CHAPTER VIII
PROSUMER LEGISLATION IN NORWAY
A First Step for Empowering Small Energy Consumers

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1. INTRODUCTION

Electricity generation in Norway is almost totally based on renewable energy sources, mostly hydropower (96.3% in 2016), followed by thermal power (2.3%) and wind power (1.4%).[1] The price of electricity for end-users is also relatively low compared to the rest of Europe. The absence of an immediate need to 'green' the energy generation mix any further[2] or to generate cheaper electricity explains the absence, for the majority of energy consumers, of a strong need to start producing electricity themselves and to turn into prosumers. This can be illustrated by the fact that in early 2018 only 1,000 Norwegian consumers have become prosumers.[3]

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1 Source: Statistics Norway, SSB, https://www.ssb.no/en/energi-og-industri/statistikker/elektrisitet.

2 This comes also from interviews conducted by researchers in the report by 'Power from the People? Prosuming Conditions for Germany, the UK and Norway', Fridtjof Nansens Institutt, FNI Report 5/2016. Note that this report does not include the latest legislative developments in Norway.

3 There are no direct reporting requirements for prosumers, beside the fact that they may need to contact their network company before installing any generation appliances. This makes it difficult to know exactly how many prosumers there are in Norway. The figure indicated here is based on the data reported by the major DSOs, the Transmission System Operator (TSO) Statnett and the suppliers, under their reporting obligations (transport volumes, trade

Meanwhile, households and other small energy consumers are becoming increasingly aware of the existing opportunities and may find new financial motivations in higher electricity prices. As elsewhere, the costs of solar panels are continuously decreasing, and both attractive and innovative market offers are focusing on prosumers as a market segment.[4] As such, the increase in electricity prices may motivate energy consumers to develop a hedging strategy by producing more electricity themselves. In the first half of 2018, electricity prices have risen significantly compared to previous years because of higher consumption due to a cold winter and because of higher and more expensive imports than usual due to a dry spring.[5] This situation worried consumers, but is expected to return to normal shortly; however, a certain fact is that grid tariffs will increase in the near future due to the need for grid investments. Finally, many Norwegian consumers find the idea of consuming self-produced electricity attractive, in particular when this electricity is based on renewable energy sources. In fact, the vast majority of registered prosumers make use of solar panels, followed by a small number using hydropower, which is traditionally very common in Norway. The topology of the country is such that many landowners develop mini- and micro hydropower plants, primarily for their own consumption, making small-scale hydropower an established practice in the countryside, based on enabling legislation.[6] The prospect of developing smart houses and buildings that are not only achieving zero-emissions, but which are also energy positive, is a growing trend.[7] Still, prosumers are a minority.

volume, etc), pursuant to Chapter 4 of the Regulations governing financial and technical reporting, income caps for network operations and transmission tariffs (the Regulations on network tariffs).

4 Some innovative Norwegian companies in the solar power market have distinguished themselves, such as Otovo.

5 The average price of electricity for households, excluding taxes and grid rent, was 42.5 øre per kWh in the first quarter of 2018, which is a 24% increase compared to the first quarter in 2017. For the same period, the overall price was 106.4 øre per kWh including grid rent and tax. The majority of Norwegian households have an electricity contract tied to spot price (almost 70%), which explains the increase in electricity price experienced in 2018. Source: SSB, Electricity prices, https://www.ssb.no/en/energi-og-industri/artikler-og-publikasjoner/higher-electricity-prices-for-households--351026.

6 In Norway, small-scale hydroelectric power plants are classified into three categories, namely, 'small power plants', with an installed effect between 1 and 10 MW; 'mini power plants' with an installed effect between 100 kW and 1 MW; and 'micro power plants' with an installed effect of less than 100 kW. Micro power plants are the most fitted for the purpose of prosumption under the current legal framework, due to the threshold defined in the legislation. See section 2.1.2.

7 The Directorate for Building Quality is running a specific programme, *Lavenergiprogrammet*, aimed at developing knowledge and good practices for building energy efficient, zero-emissions and energy positive buildings. See: http://lavenergiprogrammet.no.

Likewise, the Norwegian authorities have not shown great ambition in the area of prosumption. The 2012 National Renewable Energy Action Plan[8] does not include any specific quantitative objectives for prosumers. This changed slightly in 2016 when the Government adopted a White Paper on Energy Policy.[9] The document refers to prosumers but only in relation to the deployment of smart-metering.[10] Other parts of the White Paper related to Distribution System Operators' (DSOs) regulation[11] and grid tariff regulation are meanwhile relevant for the future of prosumers policy in Norway and can affect their increase, either positively or negatively.[12]

Together with the direct grants provided by the state enterprise Enova SF for the installation of renewable energy solutions,[13] one of the strongest signals given by the Government in favour of prosumption comes from a recent amendment to the network tariffs legislation. As of 1 January 2017, Norway has revised its legislation in order to provide a clear legal basis for the regime applicable to prosumers, with a focus on residential prosumers, small businesses and buildings. The new provisions are contained in the Regulations governing financial and technical reporting, income caps for network operations and transmission tariffs (the Regulations on network tariffs),[14] which have been amended by the Norwegian water resources and energy directorate (NVE), which is the energy regulatory authority.[15] Prior to this, a first regime facilitating prosumers was already in place. From March 2010 to 1 January 2017, an exemption regime applied, based on a derogation from the general tariffs legislation.[16]

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8 Ministry of Petroleum and Energy, National Renewable Energy Action Plan, 2012. The plan has been made for the purpose of complying with Directive 2009/28/EC on the promotion of the use of energy from renewable sources after its incorporation into the EEA Agreement. The Plan is available at: https://ec.europa.eu/energy/sites/ener/files/documents/dir_2009_0028_action_plan_norway__nreap.pdf.

9 *Energimelding* (Meld. St. 25 (2015–16)).

10 Ibid, p 144.

11 The Norwegian Government has notably expressed its desire to limit the number of DSOs, which is extremely high in Norway (approximately 145 DSOs). This goes against the trend which consists of increasing the number of actors at the end of the grid and promoting decentralised generation.

12 There are numerous distribution operators (around 150) and most of them are publicly owned. A recent committee report ordered by the Government (Reiten-*utvalget*, 'A Better Organised Electricity Network', 2013) has advised the consolidation of the sector through the creation of larger companies instead of those numerous grid operators. The effect of any consolidation of the grid operation sector on the development of prosumption has not been assessed by public authorities.

13 See section 4.2 below.

14 Regulations No 302 of 11 March 1999 governing financial and technical reporting, income caps for network operations and transmission tariffs (the Regulations on network tariffs) (*Forskrift om kontroll av nettvirksomheten – kontrollforskriften*).

15 NVE has delegated competence in the matter.

16 NVE, Decision on exemption from the Regulations on reporting, income and tariffs in connection with grid activity, of 16.03.2010 (*Håndtering av plusskunder og vedtak om dispensasjon fra forskrift 302 om økonomisk og teknisk rapportering m.v.*).

This exemption from certain network tariffs, initially given through a decision made by NVE, and which already focused on residential and small-scale prosumers, is now codified into the legislation and adjusted to recent government policy on prosumption. Consequently, the current legal framework for prosumption in Norway is composed of a few specific provisions based on a production threshold approach, while the general rules governing energy production, transport and consumption continue to apply as soon as the threshold is met.

This chapter discusses the changes that have been made to the Norwegian legal regime to accommodate the development of prosumers. Section 2 examines how the law defines the concept of prosumers. Section 3 discusses permitting requirements and the prosumers' rights and duties as to grid and market access. Section 4 gives an overview of the existing financial incentives in favour of prosumption. Section 5 concludes with an assessment of the current legal regime.

2. THE DEFINITION OF PROSUMERS IN NORWEGIAN LEGISLATION

Recent legislative amendments have ressulted in the adoption of a legal definition for prosumers, which was not the case previously. This is to be considered a major improvement, although the regulatory approach remains relatively simple. In the Norwegian context, prosumers are defined as energy consumers who are generating their own electricity and, within a certain threshold, feed-in and sell the surplus of production that they are not using themselves. Prosumers are defined as a separate category of customer.

2.1. DEFINITION OF PROSUMERS AND THRESHOLDS

The definition of prosumers is included in section 1-3 of the Regulations on network tariffs, as amended.[17] Section 1-3 defines prosumers – called 'plus-customers' (*plusskunder*) – as any end-user with consumption and production behind the connection point, where fed input power at the connection point at no time exceeds 100 kW. Where the consumer owns an installation located on their side behind the connection point which requires a licence (eg for purpose of generation or distribution), or where they are required to hold a power trading licence, they will no longer qualify as a prosumer.

[17] *Forskrift om økonomisk og teknisk rapportering, innteksramme for nettvirksomheten og tariffer* – FOR-1999-03-11-302.

In terms of interpretation, the definition of section 1-3 establishes three main criteria which are reviewed below.

2.1.1. 'End-User with Consumption and Production Behind the Point of Connection'

The prosumer must be an end-user as a starting point. An end-user is defined in Norwegian legislation as 'someone who buys electric energy but does not re-sell it afterwards.'[18] Since the prosumer will be able to sell the surplus electricity generated that they do not consume, there is a distinction to be made between a regular end-user and a prosumer.[19]

The connection point is the physical point of connection to the grid operator's grid. This is defined in the Regulations on network tariffs as 'the point in the electric transport network where electricity is fed in or fed-out, or where there is electricity exchange between grid companies.'[20] To ensure common practices, the sector has also developed guidelines containing technical definitions, including one for 'connection point'.[21] The connection point is there defined as the point in the distribution grid where a decentralised generation unit is connected to the grid operator's grid. It is also commonly referred to as the point of change of ownership between the grid operator and the consumer. In practice, the connection point is usually the meter, ie as of 1 January 2019 the smart meter which enables the measurement of the electricity flow in both directions.[22]

2.1.2. 'Where the Electricity Fed into the Grid (Input Power) at the Connection Point at No Time Exceeds 100 kW'

When the new prosumer definition was being discussed, a main discussion point was whether the threshold should be set in terms of input generation capacity (*innmatet produksjon* or *installert effekt*) or input power (power fed into the grid, *innmatet effekt*). After discussions with stakeholders, NVE has opted for 'input power' as the key criterion. First, it was felt that the wording was more accurate as a prosumer will not feed production capacity, but power into the

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18 Section 1-3, Regulation on the measurement, calculation, billing of grid services and electric energy, grid operators' neutrality, etc. (*Forskrift om måling, avregning, fakturering av nettjenester og elektrisk energi, nettselskapets nøytralitet mv.*).

19 On sale of surplus electricity from prosumers, see section 4.1 below.

20 Section 1-3, Regulations on network tariffs.

21 See, eg, the definition and technical requirements applied to houses, apartments and holiday homes in the standard NEK 399 (*Tilknytningspunkt for el- og ekomnett*), where the cabinet containing the smart meter is defined as the connection point. The configuration may however differ according to the building type, eg individual house or apartment block.

22 The roll-out of smart meters is due to be completed by 1 January 2019 for all metering points, including for households. See section 4-5, Regulations on metering and settlement no 301 of 11 March 1999, as amended.

grid. Second, it was decided not to set a generation cap as other countries may have done.[23] Setting a generation cap would entail measuring and limiting power capacity at each prosumer's premises, which was neither deemed appropriate for the purpose of prosumption nor practical to implement. There is therefore no requirement as to the measurement and reporting of the total amount of electricity generated at the prosumers' premises (and thus no requirement to install a meter for production), but a requirement based on the reading of metering data at the connection point, where both electricity consumed and fed into the grid is measured.

Setting the limit at 100 kW for the input power was another core issue discussed with stakeholders during the public consultation phase. Some actors (notably DSOs) were of the opinion that the threshold was set too high, and would be too generous towards large consumers that should not be subject to the same preferential regime than prosumers.[24] Other actors (eg small producers' associations, environmental organisations) claimed that the threshold was set too low and would result in artificial limitations of the potential for prosumption. For example, it could entail the splitting of buildings into smaller units for the purpose of avoiding reaching the limit with the negative consequence of not building the most energy-efficient buildings with the biggest possible surfaces (in particular for apartment blocks, public or commercial buildings and farms). Another consequence pointed out by stakeholders was that not all parts of the grid can stand an input power of 100 kW. Some stakeholders also raised concerns as to the consequences the threshold would have on grid dimension and the manner in which DSOs may try to minimise investment costs by dimensioning otherwise, whether that was by under-dimensioning to exclude prosumption or over-dimensioning to anticipate the inclusion of prosumers' input. NVE deems this risk to be non-existent as any miscalculation of grid dimensioning will negatively impact the efficiency component integrated into the tariffs calculation applied to DSOs, which will negatively affect their income.[25] The objective pursued by the Norwegian authorities in setting a 100 kW limit is to enable households, but also small public or commercial consumers and apartment buildings, to be included within the prosumer regime. Therefore, they decided in favour of flexibility, waiting for the market to mature. Compared to other European countries, 100 kW input power is a relatively high threshold, but not uncommon (eg Spain, Iceland, France).[26]

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23 For an overview of the criteria applied in other European countries, see the Annex to the Third Report on the State of the Energy Union presented on 23 November 2017 (COM(2017) 688 final): Study on 'Residential Prosumers in the European Energy Union,' GfK Belgium consortium, 2 May 2017.

24 See the description of the tariffs exemption regime in section 3.2.1 below.

25 NVE, Report 47-2016.

26 The study undertaken in the context of the Third Report on the State of the Energy Union presented on 23 November 2017 (COM(2017) 688 final) reveals that a group of European

It is the responsibility of each prosumer to stay within the threshold limit of 100 kW fed into the grid. If the DSO discovers that the prosumer has gone over that threshold, the prosumer will lose its status and be obliged to pay more of the tariffs (eg the generation charge).[27] Meanwhile, anyone who loses their prosumer status can regain it if the necessary measures are taken to bring it back under the 100 kW-threshold.[28] In case of disagreement, grid operators and prosumers can bring the case before NVE, which will reach an administrative decision.

2.1.3. 'A Prosumer Cannot Possess an Installation Which Requires a License Behind the Connection Point or Any License for Sale of Electricity Behind the Connection Point'

This entails that the status of prosumer is restricted to persons or legal entities who are not subject to licensing obligations or balancing agreement, as requested for normal production, transmission/distribution installations or entities involved in power trading. This means that no licence is required for prosumers under the Energy Act (generation, transport, trade)[29] as long as the installation is below the indicated threshold, which will be the case for most residential and small-scale commercial prosumers. At the same time, this also means that prosumers cannot carry out activities otherwise requiring a licence, such as the sale of electricity. No electricity distribution or trade is allowed behind the connection point if they want to keep the status of prosumers.[30]

Prosumers remain subject to other regulatory obligations in relation to building permit and construction works requirements.

First, prospective prosumers will need to assess whether they need to apply for a building permit under the Plan and Building Act (PBA) for the installation of the generation appliances at their premises.[31] As said, prosumers will mostly be interested in installing solar panels on the roof or the facade of their house/building. This type of installation or construction work may be encompassed by the permitting obligation under the PBA, where the house/building owner will need to apply for a permit from the responsible municipality, unless they fall

countries uses a 10 kW generation capacity cap to define residential prosumers, following the recommendation of the International Energy Agency (IEA). Study on 'Residential Prosumers in the European Energy Union,' GfK Belgium consortium, 2 May 2017.

27 On tariffs structure and the exemption regime for prosumers, see section 3.2.1 below.

28 *Endringer i kontrollforskriften vedrørende plusskundeordningen*, *Oppsummering av høringsuttalelser og endelig forskriftekst*, Rapport 47-2016, NVE (hereafter NVE, Report 47-2016). Available at: http://publikasjoner.nve.no/rapport/2016/rapport2016_47.pdf.

29 Prosumers are, in principle, exempted from the licensing obligation according to section 3-1 of the Energy Act.

30 For example, a prosumer cannot supply or sell electricity to their neighbours.

31 Section 20-1 (list of operations) and section 20-2 (application obligation), Plan- and Building Act (*Lov om planlegging og byggesaksbehandling, plan- og bygningsloven*).

under one of the exemptions defined in the Act.[32] Where the installation of the appliances results in minor alterations to the building or where it is consistent with the local town plan, there is no need to apply for a permit. This means that the requirement for a building permit will be assessed on a case-by-case basis, depending on the type of housing/building, the size of the installation, the surroundings and the content of the local town plan. In practice, the installation of solar panels on the roof of residential consumers' house rarely requires a building permit.

Second, prospective prosumers will remain subject to the Regulations on technical requirements for construction works (TEK 17 Regulation), notably the part defining requirements for energy supply solutions.[33] Fulfilling the requirements of the TEK 17 Regulation has practical implications as to the manner in which the generation appliances are integrated into the building. The use of renewable energy as a supply solution may also help to meet the general requirement relating to energy efficiency in buildings.

2.1.4. Assessment

The Norwegian prosumers legislative framework currently applicable is an enabling framework, focusing on small-scale energy consumers. The legislation does not distinguish between the different sources of energy for the purpose of electricity generation. The Norwegian definition of prosumers is to be deemed technology neutral.[34] All sources of energy and technologies used for generating electricity are covered, although the use of non-renewable sources for the production of electricity is very unlikely to happen. This is in line with the official view of the Government as to prosumption. In the summary of the public hearing,[35] the energy regulator NVE explained that the new prosumer regime is not meant as a support scheme for renewable energy.

2.2. THE PARTICULAR CASE OF HOUSING COOPERATIVES

A criticism expressed by stakeholders during the public consultation phase is that the new definition does not fit very well with the situation for apartment

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32 Section 20-5 f, Plan- and Building Act (*Plan- og Bygningsloven*).

33 *Forskrift om tekniske krav til byggverk* (*Byggteknisk forskrift* – TEK17), Chapter 14 (Energy), Section 14-4 (Requirements for energy supply solutions) and Section 14-5 (Exceptions and requirements for special projects).

34 While the legal definition of prosumers and the tariffs regime are technology neutral, the available financial incentives vary according to the type of installation. See section 4.2 below.

35 Endringer i kontrollforskriften vedrørende plusskundeordningen, Oppsummering av høringsuttalelser og endelig forskriftekst, Rapport 47-2016, Norwegian Water Resources and Energy Directorate, NVE. Available at: http://publikasjoner.nve.no/rapport/2016/rapport2016_47.pdf.

buildings, housing cooperatives or joint properties, which could represent a large number of prosumers.[36] Those often possess large areas on the roof, which suits the purpose of electricity generation well, notably through solar PV panels. The reason for this shortcoming is that residential consumers in, for example, an apartment building could generate electricity jointly but the meters are normally individual ones for each apartment, meaning for each consumption unit.[37]

The solution advocated by NVE is to wait until the introduction of the Elhub, which is the national point of data management (data hub).[38] NVE has assigned the Norwegian Transmission System Operator (TSO), Statnett, the task of establishing a data hub that will encompass all metering data for electricity in Norway.[39] The Elhub will aggregate the data of several consumers from different metering points and enable the exchange of the collected data. The purpose of the Elhub, therefore, is to establish an economically efficient IT-infrastructure for an improved retail electricity market in Norway, as well as to encourage demand response by enabling the development of related services. Delayed several times, the new introduction of the Elhub is now fixed at 18 February 2019.[40] As mentioned above, the parallel roll-out of smart meters is supposed to be completed by 1 January 2019.

When the Elhub starts functioning, it is expected that housing cooperatives in apartment buildings, as well as joint properties, will find it easier to claim the status of prosumers.[41] The solution envisaged by NVE[42] is to maintain the system of individual metering of each consumption unit (like apartments) adopted in 2010, but to split ex post the generated electricity and the surplus between the different units. By maintaining a system of individual metering, the objective of the Norwegian authorities is also to promote energy efficiency measures by making each consumer aware of its exact consumption. Each consumer will also get full access to the new services which can develop and which are associated with the use of individual smart meters. This will also ensure that each consumer gets information from the grid company about, for example, power outage, and the customers' rights associated with such events. NVE finally argued that if the individual metering of each unit was not allowed, this would result in an unfair allocation of network costs between end-consumers.

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36 'Endringer i kontrollforskriften vedrørende plusskundeordningen, Oppsummering av høringsuttalelser og endelig forskriftstekst', Rapport 47-2016, NVE. Available at: http://publikasjoner.nve.no/rapport/2016/rapport2016_47.pdf, p 11.

37 See NVE, Report 47-2016, p 11.

38 See NVE, Report 47-2016, p 11. See also the article on NVE website: 'Mulig å bli plusskunde i boligselskap', latest updated 10.01.2018, available at: https://www.nve.no/nytt-fra-nve/nyheter-reguleringsmyndigheten-for-energi/mulig-a-bli-plusskunde-i-boligselskap/.

39 The Elhub will be operated by a subsidiary owned by Statnett.

40 Further information on the Elhub is available at: http://elhub.no/.

41 Discussions on the treatment of joint properties (*sameie*) are less advanced and still ongoing.

42 This solution was already described by NVE in the supplementary public hearing related to prosumers which took place in 2015.

3. THE TREATMENT OF PROSUMERS IN GRID REGULATION

While most prosumers will already be connected to the grid, the installation of additional energy generation appliances will impact the functioning of the local grid to varying extents. DSOs will need to accommodate this new form for flexibility in the use of the grid. The relationship between the end-users and the grid company is also slightly different, as the status of 'prosumer' generates new rights and obligations for both the prosumer and the grid company. The perspective of not only generating electricity for self-consumption (reduced use of the network) but also feeding electricity into the grid can create needs for grid reinforcement. In the case of new smart buildings, or already self-sufficient buildings in more remote areas (like holiday houses or farms), there may be a need to build new grid connections, which involves higher infrastructure investments since there is no pre-existing connection. It is indeed expected that a significant number of prosumers will consist of new buildings without a connection yet, whether this be for residential purposes (like zero-emissions or energy positive houses), or for non-public/commercial purposes (like offices, supermarkets or schools).[43] The following sections analyse the requirements related to grid connection and access to the grid, and how the regime applies to prosumers.

3.1. CONNECTION OF PROSUMERS TO THE GRID

3.1.1. General Rules for Connection to and Reinforcement of the Grid

A particular feature of the Norwegian grid is that it is split into three grid levels: the national, regional and distribution grids. The national grid corresponds to the transmission grid and is under the responsibility of the TSO, Statnett. The regional and distribution grids are both encompassed by the concept of distribution grid under the EU Electricity Directive.[44] The regional grid makes the link between the transmission and distribution grids, and consists mainly of power grids between 66kV and 132kV.[45] The Norwegian distribution grid corresponds to local power grids. It normally delivers electricity to end-users at a voltage of up to 22 kV.[46] This means that prosumers, as defined under

43 The owners of those commercial buildings will often aim to reach the Breeam-certification standard. Breeam stands for Building Research Establishment Environment Assessment Method and is used to help measure the sustainability of buildings.

44 Article 2(5), Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity.

45 The regional grid encompasses network infrastructures over 22 kV which are not qualified as transmission infrastructure. Section 1-3, Regulations on network tariffs.

46 Ibid.

Norwegian law, may be connected to regional or distribution grids, the latter being most likely.

Chapter 3 of the Energy Act defines the regime for access to the grid.[47] Pursuant to section 3-3 of the Act, a distribution company shall provide physical delivery of electricity to all consumers within the geographic area covered by its local area license. Pursuant to section 3-4 of the Act, all entities holding a licence according to sections 3-1 and 3-2 (network and production facilities) shall connect new electricity generation installations, as well as new installations, for electricity consumption. The grid connection obligation covers all necessary network installations from the point of connection to the point of supply to consumers and includes the need to make new investments. The licence defines detailed duties and conditions, including the rules for providing access to the grid at non-discriminatory and objective terms and conditions. The Ministry of Petroleum and Energy (MPE) (when it comes to consumption) and NVE (when it comes to production) may, under exceptional circumstances, provide for an exemption to the physical delivery and connection obligations (including needs to invest).[48] The further relationship between the grid operator and the consumer is governed by a contractual agreement.

Although those provisions are not specific to prosumers, sections 3-3 and 3-4 on the grid connection obligation are both equally important for them. Prosumers, because they also are consumers, will rely on the physical delivery of electricity (section 3-3) when they are not able to produce sufficiently themselves. Then, electricity generation units and consumers, including prosumers, are given a right to access the grid, which includes grid connection and access (section 3-4). Equally important is that the connection obligation is associated with a duty to invest in infrastructure development when necessary. The background for section 3-4 (which entered in force on 1 January 2010) was the implementation of EU requirements on access to the grid in the Renewable Energy Directive, the purpose of which was to support the increase of new renewable energy generation, and in particular small-scale generation.[49] This provision also fits the purpose of prosumers. In sum, prosumers will be entitled to the rights of both consumers and producers for the purpose of physical delivery and connection to the grid.

The Implementing Regulations No 959 pursuant to the Energy Act define further the conditions of application of the grid connection requirement. Section 3-4 of the Regulations requires that:

- The connection obligation applies where it is the most rational to connect the generation facility;

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47 See in particular section 3-3 to section 3-5, Energy Act.

48 Section 3-3, para 2, and section 3-4, paras 2 and 3, Energy Act.

49 Article 16, Directive 2009/28/EC on the promotion of the use of energy from renewable sources; incorporated into the EEA Agreement by Decision of the EEA Joint Committee No 162/2011 of 19 December 2011 amending Annex IV (Energy) to the EEA Agreement.

- If the connection requires further investments in the main part of the licensee's grid, this must, in principle, be covered by the licensee;
- The licensee must put forward a schedule for the connection;
- Access shall be provided on non-discriminatory and objective terms and conditions;
- Any request for exemption must be handed over to NVE.

The questions would therefore be: (i) whether a DSO can refuse to connect a prosumer, and in which capacity – consumer or producer – when there is no pre-existing connection; and (ii) whether a DSO can refuse to upgrade the grid and make the necessary investments in order to accommodate the additional power fed in by the prosumers, in case of pre-existing connection.

Finally, the connection/reinforcement obligation only applies if the connected installations of the prosumers fulfil the technical requirements outlined in the legislation and the technical standards for electricity supply quality as defined in their contract with the grid operator, as noted in section 3.2.2 below.

3.1.2. Connection Procedures for Prosumers' Generation Installation

The procedure for assessing the need for connection or reinforcement of the grid as a consequence of prosumption is managed directly by the grid operator. In the absence of a legally defined procedure, grid operators have had to develop their own procedures. Although these can vary, some common patterns and practices can be identified. The procedure is subject to private arrangement with the distribution company.

When a consumer envisages installing a small generation facility on their premises and also feeding the surplus of electricity generated to the grid, they will first make contact with an electrical installation contractor. Together, they will assess the prosumer's facility and submit an application to the grid operator. The application will contain several documents, including: a notification on installation work (*Melding om installasjonsarbeid*, MOI); and a declaration of connection (*erklæring om tilkobling*).[50] If the application is approved by the DSO, and following the various connection requirements defined by law, the DSO will either: approve the connection, reinforce the connection, or proceed to a new connection, including making new investments if necessary. The connection will be subject to a private contractual arrangement between the prosumer and the DSO, replacing the existing agreement in case of pre-existing installations. Prosumers must contact their electricity supplier in parallel with the above procedure.

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50 See, as an example, the process describe on the website of one of the main DSOs: https://www.eidsivanett.no/plusskunder/.

The DSO can itself require the payment of a grid investment fee (*anleggsbidrag*) for the investments that it would need in order to connect the prosumer (new production facility) or to reinforce the grid connecting existing customers (reinforced or increased connection).[51] The methodology for calculating how much a system operator can ask for that purpose is regulated by law[52] and controlled by NVE. The purpose of the investment contribution is to make customers aware of the costs of expanding and upgrading the grid. Customers can weigh the need for grid access or reinforcement against the costs involved. In addition, the investment contribution is intended to separate the investment costs between the customer who triggers the investment and the other grid customers. As a general rule, grid investments triggered by a particular customer's needs are to be paid by that customer. Similarly, the connection of new customers to the grid should not negatively impact other customers connected to the same local grid, whether that be due to new inputs from generation or outputs from consumption. However, as long as the prosumer's activities do not involve changes in its overcharge profile, the DSO cannot require the payment of the grid investment fee.

As mentioned above, the grid operator will also set technical requirements for connection of any new generation facility, including generation installation at prosumers' premises. Respecting the technical requirements is meant to avoid disruption (reduced supply quality) on the network for other customers. The grid operator also usually requires that the prosumers' installation is able to be disconnected automatically in case of power outage on the network.[53] The prosumer is responsible for making sure their installation complies with the technical requirements.

3.2. USE OF THE GRID, NETWORK TARIFFS AND THE TREATMENT OF PROSUMERS

The main rule is that all producers must pay the tariff for feeding into the grid. In the case of prosumers, the central provision in the regime is an exemption from certain network charges for the consumers who would like to feed their surplus electricity. The following describes both the exemption regime for prosumers and the conditions under which they can feed electricity into the grid.

3.2.1. Network Costs: The Exemption Regime for Prosumers

Grid transport tariffs are fixed by the network operator in accordance with the criteria and the methodology defined by law and supplemented by guidance

51 Section 17-5, Regulations on network tariffs.
52 Chapter 8, Regulations on network tariffs.
53 It is predicted that smart-metering will assist in that task.

from NVE. The tariffs must be set in a non-discriminatory manner, but can be differentiated based on network-related criteria that are objective and verifiable. Another fundamental principle of optimal tariffs design is that all grid users should pay a price that is equal to the short-term marginal cost incurred through their use of the grid. The marginal loss can be positive or negative depending on whether changes in electricity fed into or tapped from the grid increase or decrease the energy loss.

For small energy customers (households, holiday homes and small commercial customers), the legislation defines two main components of the network tariffs that also apply to producers, ie the energy component (NOK/kWh) and the fixed component (NOK/year).[54] The energy component, or usage-dependent energy component, corresponds to compensation for the energy losses in the network system. The energy component for producers who feed into the distribution is set based on marginal losses in the network system as a whole. The energy component from the distribution grid may therefore be used to cover a share of the other fixed costs of grid operation. The energy component is not sufficient to cover all grid operation costs and must therefore be supplemented by a fixed component. Grid operators use other tariff components to cover the remaining costs and to provide a fair return on grid investments in the form of a fixed charge. For the purpose of calculating the fixed charge, the grid companies can divide customers into different categories (residential, holiday homes, public/commercial buildings) who are offered different tariffs on the basis of relevant grid conditions. The fixed component is paid by metering point, and therefore the metering data is used to adjust this fixed component.[55] The fixed charge constitutes about 30% of the network tariff.[56]

Under the new regime, which came into force in January 2017, prosumers are exempted from the payment of other tariff elements for feeding electricity into the grid, ie the fixed component. The legal basis for the exemption is section 16-2, paragraph 3 of the Regulations on network tariffs. This exemption regime is *de facto* the main financial incentive for energy consumers to become prosumers, although it will not save them enormous sums compared to their initial investment.[57] Furthermore, prosumers who reduce the costs of power

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54 Customers with an installed capacity exceeding a set limit, eg over 80 or 125 amperes, or customers with an expected annual consumption exceeding 100 000 kWh, usually have a capacity charge (NOK/kW) in addition to the fixed and energy charges. The capacity charge is based on used capacity within defined periods of time.

55 The requirements applicable to metering are defined in the Regulations on metering and settlement.

56 Source: SSB. For a comparison with other Nordic countries, see Nordic Energy Regulators (NorREG), 'Tariffs in Nordic countries – survey of load tariffs in DSO grids,' Report 3/2015, Annex 4.

57 In the public summary of the submissions to the public consultation (NVE, Report 47-2016), NVE calculated that, for a producer with 100 kW installed power, the fixed component will amount to NOK 1800/year (in 2016).

losses on the grid may receive payment from the energy component. As explained above, the marginal loss can be positive or negative. This is justified by the fact that prosumers pay a price for the energy-component which reflects the short-term marginal cost incurred.[58]

According to NVE, exemption from the fixed component must be understood as a 'tariff-provision' and is not meant as a financial support scheme. This argument can be debated, as the exemption provision does confer an advantage to a separate category of producers. Meanwhile, prosumers are not allowed to trade electricity on the market and will not be licensed for it. Therefore, it can also be argued that this will not directly distort competition on the relevant product and geographic market, as long as the surplus electricity is offered to suppliers for the purpose of re-sale on the open market. The situation would be different if the prosumer were obliged to sell its surplus electricity to only one actor on the market, which could then distort competition. Questions of compatibility with internal market rules could have been raised as to the practice followed until the new provisions came into force, and which may still apply until the Elhub becomes operative, consisting in selling the surplus electricity directly to the grid operator.

3.2.2. Contractual Conditions for Feeding into the Grid and Billing Prosumers

The legislation does not determine contractual conditions for feeding electricity into the grid. Prosumers will need to conclude a specific 'prosumer agreement' with the grid company for the purpose of feeding electricity into the grid, referred to as a 'plus-customer agreement' in the Norwegian context (*plusskundeavtale*). The prosumer agreement between the prosumer and the grid company is subject to contractual freedom and each company has designed its own agreement. However, conditions for setting tariffs in general are covered by the Regulations on network tariffs, as explained above.[59]

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58 In order to bring even more flexibility to the interpretation of the threshold and to facilitate feeding into the grid more electricity from small energy consumers interested in prosumption (especially from buildings), NVE has recently proposed revisions to the Regulations on network tariffs. The new rules will entail that the fixed component of the tariffs will be based on the actual volume of electricity fed in by all producers, including those under 1 MW, a component which was before based on installed capacity but not the precise use of the grid. Therefore, hydropower generation could be treated preferentially to, eg solar power (with shorter time of use). The calculation of the tariffs will therefore better reflect the actual use of the network, without discriminating between types of generation facilities. Prosumers who exceed the 100 kW threshold and that will need to pay the fixed component, will consequently pay a 'fairer' contribution than previously. The new rules will enter into force on 1 January 2019. See the hearing document: NVE, *Forslag til endring i forskrift om kontroll av nettvirksomhet*, Høringsdokument, 6-2018.

59 See section 3.2.1 above.

General conditions on billing apply and there are no special billing conditions for prosumers.[60] The sale of electricity or other related services will fall under the provisions of the Marketing Act. The Consumer Ombudsman and the energy industry have also developed joint guidelines for the marketing of electricity which will apply to the relationship between prosumers and their grid operator/supplier.

A general requirement of quality of electricity supply applies, pursuant to the Regulations No 1557 on the quality of supply in the electricity market. The Regulations define the technical criteria for supplying electricity into the grid. Those criteria will be applied by the grid operator when electricity is fed into the grid. Those conditions will apply to prosumers. If the electricity supplied to the grid by prosumers does not comply with those technical standards, the grid operator may refuse access to the grid as it will threaten electricity system management. Until general technical standards are adopted by the sector, several DSOs have indicated that they will apply the existing technical standard 'VDE-AR-N 4105:2011-08'.[61]

4. FINANCIAL INCENTIVES IN FAVOUR OF PROSUMPTION

Empirical research has found that the main motivation for becoming a prosumer may not necessarily be related to economic considerations based on the savings or additional incomes for the energy consumers, but often relates to a personal choice of lifestyle (eg greater autonomy, environmental protection, desire to follow technological trends, stylish aspect of solar panels).[62] This assessment may be slightly different for public or commercial entities for which the earnings may be higher. Nevertheless, there is a series of financial rewards from not only producing and consuming one's own electricity, but also selling the surplus electricity.

The primary financial incentive in favour of prosumption consists in the revenues from the sale of the surplus electricity that prosumers will produce. This economic gain is combined with the money saved from not paying the full grid fees (the fixed component), which normal producers must pay and, in the

60 Requirements related to the billing of end-customers are defined in Chapter 7, Regulations on metering and settlement.

61 https://www.vde-verlag.de/normen/0102017/vde-ar-n-4102-anwendungsregel-2012-04.html.

62 H Westskog, TH Jackson Inderberg, H Sæle and T Winther, 'Strøm fra folket? Drivkrefter og barrierer', CICERO Report 2018:04, April 2018. As to international research, see 'Residential prosumers – drivers and policy options (re-prosumers)', International Energy Agency's Renewable Energy Technology Deployment (IEA-RETD), 2014.

case of prosumers, can be equal to zero or even negative, as explained above. In addition, prosumers may benefit from direct grants and local support schemes for the capital investment in the generation installation.

4.1. REVENUES FROM SELLING THE SURPLUS ELECTRICITY

When it comes to the surplus of electricity generated by the prosumer, the latter will need to re-negotiate its agreement with the electricity supplier. After the Elhub becomes operative, the prosumer will need to sell the surplus electricity to an electricity supplier. Prosumers will be required to contact the electricity supplier and negotiate the selling terms. As there cannot be more than one electricity supplier per connection point, the prosumer will offer the surplus electricity to the supplier it already has a supply agreement with. Where the prosumer wishes to offer the surplus to another supplier, they will need to change supplier. So far, suppliers have offered to buy the prosumer's surplus electricity at spot price in the relevant pricing area (in average 1 øre/kWh). To keep it simple, the price offered by the supplier for the surplus electricity will be deducted from the electricity bill of the energy customer turned prosumer.

It is submitted that the approach followed in Norway appears to be more market-friendly than, for example, in countries where the surplus electricity fed into the grid is reimbursed by the State through a fixed direct compensation (eg Austria, Germany). In most cases, the latter practice will qualify as State aid under the definition of Article 107(1) TFEU, but is exempted from the use of a bidding process for allocation of the aid under the Guidelines on State Aid for environmental protection and energy (2014–20) (EEAG).[63] Most residential prosumers will be well below the limits set out in the EEAG, but Member States can choose to set lower limits. Norway has not taken that opportunity, choosing, once again, a more market-oriented approach.

However, until the Elhub becomes operative, a temporary exemption regime approved by authorities applies, under which the prosumer can sell the surplus electricity to its grid company.[64] If, during that transition phase, the prosumer insists on selling the surplus electricity to its supplier, the DSO cannot refuse it. Compared with other European countries, selling the surplus electricity back to the grid operator appears to be a common practice (eg Denmark, Germany). In some circumstances, this results in an equivalent reduction from grid costs. However, letting the DSO buy electricity raises questions of possible distortions

63 Guidelines on State Aid for environmental protection and energy (2014–2020) (EEAG), para 127. See chapter VI of this volume, discussing the case of Germany.

64 NVE, Decision on exemption from the Regulations on reporting, income and tariffs in connection with grid activity, of 16.03.2010 (*Håndtering av plusskunder og vedtak om dispensasjon fra forskrift 302 om økonomisk og teknisk rapportering m.v.*).

of competition. The volume purchased from prosumers is very limited at the moment, but with a large number of local DSOs and an increasing number of prosumers, the risks of market distortion could increase in some parts of the Norwegian grid. This accepted practice also raises question of compatibility with unbundling requirements applicable to DSOs.

A final incentive linked to the sale of electricity could originate from the non-payment of the value added tax (VAT) for the surplus electricity sold by the prosumer. In some European countries, the surplus electricity sold is exempted from VAT up to a certain threshold.[65] It is worth noting that the European Court of Justice (ECJ) ruling in the *Fuchs* case (C-219/12) has established that the operation of a photovoltaic installation (ie solar panel) on or adjacent to a private house, which results in the supply of electricity to the network in exchange for income on a continuing basis, does constitute an 'economic activity.' Such activities are normally liable to tax. In Norway, in principle, the electricity sold by the prosumers to the DSO or supplier, is not exempted from VAT. However, prosumers will not pay the electricity tax (*elavgift*) for the electricity they produce and use themselves.[66] The budget line refers to 'the producer', which raises questions of interpretation when the owner of the solar panels and the consumers are not the same (eg in apartment buildings), a matter which still needs to be clarified. It is notable that this exemption applies differently to solar PV installations and other sources of energy. The tax exemption on self-consumed electricity is consequently not technology neutral. The fiscal treatment of the electricity which can be stored in the buildings (eg in electric cars or batteries) and re-used or injected into the grid, has not yet been investigated.

Finally, another financial incentive from electricity generation could originate from the sale of guarantees of origin. Because residential prosumers will barely reach the production threshold (1 MWh over a set period), there is no measurement requirement for their production and prosumers are not able to engage in electricity trading, thus they are not expected to receive guarantees of origin for the electricity they produce.[67]

4.2. SUPPORT SCHEMES

The most relevant financial scheme measures in favour of self-consumption and prosumption are under the competence of Enova SF, a public enterprise owned

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65 For example, in Austria, up to an annual household income of €30,000. Source: see n 23 above.

66 This exemption regime developed as a practice, without legal basis until the state budget for 2018. The exemption has been recognised for the first time in the State Budget for 2018 and will be codified in the legislation. See Chapter 5541 post 70 'Om avgift på elektrisk kraft' in Prop. 1 LS (2017–2018), Skatter, avgifter og toll 2018, p 336.

67 *Forskrift om opprinnelsesgarantier for produksjon av elektrisk energi*.

by the MPE.[68] Enova manages the Energy Fund[69] and provides for a system of direct grant for the installation of appliances at home, such as solar panels.[70] The grant is increased if the installation works in combination with other energy solutions, such as energy efficiency measures. In practice, the majority of the current prosumers have received a grant from Enova.[71]

Municipalities can adopt local support schemes in favour of electricity generation from specific sources. This has been the case for example in Oslo, where the municipalities provided financial support in the form of direct grant to households in the phase of prospection before the installation of solar PV or for the installation costs themselves. Most of those local schemes have been repealed on the grounds that the market is mature enough for prospective prosumers to find the information by themselves.

As stated by NVE, the prosumers regime currently in place in Norway is not meant as a support scheme for renewable energy sources. Meanwhile, certain prosumers could be interested in applying to the existing support scheme, which in Norway is a tradeable green certificates scheme (called el-certificates).[72] The first question will be to determine whether the consumer interested in becoming a prosumer is qualified to receive the green certificates for their surplus production. If they do qualify, the prosumers will get green certificates in proportion to the electricity they produce, and will then be able to sell them on the market. In practice, it is not expected that residential prosumers would be interested in applying for these because the application fee is too high to make it economically interesting for them. However, commercial consumers that fall under the definition of prosumers could be interested in applying to the green certificates scheme. Recently released data shows that the announcement in 2015, that it would be possible to obtain green certificates and become a prosumer, encouraged the installation of more solar panels in 2016, mostly for the benefit of more commercial actors.[73] Where the prosumers' facility qualifies

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68 Enova SF was established in 2001. Enova's action focuses on the promotion of measures in favour of energy efficiency and renewable energy sources, with various financial support programmes in place, including for households.

69 The Energy Fund has been approved by the EFTA Surveillance Authority, ESA. The Energy Fund is financed via a small additional charge to electricity bills. In addition, the Energy Fund has been also allocated the proceeds from 'The Green Fund for Climate, Renewable Energy and Energy Efficiency Measures'.

70 For an overview of the different grants provided by Enova to households, see: https://www.enova.no/privat/.

71 Enova: Enovatilskuddet fordelt på tiltak og fylker, April 2018.

72 For a description of the green certificates scheme in Norway, see: O Boge, 'The Norwegian-Swedish Electricity Certificates Market' in MM Roggenkamp and H Bjørnebye (eds), *European Energy Law Report X*, Intersentia, Cambridge, Antwerp, Portland 2014, Chapter IX.

73 'Det er flere tak å ta av, vi har så vidt bare skrapt litt i overflaten', Teknisk Ukeblad, 27 February 2017, at: https://www.tu.no/artikler/norsk-solkraftutbygging-naer-firedoblet-i-2016-vi-har-savidt-skrapt-i-overflaten/377031.

under the green certificates scheme, receiving green certificates and financial support from Enova at the same time is not possible as that would amount to overcompensation.[74]

5. ASSESSMENT

As in many other energy matters, Norway distinguishes itself from other European countries on the question of prosumption. This is mainly explained by the absence of a clear need for greening the generation mix or ensuring additional generation flexibility, and by a lack of serious requests from energy consumers. Meanwhile, prosumers are a small but growing community among energy consumers. Norwegian authorities have also provided a regulatory incentive by clarifying the legal basis for the prosumption regime. The latest legislative changes represent both a codification of previous practices (based on an exemption regime) and a slight tightening-up of the rights and duties of prosumers and DSOs as to tariffs regulation.

The regulatory approach followed is relatively simple, based on one single law provision and focusing on the need to ensure that the excess electricity generated by prosumers is fed effectively into the grid. The prosumer regime consists almost exclusively in an exemption to part of the grid tariffs. Financial incentives are to be found primarily in the cumulated effects of the savings from grid costs, the sale of surplus electricity and the support for the purchase of generation appliances such as solar panels.

As the market grows and the financial attractiveness of self-generation technologies such as solar PV increases, there will be a need for amendments to the regime. The treatment of groups of prosumers such as a cooperative or apartment blocks could be improved and prosumption made more attractive for those consumers. Adjusting the threshold of 100 kW input power is also a political decision concerning the type of prosumption policy the Norwegian authorities want to pursue, not least the share of prosumption in the retail market. The interaction between self-consumption, prosumption and demand response is not promoted to a great extent. The legislation also prevents prosumers from engaging in electricity sales activities, which is the prospect of peer-to-peer energy trading and one of the possible applications of blockchain technologies.[75] Meanwhile, allowing prosumers to enter the retail

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74 Rules on cumulation of aid are defined in both the EEAG and bilateral Treaty between Norway and Sweden on a joint green certificates market (*Avtale mellom Norge og Sverige om et felles marked for elsertifikater*, 29 June 2011, as amended).

75 See for such prospects and the need for regulatory reforms: S Lavrijssen and A Carrillo Parra, 'Radical Prosumer Innovations in the Electricity Sector and the Impact on Prosumer Regulation' (2017) Sustainability 9(7) 1–21.

power market would raise practical issues, not least in terms of grid balancing, which are not precisely assessed in Norway. Another source of forthcoming regulatory amendments will be the need to align Norwegian legislation with the forthcoming revision of the Electricity Directive and Renewable Energy Directive as part of the Clean Energy for All Europeans legislative package put forward by the European Commission on 30 November 2016, which relates mostly to legal acts already incorporated into the EEA Agreement. Therefore, the adoption of the recent amendments to national legislation should be seen as a first step towards a more elaborate regime for prosumption in Norway and greater empowerment for energy consumers.