/policy/latvia-rec-cec-definitions
[dxcii] https://co2mmunity.eu/pilots/latvia funded by the EU Interreg Baltic Sea region programme.
[dxciii]Co2mmunity 2020. English summary of Latvian handbook for Community Renewable Energy Project Development
[dxciv] Pouyan Maleki-Dizaji, Francisco Rueda (lead authors). COME RES project: Deliverable 5.3 „Synthesis Report based on in-depth assessment of 10 transferable best practices', see in Annex, the pages 92-99, https://come-res.eu/fileadmin/user_upload/Resources/Deliverables/COME_RES_D5.3_Synthesis_Report_Assessment_10_best_practices.pdf
[dxcv] https://www.energyprospects.eu/
[dxcvi] https://come-res.eu/
[dxcvii] https://come-res.eu/stakeholder-desks/latvia
[dxcviii] https://co2mmunity.eu/
[dxcix] Co2mmunity 2020. English summary of Latvian handbook for Community Renewable Energy Project Development.
[dc] https://co2mmunity.eu/finalisation-of-energize-co2mmunity-project
[dci] https://powerpoor.eu/
[dcii] https://sadalestikls.lv/en/
[dciii] https://www.varam.gov.lv/lv/planosanas-regioni
[dciv] A rural partnership network under the LEADER Programme, coordinated by the association Latvian Rural Forum. In the frame of COME RES events held in Latvia, these organisations have expressed interest to promote the development of RECs particularly in rural areas. These rural partnerships participate in an EU-wide initiative on 'smart villages', so energy communities might become a part of smart villages. https://laukuforums.lv/en/par-llf-en
[dcv] https://greentechlatvia.eu/en/home/
[dcvi] https://www.energy-community.org/implementation/report/Montenegro.html
[dcvii] https://data.worldbank.org/indicator/SP.POP.TOTL?view=chart&locations=ME
[dcviii] https://data.worldbank.org/indicator/AG.LND.TOTL.K2?view=chart
[dcix] https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?view=chart
[dcx] https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?view=chart
[dcxi] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_pc&lang=en

[dcxii] https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do
[dcxiii] https://ec.europa.eu/eurostat/databrowser/view/earn_ses_pub2s/default/table?lang=en
[dcxiv] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-group
[dcxv] https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS
[dcxvi] Ibid.
[dcxvii]https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Montenegro_Europe_RE_SP.pdf
[dcxviii]https://www.pobjeda.me/clanak/vusanovic-crnoj-gori-potrebni-projekti-oie-da-odgovori-na-energetsku-krizu
[dcxix] http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dcxx] https://balkangreenenergynews.com/montenegro-expands-pv-plant-briska-gora-to-262-mw-in-spatial-plan/
[dcxxi] http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dcxxii]https://www.pobjeda.me/clanak/vusanovic-crnoj-gori-potrebni-projekti-oie-da-odgovori-na-energetsku-krizu
[dcxxiii] KOD report. Nature in the service of citizens, Podgorica 2021 https://rs.boell.org/sr/2022/01/26/prirodna-dobra-u-sluzbi-gradana
[dcxxiv] http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dcxxv] Ibid.
[dcxxvi] https://www.energy-community.org/implementation/report/Montenegro.html
[dcxxvii]https://balkangreenenergynews.com/barometer-of-sustainable-energy-transition-how-prepared-is-montenegro/
[dcxxviii] https://www.energy-community.org/implementation/report/Montenegro.html
[dcxxix] http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dcxxx] https://www.irena.org/IRENADocuments/Statistical_Profiles/Europe/Montenegro_Europe_RE_SP.pdf
[dcxxxi] https://balkangreenenergynews.com/montenegro-to-abolish-incentives-for-renewable-energy-projects/
[dcxxxii] https://www.energy-community.org/implementation/report/Montenegro.html
[dcxxxiii] Ibid.
[dcxxxiv] http://cedis.me/wp-content/uploads/2017/06/strategija_razvoja_energetike_cg_do_2030._godine_0_0.pdf
[dcxxxv] Ibid.
[dcxxxvi] https://balkangreenenergynews.com/montenegro-stops-licensing-new-small-hydropower-plants/
[dcxxxvii] https://www.irena.org/IRENADocuments/Statistical_Profiles/Europe/Montenegro_Europe_RE_SP.pdf
[dcxxxviii] https://ceelegalmatters.com/montenegro/14407-overview-of-montenegro-s-energy-sector
[dcxxxix] https://www.ecoportal.me/crna-gora-prije-dva-dana-bila-prva-u-evropi-po-proizvodnji-energije-iz-vjetra/
[dcxl] https://www.power-technology.com/marketdata/brajici-wind-farm-montenegro/
[dcxli] https://balkangreenenergynews.com/montenegro-expands-pv-plant-briska-gora-to-262-mw-in-spatial-plan/
[dcxlii] https://www.ecoportal.me/crna-gora-prije-dva-dana-bila-prva-u-evropi-po-proizvodnji-energije-iz-vjetra/
[dcxliii] WWF Policy brief Montenegro, “Small hydro power plant projects”, 2019.
[dcxliv] https://rs.boell.org/sr/2022/01/26/prirodna-dobra-u-sluzbi-gradana
[dcxlv] https://balkangreenenergynews.com/port-of-bar-preparing-to-build-lng-terminal-gas-fired-power-plant/
[dcxlvi] https://www.enercee.net/countries/montenegro/support-schemes
[dcxlvii]https://balkangreenenergynews.com/electricity-prices-in-western-balkans-highest-in-albania-montenegro-lowest-in-kosovo/
[dcxlviii] Loans are between EUR 3,000 and EUR 400,000, with a 3% annual interest rate. The repayment period can last up to 10 years including a grace period of as much as one year. (…) If they qualify for a subsidy, the beneficiaries can also get a co-financing grant for up to 40% of eligible expenses or a maximum of EUR 25,000. The total amount is EUR 100,000. https://balkangreenenergynews.com/montenegro-issues-calls-for-energy-efficiency-in-households-solar-power-for-firms/
[dcxlix] https://balkangreenenergynews.com/sarajevo-selected-for-eus-100-climate-neutral-and-smart-cities-program/
[dcl] https://balkangreenenergynews.com/which-western-balkan-countries-intend-to-introduce-carbon-tax/
[dcli] https://www.energy-community.org/implementation/report/Montenegro.html
[dclii] Ibid.
[dcliii]http://www.res-legal.eu/search-by-country/montenegro/tools-list/c/montenegro/s/res-e/t/promotion/sum/481/lpid/482/
[dcliv] https://balkangreenenergynews.com/montenegros-new-government-sees-green-energy-as-main-economic-driver/
[dclv] https://www.katalogpropisa.me/propisi-crne-gore/zakon-o-energetici-3/
[dclvi] http://cedis.me/wp-content/uploads/2017/06/strategija_razvoja_energetike_cg_do_2030._godine_0_0.pdf
[dclvii] https://caneurope.org/montenegro-s-cap-and-trade-system-could-signal-end-of-free-emissions-in-western-balkans-but-cap-needs-tightening/
[dclviii] https://balkangreenenergynews.com/montenegro-to-boost-support-for-solar-prosumers-home-energy-efficiency/
[dclix] https://balkangreenenergynews.com/montenegro-to-boost-support-for-solar-prosumers-home-energy-efficiency/
[dclx] http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dclxi] with the new rules consumers will be able to install PV systems and produce electricity for their own needs and to deliver the surplus to the grid
https://balkangreenenergynews.com/montenegrin-government-proposes-law-on-energy-eases-rules-for-prosumers/
[dclxii] https://balkangreenenergynews.com/montenegrin-government-proposes-law-on-energy-eases-rules-for-prosumers/
[dclxiii] https://balkangreenenergynews.com/montenegrin-government-proposes-law-on-energy-eases-rules-for-prosumers/

[dclxiv] http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dclxv] Ibid.
[dclxvi] Ibid.
[dclxvii] https://balkangreenenergynews.com/barometer-of-sustainable-energy-transition-how-prepared-is-montenegro/
[dclxviii] *https://www.energy-community.org/implementation/report/Montenegro.html*
[dclxix] https://investitor.me/2021/11/03/veliko-interesovanje-za-ugradnju-solarnih-panela-za-dva-dana-250-prijava/
[dclxx]30 mil euros of project worth with the aim to lower the electricity bills, enable energy independence, lower GHG emissions and protect the environment. Eligible: buyers who regularly pay electricity bills and regularly pay debts; owners of objects. https://investitor.me/2021/11/01)/krenuo-solari-epcg-objavio-poziv-za-gradjane-i-privrednike-koji-zele-da-ugrade-solarne-pan-ele-na-svojim-objektima/
[dclxxi] https://www.euki.de/en/euki-projects/solar-adria/
[dclxxii] https://www.energetskiportal.rs/en/eco-team-montenegro/
[dclxxiii] https://www.energy-community.org/implementation/Montenegro/CLIM.html
[dclxxiv] https://www.energetskiportal.rs/crna-gora-u-planu-povecanje-udela-solarnih-i-vetroelektrana-u-energetskom-miksu/
[dclxxv] Owns all of the country's largest electricity generation capacities – the Piva and Perućica hydropower plants and the Pljevlja coal plant, as well as several old small hydropower plants http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dclxxvi] https://balkangreenenergynews.com/montenegro-to-boost-support-for-solar-prosumers-home-energy-efficiency/
[dclxxvii] https://investitor.me/2020/07/27/solarna-elektrana-u-podgorici-dobila-status-povlascenog-proizvodjaca/
[dclxxviii] Montenegro's state-owned power utility **Elektroprivreda Crne Gore (EPCG**) launched a tender in July 2022 for a study on the hydropower potential of the Piva river downstream from the Piva hydropower plant to examine the possibility to build hydropower plant Kruševo https://balkangreenenergynews.com/montenegros-epcg-revamps-krusevo-hydropower-plant-project/
[dclxxix] http://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dclxxx] Ibid.
[dclxxxi] Ibid.
[dclxxxii] 1st Intergovernmental Conference on accession negotiations was held on 19 July, 2022 https://ec.europa.eu/neighbourhood-enlargement/enlargement-policy/north-macedonia_en
[dclxxxiii]https://statisticstimes.com/demographics/country/north-macedonia-population.phpttps://data.worldbank.org/indicator/SP.POP.TOTL?view=chart
[dclxxxiv] https://www.worlddata.info/europe/northmacedonia/index.php
[dclxxxv] https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?view=chart
[dclxxxvi] https://countryeconomy.com/countries/macedonia
[dclxxxvii] https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=MK
[dclxxxviii] https://vlada.mk/node/28192
[dclxxxix] https://ec.europa.eu/eurostat/databrowser/view/earn_ses_pub2s/default/table?lang=en, here: Median hourly earnings, all employees (excluding apprentices) by sex
[dcxc] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
[dcxci] https://data.worldbank.org/indicator/SL.UEM.TOTL.NE.ZS?locations=MK
[dcxcii] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dcxciii] https://www.stat.gov.mk/pdf/2022/6.1.22.69_mk.pdf
[dcxciv] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dcxcv]https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/North%20Macedonia_Europe_RE_SP.pdf
[dcxcvi]Ibid.
[dcxcvii] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dcxcviii] https://www.stat.gov.mk/PrethodniSoopstenijaOblast.aspx?id=64&rbrObl=21
[dcxcix] https://www.stat.gov.mk/publikacii/2021/6.4.21.01%20915.pdf
[dcc] https://www.erc.org.mk/odluki/22022.04.29_RKE%20GI%202021-FINAL.pdf
[dcci] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dccii] https://balkangreenenergynews.com/north-macedonia-first-in-western-balkans-adopts-national-energy-and-climate-plan/
[dcciii] https://www.economy.gov.mk/mk-MK/news/strategii-2759.nspx
[dcciv] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dccv] Energy Community Secretariat, Annual report 2019 https://www.energy-community.org/dam/jcr:a915b89b-bf31-4d8b-9e63-4c47dfcd1479/EnC_IR2019.pdf
[dccvi] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dccvii] The total installed capacity of renewable power plants was 782 MW at the end of 2020, and it is expected to reach 1,493 MW by 2025. https://balkangreenenergynews.com/north-macedonias-renewables-target-set-at-46-percent-by-2025/
[dccviii] https://balkangreenenergynews.com/north-macedonias-renewables-target-set-at-46-percent-by-2025/
[dccix] https://www.irena.org/IRENADocuments/Statistical_Profiles/Europe/North%20Macedonia_Europe_RE_SP.pdf
[dccx] https://www.stat.gov.mk/publikacii/2021/6.4.21.01%20915.pdf

[dccxi]https://ba.boell.org/sites/default/files/2021-03/POLICY%20BRIEF_North%20Macedonia%20Energy%20transition%20and%20Democracy.pdf
[dccxii] According to the Global Wind Atlas, the areas with a good wind potential, based on the average wind density and the speed for harvesting wind power and development of wind farms, are located predominantly in the western, central and southeastern parts of the country. Some patches of land viable for development of wind projects can also be found in other parts of the country, such as the northeast valley of Ovche Pole. https://ba.boell.org/sites/default/files/2021-03/POLICY%20BRIEF_North%20Macedonia%20Energy%20transition%20and%20Democracy.pdf
[dccxiii] https://balkangreenenergynews.com/north-macedonias-green-energy-output-rose-14-7-in-2021/
[dccxiv] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dccxv] https://balkangreenenergynews.com/north-macedonias-renewables-target-set-at-46-percent-by-2025/
[dccxvi] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dccxvii] Ibid.
[dccxviii] The Energy Strategy does not choose between the scenarios but presents the options based on different levels of ambition regarding energy efficiency, renewables deployment, use of electric vehicles, and dates of entry into the EU Emissions Trading Scheme (ETS) (2023, 2025 or 2027). (…) in late 2020 an update was carried out, which as of late May 2021 does not appear to have been approved https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dccxix] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dccxx] The National Energy and Climate Plan prescribes the path to achieve the goals set for 2030. North Macedonia was the first Energy Community contracting party to submit its draft NECP to the organization's secretariat. https://balkangreenenergy-news.com/north-macedonia-first-in-western-balkans-adopts-national-energy-and-climate-plan/
[dccxxi] NECP envisages a number of policies and measures in order to reduce energy consumption in buildings (households, commercial and public buildings), the industry and transport sectors and to reduce losses in the transmission and distribution grids. https://balkangreenenergynews.com/north-macedonia-first-in-western-balkans-adopts-national-energy-and-climate-plan/
[dccxxii] https://www.erc.org.mk/odluki/229.06.2022%20ODLUKA%20-%20EVN%20HOME%202022.pdf
[dccxxiii] Unfortunately, this measure is still not used enough and only a **very small number of producers have entered this category of participants in the electricity market**. The biggest reason is the fact that only consumers, i.e. households, which enter the free electricity market can become electricity prosumers, and not those who continue to be supplied by EVN Home, which is the 'universal supplier' in North Macedonia. But the low regulated household electricity prices by EVN Home do not stimulate households to change supplier, and together with a **lack of funds**, this results in **very little progress with the use of e.g. solar energy in households**. Another reason is a lack of clear and well-explained steps for the public on how to enter the free electricity market and become prosumers https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dccxxiv]https://ba.boell.org/sites/default/files/2021-03/POLICY%20BRIEF_North%20Macedonia%20Energy%20transition%20and%20Democracy.pdf
[dccxxv] According to the ministry's rulebook, a "prosumer", defined as consumer-producer, is a household, small consumer or budget user that can build a unit for the production of electricity from a renewable energy source for own consumption and deliver the surplus to the distribution grid. Accounting period for prosumers is six months. Every household, firm and state institution can sign a contract with a power supplier, including the universal supplier. Surplus is calculated according to the average purchase price of electricity that the universal supplier procures for the supply of households and small consumers, the accounting period for prosumers is six months, starting on July 1. Finally, homeowners in multiapartment buildings can form a community and build a rooftop solar power system of up to 6 kW
https://balkangreenenergynews.com/north-macedonia-enables-prosumers-to-sell-surplus-electricity/
[dccxxvi] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dccxxvii] https://www.energetika.net/eu/novice/envision/n-macedonia-abolishes-grid-fee-for-prosumers
[dccxxviii] https://economy.gov.mk/Upload/Documents/PROGRAMA%20EE%20OIE%20SUBVENCII.pdf
[dccxxix] https://economy.gov.mk/Upload/Documents/ProgramaRanlivi2022.pdf
[dccxxx] https://www.dw.com/mk/од-1-јули-фотоволтаиците-влегуваат-на-големата-врата-во-с-македонија/а-62139893
[dccxxxi] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf
[dccxxxii] Ibid.
[dccxxxiii] Ibid.
[dccxxxiv] Ibid.
[dccxxxv] https://doi.org/10.1016/j.enpol.2022.113181
[dccxxxvi] https://www.energy-community.org/implementation/report/North_Macedonia.html
[dccxxxvii]https://ba.boell.org/sites/default/files/2021-03/POLICY%20BRIEF_North%20Macedonia%20Energy%20transition%20and%20Democracy.pdf
[dccxxxviii]https://gef.eu/event/transformation-towards-energy-democracy-skopje/, https://gef.eu/event/transformation-towards-energy-democracy-2/, https://www.youtube.com/watch?v=fixnHuJDe0s
[dccxxxix] https://gef.eu/partner/sunrise/, http://www.izgrejsonce.mk/en

[dccxl] "SUNRISE is an association of citizens, active in the field of ecology and environmental protection, established in 2009. SUNRISE achieves its goals through activities for raising awareness and increased citizen participation, implementation and participation in projects, as well as organizing educational, informative and professional events." http://www.izgrejsonce.mk/en/about-us/

[dccxli] The mission of Association for Educational Development Ekvalis- Skopje is to involve the citizens in the processes of social change through the cycle of education, critical approach, analysis and taking action. https://ekvalis.org.mk/about-us/

[dccxlii] https://library.fes.de/pdf-files/bueros/sarajevo/18313.pdf

[dccxliii] Ibid.

[dccxliv] Ibid.

[dccxlv] https://european-union.europa.eu/principles-countries-history/country-profiles/poland_en

[dccxlvi] https://en.wikipedia.org/wiki/Energy_Community

[dccxlvii] https://data.worldbank.org/indicator/SP.POP.TOTL?locations=PL&view=chart

[dccxlviii] https://data.worldbank.org/indicator/AG.LND.TOTL.K2?locations=PL&view=chart

[dccxlix] https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=PL&view=chart

[dccl] https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=PL&view=chart

[dccli] https://ec.europa.eu/eurostat/databrowser/view/sdg_08_10/default/table

[dcclii] https://ec.europa.eu/eurostat/databrowser/view/earn_nt_net/default/table?lang=en

[dccliii] https://ec.europa.eu/eurostat/databrowser/view/EARN_SES_PUB2S__custom_1820603/default/table?lang=en

[dccliv] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

[dcclv] https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?locations=PL

[dcclvi] https://www.iea.org/countries/poland. Quoted information includes energy transportation use.

[dcclvii] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Poland_Europe_RE_SP.pdf

[dcclviii] https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698766/EPRS_BRI(2021)698766_EN.pdf

[dcclix] Możliwości wykorzystania odnawialnych źródeł energii w Polsce do roku 2020, IEO

[dcclx] At the beginning of the scheme's operation there were some ideas to introduce energy clusters in the system. However, no auctions for energy clusters or energy cooperatives have been performed so far. COME RES 953040 - D2.1: Assessment Report on Technical, Legal, Institutional and Policy Conditions

[dcclxi] COME RES 953040 - D2.1: Assessment Report on Technical, Legal, Institutional and Policy Conditions

[dcclxii]Until April 2022 most prosumers operated under a net-metering system that was based on the following assumptions: Owners of micro-installations (with capacity up to 50 kW) are allowed to exchange the surplus of energy produced under favourable conditions for gaps in energy production. The ratio is 1 to 0.8 for capacity up to 10 kW and 1 to 0.7 in the case of micro-installations between 10 and 50 kW. Support under the discount/net-metering formula is provided for prosumers for a period of 15 years, but no longer than until June 30, 2039. Source: COME RES 953040 - D2.1: Assessment Report on Technical, Legal, Institutional and Policy Conditions.

[dcclxiii] Until July 2024 published monthly, thereafter prices will be hourly

[dcclxiv] COME RES 953040 - D2.1: Assessment Report on Technical, Legal, Institutional and Policy Conditions

[dcclxv] Ibid.

[dcclxvi] Ibid.

[dcclxvii]https://www.ure.gov.pl/pl/urzad/informacje-ogolne/aktualnosci/10718,Ile-zaplacimy-za-energie-elektryczna-od-stycznia-2023-roku.html

[dcclxviii] http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20160000925

[dcclxix] The agreement concernsenergy from renewables or other sources, within a distribution network with voltage below 110 kV. The cluster functions as a civil law agreement meaning it is not a legal entity and cannot conduct a business activity. The cluster nevertheless shows concern for local values, sustainability of the region and engagement of residents and municipalities. It can take the shape of a local energy community or micro-network that balances demand and supply at the local level, together with both private and public actors." COME RES 953040 - D2.1: Assessment Report on Technical, Legal, Institutional and Policy Conditions.

[dcclxx] COME RES 953040 - D2.1: Assessment Report on Technical, Legal, Institutional and Policy Conditions

[dcclxxi] The entity generates electricity, biogas or heat from renewables and balances the demand for electricity, biogas or heat only for the benefit of the coop and its members. The maximum number of the coop's participants is 1,000, it can operate within a rural commune or a rural and urban commune. Its goal is to ensure energy security for its members who work with each other in the spirit of solidarity. Coops are founded on democratic principles, which means there is no hierarchy, all members are equal, and all decisions are voted on."Ibid.

[dcclxxii] As participants of legal transactions, they can, on their own behalf, perform duties and acquire rights. This is in contrast to clusters, which constitute an agreement signed by independent entities represented by a coordinator. COME RES 953040 - D2.1: Assessment Report on Technical, Legal, Institutional and Policy Conditions.

[dcclxxiii]Art. 2 USTAWY z dnia 20 lutego 2015 r. o odnawialnych źródłach energii

[dcclxxiv] https://legislacja.rcl.gov.pl/projekt/12347450/katalog/12792164#12792164

[dcclxxv] https://legislacja.gov.pl/projekt/12357005/katalog/12858155#12858155

[dcclxxvi] Ryszawska, Bożena; Rozwadowska, Magdalena; Ulatowska, Roksana; Pierzchała, Marcin; Szymański, Piotr (2021): The Power of Co-Creation in the Energy Transition—DART Model in Citizen Energy Communities Projects. In: Energies 14 (17), S. 5266. DOI: 10.3390/en14175266.
[dcclxxvii] Ruggiero et al. 2021. Context and agency in urban community energy initiatives: An analysis of six case studies from the Baltic Sea Region. Energy Policy 148, 111956
[dcclxxviii] COME RES 2021. REPORT ON THE POLISH NATIONAL DESK KICK-OFF MEETING
[dcclxxix] COME RES 953040 - D2.1: Assessment Report on Technical, Legal, Institutional and Policy Conditions.
[dcclxxx] Ruggiero et al. 2021. Context and agency in urban community energy initiatives: An analysis of six case studies from the Baltic Sea Region. Energy Policy 148, 111956
[dcclxxxi] https://www.rescoop.eu/policy/poland-rec-cec-definitions
[dcclxxxii] Ruggiero et al. 2021. Context and agency in urban community energy initiatives: An analysis of six case studies from the Baltic Sea Region. Energy Policy 148, 111956
[dcclxxxiii] Ibid.
[dcclxxxiv] **Energy poverty**, which typically influences the decision of Polish citizens to not switch fuel sources. For this reason, the project managers utilized the "Prosument Grant Programme", knowing that financing would not originate from the citizens themselves." Ibid.
[dcclxxxv] https://www.zsi.at/de/object/partner/5892
[dcclxxxvi] https://wroclaw-poludnie.pl/idealne-miejsce
[dcclxxxvii] http://nasze-poludnie.pl/nasza-zielen/juz-kilka-wroclawskich-spoldzielni-produkuje-prad-ze-slonca/
[dcclxxxviii] https://come-res.eu/
[dcclxxxix] COME RES 2021. REPORT ON THE POLISH NATIONAL DESK KICK-OFF MEETING
[dccxc] https://www.euki.de/euki-projects/srsp/
[dccxci] https://www.euki.de/wp-content/uploads/2021/07/EUKI-Broschuere-2021-DE.pdf
[dccxcii] www.ec2project.eu
[dccxciii] https://www.score-h2020.eu/
[dccxciv] https://www.score-h2020.eu/about-us/about-score/
[dccxcv] https://www.lightness-project.eu/
[dccxcvi] https://www.lightness-project.eu/pilot-sites/social-housing-in-worclaw-poland/
[dccxcvii] http://www.federacja-konsumentow.org.pl/
[dccxcviii] https://www.score-h2020.eu/about-us/score-consortium/
[dccxcix] https://bankwatch.org/office/pgn
[dccc] http://zielonasiec.pl/
[dccci] https://www.rescoop.eu/toolbox/community-energy-a-practical-guide-to-reclaiming-power-polish-edition
[dcccii] https://www.youtube.com/watch?v=fstvB5ShppY&t=6285s
[dccciii] https://www.score-h2020.eu/fileadmin/score/documents/AW-Slupska_WB_-_EN_24_III_2021.pdf
[dccciv] https://www.ure.gov.pl/pl/oze/aukcje-oze/ogloszenia-i-wyniki-auk
[dcccv] https://ec2project.eu/news/meet-our-partners-iii
[dcccvi] https://european-union.europa.eu/principles-countries-history/country-profiles/romania_en
[dcccvii] https://www.energy-community.org/aboutus/whoweare.html
[dcccviii] https://european-union.europa.eu/principles-countries-history/eu-countries/romania_en
[dcccix] https://european-union.europa.eu/principles-countries-history/key-facts-and-figures/life-eu_en
[dcccx] https://www.worldometers.info/world-population/romania-population/
[dcccxi] https://www.worldbank.org/en/country/romania/overview
[dcccxii] https://www.worldbank.org/en/country/romania/overview
[dcccxiii] https://ec.europa.eu/eurostat/databrowser/view/earn_nt_net/default/table?lang=en
[dcccxiv] https://ec.europa.eu/eurostat/databrowser/view/earn_ses_pub2s/default/table?lang=en
[dcccxv] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
[dcccxvi] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
[dcccxvii] https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS
[dcccxviii] https://ca1-clm.edcdn.com/assets/romania.pdf
[dcccxix] https://www.trade.gov/country-commercial-guides/romania-energy#_ftnref1
[dcccxx] https://balkangreenenergynews.com/prosumers-in-romania-have-installed-capacity-larger-than-cernavoda-nuclear-power-plant/
[dcccxxi] https://ceelegalmatters.com/renewable-energy-2023/renewable-energy-romania-2023
[dcccxxii] https://commission.europa.eu/document/download/c42fd541-c493-4479-8bdf-b2ba6aad85b8_en?file-name=ROMANIA%20-%20DRAFT%20UPDATED%20NECP%202021-2030.pdf
[dcccxxiii] https://commission.europa.eu/document/download/c42fd541-c493-4479-8bdf-b2ba6aad85b8_en?file-name=ROMANIA%20-%20DRAFT%20UPDATED%20NECP%202021-2030.pdf
[dcccxxiv] https://balkangreenenergynews.com/romania-has-1-4-gw-of-wind-farms-in-the-pipeline/

[dcccxxv] https://www.proquest.com/openview/a1017c94a904929f10074779333622d3/1?cbl=1536338&pq-origsite=gscholar&parentSessionId=V2vznxwtjQWG78tlXazWBYjLjdrKlN5H39KX2oXLF08%3D
[dcccxxvi] https://www.mdpi.com/2077-1312/7/5/142
[dcccxxvii] https://solargis.com/maps-and-gis-data/download/romania
[dcccxxviii] https://www.trade.gov/market-intelligence/romania-clean-energy
[dcccxxix] https://www.researchandmarkets.com/reports/5175480/romania-renewable-energy-market-growth
[dcccxxx] https://ceelegalmatters.com/renewable-energy-2023/renewable-energy-romania-2023
[dcccxxxi] https://www.euki.de/en/news/energy-security-romania/
[dcccxxxii] https://www.mdpi.com/1996-1073/14/18/5834
[dcccxxxiii] https://www.trade.gov/country-commercial-guides/romania-energy
[dcccxxxiv] https://ceelegalmatters.com/renewable-energy-2023/renewable-energy-romania-2023
[dcccxxxv] https://www.trade.gov/country-commercial-guides/romania-energy
[dcccxxxvi] http://www.res-legal.eu/search-by-country/romania/
[dcccxxxvii] https://ceelegalmatters.com/renewable-energy-2023/renewable-energy-romania-2023
[dcccxxxviii] https://balkangreenenergynews.com/romania-starts-work-on-energy-communities-legislation/
[dcccxxxix] https://commission.europa.eu/publications/romania-draft-updated-necp-2021-2030_en
[dcccxl] https://energy-communities-repository.ec.europa.eu/document/download/8934c196-2464-4ffd-a93b-73d3e625dc72_en?filename=ECR_MSfiche_Romania_final.pdf
[dcccxli] https://commission.europa.eu/document/download/c42fd541-c493-4479-8bdf-b2ba6aad85b8_en?filename=ROMANIA%20-%20DRAFT%20UPDATED%20NECP%202021-2030.pdf
[dcccxlii] https://www.ecolex.org/details/legislation/law-no-2202008-for-establishing-the-system-to-promote-the-production-of-energy-from-renewable-energy-sources-lex-faoc115082/
[dcccxliii] http://www.res-legal.eu/search-by-country/romania/sources/t/source/src/law-no-1842018/
[dcccxliv] https://cms.law/en/int/expert-guides/cms-expert-guide-to-electricity/romania
[dcccxlv] https://www.schoenherr.eu/content/romania-is-getting-ready-to-ride-a-second-wave-of-renewable-energy-investments/
[dcccxlvi] https://balkangreenenergynews.com/romania-adopts-offshore-wind-energy-law-to-get-first-megawatts-in-2032/
[dcccxlvii] https://www.rescoop.eu/uploads/rescoop/downloads/Collective-self-consumption-and-energy-communities.-Trends-and-challenges-in-the-transposition-of-the-EU-framework.pdf
[dcccxlviii] https://rlw.juridice.ro/21482/recent-changes-to-the-legal-framework-for-promoting-the-use-of-energy-from-renewable-sources.html
[dcccxlix] https://energy-communities-repository.ec.europa.eu/system/files/2023-08/ECR_MSfiche_Romania_final.pdf
[dcccl] https://www.euractiv.com/section/politics/news/romania-delays-adoption-of-energy-and-climate-plan-casts-doubt-on-renewable-targets/
[dcccli] https://energy-communities-repository.ec.europa.eu/system/files/2023-08/ECR_MSfiche_Romania_final.pdf
[dccclii] https://www.rescoop.eu/policy/transposition-tracker/rec-cec-definitions/romania-rec-cec-definitions
[dccliii] https://balkangreenenergynews.com/romania-starts-work-on-energy-communities-legislation/
[dccliv] https://www.interregeurope.eu/good-practices/the-first-energy-cooperative-in-romania
[dcclv] https://oer.ro/proiect/nrgcom/
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[dcclvii] https://energy-cities.eu/project/life-necplatform/
[dcclviii] https://www.euki.de/en/euki-projects/sustainable-building-renovation/
[dcclix] https://www.interregeurope.eu/coalescce/
[dcclxdcclx] https://www.rescoop.eu/news-and-events/news/rescoop-eu-welcomes-two-new-members-ae3r-ploiesti-prahova-izgrei-bg
[dcclxi] https://energie.gov.ro/ministerul-energiei/
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[dcclxv] https://www.primariabistrita.ro/
[dcclxvi] https://www.pmb.ro/
[dcclxvii] https://www.brasovcity.ro/
[dcclxviii] https://www.primariatm.ro/
[dcclxix] https://energy-cities.eu/members/?mode=map
[dcclxx] https://www.euki.de/en/more-about-euki/
[dcclxxi] On 21 January 2014, the 1st Intergovernmental Conference took place, signalling the formal start of Serbia's accession negotiations. Serbia has opened 18 chapters and provisionally closed 2 chapters. https://ec.europa.eu/neighbourhood-enlargement/enlargement-policy/serbia_en
[dcclxxii] https://www.energy-community.org/aboutus/whoweare.html
[dcclxxiii] https://www.energy-community.org/implementation/report/Serbia.html
[dcclxxiv] https://data.worldbank.org/indicator/SP.POP.TOTL?locations=RS

[dccclxxv] https://data.worldbank.org/indicator/AG.LND.TOTL.K2?locations=RS&view=chart
[dccclxxvi] https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=RS
[dccclxxvii] https://tradingeconomics.com/serbia/gdp
[dccclxxviii] https://tradingeconomics.com/serbia/gdp-per-capita-us-dollar-wb-data.html
[dccclxxix] https://www.stat.gov.rs/sr-Latn/oblasti/trziste-rada/zarade
[dccclxxx]https://ec.europa.eu/info/funding-tenders/procedures-guidelines-tenders/information-contractors-and-beneficiaries/exchange-rate-inforeuro_en
[dccclxxxi] These are available for every month: https://www.stat.gov.rs/sr-Latn/oblasti/trziste-rada/zarade
[dccclxxxii]https://ec.europa.eu/info/funding-tenders/procedures-guidelines-tenders/information-contractors-and-beneficiaries/exchange-rate-inforeuro_en
[dccclxxxiii] https://www.stat.gov.rs/en-US/oblasti/trziste-rada/zarade
[dccclxxxiv] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
[dccclxxxv] https://data.worldbank.org/indicator/SL.UEM.TOTL.NE.ZS?locations=RS
[dccclxxxvi] https://www.energy-community.org/implementation/report/Serbia.html
[dccclxxxvii] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Serbia_Europe_RE_SP.pdf
[dccclxxxviii] Ibid.
[dccclxxxix](IR 2021) Energy Community Annual Implementation Report. November 2021 (https://www.energy-community.org/implementation/reporting/RS.html)
[dcccxc] http://www.wecf.org/wp-content/uploads/2018/06/EnergyCoops_LongOnline.pdf
[dcccxci] https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Serbia%20First/Republic_of_Serbia.pdf
[dcccxcii] https://www.energy-community.org/implementation/reporting/RS.html
[dcccxciii] funded by the European Union, implemented by LDK Consultants SA in consortium with the Centre of Renewable Energy Sources and Saving (CRES). The Working Group engaged in the development of this document is operational and consists of 19 national institutional stakeholders and a total of 83 representatives and 3 civil society organisations. Apart from the Working Group members, the Ministry of Mining and Energy has launched a procedure of collecting the opinions of various educational institutions, scientific institutes and associations on specific topics.
https://balkangreenenergynews.com/eu-supports-serbia-in-preparing-the-integrated-national-energy-and-climate-plan-inecp/
[dcccxciv] http://country.eiu.com/article.aspx?articleid=620986645
[dcccxcv](IR 2021) Energy Community Annual Implementation Report. November 2021 (https://www.energy-community.org/implementation/reporting/RS.html)
[dcccxcvi] Ibid.
[dcccxcvii] https://www.energy-community.org/implementation/report/Serbia.html
[dcccxcviii] Ibid.
[dcccxcix] http://country.eiu.com/article.aspx?articleid=620986645
[cm] (IR 2021) Energy Community Annual Implementation Report. November 2021 (https://www.energy-community.org/implementation/reporting/RS.html)
[cmi] Ibid.
[cmii] Ibid.
[cmiii] https://www.energy-community.org/implementation/report/Serbia.html
[cmiv] Ibid.
[cmv] Ibid.
[cmvi] (IR 2021) Energy Community Annual Implementation Report. November 2021 (https://www.energy-community.org/implementation/reporting/RS.html)
[cmvii] Ibid.
[cmviii] Ibid.
[cmix]https://www.resfoundation.org/retrofits-renewable-energy-energy-communities-in-the-balkans-meet-municipal-energy-community-trailblazers-in-the-balkans/# (video, minute 10)
[cmx] Net metering is a mechanism under which prosumers are billed for the difference between the amount of electricity they produce and the amount they consume. When output from a prosumer's solar panels exceeds self-consumption needs, the surplus is added to the distribution network, which is operated by distribution system operator Elektrodistribucija Srbije, and when output is lower than the prosumer's needs, then electricity is drawn from the grid
[cmxi] https://balkangreenenergynews.com/fast-track-procedure-to-be-devised-for-connecting-prosumers-to-grid/
[cmxii] https://www.energy-community.org/implementation/report/Serbia.html
[cmxiii]https://www.gu.ni.rs/international-cooperation/cooperation-with-embassies-and-international-organizations/on-the-road-to-eu/?pismo=lat
[cmxiv] https://www.resfoundation.org/energy-cooperatives-decentralization-and-democratization-of-energy-production
[cmxv] https://balkangreenenergynews.com/sunny-roofs-serbias-first-energy-cooperative/
[cmxvi] https://germanwatch.org/fr/node/20187
[cmxvii] https://cordis.europa.eu/project/id/785171/reporting

[cmxviii]Video with brief info by Elektroponir, Bulgaria, challenges in Croatia ZEZ, BiH REIC, CZ Republic , https://www.resfoundation.org/retrofits-renewable-energy-energy-communities-in-the-balkans-meet-municipal-energy-community-trailblazers-in-the-balkans/
[cmxix] https://balkangreenenergynews.com/fast-track-procedure-to-be-devised-for-connecting-prosumers-to-grid/
[cmxx] https://greenfest.rs/en/panel-discussions-lectures/
[cmxxi] Slobodan Jerotić, Šabac municipality. Panel 'Clean energy for us' organised by RES Foundation within the Conference on Renewable Energy Sources organized by the French Institute in Belgrade (Serbia) on 19-20 June 2019. Muzej Jugoslovenske Kinoteke Beograd. (reported on in Capellán-Pérez et al. 2020, https://doi.org/10.1016/j.erss.2019.101348
[cmxxii] RES Foundation "collects, analyses and distributes knowledge for evidence-based policy making in energy and climate change, primarily in Serbia, the Western Balkans and Southeast Europe"; https://www.resfoundation.org/category/our-affiliations/
[cmxxiii] Both CONSEKO and Energia representatives appear in the video talking about energy transition / cooperatives: https://www.resfoundation.org/retrofits-renewable-energy-energy-communities-in-the-balkans-meet-municipal-energy-community-trailblazers-in-the-balkans/#
[cmxxiv] https://energy-cities.eu/members/
[cmxxv] https://european-union.europa.eu/principles-countries-history/country-profiles/slovakia_en
[cmxxvi] https://www.energy-community.org/aboutus/whoweare.html
[cmxxvii] "Slovakia Population 2022 (Live)". World Population Review. Retrieved 11 July 2022
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[cmxxix] https://european-union.europa.eu/principles-countries-history/key-facts-and-figures/life-eu_en
[cmxxx] https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?view=chart
[cmxxxi] https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?view=chart
[cmxxxii] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_pc&lang=en
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[cmxxxvi] https://data.worldbank.org/country/slovak-republic?view=chart
[cmxxxvii] https://www.okte.sk/en/guarantees-of-origin/statistics/national-energy-mix/
[cmxxxviii] Figure 2.8, TFC by source and sector, 2016. p. 22. https://iea.blob.core.windows.net/assets/7721817f-2d56-499a-866d-157873e3318b/2018SlovakRepublic.pdf
[cmxxxix] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Slovakia_Europe_RE_SP.pdf
[cmxl] Generous financial support triggered a very rapid growth in solar power in 2010-11, but the growth has since stalled, as the government cut back the subsidies out of concern for grid instability and the financial burden on final consumers. According to statistics by the Slovak Regulatory Office for Network Industries, electricity from renewable energy sources in 2021 represented about 20,77% of the Slovak Republic's energy mix.
https://www.urso.gov.sk/podiel-vyroby-elektrickej-energie-z-obnovitelnych-zdrojov-energie/
[cmxli] https://www.okte.sk/en/guarantees-of-origin/statistics/national-energy-mix/
[cmxlii] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Slovakia_Europe_RE_SP.pdf
[cmxliii] https://energy.ec.europa.eu/system/files/2020-03/sk_final_necp_main_en_0.pdf
[cmxliv] https://iea.blob.core.windows.net/assets/7721817f-2d56-499a-866d-157873e3318b/2018SlovakRepublic.pdf
[cmxlv] …mainly derived from waste from plant and animal production, from the biodegradable part of municipal waste, biodegradable kitchen and restaurant waste and waste from wastewater treatment plants.
[cmxlvi] https://energy.ec.europa.eu/system/files/2020-03/sk_final_necp_main_en_0.pdf
[cmxlvii] https://www.iea.org/policies/5166-the-concept-of-using-hydropower-potential-in-slovakia-till-2030
[cmxlviii] However, concerns about illegal logging prevail. https://iea.blob.core.windows.net/assets/7721817f-2d56-499a-866d-157873e3318b/2018SlovakRepublic.pdf
[cmxlix] https://iea.blob.core.windows.net/assets/7721817f-2d56-499a-866d-157873e3318b/2018SlovakRepublic.pdf
[cml] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Slovakia_Europe_RE_SP.pdf
[cmli] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Slovakia_Europe_RE_SP.pdf
[cmlii] The reform was prepared in line with the phasing-out philosophy, with the priority of ensuring cost- effectiveness and minimising the impact on final energy prices. Source: https://cms.law/en/int/expert-guides/cms-expert-guide-to-renewable-energy/slovakia
[cmliii] https://cms.law/en/int/expert-guides/cms-expert-guide-to-renewable-energy/slovakia
[cmliv] https://cms.law/en/int/expert-guides/cms-expert-guide-to-renewable-energy/slovakia
[cmlv] "This will create space for reducing the system operation tariff in electricity prices for consumers and at the same time promote the decarbonisation goals of the Slovak Republic. The Office's intention was to involve as many electricity producers as possible from solar energy, biogas, hydropower, biomass, landfill gas and gas from wastewater treatment plants. (…) The gradual deployment of low-carbon technologies for electricity generation has led to a reduction of fossil fuel consumption and therefore also of greenhouse gas emissions. The current support scheme enables achievement of the set goals in a cost-effective way. With the construction of electricity generation sources with a relatively small installed capacity, the necessary increase

of installed capacity leading to an increased share of RES can be expected in the coming years. Due to its proximity to the customer, such electricity generation does not place increased demands on transmission capacities". P 125. https://www.urso.gov.sk/data/att/f93/1685.afd20b.pdf

[cmlvi] P. 126. https://www.urso.gov.sk/data/att/f93/1685.afd20b.pdf

[cmlvii] http://www.czechcompete.cz/good-governance/legal-reform-and-transparency/important_legislative_changes

[cmlviii] http://eko-unia.org.pl/wp-content/uploads/2018/06/mini-report-1_-Slovakia.pdf

[cmlix] "Except of the Bratislava Self-Governing Region (BSK), OP KŽP promotes the provision for energy audits at small and medium-sized enterprises (SMEs) authorised to do business in industrial sector and related services as well as the implementation of measures arising from energy audits (incl. renewable energy sources' installation) in the enterprises (Investment Priority 2, Specific Target 4.2.1). Additionally, the use of renewable energy sources is incentivised through the Investment Priority 3 of Priority Axis 4, namely 'Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector'. Apart from other supported measures, the improvement of energy performance of public buildings can be achieved also through the construction of renewable energy plants in buildings covering their energy consumption (Specific Target 4.3.1). However, the installation of renewable energy sources will be promoted only as part of a comprehensive project for improvement of the energy efficiency of public buildings (except of BSK) (2.4.4.3 OP KŽP)."http://www.res-legal.eu/search-by-country/slovakia/single/s/res-hc/t/promotion/aid/subsidy-iii-operational-programme-environment/lastp/187/

[cmlx] https://energy.ec.europa.eu/system/files/2020-03/sk_final_necp_main_en_0.pdf

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[cmlxix] https://smartcity-atelier.eu.

[cmlxx] https://www.prog.sav.sk/sav-pripravi-analyzu-a-navrhy-definicie-energetickej-chudoby-data-jej-poskytnu-energetici/.

[cmlxxi] https://rokovania.gov.sk/RVL/Material/27993/2.

[cmlxxii] https://www.beuc.eu/events/consumerdebates-energy-communities-how-can-we-better-protect-consumers

[cmlxxiii] https://www.beuc.eu/news/how-guide-ensure-consumers-reap-full-benefits-energy-communities.

[cmlxxiv] https://sita.sk/v-kezmarku-zacali-s-vrtanim-geotermalneho-vrtu-z-ktoreho-chcu-vyrabat-teplo-pre-domacnosti-v-meste/.

[cmlxxv] https://www.asb.sk/zelena-obnova/kezmarok-planuje-na-vsetkych-skolach-aj-verejnych-budovach-fotovolticke-panely

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According to the Law, an energy cooperative is a legal entity established in accordance with the Law of Ukraine "On Cooperation" or the Law of Ukraine "On Consumer Cooperation" to carry out economic activities for the production, procurement or transportation of fuel and energy resources and other services to meet the needs of its members or local community, as well as for profit, in accordance with the law. The same law established the right to receive a "green" tariff for energy cooperatives.
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