



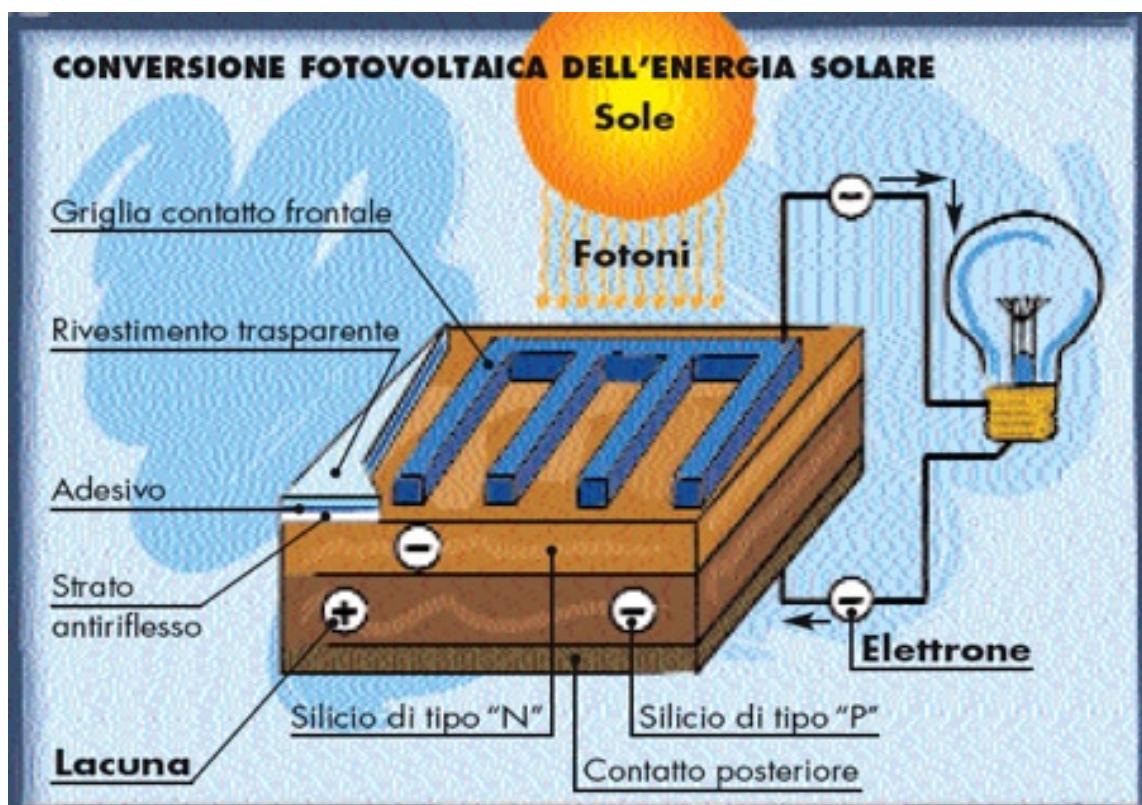
ACT *energy*



What is a photovoltaic system?

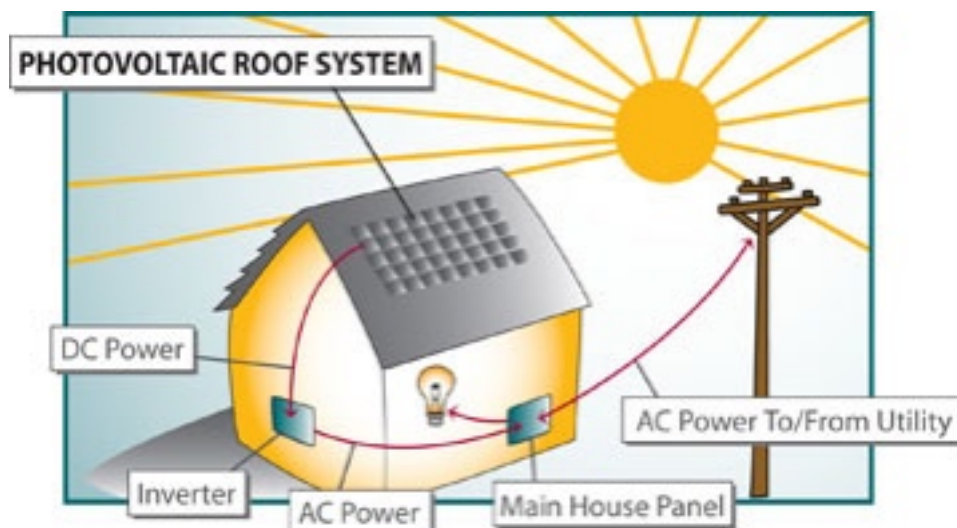
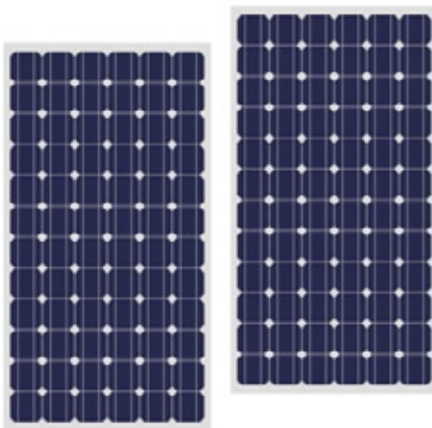
A **photovoltaic system** is an electrical system that captures the sun's rays and converts these to usable electricity using the photovoltaic principle.

The photovoltaic principle occurs when an electron situated in the valence band of a material (usually a semiconductor) is shed to the conduction band of the material through the absorption of a photon with sufficient energy hitting the material.



The main components of a photovoltaic system

- Photovoltaic panels that convert the sun's rays into electricity.
- An inverter that converts the D.C. current produced by the panels into an A.C. current that can be fed into the grid.

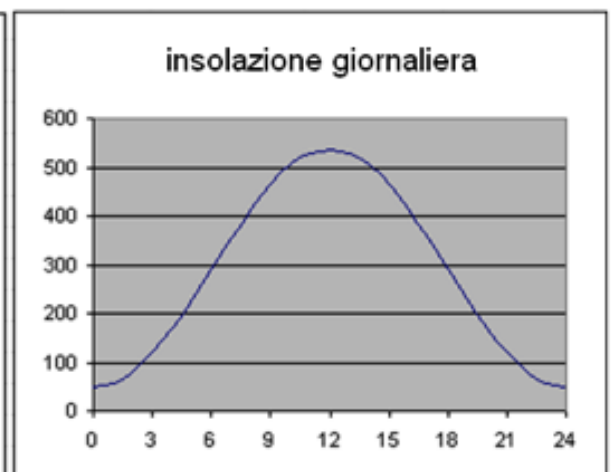


Nominal peak generating potential

A given fundamental of any photovoltaic system is its rated or peak power, this is defined as the power that the PV system is capable of producing when operating under conditions set by international standards (standard conditions), these are:

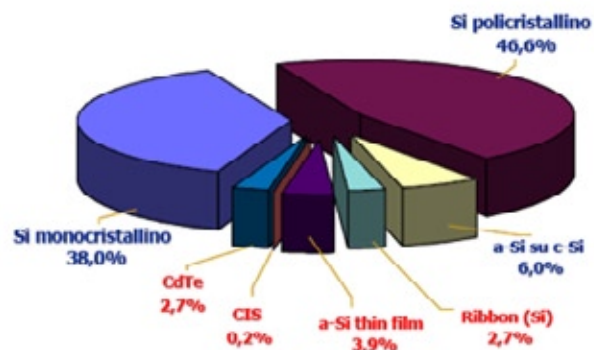
- A solar intensity of 1000 W/m^2 ;
- A photo cell temperature of $25 \text{ }^\circ\text{C}$.

It should be emphasized that the standard conditions are unlikely to be experienced during the actual operation of any photovoltaic system. The value of solar intensity of 1000 W/m^2 , in fact, the maximum value of radiation on the Earth's surface and this occurs only in special circumstances and for short periods during the year.



The different photovoltaic panel technologies

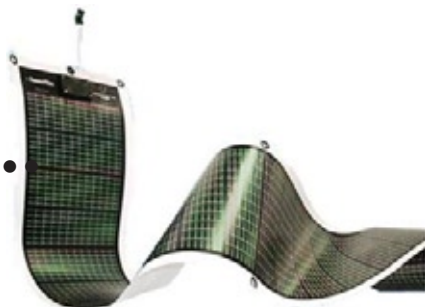
The different technologies used in the construction of photovoltaic panels are many and are seen in the above chart and they represent the main types being eligible to receive the GSE incentive payment:



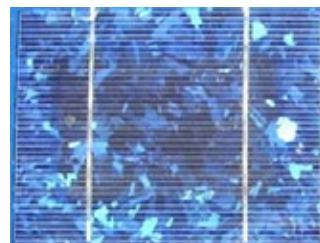
World Market Share for the different photovoltaic technologies



- Monocrystalline silicon
Highest efficiency,
(6 - 7 mq per 1 kW picco)



- Flexible thinfilm
Lowest efficiency
(10 - 20 mq per kW picco)

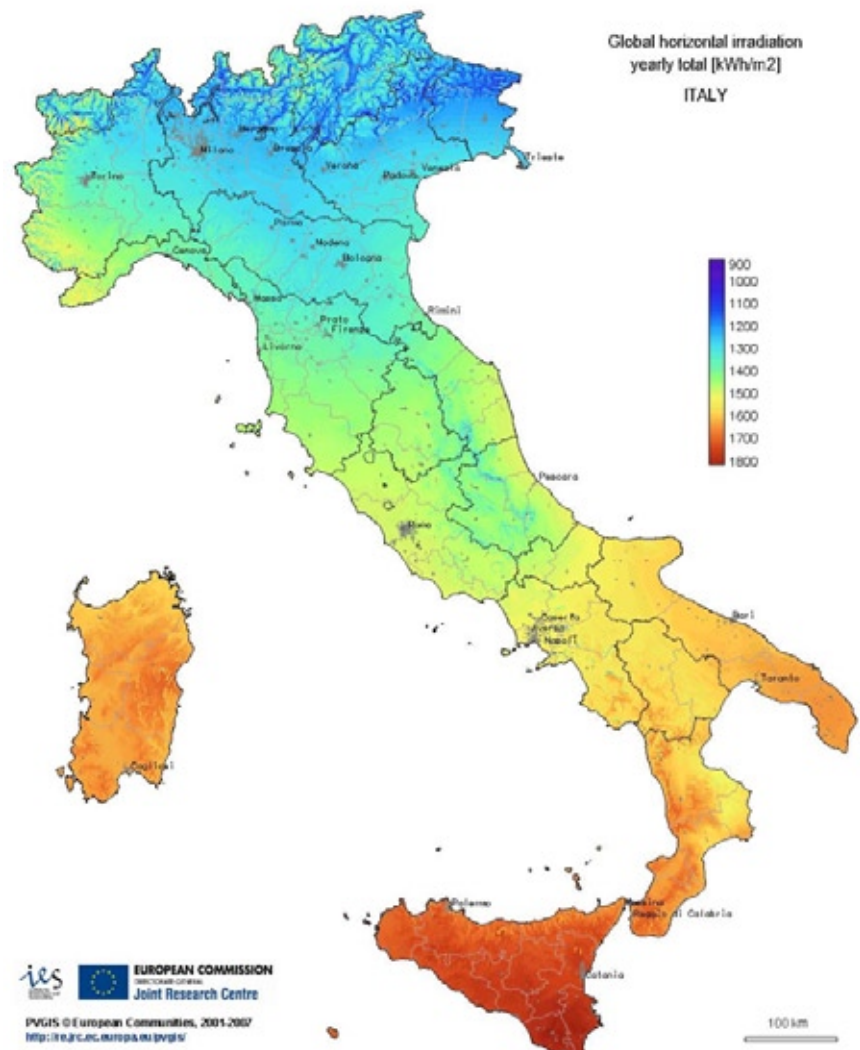


- Polycrystalline silicon
Medium efficiency
(8 - 9 mq per 1 kW picco)

Latitude & the level of the Sun's energy

As can be seen from the map, at different latitudes there are different levels of solar radiation in terms of Kw / year per square metre.

In Lombardy one goes from receiving 1080 kw/year per square metre up to 1800 Kw / year per square metre in Sicily.



The types of surface on which they can be constructed

- In the case of roofs or awnings, it should be noted that the panels cannot always be mounted with the ideal orientation and inclination.
- The actual efficiency of the system is also effected by the level of intergration.

Totally intergrated on a roof



Semi intergrated on a roof



On car parks



Ground mounted systems

The angle of the panels

The angle of every panel with respect to the ground influences the effective yield of the system, this is due to the effects of the average incidence of solar radiation on the panel itself.

The ideal angle for the installation of panels installed in Italy territory varies from 20 ° in the South to 30 ° in the North. The actual angle for any given installation is a very critical factor.

The orientation of the panels to the South

Panels can be mounted as much as 45° from true south in either an easterly or westerly direction, with only a maximum loss of power of 5%.



Ground mounted systems have the highest efficiency as the orientation and angle of the panels can be optimised.

The Benefits

- **Benefits for the environment**

The electricity produced by PV has a zero net cost of fossil fuel. Every kWh of electricity produced will save about 250 grams of fuel oil and will prevent the emission of approximately 700 grams of CO₂ plus other greenhouse gases, with a financial advantage and a positive environmental impact. This has great value when you consider that the useful life of a PV plant is at least 30 years. Each kWp installed in central Italy with an annual output of 1400 kWh will produce in its life some 33,000 kWh of power, saving 7.8 tonnes of fossil fuels while at the same time avoiding the emission of 22 tons of CO₂

- **Benefits for the country**

Renewable energy has been identified at the international level as a means of achieving the goal of helping to reduce greenhouse gas emissions under the Kyoto Protocol and to reduce the economic dependence on oil producing countries. To promote renewable energy, the European Union has set a target date of 2010 for the production of electricity from renewable sources to be 22% of total consumption. Italy, as a Member State, has adopted the EU directives since the 90s and has introduced 'feed in' incentive schemes where one of whom is on for energy produced by photovoltaic systems.

- **Economic benefits for systems owners**

The owner of a photovoltaic system receives revenue from the sale of the energy produced plus the incentive payment to which he is entitled, according to the kWh hours of energy he produces.

Key Features of the February 19, 2007 Italian law to request the payment of incentives for photovoltaic systems

Who pays the incentives?

The incentives are paid to the producers of renewable energy from a budget funded from an additional fraction added to the cost of electricity bills that all users are charged, and does not come from any State budget. The scheme is operated by an institution called GSE (Electrical Services Manager).

Who is entitled to receive incentives?

Any owner of a photovoltaic system who has have applied for admission to the program within 60 days of the system being connected by Enel will be entitled to receive incentive payments according to the following table:

Tabella tariffe incentivanti previste dal "conto energia" (DM 19/02/2007) per la fornitura di energia prodotta da un impianto fotovoltaico di potenza maggiore di 20 Kw			
Tipo di impianto	Incentivo per Kw prodotto in centesimi di Euro	Prezzo di vendita dell'energia in Euro	Totale ricavi in Euro
Impianti a Terra	€ 0,353	€ 0,10*	€ 0,4592
Impianto su tetto parzialmente integrato	€ 0,392	€ 0,10*	€ 0,4982
Impianto su tetto totalmente integrato	€ 0,431	€ 0,10*	€ 0,5372

* This value is indicative and undergoes slight variations depending on the quantity sold per year

Key Features of the February 19, 2007 Italian law to request the payment of incentives for photovoltaic systems

Producer consumed

There are additional benefits for producers who can use the energy produced on site, rather than buying it for € 0.10 to € 0,15-0,18 Kw / h

Life of the incentives

The incentives have a contract duration of 20 years and allow the owner of a roof, awning or car park to make risk free additional income from their property.

Request period

14 months after a total of 1.2 GW of PV capacity has been installed in Italy the incentives for future installations will be reviewed.

Why the installation of a photovoltaic system represents an opportunity?

The production of electricity using a PV system while receiving the incentive provided by the GSE is a great opportunity because:

- Currently the contribution is very attractive and is likely to be renewed at its current level
- The cost of photovoltaic panels have reduced greatly and in the last few months seen further declines of up to 40%.

For these reasons it is therefore easy to achieve gross yields ranging from 15% to 22% on installation costs (including cleaning, maintenance and insurance costs), depending on the geographical location.

The ACT Solution

- The supply and Installation of a photovoltaic system that earns a minimum gross annual yield greater than 15% per annum in the North, to 20% in the Middle and 22% in the South.
- ACT acquires the rights to use the surface of a roof for period of 20 years, for the placement of a PV system.
- The supply and installation of photovoltaic canopies for car parks with additional improvement to the protection of the vehicles and reduced car temperature.
- The replacement and disposal of existing asbestos roofs.



The main advantages for the property owner from the sale of rights to utilise the roof area

- Increase the value of the property and earn an extra financial return.
- Reduce ongoing property maintenance costs.

Customer support and guarantee

We can offer the following:

- A statutory guarantee for 2 years that upon completion of the installation the system functions correctly and meets all the agreed design specifications.
- A guarantee that the panels will only degrade by an amount not exceeding 1% per year over a 20 year period, as per the manufacturer's specifications.
- We can also advise and help arrange a comprehensive insurance solution to meet the needs of the financing organisation and to give protection to the owner against accidental damage, loss of income etc.
- Provide an 'on site' maintenance contract covering all parts and labour, giving total peace of mind.

The Team

The ACT team delivers all the functions necessary to create a photovoltaic system, the acquisition of land on which to build the plant, the design, the procurement of key components, construction management, customer 'hand over' and after sales service.

The physical installation of a photovoltaic system is sub contracted to specialist electrical engineers systems at local or national level, depending on the location and size of each individual project.

The ACT team consists of the following individuals

Ing. Pietro Acciarri (President)

Daniele Tumidei MBA (Sales and marketing director)

Nigel Cole-Hawkins (Finance director)

Gilberto Romboli MBA (Purchasing and management)

Ing. Giuliano Sughì (Technical manager)

Carlo Carcupino (Project manager and after sales service)

Track record

To date, 32 completed systems e.g.

- A 65 kw semi integrated roof system in Forlì
- A 30 Kw semi integrated roof system Meldola



Sede sociale:

Via Barsanti, 17
47100 Forlì

Tel: +39 0543 796574 • Fax: +39 0543 796769
Cellulare: +39 348 4200309

Uffici in Inghilterra:

Unit 41, Bookham Ind. Pk., Church Road
Bookham, Surrey. KT23 3EU

Tel: +44-(0)1372 459311 • Fax: +44-(0)1372 459306
Cellulare: +44-(0)7774 859630

North End House, North End Lane
Droxford, Hampshire, S032 3QN

Tel.: +44-(0)1489 877442 • Fax: +44-(0)1489 877813
Cellulare: +44-(0)7768 79648

E-mails

Pietro Acciarri:
pietroacciarri@actproperties.it

Nigel Cole-Hawkins:
nigelcole-hawkins@actproperties.it

Daniele Tumidei:
danieletumidei@actproperties.it