

## Article

# The Role of Renewable Energy Prosumers in Implementing Energy Justice Theory

Saulė Milčiuvienė<sup>1</sup>, Julija Kiršienė<sup>1</sup>, Enrique Doheijo<sup>2</sup>, Rolandas Urbonas<sup>3</sup> and Darius Milčius<sup>3,\*</sup>

<sup>1</sup> Law Faculty, Vytautas Magnus University, K. Donelaičio st. 58, LT-44248 Kaunas, Lithuania; saule.milciuviene@vdu.lt (S.M.); julija.kirsiene@vdu.lt (J.K.)

<sup>2</sup> Deloitte, Torre Picasso–Plaza Pablo Ruiz Picasso 1, 28020 Madrid, Spain; edoheijo@deloitte.es

<sup>3</sup> Lithuanian Energy Institute, Breslaujos st. 3, LT-44403 Kaunas, Lithuania; rolandas.urbonas@lei.lt

\* Correspondence: darius.milcius@lei.lt; Tel.: +370-687-80491

Received: 13 August 2019; Accepted: 23 September 2019; Published: 25 September 2019



**Abstract:** In recent years, the use of photovoltaic-based distributed electricity generation has played a key role in achieving climate and energy policy goals. The energy market is changing rapidly from centralized generation towards unbundling generation, transmission, distribution, and supply activities. As energy consumers also become producers, a new energy market player—the prosumer—is emerging. The role of the prosumer as a market player can be analyzed in terms of implemented technological solutions, economic assessment, environmental impact, and legal regulation requirements. The aim of this article is to investigate the importance and compatibility of energy prosumers with energy justice theory in the context of European Union (EU) law. The authors concluded first that an energy prosumer will help to meet energy justice goals only if government ensures support for generation facilities for low-income consumers, as only then can intrageneration equity be achieved. Second, seeking to ensure equality among places with different energy sources, the government should promote the development of generation facilities using different renewable energy sources. Third, the short-term electricity market, which may allow energy prosumers to participate, should be developed.

**Keywords:** energy justice; prosumer; renewable self-consumer

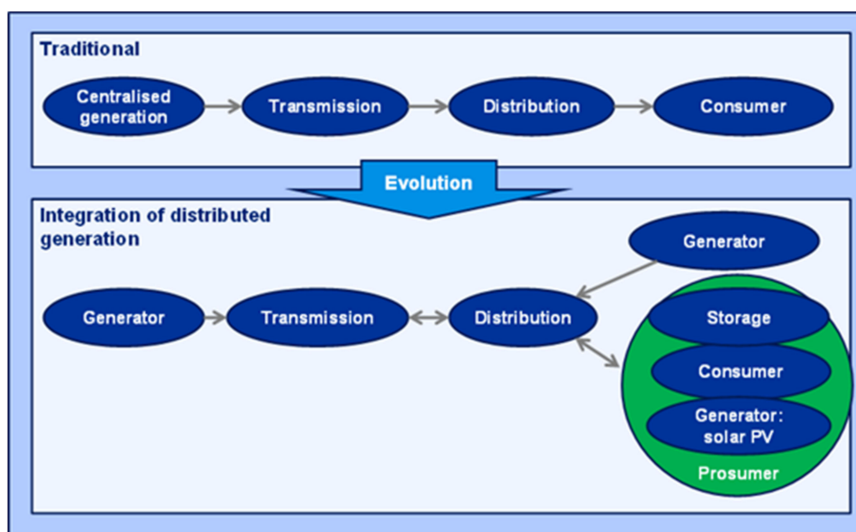
## 1. Introduction

The energy sector is changing very rapidly. Not only are the technologies, enterprises, and property rights changing, but also fundamental changes are occurring in the paradigm of regulation of the energy sector. Fifty years ago, holding monopoly rights in energy production, transportation, and supply, state-owned energy companies were dominating. This structure of the energy sector was based on the doctrine that only companies with monopoly rights can be efficient, and that state ownership is the best possible way of governance of energy companies to avoid abuse of monopoly power and to ensure the proper supply of public services.

However, it was later discovered that private actors and competition could ensure the most efficient way to operate in the energy sector and the market. This paradigm shift was followed by the privatization of energy companies and the unbundling of generation, transmission, distribution, and supply activities.

Over the last decade, new theories of economic regulation have been developing. They include energy justice, energy democracy, and the distributed economy. Distributed generation based on self-consumption could also have a positive impact in reducing grid losses. Although the idea of distributed generation is not new in the energy sector, only recently have new technologies (especially

solar photovoltaic and batteries) enabled the implementation of this idea in practice (Figure 1). The times when huge, centralized generators produced most of the electricity are changing; now, more and more electricity is produced from renewable energy sources, and new technologies are allowing for consumers not only to consume, but also to supply their surplus electricity to the grid. As energy consumers are also becoming producers, a new energy market player—the prosumer—is emerging. Moreover, currently distributed generation based on renewables could guaranty a sustainable energy supply, which is more effective in economic terms than the current centralized process using fossil fuels. The adoption of these solutions can contribute to mitigating energy poverty.



**Figure 1.** Evolution of electricity systems, with distributed generation based on solar photovoltaic power.

The implementation of the energy prosumer concept could lead to essential changes in the energy market. The self-sufficiency of the energy prosumer will increase and in peak hours demand for energy will decrease if onsite energy storage technologies (for example, batteries in case of solar photovoltaic electricity generation) is used. Photovoltaic systems produce electricity mainly during the daytime. In the case the energy prosumer has a variable electricity price, own consumption during the daytime may have a positive effect on the cost of electricity for the energy prosumer and reduce exposure to the volatility of electricity prices. The main benefit of the increasing number of energy prosumers, which uses renewable technologies, is related to the reduction of carbon emission and positive impact on the mitigation of climate changes. Despite all benefits, due to the need for stable energy supply energy prosumers will remain connected to the national networks. As more and more customers will fulfil their's energy needs by onsite energy generation it could reduce the network usage and increase the network usage price for the rest of customers. In case photovoltaic systems produce more electricity than it is consumed, losses in the transmission and distribution system may be increased and the fluctuation related to non-stable generation can negatively impact the voltage and frequency stability.

The increasing role of the energy prosumer is emphasized in the 2016 European Commission legislative proposals on renewable energy and the internal electricity market. The European Parliament and the Council adopted a new directive (European Union (EU)) 2018/2001 “On the promotion of electricity from renewable energy sources” on December 11, 2018 [1], which was one of the of eight legislative acts of the “Clean energy for all Europeans” package, published by the Directorate-General for Energy (European Commission) in 2019 [2]. Recognizing that only the changing role of consumers can meet the existing challenges in the energy sector, the European Commission put not energy companies, but energy consumers at the center of the energy sector. The active customer, renewable self-consumer, and energy prosumer are terms based on newly emerging paradigms of energy democracy, energy justice, and the distributive economy [3].

The prosumer as a market player can be analyzed in terms of technological solutions implemented, economic assessment, environmental impact, and legal regulation requirements.

Herein, we try to answer the following question: do energy prosumers contribute to the implementation of energy justice in Europe?

The main tasks of the article are (i) to reveal the main characteristics of energy justice theory in the changing energy market, (ii) to examine the concept of prosumer, (iii) to discuss the role and function of the energy prosumer in the electricity market in the EU, and (iv) to compare the impact of the energy prosumer in the electricity sector with the basic ideas of energy justice theory.

This article has three main parts. In the first part, the essence of the theory of energy justice is revealed. The second part analyzes the concept of the prosumer and his or her main activities in the energy market. The third part examines the compatibility of the energy prosumer with energy justice theory, assessing the influence of the prosumer on the availability and affordability of energy service, intragenerational equity, intergeneration equity, and responsibility.

## 2. Methodology and Data

In this article, the analysis is based on doctrinal legal research [4]. It includes (i) an analysis of EU legal acts, the drafts of EU legal acts, EU preparatory documentation, and EU strategies, (ii) a review of the scientific literature, and (iii) case analysis. It employs descriptive, historical, and comparative analysis.

### 2.1. Analysis of Energy Justice Theory

We analyzed and identified the main feature of the last stage of development of energy law—energy justice. The main research methods were a literature review and analyses. The main sources are [5–11].

### 2.2. Analysis of the Concept of the Renewable Energy Prosumer

In this part, we first examined the definition of a prosumer, and we identified the indispensable features of the prosumer. We employed literature review, analysis, and comparative methods. Second, we identified the indispensable features of the renewable self-consumer, and we compared them with the indispensable features of the prosumer to prove that the renewable self-consumer is also a prosumer. We analyzed legal acts and preparatory documents, and we also used the method of comparison. Third, we identified the role of the renewable self-consumer, mainly by analyzing the legal acts and preparatory documents, and by employing a case analysis method. The main sources are [12–28] and various pieces of EU legislation.

### 2.3. The Renewable Self-Consumer and Energy Justice Theory

As in the first part, we identified the main aims of energy justice theory, and in the second part, we identified the role of renewable self-consumer in the energy market; in this part, we developed the discussion of whether the renewable self-consumer contributes to implementing energy justice theory.

## 3. Discussions and Results

### 3.1. Identification of the Main Goals of Energy Justice Theory in the Changing Energy Market

To reveal the compatibility of the prosumer concept with contemporary energy law, this section presents a short overview of energy justice theory and identifies the main characteristics of energy justice theory. According to these characteristics, the compatibility of the energy prosumer with energy justice theory is analyzed in the following parts of the article.

Energy law lacked a coherent philosophical basis for many years [5]. The lack of a societal goal led energy law to its current stage of evolution—energy justice. At this point, the question arises, what is energy justice: What criteria define what regulations are in line with energy justice theory?

Scholars identify different main criteria that reveal the basic principles of energy justice theory. Initially, three main groups of these criteria are presented.

Heffron et al., emphasize the following main elements of energy justice: (i) cost: how it is distributed among community members (recognition justice); (ii) benefits: how the availability of access to a modern energy system is ensured (distributional justice); (iii) decision making: how due process and proper representation are ensured in the decision-making process (procedural justice) [5]; and Sovacool et al. also emphasizes (iv) globalization: how energy issues are handled at the international level (cosmopolitan justice) [6]. Scholars argue that to implement energy justice, the above-mentioned elements should be considered when making decisions in the energy sector.

Heffron et al. also emphasize that there are two particularly important elements of energy justice: (i) to ensure just and equitable decision-making and (ii) to provide benefits for all members of society at each stage of the energy cycle [5].

Accordingly, Ramazan et al. developed criteria for decision making. They presented a decision-making framework for energy justice, which is comprised of eight principles: (1) availability, (2) affordability, (3) due process, (4) good governance, (5) sustainability, (6) intergenerational equity, (7) intragenerational equity, and (8) responsibility [7].

It is worth explaining the criteria of inter-intragenerational equity, as they are not often listed in the literature. It is widely accepted that the world will face large climate changes in near future caused by the extensive emission of greenhouse gasses, mainly from the transportation and energy sectors [8]. The policy and economic instruments used to reduce greenhouse gas emissions will impose different burdens on different people [9]. Intragenerational equity is primarily about how we should distribute the burdens within particular generations, either within the generation living today or within future generations [10]. On the other hand, intergeneration equity is about the distribution of burdens between the current generation and future generations, as the costs of mitigation are borne by the current generation, while future generations benefit from it [11].

Analyzing the above-mentioned elements of energy justice theory, we have found that all of them contribute to one or several goals listed below: (i) everyone should have access to basic energy services, (ii) responsible use of energy resources, and (iii) fair activity from business and governmental institutions. Table 1 presents the possible categorization of elements of energy justice theory according to these aims.

**Table 1.** Main goals of energy justice theory.

No.	Main Goals	First Group of Criteria	Second Group of Criteria	Third Group of Criteria
1.	Everyone should have access to basic energy services.	(i) cost: how it is distributed among community members (recognition justice); (ii) benefits: how the availability of access to modern energy system is ensured (distributional justice); (iii) globalization: how energy issues are handled at international level (cosmopolitan justice).	(i) to provide benefits for all members of society at each stage of the energy cycle.	(i) availability, (ii) affordability.
2.	Responsible use of energy resources.	(i) cost: how it is distributed among community members (recognition justice); (ii) benefits: how the availability of access to modern energy system is ensured (distributional justice); (iii) globalization: how energy issues are handled at the international level (cosmopolitan justice).		(i) sustainability, (ii) intergenerational equity, (iii) intragenerational equity, (iv) responsibility.
3.	Fair activity from business and governmental institutions.	(i) decision making how due process and proper representation are ensured in decision-making process (procedural justice).	(i) to ensure just and equitable decision-making.	(i) due process; (ii) good governance.

### 3.2. The Concept of the Energy Prosumer in the EU

This part identifies the main characteristic and functions of energy prosumer in order to assess their compatibility with energy justice theory.

First, we analyze the concept of energy prosumer comparing definitions which are presented in the dictionaries and the scientific articles. Second, we investigate whether the term “renewable energy consumer” used in EU legislation means “energy prosumer”. To answer this question, we track the term “renewable energy prosumer” through the legislative procedure. The changes of the term “renewable energy prosumer” during legislative procedure disclose the main discussions concerning the scope of rights and obligations of “renewable energy consumer” in EU institutions. It allows better to identify the characteristic attributed to renewable energy prosumer by the EU legislation. Third, we investigate the role of energy prosumer in the EU energy market, seeking to identify its impact on the development of the electricity sector.

This part of the article presents the different definitions of prosumer, discusses the concept of prosumer, reveals the peculiarities of the renewable energy prosumer, and analyzes its role in the EU energy market. The key functions of the prosumer and the key aspects of legal regulation are identified for comparison with energy justice theory later in the article.

Initially, the prosumer concept was developed by Alvin Toffler (1980), in his book, *The Third Wave* [12]. In this book, Toffler argues that in future, the consumer will produce more goods and services for self-consumption.

The word prosumer is made from two words: “producer” and “consumer” [13]. The Cambridge Dictionary explains that the prosumer is “a customer who helps a company design and produce its products” [13]. The Oxford Living Dictionary gives a slightly different definition, “a consumer who becomes involved with designing or customizing products for their own needs” [14]. It might be observed that the Oxford Living Dictionary emphasizes that the prosumers produce goods for their own needs; however, the Cambridge Dictionary does not limit the aim of production only to prosumers own needs.

In the literature on energy, a prosumer is usually defined as someone who produces and consumes energy. “A prosumer is someone who both produces and consumes energy” [15]. “Prosumers are individuals who are both able to ‘produce’ as well as ‘consume’ products or services” [16]. “Prosumers in the energy markets are energy consumers who produce or co-produce their energy demand individually or through collective organizations” [16]. “Prosuming refers to when energy customers actively manage their own consumption and production of energy” [17]. Energy prosumers can be grouped depending on certain features they have: (i) connection to the grid: connected to the grid or self-sustainable (not connected); (ii) trading: not trading electricity in the market, trading directly, or trading through an intermediary; (iii) storage capacities: with storage capacities or without storage capacities; and (iv) functions: actively participating in demand response or passive in demand response.

An analysis of these definitions leads to the conclusion that there is no homogeneous definition of a prosumer. However, all definitions have the same two components: “produce” and “consume.” This means that the main feature of an energy prosumer is the ability to consume and produce energy. All other named features, for example “individually or through collective organizations” or “for their own need” are additional, and they can be significant only for defining certain types of prosumers: they are not required features.

### 3.3. Electricity Prosumers in European Union Legislation

It is important to stress that the word “prosumer” is not used in the newly adopted directives (EU) 2018/2001 “On the promotion of electricity from renewable energy sources” [1] and (EU) 2019/944 “On common rules for the internal market for electricity” [18]. The directive (EU) 2019/944 “On common rules for internal market in electricity” [18] uses the term “active customer,” and the directive (EU) 2018/2001 “On the promotion of electricity from renewable energy sources” [1] uses “renewable self-consumer.” As this research focuses on the renewable energy prosumer, this part of the

article brings up the question of whether a renewable self-consumer, as defined in the EU directive (EU) 2018/2001 “On the promotion of electricity from renewable energy sources”, is an energy prosumer. First, we define the main features of a renewable self-consumer. Second, we compare them with the previously examined required features of an energy prosumer.

Analysis of the evolution of the definition of renewable self-consumer during the legislative procedure can reveal the most debatable aspects of the energy prosumer in European institutions. Accordingly, we compare the definitions proposed by the European Commission, the European Parliament, and the European Council.

In Table 2 an analysis of the definition of “renewable self-consumer” is presented. It is obvious that in its proposal for the directive (EU) 2018/2001 “On the promotion of electricity from renewable energy sources”, the European Commission linked the definition of “renewable self-consumer” with the definition of “active customer” [18], stating that a “renewable self-consumer” is an “active customer” with some specific features. The European Parliament only slightly changed the proposed definition concerning the place of generation and storage of electricity. However, the European Council considerably changed the definition of renewable self-consumer, removing the reference to active customer, allowing Member States to define the boundaries of operation of renewable self-consumers, and forming the separate definition of jointly acting renewable self-consumers. Later, the European Parliament adopted [19] the proposed definition of the European Council; therefore, we analyze it in detail.

The analyses of proposed definitions show that the issues concerning the place of operation of renewable self-consumer were widely discussed in European institutions. The European Parliament and the European Commission limited the place of operation of self-consumer to his or its own premises by giving an exhaustive list of possible places. The European Council advocated the viewpoint that each Member State is in the best position to define the place of operation of renewable self-consumer, suggesting that each Member State should define the boundaries of operation, without restricting itself to the premises of renewable self-consumer.

From this analysis, we can determine the essential features of a renewable self-consumer. A person is a renewable self-consumer if he or she has these required features: (1) he or she is a final customer; (2) within his or her premises, or elsewhere if allowed by Member States, he or she generates, consumes, stores, or sells self-generated electricity; (3) the above-mentioned activities do not constitute his or her primary commercial or professional activity.

As in previous section of the article we concluded that the main feature of an energy prosumer is the ability to consume and produce energy, now we can conclude that despite the fact that the EU legislation does not use the term prosumer, a renewable self-consumer obviously is also an energy prosumer, as a self-consumer performs two required functions: consuming and generating electricity, and the self-consumer can also sell and store electricity.



**Table 2.** Evolution of Definitions of Renewable Self-Consumer During Legislative Procedure.

EU Commission [20]	EU Parliament [21]	EU Council [22] and the Definition in the Directive (EU) 2018/2001 [1]
<p>“renewable self-consumer” means an active customer as defined in Directive [MDI Directive]</p> <p>who consumes and may store and sell renewable electricity which is generated within his or its premises, including a multi-apartment block, a commercial or shared services site or a closed distribution system, provided that, for non-household renewable self-consumers, those activities do not constitute their primary commercial or professional activity;</p>	<p>“renewable self-consumer” means an active customer or a group of customers acting together as defined in Directive... of the European Parliament and of the Council [on common rules for the internal market in electricity (recast), 2016/0380 (COD)]</p> <p>who consume and may store and sell renewable electricity which is generated within their premises, including a multi-apartment block, residential area, a commercial, industrial or shared services site or in the same closed distribution system, provided that, for non-household renewable self-consumers, those activities do not constitute their primary commercial or professional activity;</p>	<p>“renewable self-consumer” means a final customer operating within its premises located within confined boundaries or where allowed by Member States, on other premises,</p> <p>who generates renewable electricity for its own consumption, and may store and sell self-generated renewable electricity,</p> <p>provided that, for non-household renewable self-consumers, those activities do not constitute their primary commercial or professional activity;</p> <p>“jointly acting renewable self-consumers” means a group of jointly acting renewable self-consumers according to Definition (aa) who are located in the same building or multi-apartment block;</p>



### 3.4. The Role of the Energy Prosumer in the Electricity Market

It is expected that an energy prosumer will play an important role in meeting basic energy policy goals.

The energy prosumer will add additional renewable energy generation capacity that is essential for the energy system, as the consumption of electricity by residential consumers will increase significantly as a result of the increased usage of electric vehicles and heat pumps. It is anticipated that the implementation of the distributed generation and energy prosumer concept will help to cope with the growing demand for electricity, and it will increase the use of renewable energy.

The energy prosumer will not only add additional generation capacity, but also install smart technologies that will allow him or her to participate actively in demand management according to electricity market price signals. Seeking to pay a lower price for electricity, energy prosumers will be able to modulate their demand. Leal-Arcas et al. emphasize that the transformation from consumers to prosumers will affect both small and large consumers [23]. The energy prosumer will also be able to act through intermediaries (like aggregators) rather than directly. Accordingly, it is expected that consumers will consume electricity when the price is low, and they will reduce their consumption when the price is high.

Renewable energy prosumers will increase the competition in the electricity market, because the number of energy suppliers will increase, and the market power of big players will reduce. The implementation of distributed generation technologies (renewable energy technologies, such as solar roofing, wind energy, or combined heat and power) will lead to the development of not only individual energy prosumers, but also jointly acting energy prosumers and energy communities, in this way significantly increasing the number of different types of players in the market.

Overall, energy prosumers should add renewable energy generation capacities and increase the usage of renewable energy, actively participate in demand management, and increase competition in the market. The directive (EU) 2018/2001 “On the promotion of electricity from renewable energy sources” predicts additional benefits from decentralized generation: the utilization of local energy sources, increased local security of energy supply, shorter electricity transportation distances and reduced energy transmission losses, and it will foster community development and cohesion by providing income sources and creating jobs locally [1].

The EU had no uniform legal regulations for energy prosumers. Consequently, in the Member States, the legal regulations varied widely, and they were not always favorable to energy prosumers. The European Commission strongly supported the idea of encouraging energy prosumers in its 2016 proposal for new energy legislation, and it gave significant importance to prosumers in the development of the energy market. In the impact assessment for the European Commission proposals for new energy directives, [25] the European Commission described the vision of the electricity market in 2030 and beyond. “The 2030 electricity market is highly flexible and provides a level playing field amongst all forms of generation as well as demand response ... and active consumers” [25]. In addition, the European Commission stressed that it is essential to put the consumer at the heart of the electricity market. The European Commission set out a new role for future consumers, not only to consume electricity, but also to store and generate it. This means that the traditional understanding of the role of the consumer is changing. The consumer is becoming a prosumer. Undoubtedly, the concept of the shared economy is coming alive in the electricity market [3].

In the European Union, the consumer has always played a very important role in the liberalization and (de)regulation of energy markets [16]. However, now the role of the customer is shifting from a consumer, who actively looks for the cheapest energy supplier, to the prosumer, who generates, consumes, stores, and sells electricity. In the third energy package, the consumer was considered a driver of competition [16]. Today’s energy prosumer is responsible not only for stimulating competition, but also for investing in renewable energy technologies, which increases the share of renewable energy sources, and in this way, it decreases the EU’s dependence on energy imports, and it contributes to the achievement of climate targets [16].

Seeking to stimulate consumers, the European Commission considered four main options: (i) not to develop the EU policy framework for self-consumption for renewable energy; (ii) to develop non-binding guidance on self-consumption; (iii) to develop a binding framework, enabling consumers to generate renewable electricity for their own use without their suppliers' permission; or (iv) additionally to the third option to enable distance self-consumption [25]. As an impact assessment showed that third and fourth options would be the most effective at increasing the usage of renewable energy, these options are set in the directive (EU) 2018/2001 "On the promotion of electricity from renewable energy sources" (Self-consumption, Art. 21), and energy communities are being encouraged (Energy communities, Art. 22) [25].

The European Commission seeks to set the common framework for the functioning of the energy prosumer in the energy market. Initially, Article 21 of the directive (EU) 2018/2001 "On the promotion of electricity from renewable energy sources" [1] obliges Member States to adopt laws that produce favorable conditions for consumers to become energy prosumers. This means that in all Member States, the energy prosumer will participate in the energy market. Also, the same article of the directive (EU) 2018/2001 "On the promotion of electricity from renewable energy sources" spells out the main rights of energy prosumers for all Member States. The rights of energy prosumers can be divided into two main groups: (i) operational rights and (ii) financial rights.

The first group of rights is related to the activities undertaken by energy prosumers: (a) to generate electricity from renewable energy sources, (b) to consume generated electricity, (c) to store any excess of generated electricity, and (d) to sell any excess of generated electricity, including through power purchase agreements, electricity suppliers, and peer-to-peer trading arrangements.

These activities enable the energy prosumer to choose between two options. The first option is that the energy prosumer can become sustainable and strive to disconnect his or her facilities from the grid, seeking to avoid any costs related to the grid, system maintenance, and stability (flight from the grid). This option is not preferable, as it would increase the grid maintenance cost for the remaining grid users.

The second option is that energy prosumers can actively participate in the electricity market, and they can contribute to supply and demand management. However, only well-developed short-term markets can ensure that energy prosumers will not seek to disconnect from the grid, but they will actively participate in the market. The European Commission emphasized that adequate market design is crucial for the smooth integration of renewable energy into the market. Therefore, together with an energy prosumer concept, the short-term electricity market that would open the possibility for energy prosumers to participate actively in the electricity market is under development. It is anticipated that the prosumer will use the grid for three purposes: as a "virtual battery" in the net metering case, as a back-up when their own generation is inadequate, and as a way to sell excess electricity. Only energy prosumers who actively participate in the market can significantly contribute to demand and supply management.

Also, it is very important that energy prosumers gain economic benefits from participation in the electricity market. The final energy price, which is paid by the final consumer, consists of many elements. It can be divided into three major components: energy production, a network component, and taxes and levies. The statistical information shows that only 36% of the final bill is the energy production price, 26% goes on network costs, and the remaining 38% is levies and taxes. The structure of the final energy price shows that consumers can be encouraged to move from passive to active market participants – reducing their costs in all or some of these areas.

The second group is financial rights. There are five: (i) the activities of energy prosumers can be charged only in proportion and without discriminatory charges, (ii) the right to operate electricity storage facilities without liability for any double charge, including grid fees for stored electricity that remains within their premises, (iii) the right to get payment for power generated and fed into the electricity grid, (iv) the right to get aid under support schemes, and (v) the right not to be charged for electricity produced and consumed on their premises. It is worth discussing some of them.

First, the European Commission seeks to create a favorable financial environment for electricity storage activities, and while they are not economically sustainable yet, they can play a vital role in supply and demand management. Therefore, the directive (EU) 2018/2001 [1] ensures that Member States will not charge energy prosumers for the storage of electricity that they consume, except in the case of net metering when grid is used as a “virtual battery.” However, individual Member States will decide on the application of storage charges for stored electricity not for self-consumption, but for sale. Second, the right not to be charged for electricity produced and consumed on the premises is not an absolute right. The Member States can set certain charges for generation capacities exceeding 30 kV, if necessary, to ensure the financial sustainability of the electric system. Third, the energy prosumer still is not economically sustainable, as market-based support schemes will be needed for small-scale self-consumption systems during the transition [25].

To conclude, the European Commission wants all Member States to create a favorable environment for energy prosumers. The directive (EU) 2018/2001 “On the promotion of electricity from renewable energy sources” should harmonize the activities of energy prosumers and the financial conditions under which renewable self-consumers act. The legal framework considers two basic interests: (i) to stimulate the activities of energy prosumer to get all possible benefits from them and (ii) to ensure the stability of grids and the rights of grid users.

### 3.5. Legal Status of Household Energy Prosumers

The changing business environment creates situations in which the same person using the same facilities is acting as both a private individual and a professional. The question arises: Does such a person lose all rights, which are guaranteed by consumer protection law? It is important for prosumers to maintain consumer status, while consumer protection law prevents businesses from engaging in fraud or unfair practices against consumers. Also, it provides additional protection for the most vulnerable consumers. In addition to general consumer rights, energy consumers have certain specific ones [26]:

- to have their homes connected to the local electricity network and to be supplied with electricity;
- to choose any energy supplier from the EU offering services;
- to change energy suppliers easily, quickly, and without any extra charge;
- to receive clear information on energy contracts and the right to withdraw from the contracts;
- to get information on their consumption and to be billed based on this information;
- to get information about energy efficiency measures and energy produced from renewable energy sources;
- to get easy and quick dispute resolution;
- to get energy performance certificates for their homes;
- to get access to a single contact point for information.

The new directive (EU) 2018/2001 “On the promotion of electricity from renewable energy sources” expressly states that energy prosumers maintain the rights and obligations of the final consumer. It means that energy prosumers remain the subject of protection of consumer rights law. The question is whether household prosumers in all sectors maintain the rights of a consumer, or whether this protection is granted only to energy prosumers.

The directive (EU) 2018/2001 “On the promotion of electricity from renewable energy sources” expressly states that self-consumers maintain their rights as consumers (Art. 21). However, an analysis of case C-498/16 [27] against Facebook leads to the conclusion that applying the EU legislation and case law on consumer rights, some self-consumers would lose their status as consumers. This conclusion is based on several findings.

First, the court was interpreting Article 15 of Regulation 44/2001, which limits consumer status to “matters relating to a contract concluded by a person, the consumer, for a purpose which can be regarded as being outside his trade or profession” [28]. In his opinion, the Advocate General outlined

two fundamental criteria that help to define the legal status of a contractor. First, consumer status is an abstract right; it is directly related to every individual contract, and it means that the legal status of contractor depends on the nature of the contract. Second, the purpose of the contract should be outside the trade and profession activities of the person, which means that if a person is engaged in economic activity, even if it does not bring an immediate profit, he or she will lose the status of a consumer (par. 29–31) [27].

First, the Court of Justice of the European Union (CJEU) explained that when judging on the status of a contracting party, the individual contract must be evaluated. The CJEU stated that the “position of the person concerned in a particular contract [must be considered], having regard to the nature and objective of that contract ... since the same person may be regarded as a consumer in relation to certain transactions and as an economic operator in relation to others” (par. 29) [26]. According to this explanation, an energy prosumer can be considered a consumer only when he or she uses services and electricity for consumption purposes; however, all activities concerning selling electricity to the grid operator or in the market should be considered commercial.

Second, the CJEU emphasizes that the aim of the contract is very important in deciding whether the person is the consumer or not. We can separate prosumers into major types. Some prosumers only “store” electricity in the grid, and they use it when their own generation is not enough (net metering case). So, relations with the distribution grid operator of such prosumers have no commercial purpose. However, other prosumers trade electricity in the market, and their contractual relations with market participants have a purely commercial purpose, because the prosumers receive income from the energy they sell. According to the court reasoning, such prosumers cannot be considered as consumers: “Only contracts concluded outside and independently of any trade or professional activity or purpose, solely for the purpose of satisfying an individual’s own needs in terms of private consumption, are covered by the special rules laid down by the regulation to protect the consumer as the party deemed to be the weaker party. Such protection is, however, unwarranted in the case of contracts for the purpose of a trade or professional activity” (par. 30) [27].

Also, the court considered the situation in which the same contract had a double purpose: satisfying an individual’s own needs and commercial or professional activities. The court explained that such contractors could enjoy consumer protection rights “only if the link between the contract and the trade or profession of the person concerned was so slight as to be marginal and, therefore, [it] had only a negligible role in the context of the supply in respect of which the contract was concluded, considered in its entirety” (par. 32) [27].

To sum up, according to the preliminary ruling of the CJEU, not all household energy prosumers would be subject to consumer protection law. Energy prosumers fall into two main groups for consumer rights protection law. According to the ruling of the court, one group of energy prosumers that acts as consumers (the trading activity is only marginal) would enjoy consumer protection; the other group, which acts for commercial purposes, would lose the consumer protection in relation to contracts that have commercial purposes. However as mentioned above, the wording of the directive (EU) 2018/2001 “On the promotion of electricity from renewable energy sources” guarantees all household energy prosumers the protection of consumer law, even when their activities have commercial or professional aims. Consequently, such legal regulations can be considered as part of a support scheme for energy prosumers.

### 3.6. Energy Justice and Energy Prosumers

In the previous parts of the article, we discussed the energy justice theory and the role of the energy prosumer in the market. We concluded that legal regulation based on energy justice theory must ensure (i) access to basic energy services for everyone and (ii) responsible use of energy sources. The question is whether energy prosumers will help to meet these goals. It could be concluded that an energy prosumer will be in line with energy justice theory only if a proper legal framework is

implemented, but that unregulated energy prosumers may even prevent the achievement of the goals of energy justice by increase the existing intrageneration inequity.

On the whole, the energy prosumer will generate electricity from local renewable energy sources for his or her own needs, and he or she will sell the excess generated electricity. Such activity will increase the usage of local renewable energy sources, lead to lower volumes of imported energy sources, and significantly contribute to the security of supply domestically. It will also have a positive impact on sustainability and the reduction of greenhouse gas emissions. As a result, energy prosumers are very important to reach efficiency and sustainability, and thus to manage the energy transition in a cost-effective way [16]. They will play a central role in achieving energy policy goals [16], ensuring the responsible use of energy resources.

Additionally, the emergence of energy prosumers will significantly increase private investment in renewable energy technologies. The increasing demand for renewable energy generation facilities will foster the development of new renewable energy technologies and competition between developers and producers. However, it is very important to ensure that all consumers have the financial ability to invest in these technologies; otherwise, the goal of intrageneration equity will not be reached, or it may even be damaged. Without government support, energy prosumers will only increase inequity among low- and high-income consumers. Low-income consumers will be unable to make initial investments in generation facilities and to benefit from being energy prosumers. Therefore, it is very important to establish a proper support scheme for energy prosumers for the installation of generation facilities.

Energy prosumers will help to ensure energy availability for remote areas, where the construction of electricity lines is very expensive and economically unjustifiable. Self-sustainable, renewable self-consumers or energy communities will be able to generate electricity using local renewable energy resources and decentralized self-generation technologies will guaranty a certain set of minimal energy services for local consumers. However, the energy prosumer is not a panacea for energy poverty. Renewable energy sources, like other energy sources, are distributed unevenly. From a global perspective, energy prosumers will deepen the inequality between states having many renewable energy sources and those lacking the appropriate renewable energy sources for electricity production. In some places, consumers simply will have no adequate access to energy sources, so they will be unable to enjoy the benefits of renewable self-consumers. Consequently, existing energy inequality among states will not be solved by the introduction of energy prosumers. For this reason, governments should promote the development of energy technologies, allowing for energy prosumers to use different types of renewable energy sources. The only possible way to diminish inequity among states is to develop economically feasible energy generation technologies for different renewable energy sources.

Energy prosumers may increase the affordability of energy. As the final energy price is composed of electricity generation, transportation, supply, and tax costs, energy prosumers should cover only the generation cost, which is mainly related to the installation of facilities. At this point, it is obvious that the affordability of electricity for low-income consumers will be increased only if a fair support system for installation of generation facilities is set up. However, self-generation will considerably reduce energy bills and the risk of price volatility.

Energy prosumers can also reduce energy prices in the market. Selling excess generated electricity, they will increase the supply of cheap electricity into the grid. This will have a positive impact on energy affordability for consumers who buy energy from the grid. On the other hand, there are concerns that energy prosumers will not use the energy grid, and that this will lead to a significant increase in electricity transportation prices for those who cannot generate electricity themselves. However, as it is anticipated that energy demand will increase dramatically, and that the load on grids will be very high, energy prosumers will help to balance the grid, as they will not require the additional capacity of the grid to ensure their supply of electricity. Likewise, it is very important to create favorable economic conditions for energy prosumers to participate in the market and to remain connected to the grid to sell electricity. Also, participation in the market by energy prosumers is very important for



the implementation of intrageneration equity, as it allows for benefits for a broader range of energy market participants.

The responsibility aspect is closely related to the introduction of energy prosumers to the market. As discussed above, energy prosumers are often not economically sustainable yet, except in places with abundant solar and or wind resources. Accordingly, governments are responsible for creating a legal and financial environment that allows energy prosumers to penetrate the market, creating social and economic benefits. Also, governments are responsible for investment in the research and development of renewable energy technologies, which will increase the competitiveness of energy prosumers in the market.

In a centralized energy market, all the responsibility for the proper functioning of the energy sector falls on the government and the big energy companies; however, now energy prosumers will also have responsibilities, as they are becoming important players in the energy market. Energy prosumers are becoming responsible not only for the effective use of electricity, but also for effective use of energy sources and for reasonable participation in the energy market.

#### 4. Conclusions

Over time, the development of energy law has been influenced by many drivers that represented the narrow interests of individual groups; however, it lacked a societal goal. The newly emerging energy justice theory strives to balance the interests of different groups, setting the following aims of legal regulation: (i) everyone should have access to basic energy services, (ii) responsible use of energy resources should be ensured, and (iii) the activity of business and governmental institutions should be fair.

The energy prosumer is the final consumer who consumes and generates electricity. European Union institutions recognize that energy prosumers can significantly contribute to energy policy and climate goals. Accordingly, the European Commission has proposed new legislation that should stimulate the development of energy prosumers and harmonize the legal regulation of energy prosumers in all Member States. The directive (EU) 2018/2001 “On the promotion of electricity from renewable energy sources” establishes the set of activities that energy prosumers will be allowed to undertake and their main financial rights. The legal framework considers two basic interests: (i) to stimulate the activities of energy prosumers to get all possible benefits from them and (ii) to ensure the stability of the grid and the rights of grid users.

The directive (EU) 2018/2001 “On the promotion of electricity from renewable energy sources” guarantees to all household energy prosumers the protection of consumer law, even when their activities have commercial or professional aims. Consequently, such legal regulation can be considered as part of a support scheme for household energy prosumers, as according to general norms and the case law of the CJEU, consumer law would apply only to energy prosumers who consume self-generated electricity.

An energy prosumer will help to meet energy justice goals: to ensure that everyone has access to basic energy services and to ensure responsible use of energy resources. However proper legal regulation is required to avoid a possible increase in intragenerational inequality. First, the government should provide support for low-income consumers, as only then can intrageneration equity be achieved. Second, seeking to ensure equality among places with different energy sources, the government should promote the development of generation facilities using different renewable energy sources. Third, the short-term electricity market, which will allow energy prosumers to participate, should be developed.

**Author Contributions:** Conceptualization, D.M.; Prosumer concept analysis E.D., R.U.; Legal environment analysis J.K., S.M.; Writing—original draft, S.M.; Writing—review & editing, J.K., D.M., and R.U.

**Funding:** This article has been elaborated in the project iDistributedPV. This project has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No. 764452.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the Promotion of the Use of Energy from Renewable Sources (Recast). Official Journal of the European Union L 328/82. Available online: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001&from=EN> (accessed on 23 September 2019).
2. Clean energy for all Europeans Package, Published by Directorate-General for Energy (European Commission) in 2019 (doi:10.2833/9937). Available online: [https://publications.europa.eu/en/publication-detail/-/publication/b4e46873-7528-11e9-9f05-01aa75ed71a1/language-en?WT.mc\\_id=Searchresult&WT.ria\\_c=null&WT.ria\\_f=3608&WT.ria\\_ev=search](https://publications.europa.eu/en/publication-detail/-/publication/b4e46873-7528-11e9-9f05-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=null&WT.ria_f=3608&WT.ria_ev=search) (accessed on 23 September 2019).
3. Proposal for a Directive of the European Parliament and of the Council on Common Rules for the Internal Market in Electricity (Recast). COM/2016/0864 Final/2 - 2016/0380 (COD). Available online: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52016PC0861> (accessed on 23 September 2019).
4. Kharel, Amrit, Doctrinal Legal Research (February 26, 2018). Available online: <https://ssrn.com/abstract=3130525orhttp://dx.doi.org/10.2139/ssrn.3130525> (accessed on 23 September 2019).
5. Heffron, R.J.; Talus, K. The evolution of energy law and energy jurisprudence: Insights for energy analysts and researchers. *Energ. Res. Soc. Sci.* **2016**, *19*, 1–10. [CrossRef]
6. Sovacool, B.H.; Dworkin, M. Energy justice: Conceptual insights and practical applications. *Appl. Energ.* **2015**, *142*, 435–444. [CrossRef]
7. Sari, R.; Voyvoda, E.; Lacey-Barnacle, M.; Karababa, E.; Topal, C.; İslambay, D. *Energy Justice: A Social Sciences and Humanities Cross-Cutting Theme Report*; Shape Eenergy: Cambridge, UK, 2017.
8. United States Environmental Protection Agency. Global Greenhouse Gas Emissions Data. Available online: <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data> (accessed on 23 September 2019).
9. Bye, B.; Kverndokk, S.; Rosendahl, K.E. Mitigation costs, distributional effects, and ancillary benefits of carbon policies in the Nordic countries, the UK and Ireland. *Mitig. Adapt. Strat. Gl.* **2002**, *7*, 339–366. [CrossRef]
10. Kverndokk, S.; Rose, A. Equity and justice in global warming policy. *Int. Rev. Environ. Resour. Econ.* **2008**, *2*, 135–176. [CrossRef]
11. Kverndokk, S.; Nævdal, E.; Nøstbakken, L. The trade-off between intra-and intergenerational equity in climate policy. *Europ. Econ. Rev.* **2014**, *69*, 40–58. [CrossRef]
12. Toffler, A. *The Third Wave*; Bantam Books: New York, NY, USA, 1980.
13. Cambridge Dictionary. Cambridge University Press. Available online: <https://dictionary.cambridge.org/dictionary/english/prosumer> (accessed on 23 September 2019).
14. Lexico. Available online: <https://www.lexico.com/en/definition/prosumer> (accessed on 23 September 2019).
15. Office of Energy Efficiency and Renewable Energy. Available online: <https://www.energy.gov/eere/articles/consumer-vs-prosumer-whats-difference> (accessed on 23 September 2019).
16. Cseres, K. The Active Energy Consumer in EU Law. *Euro. J. Risk Regul.* **2018**, *9*, 227–244. [CrossRef]
17. Parag, Y.; Sovacool, B.K. Electricity market design for the prosumer era. *Nat. Energ.* **2016**, *1*, 16032. [CrossRef]
18. Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on Common Rules for the Internal Market for Electricity and Amending Directive 2012/27/EU 14.6.2019 EN Official Journal of the European Union L 158/125. Available online: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32019L0944&qid=1566980826823> (accessed on 23 September 2019).
19. European Parliament Legislative Resolution of 13 November 2018 on the Proposal for a Directive of the European Parliament and of the Council on the Promotion of the Use of Energy from Renewable Sources (Recast) (COM(2016)0767 – C8-0500/2016 – 2016/0382(COD)). Available online: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P8-TA-2018-0444+0+DOC+XML+V0//EN&language=EN> (accessed on 23 September 2019).
20. Proposal for a Directive of the European Parliament and of the Council on the Promotion of the Use of Energy from Renewable Sources (Recast) COM/2016/0767 final/2 - 2016/0382 (COD). Available online: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016PC0767R%2801%29> (accessed on 23 September 2019).



21. Amendments Adopted by the European Parliament on 17 January 2018 on the Proposal for a Directive of the European Parliament and of the Council on the Promotion of the Use of Energy from Renewable Sources (Recast). (COM(2016)0767 – C8-0500/2016 – 2016/0382(COD)) P8\_TA(2018)0009. Available online: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P8-TA-2018-0009+0+DOC+PDF+V0//EN> (accessed on 23 September 2019).
22. Proposal for a Directive of the European Parliament and of the Council on the Promotion of the Use of Energy from Renewable Sources (Recast) (COM(2016)0767 – C8-0500/2016 – 2016/0382(COD)) Analysis of the final compromise text with a view to agreement. From General Secretariat of the Council to Permanent Representatives Committee. Interinstitutional File: 2016/0382 (COD) Brussels, 21 June 2018 10308/18 ENER 246 CLIMA 114 CONSOM 188 TRANS 274 AGRI 309 IND 175 ENV 455 CODEC 1118. Available online: <http://data.consilium.europa.eu/doc/document/ST-10308-2018-INIT/en/pdf> (accessed on 23 September 2019).
23. Leal-Arcas, R.; Lesniewska, F.; Proedrou, F. Prosumers as New Energy Actors. In *Africa-EU Renewable Energy Research and Innovation Symposium*; Mpholo, M., Steuerwald, D., Kukeera, T., Eds.; Springer: Cham, Switzerland, 2018.
24. Commission Staff Working Document. Impact Assessment. Accompanying the Document. Proposal for a Directive of the European Parliament and of the Council on Common Rules for the Internal Market in Electricity (recast), Proposal for a Regulation of the European Parliament and of the Council on the electricity market (recast), Proposal for a Regulation of the European Parliament and of the Council establishing a European Union Agency for the Cooperation of Energy Regulators (recast), Proposal for a Regulation of the European Parliament and of the Council on risk preparedness in the electricity sector, Brussels, 30.11.2016. SWD(2016) 410 final, PART 1/5, {COM(2016) 861 final}, {SWD(2016) 411 final}, {SWD(2016) 412 final}, {SWD(2016) 413 final}, page 24. Available online: [https://ec.europa.eu/energy/sites/ener/files/documents/mdi\\_impact\\_assessment\\_main\\_report\\_for\\_publication.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/mdi_impact_assessment_main_report_for_publication.pdf) (accessed on 23 September 2019).
25. Commission Staff Working Document. Impact Assessment. Accompanying the document. Proposal for a Directive of the European Parliament and of the Council on the Promotion of the Use of Energy from Renewable Sources (recast), Brussels, 30.11.2016. SWD(2016) 418 final, PART 1/4, pages: 137-146. Available online: [https://ec.europa.eu/energy/sites/ener/files/documents/1\\_en\\_impact\\_assessment\\_part1\\_v4\\_418.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/1_en_impact_assessment_part1_v4_418.pdf) (accessed on 23 September 2019).
26. European Energy Consumers' rights. Publications Office of the European Union. 2015. Available online: <https://publications.europa.eu/en/publication-detail/-/publication/d2eb27f5-b084-454c-adeb-1a2d7f477f91/language-en/format-PDF/source-102002971> (accessed on 23 September 2019).
27. Judgment of the Court Justice of the European Union, 25 January 2018. Maximilian Schrems v Facebook Ireland Limited Case, C-498/16. Available online: <http://curia.europa.eu/juris/documents.jsf?oqp=&for=&mat=or&lgreg=lt&jge=&td=%3BALL&jur=C%2CT%2CF&num=C-498%252F16&page=1&dates=&pcs=Oor&lg=&pro=&nat=or&cit=none%252CC%252CCJ%252CR%252C2008E%252C%252C%252C%252C%252C%252C%252C%252Ctrue%252Cfalse%252Cfalse&language=en&avg=&cid=6383865> (accessed on 23 September 2019).
28. Council Regulation (EC) No 44/2001 of 22 December 2000 on Jurisdiction and the Recognition and Enforcement of Judgments in Civil and Commercial Matters, 16.1.2001. Official Journal of the European Communities, L 12/1, ELI. Available online: <http://data.europa.eu/eli/reg/2001/44/oj> (accessed on 23 September 2019).

