State Estonia

General information	**Status EU membership**	EU member state since 1 May 2004[i]
	Population	1,331,060 (2020)[ii]
	Land area (km²)	43,470 km² (2020)[iii] 45,227 km² (2015)[iv]
	Urban population (%)	69 % (2020)[v]
Socio-economic situation	**GDP (current US$ billion)**	30.65 (2020)[vi]
	GDP per capita (EURO)	20,190 (2020)[vii]
	Annual net earnings (Single person without children earning 100% of average earning (EURO)	14,047.91 (2020)[viii]
	Median hourly earnings (EURO)	Males: 7.3 (2018) Females: 5.95 (2018)[ix]
	World Bank economic classification (2021)	High-income country[x]
	Unemployment (% of total labor force)	6.5 % (2020)[xi]
Energy situation in general	**Current energy sources**	- Highly carbon-intensive oil shale based energy system.[xii] - 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.[xiii] - From 2019 Estonia has shifted from net exporter to net importer of electricity.[xiv] - 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%).[xv]
	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.[xvi]
	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.[xvii]

Renewable energy potential	- Potential of wind and solar resources in Estonia is below world average.[xviii] - 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.[xix] - 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[xx]
Renewable energy support regime	Renewable energy feed-in tariff is offered by the Estonian government, but, in comparison to other countries, is comparably low.[xxi] Estonia's National Recovery and Resilience Plan[xxii] 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)[xxiii]
- New target to generate 100% electricity from renewable sources by 2030[xxiv].
- 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.[xxv]

Legal and political framework for citizen energy

Regulatory framework for citizen energy

- Estonian legislation supports energy self-consumption[xxvi]
- The concept of energy associations provided for since 2013, is providing a basis for renewable energy communities[xxvii]
- Energy association can generate, distribute, or sell electrical energy and heat to its members[xxviii]
- 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[xxix]
- The only funding instrument for an association (energy community) is the feed-in tariff[xxx]
- High potential to create **heating associations**[xxxi]
- 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."[xxxii]

Evaluation of the legal framework and context

- Regulatory framework is still rather hindering solar energy cooperatives in Estonia
- Grid connection is extremely expensive,[xxxiii] controlled by power plant owners and needs upgrading in certain areas[xxxiv]
- Small energy producers cannot sell electricity directly to their neighbors[xxxv]
- Lack of investment support for energy cooperatives,[xxxvi] 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[xxxvii]

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

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.[xxxix]
- Model case study in the Interreg project "Co2mmunity"

Housing Association Vilde 70 in Tallinn[xl]

- 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[xli]. 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 redistributed to the apartment owners based on the number of square meters they own[xlii]. - model case study in the Interreg project "Co2mmunity"
	City of Tartu[xliii] - 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[xliv]** - 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[xlv]
	Energize Co2mmunity[xlvi] - 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[xlvii] - 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)"[xlviii] - 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[xlix]

		- Moreover the "Energy Poverty Mitigation Toolkit" has been developed[I] - Estonian partner: Estonian Union of Co-operative Housing Associations (EKYL)
Relevant actors and stakeholders	**NGOs**	- Estonian Union of Co-operative Housing Associations (EKYL)[Ii] - NGO Green Tiger[Iii] - 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

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[i] https://european-union.europa.eu/principles-countries-history/country-profiles/estonia_en
[ii] https://data.worldbank.org/indicator/SP.POP.TOTL?view=chart
[iii] https://data.worldbank.org/indicator/AG.LND.TOTL.K2?view=chart
[iv] https://european-union.europa.eu/principles-countries-history/key-facts-and-figures/life-eu_en
[v] https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?view=chart
[vi] https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?view=chart
[vii] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_pc&lang=en
[viii] https://ec.europa.eu/eurostat/databrowser/view/earn_nt_net/default/table?lang=en
[ix] https://ec.europa.eu/eurostat/databrowser/view/earn_ses_pub2s/default/table?lang=en
[x] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
[xi] https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS
[xii] Kanger & Sovacool 2022. Towards a multi-scalar and multi-horizon framework of energy injustice: A whole systems analysis of Estonian energy transition. Political Geography 93, 102544.
[xiii] Kanger & Sovacool 2022. Towards a multi-scalar and multi-horizon framework of energy injustice: A whole systems analysis of Estonian energy transition. Political Geography 93, 102544.
[xiv] Kanger & Sovacool 2022. Towards a multi-scalar and multi-horizon framework of energy injustice: A whole systems analysis of Estonian energy transition. Political Geography 93, 102544.
[xv] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Estonia_Europe_RE_SP.pdf
[xvi] https://ec.europa.eu/clima/sites/lts/lts_ee_et.pdf
[xvii] Estonia's 2030 National Energy and Climate Plan (NREAP) , Estonian Ministry of Economy, www.riigiteataja.ee / https://faolex.fao.org/docs/pdf/est200007.pdf
[xviii] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Estonia_Europe_RE_SP.pdf
[xix] https://bankwatch.org/blog/100-per-cent-renewable-electricity-is-a-realistic-and-necessary-target-for-estonia-and-europe
[xx] Pöllumajandusministeerium, New Energy World Network
[xxi] Ruggiero 2018: Kagu commercial association pioneering community solar in the Seto region, Estonia. Case Story Fact Sheet. Co2mmunity Interreg
[xxii] https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/698886/EPRS_BRI(2022)698886_EN.pdf
[xxiii] https://www.fao.org/faolex/results/details/en/c/LEX-FAOC200007/
[xxiv] www.riigiteataja.ee/akt/122102022006
[xxv] https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Estonia_Europe_RE_SP.pdf
[xxvi] 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
[xxvii] Frieden et al. 2020. Collective self-consumption and energy communities: Trends and challenges in the transposition of the EU framework. Working Paper Compile project.
[xxviii] Ruggiero 2018: Kagu commercial association pioneering community solar in the Seto region, Estonia. Case Story Fact Sheet. Co2mmunity Interreg
[xxix] Ibid.
[xxx] Ibid.
[xxxi] Frieden et al. 2020. Collective self-consumption and energy communities: Trends and challenges in the transposition of the EU framework. Working Paper Compile project.
[xxxii] Ibid.
[xxxiii] 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
[xxxiv] Ruggiero 2018: Kagu commercial association pioneering community solar in the Seto region, Estonia. Case Story Fact Sheet. Co2mmunity Interreg
[xxxv] Ibid.

[xxxvi] 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
[xxxvii] …such as 2021 for the use of hydrogen in public transport, but also the EU's development and resilience plan. This can lead to a significant increase in renewables. A tender for 650 GWh is planned for 2030.
[xxxviii] https://www.rescoop.eu/policy/estonia-rec-cec-definitions
[xxxix] 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
[xl] 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.
[xli] Other measures included 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. The total sum invested was 1,424,637 €. All the decisions were made by the members of the housing association. The association owns the renovated building and the installed solar PV system.
[xlii] The investment was financed 60% with a bank loan and 40% by a renovation grant. The 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.
[xliii] https://co2mmunity.eu/pilots/estonia
[xliv] https://co2mmunity.eu/
[xlv] project partners consist of 8 organisations including government, energy agencies, a municipal utility, and universities from eight different countries within the Baltic Sea Region (BSR) – but no project partner from Estonia in the first phase
[xlvi] https://co2mmunity.eu/finalisation-of-energize-co2mmunity-project
[xlvii] https://powerpoor.eu/
[xlviii] https://powerpoor.eu/about/project
[xlix] https://powerpoor.eu/stakeholders/municipalities
[l] https://powerpoor.eu/toolkit
[li] http://ekyl.ee/organisation/who-we-are/?lang=en
[lii] https://rohetiiger.ee/