



TRIENERGIA
photovoltaic modules production

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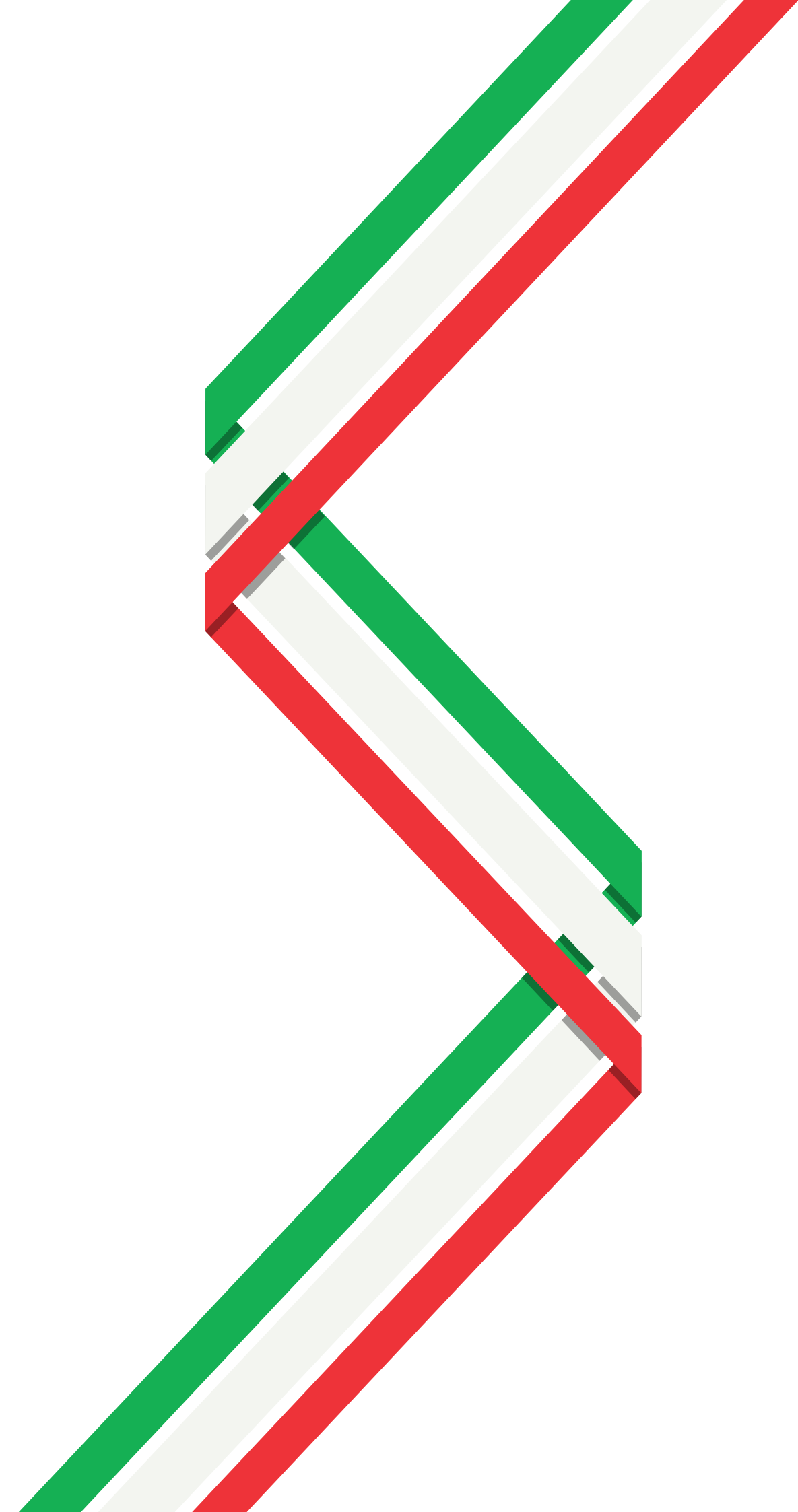
**THE RIGHT CHOICE IS
TRIENERGIA**

PHOTOVOLTAIC MODULES

+

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Why choose TRIENERGIA.



- Production line at the Bondeno headquarters in the province of Mantova (Italy).
- Production monitored during every stage of the process.
- **MWT Back Contact** technology is the most promising photovoltaic cell design technology: it offers greater efficiency (even over 21%) and reliability compared to standard cell technology thanks to the absence of soldering points (*ribbon-less technology*).
- **La N-Type TOPCon technology** enables modules with improved passivation of electrical contacts, higher efficiency, reduced degradation over time and optimized performance at high temperatures.
- **Italian R&D with specific know-how on colored modules.**
- Aesthetically perfect module, Full Black (black cells, backsheet and frame), White, Red and Green. We have created **Energy Design**, an exclusive product that consists of 3 different models (60 cells, 42 cells, 21 cells).
- Timely assistance.

ITALIAN COMPANY

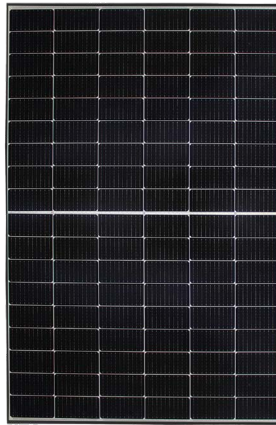
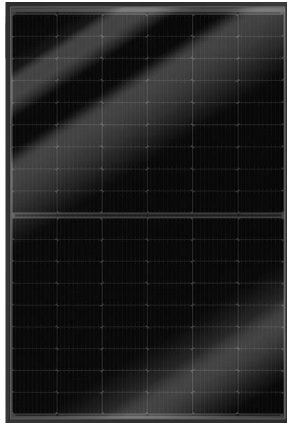
The production center is located in the province of Mantova and **makes use of skills and a highly automated production line.**

By choosing a Trienergia module allows you to have constant availability of material, in a short time, being environmentally conscious and reducing harmful emissions during transport.

We at Trienergia strongly believe in the territory, from which we draw inspiration and on which we want to build the future.



Come and visit the production site in the province of Mantova!



BLACK

LIGHT WEIGHT

**IDEAL FOR REVAMPING
UE MODULES**

TRI420LW-BB

108 HALFCUT CELLS
182.00 x 91.00 mm



CELL TYPE
N-Type TOPCon



SIZE
1720 x 1132 x 30 mm



WEIGHT
10.80 kg



COLOR
Black



FRAME
Black



NOMINAL POWER
420 Wp



WARRANTIES
Product: 12 years
Performance:
25 years 82%



COE-430M10EF

108 HALFCUT CELLS
M10 HC - 182.00 x
91.00 mm

CELL TYPE
N-Type TOPCon M10

SIZE
1722 x 1134 x 30 mm

WEIGHT
20.20 kg

COLOR
White

FRAME
Black

NOMINAL POWER
430 Wp

WARRANTIES
Product: 15 years
Performance:
12 years 90% -
25 years 80%

N-Type TOPCon technology.

STRUCTURE OF THE PHOTOVOLTAIC MODULE

TRIENERGIA modules with **N-Type TOPCon technology** are made with latest-generation **monocrystalline cells**, designed to maximize efficiency and reduce energy losses.

The advanced cell structure allows for improved passivation of the electrical contacts, limiting recombination phenomena and increasing the overall production of the module.

Thanks to the quality of the N-Type wafer, **the module guarantees greater stability over time and less sensitivity to early detection (LID) phenomena, typical of traditional technologies.**

N-TYPE TOPCON

*Tunnel Oxide
Passivated CONTACT*

TOPCon technology features a **nultra-thin layer of silicon oxide and a layer of polycrystalline silicon** on the back of the cell.

This configuration creates a **passivated contact** that:

- Reduces electron leakage
- Increase conversion efficiency
- Improves energy yield in low irradiation conditions
- Optimizes high temperature behavior
- Ensures less degradation in the long term

MORE PRODUCTION OVER TIME

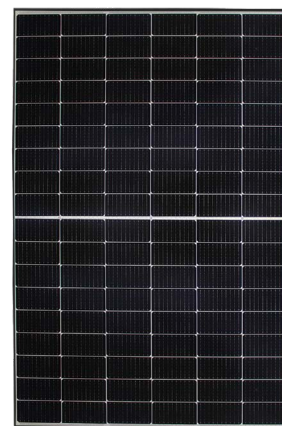
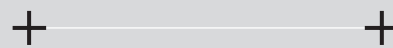
The combination of **N-Type wafer and TOPCon** architecture allows to obtain:

- Greater module efficiency
- Better temperature coefficient
- High reliability over the long term
- More stable energy production

MWT BACK CONTACT

TRIENERGIA modules also use technology

MWT Back Contact, like the TRI410VP-WB module



SUITABLE FOR RESIDENTIAL
AND C&I INSTALLATIONS

TRI410VP-WB



132 HALFCUT CELLS
M6 - 166.00 x
83.00 mm



CELL TYPE
MonoPerc MWT
BACKCONTACT



SIZE
1889 x 1035 x 30 mm



WEIGHT
20.50 kg



COLOR
White



FRAME
Black



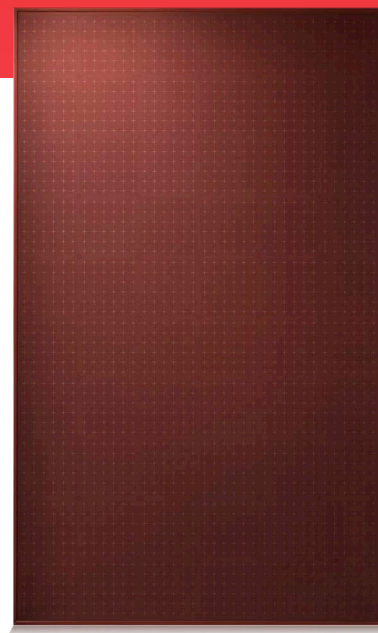
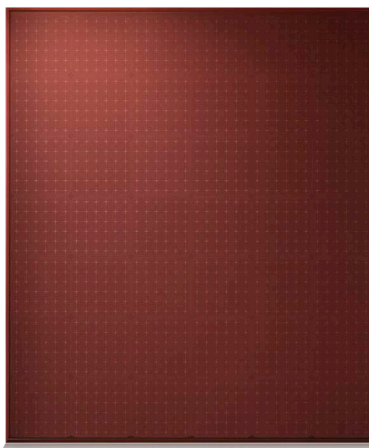
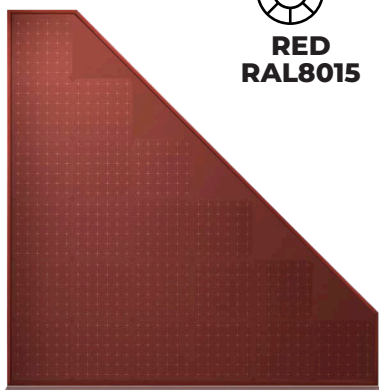
NOMINAL POWER
410 Wp



WARRANTIES
Product: 20 years
Performance:
12 years 90% -
30 years 82%



RED
RAL8015



TRI115TP-RR

21 CELLS
M6 - 166.00 x 166.00 mm



CELL TYPE
MonoPerc MWT
BACKCONTACT
CONDUCTIVE BACKSHEET



SIZE
1035 x 1035 x 35 mm



WEIGHT
7.00 kg



COLOR
Red



FRAME
Red



NOMINAL POWER
115 Wp



WARRANTIES
Product: 20 years
Performance:
12 years - 90%
30 years - 82%



TRI230DP-RR

42 CELLES
M6 - 166.00 x 166.00 mm

CELL TYPE
MonoPerc MWT
BACKCONTACT
CONDUCTIVE BACKSHEET

SIZE
1211 x 1035 x 35 mm

WEIGHT
14.00 kg

COLOR
Red

FRAME
Red

NOMINAL POWER
230 Wp

WARRANTIES
Product: 20 years
Performance:
12 years - 90%
30 years - 82%

TRI320SP-RR TRI325SP-RR

60 CELLS
M6 - 166.00 x 166.00 mm

CELL TYPE
MonoPerc MWT
BACKCONTACT
CONDUCTIVE BACKSHEET

SIZE
1712 x 1035 x 35 mm

WEIGHT
20.00 kg

COLOR
Red

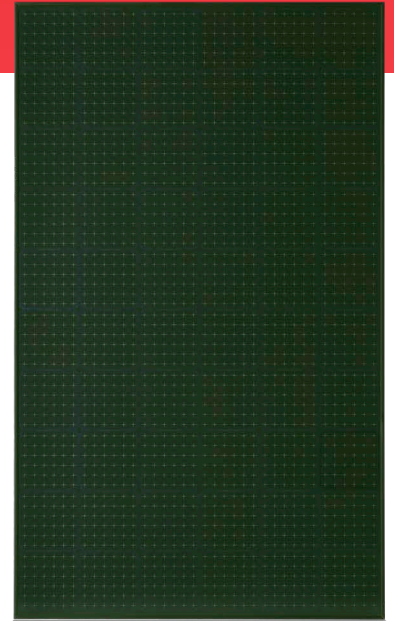
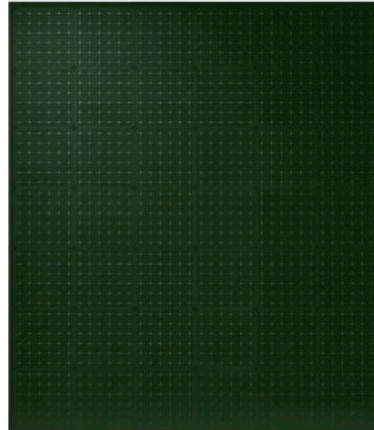
FRAME
Red

NOMINAL POWER
320 Wp
325 Wp

WARRANTIES
Product: 20 years
Performance:
12 years - 90%
30 years - 82%



**GREEN
RAL6007**



TRI115TP-GG

TRI230DP-GG

TRI320SP-GG



21 CELLS
M6 - 166.00 x 166.00 mm

42 CELLS
M6 - 166.00 x 166.00 mm

60 CELLES
M6 - 166.00 x 166.00 mm



CELL TYPE
MonoPerc MWT
BACKCONTACT
CONDUCTIVE BACKSHEET

CELL TYPE
MonoPerc MWT
BACKCONTACT
CONDUCTIVE BACKSHEET

CELL TYPE
MonoPerc MWT
BACKCONTACT
CONDUCTIVE BACKSHEET



SIZE
1035 x 1035 x 35 mm

SIZE
1211 x 1035 x 35 mm

SIZE
1712 x 1035 x 35 mm



WEIGHT
7.00 kg

WEIGHT
14.00 kg

WEIGHT
20.00 kg



COLOR
Green

COLOR
Green

COLOR
Green



FRAME
Green

FRAME
Green

FRAME
Green



NOMINAL POWER
115 Wp

NOMINAL POWER
230 Wp

NOMINAL POWER
320 Wp



WARRANTIES
Product: 20 years
Performance:
12 years - 90%
30 years - 82%

WARRANTIES
Product: 20 years
Performance:
12 years - 90%
30 years - 82%

WARRANTIES
Product: 20 years
Performance:
12 years - 90%
30 years - 82%



TECHNOLOGY

Technology.

-88,9%

LESS LEAD
COMPARED TO
OTHER PRODUCER
STANDARD PANELS

PV MODULE STRUCTURE

The production of Trienergia modules is based on a highly automated process, which allows to obtain more performing photovoltaic modules, minimizing the risk of breakage in the production phase and possible microfractures deriving from mechanical stress due to the stringing machine. The loss of watts from cell to module is reduced by one tenth compared to a standard production: from 0.1% to 0.01%.

ADVANTAGES APPLIED CELLS

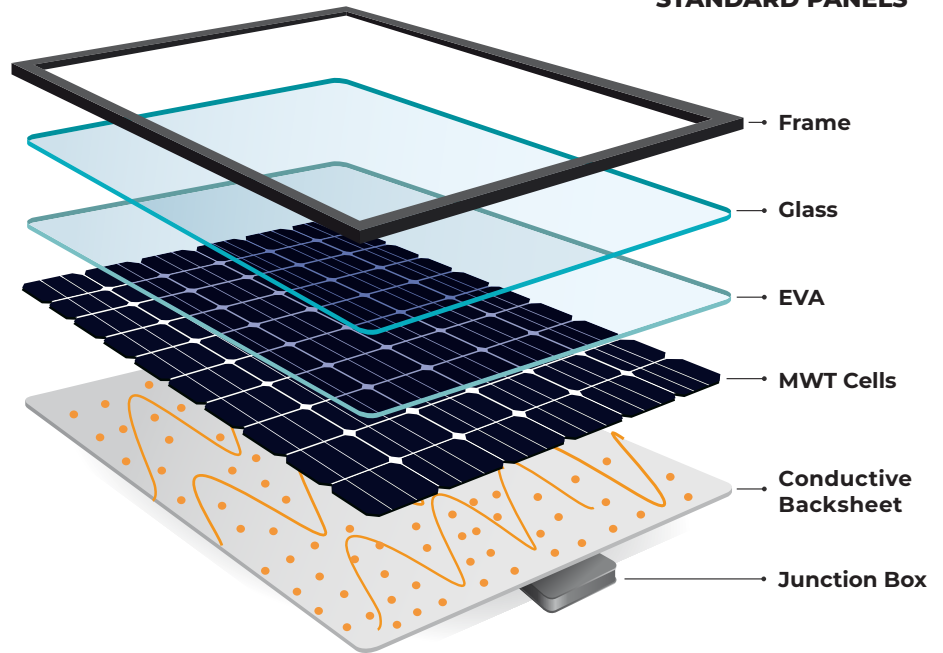
- LESS THERMAL STRESS
- NO MICRO-CRACK AND BREAKAGE CAUSED BY MECHANICAL STRESS

MWT BACK CONTACT

TRIENERGIA modules make the most of the **MWT Backcontact Technology**, which allows to achieve more performing, more resistant panels, reducing the risk of fractures and micro-crak.

Back Contact Technology provides for the pesence of electrical contacts only on the back. Cells that compose the photovoltaic module are no longer welded at the connection points no stress by contact, but applied (using a special electroconductive component) on a conductive backsheet which acts as a contact and connection for the positive and negative poles of the photovoltaic solar panel.

The use of the conductive backsheet allows energy to use the entire surface of the module to



generate power, without being necessary channeled into the surface of the ribbons.

3% less shade due to absence of ribbons

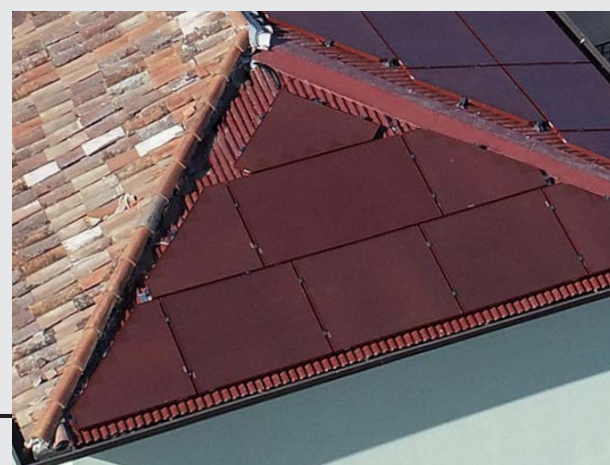
SAFEGUARDING ITALIAN ARCHITECTURAL UNIQUENESS

The **Red** module, with its characteristic "brick" red colour, blends in perfectly on roofs. By ensuring **minimal visual impact** and therefore becoming the reference panel for that demanding segment of customers who do not want to give up the installation of a photovoltaic system high performance, also in a particular historical landscape context.

MORE EFFICIENCY

This is the ideal solution to increase the efficiency of the module, due to **photovoltaic cells** that have an **efficiency of 24,2%** and the removing of welding points (ribbonless technology) for an improved use of light, with

ENERGY DESIGN





DESIGN

Design.

TRIENERGIA ENERGY DESIGN is available in red, black and green coloring.



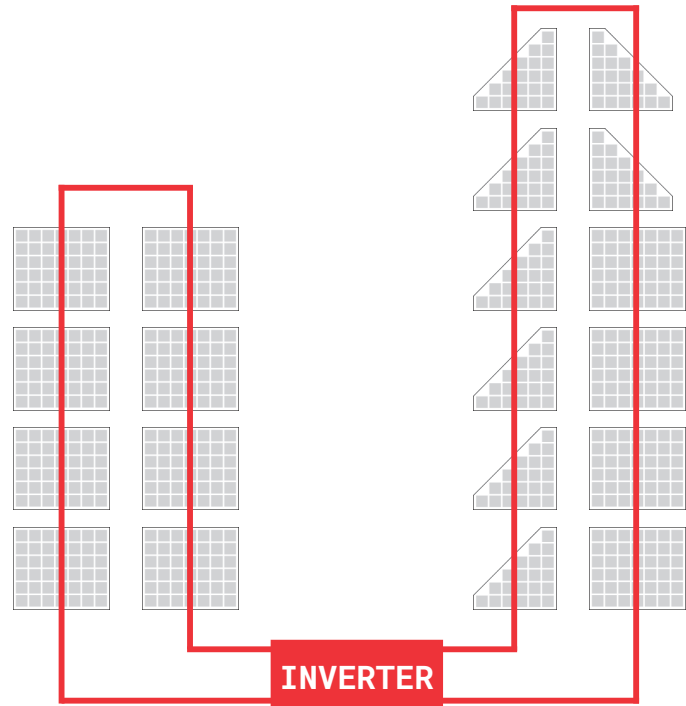
Trienergia modules have been developed to go beyond the standards, to offer the best solution for anyone who wants to install a photovoltaic system, **without being limited by the shape of their roof.**

Thanks to the **3 different sizes** (21 triangular cells / 42 rectangular cells / 60 cells) it is possible to perfectly cover roofs with different and irregular shapes for a better aesthetic result, by covering the entire roof surface therefore obtaining greater energy production.

An optimized roof covering offers better use of available space, greater installed power (therefore also greater energy production), greater return on investment and an aesthetically perfect result.

EXCLUSIVE CHOICE

The photovoltaic system **is an excellent investment. it promotes energy savings and autonomy, increases the value of the property and helps the environment,** but to be such it must be done carefully. TRIENERGIA is an exclusive choice that allows you to have a complete, high-end solution that lasts over time.



STRING 1

No. 8 rectangles 2,00 kWp

Imp: 10,65 A
Vmp: 190,40 Vdc

STRING 2

No. 4 rectangles + No. 8 triangles 2,00 kWp

Imp: 10,65 A
Vmp: 190,40 Vdc

MIXED PV STRINGS

In all mixed systems (rectangular and triangular) the rectangular modules for example with a power of 230 Wp must always be combined with the triangular modules of half power (115 Wp) in this way it is possible to create mixed strings without any particular wiring arrangements.

EASY INSTALLATION

All TRIENERGIA modules (21 cells + 42 cells + 60 cells) can be installed easily, in fact, connections and mounting structures are identical to traditional panels.

Functional design and optimal result.

LANDSCAPES

TRIENERGIA modules offer an **exclusive solution**, which meets the expectations of the most demanding customer, **also solving issues regarding landscape regulations restrictive.**

The three different shapes of the **TRIENERGIA RED** modules and the possibility of having them in different colors allow the photovoltaic system to be integrated with both the building and the surrounding environment. Furthermore, glass does not have a colored adhesive film that can deteriorate over time: **the pigments are hardened directly inside it for an always optimal result.**

TRIENERGIA



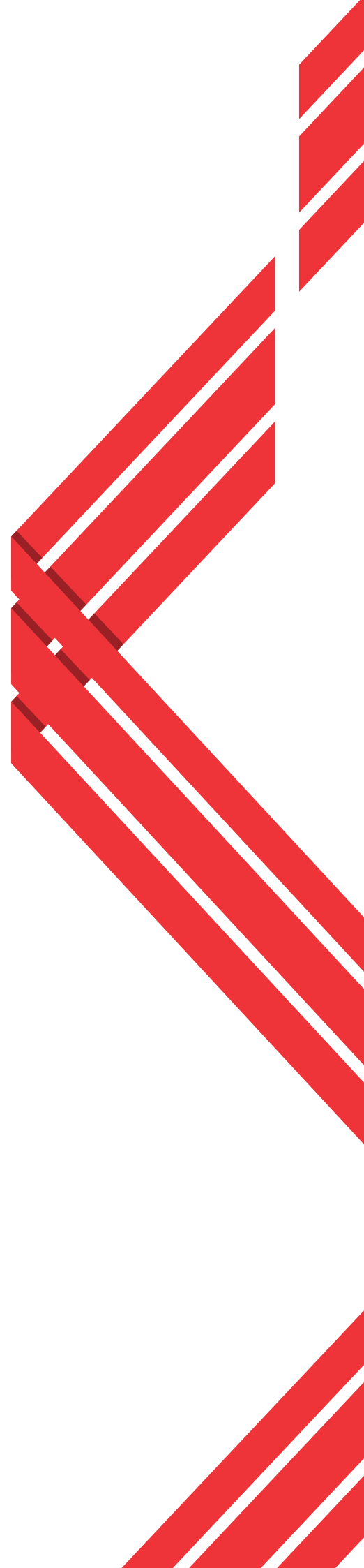
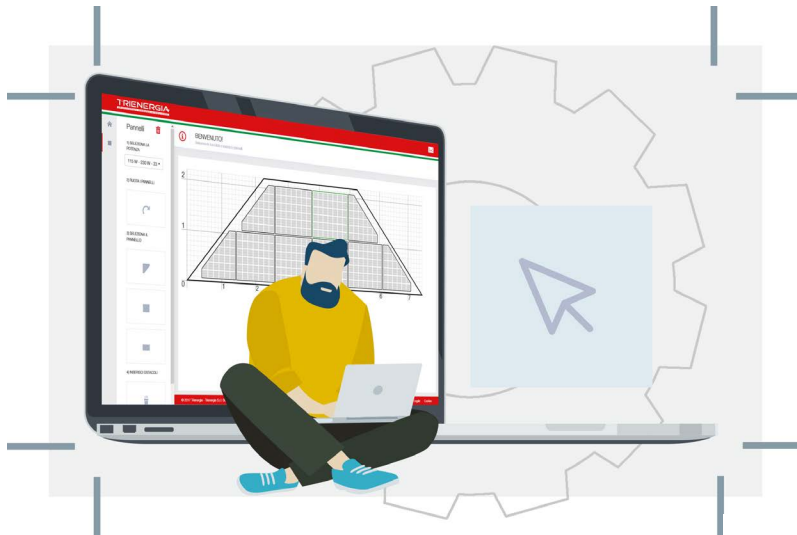
Quick Tool TRIENERGIA Energy Design.

We have created **free software** to allow anyone to **configure the ideal arrangement of photovoltaic solar panels on their roof.**

The program, designed for individuals or installers, allows you to calculate the best arrangement of the PV modules on the roof, obtaining immediate feedback on the installed power and the covered surface area. To use it for free visit

<http://designer.trienergia.com/>

designer.trienergia.com





TRIENERGIA

photovoltaic modules production

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