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1. EXECUTIVE SUMMARY

This report presents several scenarios for development, consolidation and transformation of energy citizenship in the EU. The scenarios are based on the relevant findings from PESTEL analysis (study of the political, economic, social, technological, environmental and legal conditions that have an impact on the emergence and development of energy citizenship in the European countries; see Debourdeau et al, 2023 and Hajdinjak et al, 2023) and an online survey, in which 10,071 citizens from 19 European countries participated (see Hajdinjak et al, 2024). This information was used to develop six scenario outlines – three optimistic and three pessimistic ones. These outlines were discussed and revised at a scenario building workshop, organised in January 2024 in Sofia, and attended by 28 experts on the topic of energy citizenship. The workshop deliberations were used to produce three scenarios for further uptake and consolidation of energy citizenship.

The three scenarios explore possible developments for energy citizenship in the EU until 2030. They are situated between the pessimistic and optimistic outlooks and structured along the sub-categories of the PESTEL analyses: social-economic, political-legal, and technological-environmental scenario.

The first scenario considers the combined impact of the most relevant economic developments and societal characteristics that shape the scope and options for involvement of citizens in the energy transition. The second scenario examines the wider political and legal environment in which energy citizenship forms and is manifested. The third scenario looks at the opportunities for energy citizenship emerging from the interaction between technological advances (seen as a tool or enabler of energy citizenship) and environmental consciousness and concerns (considered as motivation for citizens to act).

The scenarios underline key areas of intervention for policymakers. Drawing on these possible scenarios and areas of intervention, the report concludes with policy recommendations that aim to reinforce and strengthen positive developments for energy citizenship at the EU-level. The recommendations are clustered into several topics:

- Reconsideration of policy framings
- Science-based policymaking
- Citizen engagement
- Communication and outreach
- Capacity building
- Support measures and programmes
- Cooperation and mutual learning

2. INTRODUCTION

One of the goals of the EnergyPROSPECTS project was to design several scenarios for development, consolidation and transformation of energy citizenship in the EU. The current document attempts to fulfil this objective. It builds on the findings from the previous work conducted in the frame of the project, in particular the PESTEL analysis (study of the political, economic, social, technological, environmental and legal conditions that have an impact on the emergence and development of energy citizenship in the European countries) and an online survey, in which 10,071 citizens from 19 European countries participated. This input was discussed and refined at a scenario building workshop, organised in January 2024 and attended by 28 experts on the topic of energy citizenship. The experts considered the opinions and expectations of citizens (as expressed through the online survey) regarding the desired forms and pathways of energy citizenship, and the role of citizens in the energy transition, and "translated" them into scenarios for further uptake and strengthening of energy citizenship.

The document is divided into several chapters. First, the applied methodology is presented. The methodological chapter starts with a brief theoretical overview about the purpose and types of the scenarios. Next, the chapter explains the steps of the energy citizenship scenario development process:

- the formation of scenario task group and its work;
- the main source material for scenarios;
- six scenario outlines (an optimistic and a pessimistic version of a scenario in which the possible energy citizenship trajectories are influenced by 1) social-economic; 2) political-legal; or 3) environmental-technological contextual conditions);
- the scenario-building workshop (on which the six scenario outlines were discussed and "modified" into the final three energy citizenship scenarios).

The third chapter includes the three energy citizenship scenarios. The first scenario considers the combined impact of the most relevant economic developments and societal characteristics that shape the scope and options for involvement of citizens in the energy transition. The second scenario examines the wider political and legal environment in which energy citizenship forms and is manifested. The third scenario looks at the opportunities for energy citizenship emerging from the interaction between technological advances (seen as a tool or enabler of energy citizenship) and environmental consciousness and concerns (considered as motivation for citizens to act).

The energy citizenship scenarios build on lessons from recent major disruptive events (2021-2022 energy crisis and the increase of energy costs, COVID-19, Ukraine war, rise of Eurosceptic and far right parties) to propose policies and measures that may strengthen the resilience of European citizens in the face of potential future shocks and undesired developments.

The fourth and final chapter contains recommendations that aim to enable a realistic and effective implementation of measures that stimulate, enhance, strengthen and – if necessary – transform energy citizenship at the EU, national and local level.

The document concludes with two annexes: the first one contains the six scenario outlines, and the second one the script of the scenario-building workshop.

3. METHODOLOGY

Scenarios – a brief theoretical overview

In general, scenarios are narratives that try to provide answers to (at least) one of the following questions about the future: "What will happen?", "What can happen?" or "How can something (a specific goal) happen?" (Börjeson et al., 2006). In other words, scenarios aim to highlight the processes and circumstances that might lead to probable, possible or preferable futures (Marien, 2002). In the case of the EnergyPROSPECTS project, the three above questions might be rephrased as: "What will be the state of energy citizenship in the future?", "Which circumstances could have a major impact on the future development of energy citizenship?", or "What needs to happen in order to stimulate/support energy citizenship?"

Scenarios can be divided into "normative" and "explorative":

- Normative scenarios describe a preferable future and outline possible ways to reach it. They are very suitable for testing various policy interventions and examine how effective and efficient they might be. They may be used to identify the potential positive and negative side-effects of these interventions. The futures described by the normative scenarios need to be plausible and adapted to the current context and likely developments given that context. The normative approach seems to prevail in the energy citizenship discourse, but it also necessitates being quite specific about the normative goals at issue, which may considerably narrow the scope of the scenario. Energy citizenship does not refer to one singular value or normative commitment, as clearly demonstrated by the variety of objectives and achievements documented through in-depth study of 40 ENCI cases conducted by the EnergyPROSPECTS team (see Vadovics and Szőllőssy, 2024). This would signal that the normative approach might not be practical for this purpose.

- Explorative scenarios examine the possible effects of specific measures or circumstances on future developments. As such, they appear to be more suitable for investigating how the most impactful PESTEL factors shape energy citizenship pathways and which energy citizenship forms are most likely to prevail in the near future under the impact of certain circumstances. Explorative scenarios describe possible futures, which are based on tangible trends whose impact may or may not increase in importance. This type of scenarios broadens our understanding of alternative paths of future developments and can stimulate debates about the preferred course of action, and perhaps provide insights how to avoid certain outcomes.

Scenarios can be further divided into qualitative and quantitative types. Quantitative scenarios are based on measurable and numerical data, such as statistics and indicators, and are often presented in the form of graphs and tables. Qualitative scenarios are typically in the form of narratives, and are based on data sources such as opinions, insights, stories, and surveys. The EnergyPROSPECTS scenarios are on the qualitative side.

Scenarios do not predict the future. The future developments addressed by the scenarios are usually highly complex and therefore inherently unpredictable. Scenario building is a way to investigate the unpredictability of future developments and can be a useful tool to formulate robust policy recommendations (Tucker et al., 2009).

In order to be actionable and policy relevant, scenarios need to tread a fine line between simplification and complexity. Stirling warns that "expert advice is often thought most useful to policy when it is presented as a single 'definitive' interpretation." Yielding to the pressure to deliver catchy and easily understandable definitions and recommendations may make the science based advice vulnerable and expose it to possible manipulation (Stirling, 2010).

Therefore, energy citizenship scenarios aim to provide an understandable and clear overview of possible

futures, but without simplifying the complex set of data they are based on, and without refraining from highlighting the potential controversies, uncertainties and ambivalences. As illustrated by Figure 1, scenarios fall somewhere in the middle between facts and speculations.

Figure 1: Scenarios - between complexity and uncertainty
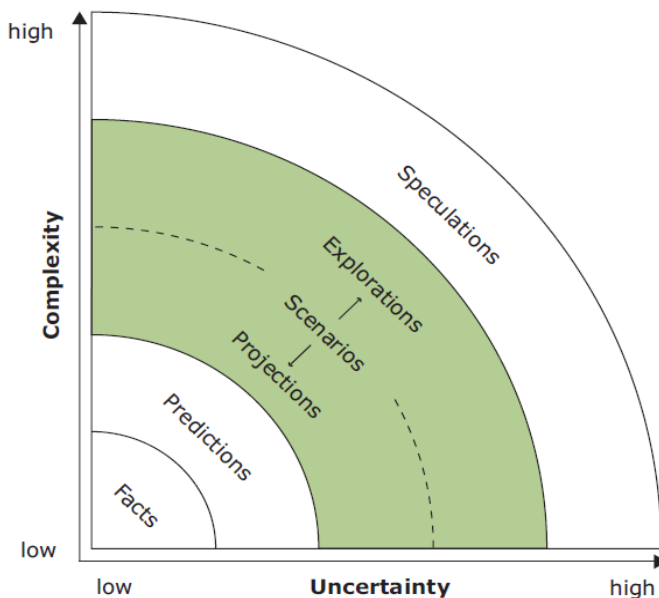
Source: Zurek and Henrichs, 2007.

Development of the energy citizenship scenarios – the steps

Scenario task group

A scenario task group, consisting of nine members of the EnergyPROSPECTS team, was formed in May 2023. The task group held several online meetings to discuss the scenario development, and contributed suggestions and comments to several drafts. The initial idea was to design scenarios that would deal with very concrete and particular challenges to energy citizenship, such as:

- the question of political support for energy citizenship (continuous support vs. decreased or withdrawn support);
- the rise of populism (rejection of EU-imposed policies, climate scepticism, anti-renewable sentiments, disinformation, lack of trust in institutions);
- European Green Deal (leading to a better future for all European citizens or causing more division and inequality);
- consequences of the COVID-19 pandemic and lessons for the future;
- technological advances and digitalisation of the energy system (and its impact on energy citizenship);
- energy literacy, awareness and skills (their role as drivers or barriers to involvement of citizens in the energy transition).

The focus of the scenarios changed several times in the process before it was decided to ground them in PESTEL analysis and relevant findings from the project specific online survey. The three reports (Debourdeau et al. 2023, Hajdinjak et al 2023 and Hajdinjak et al 2024) provided substantial information, enabling the scenario task group to anticipate which major interventions or developments could induce

considerable shifts in the energy citizenship trajectories and as a consequence have important impact on the energy transition.

The task group discussed also the timeframe of the energy citizenship scenarios, deciding between 2030 and 2050. Although 2050 appeared to be a very attractive and logical choice, given the European objective to become carbon neutral by 2050, it was agreed that the further in time they go, the more speculative the scenarios become. Recognising there was a danger that the proposed scenarios might reach the external border of the green area in the Figure 1, or even enter the speculations territory, the task group decided to base the scenarios on the tangible trends of here and now, in order to design realistic outlines of the development paths of energy citizenship in Europe with the time horizon of 2030.

PESTEL analysis and online citizen survey

The energy citizenship scenarios are based on two major sources of information that originate from the EnergyPROSPECTS project. The first one is the PESTEL analysis of the political, economic, social, technological, environmental and legal conditions that have an impact on the emergence and development of energy citizenship in the European countries. This analysis was conducted on two levels: the EU context (see Debourdeau et al, 2023) and the context of nine countries participating in the EnergyPROSPECTS project (Belgium, Bulgaria, France, Germany, Hungary, Ireland, Latvia, Spain and The Netherlands; see Hajdinjak et al, 2023).

Using the PESTEL analysis to identify and describe the external factors, which are either conducive or unfavourable to energy citizenship manifestations, enabled us to acquire a comprehensive and realistic overview of the energy citizenship situation in the nine investigated countries and in the EU. The figure below lists the PESTEL factors used to develop scenario outlines.

Figure 2: From PESTEL factors to scenario outlines

Social-economic scenarios

Economic factors:
- General economic situation (growth, inflation and purchasing power)
- Energy prices (incl. relative cost of renewables and fossil fuels)
- Economic policy instruments (energy taxation, state aid, subsidies)
- Energy market (degree of liberalisation and decentralisation)
- Financing and investment opportunities contributing to a more sustainable energy system
- Security of energy supply and security of supply of raw materials and other resources
- Green industry development and green job creation

Social factors:
- Wealth disparity and energy poverty
- Energy literacy, awareness and skills
- Demographic factors (age and gender)
- Social norms, attitudes and perceptions towards energy-efficient products, services, technologies and appliances, and social innovation
- Citizen engagement and passivity in society (social movements, civil society organisations, NGO sector)
- Trust (or lack thereof) in institutions and collective endeavours

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Political-legal scenarios

Political factors:
- Political support and commitment to energy citizenship
- Multi-level energy governance structure of countries (degree of centralisation/federalism in energy policy)
- Commitments to participative governance
- Key political objectives, targets and goals for the energy transition (incl. climate neutrality, renewable energy sources, energy efficiency, mobility)
- EU-level political unification in the energy sector
- Inclusion and empowerment policies
- Political/democratic culture and traditions (prevalent ideals and culture of citizenship)

Legal factors:
- Legal framings of energy citizenship forms
- Rights and duties of consumers, prosumers and new producers in interaction with the energy market (including rights for active participation of customers in the electricity markets)
- Legal recognition of and measures dedicated to vulnerable consumers, energy poverty and social inclusion
- Legal uncertainties (lack of regulation and/or law enforcement, contradictions, instability, etc.)
- Bureaucracy and red tape
- Support schemes for renewable energy sources
- Information and empowerment of citizens to become active consumers on the energy market

Environmental-technological scenarios

Environmental factors:
- Climate change and climatic conditions
- Pollution (air, water, noise, visual pollution, waste management)
- Climate vulnerability (global warming, extreme weather, wildfires…)
- Availability of resources (geological challenges, geographical opportunities and limitations)
- Conflicts and opportunities about land use connected to renewable energy
- Biodiversity protection issues connected to renewable installations
- Not-in-my-backyard syndrome
- Climate anxiety/depression (eco-anxiety)

Technological factors:
- Availability of technologies for the decarbonisation of the energy sector and renewable energy (solar thermal and photovoltaic, on-shore and offshore wind, renewable hydrogen)
- Technological pathways for European energy transmission and distribution infrastructure (Trans-European Networks for Energy)
- Digitalisation of the energy system (incl. smart grids deployment, smart metering, ICT solutions for peer-to-peer energy trading/virtual power plants, smart and green mobility)
- Decentralised energy system and storage
- Energy efficient buildings
- Energy labelling

The second major source of information is an online survey in which 10,071 citizens from 19 European countries participated (Hajdinjak et al, 2024). The survey gathered the views and opinions of citizens about:

- their energy-related activities;
- about the role of individuals in the energy system;
- about the energy transition.

Learning how European citizens perceive energy citizenship in terms of participation, choices/options, opportunities and barriers provided important input for the development of scenarios for strengthening the role of citizens in the transformation of European energy system.

Scenario outlines (prior to workshop)

Using the input from the PESTEL analysis and the online survey as the "building material," six scenario outlines were developed:

- Two social-economic scenarios (an optimistic and a pessimistic version)
- Two political-legal scenarios (an optimistic and a pessimistic version)
- Two environmental-technological scenarios (an optimistic and a pessimistic version)

The six scenario outlines examine three different sets of framework conditions from two opposing perspectives – an optimistic and a pessimistic one. As such, they explore different pathways for further uptake and strengthening of energy citizenship in European countries. The optimistic versions highlight the opportunities and supportive developments, while the pessimistic ones note the barriers and obstructive conditions.

The six scenario outlines are included in Annex 1.

Scenario-building workshop

The workshop was held in Sofia on 16 January 2024. Its purpose was to discuss and further develop the scenario outlines, and explore different possible futures and pathways. The workshop participants tried to draw lessons from the optimistic and pessimistic scenarios: what needs to be done (in terms of policy-making) to avoid the pessimistic scenario, and what would need to be done to achieve the optimistic scenario.

The workshop was attended by 28 participants: members of the EnergyPROSPECTS project, members of the project's Advisory Board, and distinguished experts from the fields of energy transition and energy citizenship.

Scenario-building workshop participants:

EnergyPROSPECTS team members	Advisory Board members	External experts
18	1	9

Workshop participants came from the following countries: Belgium (1), Bulgaria (9), France (2), Germany (1), Hungary (1), Ireland (3), Latvia (2), Spain (4), Sweden (1), Switzerland (1), and The Netherlands (3).

The event started with a short introduction to the EnergyPROSPECTS project, including a brief overview of the work conducted prior to the workshop and an explanation about how the scenario outlines were developed. Next, the main points from all six scenario outlines were presented.

The participants were then divided into six working groups, each with 3 or 4 participants and a table moderator. Each working group discussed both versions of the same scenario outline in two consecutive sessions – for example, the optimistic version of the social-economic scenario in the morning session and the pessimistic version of the same scenario in the early afternoon session (or vice versa). Both groups working on the same scenario united and formed a new group for the late afternoon session to develop policy recommendations, which would enable the realisation of scenarios for support and strengthening of energy citizenship.

The scenario outlines were sent to all participants several days before the workshop. For practical purposes and to facilitate the discussion, a short one-page version of each outline was prepared, summarising the major arguments in the form of bullet points. These short paragraphs were used by table moderators to facilitate the deliberations in the groups.

Figure 3: Scenario-building workshop in Sofia

The working group discussions in the first two sessions had the following main objectives:

- To verify the main assumptions in the scenario outlines, and if necessary, modify or remove them. If other relevant points emerged during the discussions, they were incorporated into the scenarios.
- To establish how these assumptions about possible futures influence energy citizenship – do the assumed developments support, encourage and empower it, or do they act as a barrier, obstacle or deterrent.

- To collect suggestions how to best take advantage of opportunities, and how to overcome the barriers to energy citizenship.

Figure 4: Scenario-building workshop in Sofia

The objective of the third session was to develop concrete recommendations that could facilitate the implementation of measures that stimulate, enhance, strengthen and – if necessary – transform the energy citizenship at the EU, national and local level.

After the workshop, the table moderators prepared detailed reports that summarised the discussions. The reports focused on the following issues:

- Which aspects, developments and conditions support energy citizenship and which represent an obstacle? How?
- How can citizens take advantage of the supporting condition and how can they overcome the barriers?
- What else needs to happen by 2030 in order to stimulate/support energy citizenship? What is missing from the scenario outlines?
- What can citizens do to contribute to the positive development of the European energy landscape by 2030?

The reports from the table discussions were used to develop the third and (as much as possible) realistic version of the three scenarios: social-economic, political-legal and environmental-technological scenario. These scenarios are presented in the next chapter.

4. ENERGY CITIZENSHIP SCENARIOS

This chapter presents consolidated scenarios resulting from the Sofia scenario-building workshop. The scenarios below explore possible developments for energy citizenship in the EU until 2030. They are divided into three sub-categories following the PESTEL analyses (see chapter 2): social-economic, political-legal, and technological-environmental. The scenarios are situated somewhere between the pessimistic and optimistic outlooks (see Annex 1) and underline key areas of intervention for policymakers. Drawing on these possible scenarios and areas of intervention, the next chapter outlines pathways for policy recommendations that aim to reinforce and strengthen positive developments for energy citizenship at the EU-level.

Social-economic scenario

This scenario explores the potential impact of probable economic developments and of prevailing societal trends on energy citizenship in the EU.

Energy prices and the relative costs of energy produced from the renewables and from fossil fuels

In the aftermath of their dramatic rise from 2021-2022, energy prices have become a contentious political matter. The overall economic situation can be expected to remain predominantly unfavourable, with slow economic growth and continuous rise of energy costs. In the face of this situation, many citizens will find themselves confronted with substantial lifestyle adjustments – not just concerning the way they consume energy, but also other resources (food, water, goods).

Energy prices will continue to impact different socioeconomic groups disproportionately. Without adequate measures in place to shield vulnerable populations from the burden of increased energy prices, inequalities can be expected to widen.

The relative cost of RES energy is expected to steadily decrease in comparison to energy produced from fossil fuels. The improved cost-competitiveness of energy from RES will play an increasingly important role for the spread of renewable energy prosumerism, which will make considerable gains as it becomes affordable and attractive for broader segments of the society. The positive expectations about the accelerated advance of self-generation of energy from renewables are grounded in the increased interest in renewable energy in recent years. However, the most active proliferation period might be expected a bit later than the timeframe of this scenario (between 2030 and 2040). Nevertheless, the necessity of adequate support mechanisms remains as pressing as ever to prevent the widening of the divide between those who are affluent enough to invest in RES installations and the disadvantaged citizens who remain entrenched in passive energy consumption.

Economic benefits are expected to remain the strongest motivation for utilisation of RES, while considerations on the positive environmental impacts will be an important reason to generate own renewable energy for a substantial number of citizens with high levels of energy literacy, climate consciousness and social value propositions.

Economic policy instruments such as state aid, grants, loans, guarantees, and subsidies

Governments on all levels are expected to continue the efforts to create favourable conditions for investment in energy production from renewable energy sources, opening up new possibilities for citizens to engage in the energy market. This will be done through development of regulations and supportive frameworks at EU and member state levels (see political-legal scenario for more details), and by provision

of specific incentives (grants, loans, guarantees, subsidies). Access to funding will be eased by different technical assistance and capacity building programmes to ensure that residents from regions and municipalities with underdeveloped or insufficient administrative capacity are not left behind. It is necessary to give particular attention to empowerment of vulnerable individuals and groups and enable their inclusion in different forms of energy citizenship. This would represent a major shift in the prevailing approach to tackling energy poverty by providing fuel subsidies to energy poor households, which has hitherto only prolonged and deepened their exposure to energy poverty. The funding instruments must work in coordinated and mutually reinforcing way to stimulate greater social acceptance and adoption of renewable energy sources.

The support measures will not be targeted only at renewable energy production (within individual households and within energy communities and energy cooperatives), but other types of energy citizenship initiatives as well. These include energy renovation of homes, switch to clean or less polluting transport means, re-skilling and up-skilling of workers for green jobs, and energy efficiency in organisations (both in public and private sphere).

Positive results from these measures also depend on the activity and engagement of citizens. It can be expected that easier access and more efficient information campaigns will enable a growing share of households to take advantage of existing funding opportunities to implement energy-efficient measures and achieve energy sufficiency. To facilitate the involvement of less affluent citizens, low-interest loans issued by the state-owned development finance institutions (independently or in cooperation with commercial banks) may help citizens to cover the initial investment. This is usually not addressed by the financial instruments provided by state support programmes. State financial institutions may as well provide assistance in the form of a guarantee for a loan issued by a commercial bank to create the trust for less affluent people.

One of the main challenges of energy subsidies is that they often disproportionately benefit economically privileged groups. To counteract the prevailing lack of trust in the EU's subsidy initiatives, transparency and communication will need to be improved. This could be addressed through an effective communication strategy with clear goals and communication channels and messages. Communication programmes should be developed and diversified according to needs and interests of different population groups.

Learning from past governmental responses to rising energy costs in 2022, certain groups of citizens can be expected to push for improvements that prioritise fairness and support for low-income consumers. Citizens may actively champion the implementation of decentralised funding solutions. By promoting local initiatives and fostering community-driven financial models, citizens can help tailor funding mechanisms to the specific needs of their regions. This decentralisation can not only expedite decision-making but also ensure that financial resources are allocated more directly to address local priorities.

Collaborative efforts between governments and the private sector would foster knowledge transfer and encourage the retention of expertise within national and local institutions. By establishing partnerships and incentivising companies and consultants to contribute to capacity-building initiatives, citizens can work towards strengthening the internal expertise required for efficient administrative processes.

Degree of liberalisation and decentralisation of the energy market

Liberalisation of the energy market, along with fast and efficient mechanisms for selling the surplus of self-produced electricity to the grid, provide important support to homeowners and businesses to generate their own renewable energy. Decentralisation of energy systems, once completed in all EU member states, will provide many opportunities for different stakeholders, including citizens. This is particularly true for individuals with a good knowledge of energy market and consumption patterns, enabling them to make

informed choices. Consumers who are literate in energy matters are likely to explore and utilise available options, such as switching to market prices or opting for energy-saving measures.

At the same time, this process hides numerous risks for households that are exposed to the unpredictable energy price fluctuations. Certain protection against such risks can be achieved by implementing regulations that set a maximum limit on energy prices for the amount of energy necessary for a basic standard of living. This creates a protective barrier ensuring that essential energy needs remain affordable and stable even for the most vulnerable members of society. Such regulatory measures would be more likely if NGOs and civil society organisations exercise pressure on policymakers and actively advocate for the enforcement of price ceilings.

NGOs and citizen organisations can also actively voice their concerns about the dominance of larger companies in the energy sector, emphasising the importance of preserving a competitive landscape that allows smaller entities to thrive. By vocalising these concerns through social media, organised protests, and community engagement, citizens can increase their knowledge about the energy system, raise wider public awareness and exert pressure on policymakers to prioritise the interests of all energy consumers.

Integration of the EU electricity market

It can be expected that this aspect will have only a moderate impact on the development of energy citizenship, considering that the integration of the EU electricity market relies heavily on government actions and initiatives. Citizens would primarily assume a more passive role in this development. A more active engagement would necessitate a good knowledge and understanding of the electricity market, which is not feasible for the majority of citizens.

The process guided by the EU Directive on common rules for the internal market for electricity has the potential to provide strong consumer protection and empowerment, and open access to the integrated market, ensuring affordable and transparent electricity prices for consumers. It might enable an expansion of citizen-led renewable energy communities.

Additional obstacles may exist in the form of insufficient transparency, contingent upon various factors such as proper implementation of regulations and the willingness of distribution system operators to adapt their practices to provide consumers with necessary information for informed decision-making. This transition may require considerable time, particularly in countries where decentralisation of the energy system process is advancing slowly.

In the longer term, this aspect might become a strong enabler for energy citizenship, opening up various opportunities for proactive involvement of citizens on the energy market.

The EU Emissions Trading System

The introduction of the EU-wide carbon price on heating and road transport in 2027 (may be postponed to 2028 in case of exceptionally high oil or gas prices) has the potential to incentivise the switch from fossil fuels to low-carbon alternatives. Yet, it also carries the risk of creating an additional financial burden for European citizens if clean energy alternatives are not easily accessible and affordable. In the latter case, the most probable form of energy citizenship stimulated by this aspect would be social unrest and dissatisfaction with the EU and its climate policies.

One way for enhancing the potential positive effects of this measure would be the promotion of affordable and efficient public transportation options. Advocating for extensive and inexpensive (free or heavily subsidised) public transport networks can reduce reliance on individual vehicles, mitigate the financial strain on citizens and curb the carbon emissions. Employers in public and private sphere could play an

active role in providing sustainable commuting options, such as offering employee transportation services or incentives for eco-friendly modes of travel. To complement this, citizens can engage with urban planning initiatives to address issues like urban sprawl, promoting the development of sustainable and accessible urban spaces that facilitate efficient usage of public transportation, electric vehicles and eco-friendly micro-mobility.

As far as emissions from heating in buildings are concerned, citizens can explore housing programmes that incentivise energy-efficient practices and renewable energy adoption. Implementing initiatives that promote eco-friendly and sustainable housing options, coupled with financial incentives, can help citizens transition to cleaner energy sources, thus reducing the carbon footprint associated with heating. The complex activities – energy efficient renovation of building together with installation of RES technologies – will become particularly important.

Green industry development and green job creation

The number and variety of green jobs can be expected to increase in the coming years, as popularity and attractiveness of this sector continues to grow, especially among young people. Green jobs will likely act as a catalyst for energy citizenship, as employees in the green sectors can foster the wider uptake of social attitudes supportive of the ecological and environmental issues (embracing circular economic practices, reducing energy consumption, implementing decarbonisation processes, etc.).

However, there are several caveats. Those citizens actively engaged in the green jobs sector would undoubtedly acquire new skills and most probably adopt environmentally friendly behaviours in their daily routines. Yet, their ability to foster the changes of social attitudes remains hypothetical at best, at least until the number of green jobs increases considerably.

Furthermore, no matter how rapidly and successfully this sector grows, green jobs will remain a prerogative of individuals with high level of skills and knowledge. The notable gender gap in the green sector is also unlikely to be reduced in the near future.

An important issue in this context are the local benefits provided by green jobs. Short supply chains for materials, services and knowledge are highly desirable for most energy citizenship projects.

Wealth disparity and energy poverty

Wealth disparity among European citizens is expected to remain high and possibly even grow in the near future due to inflation and rising energy costs. Such developments are likely to place vulnerable groups in an even more marginalised position in the energy transition in comparison to middle class and/or wealthier citizens, unless various welfare safety net measures are put in place to facilitate participation of low-income households in different forms of energy citizenship.

Such social safety net measures are already available in many countries, but to protect the vulnerable and reduce energy poverty on a larger (EU) scale, a holistic approach would be necessary. It is not enough to set up such support programmes – what is essential is to inform and educate the potential beneficiaries to take advantage of these measures, to understand their value and in the longer run to change their behaviour. If support measures would continue to prioritise financial allowances and cost compensation, their recipients will most likely remain relatively passive and trapped in the vicious circle of energy poverty.

The challenge of motivating and involving low-income households in energy-efficiency support programmes can be best tackled through targeted information and consultation programmes undertaken on a local level (municipalities, towns and villages). Energy communities can have a strong role to play in

educating and increasing citizens' awareness of measures designed to achieve energy savings. If properly supported by member states, energy communities can help fight energy poverty through facilitation of energy efficiency projects, reduced energy consumption and lower supply tariffs.

Social activity and passivity

In the environment of growing scepticism about democracy and the EU, it becomes crucial to highlight the tangible examples of individual and collective actions leading to positive change, and the role of community-driven initiatives in providing viable alternatives, demonstrating that collective action can lead to a positive change. Concurrently, regional capacity building is essential, as smaller territorial units often lack the resources and knowledge to spearhead sustainable energy initiatives.

Grassroots efforts initiated by active citizens could go a long way to stimulate awareness, shared learning and consequently engagement of larger segments of the society. Local competitions focused on energy-saving initiatives could also serve as a powerful catalyst for involvement. Such events can tap into the competitive spirit while fostering a sense of community accomplishment, creating a positive environment that encourages individuals to actively contribute to the energy transition.

Another tool for addressing the passivity and lack of engagement among citizens would be awareness campaigns that showcase successful local initiatives and highlight the benefits of energy transition. Recognising people's aversion to change, efforts should focus on emphasising the gradual and positive impact of energy-saving practices, assuaging fears and making the transition more palatable.

Initiatives that promote cross-country collaboration within the EU, emphasising shared goals and benefits, can strengthen the sense of solidarity in the EU. Addressing the urban-rural divide requires inclusive policies that recognise the diverse needs of different regions, ensuring that the benefits of the energy transition are accessible to all.

Energy literacy, awareness and skills

A good level of energy literacy and awareness is a necessary precondition for broad participation of citizens in the energy transition. The current status quo is not satisfactory, as a large proportion of EU residents remain insufficiently informed about the available opportunities and have little or no knowledge about how they could participate in the energy transition. The lack of knowledge about renewable energy and energy efficiency measures leads to distrust and low level of acceptance of new energy-efficient products, services, technologies and innovative solutions in the energy field.

Building of energy literacy, awareness and skills is a long and slow process. It is therefore essential to begin at an early age. A good practice to be replicated across the EU is integration of topics about sustainability and climate change into the school curriculum (already a fact in some countries, e.g. Spain). This is another long-term measure. Its effects cannot be expected within the time horizon of this scenario (2030), however it is essential to start its implementation as soon as possible. There is one important aspect to be considered. In many European countries, education is a very sensitive and often politicised issue, with political actors (especially from the right wing) attempting to dominate or control the educational agenda.

Raising energy citizens through education takes many years. For more immediate results, attractive and diverse information campaigns could go a long way to counter major misconceptions about the shift towards a less carbon-intensive and more sustainable energy system, and address concerns about the perceived impacts, benefits and costs. European citizens are exposed to an overflow of information, and it is getting increasingly difficult to deliver trustworthy and useful messages. The information will reach the larger number of citizens only if communicated in an accessible format, in easy to understand language, and through information resources most commonly used (and trusted) by the citizens

(conventional and social media). That said, it is important that the information is tailored and targeted to particular citizens' sub-groups, and focused on enhancing the capacity for critical thinking.

More has to be done to leverage the potential of the conventional media to act as an intermediary between policymakers, science and society. The EnergyPROSPECTS citizen survey showed that in most European countries, traditional media is still the most important source of information, although in some counties they are losing the battle against social media platforms.

At the same time, tailored communication strategies based on engaging and easily understandable content would need to be disseminated also through social networks, amplifying the reach of energy literacy initiatives. Community-based programmes that encourage peer-to-peer learning within families and social circles can further contribute to a grassroots movement toward increased energy awareness. As awareness continues to grow, individuals will be better equipped to make informed decisions, shaping a more energy-conscious society.

Creating opportunities for hands-on experiences and demonstrations can significantly enhance acceptance levels of new energy-efficient and energy-generating technologies. Citizens would benefit from practical, tangible encounters with energy-efficient products and solutions, allowing them to witness first-hand the positive impact on their daily lives. Community events, workshops, and local initiatives that showcase successful implementations of innovative energy solutions can effectively bridge the gap between theory and practice, fostering a sense of familiarity and comfort among citizens. Also important in this context are the regional demonstration centres where citizens can see and communicate face-to-face regarding new technologies and organisational procedures.

Citizens should not be considered only as recipients of information. Policymakers and researchers alike can learn from ordinary energy consumers, especially from the people engaged in various forms of energy citizenship. Such a transformative two-way education process could produce important insights about the most effective ways of citizen engagement.

The age factor

The demographic trends in Europe will continue to be negative in the near future, with aging population and declining share of working age people. Senior citizens are in a considerably underprivileged position compared to younger generations, which are better able to obtain, understand and act upon the information about energy transition – in particular information disseminated online and through social networks. At the same time, they have greater energy needs, as they often stay longer hours indoors and are less able to make compromises regarding their health and comfort. Specific efforts will have to be made to ensure that the elderly are included in different initiatives and programmes for increasing energy efficiency of households and their access to alternative energy sources. If this is not done, the problem of energy poverty will be additionally aggravated.

The elderly should not be treated as a uniform community. Many continue to be active even after retirement, others have to cope with different medical problems or disability, yet others can at the same time belong also to another type of disadvantaged group (minorities, migrants and refugees, residents of rural or remote areas, etc.). Some elderly citizens, for instance, retired professors, can be an important knowledge factor for the local neighbourhood. The programmes to involve them in energy processes have to be tailored to each of these types of elderly citizens, and would require different stimuli and approach.

It is particularly important that the support measures targeting elderly citizens are not focused on simple provision of financial aid. Elderly people will often require additional support, sometimes in the form of physical labour, to take advantage of options to improve the energy efficiency of their homes or to generate their own energy (for example, to install the roof insulation, they need to clean the attics, which might be impossible for them to do on their own). Such support could be provided in the form of

neighbourhood programmes or community groups that assist seniors with energy-efficient home upgrades, insulation, and other measures.

Advocating for cooperative housing initiatives tailored for the elderly could be a good way forward. Cooperative housing models that cater specifically to the needs of seniors can create supportive communities where energy-efficient solutions can be implemented collaboratively. These housing arrangements can integrate shared resources and technologies, making it more feasible to implement energy-efficient measures and address the unique energy needs of an aging population.

Traditional and simple solutions for energy conservation and efficiency can adequately accommodate the preferences and comfort levels of elderly individuals – for example improved insulation, energy-efficient appliances, and user-friendly heating and cooling systems do not necessitate the use of complex digital interfaces.

Environmental consciousness and climate anxieties

It is expected that the number of people willing to contribute to the energy transition will continue to increase, driven by their desire to reduce personal carbon footprint and commit to the common efforts to preserve the environment and tackle the climate change.

Although it is unreasonable to expect that such behaviour will become an entrenched social norm in most European countries in such a short period of time, there are indications that certain positive trends might increase. This includes a willingness of many people to invest effort, time and resources in the energy transition. Understandably, environmental consciousness alone is in most cases not enough to motivate people to act, and needs to be supported by appropriate context and conditions.

One way to support the development of desired social norms is to present them as modern and trendy. It is also important to communicate that environmentally responsible and energy preserving behaviour does not mean a reduction in a standard of living or wellbeing. Such messages are most effective when coming from "the inner circle" (family and friends), rather than from the state or EU institutions.

On the other hand, the pessimistic forecasts regarding climate change, environmental degradation, pollution and energy costs might discourage numerous people, strengthening their belief that their actions do not matter. This further alienates many people from becoming active energy citizens, fully responsible for their own energy production and consumption.

One way to counter such developments would be participation in local environmental groups or community initiatives focused on sustainability, allowing individuals to contribute to tangible solutions and share the burden of addressing climate concerns. By being part of a supportive community working towards positive change, citizens can transform their anxiety into meaningful action, finding strength and purpose in collaborative efforts to address climate challenges. Additionally, being part of a larger movement provides a sense of solidarity, dispels the feeling of powerlessness and fosters a belief that collective actions can make a difference. Local authorities could provide resources for these groups – for example, offer roofs of municipal public buildings to install citizens' collective owned solar energy installations.

Recognising the overwhelming nature of information overload, efforts should be directed toward simplifying and prioritising key actions that individuals can take in their daily lives. Campaigns and initiatives can provide clear and achievable steps, emphasising collective impact rather than placing the entire burden on individual actions. A more tangible and optimistic narrative about the role each person can play in addressing climate challenges can foster a sense of community and shared responsibility, helping citizens to move beyond feelings of powerlessness.

Political-legal scenario

This scenario explores the potential impact of political and legislative developments in the EU on energy citizenship.

Putting citizens at the core of the Energy Union and taking special care of the vulnerable consumers

Building on the vision of a citizens' role in the energy system enshrined in the Energy Union and the "Clean Energy for all Europeans" package, the EU member states can be expected to work towards fulfilment of this vision, setting up different enabling conditions for the energy citizenship. The main focus of these developments would most likely be the right and ability of citizens to produce their own energy.

Despite the considerable differences between countries, many European citizens will continue to view themselves not as active political subjects, but as passive recipients of regulations. Such perceptions will change only slowly through persistent efforts to underline the potential of citizens to contribute as political subjects participating in decision making. This can be achieved most effectively and concretely on the local scale, calling for more local control and decentralisation of decision making in the field of energy governance.

One of the key aspects of energy citizenship and the placement of citizens at the core of the Energy Union is providing every citizen with a fair and just chance to participate in the energy transition. This is not possible without a special consideration of vulnerable citizens. The programmes for empowerment and inclusion of vulnerable groups will help these groups to become energy citizens and provide them with the means to participate in the process. The starting point for accessible and affordable participation is a recognition that not everyone has the capacity to engage equally.

Many citizens feel excluded and perceive the energy transition as an unfair process that only benefits the rich and energy corporations. Such perceptions might be particularly articulated among various vulnerable socio-economic groups. In a way, such discontent might become a driver for a particular form of energy citizenship, namely social and political activism, if such individuals unite and voice their demands for a more just transition.

The perceived injustice of the energy transition might also motivate people to become small scale producers of energy. Individuals could strive for energy self-sufficiency in order to make themselves independent from big energy actors.

The perception of fairness/unfairness can sometimes be grounded in a lack of knowledge and information. To counteract this, national governments and the EU institutions would need to provide accessible and understandable counter-narratives. These include practical information on access to measures citizens can most easily relate to (e.g., retrofitting of houses, changing mobility patterns, self-generation of electricity) and simplification of the cumbersome administrative procedures and paperwork. Citizens themselves can contribute to this process by establishing citizen coalitions advocating for relevant administrative reforms.

Commitment to participative governance

Public participation in the preparation of energy and climate strategies, such as the Integrated National Energy and Climate Plans, is likely to continue to develop in the coming years. To enhance participative governance, policy documents need to be "translated" and presented in language clear and understandable for lay citizens. To this end, the involvement of citizens in the process would be most effective from the very beginning to ensure that their concerns and needs are integrated into the policymaking process, leading to policies that properly address them.

Particular attention needs to be given to ensuring the equal inclusion of women and other groups, which have traditionally been less interested or able to take part in energy governance. Hitherto most energy policies have been gender-blind and insensitive to differences between male and female energy needs, demands and preferences.

Other important elements of participative governance are providing citizens an opportunity to monitor and evaluate the progress of the process, to propose amendments and corrections, and exercise a limited control over the outcome. The involvement of citizens in the decision-making process enhances their acceptance and satisfaction with the final results.

Participation of citizens in the energy governance processes will undoubtedly increase citizens' trust in the energy transition. Confident that their concerns have been taken into consideration, they would not see the process as something imposed on them top down. Having a better understanding of how the process functions, citizens will feel they have a meaningful role to play – respect is an important element of citizenship. An essential activity in this respect is provision of feedback concerning the implementation of citizens' opinions. The lack of follow-up leads to frustration of citizens in deliberative processes.

The major risk threatening these positive developments would be that citizens' engagement is watered down to a pointless exercise, with citizens talking, but nobody listening. This also depends on the capacity of administrative institutions to listen and incorporate the citizens' proposals. If proper attention is given to enhance this capacity, participative governance will be considerably improved.

NGOs, citizens associations and local communities are well placed to act as intermediaries between citizens and policymakers, and can also put pressure on the institutions not to neglect or downplay the input of citizens.

The involvement of citizens in the decision-making becomes more complex and difficult to arrange the higher up we go on the governance ladder. Therefore, the local level is best suited for experimentation with different forms of public participation. Lessons learned can in the longer term be replicated on other policy levels.

EU-level legislation defining and enabling the role of citizens in the fulfilment of the objectives of climate neutrality

Citizens are expected to make a considerable contribution to the achievement of the EU climate neutrality objectives, such as 45% share of renewable energy sources in the overall energy mix and 32.5% energy efficiency (reduction in final energy consumption) by 2030. Provisions in the EU directives that enable citizens to play an active role by establishing renewable energy communities, self-consumption of renewable energy and involvement in energy-saving renovation projects are a great foundation to support energy citizenship. However, the bulk of citizens' involvement in the energy transition occurs through local efforts and initiatives. It is therefore essential to consider the concerns, capacities, needs and targets on the national and particularly local levels, taking into consideration the local differences.

While the objectives should be binding on EU and national level, the paths towards reaching these objectives will inevitably differ. There is a need for country specific guidelines on how to reach the objectives and targets. It is important to develop a monitoring framework to measure the social, environmental, and biodiversity impacts. Finally, concrete support programmes are needed on the local level for training and capacity building – not just of citizens, but the local administrations as well.

Political unification, cohesion and integration in the energy sector

A high degree of cohesion in energy policies, regulations and markets across the EU would undoubtedly facilitate the involvement of citizens in the process, making it much clearer for them to determine how they can participate and what the benefits of their actions are.

The cohesion and integration would also create better conditions for establishing coalitions within the EU, more opportunities for citizens to engage in different ways, and would increase solidarity among member states. Small and "less important" communities must not be sacrificed in the name of unified and integrated energy market. This necessitates a particular attention to ensure that less developed regions and municipalities are not left behind, and that vulnerable and disadvantaged communities are able to take advantage of the opportunities provided by the unified energy sector. There is also an issue of the ability of small energy producers to find their place in a common energy market that is dominated by large companies.

More respect for national and local specifics can enhance understanding and solidarity among the different countries. Overregulation can stifle local level initiatives, including in the energy sector (locally produced energy, which is locally consumed).

At the same time, there is a danger that member states could place their own national interest first and enforce different nationalist and protectionist strategies, especially if the benefits of unification and cohesion are not clear and tangible. This would considerably increase the differences between the countries and limit the opportunities of citizens to participate in the process. The lagging countries would fall further behind, increasing the inequality in the EU. The countries turning to protectionist strategies would additionally expose their energy sector (but also other sectors such as media) to potential capture by powerful actors outside the EU.

Considerable electoral gains by the far-right political parties would weaken the EU integration in terms of market, legislation, policies, and pooling of resources to tackle the common EU challenges. This would create further divisions not only between, but also within the EU member states, creating numerus obstacles to the development of energy citizenship.

Policies for empowerment of vulnerable groups and recognition of energy poverty as political priority

While it is beyond doubt that tackling energy poverty needs to be a political priority on all levels, energy vulnerability should not be considered outside of the more general concept of social vulnerability. Holistic policies are needed to reduce social vulnerability. This includes giving political voice to people from vulnerable and disadvantaged groups, and encouraging their involvement in political decisions, education and training, employment programmes (particularly in the green jobs sector), and support to access the funds for investments in green energy. Such groups are vulnerable on multiple levels, not only regarding energy poverty. They face a multitude of challenges, which requires consideration of the larger structural constraints (e.g. people residing in illegal houses are prevented from benefitting from any energy efficiency incentives).

Recognition of energy poverty as a political priority is particularly important for states, but as well for smaller territorial units such as municipalities, where this problem has not been adequately addressed – sometimes this is due to a basic lack of understanding of the concepts of vulnerability and inclusion. In these cases, the priority needs to be training and capacity building of local policymakers and administrations. The civil society is an excellent resource that can be used to help municipalities to better comprehend and address the complex issue of marginalisation and exclusion.

If vulnerable groups were to fall off the political agenda, this would render the very notion of just transition

impossible, as large segments of the population would be excluded from the process. In the absence of political will to resolutely tackle energy poverty, citizens would have to shoulder an even greater share of responsibility to overcome the barriers that prevent vulnerable groups from participating in the energy transition. This could be done by establishing socially aware and responsible energy citizenship initiatives, where particular care is taken to approach and include vulnerable groups.

Low energy literacy, which is a frequent obstacle to energy citizenship activity, could be addressed by NGOs through awareness raising initiatives (energy rights; access to financial help and other incentives) and energy education (teaching vulnerable groups how to increase energy efficiency in their houses). Local municipal institutions and energy suppliers should also contribute to the raising of energy literacy.

Prioritising the inclusion of vulnerable communities is essential for strengthening the wider social trust in the energy transition as a just and fair process. European societies are at the verge of a huge societal transformation. If perceived by considerable numbers of citizens as unfair, far right and populist political actors are likely to take advantage of the fears of people and push through political agendas that might obstruct or even stop the energy transition process.

Member state transposition and implementation of EU legislation that could support energy citizenship

Clear rules and procedures, including for monitoring and evaluation, are needed to ensure that member states are complying with their obligations to put citizens in the centre of the energy system. The mechanisms for enabling citizens' participation need to be uniform across the EU, ensuring fairness and equity. The timely and adequate transposition of the respective EU body of law should be stimulated through "reward" mechanisms, but without creating the perception that the EU is trying to enforce the legislation, which would cause a negative backlash.

Energy and climate targets, which are binding only at the EU level, would need to become obligatory on the national and even local level. Decentralisation of the objectives is crucial. A clear, detailed pathway to reaching the objectives is likewise needed and currently missing. The EU should not only propose guidelines, but provide a comprehensive framework with realistic minimum and maximum objectives and targets for the different member states. Such a step would undoubtedly foster energy citizenship, giving a clearer perception to the citizens about available opportunities.

As far as the EU legal regulation of grid access procedures and remuneration models for energy fed into the grid are concerned, the differences between EU countries are still vast. Grid access for citizens ranges from very easy to exceptionally difficult. These differences would need to be minimised in the coming years through stricter application of EU regulative frameworks. This question is not just a matter of political will. The main obstacles are underdeveloped infrastructure and other technical issues, which will need a longer period of time to be resolved.

Some states are being slow to transpose the needed legislation to define the status, rights and obligations of individual and jointly acting renewables self-consumers, and peer-to-peer trading. In some cases, the relevant legislation is simply copied and falls short of genuine implementation. The pressure to act should not come only from EU structures, but from the citizens themselves, who could push and ask for changes that would enable their access to the energy market with clearly defined rights, rules and obligations. Working at the local level with different stakeholders can be a way to render overarching objectives more concrete; let local actors say what they can achieve and what is feasible as target.

Environmental-technological scenario

This scenario explores the potential impact of environmental awareness and concerns, and of technological developments on energy citizenship.

Social acceptance of new energy-efficient and sustainable products, services and appliances

Social acceptance of new technologies is very important, because it creates a positive environment and opens up numerous possibilities for energy citizenship initiatives. However, there is a strong resistance to change in many parts of Europe, especially in the regions where the greening of the energy sector is expected to cause most drastic changes in the way people live. The most effective way to counter the social rejection of new developments and overcome resistance to change is by raising awareness about not only the necessity but also the benefits of the transition. Social acceptance of new technologies would increase if people felt that they are part of a collective, and did not see themselves as being excluded or left behind.

It can be expected that willingness to uptake new technologies will rise in the coming years. However, an even more important aspect is the awareness that technology is not a panacea. New energy efficient technologies can stimulate energy citizenship, but if applied without proper information and awareness raising campaigns, they can have the opposite result and lull citizens into inactivity or even contribute to careless and excessive energy consumption (rebound effect).

Technology can stimulate energy citizenship if used to change energy consumption patterns. Particularly important in this respect are smart metering and other devices that help consumers to understand and optimise their energy use. Technological developments that facilitate the transmitting of RES electricity to the grid or enable cost-effective and efficient storage will stimulate the development of energy cooperatives. Local flexibility markets are likewise important for the efficient use of energy from RES.

Responsibilities for "proper" or "desired" use of new technologies cannot be assigned only to citizens. There is a need for appropriate government policy. Even more important is a responsible approach from industry and market actors. Many people opt for cheaper products, or cannot afford the more expensive and more energy efficient options.

There is a risk that the most important technological solutions and innovations are applied mostly in large scale developments in industry and energy infrastructures, without actual consideration for sustainability and out of reach of citizens – at least in the short term. This is particularly likely in countries with underlined social distrust towards national and local politics, but also towards industry. Energy citizenship can be an effective remedy for such a situation, in particular the community engagement and social pressure on policymakers and businesses to put technologies in the service of society, rather than profit.

Roll-out of solar thermal and photovoltaic technologies, and availability of storage capacities

A large increase in both demand and supply of PV panels can be expected in the coming years – a continuation of the current trend. Solar PV installations have been widely embraced by citizens and are among the most socially acceptable technologies for generation of energy. It can be expected that availability of government grants, essential for supporting PV proliferation in the early years, will gradually start to decrease, as the costs of solar installations continue to drop. The costs of batteries for electricity storage cannot be expected to fall considerably in the short term, however their quality and capacity will likely improve substantially. This will further strengthen the demand for PV installations among the European citizens.

The deployment of PV technologies is not driven only by cost reduction, but by attitude-related changes, and mutual accountability of citizens, governments and companies. The state and other public institutions as forerunners are expected to help change the attitude of citizens.

Although these technologies are particularly suitable for individual energy generation, they are an important enabler for the creation of energy cooperatives/communities – in particular in the semi-urban and rural areas, but also in larger cities (rooftop solar PV installations on multi-apartment buildings or local public buildings). Pooling of resources of citizens in groups/cooperatives empowers them and places then in a better position vis-à-vis technological companies (better price and purchase/installation conditions). One of additional advantages of energy cooperatives is the reduced need for batteries. Large community storage facilities remain an expensive technology with high investment costs.

Proliferation of solar thermal and photovoltaic technologies has many benefits, but there are some negative aspects that need to be considered. Generating one's own green energy should not be seen as a licence for excessive energy use. Another issue is scarcity of raw materials for the production of PV panels. Additional problem is the still unresolved concern about the recycling of PV panels and batteries. This might change in the near future, as technological development around PV panels recycling is ongoing and may be further motivated if regulatory frameworks considering recycling and its costs are strengthened.

One of the potential risks is that the roll-out of solar thermal and solar photovoltaic installations could be limited to the more affluent citizens with good energy literacy and access to information. Government subsidies, despite the expected reduction, should remain available to low income and energy poor households, and therefore a major factor in overcoming this barrier.

Decentralised generation of renewable energy

The integrated and centralised energy production at the national level increases the security of supply, but limits the opportunities for energy citizenship. There are considerable differences between countries in relation to the conditions for wider deployment of RES – both in terms of legislation and technologies (smart grid).

Two separate processes – the development of the EU-wide electricity grid and the possibility of cross-European electricity trading, and the creation of local energy grids and local trading micro-systems – are not mutually exclusive and can support each other. This is where the mutual interest of governments, companies and citizens can be found. The role of local energy markets is growing and will most likely remain a very dynamic development. The importance of local level energy production and consumption is growing as well, and is expected to have a considerable impact on the overall energy system of Europe.

The problematic aspect of considerable differences between European regions in terms of smart grids deployment is likely to persist in the near future. This is a major hurdle for energy citizenship in some countries from central, eastern and southern Europe, where the smart grids are far less advanced compared to western European countries.

Citizens would have little impact on the development of smart grids. Furthermore, this is a very specific and complex issue most people are indifferent to. Therefore, all momentum for smart grid development is expected to be driven by industry and policymakers.

Demand-response infrastructure (smart metering)

Unlike smart grids, smart metering is much more tangible and closer to everyday energy consumption of citizens. It should therefore be considered as conducive to energy citizenship, but in practice, its application can be limited by information deficit, and in the case of less affluent citizens, also by financial constraints.

Despite the requirement for all European countries to deploy smart metering for at least 80% of electricity consumers already in 2020, it can be assumed that several countries will remain far below this target even by 2030. The most sustained progress has been made by countries that have opted for a mandatory roll-out and have already achieved 100% coverage (e.g., Denmark, Estonia, Finland, Spain and Sweden), or are very close to a complete rollout (e.g., France, Italy, Latvia, Luxemburg, Norway). In contrast, in several countries smart meter deployment plans have been considerably delayed (e.g., Bulgaria, Czech Republic, Cyprus, Germany, Greece; see Vitiello et al. 2022). The experience shows that smart meter roll-out works best when it is made compulsory. While this is not an advisable way to stimulate active citizenship, its benefits for the energy transition cannot be disputed. Optimal design and operation of smart grids require real-time information from smart meters. Smart meters provide additional protection, phase measurements and automation to enable higher flexibility.

Energy labelling and energy performance certificates of buildings

Ideally, energy labelling can contribute to energy savings and reduce the energy costs of households. It can also be said that it promotes innovation and investments into production of energy efficient and sustainable products. In practice, energy labelling cannot be decoupled from the cost of the energy-efficient appliances. Although consumers do pay attention to energy labels, it appears that they do so only to a certain price level, after which the price becomes the more important feature that determines which product to purchase. Most people stick to the medium price range.

An increase in awareness campaigns would be needed to stimulate the purchase of appliances from the highest energy classes. These campaigns should underline the benefits of such investments, as in the end they save money. Energy labelling should be explained with some examples so that people can better understand its benefits. Awareness raising about overuse of more efficient appliances is also needed.

One important aspect that should be considered when establishing the energy class of a given product is its lifespan. Lifespan is strongly related to energy and sustainability of environment.

Although the issue of energy labelling is also linked with the social acceptance in some countries, in general it is considered a positive concept. The market gets more efficient and consumers are used to energy labelling, which helps them to make informed and sustainable choices.

The problem remains that energy labelling does not help those people who cannot afford to buy the high-class and consequently more expensive appliances. This aspect is unlikely to improve by 2030. Low income citizens will continue to have little opportunity to take an active role.

Similarly to the energy efficient appliances, housing with the higher energy index seems to be benefiting the more affluent citizens, and is out of reach of the poor people who are unable to afford such certificates. In general, the energy rating of buildings is a sound investment into one's property, as it increases its (market) value.

A good way to promote the importance of energy certificates of buildings would be obligatory energy performance certificates of public buildings (schools, hospitals, etc.). Such examples might have no direct impact on low-income families, but would serve as positive examples and models. The government funded grants and incentives could provide low-income families with some assistance in this respect.

Environmental consciousness

Environmental consciousness (with regard to climate, biodiversity and resources use) and determination to contribute to the energy transition are crucial factors that motivate people to act. Increased incidents of extreme weather necessitated the rethinking of current energy consumption practices and standards.

Environmental consciousness is closely linked to social norms – awareness about what other people are doing can motivate more people to be environmentally conscious. However, this is a slow process. As more people recognise the negative effects of climate change on their lives, environmental consciousness will grow. Yet the growth cannot be expected to be dramatic. Part of the European citizens will continue to minimise, neglect or even deny climate change and its consequences. This constitutes a major barrier to energy citizenship.

In economically less developed EU countries, environmental consciousness and awareness will continue to be far less important than costs/savings as a motivation to adopt energy conscious behaviour. Low-income citizens will become environmentally conscious if it helps with their energy costs.

Climate change denial is exacerbated by the inappropriate and manipulative media coverage of climate change and its consequences. The growth of right-wing populism is a major factor in minimising and/or denying climate change.

Energy citizenship in the form of community engagement might be a positive way to overcome this barrier. This form is particularly appropriate for urban areas – some countries (e.g., Spain and the Netherlands) are known for having strong urban centres of community cooperation.

Governing bodies can do more to support environmental consciousness and awareness by highlighting the financial rewards.

Conflicts over land use connected to renewable energy

Conflicts over land use can take many forms: competition between food and energy crops; concerns about air and water pollution caused by large RES installations; soil impoverishment; property depreciation; and biodiversity protection.

In some countries, which can be said to have the highest proportion of people who are well informed on climate change and its consequences, the most vocal opposition to wind energy has been expressed – in particular among the coastal communities. As on-shore and off-shore wind power plants multiply across Europe, national governments will need to put in place adequate regulation that ensures that local communities in areas where wind parks will be sited will benefit from the operation of these wind parks. If this does not occur, we can expect a growing number of instances of strong and well substantiated local opposition against the wind electricity.

5. RECOMMENDATIONS FOR FACILITATING, SUPPORTING AND ENHANCING ENERGY CITIZENSHIP IN THE EU

In this chapter, we present pathways towards policy recommendations that aim to reinforce and strengthen positive developments for energy citizenship at the EU-level. These pathways were developed in two ways: first directly through discussions with experts at the Sofia workshop; and second derived from the consolidation of the possible scenarios with key areas for intervention outlined in the previous chapter. The recommendations will be deepened and concretised in Policy Brief 4, together with some of the recommendations from D6.3 (Open Working Paper).

Reconsideration of policy framings

1. The concept of sufficiency should be promoted as a desired social norm and overarching objective for the energy system. Excessive energy use should be recognised as a societal problem, not as a personal issue.

2. There is a need for a better coordination between different directorates of the European Commission to ensure more holistic perspectives. EU energy legislation should take into consideration various environmental and social aspects of the energy transition.

3. Horizontal and vertical policy coordination in the EU needs to be improved. This can be achieved through a better and more efficient dialogue between the policymakers in the EU institutions and the national-level public bodies, as well as local and regional authorities.

4. The international considerations in EU energy and climate policy should be strengthened. Attainment of outcomes and realisation of objectives must not come at the expense of unfairness and injustice in relation to third countries.

5. More needs to be done to promote solidarity and engagement on various levels: between the EU member states; between EU and the global south; and between urban and rural areas. In particular, there is a need for more responsibility and solidarity with communities that suffer environmental and economic damage on account of extraction of resources that benefits the EU.

6. The differences between the level of economic and technological development among the EU countries are very large and are very uneven within the member states as well. Although these discrepancies must be addressed at the EU level, it is essential to involve local governments in the process. Close cooperation with local authorities is also an excellent opportunity to adapt policy tools to the local realities.

7. One significant challenge could arise if political priorities shift, diverting attention away from climate concerns to more immediate crises such as war or pandemics. To overcome this, sustained advocacy for climate action and policies that prioritise long-term sustainability is crucial, ensuring that environmental issues remain on the political agenda.

8. Design and implementation of energy policies need to be gender sensitive. Most of the existing policies are based on male-centred perspectives and do not induce participation of women in the energy transition, nor do they pursue outcomes that address particular female energy needs, demands and preferences.

9. An understanding of energy poverty must be reframed. It should not be approached as a social problem that needs to be tackled through charity (provision of financial assistance for covering the energy bills) but as a systemic issue. There is a need to fight poverty as a structural condition.

10. Cohesion across sectors should be ensured. Energy citizenship should be linked to the issue of citizenship in general and the different forms of political participation.

Science-based policymaking

1. Scientific assessments are essential to better understand energy consumption behaviour. Policymakers are advised to base the relevant policies on actionable knowledge obtained through multidisciplinary and transdisciplinary research.

2. Many of the current policies are reactionary – they respond to already existing or emerging problems. What is needed is the long-term pro-active anticipatory and participatory policymaking. Science is crucial in this regard – in particular long-term foresight studies, aligned with the EU long-term policy objectives for 2050 and beyond.

3. Appropriate monitoring and evaluation mechanisms are necessary to assess the progress of energy policies and to verify that they (continue to) correspond with the societal expectations and needs. Such mechanisms would also increase transparency and accountability, building trust and contributing to better representation and participation.

Citizen engagement

1. Deliberative and participatory democracy could be a useful complement to representative democracy. It could enhance the legitimacy of EU policymaking and explore socially acceptable policy designs. Policymakers have to take into account that some people are more willing and/or able to participate than others, which necessitates a nuanced approach.

2. Decentralisation of the energy policy design and implementation will enable a more varied and efficient participation of citizens in energy initiatives.

3. Good practices on citizen engagement (for instance the citizen assemblies in Ireland) should be followed and applied in other countries. Citizen panels and stakeholder panels could be institutionalised on the EU level as well, enhancing the policymaking process and stimulating energy citizenship.

4. In order to ensure citizen control and local benefits of transition policies, citizens' concerns need to be reflected in decision-making processes.

5. Policymakers should ensure that participatory democratic exercises are followed up by transparent process with a focus on their impact and consequences. Policymakers need to make commitments to implement some of the recommendations made by citizens. At the same time, citizens have to be aware that not everything they recommend can be implemented.

Communication and outreach

1. EU energy and climate communication activities often focus on long-term plans, strategies and efforts – most often on 2050. For many citizens, this is a distant future they have trouble to relate to. The EU messages would be easier to understand by more citizens if set in a shorter timeframe, such as 2030. Developing short- and medium-term energy visions is crucial.

2. Providing information about the energy transition and about the options available to citizen to participate in it is not sufficient. Such messages often disappear in the existing information overflow. To be effective, information needs to be presented in an accessible language, in an engaging way, should be easy to digest and comprehend (non-technical language), and not overloaded with details.

3. Communication needs to be tailored to specific target groups and should clearly underline the linkages between policies and individual decisions of citizens.

4. It is important to understand and accept the emotional side of energy transition. Polarisation in society can be considerably reduced if policymakers show more sensibility towards actions of citizens, which are driven by their emotional responses to the energy transition, including their fears and anxieties.

5. The EnergyPROSPECTS survey has shown that the majority of citizens consider the information provided through EU websites and social media channels to be among the most credible sources of information, but at the same time these resources are used only by a minority of citizens. The EU institutions should do more to utilise these information resources and increase their popularity among the citizens.

6. National authorities of the EU member states should set up centralised digital platforms for citizens, providing easy to comprehend information to facilitate energy citizenship. This should include discussions and information on benefits and challenges of the energy transition (financial aspects, job loss and job creation, well-being, quality of life, climate and environment).

7. Centrally-operated one stop shops for citizens, addressing legal, technical and financial issues, would be a very important support for the local energy communities.

8. Building trust is crucial. The energy transition will be best advanced if presented through a positive narrative that highlights benefits for the citizens, the societies, the economy and the environment.

9. The communication efforts should not focus only on energy, but go beyond it (holistic inclusion). Energy should be put in perspective within the everyday challenges that citizens face.

Capacity building

1. The EU programmes for capacity building and training of local and regional governments should focus on enhancing the capacity of local authorities to support and encourage the local energy citizenship initiatives.

2. The impact of local energy citizenship initiatives is important, as they are in the direct contact with the citizens and are in the best position to involve them. At the same time, these local initiatives often rely on crucial support from local authorities. This support should go beyond financial measures, which are often indispensable, yet insufficient, and can include development of favourable legislative framework, logistical support, counselling, networking opportunities and other means.

3. The ability to distinguish between true and false information and between important and irrelevant information is a growing problem across the European societies. Education and information programmes and campaigns that support and develop critical thinking are needed. Furthermore, such programmes should also enhance the ability of citizens to act upon the provided information.

4. In order to enhance energy and environmental literacy and awareness, environmental issues should be firmly integrated into school curriculum. Sustainability should become an educational topic. Education will work best if it combines theory with practice.

5. The concept of energy literacy should be broadened to include also political choices – the ability of citizens to take an informed decision in different aspects of the political process.

6. As the number and variety of green jobs increases, it is essential to build capacity for green jobs based on the principles of equity, diversity and inclusion. Training and education must not focus only on young graduates, but on employees in sectors threatened by job losses.

Support measures and programmes

1. Programmes for energy citizenship support should go beyond the provision of grants, loans and other financial incentives. They should place more emphasis on empowerment of citizens to take advantage of these funds through provision of different auxiliary social policy measures. This is crucial for various vulnerable social groups, such as the elderly, people with disabilities, energy poor citizens, etc.

2. A variety of incentives to promote the take up of new technologies and of energy efficient practices should be applied both at the individual level (citizens / households) and at the level of businesses.

3. Financial and technical support measures can overcome many barriers vulnerable groups face if targeted specifically to them. Participation of marginalised communities will be meaningful only if recognition of their needs and concerns is assured.

4. The rapid pace of technological development and digitalisation could exacerbate inequalities and contribute to energy poverty. As new energy technologies and digital solutions emerge, there is a risk that certain segments of the population may be left behind due to a lack of access or familiarity with these advancements. Addressing this challenge requires a focus on inclusive technological policies, ensuring that benefits are distributed equitably.

Cooperation and mutual learning

1. Good practices of private, public and citizen partnerships and initiatives must be shared among EU countries. The European energy citizenship landscape is full of examples of different business and social innovation models that can be upscaled and transferred across the EU.

2. Ambitious energy transition policies at the EU level often falter when they reach the member state level. The EU should have the resources and capabilities to even out (to some extent) the differences in financial capacities of member states to implement energy sufficiency, efficiency, and renewables deployment. Energy is a common good, which needs to be accompanied by common responsibilities for all actors.

3. Strengthening vertical communication channels is crucial – citizens should actively participate in local and national dialogues on energy policies. This may involve attending community meetings, engaging in public consultations, and expressing concerns or suggestions to local representatives. By actively voicing their opinions, citizens can contribute to more inclusive and responsive energy policies that address diverse needs.

4. Implementing participatory approaches, such as community workshops or collaborative projects, can further strengthen social bonds while enhancing collective understanding of sustainable energy practices. Showcasing practical examples of individuals or communities making a positive difference in their energy consumption can serve as inspiration. Demonstrating how energy-efficient choices can reduce both environmental impact and energy poverty can motivate others to adopt similar practices, creating a ripple effect towards a more sustainable energy future.

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7. ANNEX 1: SCENARIO OUTLINES

Social-economic scenarios

Optimistic outlook

It is 2030. After the dramatic rise of **energy prices** in the 2021-2022 period, the energy markets returned to their more stable trajectories and the European Union has continued its efforts to reduce its energy dependence through diversification, energy sufficiency, efficiency and renewable energy deployment. Fossil fuel prices continued to fluctuate, responding to fairly predictable supply-demand cycles. At the same time, the European Union has considerably diversified its supply of fossil gas and petrol and as the phase-out of fossil fuels continues, energy prices are kept in check through different policy interventions and price correction arrangements. The properly applied and targeted **subsidies and market corrections** have balanced out market failures and created favourable conditions for energy production from renewable energy sources (RES).

The **economic growth** has been slow, but steady. Together with adequate public investment in the energy transition, the economic situation has opened up opportunities for investment – including in RES and energy efficiency measures. In combination with stable energy prices and market regulation, this has encouraged the spread of prosumerism and energy communities. Stability and predictability on the energy market have ensured safe, sustainable and secure energy at a reasonable price for households and businesses.

Many people have continued to **consume energy in a responsible way**, after changing their energy-consumption behaviour in response to the energy crisis. Compared to the period before 2021, they use air conditioners less, maintain lower temperature in their homes in colder months, and use public transport, walk or ride bicycles more often instead of using private cars. Many have done energy retrofitting of their homes. Others have changed their electricity supplier for one that has the largest share of green energy in its mix, taking advantage of the liberalised and decentralised energy market. Conscious that in the past they have often consumed more energy and resources than necessary, most people have abandoned or strongly reduced certain forms of energy intensive habits and behaviours (e.g. taking the plane for business and private trips, holidays in distant places, non-essential household appliances, excessive heating and cooling).

The **cost-competitiveness of energy from RES** has played a major role in the continuous decrease of the fossil fuel use, and increase of renewable energy prosumerism, which has become affordable and attractive for broader segments of the society.

Liberalisation of the energy market has also supported homeowners and businesses to generate their own renewable energy. Grants and low interest loans for solar PV installations, along with hassle-free and quick procedures for selling the surplus energy back into the grid have enabled proliferation of prosumers – both on individual and community level. Decentralisation of energy systems has been completed in all EU member states, opening up many opportunities for different actors, including citizens.

Integration of the EU electricity market enabled the development of many forms of energy citizenship. The process guided by the EU Directive on common rules for the internal market for electricity has provided strong consumer protection and empowerment, and open access to the integrated market, ensuring affordable and transparent electricity prices for consumers and enabling a proliferation of citizen-led renewable energy communities.

The **EU Emissions Trading System** has had a considerable impact after the introduction of an EU-wide carbon price on heating and road transport in 2026. It incentivised the switch from fossil fuels to low-

carbon alternatives, and raised additional revenues to finance the energy transition.

A **variety of welfare safety net measures** are in place to protect the low-income households and to ensure their participation in the programmes for energy renovation of buildings, but also in different other forms of energy citizenship. Various financial support measures have facilitated the social distribution of energy citizenship, enabling a growing group of late adopters to catch up with the energy citizenship frontrunners.

Wealth disparity among European citizens has decreased as a result of stable economic growth and predictable energy costs. Higher level of income allows for more investments in energy citizenship actions (RES installations, energy communities, improving energy efficiency, etc.).

Different types of funding (grants, loans, guarantees, subsidies, and procurements) are available to support the energy citizenship initiatives in multitude of areas – re-skilling and up-skilling of workers for green jobs, energy efficiency in companies, energy retrofitting schemes, renewable energy production and the development of clean transport. Access to this funding is facilitated by different technical assistance and capacity building programmes, making sure that also regions and municipalities with underdeveloped or insufficient administrative capacity are not left behind (for example, the Energy Community Repository, the Rural Energy Community Advisory Hub).

The number and variety of **green jobs** have continued to increase. Green jobs act as an important catalyst and motivation for citizens to embrace more sustainable living and working routines, as the increased number of workers with environmental skills fosters the development of social attitudes supportive of the ecological and environmental issues (embracing circular economic practices, reducing energy consumption, implementing decarbonisation processes, etc.).

Good level of **energy literacy and awareness** has become the norm – most citizens are well informed and knowledgeable about how they can participate in the energy transition and how to take advantage of the existing opportunities. This has been achieved through numerous and diverse education and information campaigns that have rectified the major misconceptions about energy transition and mitigated the concerns about the perceived impacts, benefits and costs. Most people obtain information about the energy issues from reliable and trustworthy sources such as public media, web pages of the relevant national and EU institutions and agencies, scholarly journals and non-governmental organisations.

Higher levels of energy literacy have led more people not just to save energy, but also to inspire people around them to be energy conscious, to join an energy community or even start one. There is a widespread perception that **energy transition is a joint task** of everyone in the society and therefore all citizens should become more active. At the same time, there is also a strong belief that it is a **civic duty to protest** against developments in the energy system that people perceive as unfair, unjust or harmful.

Although the demographic trends in Europe remained negative and the **population is ageing,** efforts have been made to ensure that the elderly are included in different initiatives and programmes for increasing energy efficiency of households and access to alternative energy sources.

The **involvement of women** in energy initiatives has improved considerably, owing to targeted information campaigns and examples of successful female role models.

The **social attitudes** towards innovative energy-efficient products, services, technologies and appliances, have become predominantly positive. Large segments of the population are ready to embrace new technologies and different types of innovations, which is contributing to the spread of energy communities, prosumerism and sustainable transport. Energy-related social innovations are thriving. They have reinforced the role of citizens in energy transition, changed the established social relations and practices, and offered innovative responses to the climate crisis.

Environmental consciousness and determination to contribute to the energy transition have increased

considerably and are now exceptionally important factors motivating people to act. The main reasons for acting are the desire to contribute to the common good, ambition to reduce personal carbon footprint, and recognition of own responsibility for the climate change.

Energy conservation and protection of the environment have become entrenched **social norms** in most European countries. This has positively affected the willingness of many people to invest effort, time and resources in the energy transition. Although many citizens continue to take independent actions, the majority are engaged in community activities taking place in their neighbourhoods or municipalities.

Concerns and anxieties associated with climate change have become an important driver for action and development. Eager to limit the negative consequences of their daily lives on the environment, many people act in a more responsible and sustainable way. This includes their consumer choices (purchasing environmentally friendly local products), recycling and/or reuse of products instead of their disposal, use of green transport alternatives, and cutback on consumption – including of energy. In addition, the environmentally conscious consumers are more motivated to participate in energy decision-making, community or individual prosumerism, and in social movements or protests.

Pessimistic outlook

It is 2030. High inflation and the continuous rise of **energy prices** are clear indications that the 'age of abundance' is gone for good. Forced to cut costs, many people had to make considerable changes to their lifestyle. Many of these changes affect the way they consume not only energy but also other resources (food, water, goods). The economic growth has been brought to a standstill, and many European countries are struggling with recession. This constrains the possibilities of citizens for participation in the energy market. Instead of investing in energy retrofitting of homes or self-generation of energy, most citizens focus on energy savings and energy conscious behaviour, sometimes at the expense of their comfort or even at risk of their health (cold homes, cooking, washing and showering less often, using cheaper fuels of lower quality).

Wealth disparity among citizens in Europe has grown considerably due to inflation and rising energy costs. The **vulnerable groups** have never been more marginalised in the energy transition in comparison to the middle class and/or wealthier citizens. There is little or no social solidarity. Those who have no problems with covering their energy needs and paying their bills are convinced that all members of the society regardless of their income should make a sacrifice to ensure the success of the energy transition.

The **subsidies and market corrections** typically serve to correct market failures and create favourable conditions for sustainable energy production. They are also meant to empower vulnerable individuals and groups and enable their inclusion in different forms of energy citizenship. However, these practices have been accompanied by various complications and uncertainties – many subsidy schemes have in fact favoured the relatively privileged groups and failed to reach the vulnerable, thereby increasing social injustice. The energy subsidies that the energy poor households receive to cope with the high costs are prolonging and deepening their exposure to energy poverty, as they lead to an increased energy consumption and make investments in energy conservation technologies less attractive.

Access to financing is also correlated to **administrative capacity**. The countries, regions and municipalities with the highest need for financing often lack the expertise and human resources to go through sometimes lengthy and administratively burdensome processes and are therefore the least likely to obtain the financing. Access to EU funding is also more challenging for small actors (NGOs, businesses).

The **very high energy prices** are becoming economically and socially disruptive. A growing number of citizens, unable to cover their energy costs, experience anxiety, resentment and resignation. The discontent is not restricted to the discussions and publications on the social media but is also visible on the streets – **protests** against high energy prices are organised in numerous countries. Many people

believe it is their civic duty to protest against developments in the energy system they perceive as unfair, unjust or harmful. This is another aspect of the growing divide in the European society. On the one side are the angry voices, and on the other side is the passive, disempowered and silent majority, with no interest to actively participate in the energy transition and despondent about the way the process is unfolding.

The previous trend of rising **cost-competitiveness of energy from renewable sources** has slowed down considerably, making renewable energy prosumerism not a particularly attractive option. This has also increased the gap between the privileged active energy citizens and the disadvantaged citizens who remain locked-in in passive energy consumption.

The complete **liberalisation of the energy market** has left a growing number of households vulnerable and in risk of energy poverty. Despite the intended protection and empowerment of energy consumers, many remain exposed to the unpredictable energy price fluctuations. Member states continue to spend billions of euros to shield private consumers and businesses from high electricity prices, while not doing enough to target these measures towards the most vulnerable members of the society, or incentivising energy savings among the biggest consumers.

The inclusion of buildings and transport into the **EU Emissions Trading System** (ETS) was intended to further reduce the greenhouse gas (GHG) emissions across the EU. In fact, the introduction of EU-wide carbon price on heating and road transport in 2026 has only brought additional financial burden for European citizens, while the most carbon intensive sectors such as energy-intensive industries and commercial aviation continued to benefit from generous free allocations of GHG emissions rights. Instead of contributing to the phase-out of fossil fuels, the ETS triggered social unrest and dissatisfaction with the EU and its climate policies. Many people across the continent are convinced that climate and energy policies should be the prerogative of the national governments and not coordinated by the EU institutions.

The levels of **energy literacy and awareness** (literacy about energy devices, energy actions, energy finances and more general energy-related knowledge) have remained low – most citizens are not informed about the available opportunities and have little or no knowledge about how they could participate in the energy transition. A huge majority of citizens obtain their energy-related information and advice from their families and friends, or from social media.

The lack of knowledge about renewable energy and energy efficiency measures leads to **distrust and low level of acceptance** of new energy-efficient products, services, technologies and innovative solutions in the energy field. The repeated education and information campaigns have failed to correct the widespread misconceptions about energy transition and to mitigate the concerns about the perceived impacts, benefits and costs.

The demographic trends in Europe continue to be negative. The **population is ageing,** and the share of working age people is decreasing. The problem is not being addressed by appropriate initiatives and incentives for the elderly, at least not on the necessary scale and not in all countries. This deepens the problem with energy poverty, since energy consumption of the elderly is higher than the average, as they stay longer hours indoors and are less able to make compromises regarding their health and comfort. At the same time, they are less likely to take up alternative energy forms or adopt energy-efficient behaviours.

The **gender misbalances** in energy initiatives have persisted. Female role models are few. Women are discouraged, not interested or not equipped with necessary knowledge and skills to actively participate in energy initiatives, although they are often disproportionately affected by energy poverty.

Environmental consciousness and desire to contribute to the energy transition remain rather low. Most people are fine with limiting their involvement to simple low-cost actions like energy saving at home (limit the use of household appliances, heating and cooling devices).

The **trust of citizens** towards institutions and organisations, from political bodies to non-governmental organisation and academia, is very low, and most people stay away from any organised or collective forms of energy citizenship.

Numerous people are troubled by **climate anxiety** (fear of environmental catastrophe), which is causing considerable damage to the physical and mental health of citizens, but rather than becoming a driver for action, it creates a sense of powerlessness and resignation that nothing can be done. This further distances many people from becoming active energy citizens, fully responsible for their own energy production and consumption.

Political-legal scenarios

Optimistic outlook

It is 2030. After the 2024 and 2029 elections, political formations that support the Green Deal and the energy transition have maintained a comfortable majority in the EU Parliament.

The vision of **citizens' role in the energy system** enshrined in the Energy Union and the "Clean Energy for all Europeans" package has been successfully realised and even expanded to include a holistic vision of energy citizenship into its policies and legislation. Citizens are at the core of the Energy Union, benefitting from new technologies and participating actively in the energy market, as well as in social and political processes concerning the energy transition. The energy transition has been recognised by the wide segments of the society as an inclusive, accessible, just and socially fair process. Special care is being taken to protect and empower vulnerable and marginalised citizens.

Citizens are **engaged in the energy transition** in an active and meaningful way. Many participate in different energy decision-making processes or are active in social movements in the energy field. For the voters, political views and positions of political parties or candidates about the energy transition and climate are among the most important issues that determine their decision at the ballot box. Many citizens take part in public debates and consultations on the energy and climate topics. A smaller, but significant number are members of various citizen-based organisation or other collective forms of citizen engagement and participate in demonstrations and protests linked to various aspects of the energy/climate transition. These different aspects of citizen participation are facilitated by various formal arrangements and procedures, which support and safeguard 'bottom-up' initiatives towards energy democracy. These processes are further enhanced through informal political cultures and participation traditions.

The **commitments to participative governance**, including in the field of environment and climate, that were prioritised during the 2019-2024 term of the European Commission (the priority 'A New Push for European Democracy') have been further strengthened and institutionalised. One of the key initiatives related to this priority was The Conference for the Future of Europe. Its successful implementation demonstrated the importance of EU-wide citizen consultations for shaping a common future, including the areas of climate change and environment. Most member states have integrated binding public participation and multi-level climate and energy dialogues, across a wide range of stakeholders, in the preparation of the Integrated National Energy and Climate Plans and other strategic documents.

Another important political process has been the initiation of **public-private partnerships** – especially the large-scale projects of infrastructure development and/or construction where citizen-driven organisations and citizens living in their vicinity have a strong voice through co-decision making structures and dialogues. By safeguarding citizens' voice and influence in decision-making, these initiatives have also supported the development of energy citizenship, as they contribute to the consolidation of energy democracy and sustainability.

The EU member states are on a good track to meet the objective of **climate neutrality** by 2050, having reached a comprehensive agreement of the energy policies and targets, including an ambitious 2040 target in line with the recommendations of the European Scientific Advisory Board on Climate Change. Member states are cooperating towards achieving these objectives through increased political integration within the energy and climate field. There is hardly any need to enforce the compliance with the EU directives. The target of at least 45% renewable energy sources in the EU's overall energy mix by 2030 has been exceeded. This success has been possible due to the active role of local and regional authorities, which have worked hard to ensure the empowerment and meaningful inclusion of citizens, consumers

and businesses in the clean energy transition. Most member states have successfully implemented their National Energy and Climate Plans, helping the EU to meet its energy efficiency target (at least 32.5% by 2030).

A high degree of **political unification and integration** in the energy sector has been achieved across the EU. The energy policies of member states are well coordinated, market barriers have been minimised. The high degree of cohesion in policies, regulations and markets has enabled the EU to speak with one voice in the global energy affairs. This has also increased solidarity between member states. The high level of political integration has ensured **common legislative frameworks** that enable homogeneous development of energy citizenship across the EU, as well as new own financial resources for the EU to support the energy transition across the Union, especially for Member States with the least financial capacity to invest.

A wide range of governmental policies and non-state initiatives dedicated to the **empowerment of vulnerable groups** have allowed so far "passive" individuals and marginalised communities to become energy citizens. The crucial development in this aspect was the recognition of energy poverty and vulnerable citizens as a political priority in EU legislation and strategies, especially in the Fit for 55 package. The establishment of Energy Poverty Advisory Hub / EU Energy Poverty Observatory has fostered a transformational change in knowledge about the extent of energy poverty in Europe and enabled the design of innovative policies and practices to combat it. Member states have adopted the necessary policy measures to tackle energy poverty, ensuring that energy efficiency measures and benefits of renewable energy deployment truly reach the energy poor citizens. Programmes for improving the energy efficiency of buildings have in particular targeted vulnerable households. Measures were also taken to empower vulnerable consumers to participate in renewable energy communities.

The **empowerment projects and programmes** are not limited to energy poor citizens and households. Various initiatives, projects and programmes aim to strengthen 'sustainable competitiveness' (as set out in the European Green Deal) in regions and sectors that are most affected by the energy transition, given their dependence on fossil fuels and their reliance on unsustainable industries and businesses.

Various forms of energy citizenship have been consolidated in the **European body of law.** Relevant legislation has strengthened the legal status of Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs) at EU level, and the rights and obligations of individual consumers at EU level. Legislation has also prescribed steps to address the growing concerns about vulnerable people and energy poverty. The member states have also proceeded with transposition of relevant legal frameworks into the national legislation.

RECs and CECs have been given a considerable push when all member states established the regulatory framework, which defined the **status, rights and obligations** of individual and jointly acting renewables self-consumers, and peer-to-peer trading. This step has empowered renewables self-consumers to generate, consume, store, and sell electricity without facing disproportionate burdens.

Most member states have developed and are regularly implementing **information, awareness-raising, guidance and training programmes**. These programmes inform citizens how to exercise their rights as active customers, and about the benefits and practicalities (including technical and financial aspects) of developing and using energy from renewable sources. The effect of these measures has been considerable, as testified by different studies and polls, which show that such programmes are among the most trustworthy and often used sources of information among the European citizens.

The requirement for energy companies to provide **clear and easily understandable bills** for their services, including accurate information about consumption and cost allocation (in multi-apartment buildings) has enabled the consumers to regulate their energy consumption, compare offers and switch suppliers. Having access to transparent and accurate data about household consumption and costs has

been an important stimulation for many citizens to take the decision to become prosumers. This development was additionally facilitated by the obligatory installation of smart meters in most member states.

Prosumerism has been further stimulated through legal regulation of **grid access procedures and remunerations models** for energy fed into the grid. The regulation has made it possible for all consumers to benefit from direct participation in the market. With the raised awareness about the possibilities and benefits from self-generation of energy, the active participation of citizens in the energy market increased substantially across the EU.

Pessimistic outlook

It is 2030. After the **electoral success of Eurosceptic and far right political parties** in 2024 and 2029 European Parliament elections, most attempts for further political unification in the EU have failed. This is valid also for the energy sector. The process of **political integration** in the EU energy sector has come almost to a standstill. The energy policies of member states are very diverse, with most states placing their own national interest first and enforcing different **nationalist and protectionist strategies**. The sanctioning mechanisms of European Commission have been inefficient to discipline the non-compliant member states. There are huge differences between states in terms of energy citizenship types and maturity, mirroring the disparities across countries. This situation has been conducive to certain more nationalist variants of energy citizenship ('solidarity with our own'). The **lack of cohesion** in policies, regulations and markets has weakened the role of the EU in global energy affairs.

The EU states are completely **off course from reaching the binding objective** of climate neutrality by 2050, and the reduction of net greenhouse gas emissions has been way below the 2030 target of at least 55% compared to 1990 levels. The lack of cooperation between the states, as well as the inability of some of them to fully implement all measures foreseen in their National Energy and Climate Plans, means that neither the target of at least 45% renewable energy sources in the EU's overall energy mix by 2030, nor 15% reduction of energy consumption by 2030 have been met.

Considerable segments of European societies feel excluded and perceive **energy transition as an unfair process** that only benefits the richest segments of society and energy corporations. The majority of citizens have resigned themselves to the role of passive and powerless energy consumers. They are not engaged in the energy transition process (apart from making limited choices about how to consume energy in their private lives) and see participation in energy decision-making processes or in social movements and protests as meaningless. Overall, they are **deeply unmotivated to act** despite being aware of the need to take action. They strongly believe that views and opinions of ordinary citizens about the development of the energy system are not sufficiently considered by politicians and that everything individual citizens can do is confined to simple actions within their households. Despite being frustrated by the inadequate actions taken by policymakers and strongly distrusting them, many citizens continue to believe that the complete responsibility for the energy transition is in the hands of the national governments and the European institutions.

Despite the good intentions and optimistic start in the 2019-2024 term of the European Commission (the priority 'A New Push for European Democracy' and successful implementation of one of the key initiatives related to this priority – the Conference for the Future of Europe), the **commitments to participative governance**, including in the field of environment and climate, have been watered down and rendered meaningless. This is valid also for the Conference for the Future of Europe. Apprehensiveness of member states and persistent calls that the Conference should not adopt any recommendations that may create legal obligations have shown that the initiative was seen by the policymakers as hardly more than an opinion poll. Few of the 49 proposals had any impact on member states' positions. Instead of marking a new page in the development of participatory democracy in the EU, the Conference only strengthened the

opinion of most citizens that politicians were indifferent to their needs and opinions. As one channel for citizen engagement has been obstructed, another one has opened up – citizen movements and protests as a reaction to autocratic, overcentralised modes of decision-making.

Despite the wide range of governmental policies and non-state initiatives dedicated to the **empowerment of vulnerable groups**, little has changed for citizens suffering from energy poverty, those marginalized through low energy literacy, and those overlooked or underrepresented in decision-making on energy matters. The 2021-2022 energy crisis has highlighted the need to recognise energy poverty and vulnerable citizens as a political priority, but in the years after the crisis these issues have almost completely fallen off the political agenda.

Despite a multitude of data and evidence gathered by the Energy Poverty Advisory Hub, EU Energy Poverty Observatory and numerous academic and non-governmental organisations, hardly any innovative policies and practices to combat energy poverty were initiated.

Concerning **the legislative aspects of energy citizenship**, the European body of law has made a modest progress, defining the legal status of renewable and citizen energy communities, the rights and obligations of individual consumers, and measures to tackle the energy poverty. However, enactment and implementation thereof on the national level remain in many ways uncertain, due to the loose obligations imposed on member states and the lack of a clear view on energy citizenship that the EU body of law is supposed to rule and support.

Despite the necessity and obligations to adopt a uniform regulatory framework, which would define the **status, rights and obligations** of individual and jointly acting renewables self-consumers, and peer-to-peer trading, some states have been slow to introduce the needed legislation. This has considerably delayed or limited the development of renewables self-consumption in certain countries.

Although many member states have developed and are regularly implementing **information, awareness-raising, guidance and training programmes** that inform citizens how to exercise their rights as active consumers, and about the benefits and practicalities of producing and using energy from renewable sources, the effect of these measures has been limited. Different studies and polls show that such programmes are used or known among a relatively small share of the population. There is also the issue of low trust towards information coming from the EU institutions.

The EU legal framework has also included a number of very practical aspects of **energy-related rights and duties of energy consumers and prosumers**. They include rights relating to transparent information of users (billing, consumption, implementation of submetering and cost allocation for heating, cooling and domestic hot water). Although the bills have indeed became clearer and easier to understand, potentially enabling the consumers to regulate their energy consumption, compare offers and switch suppliers, in practice the situation did not change for significant segments of the population, who continue to struggle with understanding, or have no interest in understanding their bills.

Although a considerable progress has been achieved on the EU level and some member states, in many parts of the EU **legal uncertainties** (lack of regulation and/or law enforcement, contradictions in legislation), lengthy administrative procedures and high administrative costs remain a massive barrier. Project developers and citizens wishing to invest in renewable energy continue to struggle with complicated permit granting processes, with unclear time-limits for decisions to be taken by the competent authorities, and with misleading or missing information.

Environmental-technological scenarios

Optimistic outlook

It is 2030. Technological innovations and developments have enabled a proliferation of energy citizenship activities and forms. Energy citizenship has been additionally invigorated by the enhanced environmental consciousness and awareness of Europeans.

The **social acceptance** of new energy-efficient products, services and appliances is very high, and the majority of people are quite open to embrace the new technologies. At the same time, there is a widespread awareness that technology is not a panacea and that a successful energy transition necessitates a considerable change in the energy consumption patterns of Europeans.

Solar thermal and photovoltaic technologies have been the most important technological tools enabling participation of citizens in the energy transition. Their rapid roll-out has helped to considerably reduce the European dependence on fossil fuels across all sectors of the economy – from residential heating to industrial processes. The spectacular decrease of solar energy costs has turned it into one of the most competitive sources of electricity in the EU. EU citizens appreciate the autonomy that the production of their own energy gives them. Solar energy also protects them from the volatility of fossil fuel prices. The proliferation of small renewable energy projects such as rooftop solar installations has promoted and increased public acceptance of renewable energy technological solutions.

Decentralised and efficient generation and distribution of renewable energy across Europe has been greatly supported by **Trans-European Networks for Energy** – a policy focused on interconnecting the energy infrastructure of EU countries. Good progress was recorded regarding the **deployment of smart grids** that help to integrate renewable energy and allow consumers to better regulate their energy consumption. The introduction of smart grids has helped the member states to modernise their distribution networks, which has encouraged decentralised generation and energy efficiency and therefore acted as an important boost for energy citizenship.

Important progress was made also with the deployment of demand-response infrastructure (**smart metering**). Smart metering systems have empowered consumers in a number of ways. They allow them to receive accurate and near real-time feedback on their energy consumption and/or generation. They also help them to manage their consumption better, thus lowering their electricity costs. Furthermore, they enable their participation in demand-response programmes and other services.

Deployment of long-distance transmission grids (**electricity highways**) has proceeded with a good pace. Electricity highways are large grids that allow electricity to be transported over long distances across Europe (e.g. from wind farms in the North and Baltic Seas to storage facilities in Scandinavia and the Alps). These grids have also facilitated decentralised generation and energy efficiency and eased the integration of citizen-generated RES electricity into the European energy system.

Energy labelling (clear and understandable information about energy consumption of appliances) is another tool that has helped energy consumers to make informed choices when buying appliances. Clear and understandable information about energy consumption of appliances has contributed to energy savings, reduced energy costs and has promoted innovation and investments into production of energy efficient products. Most European households are now equipped with energy efficient home appliances and smart devices that help households to consume less energy.

Similarly, **energy performance certificates of buildings**[1] have provided information to consumers on buildings they plan to purchase or rent. Being informed about the energy performance of buildings enables buyers and tenants to make informed choices and to plan the necessary building renovations

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[1] https://ec.europa.eu/commission/presscorner/detail/en/ip_23_6423

needed to improve their energy efficiency. 85% of EU buildings were built before 2000 and amongst them, 75% have a poor energy performance. Buildings account for 40% of total energy consumption in the EU and as such are the single largest energy consumer in Europe. The aim to achieve a fully decarbonised building stock by 2050 is vital for reducing GHG emissions in the EU. The European Commission developed an action plan to at least double the annual energy renovation rate of buildings and foster deep renovation.

Technological developments and solutions are **tools** to increase energy efficiency and produce energy from RES, while environmental concerns, opinions and attitudes are an important reason and **motivation** for energy citizenship. **Environmental consciousness** and determination to contribute to the energy transition have increased considerably and are now exceptionally important factors motivating people to act.

The awareness about the inevitable **consequences of climate change** is one of the most basic motivations for the creation of energy citizenship initiatives. This has been acknowledged by the European Climate Law, which says that "citizens and communities have a powerful role to play in driving the transformation towards climate neutrality forward." For this reason, strong public and social engagement on climate action has been encouraged and facilitated in all EU states on national, regional and local levels. For many European citizens, desire to contribute to the common good, ambition to reduce their own carbon footprint and recognition of their personal responsibility for climate change have been the most important reasons to take action and try to improve not just their own lives, but also the economy and society.

The number of people who do not believe in climate change has been considerably reduced by the **increased incidents of extreme weather** such as flash floods and heat waves in recent years. These events have necessitated the rethinking and updating of current energy consumption practices and standards. The extreme weather incidents have served as a wake-up call for the majority of EU citizens, making them more concerned with and interested in participating actively in the energy transition. As a result, European societies have become more resilient.

In a similar way, the continuous **rise of global temperatures and the levels of atmospheric carbon dioxide** have motivated a growing number of citizens to calculate their carbon footprint and take actions to reducing carbon emissions by limiting their energy consumption at home or changing their mobility habits. Carbon footprint calculations and the dissemination of knowledge on the sustainable footprint have become one of the awareness-raising pillars of energy citizenship.

The problem with **pollution** (in particular air pollution) has also boosted energy citizenship – especially in larger European cities. Some of the measures to reduce air pollution were the introduction of Low Emission Zones, set up to phase out cars with internal combustion engines, and development of infrastructure for less polluting transport, for example electric bikes and scooters. These measures had a strong effect on the mobility behaviour of citizens.

Concerns and anxieties associated with climate change have become an important driver for action and development. Eager to limit the negative consequences of their daily lives on the environment, many people act in a more responsible and sustainable way. This includes their consumer choices (purchasing environmentally friendly local products), recycling and/or reuse of products instead of their disposal, use of green transport alternatives, and cutback on consumption – including energy. In addition, the environmentally conscious consumers are more motivated to participate in energy decision-making, community or individual prosumerism, as well as in social movements or protests.

Pessimistic outlook

It is 2030. Over the past decade, numerous **technological solutions and innovations,** aimed towards the decarbonisation of the energy sector, have been widely applied. However, in most cases they are linked

to large scale developments in industry and energy infrastructure, mostly benefitting incumbent energy system actors. Despite their potential to pave the way for expansion of energy citizenship in Europe, technologies have been used by citizens in a very limited way. The **social acceptance** of new energy-efficient products, services and appliances is low, and the majority of people are sceptical towards new technologies. The repeated education and information campaigns have failed to correct the widespread misconceptions about energy technologies and to mitigate the concerns about the perceived impacts, benefits and costs.

At the same time, **environmental consciousness and awareness** have managed to motivate only a limited number of European citizens to invest in technologies that could help them to save or produce energy. It appears that even among those who have embraced new technologies, the possibility to earn or save money, or take advantage of available financial subsidies, has a much stronger motivational effect than the ambition to reduce carbon footprint or mitigate the effects of climate change. These concerns have been confirmed by different studies, which have shown that many people who did embrace innovative technological solutions for energy efficiency have been lulled into inaction and passivity, not making any effort to modify their energy consumption behaviour and thereby causing rebound effects.

Despite the substantial decrease of the cost of **solar thermal and solar photovoltaic installations**, solar energy failed to reduce European dependence on fossil fuels, which remains indispensable across all sectors of the economy, from residential heating to industrial processes. A modest success has been noted with the roll-out of micro renewable energy projects such as rooftop solar installations, but this has been limited to the more affluent citizens with good energy literacy and access to information. The majority of citizens have remained sceptical or uninterested in producing their own electricity from solar power. The more widespread uptake of solar installations has been further impeded by slow and cumbersome administrative procedures.

The large European energy infrastructure projects are progressing without major deviations from the timeline envisaged in the **Trans-European Networks for Energy** policy, but without having any considerable impact on energy citizenship. Most citizens remain unaware or disconnected from these processes.

Smart grids deployment has progressed well in western European countries, but remains underdeveloped in central, eastern and southern Europe. This has further deepened the gap between the frontrunners and laggard countries. Countries with the largest share of energy communities and prosumers have additionally improved the conditions that help small producers to integrate into the distribution networks. In contrast, the countries where prosumers are still a novelty remain an almost blank spot on the map of EU smart grid network.

Similarly, huge regional differences persist regarding the deployment of **smart metering**. The "Clean Energy for all Europeans" package encouraged smart metering roll-out in all EU countries. Smart metering has been addressed in the Directive on common rules for the internal market in electricity. Despite the requirement for all European countries to deploy smart metering for at least 80% of electricity consumers already in 2020, some countries are still far from this target in 2030 – especially the ones that did not adopt the legal framework for a mandatory roll-out or have considerably delayed their smart meter deployment plans. Without these legislative steps, engagement of consumers becomes practically impossible, as no information is available about costs, benefits and appropriate incentives.

Technological choices often present both opportunities and threats, such as the ones aimed at enhancing energy efficiency though **labelling of appliances and buildings**. Energy labelling (clear and understandable information about energy consumption of appliances) did in fact help many energy consumers to make informed choices when buying energy-related products. However, energy labelling is meaningless to people who cannot afford buying the high-class and consequently more expensive appliances and other products. Many citizens from vulnerable groups are therefore unable to benefit from

the information that could potentially help them to save energy and reduce their energy costs.

The same can be said about the information about the **energy efficiency of residential buildings** – particularly multi-apartment buildings in cities. The information alone does not help low-income families that can only afford to live in low quality, poorly insulated and therefore cheaper housing. Without effective and targeted support measures, the information on energy efficiency of buildings remains meaningless for the growing number of energy poor European citizens.

Technological developments and solutions are **potential tools** to increase the energy efficiency and produce energy from RES (for those who can afford them), while environmental concerns, opinions and attitudes may be an important reason and **motivation** to act (for those with the access to information and interest/desire to be informed).

Despite all the evidence to the contrary, most European citizens, especially the ones for whom social media are the most important source of information, continue to minimise, neglect or even deny **climate change and its consequences**. The rapid deterioration of the climatic conditions has acted as a wakeup call only for citizens of those countries where environmental awareness was already on a high level. Many people, especially the voters of far right and Eurosceptic parties, which registered a major breakthrough in the 2024 and 2029 elections, remained followers of climate change conspiracy theories. Furthermore, the rising average temperatures, especially the summer heatwaves, have led to intensification of certain unsustainable energy practices, such as the massive use of air-conditioning systems in the summer.

The environmental awareness and concerns are not the only aspects that have affected the engagement of citizens in the energy transition. Energy citizenship is conditioned also by different circumstances that are beyond the control of both the governments and the citizens – for example, the **availability of resources and the RES potential**. The fast growth of the use of renewable energy has been facilitated by the geographical position and prevailing weather conditions in countries like Spain and Greece (solar energy) and The Netherlands and Denmark (wind energy). This is in sharp contrast to countries in central and eastern Europe, where these conditions are far less favourable. Transition to a greener lifestyle has therefore been influenced also by the availability and extent of renewable energy potentials.

When the options for "positive" energy citizenship (one that supports and participates in the green energy transition) are limited, "negative" forms of energy citizenship may emerge – opposition to (certain types of) RES projects. The examples of so-called **not-in-my-backyard phenomenon** can be found across Europe, mostly concerning the installation of large wind energy parks, but also in connections with the construction of hydropower plants and solar PV parks. The reasons for the opposition to RES projects range from the visual pollution and landscape degradation to the problem of waste that accumulates during the process of energy generation and after future dismantling of installations (e.g. used solar panels or electric car batteries are almost impossible to recycle) and to the biodiversity protection (installing RES projects in environmentally vulnerable or protected areas).

Finding **suitable land for renewable energy projects** has been a cause of numerous controversies, especially when the land in question is appropriate for agricultural purposes. Conflicts over land use connected to renewable energy have emerged for a variety of reasons: competition between food and energy crops, air and water pollution, soil impoverishment, odours, property depreciation, and biodiversity protection. Citizen mobilisations against such energy projects have been on the rise, especially in countries where strong interest groups (e.g. farmers) are well organised and active.

Numerous people are troubled by **climate anxiety** (fear of environmental catastrophe), which is causing considerable damage to the physical and mental health of citizens, but rather than becoming a driver for action, it creates a sense of powerlessness and resignation that nothing can be done. This further alienates many people from becoming active energy citizens, undertaking responsibility for their own energy production and consumption.

8. ANNEX 2: SCENARIO-BUILDING WORKSHOP SCRIPT

Time	Description	Necessary materials
9.00-9.30	Arrival of participants and registration	Participant list for registration Name tags Copies of programme and draft scenarios
9.30-10.30	Short presentation of EnergyPROSPECTS project Short presentation of six draft energy citizenship scenarios and how and why they were developed (PESTEL analysis, online citizen survey) Allocation of participants to six working groups, in accordance with the preliminary plan	PowerPoint presentation Lists of participants per group
10.30-10.50	Coffee break and group photo	
10.50-12.30	Revision and further development of the draft scenarios – first session Moderators read each paragraph point in the scenario outline one at the time and then ask the participants the following questions: Optimistic scenarios: 1. Is this aspect/situation conducive to the development and strengthening of energy citizenship? How? 2. What is the role of citizens in this aspect/situation? 3. How can citizens take advantage of this aspect/situation? In what ways? After all statements from the scenario outline have been read, moderator asks the following questions: 4. What else needs to happen by 2030 in order to stimulate/support energy citizenship? What is missing from the scenario? 5. What else can citizens do to contribute to the positive development of the European energy landscape by 2030? 6. Is there anything in the scenario that needs to be changed? Pessimistic scenarios: 1. Is this aspect/situation a barrier to the development and strengthening of energy citizenship? How 2. What is the role of citizens in this aspect/situation? 3. How can citizens overcome these barriers? After all statements from the scenario outline have been read, moderator asks the following questions: 4. What other difficulties and barriers prevent European citizens from actively participating in the energy transition? What is missing from the scenario? 5. What else can citizens do to prevent the negative development of the European energy landscape by 2030? 6. Is there anything in the scenario that needs to be changed?	Table etiquette and one-page scenario outline on each table Moderators take notes (paper or laptop) and record the discussions on dictaphone or smartphone

12.30-13.30	Lunch	
13.30-15.00	Revision and further development of the draft scenarios – second session Moderators stay at the same table, participants move to the other table (optimists and pessimists change their places) The same questions are used as in the first session.	Table etiquette and one-page scenario outline on each table Moderators take notes (paper or laptop) and record the discussions on dictaphone or smartphone
15.00-15.20	Coffee break	
15.20-16.30	Both groups working on the same set of scenarios work together. Moderators from the previous two sessions join the participants. Three new groups are formed with new moderators. Based on the scenarios discussed in the previous two sessions, and guided by the moderators, participants develop recommendations for measures that stimulate, enhance, strengthen and transform energy citizenship at the EU, national and local level. Recommendations target policymakers at all three levels, and may be divided in these three clusters. Guiding questions: 1. What needs to be done by the policymakers to additionally facilitate, encourage and ease participation of citizens in the energy transition? 2. What needs to be done by the policymakers to remove or at least reduce the barriers preventing participation of citizens in the energy transition? 3. What else is needed to support and enhance energy citizenship in EU?	Moderators take notes. In the last 20 minutes of the session, moderator writes the finalised recommendations on the flipchart to be presented in the plenary session.
16.30-17.30	Presentation of recommendations in the plenary session (three moderators of the third session)	
17.30	Final words and conclusion	