



**SUSTAINABLE
SOLAR —
EUROPE 2024**

Opening

12 December 2024



Sara Matthieu

MEP,
European Parliament

SUSTAINABLE
SOLAR _____
EUROPE 2024



Dries Acke

Deputy CEO,
SolarPower Europe

Sustainable Solar

Environmental, social, and
governance actions along
the value chain



solarpowereurope.org



Context

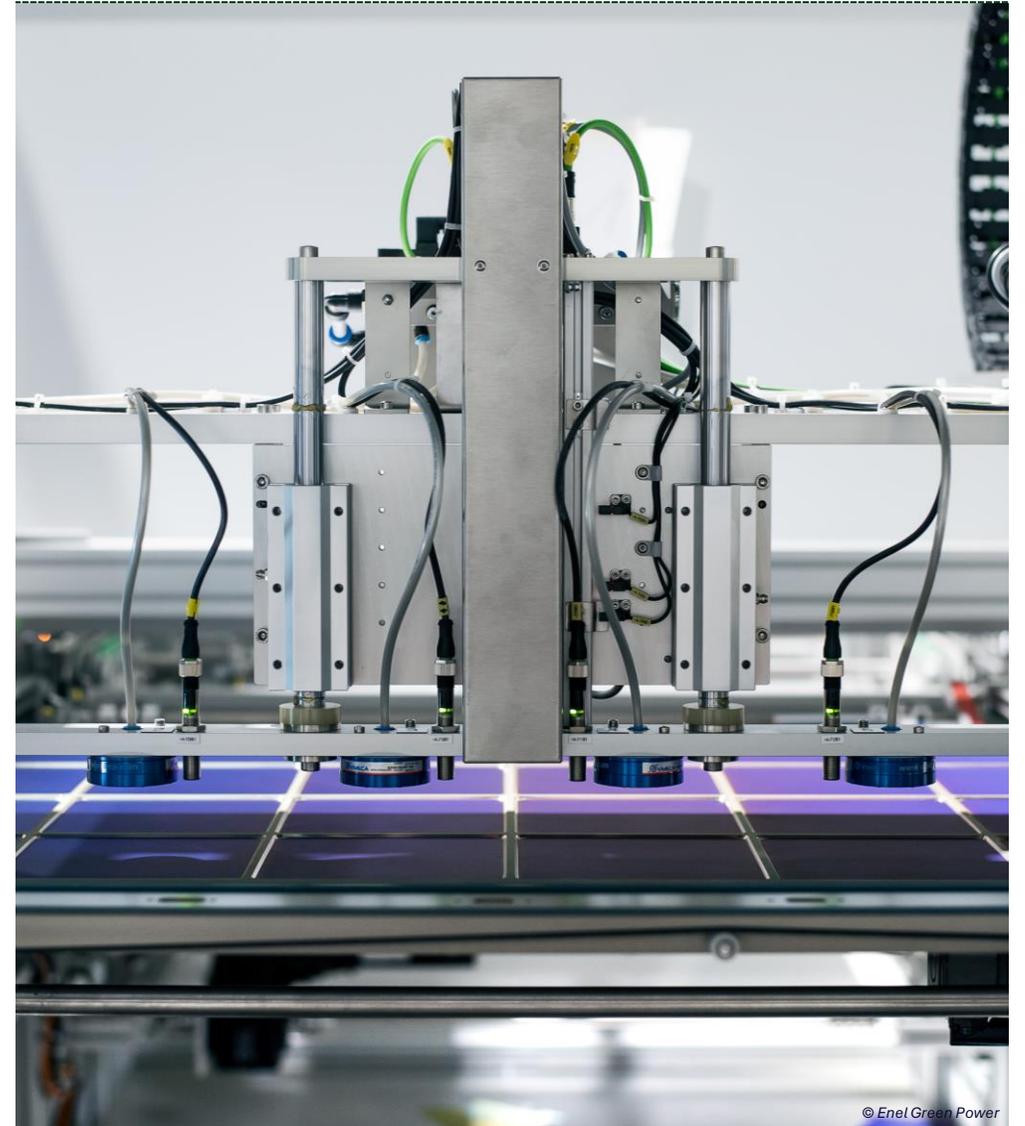
- Solar PV is a **crucial technology** in global decarbonisation efforts
- The concept of sustainability, however, goes much **beyond climate change** and affordable clean energy
- The solar sector is mindful of its own sustainability and **committed to continuing efforts to reduce its impact** across various domains

FIGURE 1 SUSTAINABILITY CHALLENGES AND THE UN SUSTAINABLE DEVELOPMENT GOALS



Methodology and scope

- The report goal is to illustrate how the solar sector is addressing **multiple sustainability challenges** across its complex value chain
- The report covers sustainability considerations across the solar value chain – from the **supply chain phase**, through the **use phase**, and to the **end-of-life phase**
- For each sustainability domain, it outlines the overall **context and background**, an overview of **approaches and best practices**, and hands-on **case studies**



How did we do it?

4

SolarPower Europe workstreams involved

63

SolarPower Europe member experts contributing

17

SolarPower Europe team members involved

9

Month process

100

Pages report

40

Meetings dedicated to the report

Chapter 1: Supply chain phase

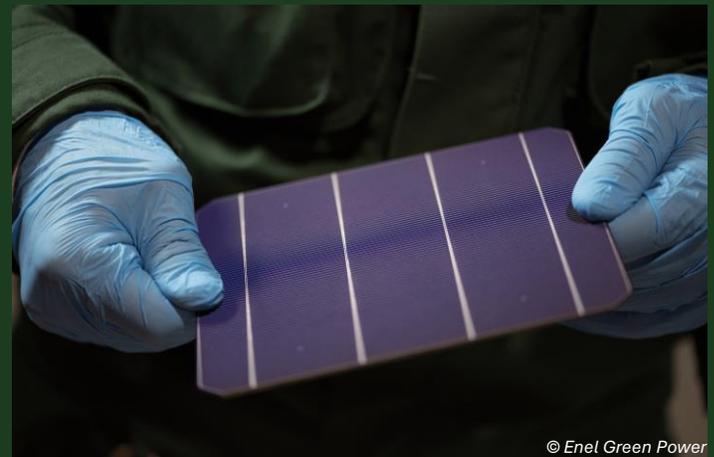
1.1: Human rights due diligence, responsible sourcing, and decent work



1.2: Carbon footprint



1.3: Circular design



Focus: Human rights due diligence,
responsible sourcing, and decent work

Solar Stewardship Initiative



solarpowereurope.org



- Solar-specific, multi-stakeholder sustainability assurance scheme
- Working with all relevant stakeholders, fosters responsible production, sourcing, and stewardship of solar materials
- Supply Chain Traceability Standard published today

Chapter 2: Use phase

2.1: Community engagement



A worker wearing a high-visibility vest and a hard hat is shown from the side, working on a roof. They are using a tool to install solar panels. The background shows a clear sky and some trees in the distance. A small copyright notice '© berdrola' is visible in the bottom right corner of the image.

2.2: Land use



A flock of sheep is grazing in a green field. In the background, there are solar panels mounted on a structure. The sky is overcast. A small copyright notice '© Statkraft' is visible in the bottom right corner of the image.

2.3: Biodiversity



A close-up view of solar panels. In the foreground, there are yellow flowers, possibly rapeseed, in focus. The solar panels are blue and silver, and the sky is a clear blue. A small copyright notice '© Lightsource bp' is visible in the bottom right corner of the image.

Focus: Community Engagement

Cedillo Solar Village



- Iberdrola's 375 MW solar park in Extremadura, designed to enable natural vegetation to grow and act as an ecological corridor
- Large-self consumption project through the Cedillo Solar Community benefits local citizens and businesses, saving up to 50% of their energy bills

Chapter 3: End-of-life phase

3.1: Revamping and repowering



3.2: Reuse and repair



3.3: Waste management and recycling



Focus: Waste management and recycling

Advanced PV module recycling



- SOLAR MATERIALS' PV recycling plant recovers 98% of PV module raw materials
- Without using environmentally harmful chemicals and with reduced energy consumption, key materials as silver, silicon, and high-quality glass, are recovered
- Current capacity of 3,000 tons per year is planned to increase to 10,000 tons by spring 2025

Download SolarPower Europe's latest report

Sustainable Solar:

Environmental, social, and governance actions along the value chain



**SUSTAINABLE
SOLAR _____
EUROPE 2024**

THANK YOU

**inter
solar**
connecting solar business | EUROPE

Solar Promotion GmbH

Kiehnlestraße 16
75172 Pforzheim, Germany
Phone: + 49 7231 58598-0
info@TheSmarterE.de
www.TheSmarterE.de

 **SolarPower
Europe**

SolarPower Europe

Rond-Point Robert Schuman 3
Brussels 1040, Belgium
info@solarpowereurope.org
www.solarpowereurope.org



**SUSTAINABLE
SOLAR —
EUROPE 2024**

European Solar Sustainability Award 2024

12 December 2024

**inter
solar**
connecting solar business | EUROPE

 **SolarPower
Europe**

**SUSTAINABLE
SOLAR _____
EUROPE 2024**



Michael Schmela

Executive Advisor & Director of
Market Intelligence,
SolarPower Europe

Dr. Jan-Philipp Mai

CEO

Solar Materials



SUSTAINABLE
SOLAR _____
EUROPE 2024



SOLAR
MATERIALS

Solar panel recycling revolution
for real green solar energy.



PROBLEM

Solar panel waste is the fastest growing electronic waste segment around the globe.

- ✦ Global waste volumes with multifold several times over the next decade.
- ✦ Europe is currently the largest recycling market but will be overtaken by Asia-Pacific and the USA.

Annual recycling volumes

100kt

2024

1 Mt

2030

6 Mt

2050

TECHNICAL & ENVIRONMENTAL CHALLENGE

Current recycling processes
lose 50% of raw material value and
waste critical resources.

- ✦ Silicon is labelled a critical raw material by EU and USA, but its recycling rate is 0%.
- ✦ Silver demand for solar panels is already 10% of annual global production and could outrun supply.
- ✦ Shredding and sorting are unable to recover minor metal fraction like silver at only 0.07% of total weight.

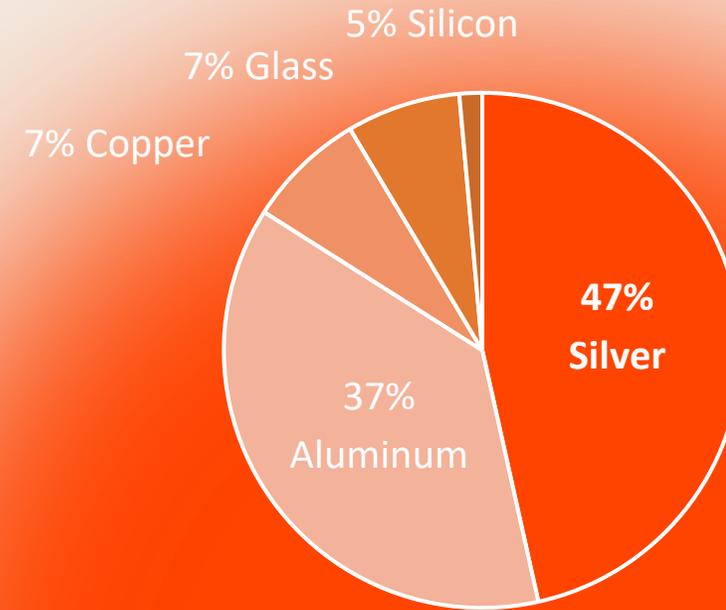
recovery rate for

0%

silicon & silver

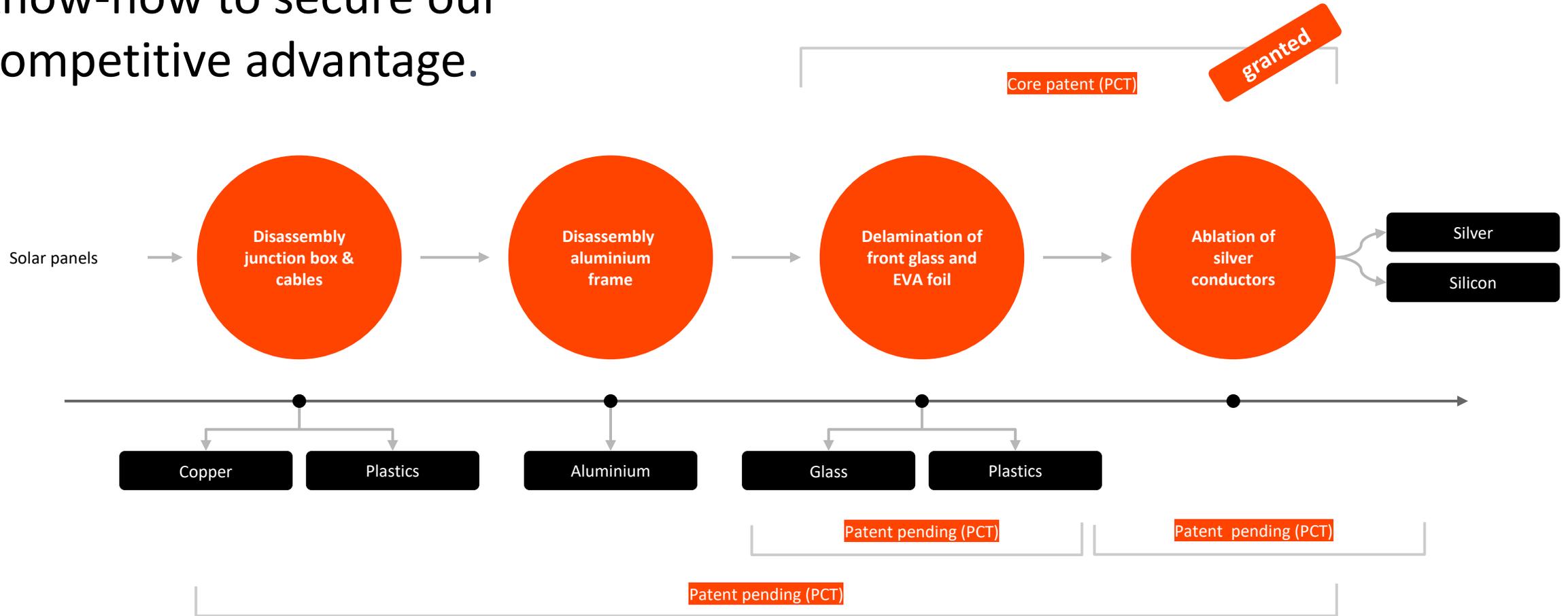
OUR TECHNICAL USP

With our patented, thermo-mechanical process, we recover all raw materials.
Silver is the key value driver.



OUR COMPETITIVE ADVANTAGE

5 patents and extensive process know-how to secure our competitive advantage.



OUR ACHIEVEMENTS

We are one of only two certified recycling sites specializing in solar panels in Germany.

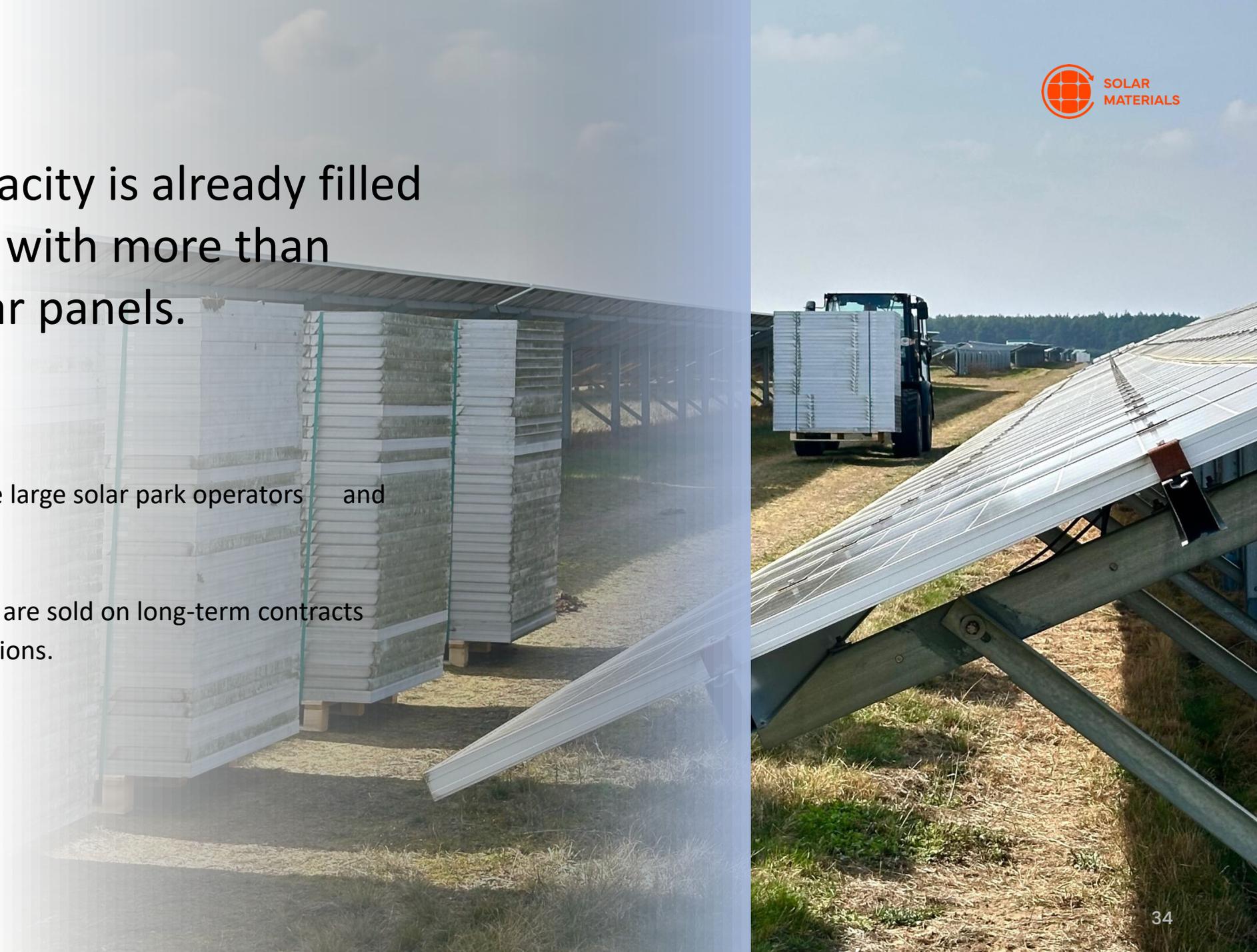
- ✦ Fully certified as two first treatment plant for solar panels since 2023 with over 3,000 tons of capacity.
- ✦ €12.2M Series A round with current investors and supported by EIC Accelerator grant.
- ✦ Currently expanding our recycling capacity to 10,000 tons by end of 2025.

COMMERCIAL TRACTION



Our recycling capacity is already filled until mid of 2026 with more than 6,000 tons of solar panels.

- ✦ Our customers are large solar park operators and asset owners.
- ✦ Our raw materials are sold on long-term contracts for major weight fractions.



TEAM

Combining expertise and passion to revolutionize the solar recycling market.



Fridolin Franke (CMO)

Marketing
Business
Development



Dr. Jan-Philipp Mai (CEO)

Organization
Supply & Sales



Jan Bargel (CTO)

Production
Research &
Development

**From
30 to 50 FTE
by mid of 2025.**

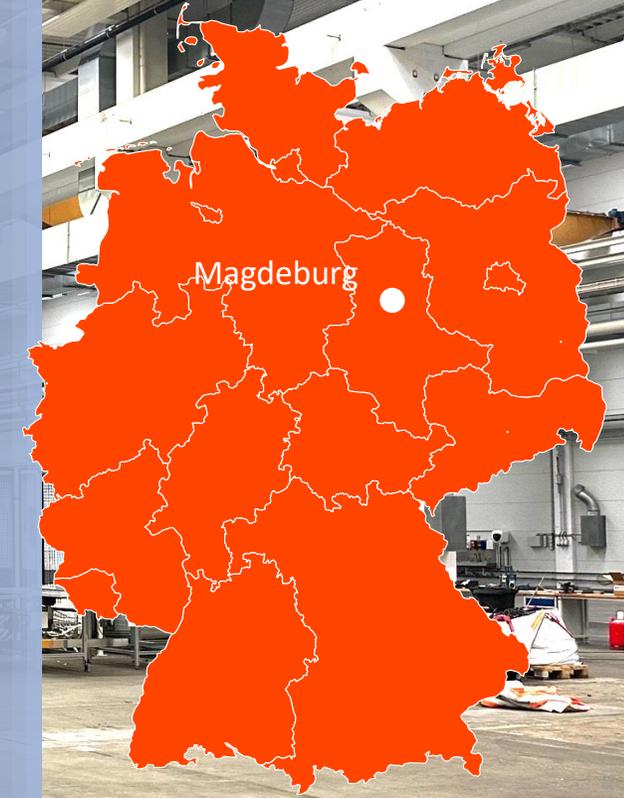
Key positions:

Head of Finance
Head of Production
Head of R&D

INDUSTRIAL PLANT

Our first industrial plant will start its operations in April 2025 adding 7,200 tons of capacity.

- ✦ We further plan to more than triple our recycling capacity to 36,000 tons by 2026.
- ✦ We will build our first European plant in Italy in 2025.
- ✦ We are currently raising a €20-30M Series B round to close in early 2025.





SOLAR
MATERIALS

THANK YOU

Let's transform solar
into a circular economy together.

Dr. Jan-Philipp Mai
SOLAR MATERIALS GmbH
Paul-Ecke-Str. 4
39114 Magdeburg / Germany
jp.mai@solar-materials.com
[Website](#)



LinkedIn

bmp Ventures

FIRSTIMAGINE!

 Katapult

Supported by

Co-funded by the
European Union 

 SACHSEN-ANHALT

 EUROPÄISCHE UNION
EFRE
Europäischer Fonds für
regionale Entwicklung

European Solar Sustainability Award 2024

Jury



Michael Schmela

Executive Advisor & Director of
Market Intelligence,
SolarPower Europe



Guido Agostinelli

Principal Risk Officer,
Sustainable Supply Chains,
IFC (International Finance
Corporation)



Beatriz Argueso Estirado

Environmental Engineering,
Iberdrola



Noor Yafai

Europe Director Global Policy
and Institutional Partnerships,
TNC

**SUSTAINABLE
SOLAR _____
EUROPE 2024**



Martín Behar

Director of Research and
Environmental Affairs
UNEF

SUSTAINABLE
SOLAR _____
EUROPE 2024



Environmental integration tool :
Seal of excellence in sustainability



Developed collaboratively by 30 experts over one year

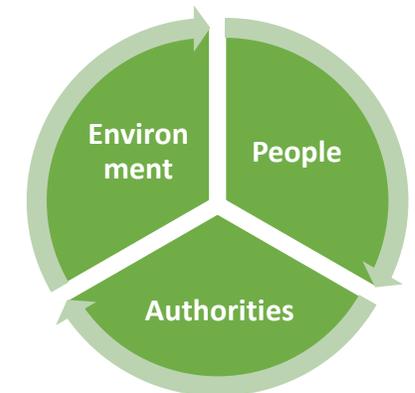
Endorsed by 5 leading environmental associations



GREENPEACE



Designed for projects that create a positive long-term impact



Objective: Raise Standards to Excellence



Seal of excellence in sustainability



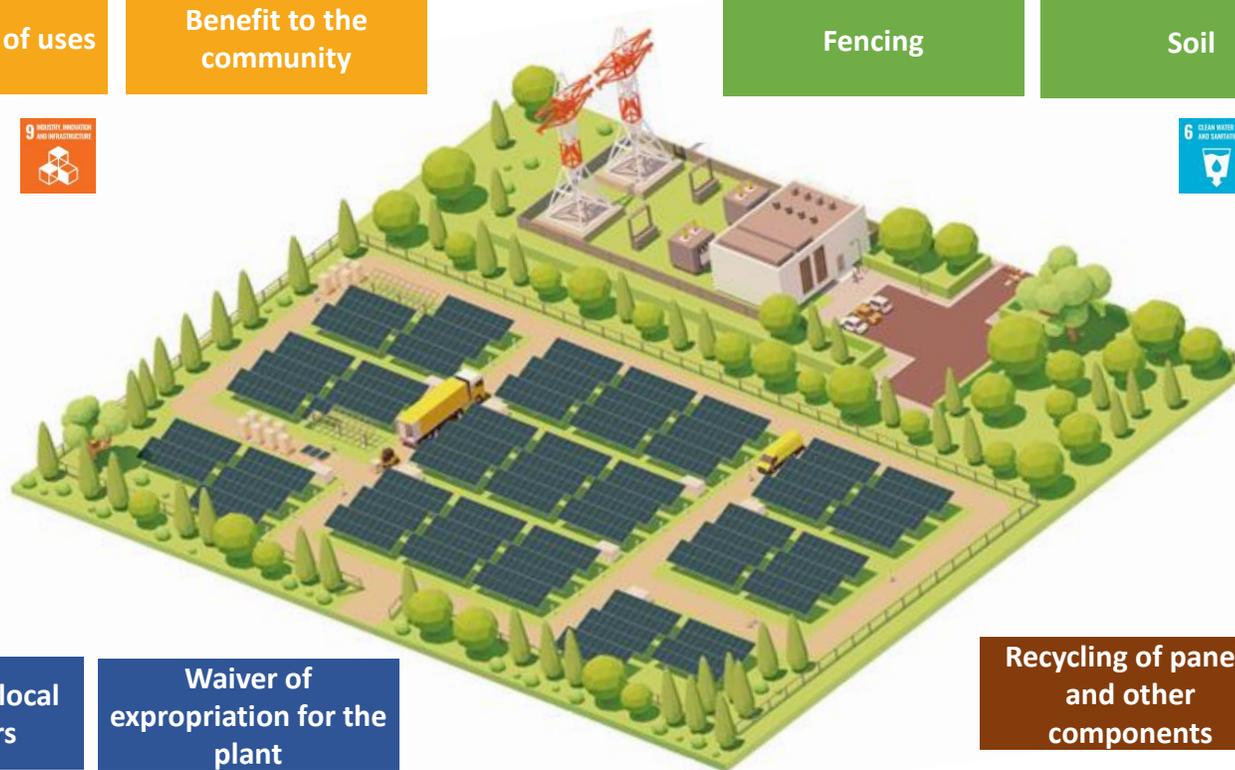
Socioeconomic impacts

Training for employment	Local job creation	Tractor effect
Job placement	Compatibility of uses	Benefit to the community



Environmental integration

Location	Renaturalization	Minimizing occupancy	Transplant
Fencing	Soil	Evacuation lines	Topsoil



Governance

Collaboration agreements	Dialogue with local stakeholders	Waiver of expropriation for the plant
--------------------------	----------------------------------	---------------------------------------



Circular economy

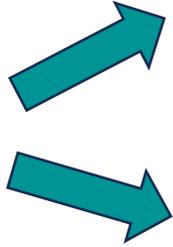
Recycling of panels and other components	Recycling of materials	waste management
--	------------------------	------------------





Seal of excellence
in sustainability

Independent certifiers



SGS

cere

52 Total Certified Plants (4,476 MW)

+ 36 Under Development (3,500 MW)

+ 16 in Operation (975.4 MW)

+ 11 under review



Planta Solar Fotovoltaica la Solanilla (Trujillo)



Contrasted results on **BIRDLIFE**



Plants can become **REFUGE OF NATURE**

Greater richness in the oldest plants

Protected species: Sheltering place such as the alcaraván (steppe), or the “ganga Ortega” in the immediate surroundings.

Birds of prey: Notable presence of vultures, eagles, kites, etc.

Comparison of control areas: very similar (with the exception of the great bustard).

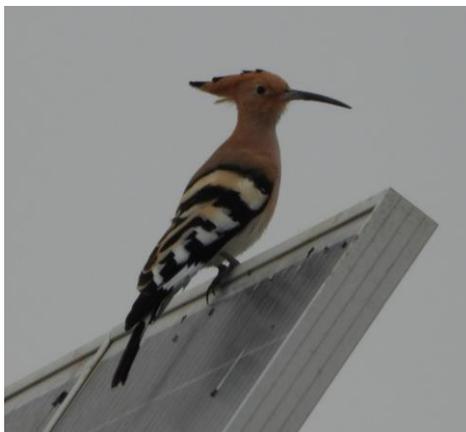
Bee-eater (Campoarañuelo)



Crested Lark (Almendralejo)



Royal Shrike (Calatrava)



Hoopoe (Totana)



Stone-curlew (Totana)



Hawk



Contrasted results on **SOCIOECONOMIC IMPACTS**



EARLY COMMUNICATION, DIALOGUE WITH LOCAL COMMUNITIES & TRANSPARENCY

- Collaboration agreement with local authorities
- Outreach to citizenship (Totana: open days, 200 people)

LOCAL JOB CREATION & EMPLOYMENT TRAINING

- Núñez de Balboa: 1,200 jobs, 70% of jobs in the region
- Peñarrubia: Training course 8 weeks long

BENEFITS THAT REMAIN IN THE COMMUNITY

- Proximity purchases
- Long-term benefits for local communities

COMPATIBILITY WITH OTHER ACTIVITIES

- Agreements with local farmers: Sheep grazing/Agrivoltaics
- Carmona: Cultivation of aromatic plants for extracts used in pharmaceutical products



UNEF – Unión Española Fotovoltaica

C/Velázquez 24, 4º dcha – 28001, Madrid



estudios@unef.es

<https://www.unef.es/es/sello-sostenibilidad>

www.unef.es

European Solar Sustainability Award 2024

Jury



Michael Schmela

Executive Advisor & Director of
Market Intelligence,
SolarPower Europe



Guido Agostinelli

Principal Risk Officer,
Sustainable Supply Chains,
IFC (International Finance
Corporation)



Beatriz Argueso Estirado

Environmental Engineering,
Iberdrola



Noor Yafai

Europe Director Global Policy
and Institutional Partnerships,
TNC

**SUSTAINABLE
SOLAR _____
EUROPE 2024**

Tadas Radavičius

Sustainability Manager
SoliTek



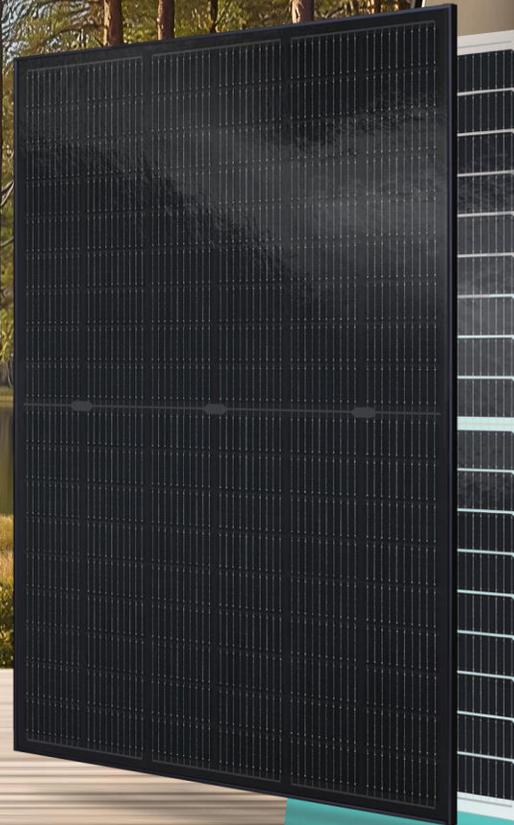


Dual-purpose solar generation & storage solution provider

Top quality
glass-glass
solar panels

Smart energy
management
systems

Integrated
solar
solutions



We could cover millions of hectares with gigawatt PV parks...

OR

Utilize existing/future infrastructure



Photovoltaic Noise Barriers – Double Purpose & Benefit



How?

Huge Potential of PV Noise Barriers



52.2 GW on
Germany's
national highways



EU highways and railroads could
power over **40M citizens** (size of
Poland)

Social
benefits

Delivering substantial value



Reduce noise pollution
in noise-sensitive areas



Turns unprofitable
roads/railways into self-
sustaining system



Generates electricity
in rural regions

Environmental
benefits

Delivering substantial value

EU highways and railroads could:



Generate
120 000 000 MWh
of green electricity
annually



Supply energy to EV
charging stations



Offset 24 000 000 tonnes
of CO₂ every year, equal
to half of Germany's
forests

Yet, nothing comes for free...

PV Noise Barrier Challenges:

1

Long procurement process: 1,5 years

2

Non-standartized noise barriers infrastructure

3

Grid connection issues

4

Specific requirements: passing vibration & radio-frequency tests

So, what about the price?

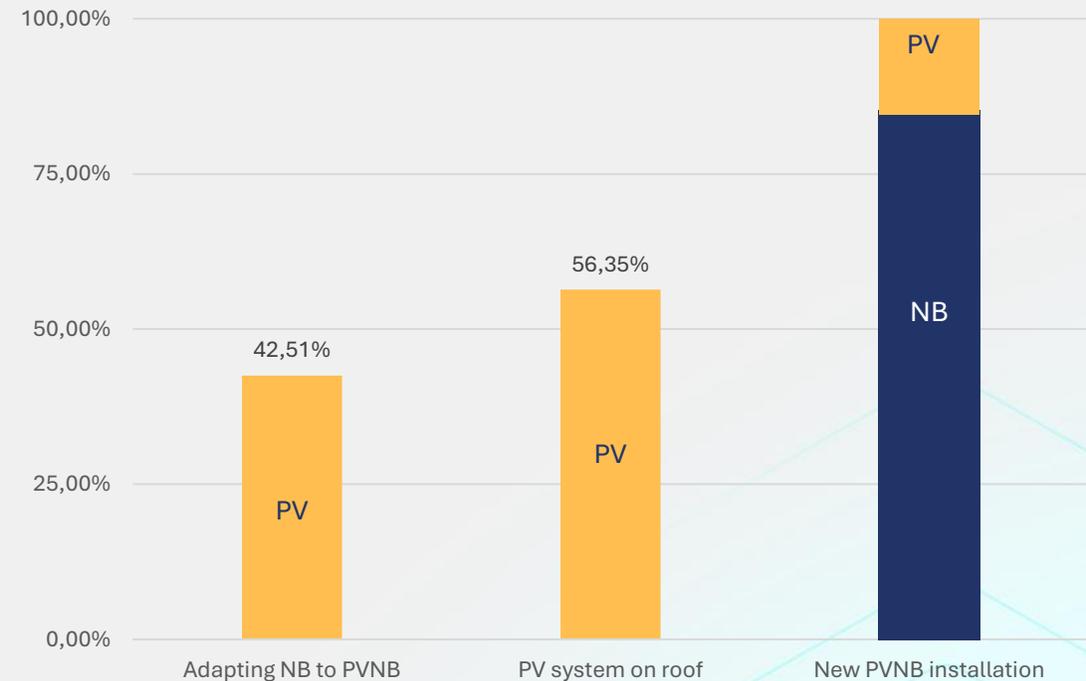
PVNB is competitive when:

1. Adapting NB to PVNB.
2. New PVNB installation.

Energy generation is 20% lower with vertical PVNB installation, yet:

1. More kWh generated in the morning/evening.
2. Grid kWh prices are higher in the morning/evening.

PVNB costs compared to other systems





Let's preserve
the land for
food and fun

Making EU roads and railways green!

Going beyond the industry standard:

Providing product circularity datasheet

Guiding our clients & end-users to handle PV modules for re-use or recycling properly

Nice, but how to recycle your recyclable modules?

First, re-use

Contact second-hand PV panel buyers

SecondSol

2ndlifesolar

Preparation for re-use:

please be careful and remove the module from the system without damaging it. Otherwise, it won't be possible to re-use. Carefully stack them on the pallet. The economic return is around 0,03-0,25 EUR/Wp for second-hand PV modules.

If not possible, then recycle:

Contact our dedicated recycling partner in Germany - LuxChemtech

LuxChemtech

Preparation for recycling:

please be careful and remove the module from the system without damaging it. Otherwise, it won't be possible to recycle PV modules with the high-efficient recycling process. Carefully stack them on the pallet.

Material composition

	Framed glass-glass module	Non-framed glass-glass module
Weight	24-35 kg	30-32 kg
Power	370 - 505 Wp	370 - 435 Wp
Aluminum frame	8,7% - 12,3%	none
Front glass	38,8% - 43,4%	46,4% - 46,6%
Back glass	38,8% - 43,4%	46,4% - 46,6%
Junction box	0,25% - 0,35%	0,26% - 0,28%
POE encapsulant film	2,69% - 3,8%	2,94% - 3,1%
Solar cell	1,98% - 2,8%	2,1% - 2,2%
Copper ribbons	0,62% - 0,88%	0,67% - 0,71%
Cables	0,47% - 0,66%	0,5% - 0,53%

Recyclability

Recycled glass content	35%
Recyclability	95-98%
Energy recover (encapsulation + recycling efficiency loss)	2-5%

Sustainability

Sustainability certifications of SoliTek glass-glass panels



Circularity certificate Cradle to Cradle

Gold level

Industry leader



Digital product passport SundaHus

A level

Industry leader



Digital product passport Byggarbetsmyndigheten

Accepted level

Among the few other



Globally recognized sustainability assessment platform EcoVadis

Silver level

Among the few other

What do I get by choosing SoliTek panels with these sustainability certificates?

Extra 7 points

LEED

Extra 5 points

WELL

Extra 2 credits

BREEAM

Lifecycle assessment*

(Cradle-to-gate emissions) Scope 1-3

SoliTek

Industry average

808-858 **<540** **1050**
kg CO₂ per kWp on request kg CO₂ per kWp

*(Calculations based on CERTISOUS methodology)

European Solar Sustainability Award 2024

Jury



Michael Schmela

Executive Advisor & Director of
Market Intelligence,
SolarPower Europe



Guido Agostinelli

Principal Risk Officer,
Sustainable Supply Chains,
IFC (International Finance
Corporation)



Beatriz Argueso Estirado

Environmental Engineering,
Iberdrola



Noor Yafai

Europe Director Global Policy
and Institutional Partnerships,
TNC

**SUSTAINABLE
SOLAR _____
EUROPE 2024**



Michael Schmela

Executive Advisor & Director of
Market Intelligence,
SolarPower Europe



Voting

**SUSTAINABLE
SOLAR _____
EUROPE 2024**

THANK YOU

**inter
solar**
connecting solar business | EUROPE

Solar Promotion GmbH

Kiehnlestraße 16
75172 Pforzheim, Germany
Phone: + 49 7231 58598-0
info@TheSmarterE.de
www.TheSmarterE.de

 **SolarPower
Europe**

SolarPower Europe

Rond-Point Robert Schuman 3
Brussels 1040, Belgium
info@solarpowereurope.org
www.solarpowereurope.org