



PROSEU

Prosumers for the Energy Union: mainstreaming active participation of citizens in the energy transition

D3.3 Report: Principles for Prosumer Policy Options

Recommendations to strengthen prosumers and energy communities in NECPs and other EU,
national and local policies

Horizon 2020 (H2020-LCE-2017)

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Summary of PROSEU

PROSEU aims to enable the mainstreaming of the renewable energy Prosumer phenomenon into the European Energy Union. Prosumers are active energy users who both consume and produce energy from renewable sources (RES). The growth of RES Prosumerism all over Europe challenges current energy market structures and institutions. PROSEU's research focuses on collectives of RES Prosumers and will investigate new business models, market regulations, infrastructural integration, technology, scenarios and energy policies across Europe. The team will work together with RES Prosumer Initiatives (Living Labs), policymakers and other stakeholders from nine countries, following a quasi-experimental approach to learn how RES Prosumer communities, start-ups and businesses are dealing with their own challenges, and to determine what incentive structures will enable the mainstreaming of RES Prosumerism, while safeguarding citizen participation, inclusiveness and transparency. Moving beyond a case by case and fragmented body of research on RES Prosumers, PROSEU will build an integrated knowledge framework for a socio-political, socioeconomic, business and financial, technological, socio-technical and socio-cultural understanding of RES Prosumerism and coalesce in a comprehensive identification and assessment of incentive structures to enable the process of mainstreaming RES Prosumers in the context of the energy transition.

Summary of PROSEU's Objectives

Eight key objectives at the foundation of the project's vision and work plan:

- **Objective 1:** Document and analyse the current state of the art with respect to (150-200) RES Prosumer initiatives in Europe.
- **Objective 2:** Identify and analyse the regulatory frameworks and policy instruments relevant for RES Prosumer initiatives in nine participating Member States.
- **Objective 3:** Identify innovative financing schemes throughout the nine participating Member States and the barriers and opportunities for RES Prosumer business models.
- **Objective 4:** Develop scenarios for 2030 and 2050 based on in-depth analysis of technological solutions for RES Prosumers under different geographical, climatic and socio-political conditions.
- **Objective 5:** Discuss the research findings with 30 relevant stakeholders in a Participatory Integrated Assessment and produce a roadmap (until 2030 and 2050) for mainstreaming RE Prosumerism.
- **Objective 6:** Synthesise the lessons learned through experimentation and co-learning within and across Living Labs.
- **Objective 7:** Develop new methodological tools and draw lessons on how the PROSEU methodology, aimed at co-creation and learning, can itself serve as an experiment with institutional innovation.
- **Objective 8:** Create a RES Prosumer Community of Interest.

PROSEU Consortium Partners

| Logo | Organisation | Type | Country |
|--|--------------------|---------------------------------------|-----------------|
|  <p>FCiências^{ID} ASSOCIAÇÃO PARA A INVESTIGAÇÃO E DESENVOLVIMENTO DE CIÊNCIAS</p> | FCIENCIAS.ID | Private non-profit association | Portugal |
|  <p>U^{PORTO} FEUP FACULDADE DE ENGENHARIA UNIVERSIDADE DO PORTO</p> | U ^{PORTO} | University | Portugal |
|  <p>I.C.L.E.I Local Governments for Sustainability</p> | ICLEI EURO | Small and medium-sized enterprise | Germany |
|  <p>ClientEarth</p> | CLIENTEARTH | Non-governmental organisation | United Kingdom |
|  <p>UNIVERSITY OF LEEDS</p> | UNIVLEEDS | University | United Kingdom |
|  <p>drift for transition</p> | DRIFT | University | the Netherlands |
|  <p>FSB</p> | UNIZAG FSB | University | Croatia |
|  <p>LEUPHANA UNIVERSITÄT LÖNEBURG</p> | LEUPHANA | University | Germany |
|  <p>eco-union</p> | ECO-UNION | Non-governmental organisation | Spain |
|  <p>i ö w INSTITUTE FOR ECOLOGICAL ECONOMY RESEARCH</p> | IÖW | Private non-profit limited company | Germany |
|  <p>40^{years} CE Delft Committed to the Environment</p> | CE Delft | Small and medium-sized enterprise | the Netherlands |

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Glossary

| | |
|--------|---|
| CEC | Citizen Energy Community |
| DSO | Distribution System Operator |
| EE | Energy Efficiency |
| EMD | Electricity Market Directive |
| EU | European Union |
| FIT | Feed-in-Tariff |
| GWh | Gigawatt hours |
| kW | Kilowatt |
| LCOE | Levelized Costs of Electricity |
| LTS | Long Term Strategy |
| MW | Megawatt |
| NECP | National Energy and Climate Plan |
| PV | Photovoltaic |
| RE | Renewable Energy |
| REC | Renewable Energy Community |
| RES | Renewable Energy Sources |
| RED II | Renewable Energy Directive (Recast) from 2018 |
| TSO | Transport System Operator |

Executive Summary

This paper offers a **set of principles for prosumer policy options** that allow prosumers to become an integral part of the energy system. It aims to inform and influence National Energy and Climate Plans (NECPs) as well as transposition into national legislation and regulation of the Renewable Energy Directive (RED II), the Electricity Market Directive (EMD) and the Governance Regulation by developing strategies around the involvement and mainstreaming of prosumers and renewable energy communities in EU countries.

To that end, the paper provides **concrete propositions and examples on** how the identified principles can be put into practice so that policy makers and political decision makers are able to apply them when defining the final NECPs and drafting national legislation that ensures the transposition of the above mentioned directives..

The **five key principles** and the main recommendations are the following:

1. Setting ambitious targets for prosumers and energy communities: NECPs should contain at least two concrete targets in addition to the required targets and milestones for different sectors and technologies: one for **roof-top PV** and one for **Energy Communities** which could include all renewable technologies. These targets can be either capacity targets in megawatt or energy generation targets in GWh. The main reason for a roof-top PV target is that basically all rooftop PV projects would be also used for self-consumption; apart from that it is also a good indicator for making maximum use of the built environment. The target should be set in relation to the rooftop PV potential in each Member State. The energy community target can be share of the total national RE target which includes all renewable technologies. As energy community projects tend to have a higher public acceptance, the share should be significant. In addition, non-energy targets like number of (renewable) energy communities and the number of their members should also be defined.

2. Ensuring economic viability through favourable framework conditions: For prosumers to become a key driver for a low-carbon Energy Union, there needs to be a viable business case when investing in renewables. NECPs should describe measures that facilitate shared self-consumption schemes, provide **fair remuneration** for excess electricity that goes beyond the wholesale market price, an inducing rate design and **simple taxation** mechanisms. Furthermore, governments should guarantee open, transparent and competitive market access, **priority grid access** and priority dispatch when transposing the RED II and EMD into national legislation. Additional revenue streams can be tapped by facilitating sector coupling and provision of grid services. Long-term, stable and balanced contracts between prosumers and business partners can be secured through e.g. **Power Purchase Agreements (PPA)** or **Green and Sustainable Public Procurement** programs.

3. Fostering Renewable Energy Communities: NECPs and related legislation and regulation should define which kind of legal organisations they propose to be used for energy communities. Moreover, transparent cost-benefit analyses should be conducted on the benefits that renewable energy communities provide to the energy system and the local communities. NECPs should either reference to a transparent cost-benefit analysis or provide a plan on how and when to do it. Governments should also simplify administrative procedures, e.g. by creating **single contact points**, and support in technical, financial and legal matters. Providing **education and capacity-building** ensure sustainable energy literacy so that all potential prosumers are well informed. NECPs should also show concrete actions to engage energy communities in tackling energy poverty.

4. Establishing energy responsibility and coherence at all levels: National legislation and the NECPs should reflect the future character of the distributed energy system by making clear that energy planning and implementation needs to take place at all political and institutional levels, including citizens, companies, municipalities, cities, regions, states, and countries. **Local, regional and national actors will have to become (energy) accountable** by defining their own energy and climate plans including energy targets and measures supporting the NECPs and any new laws resulting from the transposition of the EU Directives. This also means that higher governmental levels must be able to count on the contributions made by lower levels and to aggregate them to the national and EU level.

5. Ensuring prosumer participation in governance processes: The arrival of citizens and prosumers as new players in the energy system means that the roles of the different stakeholders need to be redefined. This, in turn, requires a new or enhanced governance model because prosumers are currently not sufficiently represented in decision and policy making processes. Participation of prosumer representatives – which will need to be formed and identified – is required in a number of EU and national policy fields as well as on the local level. In NECPs and national legislation it should be made clear that **governments actively seek the input and advice of prosumer representatives**, and that they encourage the creation of bodies (like associations) that can act as prosumer representatives. Governments should propose which kind of legal organisations they propose to be used for energy communities

The remaining time until the final versions of the NECPs are issued will be crucial to secure satisfactory results for prosumers and energy communities. Nevertheless, the transposition of the Renewable Energy Directive and the Electricity Market Directive into national laws will provide further opportunities to influence national policies towards a prosumer-centred Energy Union. Most important is, however, it needs to be ensured that the plans match the Paris Agreement in their ambition – currently they are well behind – , and that are rigorously implemented and enforced over the next years.

Introduction

Objectives of this report

This paper offers a **set of principles for prosumer policy options** that allow prosumers to become an integral part of the energy system. It aims to inform and influence future energy and climate policies, including National Energy and Climate Plans (NECPs) by developing strategies around the mainstreaming of prosumers and renewable energy communities in EU countries. The paper thus contributes to the overall EU goal of achieving the climate targets defined in the Paris Agreement.

Besides identifying and describing the key principles, this paper **also provides – where possible – concrete propositions and examples** on how these principles can be put into practice, so that policymakers can apply them when defining the final NECPs and national legislation and regulation.¹

Situation – current and future role of prosumers

The rights of prosumers (citizens) and prosumer initiatives (energy communities) to produce, self-consume, store and sell energy have been acknowledged in the latest Renewable Energy Directive (RED II, Directive (EU) 2018/2001) and the Electricity Market Directive (EMD, Directive (EU) 2019/944). This means it does not have to be discussed anymore *if* the concept of prosumerism is justified but only on *how* it can be implemented. **The RED II is also clear on that renewable self-consumption and renewable energy communities shall be promoted within the Energy Union.** It is now upon Member States to implement these directives and support the development of prosumers at national and local level.

Furthermore, prosumers are likely to play an important role due to the contribution they can make for the future energy mix. For instance, a study published by Energy Watch Group on 100% renewable energy calculated that European PV prosumers alone could represent up to 700 GW by 2030 and about 1500 GW by 2050 (Ram et al. 2018).

¹ It should be noted that another Work Package of the PROSEU project defined 10 “principles” which relate to individual business models, while the principles in this Deliverable 3.3 relate to the national system of energy and associated regulations.

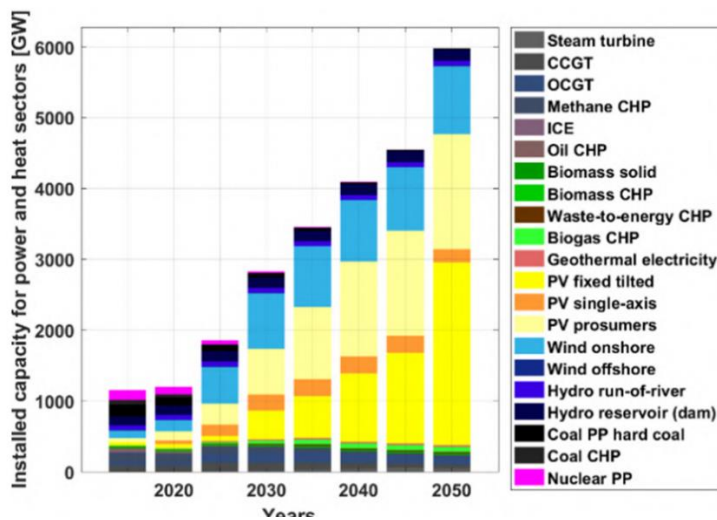


Figure 1: 100% RE Energy System for Europe. Source: Energy Watch Group, LUT University (2018)

Prosumers are also key players to implement the energy transition in a sustainable way compared to purely commercial projects like utility-led projects or the ones commissioned under an Independent Power Producer (IPP) developer approach²:

- The **social benefits of prosumers** initiatives are clearly superior to non-prosumer projects, i.e. regarding inclusiveness, citizen participation and involvement in the energy sector, solidarity with energy-poor households and other consumers, the fairness of redistribution of benefits and even gender aspects. This is mainly due to not-for-profit nature of prosumer projects and the social orientation of the cooperative governance model.
- In the **environmental dimension** individual and collective prosumer projects have advantages regarding overall energy savings and carbon emission reductions as well as biodiversity and ecosystem protection. For recycling and avoiding rebound effects, they are quite similar. IPP developer and utility projects may be preferential when it comes to avoiding inefficient use of resources, as they may have a more mature and professional supply chain.
- In the **economic dimension**, the viability of business cases (without additional public support) and cost-efficiency tend to be higher for IPP and utility projects due to economies of scale. For local job and value creation and as well as avoided grid investments the individual prosumer model may be most advantageous.

² As detailed in the PROSEU Task 3.2 report (Petrick, K., Fosse, J., Klarwein, S. (2019b))

For all these reasons, prosumers will and have to move into the centre of the future energy system, thus becoming a catalyser of the Energy Union as shown in Figure 2 where the “importance” or “weight” of the different stakeholders is depicted through the size of the boxes (in a very qualitative way):

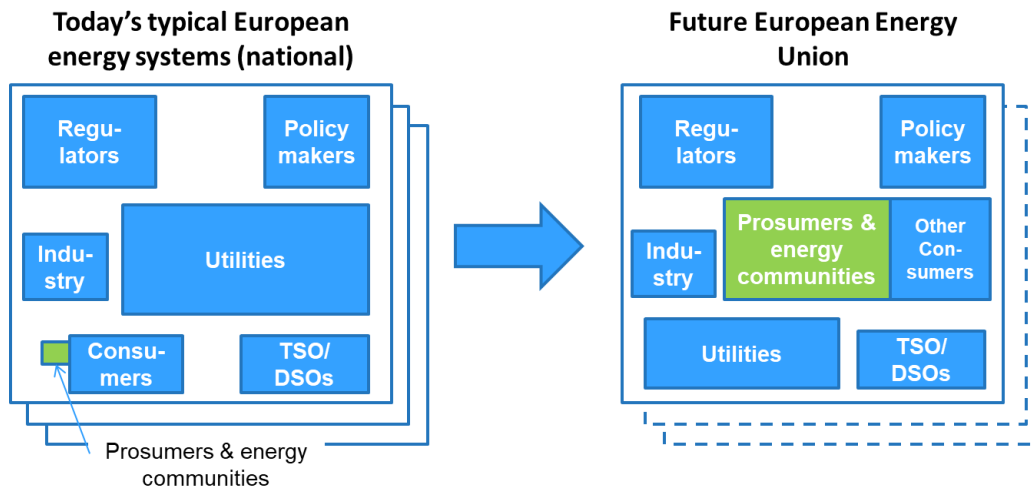


Figure 2: Prosumer centred Energy Union. Source: Own elaboration

Today, prosumers play in most national energy systems only a minor role while a few large utilities dominate the energy markets. In the future, there may be still national and regional energy systems (represented by the various layers in the figure above), but they will be more integrated within the Energy Union which will see prosumers playing a major role.

Principles for regulatory and policy pathways

The following sections will explore principles for regulatory and policy pathways that shall increase the involvement and role of prosumers in the Energy Union. These principles are meant to provide guidance to policy makers and prosumer representatives when defining and contributing to the final NECPs due by end of 2019 as well as the subsequent transposition of the directives into national laws and regulations. Where possible, concrete recommendations will be proposed going beyond mere principles.

1. **Overview of principles:** Setting ambitious targets for prosumers and Energy Communities
2. Ensuring economic viability through attractive framework conditions
3. Fostering Renewable Energy Communities
4. Establishing energy responsibility and coherence at all levels
5. Ensuring prosumer representation in governance processes

The following figure intends to visualize that the first three principles refer to a set of targets and related measures while principles four and five relate to the overall framing and governance.

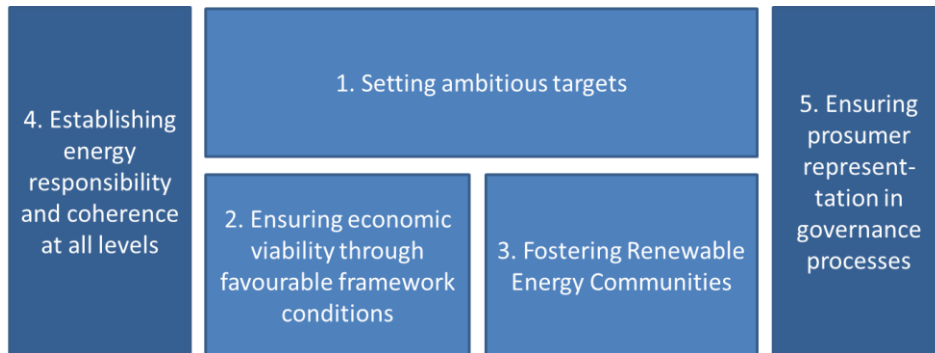


Figure 3: Five key principles

The principles are based on PROSEU partner’s experience with prosumerism, outcomes of discussions in the PROSEU Living Lab workshops, the outcomes of Task 3.2 on Policy Coherence and Sustainability Guidance, the survey of Task 2, the review of NECPs and assessment of existing literature as well as focus group discussions to validate them.

1. Setting ambitious targets for prosumers and energy communities

Without well-defined, consistent and ambitious targets, it will not be possible to monitor the progress of prosumer uptake, nor to achieve the objectives of the Paris Agreement. While the Governance Regulation leaves it up to the Member States to provide targets and trajectories for renewable energy communities and self-consumers³, it cannot be considered satisfactory if these targets are not clearly defined. Obviously, targets need to be complemented by rigorous measures.

Unfortunately, the draft NECPs published in the first semester of 2019 stay largely beyond expectation: Only France, Scotland, Wales and Greece have defined targets in the area of self-consumption or small-scale generation and energy communities, all other countries did not provide any concrete numbers.⁴ However, even **the few available targets are not necessarily convincing** as shown in the following examples:

- For instance, France proposed, on the one hand, 65-100,000 PV self-consumption sites by 2023. As there are currently some 30,000 self-consumption sites, this would translate to some additional 10-20,000 sites per year. On the other hand, France wants to install 3,050 MW annually on small and medium-sized roofs (< 100 kWp) which means over 60,000 sites per year⁵, i.e. three times more than the other self-consumption site target. While the fact that there are two targets given is laudable, the inconsistency between the two leads to confusion.
- Another example is Scotland that proposes within UK's NECP a GW of community and locally owned renewables by 2020, and 2 GW of community and locally owned renewables by 2030. This translates to 100 MW per year of community energy projects, a number that is not very ambitious.
- The same holds for Greece which plans to increase from one GW of energy community energy in 2020 to 1.5 GW by 2030, a mere 50 MW per year, making up only 8% of the overall RES-E target of 17.7 GW in 2030.

The examples all show that the countries consider prosumers as some add-on – at best – but their main policy framework (if any) focusses on large(r) scale utility run installations. Therefore, **NECPs should contain at least two concrete national targets: one for roof-top PV and one for Energy Communities** which includes all renewable technologies. These targets can be either capacity targets in gigawatts of installed capacity (GW) or energy generation targets (i.e. in GWh).

³ “if applicable”, see Art. 2.1.2.v

⁴ <https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/governance-energy-union/national-energy-climate-plans> ; <https://www.rescoop.eu/blog/necps>

⁵ This calculation assumes a rather high average value of 50 kW per installation. It is also not clear until when this annual target will count.

As can be seen in Figure 4 below, these two targets are both complementary as well as partially overlapping because Energy Community projects can also include rooftop PV projects.

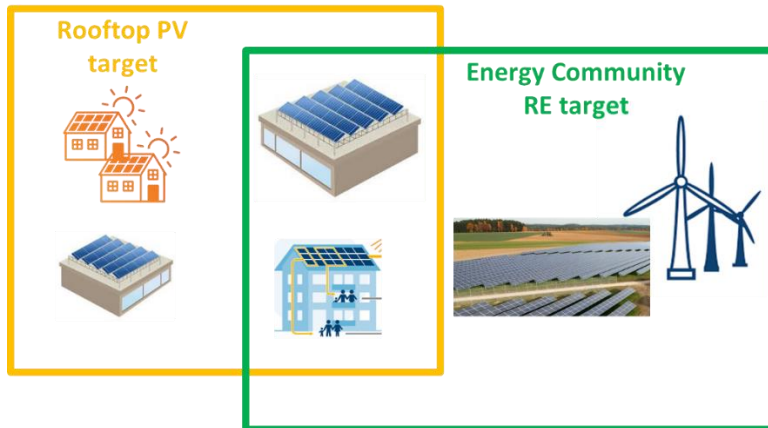


Figure 4: Two NECP targets. Source: Own elaboration

These two targets are considered a minimum, i.e. Member States may want to opt for additional or more sophisticated targets, for instance by technology, size, regions, etc. The following paragraphs explain the idea behind these two targets (additional measures are described under the other principles described further below). Due to the distributed energy accountability described under principle 0, municipalities and regions should also define these two targets for their respective jurisdictions.

1.1 Targets for roof-top PV

The main reason for a roof-top PV target is that **basically, all roof-top PV projects are likely to be also used for self-consumption** because the incentives for pure feed-in are decreasing in Europe. This means that most PV projects will only be viable if there is some degree of self-consumption involved. Even installations on large warehouses or farm buildings that have a small amount of own consumption will most likely be combined with self-consumption models in the vicinity. Therefore roof-top PV projects include basically “by default” the involvement of citizens, companies or public administration as active energy users.

A roof-top PV target will also be a good indicator for making **maximum use of the built environment** for energy generation which is key for a sustainable energy system⁶, as well as following the suggestions to define trajectories and objectives for renewable energy use in buildings. Rooftop-PV targets should thus include both small- and large-scale installations. Furthermore, they could extend to any building-integrated PV systems, such as PV for facades or micro-PV. That is, single panels with integrated inverters plugged into a socket that can be used, e.g. on balconies, or they could also combine with solar thermal or hybrid systems.

In order to define a reasonable **ambition level**, it is proposed to **set the target in relation to the rooftop PV potential in each Member State**. The following graphic shows the national technical potentials as recently calculated by JRC (JRC, 2019)⁷, adding up to over 680,000 GWh or 24% of the final electricity consumption. The

⁶ See PROSEU Task 3.2 report

⁷ See also table in the annex

colour of the columns shows what share of the technical potential can be produced at which band of levelized costs of electricity (LCOE).

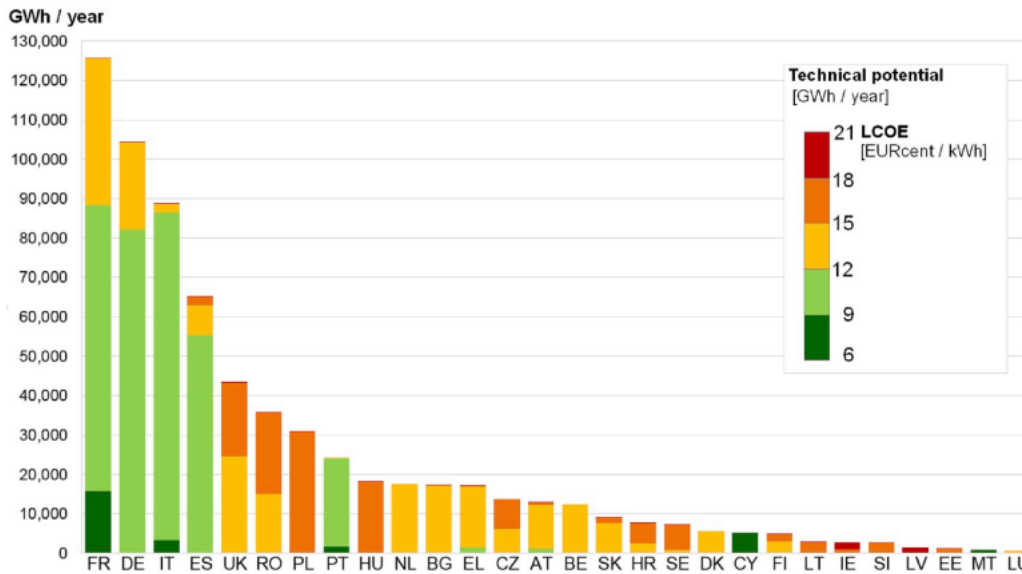


Figure 5: Technical potential of rooftop solar PV systems in each EU Member State expressed in GWh/ year. Source: JRC 2019

Since the calculations depend on various assumptions, e.g. concurrent use of rooftops, irradiance levels, details of spatial data, a common methodology is preferred, but eventually, each Member State should have a value or range of values calculated according to the national circumstances (ADEME calculated a potential of 100 kW for France⁸).

The 2030 target would then be a percentage of the national potential. The **minimum target should be at least 50% by 2030**, given the urgency to reach the renewable and climate goals. It would require appropriate regulation such as removal of existing caps (like the 52 GW cap in Germany), incentivisation, lean administrative processes, etc. to allow for fast and consistent deployment of roof-top PV. The following Table shows the roof-top PV potentials as well as the proposed minimum targets for 2030:

Table 1. PV roof-top potentials. Source: JRC 2019, own elaboration⁹

| <i>Conservative values</i> | EU | Germany | France | Greece | Spain |
|--|---------|---------|---------|--------|--------|
| PV rooftop potential [GWh]. Source: JRC 2017 | 680.276 | 104.313 | 125.580 | 17.090 | 65.244 |
| Minimum 50% target for 2030 [GWh] | 340.138 | 52.156 | 62.790 | 8.545 | 32.622 |
| PV rooftop potential - capacity [GW] | 680 | 116 | 114 | 14 | 54 |
| Minimum 50% capacity target for 2030 [GW] | 340 | 58 | 57 | 7 | 27 |

It should be noted that according to JRC the potentials are the conservative values. Energywatch (2018) estimates at least the double capacity for roof-top PV in 2050, i.e. about **1500 GW** (see Figure 1). This means that the minimum targets for 2030 shown above may only represent about a quarter of the technical potentials, which means that the targets could be set even higher.

⁸ ADEME, http://www.ademe.fr/sites/default/files/assets/documents/82574_feuilledeRoute_electricitephotovoltaique.pdf

⁹ Note that the GW values were calculated by the authors assuming reasonable full-load hours. However, we will still try to get the original numbers from JRC. For the GWh-values for all countries, see annex.

The countries will also have to consider the current situation: For instance, in Germany there are currently 48 GW PV installed (both roof-top and ground-based) and over 1.65 million households have PV installations. By contrast, in France 7,6 GW of PV are deployed and only 30,000 households have PV installations.

An important measure to achieve this target is **obligation to use renewable energy sources for all new construction** as mandated by the Energy Performance of Buildings Directive (EPBD, 2018/844/EU) which includes the definition of net zero energy buildings. This should be complemented by mandatory RE use in existing buildings. These mandates do not have to be necessarily focused on PV but they can be technology-neutral, and based around a minimum percentage share of energy use which shall be supplied by onsite technologies (with exceptions for certain cases). That leaves building owners to comply with the mandate however they see fit, either via solar PV, solar thermal, heat pumps, or by buying from qualifying RE-based suppliers.

1.2 Targets for energy communities

Energy communities can cover all RE technologies, including large installations like wind parks or solar fields in the megawatt range. It is not so relevant if the capacity targets are differentiated by RECs and CECs—ideally, they capture both. The target includes all RE projects that are initiated by energy communities.

The **energy community target can be a share of the total national RE target**. As energy community projects tend to have a higher public acceptance, the share should be significant, **for instance, 30-50%**, taking into consideration the specific national circumstances. For instance, the Netherlands proposes that 50% of RE projects shall include citizen participation, but it is still not clear how this share will be measured.¹⁰ In other countries where collective actions are less frequent – e.g. Portugal and Croatia, among others –, the shares may be lower or the criteria less stringent. Achieving high shares of energy community projects requires appropriate regulatory frameworks that prevent the failure of RE projects due to a lack of active citizen involvement (see also section on governance and incentives).

In any case, some kind of **obligation to include energy communities in RE projects**, especially those that are close to settlements (e.g. onshore wind, ground-based PV, biogas), are necessary to boost citizen participation and increase social acceptance. NECPs may also include **additional targets**, because, especially Citizen Energy Communities, can do more than investing in renewable installations. Such targets – or at least the tracking of the respective numbers – may include:

- Number of (renewable) energy communities
- Number of members in (renewable) energy communities
- Number of jointly acting renewable self-consumption activities

According to REScoop, there are currently 1,500 European energy cooperatives with 1 million citizens which translates to 0.2% of the EU population or about 0.4% of the households.¹¹ To be considered a significant player in the energy market, possibly about 10-20% of the households should be members of an Energy Community. Reaching about 5% by 2030 could be a reasonable minimum target.

¹⁰ For instance: Is a project developed and financed mainly by a commercial developer but where citizens can have a certain share, considered to be part of that percentage? It would be rather a financial set up which is not an Energy Community.

¹¹ There are about 512 million people and 221 million households in the EU <https://www.statista.com/statistics/868008/number-of-private-households-in-the-eu/>

In addition, it would be advisable to measure and publish on a regular basis the number of **jointly acting renewable self-consumption activities**. These can include projects among neighbours or neighbourhood projects that may or may not involve commercial companies like energy providers, aggregators or energy service companies. This will allow for a better understanding on what is happening in the markets by providing transparency on how many and which kind of consumers are participating in which kind of set-up etc.

Overall it is important to ensure that targets are clear, consistent and precise in order to be implemented. Vague targets encourage gaming and paperwork, and they cannot be properly monitored and enforced.

2. Ensuring economic viability through favourable framework conditions

For prosumers to become a key driver for a low-carbon Energy Union, there needs to be a viable business case for them when investing in renewables. As a new player in the energy market, prosumers encounter numerous barriers and obstacles from various origins, including vested interests from incumbent operators, lack of capacity from technical suppliers, higher costs from financial institutions, etc. Governments should therefore guarantee a level playing field between all energy actors, including prosumers, by not only identifying, monitoring and removing technical and non-technical as well as financial barriers (such as direct and indirect subsidies for fossil and nuclear energy) but also by providing fair and transparent incentive mechanisms so that the economic viability and business case of prosumers initiatives are well ensured.

2.1 Facilitating shared self-consumption schemes, fair remuneration and simple taxation mechanisms

In order to allow high self-consumption levels, it is crucial that prosumers can easily **share their excess generation** with other energy consumers located nearby. By doing so, they will receive much higher revenues for the energy sold than if it was sent directly to the grid.¹² The NECPs should, therefore, include concrete references to legislation and regulation, which will **facilitate shared self-consumption in the distribution grid** for up to at least 100 kW (ideally more). Virtual power-sharing over larger distances should be also possible, even if in these cases higher grid charges would be justified.¹³

While the production of renewable energy by households and SMEs is becoming increasingly competitive against the electricity wholesale market price in many European countries, it is still not the case everywhere. For instance, the **business case of rooftop PV investments based on self-consumption is still not viable in almost half of the European countries**. This is especially true in Eastern European countries, see Figure 6 below, where the percentage figures indicate the share of cost-competitive technical potential¹⁴. The low cost-competitive potential is due to either high cost of finance, low retail prices, or a combination of both.

¹² In Spain a prosumer can deduct about 5 ct/kWh from the invoice for excess energy but if shared with others, the value increases up to 17 ct, more than three times as much.

¹³ For prosumer business models archetypes such as peer-to-peer power sharing and other examples, see PROSEU report on financial models (University of Leeds, 2019)

¹⁴ 0% means that there is no business case even if the technical potential is quite high like in Romania

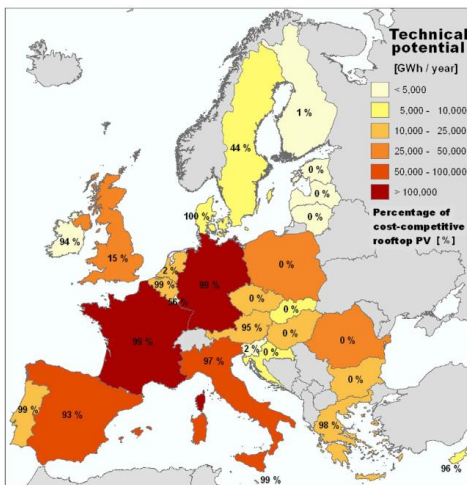


Figure 6: Technical electricity potential of rooftop PV in the current EU building stock and share (%) of the cost-competitive technical potential. Source: JRC 2019

Therefore, for both small scale prosumers as well as for larger installations financed or developed by energy communities, there should be a **remuneration that goes beyond the wholesale market price**, at least for the excess electricity fed into the grid. Such a scheme should stay in place as long as there is no level playing field with non-renewable generation which benefit from long-standing subsidies and are not charged with appropriate carbon-prices (or in the case of nuclear energy a comparable surcharge based on nuclear externalities). In these cases, governments should set up special **financial mechanisms**¹⁵ to support the development of prosumer initiatives, such as investment grants, feed-in-tariffs (FiTs), feed-in-premiums or NET-FiTs, i.e. FiTs strictly for the net excess generation. While several countries still use FiTs for small scale systems, they often have unattractive rates. In fact, financial support is no longer a popular measure among governments—a process supported by EU State Aid Guidelines—despite that support schemes are crucial to capture the technical potential of prosumer projects. A positive reframing of financial mechanisms like “FiT 2.0” (which take the form of NET-FiTs), could help create a much more dynamic and interactive prosumer market. This is because the NET-FiT off-take guarantee price can in most cases still be below retail prices (except, e.g. southeast Europe).

Making self-consumption attractive entails **adjusting the rate design** by establishing a balanced ratio between variable/volumetric and fixed charges of the retail tariffs. The higher the share of variable charges, the more attractive become self-consumption and energy-efficient behaviour, but the more challenging it becomes to recover overall grid and energy system costs.

NECPs should also promote **simplified taxation** for prosumers, including potential exemption of income taxes on excess or shared energy. **Tax schemes** should also be coherent and consistent both at local, national and European levels, to guarantee the same rights and duties for all European citizens. Although the EU has limited tax competences, it could facilitate dialogue and coordination mechanisms between all EU member states.

Prosumers are usually regular citizens with no or low knowledge of the energy market or tax system. Therefore, the regulation should be designed, promoted and enforced in a simple and understandable way. Governments could create a **single information point**, at local or sub-national level, where all doubts and questions could be solved by competent authorities, including on energy, finance, legal or tax issues (see also 3.2). Access to relevant

¹⁵ <https://ec.europa.eu/energy/en/topics/renewable-energy/support-schemes>

information is a key driver to mainstream prosumers at all administrative, political and geographical levels; and ensure the participation of all kind of citizens, including from rural areas, without any restrictions.

Another issue that needs to be tackled in that regards is that the **marginal market price system does not properly work anymore with renewables**. This is because market prices drop when there is high resource availability, which, in turn, leads to a cannibalisation of renewable revenues. Member states, EU institutions, regulators as well as prosumer representatives will thus need to develop new market models.

2.2 Guaranteeing transparent market access

As prosumers initiatives are greatly contributing to the transition towards a low-carbon energy system in the European Union, they should be adequately supported by the **energy regulators and market monitoring authorities**. The incumbent energy players, usually large multinational with a situation of oligopoly, might hinder, consciously or unconsciously, the development of independent prosumers by putting in place aggressive commercial policies, potentially cross subsidised through other revenues from mature products and services. Market and energy authority should, therefore, carefully monitor their behaviour and sanction any anti-competitive business mechanisms. As the power balance is clearly in favour of incumbent energy players and utilities, special attention should be provided to protect the interests, support claims and guarantee the rights of prosumers, in particular for small-scale projects. Incentive mechanisms could also be provided to create or develop the quality and competitiveness of the business environment and the whole prosumers supply chain, including the technical capacity of the contractors, availability of financial services, awareness and skills of local authorities, etc. **Regular reports** by energy authorities could be published to follow-up the development of the prosumers markets at local, national or European level.

Prosumers and energy communities should also have **priority grid access and – where needed – priority dispatch** to be able to evacuate all produced power to the grid in a preferential way. This may give them an advantage over other RE projects (that may have to curtail power production at certain times) and ensure that citizens are not penalised when participating in RE projects. As small energy producers, prosumers should benefit from **special protection provided by energy authorities** to avoid discrimination by larger actors, that might have more political or technical capacity to access (and monopolise) the grid. Also, by ensuring an effective and fair connection to the electrical grid, the whole system can reduce the capacity losses due to transport of energy over shorter distances, and therefore increase its overall efficiency and financial stability¹⁶. Otherwise, compensation measures need to be put in place.

The rise of prosumers initiative will have a significant impact on the **functioning of the electric grid**, by increasing the need for a more adequate balancing between consumption, storage and demand response. The multiplicity of micro or small connections to the low and medium voltage grids will require the development of new management schemes for the network and distribution operators. This should not be seen as a risk but instead as an opportunity to optimize the security, resilience and stability of the whole system. Powerful algorithms and the rise of Artificial Intelligence (AI) will be key assets to **integrate prosumer services into the ancillary service market** and ensure a smooth functioning of the grid¹⁷.

¹⁶ <https://www.edsoforsmartgrids.eu/home/why-smart-grids/>

¹⁷ According to the SmartNet project, prosumers facilities could provide significant frequency ancillary services using storage systems, Combined Heat and Power (CHPs), industrial shiftable loads, wind turbines, photovoltaic, EVs and other curtailable loads. <http://smartnet-project.eu> (Deliverable 1.2)

2.3 Facilitating sector coupling and green energy convergence

The **coupling of the heating, transport and industrial sectors** based on renewable power can be facilitated to – and provided by – prosumers. Making electricity produced by prosumers the default form of energy in these sectors would be a step towards a more electrified world – accelerating the decarbonization of the economy and decentralization of the energy production drastically. Moreover, it will help to improve the business case for investments into RE capacity because prosumers will tap into different revenue (or cost) streams.

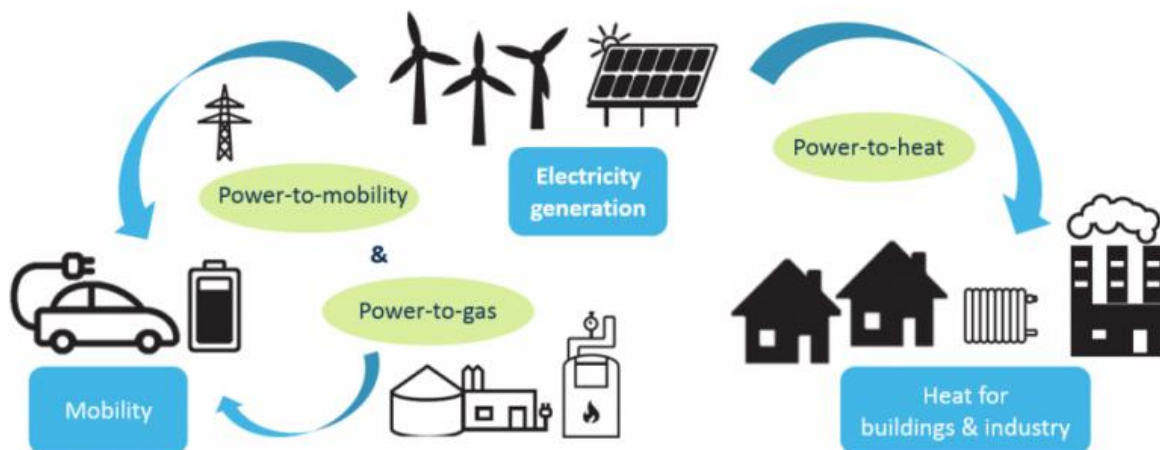


Figure 7: Sector coupling – an integrated energy system based on renewable electricity. Source: Clean Energy Wire¹⁸

As prosumers usually generate electricity also at times where they cannot use it for personal electric appliances, this energy can also be used to supply additional services such as **power-to-heat** (heat pumps and heat storage), **power-to-mobility** (charging of electric vehicles), (power-to-gas (production of hydrogen or synthetic gas) or energy storage (batteries). It, therefore, requires an **adequate planning**, and sometimes **energy conversion of appliances**, to use all the self-produced energy in order to cover the full energy needs from the prosumer. The development of energy management schemes, new business models and monitoring devices makes it more accessible and more straightforward for prosumers to optimize the **balance between energy production and consumption**.

Additionally, (renewable) energy is increasingly becoming at the centre of the citizens’ life. With the booming of electronic devices, electric mobility, energy storage and renewable energy productions, households and businesses can integrate and connect a multiplicity of devices producing and consuming energy. Energy planning policies and regulations should, therefore, facilitate the **convergence, ownership and monitoring of decentralized energy devices** from, for and by the citizens and other energy users and producers such as SMEs, industry or cities. In particular, the rise of **Electric Vehicles (EV)** will add to the grid large energy storage capacities that will be able to store or complement the production of energy by prosumers, in particular during peak-time or at night¹⁹.

The NECPs should, therefore, include **support mechanisms for business and technical models that facilitate the energy shift of household appliances as well as sector coupling** by making them “prosumers-ready,” in order to

¹⁸ <https://www.cleanenergywire.org/factsheets/sector-coupling-shaping-integrated-renewable-power-system>

¹⁹ <https://www.transportenvironment.org/publications/batteries-wheels-role-battery-electric-cars-eu-power-system-and-beyond>

balance and optimise energy produced and consumed by prosumers. This entails feeding all energy-based services such as for heating, cooling, and mobility.

2.4 Facilitating balanced agreements between prosumers and business partners

Direct access to electricity markets is becoming increasingly difficult in European countries: due to the constantly decreasing cost of electricity production, **short-term sale agreements** are usually concluded. Additionally, **auction mechanisms**, replacing Feed-in tariff in many EU countries, are not adequate to the prosumer market, with limited capability or willingness to participate in time-consuming administrative processes with high upfront costs and the risk of not getting awarded.²⁰ Hence, auction mechanisms mainly benefit large utilities.

However, prosumers need to have predictable, stable and balanced long-term contracts with their business counterparts to ensure a smooth and efficient prosumer up taking. NECPs should include measures that enable energy communities to have easy access to attractive and simple Power Purchase Agreements (PPA). The PPAs should allow energy communities to sell their non-used energy directly to private or public buyers or to buy directly from RE developers to supply their members.

The PPAs also should count on long-term, efficient and cost-effective **maintenance contracts** to guarantee the proper function of their installations. Furthermore, PPAs should count on secure and competitive **financial loans** from banks and financial agents, to buy equipment and build prosumer installation. Although PPAs, maintenance or loan contracts are private agreements, national authorities should help to elaborate contracts adapted to the characteristics of Prosumers, with potential fiscal advantages for sellers and buyers. Standard templates could be facilitated on a specific website that could also provide legal and regulatory advice to ensure the quality of PPAs, financial or maintenance contracts²¹. Apart from traditional PPAs, the development of **blockchain technology** may also become an attractive option to secure the selling of prosumers non-used energy in the Peer-to-Peer Market, if adequately monitored and regulated by national authorities.²² The use of blockchain technology must be supported by carefully assessed regulation in order to prevent cybersecurity-related risks, which could lead to significant consequences in electricity-grid security and data privacy issues (Dosē, 2018).

Public administration can also play a significant role to mainstream prosumers, not only by developing self-consumption facilities within its own installations but also by becoming members of local energy communities and buying excess energy from local prosumers. The development of **Green and Sustainable Public Procurement** programs (GPP or SPP) is a key driver to propose stable and attractive PPAs to local prosumers, as they provide them with long term and secure contracts to sell their excess energy while reducing market or regulatory uncertainties. **NECP** should therefore describe measures that require that Public administrations set up PPAs with local RE suppliers or ideally even local energy communities.

²⁰ <https://www.roedl.com/insights/erneuerbare-energien/2018-02/corporate-ppa-direct-sale-electricity>

²¹ Example of PPA where RE cooperative is buying energy for their members https://communityenergyengland.org/files/document/110/1508504912_what-does-a-good-ppa-look-like.pdf - or where RECs are selling to corporates, SMEs or public authorities: <http://resource-event.eu/new-to-ppas/> or see <https://www.roedl.com/insights/erneuerbare-energien/2018-02/corporate-ppa-direct-sale-electricity>

3. Fostering Renewable Energy Communities

The Renewable Energy Directive (Article 22) and the Electricity Market Directive (Article 16) require governments to put in place enabling national frameworks for the development of energy communities. Energy communities are essential to accelerate the development of prosumerism and the decentralization of renewable energy productions at the citizen level. Countries can support energy communities, and specifically renewable energy communities, following the succeeding points.

3.1 Defining national forms of energy communities

The EU legislation distinguishes between two types of energy communities: **Citizen Energy Communities (CECs)**, as defined in the Electricity Market Directive (EMD) and **Renewable Energy Communities (RECs)**, as defined in the Renewable Energy Directive (RED II). While both definitions describe ways of organising collective cooperation of energy-related activities applying for specific ownership, governance and a non-commercial purpose (as opposed to traditional market actors), there are some differences regarding the scope of activities and eligibility criteria.

In general, **RECs can be seen as a subset of CECs**. RECs cannot have any members that are larger than a medium-sized enterprise, and effective control is to be held by local members. According to current EU directives, RECs have to be actively promoted by Member States, while CECs are only required to get non-discriminatory market access and a level playing field with other energy actors (REScoop, 2019b). The EMD points out that CECs facilitates the uptake of new technology, improve energy efficiency, reduce energy poverty, and overall results in economic, social, and environmental benefits to the community (EMD, para. 43). On the other hand, RED II explains how RECs leads to public acceptance of RE projects and opens access to private capital which results in local investments (RED II, para 70). Both RECs and CECs must be organised through a legal entity that complies with the criteria in the EU definitions (Rescoop, 2019b).

In order for a clear transposition of the concepts of CECs and RECs to national law, Member States should clearly define CECs and then identify additional criteria that a CEC must comply with to be considered a REC. Incentives for CECs to become RECs could accompany this approach. Furthermore, it reduces complexity as the national definitions would illustrate that all RECs are a more stringent standard than CECs. As already mentioned under section 0, NECPs should also define **which kind of legal organisations they propose to be used for energy communities** (both RECs and CECs).

Besides, RED II requires Member States to permit **jointly acting renewable self-consumers** to “arrange sharing of renewable energy that is produced on their site or sites between themselves, without prejudice to the network charges and other relevant charges, fees, levies and taxes applicable to each renewable self-consumer” (RED II, art. 21(4)). Jointly acting renewable self-consumers are a group of at least two renewables self-consumers who are located in the same building or multi-apartment block. The difference with energy communities is that jointly acting renewable self-consumers can use any business model through contractual agreements between the participants. Hence, separate national laws should clearly define jointly acting renewable self-consumers in order to allow support mechanisms for such arrangements.

3.2 Removing administrative, technical, financial and legal barriers

Concrete administrative procedures are needed so that energy communities can participate as generators, suppliers and aggregators, and so they can gain access to different markets. The RED II outlaws discriminatory and disproportionate administrative procedures to becoming RECs. As a result, national policies that impose administrative hurdles to renewable energy communities will become illegal once transposed, such as the former Spanish “sun tax” law which was abolished end of 2018. Hence, the transposition of the RED II to national law should result in Member States assessing and removing administrative and regulatory barriers for citizens in forming energy communities and participating as suppliers or producers with access to different markets. The assessment and removal of barriers should be done in accordance with the principle of non-discrimination, resulting in **fair, proportionate and transparent licensing and registration procedures and charges**.

One concrete measure could be the creation of single contact points (“one-stop-shops”). **Single administrative contact points** are authorities that guide energy communities through the permit-granting process for establishing any RE project as a supplier, generator or aggregator. RED II requires that project developers do not need to contact more than one contact point and have easy access to dispute-settlement mechanisms (RED II, art. 16). This is a step forward to the current situation in many countries where project developers must contact several authorities depending on the technology used and how they want to engage with the energy system. Besides, countries should adopt measures that aim at ensuring that the single contact points have the capacity of delivering tailored assistance to all types of renewable energy community projects. This process should include the participation of distribution companies, energy suppliers and other actors of the respective national energy systems.

So far, only four draft NECPs state measures for the creation of single contact points (Rescoop, 2019c). Single contact points must be able to be easily available for assisting project developers and energy communities. This means that they must be sufficiently funded and have enough offices to respond to the growth of energy communities. **NECPs should reflect measures aimed at assessing the best form of single contact points**. For instance, with pilot projects—in collaboration with energy communities—that examine the effectiveness regarding time to complete permitting and communication satisfaction among energy communities with different designs of contact points.

In general, for an effective elimination of administrative barriers, national governments should agree with energy communities with the support of local authorities on the most practical administrative procedures that fit the national context. Hence, measures assessing and ameliorating hurdles should ideally seek the active participation of all actors of the energy system.

3.3 Supporting participation of energy poor and marginalised households

While the Renewable Energy Directive suggests that Member States should take measures to engage energy-poor and marginalised households (e.g. in rural or remote areas) in participating in renewable energy communities (paragraph 67), it does not require any concrete action following this line. Some countries, such as the Czech Republic, mention in their NCEPs the possibility of using energy communities to address energy poverty but fail to describe specific policy measures. **NECPs should thus show concrete actions to engage energy communities in tackling energy poverty and addressing the needs of marginalised minorities**.

For instance, NECPs can describe measures similar to Greece’s national law on promoting energy communities that aims at reducing energy poverty. The law enables municipalities, small and medium enterprises, and other

energy communities to share renewable energy with vulnerable households through virtual power-sharing. Organisations, such as Greenpeace Greece, are using the law to support further the creation of energy communities that provide free solar energy to nearby energy-poor households.²³

Furthermore, governments can **support projects** aimed at assessing how energy-poor households can participate in energy communities in specific locations. Moreover, governments can commit to specific targets of RE production in low-income neighbourhoods and communities by supporting local governments in helping and co-creating renewable energy communities. Governments can also offer support schemes sponsoring the participation of local energy-poor households in renewable energy communities.

3.4 Providing energy-related education and literacy

Citizens, local authorities and non-energy businesses are usually not aware that they can actively participate in the energy market as prosumers. Therefore, it is essential to **ensure sustainable energy literacy so that all potential prosumers are well informed** and trained about their rights, duties and capacities to produce and consume their own energy.

Municipalities are increasingly open to start renewable energy communities by themselves or support local renewable energy communities. National strategies should aim at catalysing the cooperation between local authorities and renewable energy communities by empowering local authorities to act as agents that facilitate the process of capacity building for the creation of local energy communities. Thus, **NECPs should illustrate how governments plan to support municipalities to participate, support, educate and engage local renewable energy communities**. Such support can be related to financial access, elaboration of guidelines, as well as technical and legal assistance.

In addition, national plans should clearly define the responsibilities of local and regional authorities in promoting local renewable energy communities, for instance, local measures on spatial planning, access to finance, public procurement, and awareness and education campaigns that in all engage participation; support RE communities in any technical, regulatory, administrative, and financial matter; and promote the importance of RE communities in tackling climate change, energy poverty and ensuring energy democracy and energy security (Rescoop, 2019c).

3.5 Conducting comprehensive cost-benefit analysis

Ensuring that energy communities contribute to network and system costs in a fair way is required by RED II. The costs should be calculated using a comprehensive cost-benefit analysis that values the (social, environment and/or economic) benefits that renewable energy communities provide to the energy system and to the local communities (Rescoop, 2019c). NECPs should either reference this analysis or provide a plan on how and when to do it. The cost-benefit analysis must recognise the crucial importance of a well-functioning energy infrastructure for the energy transition as it enables the sharing of RE energy among consumers.

In order to conduct national cost-benefit analysis, regulators must ensure that Distribution and Transmission System Operators—which naturally have a monopoly of their respective networks—actively support renewable energy communities through their services and provide transparent infrastructure costs. Government bodies

²³ <https://www.rescoop.eu/blog/energy-communities-in-greece-new-legislation>

should regularly assess how grid operators are running their businesses in order to ensure that there are adequate investments in grid infrastructure and adequate cost and service levels. In consequence, this supervision must translate in adjustments of grid financing when inadequate investments are identified.

4. Establishing energy responsibility and coherence at all levels

The increasing role of prosumers in the European energy systems requires a re-thinking of the competencies, roles and responsibilities of the various stakeholders, including prosumers. The centralised approach where only national authorities or a few utilities can take decisions will have to make place for a new model of accountability.

4.1 Distributed Energy leads to distributed responsibilities

The recast of the Renewable Energy Directive (RED II), which ensures the right for citizens and energy communities to produce, use and sell electricity, ensures that an important part of the **future electricity – and energy in general – will be produced in a distributed way**. The text box below explains how an energy system based on renewables and highly efficient energy units or “cells” will work. This new paradigm should be acknowledged and clearly described in the NECPs and subsequent legislation. Member States cannot pretend anymore that the centralised energy systems – which still prevail in many EU countries – will continue to exist in the same way in 2030 as they do today. This concerns not only the future deployment of renewable energy but also the future players – namely prosumers.

Textbox: Distributed Energy Generation

²⁴ Under this approach, the entire energy system can be broken into individual units, or cells, each of which can be designed to attempt to meet as much of its electricity needs as it can on its own using renewable energy sources. Appliances, homes, buildings, districts, cities, regions, and even entire countries can be thought of as different interlocking cells, each of which is aiming to be energy self-sufficient.

If this approach is followed by all citizens, municipalities, industry players, countries and regions, then **Europe** as a whole can (in principle) become largely energy self-sufficient through the individual actions of its parts.

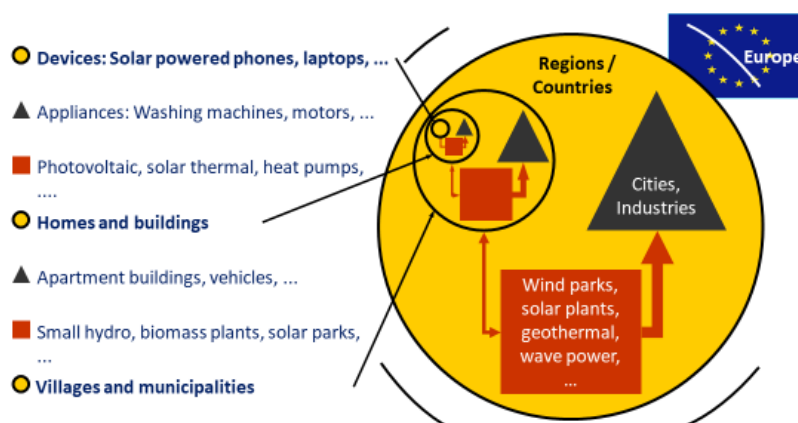


Figure 8: Energy Cells: Largely energy-autonomous units (Source: Own elaboration)

²⁴ Amado, M. et al. (2017), A Cellular Approach to Net-Zero Energy Cities, in: *Energies* 2017, <https://www.mdpi.com/1996-1073/10/11/1826>; VDE (2015), Der Zellulare Ansatz - Study, <https://shop.vde.com/en/vde-study-the-cellular-approach> Scheer, H. (2005), Energy Autonomy, The Economic, Social & Technological Case for Renewable Energy; Lowitzsch, J. et. al (2019b)

It should be emphasised that **energy autonomy does not mean autarky** in the sense that prosumers would aim for disconnection from the grid (apart from certain, very remote areas and islands) or avoid any energy trade. In fact, prosumers can and arguably should aim to export their surplus energy or electricity to others on the network, as this may be the most cost-effective way to achieve ambitious renewable energy targets, make it easier for each individual cell to even-out its production and its consumption, and increase the benefits for other energy customers (see also sustainability guidance of PROSEU 3.2b report). Energy autonomy thus refers to the possibility to be largely free to choose and manage one's own energy supply, being an independent and active energy user.

Consequently, the NECPs and subsequent legislation should reflect the future character of the distributed energy system by clearly stating that **energy responsibility, planning and implementation, should take place at all political and institutional levels**, including local, national, and regional level, as well as citizens, companies. While subsidiarity should stay in place to allow for efficient processes, energy-related matters cannot just be “outsourced” or delegated to certain, specialised bodies or institutions.

Local, regional and national actors will have to become (energy) accountable, which means that they have to define their own energy and climate plans, including energy targets and measures supporting the NECPs. This also means that higher governmental levels must be able to **count on the contributions made by lower levels** in prosumers energy planning, implementation and monitoring²⁵. These commitments can be aggregated up to the national and then finally, the EU level.

Where these sub-national plans already exist, they should be referenced in the NECPs. Where they are still to be developed, member states should describe how the process and responsibilities for their elaboration will look like and how the different levels are involved in achieving the national plans.

²⁵ This may pose a challenge given that currently in many Member States such interaction between government levels might not yet exist.

Germany's NECP could make reference to the various existing subnational plans that have been elaborated in several dozen municipalities and regions. These plans put a strong focus on RE and EE, often with the goal to become 100% renewable²⁶ (see Error! Reference source not found.).



Figure 9: Energy municipalities in Germany. Source: Kommunal-erneuerbar.de

For instance, the **Frankfurt am Main 100% Master Plan**²⁷ which aims at providing the city of Frankfurt with 100% RE by 2050 in collaboration of neighbouring areas. The strategy intends to achieve this target by producing 25% of the city's energy needs in RE plants outside the city, another 25% in RE plants within the city, and by reducing energy consumption by 50%. The plan envisions involving local businesses and citizens in achieving the 100% RE target, as well as developing a Virtual Power Plant in order to efficiently manage RE-output (Couture and Leidreiter, 2014). Likewise, the Spanish NECPs should integrate regional plans, such as the climate **strategy of the Balearic Islands** of achieving 35% RE by 2030 and 100% RE of final consumption by 2050.²⁸ This strategy involves a deep transformation of the insular energy system as 98% of the electricity generation of the Balearic Islands currently relies on coal-fired power plants (BOIB, 2019). It aims at achieving the targets with the support of the prosumer model and reducing energy demand. Moreover, the **Covenant of Mayors** with its Sustainable Energy Action Plans and other initiatives set targets and define measures. These activities should be built on and taken into considerations in the NECPs.

This multi-level and multi-stakeholder approach requires that higher political or institutional levels should not interfere by preventing prosumerism at lower levels, respecting the **principle of subsidiarity**. For instance, a municipality whose citizens agree to invest in a local renewable energy project – and thus contribute to a local renewable energy target – shall not be hindered by restrictive regulatory requirements imposed by higher-level institutions. In the German Bundesland of Bavaria wind energy developments have stalled due to a Bavarian law requiring a minimum distance of ten times the total turbine height to the next settlement. This makes any wind

²⁶ <http://www.go100re.net/map/kommunen/kommunalatlas.html>

or <http://www.kommunal-erneuerbar.de/energie->

²⁷ See short version at: https://www.frankfurt.de/sixcms/media.php/738/170124_Masterplan%20Broschu%CC%88re_ENG_bf_pdfua.pdf

²⁸ Law 10/2019, 29th of February 2019 on climate change and energy transition.

development impossible even in areas where local support exists, and other environmental requirements would be respected.²⁹

4.2 Pursuing a common zero-carbon goal and coherence with other legislative frameworks

Eventually, all sub-national plans should contribute to the – not yet agreed – **common EU goal of achieving net-zero carbon emissions by 2050 at the latest**. Ideally, this goal should be extended to a 100% renewable energy target, applied to different levels (see chapter 0 on targets). The current NECPs fall well behind from achieving the Paris Agreement (Ecologic & Climact, 2019; Morgan, S., 2019). Hence, the EC and Member states should ensure that the NECPs are in line with both, EU long-term climate goals, as well as the Paris Agreement and any future multilateral agreement with higher ambitions. Member states should make such statements in the NECPs, which should then be further explained in the Long-Term Strategies (LTS). Without a common long-term vision, policy frameworks and regulations indirectly related to energy will not be consistent.³⁰

These frameworks include climate; environment; infrastructure and territorial development (including spatial planning and national building codes); social affairs; data security and privacy; economic and fiscal policies; trade and international investment; and, education. The overall assessment of the impact of the reviewed policy areas on prosumerism clearly shows that the prosumer model is either not yet embraced or not (fully) understood. In order to change this, policy makers should get more familiar with the opportunities that prosumers can offer and adopt their strategies, regulations and objectives accordingly.

As policymakers in above-mentioned policy areas are usually not concerned with energy issues (at least not systematically), it is upon the policymakers in the energy sector – like the ones drafting the NECPs – as well as other stakeholders – like prosumer initiatives – to **make non-energy policymakers aware of the necessary changes in their respective policy areas and regulatory frameworks**. This requires cross-sectoral and “non-silo” thinking which can only be achieved if all policy areas have the common objective of achieving the goals of the Paris Agreement. As prosumerism can play a significant role in reaching these objectives and at the same time improve social, economic and environmental conditions of the energy sector, it is essential to mainstream the awareness and knowledge about the opportunities that prosumerism can offer.

4.3 Ensuring environmental, social and economic sustainability

While the transformation towards a 100% RE system should be carried out as fast as possible to be in line with the Paris Agreement, the **social, environmental and economic dimensions of sustainability should be ensured**, too. To that end the a PROSEU report has developed some 40 recommendations for prosumers (including both individual and collective initiatives) and policymakers which also provide answers to the most prominent concerns that are being raised against the phenomenon of prosumerism, such as the alleged lack of solidarity with other energy consumers or the potential revenue decrease for network operators and incumbents (Petrick et al., 2019b).

²⁹ <https://www.br.de/nachrichten/wissen/herrscht-bei-der-windenergie-in-bayern-flaute,RP7ftwn> ; <https://www.windpowermonthly.com/article/1496776/reintroduction-german-setback-rules-proposed>

³⁰ This has been explained in the PROSEU Deliverable 3.2 on Policy Coherence (Petrick et al. 2019a).

Table 2 below provides an overview of the guidelines provided in the above-mentioned report. Certain elements are taken up in the present document again, like the maximisation of renewable capacity in the built environment, the promotion inclusive business models that allow participation of all citizens or the inclusion of energy-poor households.

Table 2: Sustainability Guidelines for prosumer initiatives and policy makers

| Issues | Guidelines for prosumer initiatives | Guidelines for policymakers |
|---|--|--|
| Ensuring social sustainability | | |
| Solidarity with the other energy consumers | <ul style="list-style-type: none"> Promote grid-connected projects to support the grid infrastructure and sector coupling Advocate for sustainable and inclusive tariff structures | <ul style="list-style-type: none"> Calculate the entire “value of solar” Ensure that electricity costs and charges are transparently calculated and justified Reform financing of the energy system to distribute costs fairly Develop short and long-term scenarios for prosumer uptake |
| Social Inclusiveness | <ul style="list-style-type: none"> Promote inclusive business models that allow the participation of poorer households Integrate Corporate Social Responsibility (CSR) criteria in procurement decisions Aim for gender parity in initiative’s management and membership | <ul style="list-style-type: none"> Support business models inclusive of energy-poor and marginalized households Incentivize RES/EE investments in poor households Raise social awareness through targeted communication campaigns |
| Data security and privacy | <ul style="list-style-type: none"> Reduce the amount of personal data collected Implement data security and privacy schemes | <ul style="list-style-type: none"> Provide clear data security and privacy regulations Support data secure hardware and software |
| Ensuring environmental sustainability | | |
| Material efficiency and reduction of environmental impacts | <ul style="list-style-type: none"> Maximise renewable capacity in the built environment Design RES installations to maximise energy output Integrate environmental impact assessments for those projects that are likely to have a significant effect on the environment Use only batteries or storage schemes that can provide energy system services | <ul style="list-style-type: none"> Provide a framework to make prosumer grid-support attractive Promote the use of existing public built spaces |
| Waste reduction, eco-design and recycling schemes | <ul style="list-style-type: none"> Prioritise suppliers offering reuse, repair and recycling schemes Plan reuse, recycling and decommissioning during the design and construction phase | <ul style="list-style-type: none"> Implement eco-design and enforce obligatory collection, reuse and recycling schemes Foster R&D in eco-design and circular economy |
| Ensuring economic sustainability | | |
| Efficient use of economic resources | <ul style="list-style-type: none"> Partner with professional suppliers and contractors Prioritise local installers and contractors Contribute to local taxes and levies | <ul style="list-style-type: none"> Streamline processes for prosumer projects Support on-line markets and solution platforms |
| Economic viability of the energy system | <ul style="list-style-type: none"> Contribute to grid infrastructure costs Provide grid services | <ul style="list-style-type: none"> Regularly review grid operator services, costs and regulation Refrain from subsidising utilities using non-renewable energy |
| Access to finance | <ul style="list-style-type: none"> Prioritise low-risk projects with reasonable size Professionalise project development and financing | <ul style="list-style-type: none"> Provide stable economic schemes for prosumer projects Educate, train and empower citizens and prosumers |

(Source: PROSEU, 3.2b report, 2019)

5. Ensuring prosumer representation in governance processes of the Energy Union

There won't be an energy transition that is fair and adequate in speed and scale if citizens and communities cannot actively participate and make decisions. People's ownership and control is key in the energy transition to be democratic, transparent and effective.

The Governance Regulation states in its Article 11 (“Multilevel climate and energy dialogue”): *“Each Member State shall establish a multilevel climate and energy dialogue pursuant to national rules, in which local authorities, civil society organisations, business community, investors and other relevant stakeholders and the general public are able actively to engage and discuss the different scenarios envisaged for energy and climate policies(....)”* The term governance as used in this report should be understood as a process leading to the adoption of regulations and policies on the Energy Union as well as their implementation.³¹

5.1 Acknowledging importance of governance

The arrival of prosumers as a new player in the energy system – in combination with the other trends like decarbonisation, decentralisation, and digitalisation – means that **the roles of the different stakeholders need to be redefined**. This, in turn, requires to extend **current governance model towards prosumers** as they are currently not sufficiently represented in decision and policy making processes.

While this provision is in place for the definition of the NECPs and the LTS, the **participation of the various stakeholders needs to also take place on a continuous basis**. For prosumers or prosumer initiatives to get heard in public consultations or other processes, they need to be duly represented ideally through organised bodies which agglutinate all energy self-consumers and renewable energy communities. As can be deduced from the low importance given to prosumer issues in the current NECP drafts, it can be assumed that prosumers do not have a strong voice as they are not yet sufficiently organised and those initiatives are relatively new. The PROSEU Living Lab workshops in France and Spain gave evidence that decision and policy makers look for knowledgeable contact persons/groups which can give valuable feedback and input.

It is naïve to hold that the decentralisation of the energy system automatically leads to more energy democracy (Brown, Cloke, Harrison, 2015). Hence, the organising of prosumers, into unions or other forms of associations, should also have the role in ensuring that the **decentralisation of the energy system to more local control is done in a democratic manner**. Key legislation which ensures the participation of prosumers in environmental related decision-making is the Aarhus Convention in combination with the Maastricht Recommendations.

The **Aarhus Convention** of 25 June 1998 on ‘Access to information, public participation in decision-making and access to justice in environmental matters’, ensures everyone to have access to environmental information, the right to participate in environmental decision-making, and the right to access to justice regarding environmental matters.³² The Aarhus Convention

³¹ One of the most comprehensive definitions of governance is the one provided by the Commission on Global Governance in its 1995 report, *Our Global Neighbourhood*: “governance is the sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and cooperative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest” (Commission on Global Governance, 1995, chap.1).

³² <http://ec.europa.eu/environment/aarhus/index.htm>

is an essential instrument to ensure good governance and bottom-up approaches in the governance of matters relating to the environment which includes renewable energy projects. Its **Maastricht Recommendations** on Promoting Public Participation sets basic guidelines on the aspects of governance regarding transparency and public participation, which, along with the implementation of effective rules and enforceability, are essential governance aspects for the prosumer model. The Maastricht Recommendations consider that public participation is a prerequisite for effective governance, and thus, should be fully incorporated and encouraged into the decision-making on all decisions subject to environmental matters, including the governance of energy systems (see UNECE, 2014, p.12).

Due to the different prosumer-relevant decisions as well as different potential prosumer representatives that are active at the EU / national level vs. the local level, the following will describe the potential governance processes in two separate sub-sections.

5.2 Governance at EU and national level

5.2.1 Prosumer-relevant decisions at EU and national level

Participation of prosumer representatives is required in a number of EU and national policy fields where multi-stakeholder governance processes should be in place. These include but are not restricted to the following ones:

- **Energy targets:** The targets for renewable energy and energy efficiency in the NECPs and LTS should include prosumer related targets (see previous section) which should be defined under consideration of the input from prosumer representatives.
- **Incentives:** National support policies, taxation and other kind of economic measures need to be reviewed by prosumer groups who can judge the effects.
- **Electricity and energy market policies:** The electricity as well as parts of the energy market legislation and regulation are affected by prosumers and have an effect on prosumer deployment.
- **Other policy frameworks which can have impact on prosumerism:** As mentioned under section 4.2, there are various other policy frameworks that can have direct or indirect effects on prosumer uptake, for instance infrastructure and territorial development or data security.

The NECPs should make clear that prosumers and their representatives will be actively involved in decision making processes that are concerned with these policy areas. In general, prosumers should be able to participate in any consultations that may be relevant to them.

5.2.2 Prosumer representation at EU and national level

As pointed out in the D2.2 PROSEU deliverable (Wittmayer et al. 2019), there are various legal forms of collective prosumers: for-profit-companies, public institutions, associations, cooperatives, social enterprises, and partnerships. The legal form by which these collectives run, also influence or determine the way they would get represented in a national or regional governance process. Thus far, energy utilities have been the key interlocuters for governments and regulators when it came to policies and regulation in the energy market. In some countries, larger energy suppliers or utilities are organised in national associations such as UNESA in Spain or the BDEW in Germany. However, these associations tend to support their members in their traditional activities which are often not in favour of prosumerism.

The following list captures a number of actors that could potentially act as either prosumer representatives or as defendants of prosumer interests within a governance framework.

- **Associations of Renewable Energy Suppliers (RE Utilities) and Cooperatives:** In Denmark, energy utilities have played an active role in engaging their clients in becoming prosumers (Wolfgang, 2018). About 1500 European energy cooperatives are organized in REScoop.eu. By contrast, certain for-profit-companies of the renewable sector may not feel represented by REScoop.eu even though many interests in terms of regulation may be similar.
- **Energy Agencies,** like ADEME in France or IDAE in Spain. By 2013 they were around 400 energy agencies in Europe.³³
- **Consumer associations** like BEUC on the European level, or “Which?” in the UK³⁴.
- **RE industry associations like PV associations like** UNEF in Spain or RE-sector wide associations like BEE (Germany) or EREF on the European level.
- **Environmental and social NGOs,** like Greenpeace and WWF, or initiatives like the “Alianza por el Autoconsumo” in Spain where NGOs and renewable energy companies collaborate and regular meet with the energy ministry and the national energy agency IDAE.³⁵
- **Trade unions:** The workforce of the RE sector would have to increasingly unionise in order to make their voice heard upon policymakers. However, given the often small size of companies, especially when it comes to installers, make it challenging for employees in the RE sector to protect their interests.³⁶
- **Aggregators and other service providers:** These emerging actors may facilitate the transaction of energy between prosumers and with other market participants (through potentially innovative business models such as shared self-consumption, virtual net metering, peer-to-peer or Power Purchase Agreements) and the use of different technologies (storage, electric vehicles, demand response, etc.).
- **Local and regional governments,** especially those organised in initiatives like the Covenant of Mayors which can represent various progressive cities and municipalities in national debates.

In the **NECPs it should be made clear that governments actively seek the input and advice of prosumer representatives,** and that they encourage the creation of bodies (like associations) that can act as prosumer representatives. An important point in this context is that governments should state **which kind of legal organisations they propose to be used for energy communities** (both RECs and CECs). For instance, if the most appropriate legal form of how the RE Directive can be transposed in a certain country is the legal form of a cooperative, then it will be easier to set up a corresponding association because all participating communities would work under the same rules. If the legal entities are very different, they may not find enough common ground to establish a joint association.

Moreover, the EU and its members must not only enable the conditions for self-consumption, but also, must **facilitate the association of prosumers** and ensure that they participate in the decision-making process at the

³³ <https://ec.europa.eu/easme/en/local-and-regional-energy-agencies>

³⁴ <https://www.which.co.uk/about-which/company-info/governance-overview>

³⁵ We noted that such a group does not seem to exist in France which may be one of the reasons the reason why energy communities are hardly mentioned in the French draft NECP.

³⁶ This is one of the reasons why the tens of thousands of jobs that were lost in the German and Spanish PV sector in the last years – and currently in the German wind energy sector – were hardly acknowledged by politicians and trade unions.

local, regional, national, and EU level. In order to achieve this, it is paramount that policymakers at all levels are aware of the requirements of an effective decentralised energy system. A crucial requirement for prosumers to effectively participate in the decision-making process is that the intermediaries between local prosumers and policymakers, be it a prosumer union, a local authority or both, **must be sufficiently funded**. In fact, the main reason of failure of decentralisation programmes is their lack of financial support (Brown, Cloke, Harrison, 2015). While individual and collective prosumers will have to invest own resources and time to engage, public financial support may be given to their representatives, e.g. by providing a certain base funding, for instance in relation to the number of associated members.

5.3 Governance at local level

NECPs have naturally a national focus. However, the very nature of prosumerism is local. Therefore, NECPs need to define measures, which ensure prosumer participation at the local level in decision processes. This can be done by defining prosumer rights in national legislation and regulation, which have to be adopted at the local level. In addition, local-level activities and ideas could be an inspiration for national legislation.

5.3.1 Prosumer-relevant decisions at local level

On the local level, various decisions and processes can influence the uptake of prosumer initiatives. For instance:

- **Participation in setting local RE targets:** Municipalities and cities that are pro-actively implementing RE and EE targets and measures should do so by involving prosumer representatives. 100% RE targets – which are pursued by a multitude of European villages, cities and regions – can only be reached with strong commitment of prosumers.
- **Participation in urban planning³⁷:** Urban plans have a major impact on achieving energy-balanced cells, both for individual buildings as well as for urban quarters. The energy supply of new built areas or in case of upgrades of existing areas needs to be taken into consideration. This concerns consideration of roof-top potentials, orientation to avoid shading, density, potential district heating & cooling, etc.
- **Participation in defining building ordinances:** Local building ordinances can go beyond national building codes by enforcing stricter rules on use of building materials, efficiency and use of renewables. NECPs should encourage municipalities to make use of these tools.
- **Administrative processes like building licences:** The processes can hinder prosumer set up if they are too cumbersome or time-consuming. For instance, some municipalities in Spain require a building licence to install even small numbers of PV panels on buildings. The issuance can take several months and includes administration fees.
- **Participation in defining tax exemptions:** Certain taxes, e.g. the property tax in Spain (“IBI”), are defined by local governments. Many local governments have decided to provide bonifications for energy efficient buildings or the use of renewable energy. (see also incentive section).

³⁷ See also PROSEU Task 3.2 report

All these issues require a fair amount of planning where prosumer initiatives can and should provide valuable input. For local governments that means that they should make planning processes easily accessible, even during initial phases of a project in order to facilitate the information to prosumer groups.

5.3.2 Prosumer representation at local level

It is important that local governments actively seek the participation of prosumer representatives in decision-making processes. At the same time, prosumer representatives should establish contact with the local government. If prosumer groups do not organize themselves, they won't be heard.

Organizational forms through which the key problem of unorganized citizens on the local level can be addressed are described by the following:

- **Associations of RE communities:** Over time the number of local energy communities will increase, especially in larger cities. It will then become important for them to establish some kind of association or make agreements who may “officially” represent all locally active energy communities and individual prosumers and to define their mandate.
- **Local energy groups:** Local groups of national prosumer cooperatives or groups, like the local groups set up by members of Som Energia (Spain), can also play an important role, especially in the early stages.
- **RE industry associations:** Local RE industry associations can provide a strong voice in favour of prosumerism. If they are able to attract also small companies like local installers as members, they can be important interlocutors in decision-making processes.

In the mid- to long-term governments should ensure that any entity claiming to speak on behalf of prosumers, truly represents the interests of (most) prosumers and energy communities. It should be avoided that the first powerful group that is able to get formed tries to become “the only” prosumer representative. There is a **risk that supposedly representative bodies doing collective bargaining whilst only representing interests of a particular group** are excluding third parties and possibly hampering further innovation and improvement. However, for governments, clear contacts with defined mandates are easier to deal with as with a multitude of different groups. It will be upon the prosumer initiatives themselves to stay alert and actively involved in decision making processes and to try to align prosumer interests.

Conclusions

The NECPs provide the unique opportunity for Members States to define truly consistent, ambitious and sustainable roadmaps which acknowledge the new paradigm of distributed generation and the advent of an Energy Union with a multitude of new players, namely prosumers and energy communities.

The principles and policy options described in the previous sections shall provide guidance to policy makers, NGOs and prosumer initiatives to ensure that the key aspects for prosumer uptake are well defined in the NECPs – or at least described in a way that subsequent regulation and measures will duly consider them.

The following table provides an overview of the points mentioned in the form of a checklist:

Table 3: Checklist of prosumer policy options

| Key principles and sub-principles | Mentioned, defined, planned in NECP? |
|---|--------------------------------------|
| Setting ambitious targets for prosumers and energy communities | |
| Targets for roof-top PV set | |
| Targets for energy communities set | |
| Ensuring economic viability through favourable framework conditions | |
| Shared self-consumption schemes, fair remuneration and simple taxation mechanisms established | |
| Open, transparent and competitive market access guaranteed | |
| Sector coupling and green energy convergence facilitated | |
| Balanced agreements between prosumers and business partners facilitated | |
| Supporting RE Communities | |
| National forms of energy communities defined | |
| Participation of energy poor and marginalized households secured | |
| Simplified procedures defined | |
| Energy related education and and literacy provided | |
| Comprehensive cost-benefit analysis available | |
| Establishing energy responsibility and coherence at all levels | |
| Distributed responsibilities acknowledged | |
| Zero-carbon goal and coherence with other policy frameworks defined | |
| Environmental, social and economic sustainability ensured | |
| Ensuring prosumer representation in governance processes | |
| Importance of governance acknowledged | |
| Governance at national level defined | |
| Governance at local level defined | |

The remaining months until the final versions of the NECPs are issued by the end of 2019 will be crucial to secure satisfactory results for prosumers and energy communities. Nevertheless, the transposition of the Renewable Energy Directive and the Electricity Market Directive into national laws will provide further opportunities to influence national policies towards a prosumer-centred Energy Union.

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Annex

Table 4: . Solar Rooftop PV in Europe: Technical and economic solar electricity potential and their potential share in the final electricity consumption. Source: JRC 2019

| MS | Available rooftop area (km ²) | Technical potential (GWh/year) | Economic potential (GWh/year) | Final elec. consumption (GWh/year) | Technical potent. share (%) of consumption | Economic potent. share (%) of consumption |
|----|---|--------------------------------|-------------------------------|------------------------------------|--|---|
| CY | 31 | 5270 | 5084 | 4399 | 119.8% | 115.6% |
| PT | 170 | 24259 | 24030 | 46353 | 52.3% | 51.8% |
| MT | 5 | 782 | 782 | 2114 | 37.0% | 37.0% |
| EL | 128 | 17090 | 16866 | 53463 | 32.0% | 31.6% |
| IT | 752 | 88651 | 86488 | 286027 | 31.0% | 30.2% |
| FR | 1346 | 125580 | 125454 | 440971 | 28.5% | 28.4% |
| ES | 462 | 65244 | 61215 | 233172 | 28.0% | 26.3% |
| DE | 1523 | 104313 | 103782 | 517377 | 20.2% | 20.1% |
| AT | 151 | 12854 | 12294 | 61852 | 20.8% | 19.9% |
| DK | 120 | 5720 | 5720 | 31152 | 18.4% | 18.4% |
| BE | 183 | 12449 | 12440 | 81725 | 15.2% | 15.2% |
| IE | 56 | 2919 | 2750 | 26099 | 11.2% | 10.5% |
| LU | 9 | 696 | 395 | 6372 | 10.9% | 6.2% |
| SE | 157 | 7255 | 3203 | 127496 | 5.7% | 2.5% |
| UK | 771 | 43646 | 6517 | 303902 | 14.4% | 2.1% |
| SI | 29 | 2704 | 54 | 13026 | 20.8% | 0.4% |
| NL | 283 | 17629 | 255 | 105332 | 16.7% | 0.2% |
| RO | 354 | 35877 | 58 | 43569 | 82.3% | 0.1% |
| FI | 102 | 4941 | 63 | 80759 | 6.1% | 0.1% |
| PL | 469 | 30910 | 73 | 132839 | 23.3% | 0.1% |
| HR | 85 | 7769 | 5 | 15300 | 50.8% | 0.0% |
| LV | 30 | 1432 | 1 | 6482 | 22.1% | 0.0% |
| SK | 108 | 9079 | 3 | 24987 | 36.3% | 0.0% |
| BG | 150 | 17307 | 0 | 28939 | 59.8% | 0.0% |
| CZ | 185 | 13725 | 0 | 57997 | 23.7% | 0.0% |
| EE | 27 | 1220 | 0 | 7139 | 17.1% | 0.0% |
| HU | 191 | 18034 | 0 | 37541 | 48.0% | 0.0% |
| LT | 58 | 2923 | 0 | 9750 | 30.0% | 0.0% |
| EU | 7935 | 680276 | 467532 | 2786134 | 24.4% | 16.8% |



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