





### RENEWABLE ENERGY COMPANY

"Our profession, by default, puts on us the responsibility and obligation to be part of meeting the challenge of halting the global warming and degradation of the environment. To meet this challenge, our ultimate goal must be to enable countries, corporations, companies, institutions, households and individuals achieve energy independence. Simply put, enable them to own the power. The solar, and only the solar, has that potential."



Hamlet Tunyan, CEO

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# What Drives Us

At RECOM we think differently and we are committed to the mission before us to lessen humanity's dependence on fossil fuel, overcome global imbalances and halt the degradation of our environment.

Renewable sources, ubiquitous and infinitely available, can supply energy evenly to people and communities across continents and regions, regardless of their wealth and social standing, generate growth and help avoid economic and military conflicts around the world-and all this in a clean and sustainable environment.

At RECOM we believe in such a future and we work constantly to make solar energy available everywhere and for everyone. Our aim is to solarize the world energy supply and make clean energy the source for all electricity, mobility and smart infrastructure of the future.

# **Our Values**

Doing things right is one of our most important values at RECOM. We are committed to providing highquality services and products to meet the interests and satisfaction of our customers. We provide value for money and deliver the best customer service and experience.

As we aim to achieve our dual goals of exceptional quality and fair price, we are always mindful of our commitment to act with the highest standard of integrity in all of our business decisions and actions. Internally, we are ethnically diverse, gender-equal one team, accountable and respectful among ourselves and towards others. Externally, the respect for human rights, labor laws, fair competition and environmental considerations are the guiding principles in our choices for outsourcing, procurement and end users.

# Who we are

RECOM Technologies is a leading European renewable energy company with notable global presence in the solar industry. RECOM is a manufacturer of cells, PV modules, inverters, hybrid storage systems, batteries, and electric vehicle (EV) chargers, and is an innovative company that integrates R&D, manufacturing, and distribution. RECOM is a leading PV module manufacturer in Europe with above 3,2 GW annual production capacity and with sales of solar modules in more than 110 countries.

From the early years of its operation the company expanded its manufacturing capabilities by acquiring a cell production facility in Padua, Italy, in 2015 and a module manufacturing plant in Lannion, France, in 2017. In 2024 RECOM is streamlining its operations and transferring its module production from France to Italy.

Along with our internal R&D team, we invest in, and work with leading global research institutions and manufacturers to innovate, develop, share and commercialize the latest technological advances in solar module manufacturing. Our primary R&D partner in the area of solar panels is a leading French research center, the National Institute for Solar Energy (CEA/INES). We also work with other research centers, universities and manufacturing companies as our portfolio expands. We pioneer in solar power and energy storage solutions, as it comes to skid mounted panel-inverter solutions for residential, commercial, and utility scale energy applications.



# **RECOM Manufacturing Plant**

Recom-Italia serves as the cell and module production division of Recom Technologies. Recently, the module production operations have transitioned from Lannion, France to Recom's cell manufacturing facility in Padua, Italy.

This strategic move aims to vertically integrate and consolidate cell and module manufacturing, enhancing operational efficiency. In 2017, Recom acquired SILLIA VL in Lannion, France, inheriting a legacy of quality manufacturing dating back to 1965 when the facility operated under French telecommunications giant SAGEM–SAFRAN, and later under BOSCH since 2014.

Since the acquisition, Recom has made significant investments to modernize and expand the facility, improving cost efficiency, increasing output, and reducing carbon footprint. The skilled labor force at SILLIA has been retained, bringing decades of experience, production ethics, and adherence to the highest quality standards.

Recom-Italia originally joined Recom as a solar cell manufacturing facility in Padua, Italy in 2015. With the amalgamation of Recom-Sillia's manufacturing expertise, a subsequent technological upgrade, and the integration of cell manufacturing, Recom-Italia now stands as Recom Technologies' primary European manufacturing center.



# **RECOM** in numbers



**Production Capacity** 



Year that the company was founded



Clean and affordable energy replacing 2m tons of CO2 emission



Experienced and qualified industry personnel across many continents



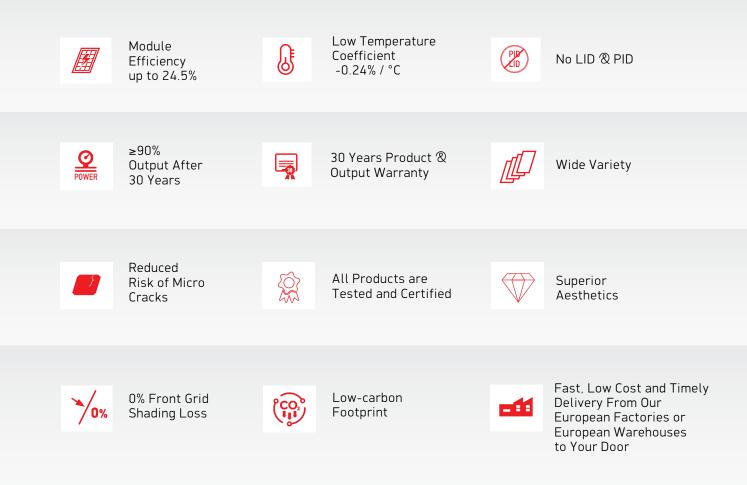
Countries RECOM PV modules installed



Revenues



**RECOM** advantages at a glance







# Leading European PV Module Manufacturer

**TOP PV BRAND & TOP PV SUPPLIER** 

FRANCE - USA - MENA - VIETNAM - HUNGARY - GREECE - NORWAY - ROMANIA - IRELAND



**GLOBAL PARTNERS** sunnova Marubeni engie ROSENDIN NEXT**era** nra ELECTRIC ENERGY 🥢 Rexel enel **G**CSEnergy **edf TotalEnergies** ارامكو السعودية res Con Saudi Aramco

# Reinvent Technology PV Modules

Solar technology holds immense potential as a crucial component of the renewable energy landscape, paving the way for a sustainable future.



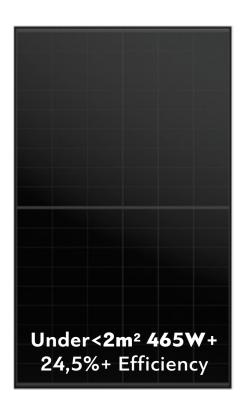


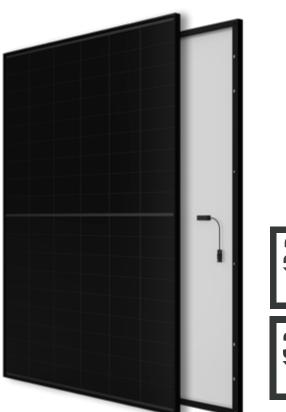
UNLEASH THE POWER OF THE BLACK TIGER: EXTREME EFFICIENCY,

FLAWLESS BLACK AESTHETICS

## **BACKCONTACT TECHNOLOGY**

From 440Wp & up to 700Wp









### ADVANTAGES OF BLACK TIGER BACKCONTACT MODULES



World's 1st Efficiency Black Tiger modules provide numerous benefits to customers seeking a high-quality product with exceptional performance and aesthetic, captivating design.

The "Black Tiger" module utilizes N-Type cell technology in conjunction with a rear connection method known as BackContact. As a result, there is 0% front grid shadow loss, which increases the PV module yield. Due to reduced shading on the front of the cell, the module maximizes total cell area realizing higher efficiency and resulting in a fast return on investment.



Guaranteed mechanical resistance to severe weather conditions



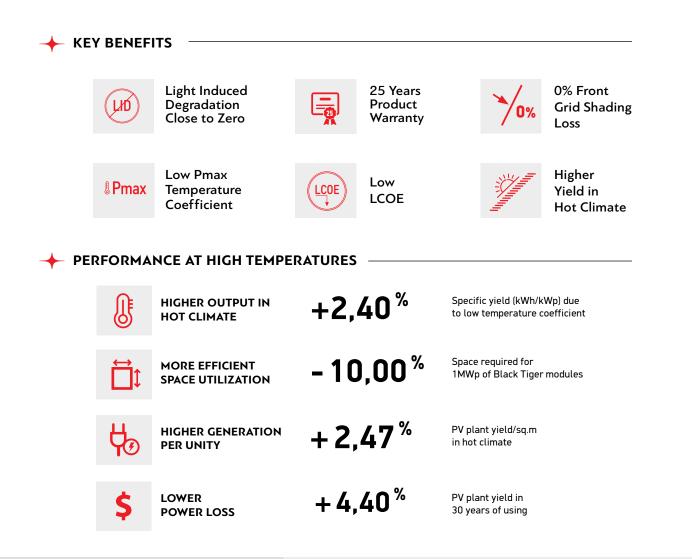
Positive tolerance



100% electroluminescence tested





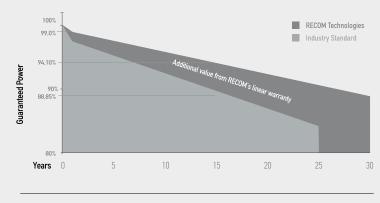


HIGHEST EFFICIENCY IN THE WORLD

Black Tiger Series has "World's 1st" module efficiency, as it reaches up to 24.5%.

#### BENEFITS OF BACKCONTACT TECHNOLOGY

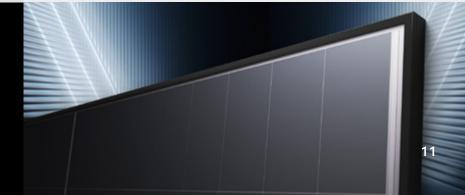
- No grid lines, pure black with cutting-edge all back contact cells
- +13.4% full life-cycle power generation than the traditional P-type modules
- >5% BOS reduction, significant saving on cables and mounting systems
- 100% silver-free, reliable supply than the other N-type modules



≤ 0.35%

<sup>30 Year</sup> | ≥ 88,85%

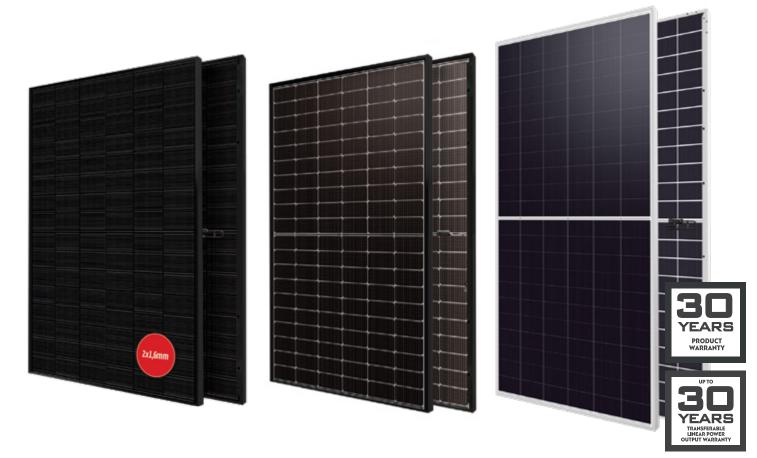




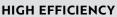


# **HETEROJUNCTION TECHNOLOGY**

### From 430Wp & up to 750Wp



### ADVANTAGES OF LION HETEROJUNCTION MODULES



In STC condition, due to the Tandem technology, HJT modules have higher efficiency at least by 1% compared to other technologies. HJT is active on both UV and infrared wavelengths and has a higher light output.

#### NO LID&PID

HJT has no power loss against 1% first year (LID) and up to 5% after with PID syndrome in standard mono perc module.

**Heterojunction (HJT)** photovoltaic module is a ground breaking technology. HJT technology guarantees high performance and low degradation of the PV module, substantially improving results and yield over time.

Lion series reaches over 750Wp power, 7% higher compared to standard PV modules.



Up to 24,1% Module

Efficiency

Low temperature coefficient

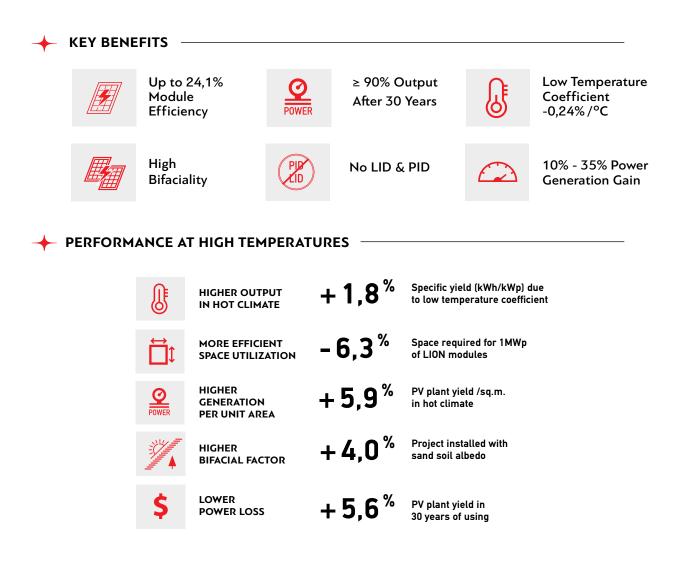


High energy yield









#### LOW DEGRADATION

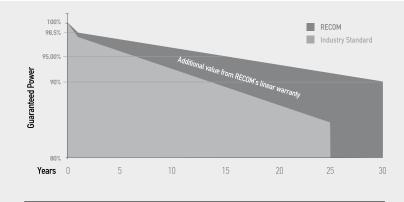
Lion series modules use HJT cell technology, which have lower degradation than Mono PERC panels.

More stable and sustainable electricity production.

Power yield  $\geq$  95% after 15 years,  $\geq$  92,5% after 25 years and  $\geq$  90% after 30 years.

#### **HIGHER PERFORMANCE**

Gain up to 20% more energy yield, in low-light conditions, in the morning and evening hours and during cloudy skies.





Great Appearance

BLENDS PERFECTLY WITH THE ROOFTOP



# **Scenario Analysis 1**

### 100000m<sup>2</sup> (250\*400m)Fixed area

**GROUND POWER PLANT** 

#### BOS cost analysis Fixed adjustable mounting system , longitudinal double row 2P,30% sand reflectivity , Extremely low Environmental Temperature 9°C

Ce	ell size/Layout	166mm /120pcs		210mm /132pcs	
Module		Lion Series HJT Half-cut	L Brand Perc Half-cut	Lion Series HJT Half-cut	H Brand Perc Half-cut
Power ( W )		375	375	700	670
conversion efficiency (%)		19.98%	20.59%	22.53%	21.57%
Installed capacity ( MW )		11.09	10.71	12.15	11.22
Power generation	30-year power generation with the same area	589247	501568	643358	547095
	30-year cumulative increase rate	17.48%	benchmark	17.60%	benchmark
BOS cost	Land cost	-3.53%	benchmark	-8.35%	benchmark
	Combiner box & cable costs	-4.78%	benchmark	-4.54%	benchmark
	Variable BOS cost	-0.42%	benchmark	-4.39%	benchmark
LCOE	LCOE	0.1957	0.2110	0.1872	0.1954
	LCOE calculation	-7.82%	benchmark	-4.4%	benchmark

<ul> <li>Improved energy yield for 30 years:</li> </ul>	+17.6%
• Land cost saving:	-8.35%
• Combiner box & cable costs:	-4.78%
• Variable BOS cost:	-4.39%
• LCOE reduce:	-7.82%





# **Scenario Analysis 2**

**ROOF POWER PLANT** 

BOS cost analysis Fixed adjustable roof mounting system , longitudinal double row 2P,70% sand reflectivity Extremely low Environmental Temperature -5℃

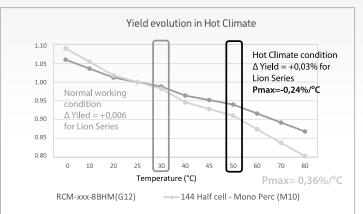
Module	Lion series HJT Half-cut	L Brand Perc Half-cut	Lion series HJT shingled all black	H Brand Perc Half-cut
Cell size/Layout	166mm/120pcs	166mm/120pcs	158.75mm/132pcs	210mm/120pcs
Power (W)	385	375	415	405
Efficiency (%)	20.51%	20.59%	21.17%	21.07%
Installed capacity ( MW )	1.11	0.77	0.79	0.83
30-year power generation with the same area	43567	36791	31057	27504
30-year cumulative increase rate	18.42%	benchmark	12.92%	benchmark
Roof cost	-1.48%	benchmark	-0.89%	benchmark
LCOE	0.2629	0.2880	0.3793	0.3964
LCOE calculation	-9.58%	benchmark	-4.51%	benchmark

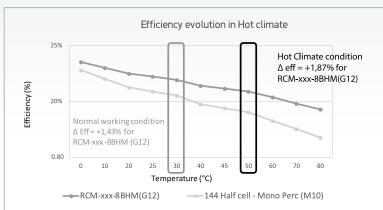
<ul> <li>Improved energy yield for 30 years:</li> </ul>	+18.42%
<ul> <li>Land cost saving:</li> </ul>	-1.89%
LCOE reduce:	-9.58%

### LOWEST TEMPERATURE COEFFICIENT

Lion series modules with HJT cell Technology, perform at high environmental temperature. • Amorphous silicon (a-Si) has less power loss due to the temperature and reduce the thermal powercoefficient of the HJT (compared to single Monocrystalline composition).

 $\bullet$  At the operating temperature of 50  $^\circ$  C, Lion series has better Efficiency than standard modules



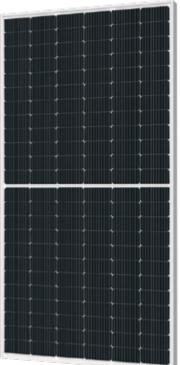




# N-TYPE PV MODULES WITH TOPCon TECHNOLOGY

### From 410Wp & up to 720Wp







### ADVANTAGES OF LYNX BIFACIAL MODULES

#### HIGH EFFICIENCY (23,18%)

The N-TOPCon module has a strong power generation capacity per watt, which is reflected in its strong advantage in the cost of electricity and a strong premium capacity.

# **Pmax**

Low Pmax

## No LID (< 0.2%) & no risk of LeTID

N-type module is a fundamental solution to the risk of LID because there is no BO pairs for its phosphorus-doped substrate. After LeTID test, N-TOPCon modules show no power loss.

#### Bifaciality

Lynx bifacial series have been widely applied in a large number of PV systems in the world with more than 10% power gain from the bifacial design comparing to monofacial power plant (Bifaciality factor up to 80%).



Positive tolerance



Guaranteed mechanical resistance to severe weather conditions



100% electroluminescence tested



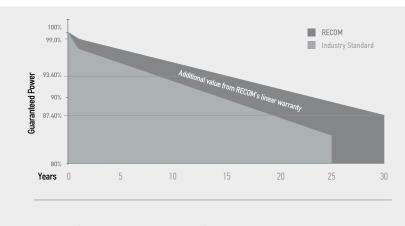




N-type solar cells (TOPCon) are seen as the technology of the future.

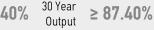
N-type (TopCon) technology guarantees high performance and low degradation of the PV module, substantially improving results and yield over time.

"Lynx" Series module is the ideal solution for end users who want a Quality PV & reliable product over time and a fast turnaround on their investments.



First Year 2-30 Year ≥ 99.0% Decline Output

**≤ 0.40%** 









SUPERIOR PERFORMANCE & RELIABILITY

# SHINGLED TECHNOLOGY

From 420Wp & up to 675Wp











### Reduced Risk Of Micro Cracks

### ADVANTAGES OF PUMA SHINGLED MODULES

#### **REDUCED RISK OF MICRO CRACKS**

The replacement of soldered ribbons with a low temperature and flexible ECA decreases thermal stresses during the modules production and operation, decreasing the risk of micro cracks formation.

Mechanical stresses (e.g. snow load) are relieved by the flexible interconnection, improving the reliability in harsh environments (as reflected in the increased warranty provided).

#### HIGHER CELLS DENSITY AND IMPROVED AESTHETICS

The inactive area is considerably reduced, no ribbons and cells gaps on strings improving the efficiency and aesthetic in full black modules.

#### LOWER RESISTIVE LOSSES AND THERMAL COEFFICIENT

The resistive losses in strings are considerably decreased thanks to the lower current of shingles (1/6 or 1/7 of the original cell) and the lack of interconnection ribbons in strings, improving at the same time the performance at high temperatures.



Higher yield per surface area



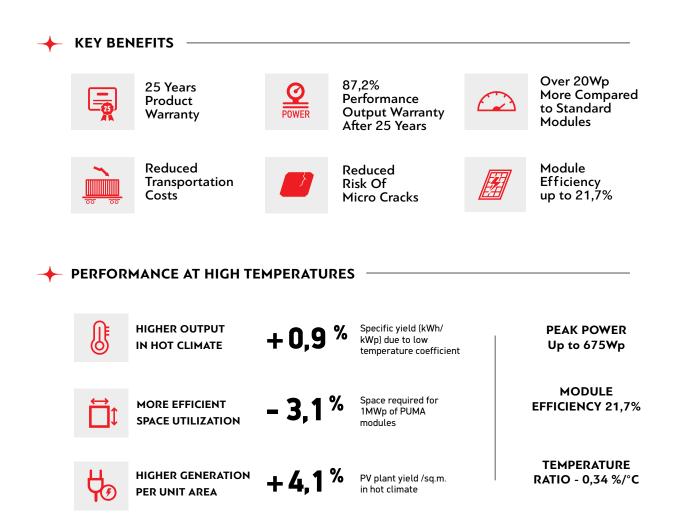
Higher yield in hot climate



Low Pmax at-0,3% / °C







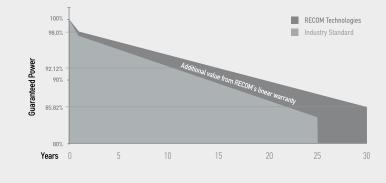
#### SMALL SIZE FOR ROOF TOP INSTALLATION

The PUMA module with power class over 555Wp, efficiency up to 21,6% and 25 years product & up to 30 years output warranty is:

- Best "Value for money" choice
- Ideal for rooftop installations (in the same size of the rooftop, more power can be installed compared to standard modules)
- Low LCOE

**FOR COMMERCIAL & UTILITY INSTALLATIONS** The PUMA module with power class up to 675Wp, efficiency up to 21,7% and 25 years product & output warranty.

> SEAMLESSLY INTEGRATES WITH THE ROOFTOP



First Year Output **2-30** Year Decline ≤ 0.42% <sup>30 Year</sup> ≥ 85.82%





FAST RETURN ON YOUR INVESTMENTS

# **HALF-CUT TECHNOLOGY**

From 360Wp & up to 665Wp





### ADVANTAGES OF PANTHER HALF-CUT MODULES

# Pmax

### Low Pmax

Groundbreaking technology; higher power output and improved system performance. The ideal solution for end users who want a fast turnaround on their investments. A fully certified premium quality and high efficiency module made with A grade materials.



Industry leading Low Pmax



Outstanding performance under extreme heat and low-intensity solar conditions



100% electroluminescence tested







BLENDS PERFECTLY WITH THE ROOFTOP



# INVERTERS - STORAGE ACCESSORIES

Intelligent energy management for a resilient energy ecosystem.



### **INVERTERS**



#### HELIOS



Single MPPT 0.6 - 3.3 kW

### AP⊕LLO



Dual MPPT 2.5 - 6.0 kW

#### SINGLE PHASE SERIES

- Max efficiency 98% IP66 protection
- Zero-export feed-in operation
- DC Input: 200% oversizing
- In-built global MPP scan for higher yields during shadowing conditions
- Quick and easy commissioning / configuration



### 

3 - 15 kW

#### THREE PHASE SERIES

- Max efficiency 98,3% IP66 protection
- Low startup voltage
- Ultrawide MPPT voltage range
- Support high power solar panels
- Built-in export power control



POSEIDON 17 - 30 kW







40 - 60 kW

#### **MULTI MPPT**

- Max efficiency over 98% -IP66 protection
- Low startup voltage
- Ultrawide MPPT voltage range
- Built-in export power control
- SPD type II protection (AC & DC)



275 kW

#### MULTI MPPT

- Max efficiency 99,03% -IP66 Protection
- 40A max input current per MPPT
- 12 MPPT trackers
- 2 strings per MPPT
- Supports high current bifacial PV modules with max PV current 20A

### **INVERTERS**

#### **HYBRID SERIES**



# Dual MPPT 3.0 - 7.5 kW

T+TAN

Dual MPPT

5.0 - 15 kW

#### SINGLE PHASE HYBRID SERIES

- Max efficiency 97,6%- IP65 protection
- Higher efficiency on charging and discharging up to 97.0%
- Switchover time <10ms
- Low start output voltage resulting to longer operation (higher yields) throughout the day
- On & Off-grid parallel function up to 15kW
- Zero-export feed-in operation



#### THREE PHASE HYBRID SERIES

- Max efficiency 98%- IP65 protection
- Higher efficiency on charging and discharging up to 98.5%
- Switchover time <10ms
- Less energy loss from battery to inverter
- Three-phase unbalanced output up to 50% nominal output power on single phase
- Zero-export feed-in operation

### STORAGE



### PANDORA

5.0 - 32.5 kWh & 7.2 - 46.8 kWh

- Stackable modules, easy and fast for single-person installation.
- Unique battery heating technology which enables efficient operation at low temperatures
- Soft start protecting batteries and inverters from a sudden surge
- IP65 for both indoor and outdoor installation

# ACCESSORIES

### DATA LOGGERS



#### Logger-Z

- Supports up to 32 devices
- Supports local & remote monitoring



#### Logger

- Local & Remote monitoring, setting and upgrade of batch inverters
- Support large-capacity data storage



• Quick installation with "Plug & Play" function

- IP 65 dust prevention water proofing designs
- Stable data transmission and good reliability
- Data Transfer Interval 5 mins
- WiFi Plus
- Data Transfer Interval 10 sec

### SOFTWARE (MONITORING)



- Quick and easy WIFI configuration
- Rich data analysis-Realtime/ Daily/Monthly/Yearly
- Check and control of the plant anytime, anywhere





EV chargers are the catalysts of a transformative era, fueling a future where electric vehicles reign supreme, emissions are minimized, and sustainable mobility becomes a seamless reality.







# **ADVANTAGES**

- Plug or socket outlet selectable.
- Integrated current failure monitoring (30mA AC & 6mA DC)
- Integrated with PEN protection and no earth rod
- Encrypted communication based on TLS
- Indoor and outdoor easy installation
- Integrated RFID function

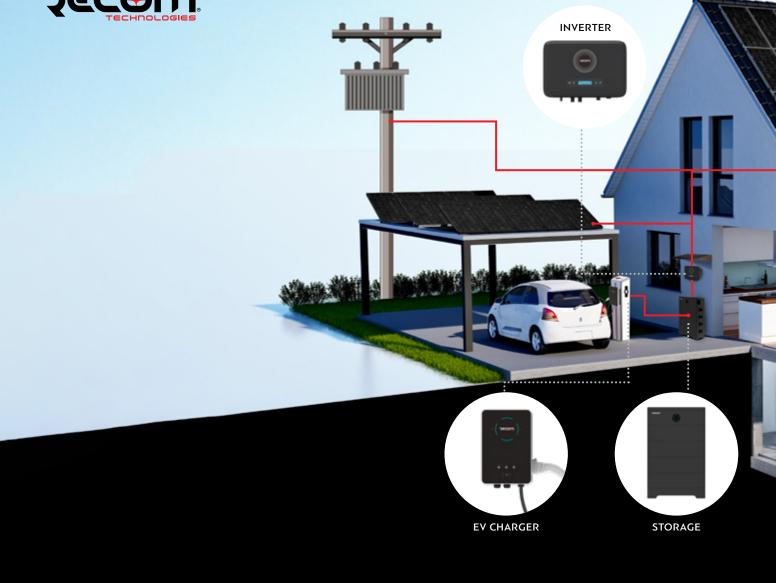
- Form an intelligent photovoltaic, storage and EV charging energy system through the communication between the smart EV charger and RECOM inverter.
- Remote setting and monitoring with APP and website

Jecom

- Smart dynamic load balance control
- Set timers to reduce your cost during peak and valley price







### **REPOWER THE WORLD**

Driven by the vision of a sustainable future, at RECOM we support the transition of solar energy into a meaningful and integrated part of everyone's livelihood. Committed to our vision we actively contribute to the development of emerging energy solutions.

RECOM drives households and businesses to produce energy through solar and achieve energy independence towards a sustainable future.



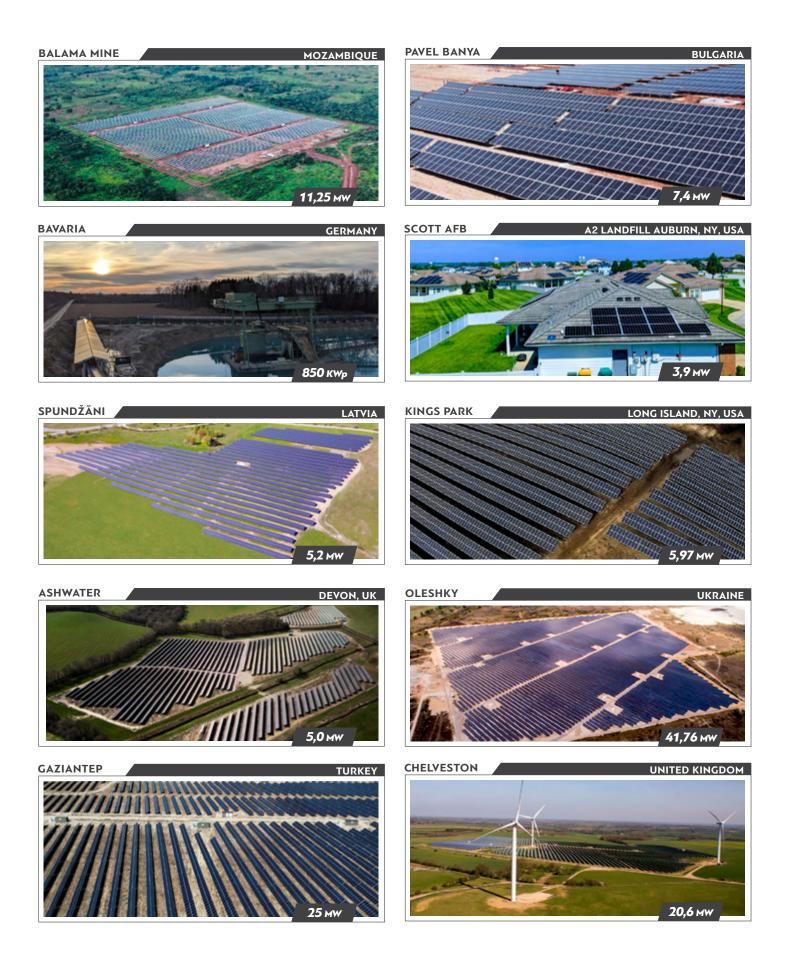
# EUROPEAN MANUFACTURER

### SOLAR ASSOCIATION MEMBERSHIPS





### **PROJECT REFERENCES**



### **PROJECT REFERENCES**



1.6 MW

13,41 мw

# E WORK WITH AND FOR THE WORLD

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