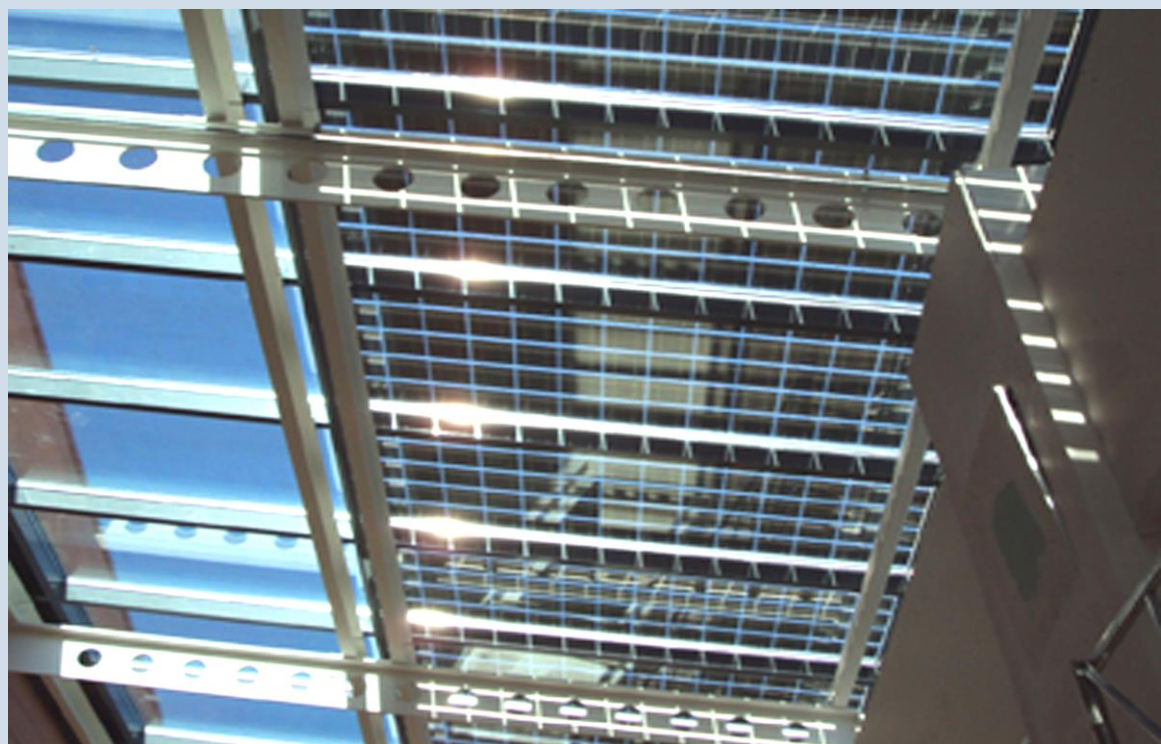


National Survey Report of Photovoltaic Applications in ITALY 2017



PHOTOVOLTAIC
POWER SYSTEMS
PROGRAMME

Prepared by Francesca Tilli (GSE), Giosuè Maugeri (RSE)

PVPS

IEA PVPS TASK 1

**National Survey Report of PV Power Applications in ITALY
2017**

TABLE OF CONTENTS

	Foreword.....	3
	Introduction	4
1	INSTALLATION DATA	5
	1.1 Applications for Photovoltaics	5
	1.2 Total photovoltaic power installed	6
	1.3 Key enablers of PV development.....	9
2	COMPETITIVENESS OF PV ELECTRICITY	9
	2.1 Module prices	9
	2.2 System prices.....	10
	2.3 Cost breakdown of PV installations.....	11
	2.3.1 Residential PV System < 5-10 kW	11
	2.3.2 Utility-scale PV systems > 10 MW	12
	2.4 Financial Parameters and specific financing programs	12
	2.5 Specific investments programs	12
	2.6 Additional Country information	13
3	POLICY FRAMEWORK	14
	3.1 Direct support policies for PV installations	14
	3.1.1 New, existing or phased out measures in 2017	14
	3.2 Self-consumption measures	16
	3.3 Collective self-consumption, community solar and similar measures	16
	3.4 Tenders, auctions & similar schemes.....	16
	3.5 Financing and cost of support measures	16
	3.6 Indirect policy issues	17
4	INDUSTRY	17
	4.1 Production of feedstocks, ingots and wafers (crystalline silicon industry).....	17
	4.2 Production of photovoltaic cells and modules (including TF and CPV).....	17
	4.3 Manufacturers and suppliers of other components.....	18
5	PV IN THE ECONOMY	19
	5.1 Labour places.....	19
	5.2 Business value.....	19
6	INTEREST FROM ELECTRICITY STAKEHOLDERS	19
	6.1 Structure of the electricity system.....	19

6.2	Interest from electricity utility businesses	20
6.3	Interest from municipalities and local governments	20
7	HIGHLIGHTS AND PROSPECTS	20

Foreword

The International Energy Agency (IEA), founded in November 1974, is an autonomous body within the framework of the Organisation for Economic Co-operation and Development (OECD) which carries out a comprehensive programme of energy co-operation among its member countries

The IEA Photovoltaic Power Systems Technology Collaboration Programme (IEA-PVPS) is one of the collaborative R & D agreements established within the IEA and, since 1993, its participants have been conducting a variety of joint projects in the applications of photovoltaic conversion of solar energy into electricity.

The participating countries and organisations can be found on the www.iea-pvps.org website.

The overall programme is headed by an Executive Committee composed of one representative from each participating country or organization, while the management of individual Tasks (research projects / activity areas) is the responsibility of Operating Agents. Information about the active and completed tasks can be found on the IEA-PVPS website www.iea-pvps.org

Introduction

The objective of Task 1 of the IEA Photovoltaic Power Systems Programme is to promote and facilitate the exchange and dissemination of information on the technical, economic, environmental and social aspects of PV power systems. Task 1 activities support the broader PVPS objectives: to contribute to cost reduction of PV power applications, to increase awareness of the potential and value of PV power systems, to foster the removal of both technical and non-technical barriers and to enhance technology co-operation. An important deliverable of Task 1 is the annual “*Trends in photovoltaic applications*” report. In parallel, National Survey Reports are produced annually by each Task 1 participant. This document is the country National Survey Report for the year 2017. Information from this document will be used as input to the annual Trends in photovoltaic applications report.

The PVPS website www.iea-pvps.org also plays an important role in disseminating information arising from the programme, including national information.

1 INSTALLATION DATA

The PV power systems market is defined as the market of all nationally installed (terrestrial) PV applications with a PV capacity of 40 W or more. A PV system consists of modules, inverters, batteries and all installation and control components for modules, inverters and batteries. Other applications such as small mobile devices are not considered in this report.

For the purposes of this report, **PV installations are included in the 2017 statistics if the PV modules were installed and connected to the grid between 1 January and 31 December 2017, although commissioning may have taken place at a later date.**

1.1 Applications for Photovoltaics

At the end of 2017 more than 774.000 plants are installed in Italy for a total capacity of 19.682 MW. The Italian market was quite stable with a new capacity of 414 MW and about 44.000 PV plants installed in 2017.

The monthly average installed capacity was quite constant with around 29 MW. The average capacity at the end of 2017 is 25,4 kW.

Around 80% of the all PV systems installed in 2017 are residential, while half of the total capacity is related to industrial applications, with several plants with capacity between 200 kW and 1 MW.

Around 97% of PV plants installed in Italy are connected to the low voltage distribution grid; the remaining share of 3%, consisting of less than 20.000 plants connected to medium voltage grid, is almost 60% of total existing capacity. Only a small number of installations is connected to the high voltage grid and with a capacity of around 1.256 MW, the 6,4% of the total.

Public administration owns 16.073 PV plants for a capacity of 748 MW (3,8% of the installed capacity in Italy). As a matter of fact, around 66% of the Italian municipalities has at least one PV plant owned by the public administration.

PV electricity production reached 24,4 TWh in 2017, a growth of 10% compared to the previous year.

PV Self-consumption in 2017 was 4.889 GWh, around 20% of total PV systems production, with a slight increase compared to 2016.

1.2 Total photovoltaic power installed

Table 1: PV power installed during calendar year 2017⁽¹⁾

			MW installed in 2017	MW installed in 2017	AC or DC	
Grid-connected	BAPV ⁽²⁾	Residential	351 ⁽⁴⁾	155	DC	
		Commercial		131		
		Industrial		65		
	BIPV ⁽³⁾ (if a specific legislation exists)	Residential				DC
		Commercial				
		Industrial				
	Utility-scale	Ground-mounted	63 ⁽⁴⁾	63		DC
		Floating				
		Agricultural				
Off-grid	Residential (SHS)					
	Other					
	Hybrid systems					
Total			414		DC	

¹ Blank box stands for not available data

² Building Applied PhotoVoltaic

³ Building Integrated PhotoVoltaic

⁴ Best estimate

Table 2: Data collection process

If data are reported in AC, please mention a conversion coefficient to estimate DC installations.	Data refer to the sum of PV nominal power
Is the collection process done by an official body or a private company/Association?	Public bodies: GSE, RSE. Association: Elettricità Futura
Link to official statistics	www.gse.it www.terna.it http://www.arera.it

Table 3: PV power and the broader national energy market

<i>MW-GW for capacities and GWh-TWh for energy</i>	2017 numbers	2016 numbers
Total power generation capacities (all technologies)	117.144,3 MW	117.080,8 MW
Total power generation capacities (renewables including hydropower)	53.259,2 MW	52.272,8 MW
Total electricity demand (=consumption)	320.548,2 GWh	314.260,9 GWh
Total energy demand (= final consumption)	301.880,5 GWh	295.508,3 GWh
New power generation capacities installed during the year (all technologies)	63,5 MW	-2.959,8 MW
New power generation capacities installed during the year (renewables including hydropower)	986,4 MW	789,3 MW
Total PV electricity production in GWh-TWh	24.377,7 GWh	22.104,3 GWh
Total PV electricity production as a % of total electricity consumption	8,1%	7,5%

Table 4: Other information^{(1) (2)}

	2017 Numbers
Number of PV systems in operation in your country (a split per market segment is interesting)	774.014
Capacity of decommissioned PV systems during the year in MW	
Total capacity connected to the low voltage distribution grid in MW	7.123
Total capacity connected to the medium voltage distribution grid in MW	11.303
Total capacity connected to the high voltage transmission grid in MW	1.256

¹ Blank box stands for not available data² Grid connected

Table 5: The cumulative installed PV power in 4 sub-markets (MWp) ^{(1) (2)}

Year	Off-grid ⁽³⁾	Grid-connected distributed	Grid-connected centralized	Other uses (VIPV, wearables)	Total
1992	7,8	0,1	0,7		8,6
1993	8,6	0,1	3,5		12,2
1994	9,4	0,2	4,6		14,2
1995	9,6	0,3	5,9		15,8
1996	9,8	0,4	5,9		16,1
1997	9,9	0,7	6,2		16,8
1998	10,3	0,8	6,6		17,7
1999	10,8	0,9	6,7		18,4
2000	11,1	1,2	6,7		19,0
2001	11,7	1,6	6,7		20,0
2002	11,7	3,6	6,7		22,0
2003	11,7	7,6	6,7		26,0
2004	12,0	12,0	6,7		30,7
2005	12,3	18,5	6,7		37,5
2006	12,8	30,5	6,7		50,0
2007	13,1	68,7	18,3		100,1
2008	13,3	309,1	173,9		496,3
2009	13,0	682,6	581,4		1277,0
2010	13,0	1.544,6	2.047,5		3.605,1
2011	10,0	4.333,3	8.797,7		13.141,0
2012	11,0	6.042,6	10.742,4		16.796,0
2013	12,0	7.010,0	11.175,5		18.197,5
2014	12,0	7.236,4	11.358,0		18.606,4
2015	14,0	7.493,5	11.407,2		18.914,7
2016 ⁽⁴⁾	14,0	7.808,9	11.459,7		19.282,7
2017		8.105,5	11.576,7		19.682,3

¹ Blank box stands for not available data

² The classification for grid-connected distributed and grid-connected centralized PV plants, applied since 1992, is below or over 200 kW

³ Best estimate

⁴ Grid connected data updated with GSE statistics 2017

1.3 Key enablers of PV development

Table 6: information on key enablers⁽¹⁾

	Description	Annual Volume (Units)	Total Volume (Units)	Source
	Decentralized storage systems			
	Residential Heat Pumps			
	Electric cars (and light weight)	1.898	7.560	www.aci.it
	Electric buses/trucks	545	4.072	www.aci.it

¹ Blank box stands for not available data

2 COMPETITIVENESS OF PV ELECTRICITY

2.1 Module prices

Table 7: Typical module prices for a number of years – local currency per W⁽¹⁾

Year	2009 ⁽²⁾	2010 ⁽²⁾	2011 ⁽²⁾	2012 ⁽²⁾	2013 ⁽²⁾	2014	2015	2016	2017
Standard module crystalline silicon price(s): Typical	2,50	1,70	1,50	0,80	0,60	0,55 ⁽³⁾	0,55 ⁽³⁾	0,48 ⁽³⁾	0,40 ⁽³⁾
Lowest prices	2,30	1,50	1,20	0,70	0,50	0,50 ⁽⁴⁾	0,50 ⁽⁴⁾	0,40 ⁽⁴⁾	0,32 ⁽⁴⁾
Highest prices						0,80	0,75	0,65	0,56

¹ Blank box stands for not available data

² Statistics updated according to GSE analysis data related to database of plants accessing incentive scheme

³ Crystalline silicon modules

⁴ Imported crystalline silicon modules

2.2 System prices

Table 8: Turnkey Prices of Typical Applications – local currency

Category/Size	Typical applications and brief details	Current prices per W ⁽¹⁾
OFF-GRID Up to 1 kW (SHS)		
OFF-GRID > MW scale		
Grid-connected Rooftop up to 5-10 kW (residential BAPV)		1,20 – 1,60
Grid-connected Rooftop from 10 to 250 kW (commercial BAPV)		1,00 – 1,40
Grid-connected Rooftop above 250 kW (industrial BAPV)		0,80 – 1,00
Grid-connected Ground-mounted above 10 MW		0,70 – 0,90
Other category (hybrid diesel-PV, hybrid with battery...)		
Floating PV		
Agricultural PV		
Residential BIPV (tiles, or complete roof).		
Industrial BIPV		

¹ Blank box stands for not available data

Table 9: National trends in system prices (current) for different applications – local currency

Price/Wp	2011 ⁽¹⁾	2012 ⁽¹⁾	2013 ⁽¹⁾	2014	2015	2016	2017
Residential PV systems < 5-10 kW	3,60	2,60	2,20	1,67	1,60	1,55	1,44
Commercial and industrial BAPV	2,70	1,80	1,40	1,40	1,32	1,22	1,10
Ground-mounted > 10 MW	2,80	1,70	1,20	1,03	0,96	0,88	0,80

¹ Statistics updated according to GSE analysis data related to database of plants accessing incentive scheme

2.3 Cost breakdown of PV installations

2.3.1 Residential PV System < 5-10 kW

Table 10: Cost breakdown for a residential PV system – local currency⁽¹⁾

Cost category	Average (local currency/W)	Low (local currency/W)	High (local currency/W)
Hardware			
Module	0,50	0,44	0,56
Inverter	0,14	0,13	0,16
Other (racking, wiring...)	0,27	0,22	0,32
Soft costs			
Installation	0,09	0,07	0,10
Customer Acquisition	0,03	0,02	0,03
Profit	0,30	0,25	0,35
Other (permitting, contracting, financing...)	0,11	0,09	0,12
Subtotal Hardware	0,91	0,79	1,04
Subtotal Soft costs	0,53	0,43	0,60
Total	1,44	1,22	1,64

¹ GSE specific survey

2.3.2 Utility-scale PV systems > 10 MW

Table 11: Cost breakdown for an utility-scale PV system – local currency⁽¹⁾

Cost Category	Average (local currency/W)	Low (local currency/W)	High (local currency/W)
Hardware			
Module	0,37	0,32	0,42
Inverter	0,06	0,05	0,07
Other (racking, wiring, etc.)	0,12	0,11	0,13
Soft cost			
Installation	0,04	0,03	0,05
Customer acquisition	0,02	0,01	0,02
Profit	0,16	0,14	0,17
Other (contracting, permitting, financing etc.)	0,03	0,02	0,04
Subtotal Hardware	0,55	0,48	0,62
Subtotal Soft cost	0,25	0,20	0,28
Total Installed Cost	0,80	0,68	0,90

¹ GSE specific survey

2.4 Financial Parameters and specific financing programs

Table 12: PV financing scheme ⁽¹⁾

Average rate of loans – residential installations	4,9%
Average rate of loans – commercial installations	3,5%
Average cost of capital – industrial and ground-mounted installations	2,5%

¹ GSE specific survey

2.5 Specific investments programs

Not available.

2.6 Additional Country information

Table 13: Country information

Retail Electricity Prices for an household (range)	21,11 ⁽¹⁾ - 22 €cent/kWh			
Retail Electricity Prices for a commercial company (range)	20-26,42 €cent/kWh ⁽²⁾			
Retail Electricity Prices for an industrial company (range)	9,43- 16,94 €cent/kWh			
Population at the end of 2017 (or latest known)	60,483,973			
Country size (km ²)	301.336			
Average PV yield (according to the current PV development in the country) in kWh/kWp	1.251			
Name and market share of major electric utilities ³	Year 2017		Year 2016	
	<i>Electric utilities</i>	<i>Share %</i>	<i>Electric utilities</i>	<i>Share %</i>
	Enel	20,5	Enel	22,1
	Eni	9,6	Eni	9,1
	Edison	7,6	Edison	7,7
	A2A	6,3	A2A	5,3
	EPH	5,5	EPH	3,5
	Iren	3,1	Iren	3,1
	Engie	2,7	Engie	3,5
	Tirreno Power	2,4	Tirreno Power	2,0
	Sorgenia	2,2	Sorgenia	1,5
	ERG	2,0	ERG	2,2
	Axpo Group	2,0	Axpo Group	1,8
	Saras	1,6	Saras	1,8
	Lukoil	1,2	Lukoil	1,4
Alperia	1,0	Alperia	0,7	
Others	32,3	Others	34,3	

¹ Consumption up to 5.000 kWh per year

² Nomisma Energia estimate

³ Generation share

3 POLICY FRAMEWORK

3.1 Direct support policies for PV installations

3.1.1 New, existing or phased out measures in 2017

3.1.1.1 Climate change Commitments

At the end of 2017 a new National Energy Strategy plan was approved with ambitious growth of PV as one of the most important instruments to reduce CO2 emissions.

3.1.1.2 Description of support measures (excluding BIPV, VIPV and rural electrification)

The cumulative installed capacity is mostly due to past incentive mechanisms, from the so-called “10.000 PV Roofs” of early 2000 to the five decrees of 2005 – 2013 (from Feed-in Premium to Feed-in Tariff, all named “Conto Energia”).

After the end of the FiT law in 2013, tax credit (available for small size plants up to 20 kW and for storage devices), together with a net-billing scheme (so-called Scambio Sul Posto - SSP), and a specific national tax relief for medium commercial/industrial installations, are the measures to support PV market that exist now. Italy switched from the net-metering mechanism to a net-billing scheme for systems below 500 kW in 2009, in which electricity fed into the grid is remunerated through an “energy quota” based on electricity market prices and a “service quota” depending on grid services costs (transport, distribution, metering and other extra charges). The net-billing scheme is valid for one year and automatically renewed once granted. Market prices are applied for the electricity injected into the grid as an alternative to SSP. Self-consumption is allowed for all PV system sizes.

3.1.1.3 BIPV development measures

None.

3.1.1.4 Utility-scale measures including floating and agricultural PV

None.

3.1.1.5 Rural electrification measures

None.

3.1.1.6 Support for electricity storage and demand response measures

Tax credit measures are foreseen for storage.

3.1.1.7 Support for electric vehicles (and VIPV)

None.

Table 14: PV support measures (summary table) ⁽¹⁾

	On-going measures residential	Measures that commenced during 2017 - residential	On-going measures Commercial + industrial	Measures that commenced during 2017 – commercial + industrial	On-going measures Ground-mounted, including floating	Measures that commenced during 2017 – ground mounted, including floating
Feed-in tariffs	No					
Feed-in premium (above market price)	No					
Capital subsidies	Yes, at a regional level (most of tenders are for buildings of public administration and small and medium-sized enterprises (SME))				No	
Green certificates	No					
Renewable portfolio standards (RPS) with/without PV requirements	No obligations for utilities to obtain a minimum percentage of their power from renewable energy sources					
Income tax credits	Yes	No	Yes ⁽³⁾	No		No
Self-consumption	Yes	No	Yes	No	No	No
Net-metering	No					
Net-billing ⁽²⁾	Yes	No	Yes	No	Yes	No
Collective self-consumption and virtual net-metering	Yes, under some conditions (paragraph 3.3)	No	Yes, under some conditions (paragraph 3.3)	No		
Commercial bank activities e.g. green mortgages promoting PV	Yes	No	Yes			
Activities of electricity utility businesses	Yes	No	Yes	No	Yes	No
Sustainable building requirements	Yes	No	Yes	No		
BIPV incentives	No					

¹ Blank box stands for not available data

² Up to 500 kW

³ Specific national tax relief

3.2 Self-consumption measures

Table 15: Self-Consumption Schemes

PV self-consumption	1	Right to self-consume	Yes
	2	Revenues from self-consumed PV	Savings on the electricity bill
	3	Charges to finance Transmission & Distribution grids	No
Excess PV electricity	4	Revenues from excess PV electricity injected into the grid	SSP, net-billing based on energy and services; market price for selling
	5	Maximum timeframe for compensation of fluxes	Self-consumption, real time; SSP, advance payment twice per year
	6	Geographical compensation	On site (meter aggregation is allowed for some specific SSP cases)
Other characteristics	7	Regulatory scheme duration	Unlimited
	8	Third party ownership accepted	Yes, with condition for SSP
	9	Grid codes and/or additional taxes/fees impacting the revenues of the prosumer	None
	10	Regulations on enablers of self-consumption (storage, DSM...)	Yes (tax credit for storage)
	11	PV system size limitations	Self-consumption, none; SSP, up to 500 kW
	12	Electricity system limitations	None
	13	Additional features	None

3.3 Collective self-consumption, community solar and similar measures

Meter aggregation and virtual net-billing are allowed for some specific cases, i.e., Municipalities of up to 20.000 inhabitants and the Ministry of Defence.

3.4 Tenders, auctions & similar schemes

None.

3.5 Financing and cost of support measures

The Feed-in Tariff law set the financial cap for PV of 6,7 BEUR in terms of yearly payments.

The cost of the incentives for the FIT/FiP for the years 2005-2013 is covered by a component of the electricity tariff paid by all final electricity consumers; for high energy intensive industry there are reductions or exemptions.

3.6 Indirect policy issues

None.

4 INDUSTRY

4.1 Production of feedstocks, ingots and wafers (crystalline silicon industry)

Not available.

4.2 Production of photovoltaic cells and modules (including TF and CPV)

Table 16: Production and production capacity information for 2017^{(1) (2)}

Cell/Module manufacturer (or total national production)	Technology (sc-Si, mc-Si, a-Si, CdTe)	Total Production (MW)		Maximum production capacity (MW/yr)	
		Cell	Module	Cell	Module
<i>Wafer-based PV manufactures</i>					
3SUN – Enel Green Power	Si-HJT				190
AVProject	sc-Si, mc-Si				50
Azimut S.r.l.	sc-Si, mc-Si		3,4		30
Micron - Cappello Group SpA	sc-Si, mc-Si				40
Eclipse Italia	sc-Si, mc-Si		35		90
Energy Glass - Gruppo STG	sc-Si, mc-Si				3
EXE s.r.l.	mc-Si		6		70
Ferrania Solis	sc-Si, mc-Si				110
Meridionale Impianti	mc-Si		0,5		20
Schlaefer SpA	sc-Si, mc-Si		10		40
Solbian	sc-Si, mc-Si		0,7		2,4
SPS ISTEM	mc-Si				75
Sunerg Solar	sc-Si, mc-Si				100
Torri Solare	mc-Si				18
Trienergia srl	sc-Si, mc-Si		0,2		24
V-energy Green - Gruppo STG	sc-Si, mc-Si		7,5		23
TOTAL			63,3		885,4

¹ Blank box stands for not available data

² RSE specific survey

By the end of 2017, the total production capacity of Italian PV module manufacturers was about 885,4 MW/y. Despite the national photovoltaic industry is represented by limited annual production (63,3 MW/y in 2017 from the interviewed companies), national PV manufactures have been reaching efficiency values comparable to the best worldwide producers.

A particular case is represented by 3SUN, a company of ENEL Group, located in Catania, which is presently the main Italian PV factory and one of the biggest in Europe. 3SUN has started the conversion of its production lines from the double junction thin-film modules, with annual capacity of 190 MW/y, to a new bifacial PV technology based on silicon Hetero-Junction technology (HJT).

Several other Italian manufacturers are also targeting specific niche markets, related to building integration products or the revamping of PV power plant (to bring back the existing photovoltaic systems to initial or design performances).

In this framework, Azimut targets a good part of its production to the BIPV market, offering red colored glass modules for roof integration and customized size of modules. Moreover, Azimut has developed in 2017 PV modules to cover the revamping market, offering 60 cell monocrystalline module (300 W) and 54 cell polycrystalline module (250 W)

The SOLBIAN manufacturer develops almost exclusively modules for off grid applications with customised formats.

Trienergia proposes also triangular photovoltaic panels (21 cells) and rectangular panels (42 or 60 cells), designed for triangular roof. Trienergia manufactures modules only in MWT back contact technology which allows modules to have electrical contacts exclusively on the back.

4.3 Manufacturers and suppliers of other components ⁽¹⁾

New challenges and new business segments allow Italian manufacturers to maintain their position in the PV system value chain leading to the introduction of products with new characteristics able to respond to completely different needs compared to a few years ago. The PV plant's revamping market, the interest in better management of residential energy consumption and the challenge of PV system digitalization have pushed the Italian producers to introduce even more efficient inverters on the market, with new features that offer advantages to end users and the network.

In the field of PV inverter for small-scale and utility-scale applications, the most important Italian companies are ABB (former Power One), Elettronica Santerno, Elpower, Borri, Fimer, Friem, Reverberi, Nidec ASI S.p.A., Aros Solar Technology, TDE Macno and Siel S.p.A. In the framework of energy storage systems, also for residential applications, the most relevant Italian companies are ABB, Aton, Fiamm, Reverberi Enetec, SIEL.

Other Italian companies (like Bitron Electronic, Loccioni Group and also ABB Italia SpA) offers innovative solution for residential PV System, able to maximize residential self-consumption and communicate with home automation or energy management systems and other technologies for energy saving.

In the field of supporting structures for PV modules, a relevant Italian company specialized in the development of single-axis trackers for the PV utility scale applications is Convert Italia SpA which has exported its technological solutions mainly in Chile, Brazil and India.

¹ The list is not exhaustive of the entire sector

5 PV IN THE ECONOMY

5.1 Labour places

Table 17: Estimated PV-related labour places in 2017⁽¹⁾

Research and development (not including companies)	
Manufacturing of products throughout the PV value chain from feedstock to systems, including company R&D	
Distributors of PV products	
System and installation companies	
Electricity utility businesses and government	
Other	
Total	13.656 ⁽²⁾

¹ Blank box stands for not available data

² 2017 GSE preliminary data, concerning permanent jobs, in terms of FTE (Full Time Equivalent), directly and indirectly related to O&M activities on existing PV facilities.

5.2 Business value

Table 20: Value of PV business

Not available.

6 INTEREST FROM ELECTRICITY STAKEHOLDERS

6.1 Structure of the electricity system

Short description of the electricity industry landscape	Italian electricity sector went through a deep reform over the last 20 years that changed it from a vertically integrated monopolistic structure to a liberalised market. The process started in 1999 but the full liberalisation was decided only in August 2017 and it is expected to be fully completed in July 2020, when the tariff system will end also in the domestic sector. The former monopolist ENEL still holds relevant market shares in all segments, especially in the domestic sector.
---------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>Short description of the electricity industry landscape</p>	<p>Structure: generation, transmission and distribution are separated. Generation is a free activity where ENEL has a 22% market share while the rest is scattered among several players. Transmission is a regulated activity held by the transmission system operator (TSO) Terna; distribution is a regulated activity where ENEL still holds a 89% market share. Retail activity is free, but with tariffs until mid 2020, where ENEL holds 70% of the market with a formal separation from the other activities. Enel is a private stock company where the state holds a 26% stake. Terna is a stock company with the state holding a 30% stake. Some companies with activities in production, distribution and retail are former municipalities hold by local authorities. A2A and Iren are the largest producers among the former municipalities.</p> <p>The energy authority was created in 1995 and is regulating the electricity sector following directives from the Italian Government and the Parliament.</p>
----------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

6.2 Interest from electricity utility businesses

Not available.

6.3 Interest from municipalities and local governments

Not available.

7 HIGHLIGHTS AND PROSPECTS

After incentive era, market evolved from large ground plant investments to small residential systems based on self-consumption and net-billing scheme.

Two main segment emerged from the market, first one that of residential small plants, the other that of large systems that created a secondary market of managing and acquisition.

The National Energy Strategy approved at the end of 2017 set ambitious target for PV, for which path and instruments must be defined and reviewed within the Italian National Energy and Climate Plan.

