



Introducing the world's
most reliable solar panel

Company presentation

 **sener****sun**
we mean quality

Content

I. The company

- i. Overview
- ii. Milestones
- iii. Value chain
- iv. Company sustainability
- v. Eco-responsibility
- vi. Global presence
- vii. References

II. We mean quality

III. The benefits of choosing Senersun



The company

French company

Senersun is a French company, specialized in the manufacturing of premium quality solar panels. We employ 430 employees worldwide.

Vertically integrated

Senersun solar panels are produced in our vertically-integrated factory, which features state-of-the-art equipment, and ingots and cells workshops.

Strong financial asset

Senersun is a division of Senergy Corp., a leading supplier of silicon and semiconductor materials worldwide.

Emphasis on Quality

Quality is part of Senersun's DNA. The quality of our solar panels is guaranteed by the combination of in-house QC and a full independent testing program on every module after production.



Milestones

A thoughtful expansion

Senersun has recorded a steady growth since its creation in 2009. Our development has always been driven by our commitment to increase our support to our customers worldwide, and provide them with solutions in line with their requirements. This model of development has lead our products to be increasingly recognized for their unique quality.



The company / Value chain

SENERGY
CORPORATION

sener**sun**

Silicon

Ingots

Wafers*

Cells

Modules

Quality
Control**

Delivery



*outsourced to strategic partners

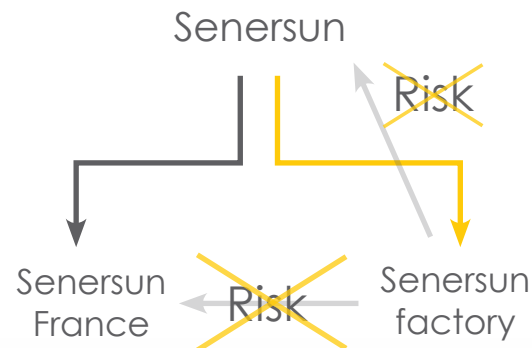
**Senersun Premium Quality Program,
in cooperation with STS Certified

A business model designed for long-term reliability

Financial sustainability

As a division of Senergy Corp, Senersun benefits from strong financial assets. The company's structure enables Senersun and its branches not to bear the factory's financial risks.

Senersun's liability is immutable over time; our solar panels are covered throughout their lifetime, no matter what.



Senersun France SAS and Senersun Ltd. do not bear the risks associated to the factory.

Product sustainability

Senersun solar panels' reliability is ensured through a fivefold guarantee:

- i. 100% independent re-test of the panels
- ii. Positive power tolerance
- iii. 10-year product warranty
- iv. 25-year linear performance warranty
- v. Warranty backed up by Zurich insurance



10-year product warranty and
25-year linear performance warranty
backed up by Zurich insurance

Strictest product
quality control



In-house quality control



100% independent
product testing

The company / We mean eco-responsibility



Contributing to a better world

As a leading company involved in renewable energies, everyday we strive to improve our environmental behaviour through best practice and thoughtful product design.



Eco-responsibility

Factory's compliance with international and local regulations

Our factory is certified ISO 14001. Independent inspections are performed at our factory on a regular agenda to check the compliance of our factory with the highest environmental standards.

In-house waste management program

We organize a clean disposal of the waste generated by the factory, and ensure a proper management of waste water.

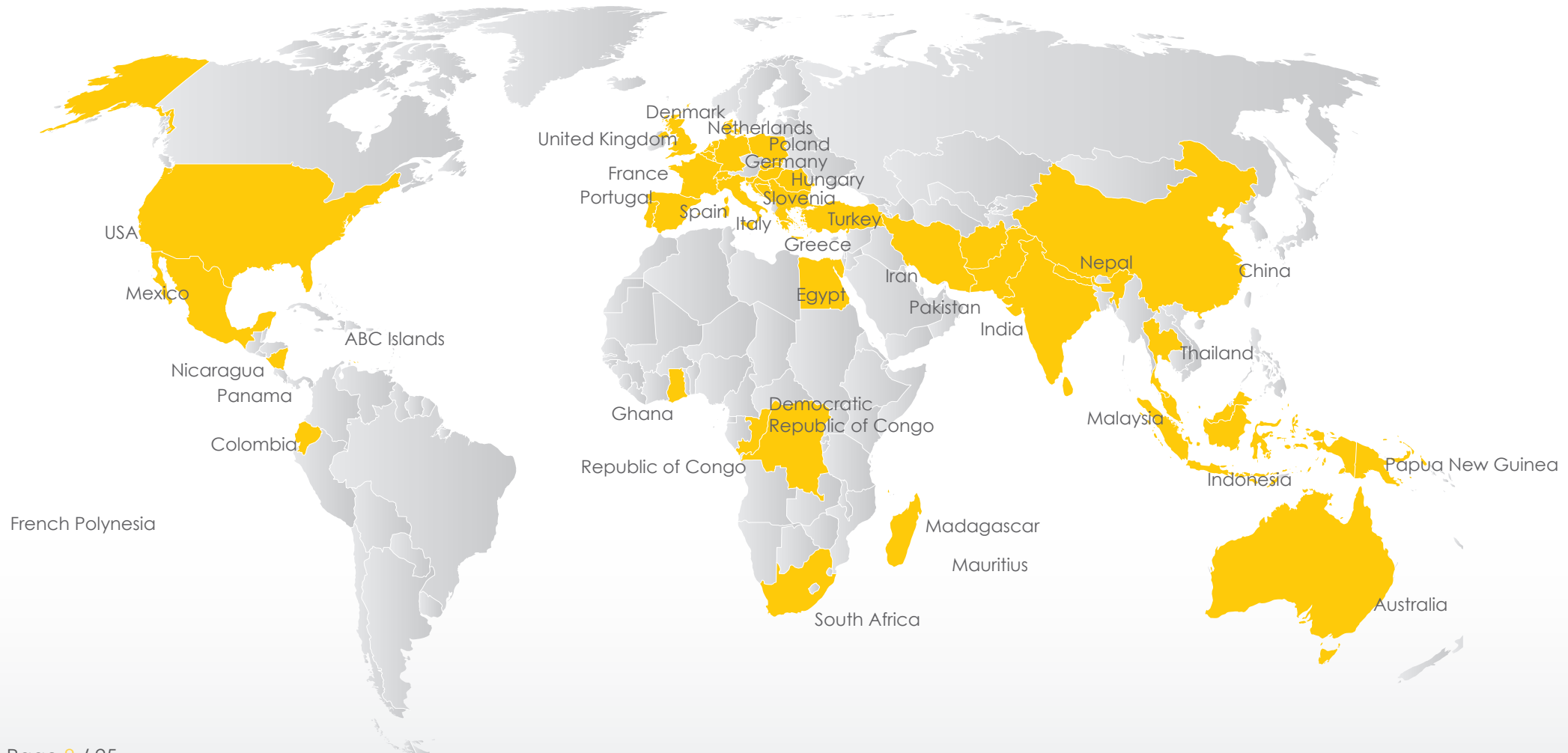
Recycling programs

Senersun is one of the first members of the French program of recycling CERES, which will enable the recycling of end-of-life panels.

Recycling is also processed upstream, the silicon broken during cells production is treated, and internal recycling programs on components have been implemented at our factory.

Distributed around the world

We commit to serve EVERY customer worldwide in major and emerging PV markets; this is why we have partnered with major distributors around the world.



The company / References



Location : Spain
Rated system size: 2.85kW
Construction type: Carport
Completion date: 2011
Operator/installer: Sendekia



Location : Various cities, France and Belgium
Construction type: Residential rooftop
Completion date: 2011
Operator/installer: Various



Location : Italy
Rated system size: 10MW
Construction type: Ground mounted

Completion date: 2011
Operator/installer: Cellini



Location: Mexico
Rated system size: 28.8kW
Construction type: Carport
Completion date: 2012
Operator/installer: Voltaika



Location : Nepal
Rated system size: 4.18kW
Construction type: Off-grid industrial rooftop
Completion date: 2012
Operator/installer: Solar Solutions



Location : Perth, Australia
Construction type: Residential rooftop
Completion date: 2012
Operator/installer: Phase



Location : Various cities, French Polynesia
Construction type: Residential rooftop
Completion date: 2012
Operator/installer: Conexun



Location : Madagascar
Rated system size: 3.8kW
Construction type: Built-in PV container
Completion date: 2011
Operator/installer: IE Solar

Trusted by banks

Because banks trust the reliability of Senersun solar panels, our products have been used in several large-scale projects financed by large banking groups, such as Unicredit, Banca Etruria, MPS.

Content

I. The company

II. We mean quality

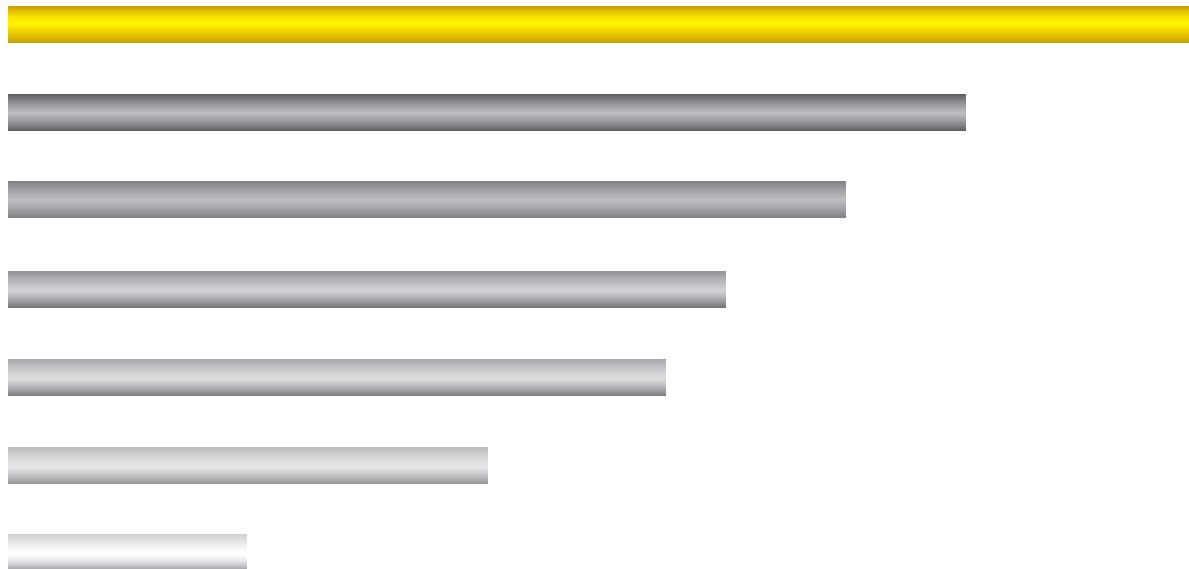
- i. The highest quality
- ii. Manufacturing
- iii. Senersun Premium Quality Program
- iv. The risk-free solar panel
- v. Warranty
- vi. Certifications

III. The benefits of choosing Senersun

We mean quality / The highest quality

The highest quality on the market

STS testing campaign 2012, Senersun ranks n°1.



STS Testing campaign

In 2012, STS Certified has launched a testing campaign aimed at providing the solar industry with an accurate picture of manufacturers' quality on a mass-production scale.

The concept brought up by STS is to test a randomly-selected container of a given product, in order to determine the ability of a manufacturer to guarantee a high level of quality on a whole shipment.

The first results of the campaign have been published in April 2012. The results speak for themselves, Senersun outranks the competition, a real testimony of the consistency of our products' quality.



We mean quality / Manufacturing



Factory

Senersun solar panels are manufactured in our factory, where quality is controlled throughout the manufacturing process.

Our factory is strategically located, in order to increase the cost-competitiveness of our products, and reduce breakage risk linked to transportation.

The factory is vertically integrated, and features cells and ingots workshops.

Solar ingot workshop

100 x Mono ingot furnaces
20 x Poly ingot furnaces

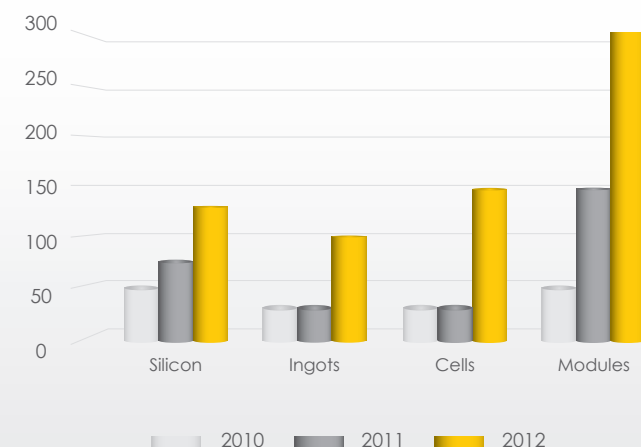


Solar cell workshop

Printing machine: BACCINI (Italy)
Sintering machine: DESPATCH (USA)



Capacity per workshop (in MWp)



We mean quality /
Manufacturing



Module assembly line

Senersun solar modules are assembled on state-of-the-art equipment and automated production lines.



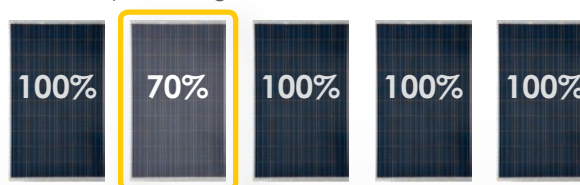
We mean quality / Senersun Premium Quality Program (SPQP)



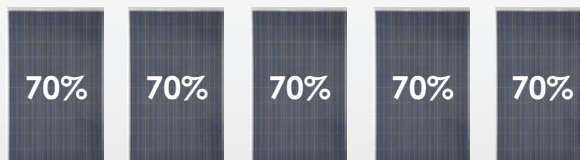
Explaining the weakest link effect

In any electrical system, the element from which the current is the lowest determines the current generated by the whole system. In short, the weakest rules. In a PV module, less current in a cell means a reduction of the current in the whole module. This phenomenon will spread to the range of modules installed, connected in series... In short, only one solar cell containing a microcrack in one solar panel can reduce the performance of the whole system by up to more than 30%.

One cell performing less = the whole module affected



One module performing less = the whole array affected



Why SPQP is necessary

Because a single broken solar cell in one solar panel of a PV system can reduce the performance of the same system by up to more than 30%, we find it critical to deliver 100% defect-free solar panels. And because no other solar panel manufacturer is willing to commit on such quality level*, Senersun has created Senersun Premium Quality Program, the most extensive quality control program ever implemented by a solar panel manufacturer.

Senersun Premium Quality Program consists of:

- i. In-house testing, at Senersun factory
- ii. In-house inspection by STS Certified
- iii. Independent testing at STS Certified's facility

Tests are performed on EVERY panel, according to Senersun standards.

*STS Certified reported in 2013 having found more than 13% of defective panels among the 200,000 solar panels they had tested the year before, from the largest to the smallest manufacturers.

Senersun Premium Quality Program: 1 program, 3 stages



i. In-house quality, performed by Senersun

Our factory is certified ISO compliant (9001:2008: Quality Management System), and features automated production lines as well as high-end testing equipment. In-house, our solar panels are submitted to a first series of intensive tests, including 3 EL tests and Flash test. All the tests are performed on high-end equipment.



ii. In-house inspection by STS Certified

A team of experts from STS Certified is present at our factory, during production. STS Certified's experts control the compliance of the production process with our quality standards.



iii. 100% re-test at STS QC Center

After production, each Senersun solar panel is sent to STS facility. Every characteristic of each panel is being checked, from cell quality (100% EL test) and performance (100% Flash test + analysis of the curve), to technical and visual quality. Components and packaging are also controlled.

The panels offered by Senersun all comply with Senersun Premium Quality Program.

Beyond industry standards

Existing safety and quality standards are necessary but they do not suffice to guarantee the long-term performance of a solar panel. This is why Senersun has developed exhaustive quality standards, which cover the whole scope of quality on a solar panel, from the determination of what is a micro-crack to the assessment of the packaging. Like no other solar panel manufacturer, Senersun applies these standards to every solar panel, to guarantee the most sustainable generation of electricity that a solar panel can produce.

Tests performed on EVERY panel

Because it is impossible for a manufacturer to guarantee the quality of all its products by testing only a few samples, we test 100% of our solar panels and only ship products that comply with our standards.



We mean quality / The risk-free solar panel

A solution to EVERY risk

Senersun Premium Quality Program (SPQP) enables us to bring a solution to every risk.

1

Electrical risk

Fast reduction of power output
Cells overheating, fires

Our solution:

100% electrical characteristics check
100% Flash test + IV curve analysis
4 x Electro luminescence tests on each panel

2

Workmanship risk

Premature degradation of the panels
Injuries during handling

Our solution:

Independent visual inspection
Independent water-proofing check
Independent components, connections check

3

Breakage risk

Creation / increase of defects
Theft

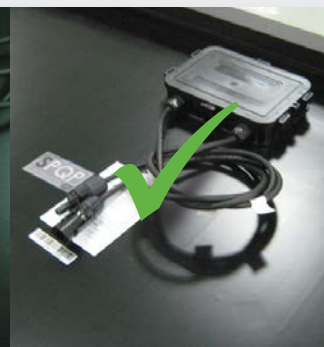
Our solution:

Quantity, packaging
Container loading check

EL test: an "X-ray" of the panel revealing microcracks and hotspots



Workmanship defect vs quality

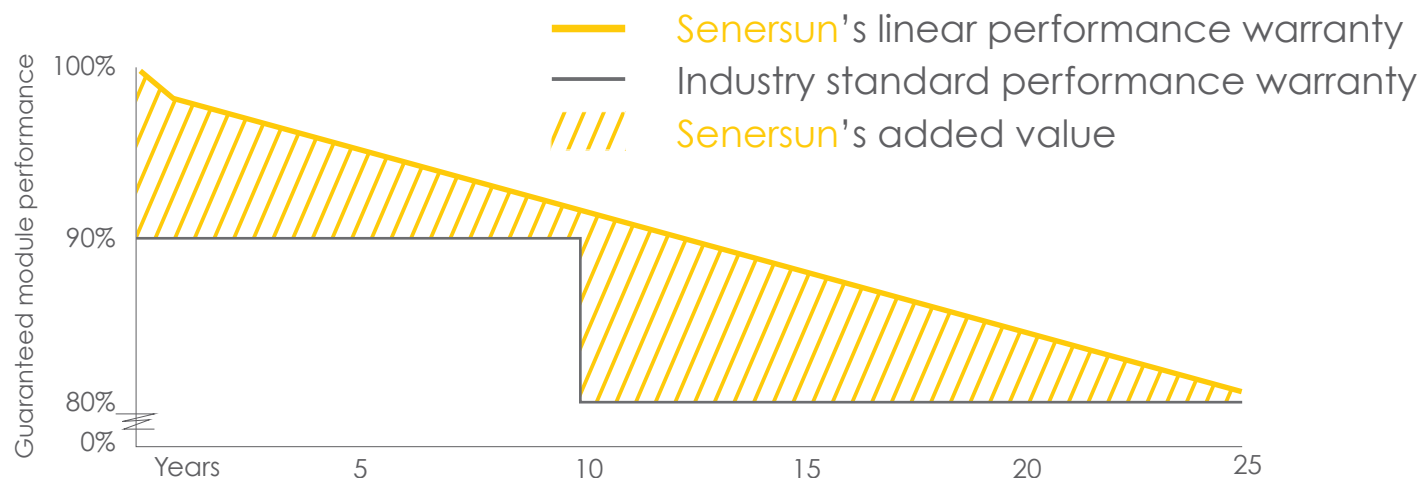


Packaging checking



25-year linear performance warranty

Senersun is one of the few companies offering a 25-year linear performance warranty on all its panels, in standard. This warranty guarantees to end-users that their panels will perform more and longer. It complements the 10-year product warranty available with every Senersun panels.



25-year linear warranty, what does that mean?

Senersun guarantees that the actual power of its solar panels cannot differ by more than 3% from the specified power during the first year. From the second year onwards, the power will not decrease by more than 0.7% of the rated power per year.

For example, at year 10, Senersun modules' performance is guaranteed to be at least 90% of the rated power, compared to the industry standard warranty of 80%.

We mean quality / Certifications



Products fully certified

As a testimony of Senersun's quality and safety standards, our modules are certified by the world's most renowned laboratories, including TÜV Rheinland, Underwriting Laboratories, etc.

The compliance of our panels with our product specifications is systematically controlled after production.



Materials

Quality materials only



Components

Compliance with certificates checked and validated



Modules

Compliance with specifications checked and validated



Content

- I. The company
- II. We mean quality
- III. The benefits of choosing Senersun
 - i. Product line
 - ii. The most sustainable performance
 - iii. The best return on investment
 - iv. Exceed your expectations
 - v. At your side

Why choosing Senersun / Product line



100%
independently
re-tested

Unique quality: 100% re-test on EVERY module by a third-party testing company (STS Certified)

High
module
efficiency

Up to 16% efficiency and lower operating cell temperature: higher performance to maximize the production of electricity for each m²

-0/+3%
positive
tolerance

Guaranteed power output: positive tolerance on each panel (-0/+3%)

25
-year
warranty

10-year product warranty
Linear 25-year power output warranty

The choice is yours

Tailored for our customers

Senersun offers an extensive line of premium quality solar panels, featuring polycrystalline and monocrystalline cells, in order to serve every customer worldwide, and meet their needs for diversified products.

Compatible worldwide

Our solar panels range from 90 to 305Wp, and are compatible with off and on-grid applications.

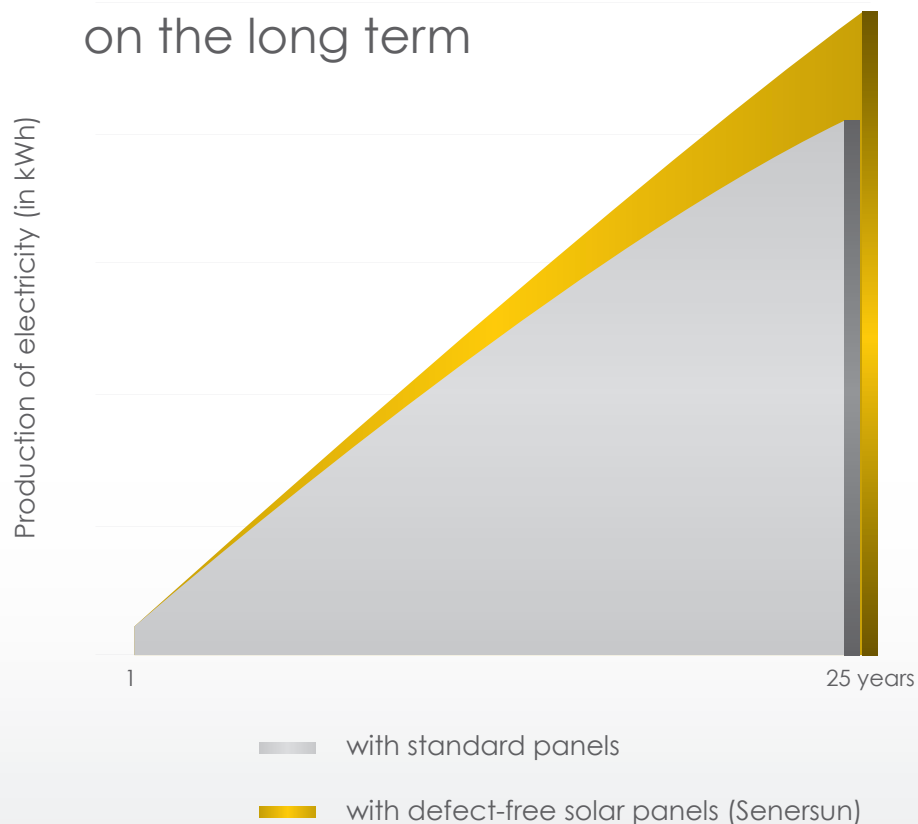
Black or White

Our panels are available in standard or in "All Black" version, to meet the requirements of the most demanding homeowners.



PRODUCE MORE

on the long term



Defective solar panel: your ROI in danger!

STS-Certified has recorded in 2012 13% of defective solar panels out of the 200,000 solar panels they had tested the same year, from the smallest to the largest PV makers.

Senersun: the defect free solar panel

Every Senersun follows Senersun Premium Quality Program, the most advanced quality control program ever implemented by a solar panel manufacturer.

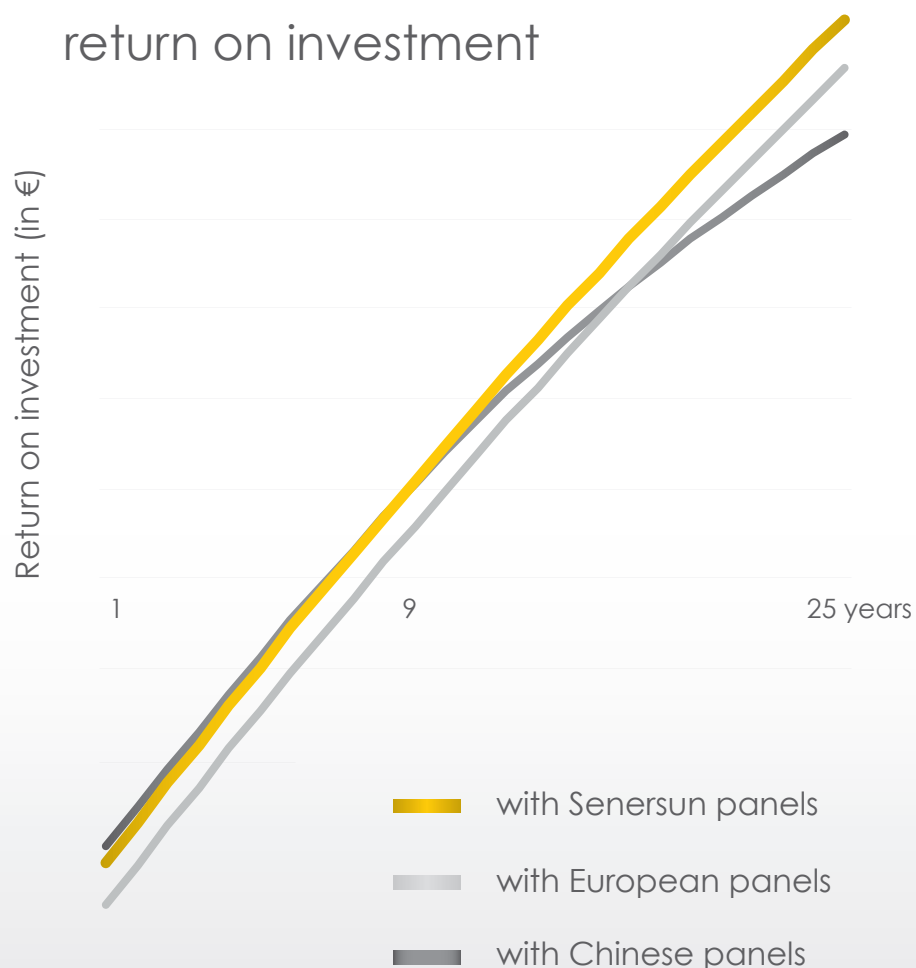
As part of the program, more than 50 points of control are checked on EVERY panel by an independent laboratory after production.

...For guaranteed performance

Simulations based on data from independent institutes show that defect-free solar panels like Senersun perform better on the long term than standard panels (see opposite chart).

THE BEST

return on investment



Performance, reliability,
at attractive prices

Unique quality

Every Senersun panel follows the most advanced QC program ever applied by a solar panel manufacturer.

Higher performance

Up to 16% efficiency and lower nominal operating cell temperature for better performance. Positive tolerance (-0/+3%) of every solar panel validated by a third party for a guaranteed power output.

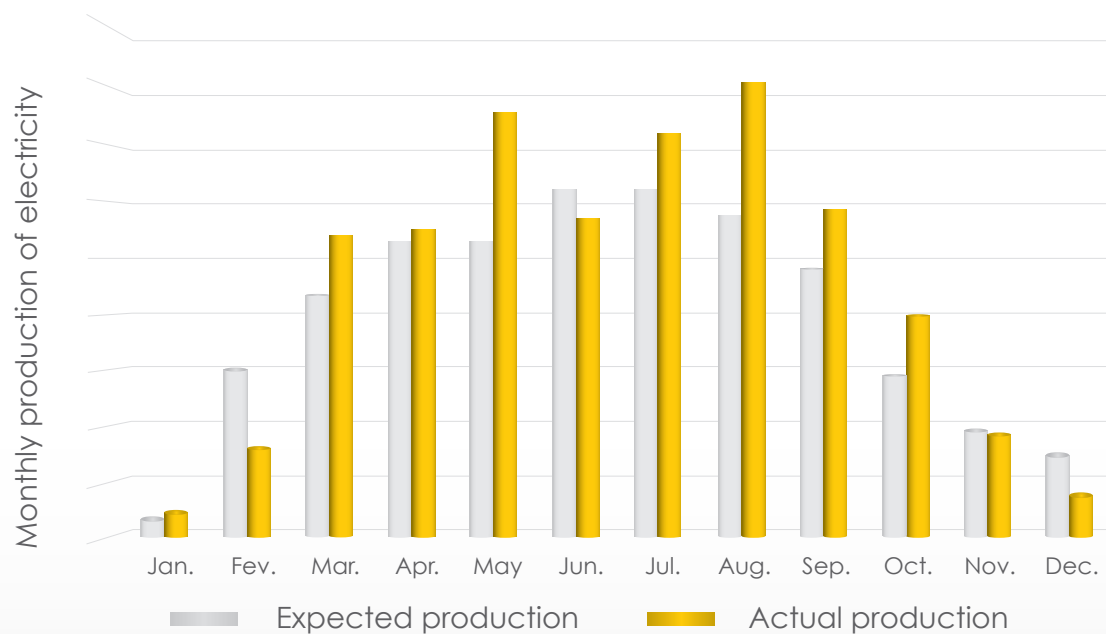
At attractive prices

Our business model has been designed for more cost competitiveness. The strategic partnerships we have entered into enable us to provide you with more, without impacting your investment upfront.

For the best return on Investment

As a result, our modules require a minimum investment upfront, and perform better on the long run.

Senersun panels perform more in real-life conditions



NB: the lower performance observed in February is due to maintenance services, during which the system was turned off for a few days.

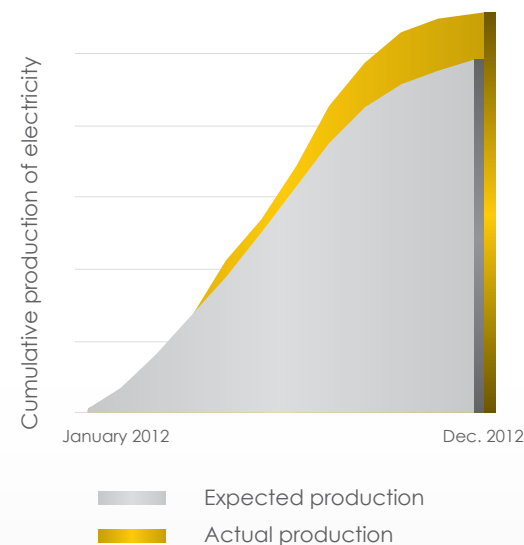
System features

Product type: Poly crystalline 235W
System size: 11.5kW
Project location: Belgium
Production observed throughout 2012

Annual production:

13.43%

more than expected



Data recorded with Solar-Log™ WEB
Solar-Log™ WEB enables the visualisation of the values recorded by the inverter

Why choosing Senersun /
At your side

A better service

A commitment to quality

Because quality is not only a matter of workmanship, Senersun also regards service as part of its quality commitment.

From on-time delivery to exquisite after-sales services, our local team spares no effort from production to delivery to guarantee that our customers always remain 100% satisfied.

Safer packaging

Shipment solution

Senersun introduces the shipment solution. Everything has been designed from packaging to the service surrounding the shipment to guarantee your satisfaction.

Senersun packaging is specifically designed to protect your products and ensure their quality until their destination.



STS reports with every shipment

To guarantee that your whole delivery is complying with the highest standards, we systematically provide our professional customers with complete test reports with our panels.





SNS-MAR-CIWE-12001:2.1 - © 2012 Senersun Limited. All right reserved.

You have a question about this document?
Please feel free to contact us at info@senersun.com

www.senersun.com