



e c b r e c

Institute for Renewable Energy

2018

# PV MARKET IN POLAND



SPECIAL TOPIC:

*THE IMPACT OF THE  
IMPLEMENTATION OF RES  
AUCTIONS TO THE PV MARKET  
IN POLAND*

**INSTITUTE FOR  
RENEWABLE ENERGY**

June 2018

Warsaw



Main Partner of the Report

## MAIN PARTNER OF THE REPORT



## OTHER PARTNERS



## HONORARY PATRONAGE



POLISH INVESTMENT & TRADE AGENCY



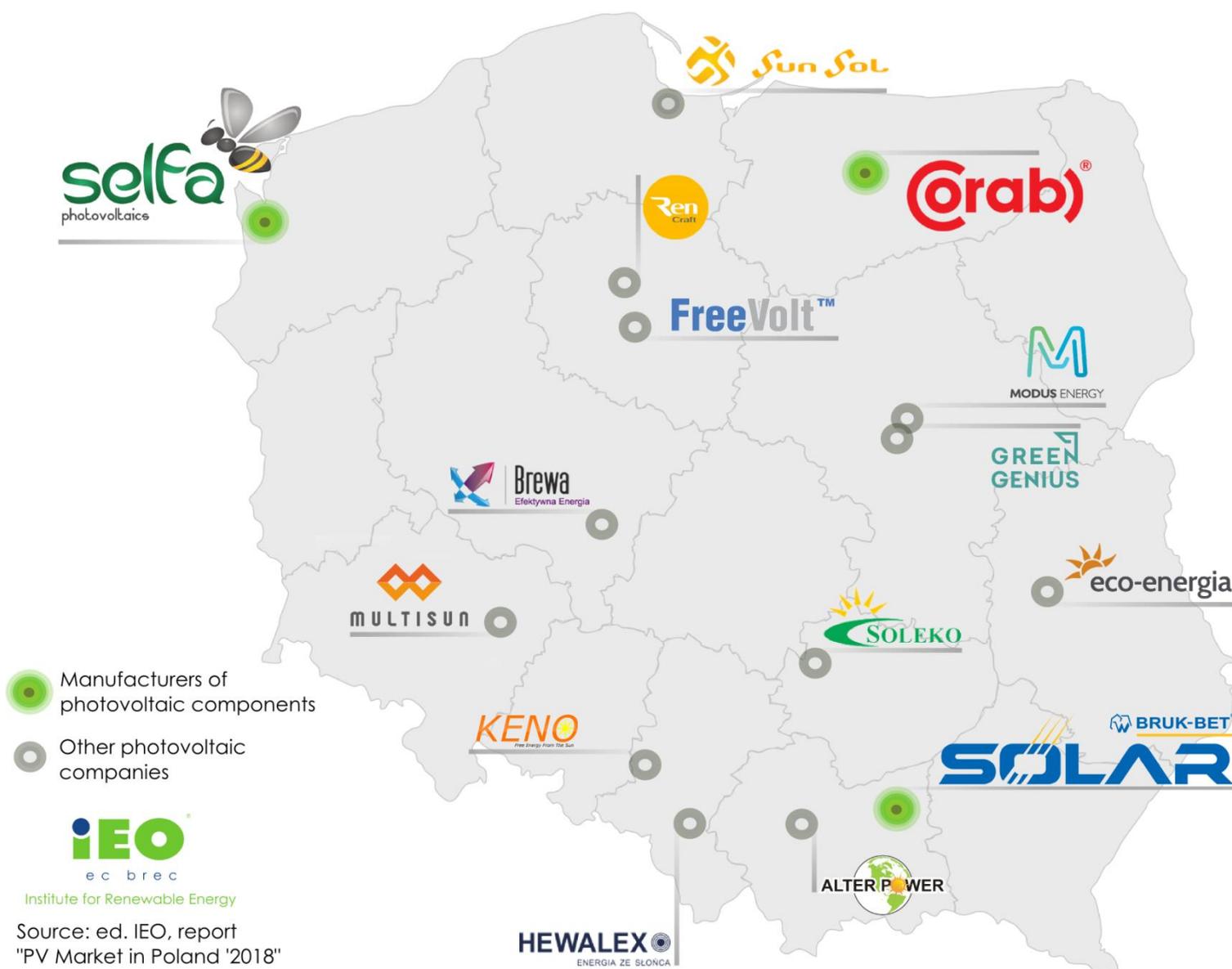
THE NATIONAL CENTRE FOR RESEARCH AND DEVELOPMENT



THE POLISH BANK ASSOCIATION

ZWIĄZEK BANKÓW POLSKICH

# WE THANK THE COMPANIES FROM THE PHOTOVOLTAIC MARKET FOR DELIVERED THE DATA FOR THE NEEDS OF THE REPORT



# AUTHORS



**Grzegorz Wiśniewski**

President of the Institute for Renewable Energy

[gwisniewski@ieo.pl](mailto:gwisniewski@ieo.pl)



**Andrzej Curkowski**

[acurkowski@ieo.pl](mailto:acurkowski@ieo.pl)



**Aneta Więcka**

[awiecka@ieo.pl](mailto:awiecka@ieo.pl)



**Bartłomiej Pejas**

[bpejas@ieo.pl](mailto:bpejas@ieo.pl)



**Justyna Zarzeczna**

[jzarzeczna@ieo.pl](mailto:jzarzeczna@ieo.pl)

**Institute for Renewable Energy (IEO)** was established in 2001. It's an independent research group, and the first private research institute in Poland with a deep knowledge of the renewable energy issues: wind energy, solar energy, biogas, biomass, energy planning, ranging from politics energy and law, economic and financial analysis, and ending with the technical issues and design.

IEO also has an extensive [experience](#) in participating as an advisor ([due-diligence](#), assumptions and concepts of technical solutions, functionality and utility programs, feasibility studies, business plans, terms of reference for a tender, supervision and construction monitoring) in the investment processes in the area of renewable energy implemented by the company and local governments.

IEO since 2009, conducts postgraduate studies "Investments in renewable energy sources", trainings and conferences in the field of technology, market economics and the law of renewable energy sources for national energy companies (eg. PGE, PKP Power Engineering), municipalities, financial companies (Alior Bank BGZ, ZBP) and foreign institutions (chambers of commerce in Germany and France, energy companies).

In addition, as part of its work, the IEO completed a number of expert opinions commissioned by the Ministry of Economy, Ministry of Environment, Ministry of Regional Development and other governmental and commercial projects for business customers.

## Institute for Renewable Energy

Mokotowska 4/6

00-641 Warsaw

tel/fax. 22 825 46 52, 22 875 86 78

e-mail: [biuro@ieo.pl](mailto:biuro@ieo.pl)

[www.ieo.pl](http://www.ieo.pl)

[www.odnawialny.blogspot.com](http://www.odnawialny.blogspot.com)



[www.facebook.com/instytut.energetyki.odnawialnej](http://www.facebook.com/instytut.energetyki.odnawialnej)



[www.twitter.com/InstEneregOdnaw](http://www.twitter.com/InstEneregOdnaw)

[www.twitter.com/Odnawialny](http://www.twitter.com/Odnawialny)

# TABLE OF CONTENTS

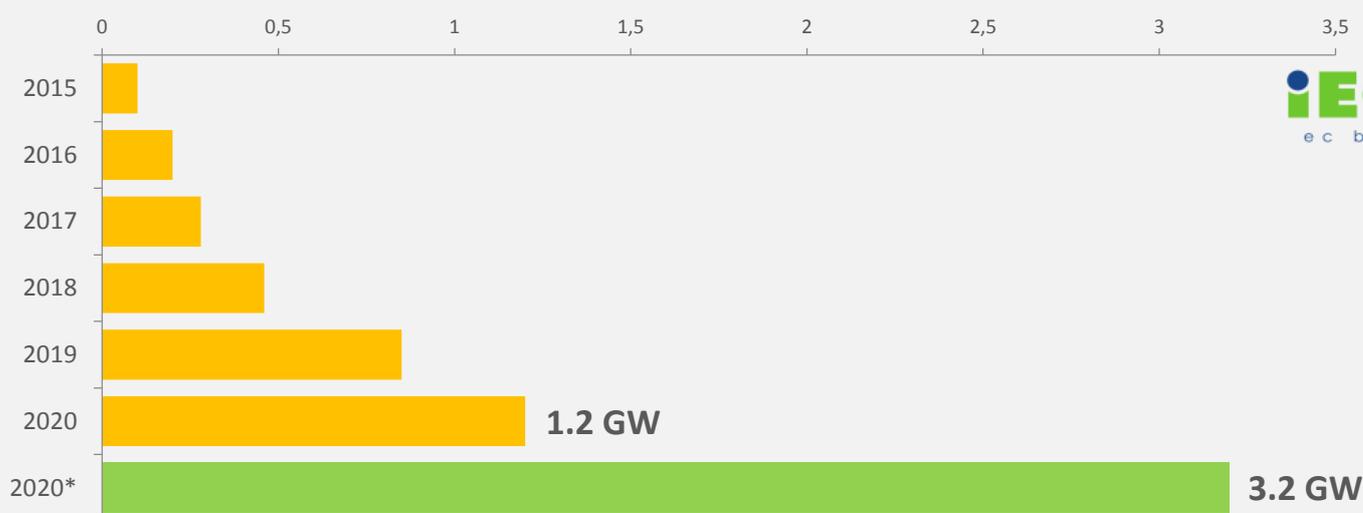
<b>1. ABSTRACT .....</b>	<b>6</b>
<b>2. BUSINESS MODELS IN POLAND .....</b>	<b>10</b>
2.1 AUCTION SYSTEM ON THE PV MARKET .....	10
2.2 PROSUMER MODEL .....	11
2.3 AUTOPRODUCER MODEL (BUSINESS PROSUMER).....	12
<b>3. AUCTION SYSTEM .....</b>	<b>15</b>
3.1 CHARACTERISTICS OF THE AUCTION SYSTEM IN POLAND.....	15
3.2 RESULTS OF THE RES AUCTIONS .....	17
3.3 SCHEDULE OF UPCOMING RES AUCTIONS .....	19
3.4 THE ROLE OF PV IN ACHIEVING THE RES GOALS IN 2020.....	20
<b>4. COMPETITIVENESS OF ELECTRIC ENERGY FROM PV INSTALLATIONS AND FARMS IN VARIOUS SUPPORT SYSTEMS .....</b>	<b>24</b>
4.1 COMPETITIVENESS OF PROSUMERS IN THE TARIFF SYSTEM FOR ELECTRIC ENERGY.....	24
4.2 FACTORS OF COMPETITIVENESS OF ENERGY OFFERS FROM PV FARMS IN THE AUCTION SYSTEM .....	25
<b>5. THE ROLE OF EU FUNDING IN THE DEVELOPMENT.....</b>	<b>27</b>
5.1 REGIONAL OPERATIONAL PROGRAMS .....	27
5.2 PV FARMS.....	29
<b>6. COMPANIES– MAIN PLAYERS ON THE POLISH PV MARKET .....</b>	<b>31</b>
6.1 INVESTORS AND DEVELOPERS .....	32
6.2 MANUFACTURERS OF PV INSTALLATIONS .....	34
6.3 CONTRACTORS IN THE EPC FORMULA AND INSTALLERS.....	35
6.4 BANKS.....	36
<b>7. PRICES OF THE EQUIPMENT AND PV INSTALLATIONS ON THE POLISH MARKET .....</b>	<b>39</b>
<b>8. THE FUTURE OF THE PV MARKET IN POLAND.....</b>	<b>40</b>
<b>DISCLAIMER .....</b>	<b>44</b>

# 1. ABSTRACT

The Polish PV market is basically based on three models of electricity sales to the network and the corresponding business variants. It is an renewable energy auction system and a prosumer system, which are official instruments supported by the state and are to help Poland meet international commitments related to obtaining a 15% share of energy from renewable energy sources (RES) in energy consumption in 2020, and a business autoproducer system that, due to rising energy electricity prices for companies, is developing on market principles.

Investments under the auctions for energy from RES will soon dominate the Polish PV market. So far, only two auctions for energy from renewable energy have been held. The first took place at the end of December 2016, while the second was held in June 2017. In total, in the first auction, for new solar and wind farms with a capacity below 1 MW, they won 84 offers, in the second auction 352 (the number increased fourfold). As a result of pilot auctions until 2020, approximately 360 MW of new capacities will be created. Until the end of May 2018, 40 PV installations started to produce energy (less than half of the projects from the first auction) with a total capacity of 27 MW.

Considering the estimated volumes in the amendment of the Act on Renewable Energy Sources adopted by the government in a new auction basket dedicated to solar farms and wind farms, as a result of this year's (probably third quarter) auction for renewable energy, a further 750 MW of new capacities may be installed in PV installations. Not all projects in the auction system will be implemented within the maximum currently allowed 24 months, but by the end of 2020, the cumulative power in all solar systems may exceed 1.2 GW. It would be a rapid upsurge in power increase in relation to current moderate growth. Total installed capacity in PV systems at the end of 2017 (taking into account PV installations completed in the system of certificates of origin, solar farms already built (until the end of 2017) in the auction system as well as micro installations (prosumer installations) built in 2013-2017) was approximately equal to 280 MW. The figure illustrates the planned development of PV installations by 2020 with the scenario of possible reinforced support.



\* according to the reinforcement scenario by the IEO (the scenario to reduce costs of statistical transfer) – including the intervention auction proposed by the IEO

POWER INSTALLED IN PHOTOVOLTAICS BY 2020

At the time of publication of the report - taking into account subsequent solar farms implemented in the auction system by the end of May 2018 - the total installed capacity in PV was approximately 300 MW, which gives a 3,4% share of photovoltaics in the Polish mix of RES. In the years of 2018 and 2019, photovoltaics is estimated to emerge from the niche, especially thanks to the auction system and by the end of 2020 it may become one of the leading renewable energy technologies in terms of installed capacity, and the auction system might radically change today's photovoltaic industry image.

The maximum value of energy (introduced into the network over the next 15 years) which the state plans to buy in this year's renewable energy auction is 16.2 billion EUR. The scale of investments in solar farms alone in 2019 may exceed 0.7 billion EUR. Such large investments in the PV sector, with periods for their implementation shortened by the legislator (from 24 to 18 months) and other restrictions of the auction system, are not only a challenge for engineering companies like "EPC" serving investors, but most of all are a challenge in terms of financial security.

RES development between 2006 and 2015 was based on relatively cheap bank financing and a growing share of corporate financing, but these sources of funding began to shrink. Currently, according to the Polish Bank Association, the total amount of unpaid loans granted by banks to finance RES projects, mainly wind, has already reached 11 billion PLN. Banks see shortcomings of the legal environment, in which renewable energy operates, which are: the lack of a broader perspective (of 25 years) in state policy, impulsive and not always thought-out regulations, legal instability and increasing legislative uncertainty. Without achieving the economic stability of the portfolio of current renewable energy projects implemented in the green certificates system, the banks so far involved in such projects will not take the risk of financing further projects planned for implementation in the auction system.

Observed investors problems with obtaining promises of financing before the auction may limit the number of offers and higher than expected capital costs for project winnings may even make it impossible to implement already contracted volumes at auction prices. Photovoltaics, however, has open alternative development paths. The strength of PV is the possibility of parallel acquisition of several segments of the electricity market: solar farms (wholesale market) and business autoproducers and individual prosumers (retail market). The drive for the development of PV is primarily the growing energy prices in Poland, not regulations.

## PV Farm built by Modus Energy Group

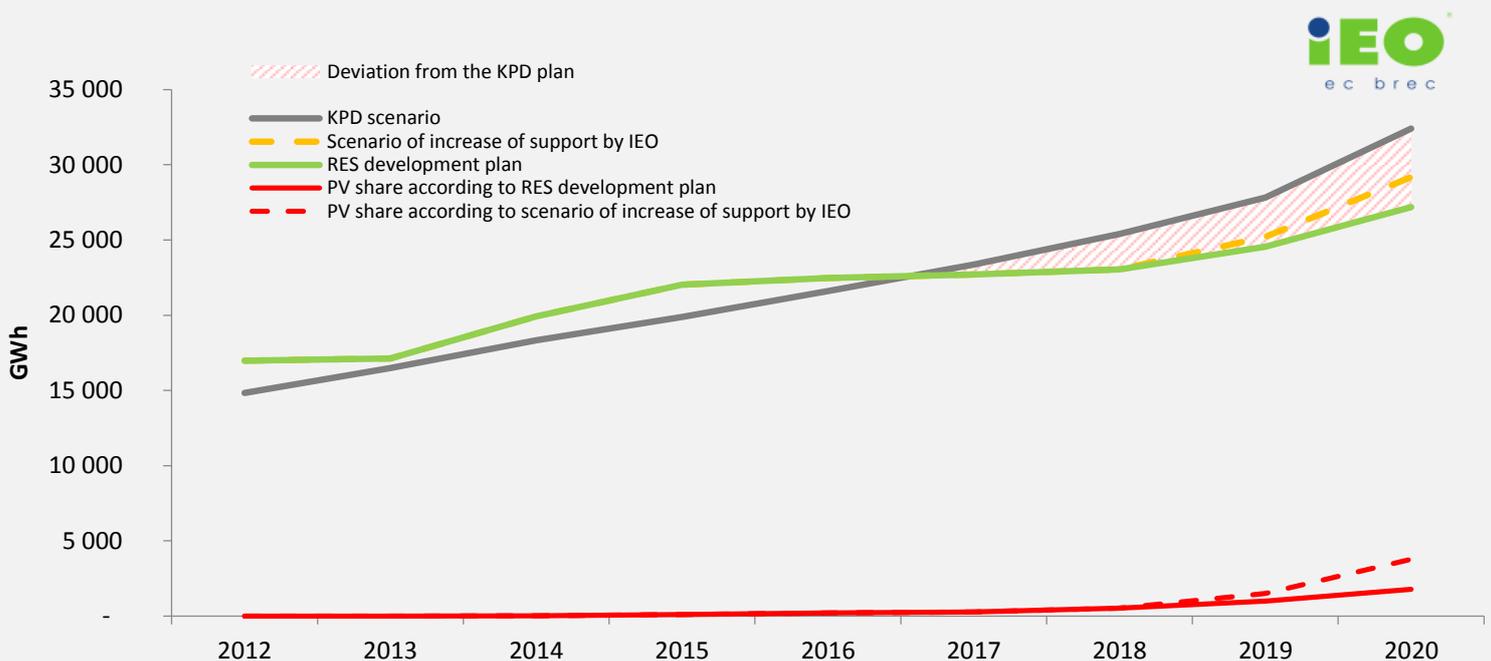


The PV technology in Poland has matured to play a much larger role than before in the renewable energy sector, all Polish energy sector and in energy policy. The current situation in the entire renewable energy sector creates new circumstances and a chance to improve regulations and support for photovoltaics. Current trends indicate that Poland will lack 3,6% to achieve the obligation to produce at least 15% of energy from RES in the final gross energy consumption balance in 2020, including over 2% of RES share in electricity production. For every deviation below this level, Poland will have to do costly statistical transfers with other countries or financial sanctions will be imposed on our country. The situation may be improved, first of all, by RES technologies with the shortest investment cycles, i.e. PV in the prosumer system and small solar farms.

In relation to current plans for the development of PV, in the case of policy change and improvement of regulations, a much more ambitious scenario is possible - thanks to an additional intervention auction and expand the group of technologies using guaranteed tariffs in the current amendment to the RES Act on PV - for additional capacity increase by 2 TWh which would reduce the costs of statistical transfer (depletion in the state budget) by 0.5-1 billion PLN. In this way, a PV plants, thanks to the improvement of the support system in the auction and prosumer systems, could reduce almost by 40% the expected deviation from the RES development objectives adopted by the government in the National Action Plan for renewable energy (in Polish: KPD) and agreed with the European Commission, which has become a Polish obligation towards the EU.

Trends and scenarios of electric energy production from RES in Poland are shown below:

- RES development plan: real state at the end of 2016 and the IEO forecast according to current government's plans, including 1,2-1,5 GW of power installed in PV;
- Scenario of reinforcement of support according to IEO (scenario to reduce the costs of statistical transfer) - including the proposed by the IEO intervention auction and support for prosumers: increase in solar capacity to 3,2 GW
- KPD Scenario: electrical energy production according to the National Action Plan, power assumed in PV: 0,003 GW.



TRENDS AND SCENARIOS OF ENERGY PRODUCTION FROM RES IN POLAND UNTIL 2020

It would require several conditions to be met. First of all, the market should be informed as soon as possible about such a plan, so that it would be possible to proceed with the accelerated development of projects. The instruments for the implementation of this undertaking seem obvious:

1. An intervention auction for all types of RES, which would guarantee the start of energy production in the first quarter of 2020 at the latest, announced at the beginning of 2019.
2. A system of guaranteed tariffs for all types of micro-installations for households and SMEs, introduced, at the latest, in the first quarter of 2019, with a guarantee (for those who will be able to join the network in the aforementioned date) of maintaining a fixed price for 15 years.

The activities of this type would allow to increase the production potential of PV technologies from the expected 1,2 GW to 3,2 GW by the end of 2020 (0,5 GW in the prosumer segment and 1,5 GW in the solar farm segment), thus increasing the role of photovoltaics in achieving the RES target in the area of electricity from 6,5% to 12,5%. In the wake of these activities, support instruments for the development of the domestic photovoltaic industry, intelligent energy network technologies and renewable energy based electromobility should be launched and the inclusion of photovoltaics in the new energy policy in Poland should be much wider than in the present decade.

PV installation at the business autoproducer, BREWA

