

Residential Prosumers in the European Energy Union

EAHC/2013/CP/04

Mapping the legal and regulatory framework in the 28 Member States, Iceland and Norway

Germany



This study is part of the mapping of the legal and regulatory framework for residential prosumers in the 28 Member States, Iceland and Norway, within the project on Residential Prosumers in the European Energy Union EAHC/2013/CP/04, and carried out by Milieu Ltd (Belgium), Chaussée de Charleroi, 112, B-1060 Brussels, tel: +32 (0)2 506 1000; web address: www.milieu.be

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Disclaimer: The information and views set out in this study are those of the authors and do not necessarily represent the official views of the Commission.

National report on the regulatory framework for residential prosumers Germany

General Description of the national legal and regulatory framework

General

Germany is a Federal Republic whose federal system is based on the German Constitution (*Grundgesetz* – Basic Law)¹. The Basic Law provides for the distribution of legislative, judicial and executive competences between the Federal Republic (*Bund*) and the 16 federal states (*Länder*). The *Länder* are provided for with independent constitutions setting up their legislative, executive and administrative structure in accordance with the Basic Law. According to the Basic Law the legislative competences are vested in the *Länder*, except where the Basic Law assigns these powers to the *Bund*.

The Basic Law assigns various subject matters either to the exclusive legislative competence or the shared legislative competence (concurrent competence) of the *Bund*. In the case of shared legislative competence, the *Länder* are entitled to adopt legislation if and insofar as the *Bund* has not made use of its competence.

Executive power is also divided between the Federation and the *Länder*. The Basic Law provides that usually the *Länder* implement federal legislation themselves, in the case of which they are subject to very little control by federal bodies. In other areas they execute federal laws on behalf of the Federation, in the case of which they are subject to more stringent control by the Federation. Finally, the Federation may be empowered to execute federal laws through its own administration. The legislative competence of the *Bund* (concurrent competence) in the areas of economic matters (including energy) derives from Article 74(1) No 11 of the Basic Law. More information on the division of competences and the regulatory framework applying to prosumers is included in the following sections.

Regarding renewable energy, in 2015, renewable energy sources covered roughly 33 per cent of gross electricity generation. By 2025, 40-45 per cent of electricity consumed in Germany is to derive from renewables; the figure for 2035 is to be 55-60 per cent. The growing significance of renewable energy sources in the power sector is largely due to the Renewable Energy Sources Act (EEG), further discussed below. Wind and solar energy are the most important renewables in Germany's energy transition. Additionally, biomass, hydropower and geothermal energy make valuable contributions to the sustainable energy supply. The 2017 Renewable Energy Sources Act creates a paradigm shift: From January 1 onwards, the rates of renewables funding will be determined by the market by means of dedicated auction schemes, rather than being fixed by the government. What this means is that in order to be awarded funding, operators of new photovoltaics installations, wind turbines and biogas plants will need to bid in auctions, and thus face up to competitors in their field. The bidder who asks for the lowest amount of funding wins.

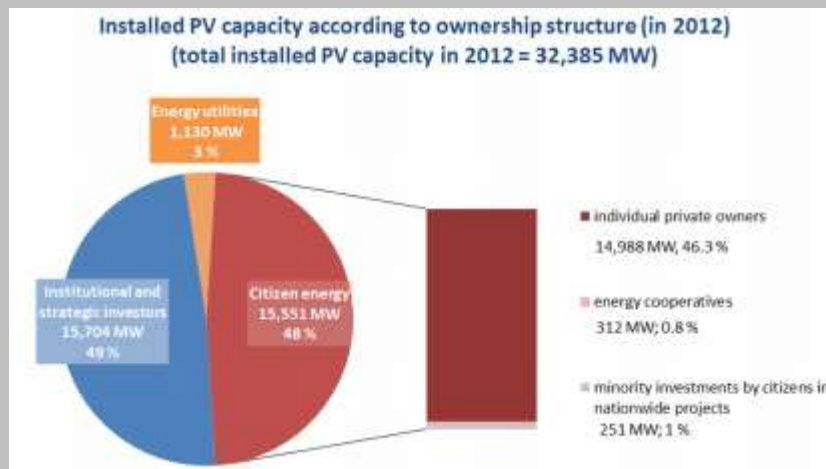
Historically, small-scale and citizen-owned renewable energy producers have been at the heart of the German energy transition. About 50% of all renewable energy installations are owned and financed by small-scale power producers, community cooperatives, and private citizens. Some researchers have argued that citizen engagement (in particular citizen *financial* engagement) is an important component of maintaining public support for the energy transition.² In the absence of supportive policy frameworks at the national level, prosumer-driven PV could become one of the primary ways through which citizens contribute to the energy transition in the years ahead³

¹ Basic Law for the Federal Republic of Germany (Federal Law Gazette I 1949 p.1) last amended by the Act of 11 July 2012 (Federal Law Gazette I p.1478).

² IEA-RETD, note 35 below, at 110.

³ Ibid.

Nearly half (46.6 percent) of the total renewable energy capacity installed in Germany is owned by citizens and citizens' energy cooperative⁴ The following figure presents an overview of the share regarding PV:



Electricity markets remain dominated by four largest suppliers (78% of the electricity fed into the grid in 2012 outside of renewable electricity with priority grid access produced under the feed-in tariff law). While retail prices rank amongst the highest in the EU, wholesale market prices decreased because of overcapacities and the rapid expansion of renewable generation capacities, putting wholesale prices and the four largest suppliers under pressure⁵.

1. What types of residential prosumers are there in your country on the basis of type of RES used and size of the installation?

There is no differentiation applicable amongst the different types of residential prosumers. There is however a distinction between industry and residential prosumers.

The most common forms of residential prosuming are solar PV and private mini-CHPs. Residential PV (<10 kWp) accounts for only 13 percent of total installed PV capacity.⁶ However there are no figures available for private supply from private mini-CHPs.

2. What is the institutional framework & division of competences regarding residential prosumers in your country?

Competences

The regulatory framework for energy policy, hence also for residential prosumers, is developed at federal level. However, Germany is a multilevel federal system, thus, the subnational level does not only implement federal law, but also enjoys legal, administrative and budgetary competencies. States, counties or municipalities can, for example, specify their own renewable energy policy

⁴ trend:research GmbH and the Leuphana Universität Lüneburg, Definition und Marktanalyse von Bürgerenergie in Deutschland, 2013, available at:

https://www.buendnisbuengerenergie.de/fileadmin/user_upload/downloads/Studien/Studie_Definition_und_Marktanalyse_von_Buengerenergie_in_Deutschland_BBEn.pdf.

⁵ Current practices in voluntary and consumer-driven renewable electricity markets, BEUC, January 2016 (BEUC mapping report 2016) p. 72.

⁶ Kerstin Tews, 'Mapping the Regulatory Features Underpinning Prosumer Activities in Germany- The case of residential photovoltaics', 2016, available at http://www.diss.fu-berlin.de/docs/servlets/MCRFileNodeServlet/FUDOCSS_derivate_000000006718/Prosuming_Germany_ffu-report_final.pdf

targets and adequate policies and measures to achieve them. Particularly relevant for renewable energy projects, especially for those renewables with a spatial impact, are the subnational level's competencies with regard to spatial planning. The most obvious political challenge of the current energy transition process is a lack of multi-level coordination, due to the multiplicity of renewable energy expansion strategies made by municipalities, counties, regional states and the federal government, which often hardly relate to one another.⁷ Regarding prosumers, important provisions are included in the Federal legislation on renewable energy (EEG).

Authorities

At the federal level, primary responsibility for the energy and electricity sector lies with the *Federal Ministry of Economic Affairs and Energy* (Bundesministerium für Wirtschaft und Energie, or BMWi), although the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit, or BMUB) has some competencies in the area as well.⁸ In addition, the *Federal Network Agency* (Bundesnetzagentur, or BnetzA) is responsible for the regulation of natural monopolies such as grids, telecommunications, postal services, etc. The agency falls under the authority of the BMWi. The BnetzA's central task in the energy field is to ensure non-discriminatory third-party access to the grids and to authorize calculations on the network charges made by grid operators. The BnetzA and the respective regulatory authorities at state level, the Landesregulierungsbehoerden, are responsible for expansion and/or optimization of the electricity grids.⁹

Specific Questions on the regulatory framework for residential prosumers

3. What is the regulatory framework for residential prosumers in your country?

Answer:

The **Renewable Energy Sources Act (EEG)** is the main instrument for stimulating self-consumption in Germany, more precisely, Articles 60 to 61e are of special importance and further discussed in the following sections.

Further, for CHP energy, the Combined Heat and Power (KWK) Act is of importance. The rules for combined heat and power generation (CHP) and for self-suppliers included in the Renewable Energy Sources Act have been revised as of 2017. CHP funding for small installations that generate between 1 and 50 MW are determined via auctions. In addition to this, the special equalisation scheme included in the Renewable Energy Sources Act are transferred to the Combined Heat and Power Act.

Further, the **Low Voltage Connection Ordinance** (Verordnung über Allgemeine Bedingungen für den Netzanschluss und dessen Nutzung für die Elektrizitätsversorgung in Niederspannung, AV) applies for access to the low voltage grid.

Regarding digitalisation and smart meters, a new law, the **Act for the digitisation of the energy industry** is to create the right legal framework for this.

In addition, the **new Electricity Market Act** is to be more market-based and to provide for greater flexibility within the entire power system.

⁷ Ibid, at 9.

⁸ Ibid.

⁹ Ibid, at 10. For an overview of the authorities on State level refer to

<https://www.bundesnetzagentur.de/SharedDocs/FAQs/DE/Sachgebiete/Energie/Verbraucher/Rechte/ZustaendigeRegulierungsbehoerden.html> (in German only).

3.1. What is the existing legislative framework regulating Renewable Energy Projects in your country?

As established above, the **German Renewable Energy Act** (Erneuerbare Energiengesetz, EEG) is the main legislative tool for renewable energy projects. The EEG was adopted in 2000 and underwent four amendments in 2004, 2009, 2012, 2014 and 2017. The key elements of the EEG are

- the establishment of a support scheme for electricity from renewables,
- a purchase obligation for grid operators,
- and the solidarity principle in bearing the cost for renewable energy¹⁰.

Until the reform of the Renewable Energy Act (EEG) in 2014, Germany has applied a price-based support scheme for all renewable energy. However, in 2014, the support scheme underwent a fundamental instrumental shift replacing the fixed feed-in tariffs by a market premium that fills up the gap between the wholesale market price and the reduced level of the former feed-in tariff. This means that the plant operator running a renewable power plant installation above a certain installed capacity, has to sell the kilowatt-hours directly to the wholesale markets. In case the monthly wholesale market price is lower than the theoretical level of the feed-in tariff – which is mostly the case – a market premium is paid to cover the difference¹¹. Direct marketing therefore became mandatory for all newly installed renewable energy facilities with a capacity of more than 100 kW¹².

In addition, instead of the existing feed-in tariff or premium tariff, by 2017, the level of support granted will be determined by a competitive bidding process. Energy installations have to respond to a tender in order to be able to apply for the market premium which is fixed through the auction. Thus, Germany has introduced a volume-based auction system, which differs fundamentally from the previous price-based support scheme with administratively fixed prices for renewable energy. However, small-scale residential renewable energy producers are still exempted from this instrumental shift¹³.

In addition to the EEG relevant provisions can derive from other energy law, such as the Energy Industry Act, Electricity Tax Act and the Electricity Network Remuneration Regulation Stromnetzendgeltverordnung (EnWG, StromStG and StromNEV).

3.2. Does the Renewables National Action Plan include any objectives for residential prosumers (if so, please specify)

No, the German NAP does not include specific objectives for residential prosumers. The NAP merely states that the incentive for self-consumption of solar power was increased¹⁴, as well as specifications in relation to an amendment of the EEG regarding photovoltaic remuneration. More precisely, the NAP specifies that “The benefit for households with an average household electricity price of net 20 cents per kilowatt hour, which do not feed solar power into the grid, but use it themselves, amounts to 3.6 cents per kilowatt hour if they consume less than 30 % of their annually produced solar electricity themselves. If private use of electricity is over 30 %, the benefit amounts to 8 cents per kilowatt hour.”¹⁵

¹⁰ Ibid, at 12.

¹¹ Current practices in voluntary and consumer-driven renewable electricity markets, BEUC, January 2016 (BEUC mapping report 2016) p. 73.

¹² Tewes, note 6 above, 12.

¹³ Ibid, at 12.

¹⁴ Federal Republic of Germany, National Renewable Energy Action Plan in accordance with Directive 2009/28/EC on the promotion of the use of energy from renewable sources, 2016, at 2

¹⁵ Ibid, at 73.

3.3. Is there a definition (legal or regulatory) of residential prosumers (or self-consumption) in your country? If so, state it and describe the elements of this definition?

Answer:

There is no definition of the term “(residential) prosumer” in Germany.¹⁶ However the term “self-supply” shall mean ‘the consumption of electricity which a natural or legal person consumes himself in the immediate vicinity of the electricity-generating installation if the electricity is not fed through a grid system and this person operates the electricity-generating installation himself’ (Article 3(19) EEG). The definition therefore includes several key characteristics for being a self-supplier

- The electricity is generated by an installation in the immediate vicinity¹⁷
- The whole electricity generated has to be self-consumed by a natural or legal person
- It focuses on the electricity that is for consumption and not to be passed into the grid
- This has to be in an immediate spatial context with the electricity generating plant
- and that person operates the electricity generating plant itself

4. What are the permitting requirements for each type of residential prosumer?

General

There are no specific permitting requirements for prosumers in Germany. The procedure depends on the technology. Generally, the degree of bureaucratic complexity and the burden for private households to become prosumers are rather low.¹⁸

See below the requirements for solar PV and heat pumps as they are the relevant technologies for prosumers.

4.1. Does your country recognize certain forms of self-consumption and subject prosumers to certain

- requirements,
- application fees and
- one-off costs

in order to give them a permit or licence to generate energy?

As stated above, the degree of bureaucratic complexity and the burden for private households to become prosumers are rather low.¹⁹

PV installations are subject to building law, which differs between the subnational jurisdictions at state level in Germany (Bundesländer). However, in most States, roof-mounted PV systems do **not need a special permit**. The exact provisions differ from State to State and are included in the State Building codes.²⁰ There are no differences regarding permitting for prosumers and general PV systems. Differences arise however regarding **contracts, access to the grid and costs**.

PV installations on the roofs of historic buildings need a permit, but this is granted in most cases

¹⁶ See also Tewes, note 6 above, at 2.

¹⁷ See for the definition of immediate vicinity: Clearingstelle EEG, Leitsatz 6 and section 3.1.5 of Recommendation 2011/2/1 (in German only).

¹⁸ Ibid, at 28.

¹⁹ Ibid.

²⁰ An overview of the applicable provisions per State is included here (in German only):

http://www.sfv.de/artikel/genehmigung_von_pv-anlagen.htm

if the installation does not disrupt the building or alter its visual quality.²¹ Although the municipalities in Germany have the relevant competencies with regard to the main elements of spatial planning, respective legal provisions are not relevant for roofmounted PV systems as they do not have a spatial impact.²²

As for mini CHPs or heat pumps there are no permitting provisions for prosumers.

No formal contract between the self-generator and the grid operator has to be concluded. Further, **no application fees and one-off costs** have been identified. **No charges related to grid connection** and expansion occur. There is guaranteed and priority interconnection for renewable energy projects, and prosumers (like all renewable energy generators) are not burdened with grid-related costs for the prosumed energy. Grid operators cover these costs which are allocated to all electricity consumers via the network fees²³.

4.2. Does the national legal/regulatory framework determine the contractual conditions under which prosumers are allowed to feed or sell their surplus back into the grid or to other consumers?

The EEG does not include specific provisions for prosumers to feed or sell their surplus into the grid. The general provisions apply, as included in Article 8 EEG and discussed in question 5.

There is no special framework for prosumers to feed into the grid/sell.. The Federal Network Agency clarifies in this regard, that “If he (=the self-supplier) surrenders (surplus) electricity to another final consumer, he supplies this as an “electricity supplier within the meaning of § 5 No. 13 EEG (EEG 2014, now § 3 No. 20 EEG 2017). In this respect, he is obligated, inter alia, to pay the EEG levy on the delivery quantities and must comply with the statutory notification requirements as an electricity supplier.”²⁴ The Federal Network Agency further clarifies that ‘all (surplus) quantities which are fed into the grid must be assigned to a balancing group and thus to a balancing group manager in accordance with § 4 para. 3 p. 1 StromNZV at the injection site. “Wild feedings” of electricity into the grid, in which the producer (in this case the self-supplier) does not comply with the proper handling and allocation of the (surplus) feed-in to a balancing group, are not permitted.”²⁵

Article 27a includes a general prohibition for self-consumption for operators who feed the electricity into the grid. The EEG includes a provision (Article 27a) stating that the operators of installations whose value to be invested (anzulegender Wert) has been determined by means of invitations to tender may not self-consume the electricity generated in their installation for the entire period during which they make use of payments under this Act. Exceptions allowing operators to self-consume electricity are made for electricity that is consumed:

- Through the installation or other installations, which are connected to the network via the same linking point,
- In the auxiliary installation and auxiliary systems of the installation or other installations which are connected to the network via the same linking point,
- to compensate for physical network losses,
- In the hours in which the value of the hour contracts for which the price zone for Germany on the spot market of the electricity exchange in the previous auction is negative, or
- In the hours in which the feed-in capacity is reduced in the case of grid congestion in accordance.

²¹ Tewes, note 6 above, at 26.

²² Ibid.

²³ Current practices in voluntary and consumer-driven renewable electricity markets, BEUC, January 2016 (BEUC mapping report 2016) p. 77.

²⁴ Bundesnetzagentur, note **Error! Bookmark not defined.** above, at 40.

²⁵ Ibid.

5. What are the rules applicable to the access to the grid?

Answer:

There are **no specific access to the grid provisions** for prosumers in Germany.

Generally, the provisions regarding grid connection, technical requirements, transmission and distribution are regulated by several provisions of the Renewable Energy Act and also apply to prosumers feeding into the grid. Provisions in section two of the law (“Connection, purchase, transmission and distribution”) clearly regulate the relationship between a grid operator and the operator of a renewable energy installation and their respective obligations.

According to Article 8 of the law, a grid operator is obliged to offer the grid connection for installations to generate electricity from renewable energy sources without delay. This obligation generally applies to the grid operator technically suited for connection (in terms of grid voltage level) whose distance to the location of the installation is the shortest (linear). In the case of one or several installations with a total maximum installed capacity of 30 kWp which are located on a plot of land with an existing connection to the grid, the point of connection of the plot of land with the grid system shall be deemed the most suitable connection point.

The procedure to be followed is:

- The operator of the renewable energy installation has to place an application for grid connection to the respective grid operator. In reality the firm charged with the installation of the PV system by the private homeowner often assumes this application.
- The grid operators must communicate to those wishing to feed in a precise timetable for the processing of the application to connect to the grid system. This timetable must state:
 - the procedural steps in which the application to connect will be processed, and
 - what information those wishing to feed in must transmit to the grid operators so that the grid system operators can determine the point of connection.
- Grid operators must communicate the following information to those wishing to feed in *within eight weeks*:
 - a timetable for the establishment of the connection to the grid system comprising all the necessary procedural steps
 - all the information needed by those wishing to feed in to test the connection point, and — on application — the grid system data required for a system compatibility check, and
 - an estimate of the costs incurred by the installation operators due to the connection to the grid system; this cost estimate shall include only the costs resulting from the technical provision of the connection to the grid system, and in particular shall not include the costs of obtaining permission to use third-party real estate for laying the line to connect to the grid system.

5.1. What is the inter-connection configuration used for each type of residential prosumer?

There are no specific inter-connection configuration provisions for prosumers in Germany. The general rules of the EEG apply.

According to Article 10 EEG on the establishment and use of the connection, the installation operators (the residential prosumer, household or other) may have the connection of the installations and the setting up and operation of the metering devices including the metering undertaken by the grid system operator or a qualified third party.

The establishment of the connection and the other devices required for the safety of the grid system must correspond to the individual technical requirements of the grid system operator and Section

49 on requirements for energy installations of the Energy Industry Act. Accordingly, energy installations have to be installed and operated in such a way as to ensure technical safety. Subject to other regulations, the generally accepted rules of technology must be observed. Compliance with the generally recognized rules of technology is presumed when the technical rules of the Association for Electrical, Electronic & Information Technologies are followed for electricity and the technical rules of the German Technical and Scientific Association for Gas and Water for gas have been respected. These provisions are generally applicable and not prosumer specific.

5.2. Does the competence to determine the inter-connection configuration lie at State level or at a regional/lander level?

The provisions cited above (question 2) are included in the Federal Renewable Energy Act. The Federal Network Agency (Bundesnetzagentur, or BnetzA) is responsible for the regulation of natural monopolies such as grids. The BnetzA's central task in the energy field is to ensure non-discriminatory third-party access to the grids and to authorise the grid charges made by grid operators.

In addition to the BnetzA the respective regulatory authorities at state level, the Landesregulierungsbehoerden in each State are responsible for expansion and/or optimization of the electricity grids for the tasks determined in Article 54(2) EnWG. This includes amongst others the approval of charges for grid access and the monitoring of the provisions on the grid connection.

5.3. Are there any rules to ensure that prosumers are inter-connected to the distribution network/the grid?

There is guaranteed and priority interconnection for renewable energy projects (Article 8 EEG), with grid upgrade costs recovered from ratepayers (rather than generators) (Article 8 EEG). This does not only apply to prosumers but to all renewable energy.

In addition the Low Voltage Connection Ordinance (Verordnung über Allgemeine Bedingungen für den Netzanschluss und dessen Nutzung für die Elektrizitätsversorgung in Niederspannung, NAV) specifies in Article 19 that before setting up a self-installation, the user must notify the network operator. The user has to take appropriate measures to ensure that his own installation does not have any harmful effects on the electricity supply network. The connection of own systems is to be coordinated with the grid operator. The latter can make the connection dependent on the observance of the measures to be defined by him in accordance with § 20 for protection against back-tensioning.

5.4. What are the grid access and grid use principles and rules for the energy generated by each type of residential prosumer?

There are no specific grid access and grid use principles and rules for the energy generated by prosumers in Germany. As established above, there is guaranteed and priority interconnection for renewable energy projects, with grid upgrade costs recovered from ratepayers (rather than generators) (Article 8 EEG). This does not only apply to prosumers but to all renewable energy, see also the previous question.

5.5. What are the network costs and charges for each type of residential prosumer?

There are no specific network costs for prosumers.²⁶

However, as mentioned in the answer above, there is guaranteed and priority interconnection for renewable energy projects, with grid upgrade costs recovered from ratepayers (rather than generators).

6. What are the incentives (e.g through taxes or tariffs) for each type of residential prosumers?

General

The Renewable Energy Act has offered a high degree of planning security for investors. It has sheltered small-scale and new actors' investments and fostered small-scale RES-growth in a niche for over a decade. In general, it can be stated that the economic attractiveness of self-production and consumption of electricity has significantly increased in recent years, particularly with respect to the EEG surcharge and grid charges.

In the past PV was subject to high remuneration rates and all produced electricity had to be fed into the grid. This led to a massive increase in PV energy production in Germany in such a way that the distribution and transmission grids were overloaded. As a consequence, in 2009, a "self-consumption bonus" was introduced allowing producers of solar power to receive a payment from the support scheme and a reduced Feed In Tariff (FIT) rate for the power they did not feed into the grid but consumed at home.²⁷ For prosumers, thus, it became economically more attractive to consume all or a portion of their own electricity instead of feeding all PV power into the grid, as the self-consumption bonus, plus the reduced costs for electricity purchased from the grid, guaranteed a surplus. The bonus was however phased out again in 2012. Grid parity was reached in around 2012 for small residential systems: increasing retail prices for electricity and decreasing remuneration rates for feeding electricity into the grid provided the economic rationale for self-consumption.²⁸

Since August 2014, the existing EEG surcharge which was raised only on electricity circulating in the grid was broadened to all electricity consumed, hence also including self-consumed electricity. For self-suppliers a **reduced surcharge** is applied. In 2015 it was 30 percent of the regular EEG surcharge, in 2016 35 percent and in 2017 40 percent, (see also the question below). This provision was a reaction to the fear of an erosion of the solidarity principle in bearing the cost of the renewable energy support scheme²⁹. Accordingly, because self-consumers fulfil their electricity needs partly with own power, they do not pay the full EEG surcharge but only for the electricity they purchase from the grid³⁰. However, this has the effect that the remaining consumers, who do not produce own electricity, have to bear more of the total cost for the support scheme and this would result in an increase of the EEG surcharge³¹.

As of 2014, feed-in tariffs gradually were no longer fixed by the government, but determined by auction. In 2017, only small renewable installations under a capacity of 750kW are excluded from the auctioning process and still subject to FiTs. For PV, feed-in tariffs are capped once a total capacity of 52 GW is reached (at the end of 2015 PV capacity was 40 GW).

In addition, in Germany, the Neighbour solar supply "Mieterstrom" model (or on-site direct wire mini PPAs) has developed recently. This is however strictly speaking not only targeted to

²⁶ See also Agora Energiewende, Netzentgelte in Deutschland, Dezember 2014, at 13, available at https://www.agora-energiewende.de/fileadmin/downloads/publikationen/Analysen/Netzentgelte_in_Deutschland/Agora_Netzentgelte_web.pdf

²⁷ Tewes, note 6 above, at 19.

²⁸ Ibid., at 20f.

²⁹ Ibid.

³⁰ Ibid.

³¹ Ibid.

prosumer as refers to energy providers through a neighbour-solar-supply model which delivers electricity to final consumers and must therefore satisfy the requirements of a licensed supplier as stipulated in the Energy Industry Law (EnWG). In this model, a provider offers to supply the residents of a building with solar PV electricity from the building's roof. If there is adequate take-up, the provider installs the solar PV system. From a legal perspective the solar electricity is not considered to have been supplied via the public grid even if technically speaking it is using the cables and wires in the building. The residents receive cheaper electricity than if they paid the retail electricity price and the provider receives a return on his/her investment in the solar PV system.³²

The EEG 2017 has been amended as to authorise the federal government to reduce the surcharge for PV on residential buildings through a legislative decree. However the newest proposal by the government seems to skip the option of adopting the decree while promote the implementation of the "Mieterstrom" law that would impose a tariff for directly used electricity. No final decision has been made as yet³³.

6.1. Does your country apply specific tariffs to prosumers

- to charge them for the electricity they draw from the grid for consumption?
- or to compensate them for the electricity they feed back into the grid?

The system of surcharge has changed in the recent amendment of the EEG³⁴. Under the Renewable Energy Sources Act (EEG), only **existing** self-supply installations including small solar systems on house roofs up to a size of 10 kWp for self-consumption will remain fully exempt from the EEG surcharge. If they undergo substantial modernisation, existing installations will be permanently granted a reduction of at least 80% of the surcharge; i.e. they will normally pay a maximum of 20% of the EEG surcharge. For **new installations**, the EEG surcharge will apply to self-supply installations but will be reduced to 40% for new RE plants and highly efficient CHP installations.

Since 2017, according to Article 61 EEG on the surcharge for final consumers and self-suppliers, network operators are entitled and obliged to charge the **EEG surcharge** of final consumers for their energy or own energy supply. The surcharge is however **reduced** in certain circumstances. According to Article 61a EEG 2017, the surcharge does not have to be paid in the following circumstances:

- In so far as the electricity is consumed in the electricity generating plant or in its auxiliary installations for the generation of electricity in the technical sense (power plant consumption),
- When the electricity generating system of the self-supplying unit is neither connected directly or indirectly to the grid
- If the **self-supplier fully supplied himself with electricity** from renewable energies and he does not rely on payments of a market premium or a feed-in tariff for the electricity from its installation, which it does not itself consume
- If electricity is generated from electricity **generating plants with an installed capacity of 10 kilowatts maximum**, for a maximum of 10 megawatt hours of self-consumed electricity per calendar year. This applies from the start-up of the electricity generating plant for a period of 20 calendar years plus the year of commissioning

According to Article 61b the EEG surcharge is reduced in cases of self-consumption in highly

³² See F. Zuber, "The Mieterstrom neighbour solar supply model in Germany", available at http://www.pv-financing.eu/wp-content/uploads/2017/02/pv_inancing_webinar_feb_2017.pdf

³³ Ibid.

³⁴ For an overview of the old legislation and (old) self-consumption bonuses see <https://www.clearingstelle-ee.de/beitrag/1990> (in German only).

efficient CHP plants to 40 per cent of the EEG surcharge on self-sufficiency if:

- The electricity has been generated in an installation; or
- The electricity has been produced in a cogeneration plant which is highly efficient (according to Article 53a (1) of the Energy Tax Act (EnergieStG)) and the cogeneration plant has reached:
 - In the calendar year for which the reduction of the EEG surcharge is to be claimed, an annual utilization rate of at least 70% pursuant to section 53a (1), second sentence, point 2 of the Energy Tax Act;
 - In the calendar month for which the reduction of the EEG surcharge is to be claimed, a monthly utilization rate of at least 70 percent pursuant to section 53a (1) sentence 2 number 2 of the Energy Tax Act

According to Article 61c, in case of **existing installations**, the EEG surcharge is reduced to zero percent under the following instances

- if the final consumer operates the electricity generating plant for self-consumption, as long as
 - the final consumer consumes the electricity himself and
 - provided that the electricity is not passed through a grid, unless the electricity is consumed in a spatial connection with the electricity generating plant.

According to Article 61d, in case of old **existing installations**, the EEG surcharge is also reduced to zero percent under the following instances

- if the final consumer operates the electricity generating plant for self-consumption, as long as
- the final consumer consumes the electricity himself.

According to Article 61e, the EEG surcharge can be reduced in the case of replacement of an (old) existing installations. Accordingly, the surcharge shall be reduced to 20 percent if an existing installation or a plant is renewed or replaced according to this paragraph at the same location without expansion of the installed capacity after 31 December 2017; and insofar as the same final consumer uses the electricity generating plant in accordance with the requirements of Article 61c (1) or Article 61d (1) for old existing installations.

By way of derogation from the above provisions, the entitlement pursuant to Article 61 (1) shall be reduced to 0 percent of the EEG surcharge in the case of renewals or replacements if the

- existing or old existing plant which had been renewed or replaced, would still be subject to depreciation or amortization or funding under the EEG
- The electricity generating plant which replaced or renewed the existing plant or the older plant has not been fully depreciated under commercial law and if the renewal or replacement has taken place based on stone or brown coal in favor of generation of electricity based on gas or renewable energy at the same location.

Regarding combined heat and power generation (CHP), amendments entered into force on 1 January 2017. Accordingly, CHP funding for small installations that generate between 1 and 50 MW will be determined via auctions. The law includes the first essential elements for this and an authorisation to issue ordinances. The necessary ordinance to implement this scheme will be issued in the middle of 2017 and the auctions will commence in the winter of 2017/18.

6.2. Does your country

- tax prosumers in a specific way?
- allocate to them a certain part of the cost to upgrade the grid to accommodate the extra generation they feed into the grid?

No specific taxes to prosumers have been identified. In addition, prosumers are not allocated a certain part of the cost to upgrade the grid to accommodate the extra generation they feed into the grid. The general rules of Article 8 EEG apply.

7. A. What are the conditions that may encourage residential prosumers (to entry into activity or during functioning)?

Answer:

As mentioned above, since 2017, Article 61 EEG imposes a surcharge for final consumers and self-suppliers for their energy consumed or own energy supply. The **EEG surcharge** is however **reduced** in certain circumstances which apply to energy prosumers. In brief, under the Renewable Energy Sources Act (EEG), only **existing** self-supply installations including small solar systems on house roofs up to a size of 10 kWp for self-consumption will remain fully exempt from the EEG surcharge. If they undergo substantial modernisation, existing installations will be permanently granted a reduction of at least 80% of the surcharge; i.e. they will normally pay a maximum of 20% of the EEG surcharge. For **new installations**, the EEG surcharge will apply to self-supply installations but will be reduced to 40% for new RE plants and highly efficient CHP installations.

In particular, according to Article 61a EEG 2017, the surcharge does not have to be paid in the following circumstances:

- In so far as the electricity is consumed in the electricity generating plant or in its auxiliary installations for the generation of electricity in the technical sense (power plant consumption),
- When the electricity generating system of the self-supplying unit is neither connected directly or indirectly to the grid
- If the **self-supplier fully supplied himself with electricity** from renewable energies and he does not rely on payments of a market premium or a feed-in tariff for the electricity from its installation, which it does not itself consume
- If electricity is generated from electricity **generating plants with an installed capacity of 10 kilowatts maximum**, for a maximum of 10 megawatt hours of self-consumed electricity per calendar year. This applies from the start-up of the electricity generating plant for a period of 20 calendar years plus the year of commissioning

According to Article 61b the EEG surcharge is reduced to 40 per cent of the EEG surcharge on self-sufficiency in cases of self-consumption in highly efficient CHP plants. Furthermore, according to Article 61c, in case of **existing installations**, the EEG surcharge is reduced to zero percent if the final consumer operates the electricity generating plant for self-consumption, as long as

- the final consumer consumes the electricity himself and
- provided that the electricity is not passed through a grid, unless the electricity is consumed in a spatial connection with the electricity generating plant.

A study by IEA-RETD identified several opportunities or conditions that encourage the taking up of **prosumers in Germany**.

First, high retail prices combined with **low installation costs** (and constantly falling FIT

payment levels) create an opportunity for solar PV on residential homes, **as self-suppliers do not need to pay the retail prices and can further qualify for a reduction in/exemption of the surcharge** (see question 6.1) and hence self-supply becomes for profitable.

Currently, small-scale systems (e.g. 2 kW) are considered to be economically viable without feeding excess electricity into the grid – in other words, a positive return on investment can be achieved simply by consuming one's own on-site PV generation during the daytime instead of purchasing power from the grid. In fact, the feed-in tariff rates **are now so low in Germany that system profitability can be significantly improved by consuming a portion of power onsite.**³⁵ In addition, IEA-RETD have identified challenges for other actors (non-prosumers) which are in turn also regarded as opportunities for prosumers. IEA-RETD notes the following:

“Early adopter” prosumers have started to invest in **stationary storage capacities**. Their motivation is rather to increase self-sufficiency and thus to reduce their dependence on electricity from the grid instead of maximizing returns. Furthermore, with public **grants for battery storage for systems**³⁶ combined with a further decline in EEG remuneration rates and rising household prices for electricity, a high growth potential for the storage market is expected.³⁷

Regarding **solar community energy, PV plants** up to 1 MW receive up to a total volume of 2,000 MW **feed-in tariffs or market premium** (without tender). No exemptions are included for community energy provided by the PV tendering procedure (500 MW).

B. What are the conditions that may act as barriers for residential prosumers (to entry into activity or during functioning)?

Answer:

The IEA-RETD study also identified barriers regarding to prosumers. In the past, in particular since 2012, the **degression in the remuneration rates** has already caused a massive drop in investment in PV capacity in the residential sector. This can be interpreted as a rise in uncertainty among residential investors as the revenue calculation becomes increasingly risky due to (theoretically) monthly changing remuneration rates and very low remuneration rate for PV.

The **EEG surcharge**: A major concern is that as the number of consumers who are exempt from paying the surcharge grows (e.g. energy-intensive industries), and a growing number of customers reduce their demand through energy efficiency, or via selfconsumption (e.g. prosumers), the higher the surcharge will have to be for remaining consumers. This has pushed the government to look for ways to broaden the base of ratepayers contributing to the surcharge, partly by reducing the number of exempt industrial customers, and partly by requiring prosumers to contribute directly. The proposal to require prosumers to pay a portion of the EEG surcharge³⁸ has been manifested in the EEG reform of 2017. According to the 2017 amendment, prosumers have to pay the surcharge, except in certain circumstances as established above. This hence negatively impacts the economics of PV prosumers. According to IEA-RETD however, from a legal perspective, it is **not yet clear whether it is constitutional** for policy makers to require prosumers to pay surcharges on self-consumed electricity. This issue will likely be debated in the courts in the coming years.³⁹

³⁵ IEA-RETD, Residential Prosumers – Drivers and Policy Options, 2014, at 110.

³⁶ Tewes, note 6 above, at 24

³⁷ Ibid.

³⁸ IEA-RETD, note 35 above, at 110

³⁹ Ibid.

7.1. What are the metering systems for each type of residential prosumer? Do these systems provide adequate conditions for prosumers integration in the market?

Self-suppliers use three different metering systems, namely

- a consumption meter for the power consumed from the public grid
- feed-in meters for the number of kilowatt hours that are fed into the public grid and remunerated according to the EEG and
- yield meters for the number of kilowatt hours produced by one's own PV-system).⁴⁰

These meters guarantee a certain transparency and feedback on one's own consumption pattern, but the majority of these meters are not smart in the sense of enabling intelligent communication with smart home appliances or an external control centre to steer smart consumption or load patterns⁴¹.

According to Tewes, "...measures such as smart load or smart consumption management, are estimated to increase the rate of self-consumption up to just 30 percent. Both these options, however, are currently still characterized as economically unattractive for small prosumers for the following reasons:

- Potential to switch consumption patterns in households is low
- The required technical infrastructure and price incentives are not in place
- Investment in storage capacity is still risky but early adopters seem to pave a way forward
- Concerns about the environmental desirability of certain options to increase the rate of self-consumption"⁴².

The legislation on the "digitization of the energy transition" of 2016 introduced as a step-by-step rollout of smart metering systems, which also have to be installed mandatory from 2017 in all residential prosumer systems with a capacity of >7 kWp. The key aim of the legislation is to increase supply security and hence the idea behind the provisions on metering is to better match distributed feed-in of volatile renewable electricity with the grid's capacity⁴³.

In addition, the BMWI⁴⁴ issued the following recommendations for prosumer systems which clearly refer to the security of supply argumentation: Small systems below 7 kWp are perceived as only potentially relevant for system stability in the future. However, PV systems >7 kWp are perceived as relevant for grid stability. Thus, the installation of advanced smart metering system should be obligatory by 2017 for all (new and existing) RES and CHP systems with a capacity >7 kWp. Systems with a capacity of between 0.8 kWp and 7 kWp are not obliged to install advanced smart metering systems; however, the 2016 bill leaves them the option to install smart metering from 2018⁴⁵.

7.2. What are the billing conditions for each type of residential prosumer?

In Germany, electricity consumption is assessed through meter reading by the distribution network operator or through an estimate based on consumption habits done by electricity suppliers. No specific provisions for prosumers have been identified.

The billing of own consumption with the distribution network operator is straightforward. On the basis of the expected feed-in and self-consumption values, a credit memo is generated on which the remuneration including self-consumption is already fully calculated. On the basis of the credit memo display, the advance payments are then made to the plant operator. At the end of the year, the counter values are checked and the assumptions are adjusted.

⁴⁰ Tewes, note 6 above, at 23

⁴¹ Ibid

⁴² Ibid.

⁴³ Ibid.

⁴⁴ BMWI, Key Issue Paper on a Package of Ordinances Regarding Intelligent (Smart) Grids, 2015, see also *ibid*.

⁴⁵ Ibid.

7.3. Are there measures to encourage the creation of energy communities at municipal level, or other schemes to encourage inclusive development of the market?

Energy communities are very important in Germany. The EEG in the section on principles of the Act (Article 2 (3) S. 2 EEG 2017) includes the maintenance of diversity of actors as one key principle. In Germany, the use of co-operatives – or registered co-operative societies (eingetragene Genossenschaften – eG) is expanding. Traditional cooperatives can be set up to pursue various activities (e.g. housing, farming and building co-operatives), and in reality there is no ‘energy co-operative’ as such. Nevertheless, this ownership model has increased in popularity as a democratic legal vehicle for community investment in renewable energy production.⁴⁶

At the end of 2014, there were 973 energy cooperatives listed in the commercial registry.⁴⁷ The foundation of new energy communities is however decreasing since 2013.

Jahr	2006	2007	2008	2009	2010	2011	2012	2013	2014
Neugründungen	9	23	58	132	160	194	183	104	29
Neueintragungen	9	8	37	90	132	195	187	172	66

⁴⁸

Regarding wind energy, Article 36g EEG2017 includes specific tendering rules for energy communities of wind energy. However these provisions are optional, communities can choose to apply them but do not have to. Alternatively they can also adhere to the provisions which are applicable for other bidders (Article 36 EEG). If communities choose to reply on the general bidders, they do not have to comply with the specific tendering requirements of Article 36g.

7.4. Are there rules facilitating the creation of energy cooperatives to provide a legal entity to energy communities? Are there measures facilitating other type of schemes and if so which ones?

There are certain difficulties for a general determination of the concept of citizens' energy, particularly because there are various organizational and participatory structures as well as the associated different co-determination possibilities. The following core criteria have developed:

- investment in renewable energy systems,
- substantial participation of individuals (citizens),
- Size and organizational form as well
- Regionality as an additional differentiation.⁴⁹

The legal entity which is most used in Germany is the GmbH and Co. KG. It combines elements of a pure limited partnership with a private limited company as a general partner. The individuals are owners of shares with limited responsibility while have co-management rights. The limited company represents the entity and are generally governed by a management board. There are no rules specifically for energy communities facilitating the creation the GmbH & Co. KG. General company law applies.

⁴⁶ Roberts, J, Bodman, F and Rybski, R (2014). Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy. (ClientEarth: London), at 19.

⁴⁷ Jakob R. Müller, Lars Holstenkamp, Zum Stand von Energiegenossenschaften in Deutschland Aktualisierter Überblick über Zahlen und Entwicklungen zum 31.12.2014, available at https://www.buendnis-buergerenergie.de/fileadmin/user_upload/downloads/Studien/Studie_Zum_Stand_von_Energiegenossenschaften_in_Deutschland_Leuphana.pdf

⁴⁸ Neugründungen: new foundations, Neueintragungen: new registrations, see *ibid*, at 8.

⁴⁹ Hoffmann, note **Error! Bookmark not defined.** above, at 8.

However, the EEG since 2017 further includes a definition of “citizens energy community”(Bürgerenergiegesellschaft) in Article 3(15). Accordingly, citizens energy community means any society,

- which consists of at least ten natural persons as voting members or voting shareholders,
- in which at least 51 per cent of the voting rights are held by natural persons who, pursuant to Section 21 or Section 22 of the Federal Law Gazette (Bundesmeldegesetz), have their principal domicile in the district town or the district for at least one year prior to the bidding in the district town or the district in which the planned wind energy installation is to be erected on land, and
- in which no member or shareholder of the Company holds more than 10 per cent of the voting rights in the Company, whereby in the case of a merger of several legal entities or partnerships, a company is sufficient if each of the members of the company fulfils the requirements stated above.

This definition is however tailored to wind energy projects on land. The definition only applies to a certain part and an overall definition cannot be derived from the legal framework.

Further the federal consumer organization “Verbraucherzentrale Bundesverband e.V.” and its decentralized member organizations at the state level offer as part of their on-site counselling on energy-related renovations of private homes, information on grant and subsidy programs for PV, renewable warmth and power storage, as well as individualized calculations and recommendations regarding the economic benefits of investing in the various measures⁵⁰.

7.5. What are the procedures/provisions for establishing cooperatives for prosumers? Are they more simple/less costly than those for other schemes?

See previous question. There are no rules specifically for energy communities or prosumers facilitating the creation of a legal entity. General company law applies.

8. Other questions on the regulatory framework

8.1. What are the provisions for establishing a complaint procedure? What are the complaint handling procedures for each type of residential prosumer?

According to Article 81 (2) EEG 2017, the EEG Clearing House is responsible for questions and disputes arising regarding the application of Articles 3, 7 to 55a, 70, 71, 80, 100 and 101, as well as to the ordinances issued pursuant to this Act and hence also covers disputes and questions regarding prosumers.

The Clearing House EEG was established in 2007 by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and is now operated by the Federal Ministry of Economics and Energy (BMWi). It is a neutral and independent institution for clarifying disputes and application questions of the EEG. In order to clarify disputes and application questions of the EEG, the Clearing House offers the following: mediation, joint dispute resolution, arbitration. Thereby, opposing parties can avoid costly litigation and tedious, lengthy court action, but yet achieve a feasible and mutually acceptable solution.

This is usually achieved through one of the following formal Alternative Dispute Resolution proceedings:

⁵⁰ Tewes, note 6 above, at 28.

- 1.moderated discussions (mediation)
- 2.assessment of the matters of fact and the legal situation in individual cases ('Vote Action')
- 3.arbitration under the code of civil procedure.

8.2. Are there any specific redress procedures available only to residential prosumers?

There are no specific redress procedures available only for prosumers. Article 83a EEG only includes a provision on legal protection in tenders.

Country fiche (Summary and ranking)

The **country fiche** below summarises the information from the report and ranks the **level of favourable impact** of measures in relation to its favourable impact to the take up of residential prosumers.

Country fiche	Ranking Low/Medium/High
General Description of the national regulatory framework - There is no differentiation applicable amongst the different types of <u>residential</u> prosumers - The regulatory framework for energy policy, hence also for residential prosumers, is developed at federal level. However, Germany is a multilevel federal system, thus, the subnational level does not only implement federal law, but also enjoys legal, administrative and budgetary competencies. - The EEG is the main instrument for stimulating self-consumption in Germany, more precisely, Articles 60 to 61e are of special importance. In addition, regarding digitalisation and smart meters, a new law, the Act for the digitisation of the energy industry is to create the right legal framework for this. In addition, the new Electricity Market Act is to be more market-based and to provide for greater flexibility within the entire power system - There is no definition of the term “(residential) prosumer” in Germany.	Medium
Specific Questions on the regulatory framework for residential prosumers	
Permitting requirements for each type of residential prosumer There are no specific permitting requirements for prosumers in Germany. The procedure depends on the technology. Generally, the degree of bureaucratic complexity and the burden for private households to become prosumers are rather low.	Medium
Rules applicable to the access to the grid There are no specific access to the grid provisions for prosumers in Germany. They fall under the general regulatory framework.	High
Incentives (e.g taxes and tariffs) for each type of residential prosumers In general it can be stated that the economic attractiveness of self-production and consumption of electricity has significantly increased in recent years, particularly with respect to the EEG surcharge and grid charges. Since 2017, according to Article 61 EEG on the surcharge for final consumers and self-suppliers, network operators are entitled and obliged to charge the EEG surcharge of final consumers for their own supply. The surcharge is however reduced in certain circumstances	Medium
Conditions encouraging residential prosumers Conditions acting as barriers for residential prosumers Residential prosumer systems are already obliged to have meters or metering systems for power consumed from the public grid (consumption meter), the number of kilowatt hours that are fed into the public grid and remunerated according to the EEG (feed-in meter), and the number of kilowatt hours	Medium

produced by one's own PV-system (yield meter).	
Nearly half (46.6 percent) of the total renewable energy capacity installed in Germany is owned by citizens and citizens' energy cooperative. The EEG since 2017 further includes a definition of "citizens energy community".	
Further aspects on the regulatory framework - Complaint handling procedures for residential prosumers: According to Article 81 (2) EEG 2017, the EEG Clearing House is responsible for questions and disputes arising regarding the EEG and hence also regarding prosumers - Redress procedures available only to residential prosumers: There are no specific redress procedures available only for prosumers.	Medium

Executive summary

The EEG is the main instrument for stimulating self-consumption in Germany, more precisely, Articles 60 to 61e are of special importance. In addition, regarding digitalisation and smart meters, the Act for the digitisation of the energy industry is to create the right legal framework for this. In addition, the new Electricity Market Act is to be more market-based and to provide for greater flexibility within the entire power system.

As such, German law does not have a definition of the term residential prosumers but **defines 'self-supply'** as 'the consumption of electricity which a natural or legal person consumes himself in the immediate vicinity of the electricity-generating installation if the electricity is not fed through a grid system and this person operates the electricity-generating installation himself' (Article 3(19) EEG). There are no specific permitting requirements for prosumers in Germany. The procedure depends on the technology. Generally, the degree of **bureaucratic complexity and the burden for private households to become prosumers are rather low**.

The economic attractiveness of self-production and consumption of electricity in Germany has significantly increased in recent years particularly with respect to **the EEG surcharge and grid charges**. For prosumers it was economically more attractive to consume all or a portion of their own electricity instead of feeding all PV power into the grid, as the self-consumption bonus, plus the reduced costs for electricity purchased from the grid, guaranteed a surplus. However, as of 2014, residential prosumers are subject to a **reduced EEG surcharge**.

There are no specific access to the grid provisions for prosumers in Germany. They fall under the general regulatory framework. The EEG Clearing House EEG is responsible for questions and disputes arising regarding the EEG and hence also regarding prosumers, however there are no specific redress procedures available only for prosumers.