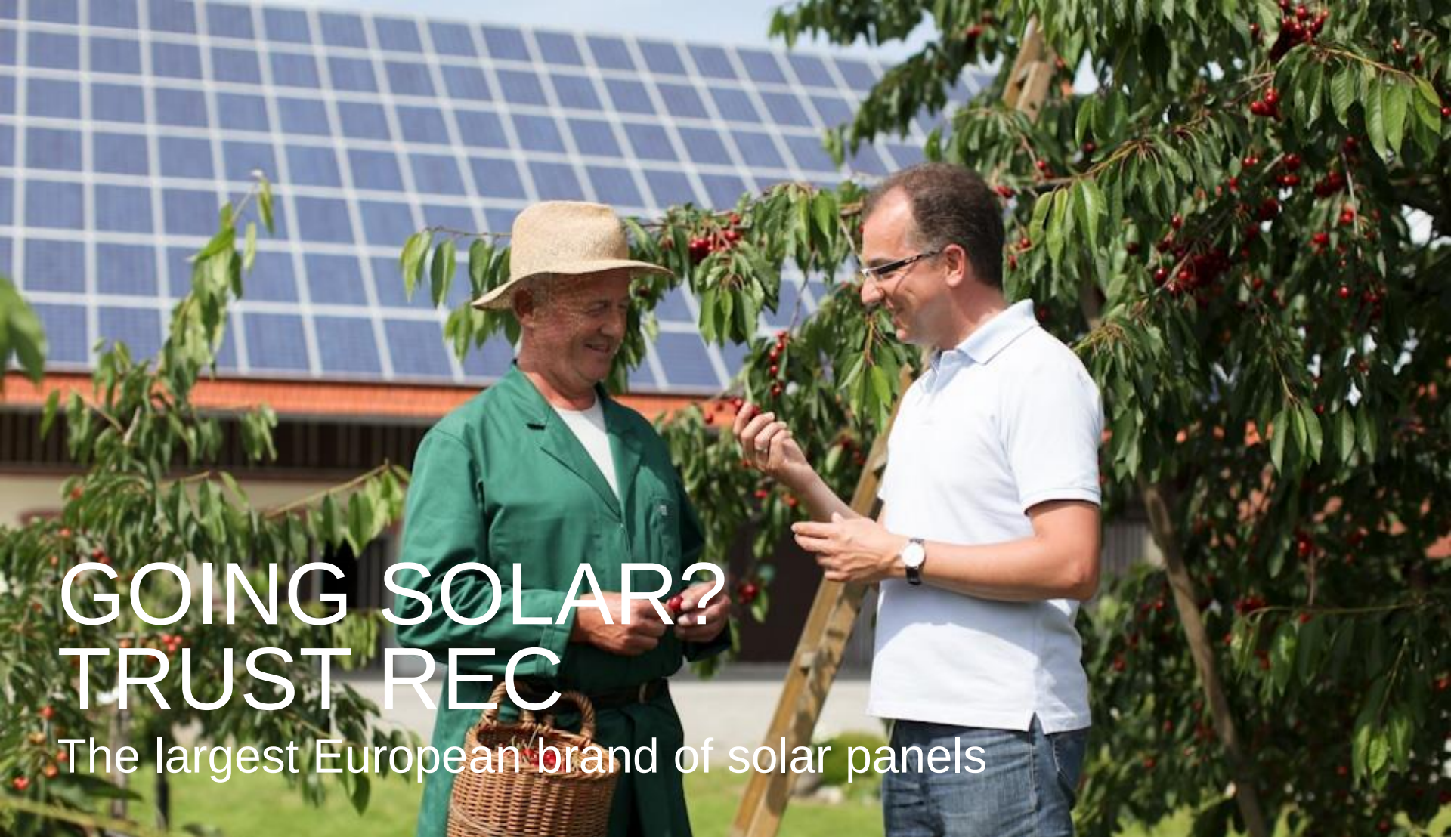


GOING SOLAR?
TRUST REC

The largest European brand of solar panels

BayWa r.e.

REC SOLAR'S MOST TRUSTED

Public

Alessandro Cicolin
8 Aprile, 2020


2.2 MW, Singapore

REC at a glance

Our Vision:

We want every person to benefit from electricity directly from the sun.

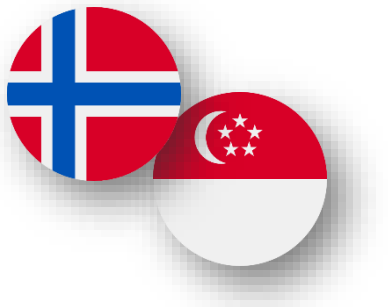
REC at a glimpse

Founded
1996

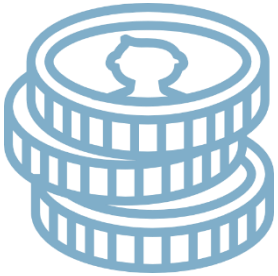
>34 million
solar panels produced and sold

>17M people
powered at home

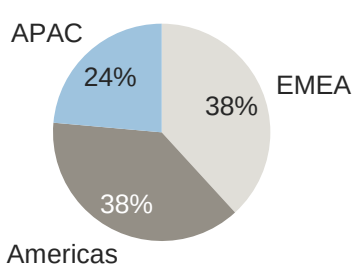
~2,000
employees globally

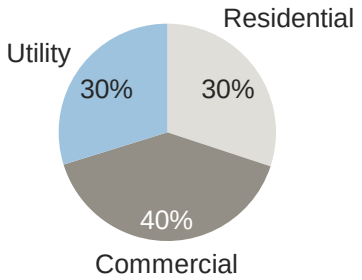


Norway & Singapore
Manufacturing facilities



~USD 500 million
2018 sales revenue





Balanced global sales
By geography and market segment

A partnership approach to business

- REC is a well-recognized brand in global solar industry
- Focus on and demonstrated commitment to partnership
- Not only offer high-quality products and services, but also reliable and lasting partnerships:
- **BayWa: main REC Partner in volume in Europe!**

BayWa r.e.

- This mentality is lived by our four values:
  - We are Responsible
  - We are Experienced
  - We are Collaborative
  - We are Straightforward

REC – The Facts

Leading **EUROPEAN** brand of solar panels, founded and headquartered in **NORWAY**

CELEBRATING 20 YEARS

Over 20 years experience in the solar industry, from silicon to panels

1,500 MW
annual panel production (2018),
FULLY AUTOMATED

WINNER of THREE AWARDS in 2017

1. Solar + Power Award in Silicon Module category
2. Norwegian Climate Business of the Year
3. Made in Singapore Award in Energy & Power category

Part of $63B **FORTUNE 500** global conglomerate

>99%
accuracy of deliveries vs. orders (2018)

LOWEST
known warranty
CLAIMS rate
(REC 2018 PPM: <100)

WORLD'S MOST POWERFUL
multicrystalline panel
300 Wp (60 cell), 355 Wp (72 cell)

LOWEST CARBON FOOTPRINT
for solar grade silicon
(75% less energy used compared to traditional Siemens method)

PID FREE

100%
of production clearing IEC PID protocol

#1 producer of panels with **HALF-CUT CELLS**

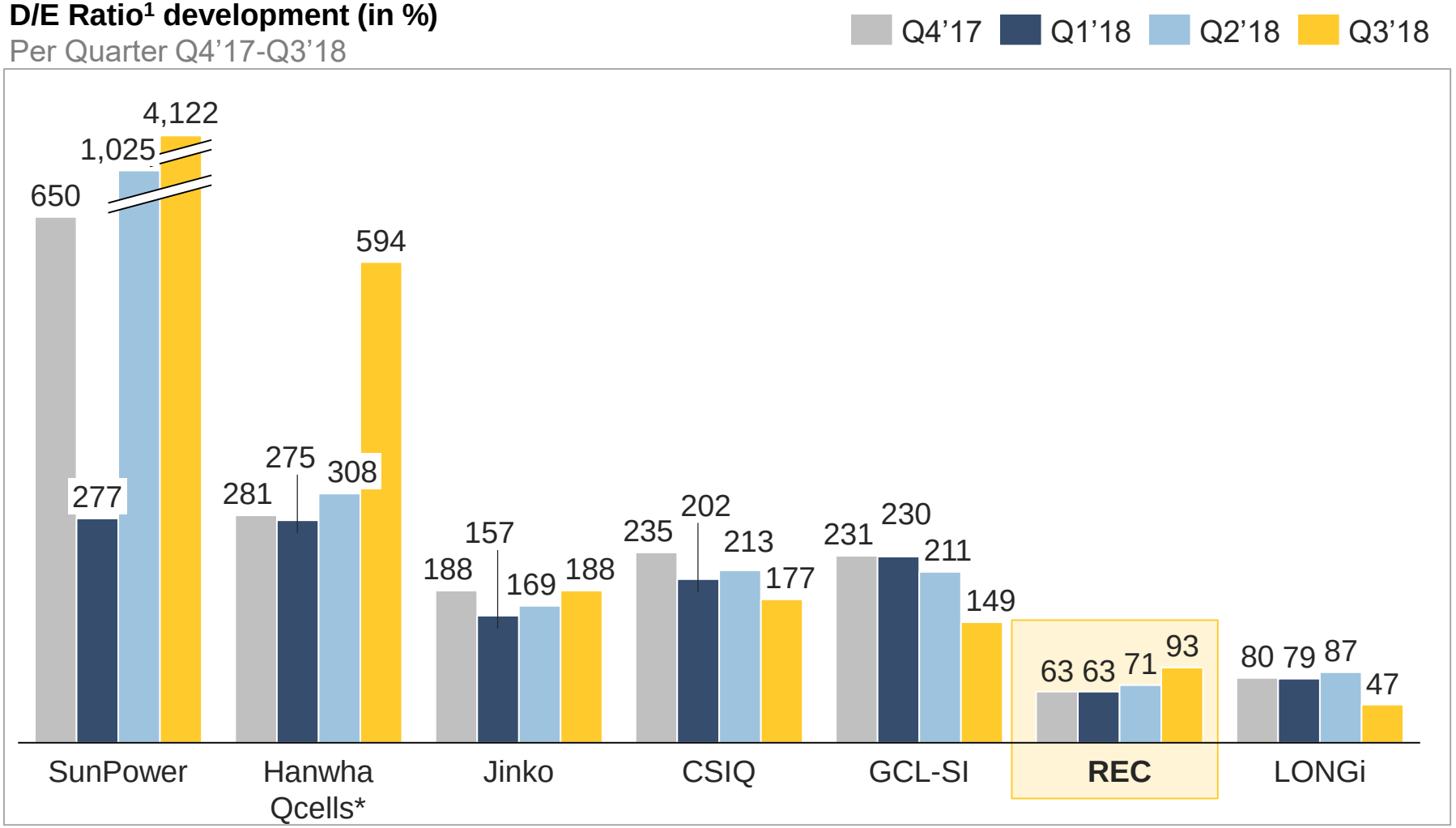
LOWEST DEBT
among leading panel manufacturers

REC

1st to mass produce **PERC** on multi-crystalline cells

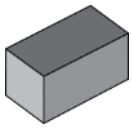
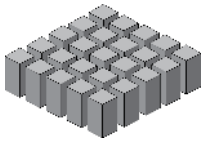
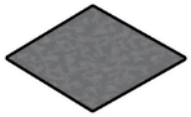
REC's strong debt position against key crystalline silicon players provides a competitive advantage

D/E Ratio[1] development (in %)
Per Quarter Q4'17-Q3'18



1 Debt refers to interest-bearing debt; Debt / Equity ratio based on Debt (long+short-term) / total equity)
*HQCL shifted its notes payable into Accounts payable, hence the debt/equity ratio in Q2 2018 not 100% comparable to previous quarters
Source: Quarterly financial reports

Strength throughout the value chain

Silicon	Ingot/Block	Wafer	Cell	Panel
				
				
Metallurgical processes	Casting and Block sawing	Wafer Slicing	Doping, Passivation, Metallization	Assembly, Testing
				

- Leading **European** brand of solar panels
- Founded in **Norway** in 1996
- Industry pioneer with **22 years** of experience
- **34 million panels** manufactured, amounting to 8.8 GW (at end-2018)
- **Integrated** manufacturing from silicon to blocks, wafers, cells, and panels

REC – a global company with 2,000 employees

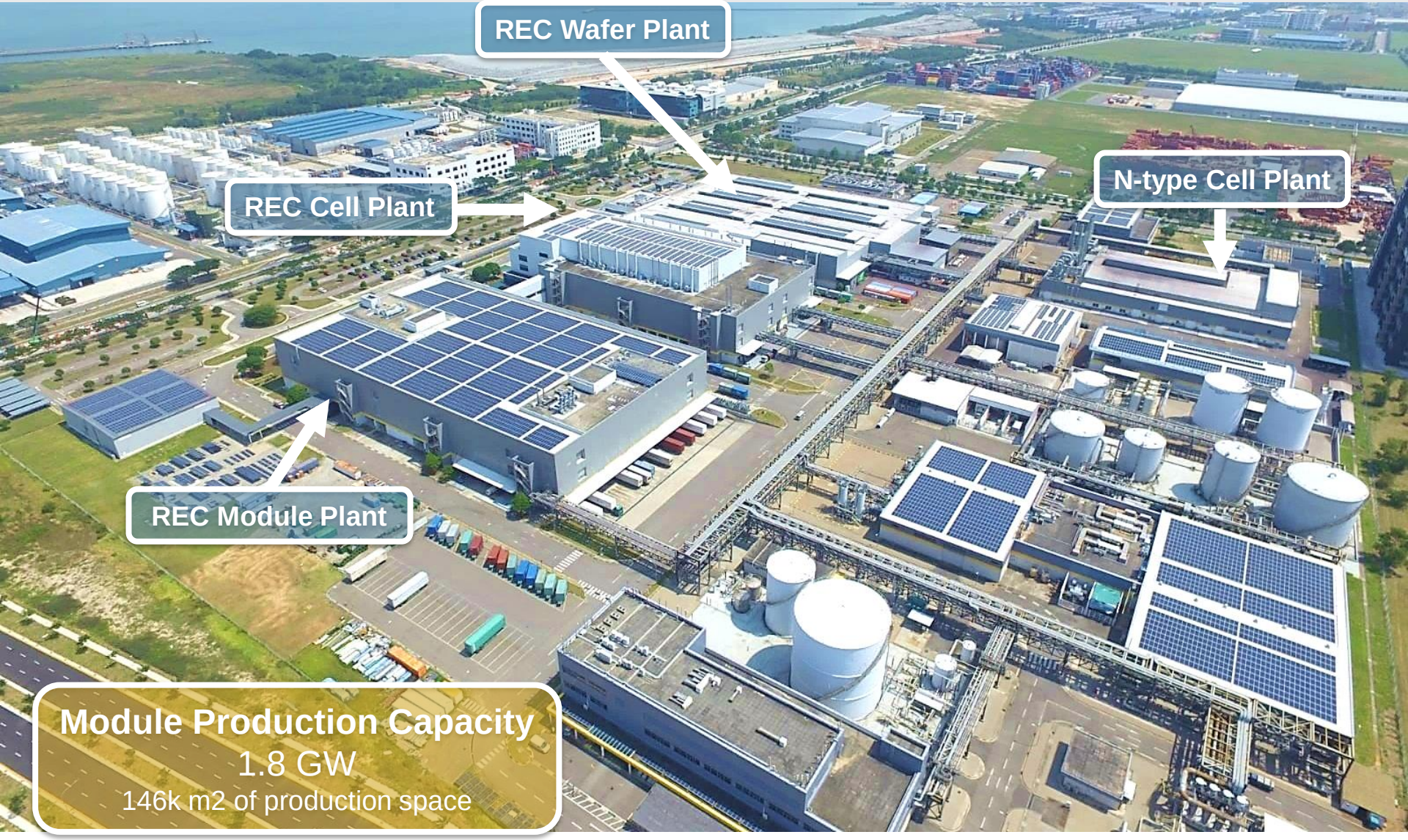
Why Singapore?

- Most open economy in the world
- One of the world's most business-friendly regulatory environment
- third highest per-capita GDP in the world in terms of Purchasing Power Parity (PPP).
- One of the world's most competitive economies
- the world's second-busiest port in terms of total shipping tonnage
- World leading education system: in the most recent World Bank Human Capital Index, Singapore ranks the best country in the world in human capital development
- World's Best Engineers

Manufacturing in both Norway and Singapore provide REC with significant advantages

Source: 2017-18 World Economic Forum Competitiveness Report, Global Ranking of Major solar PV producing countries; Global Human Capital Index 2017

REC's integrated production facility in Singapore



Watch the video!

REC's integrated production site in Singapore

Wafer, Cell and Module production in one location

REC – A Multiple Award-Winner

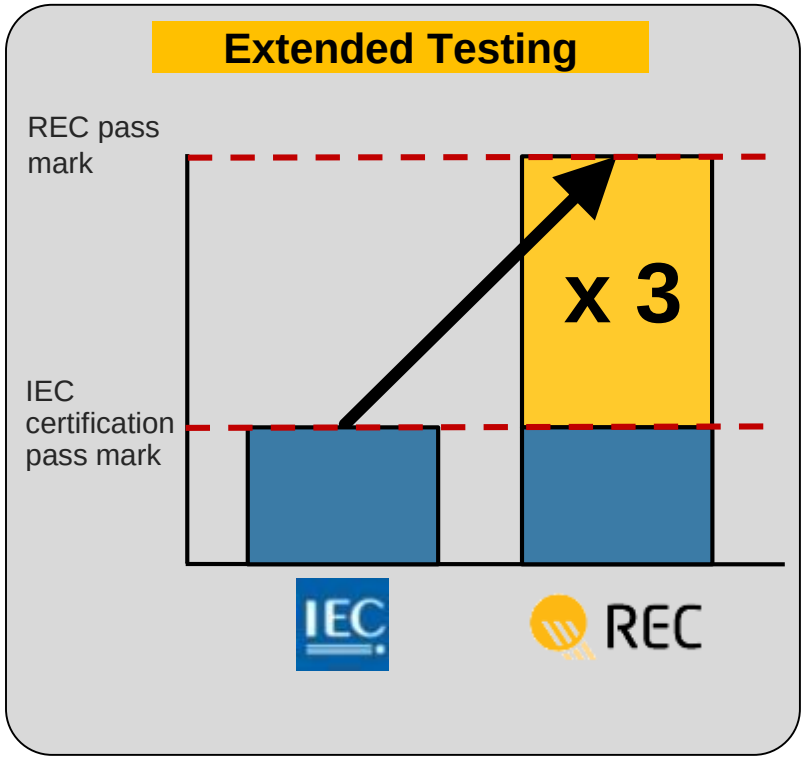
REC's industry leadership has been recognized by multiple awards worldwide

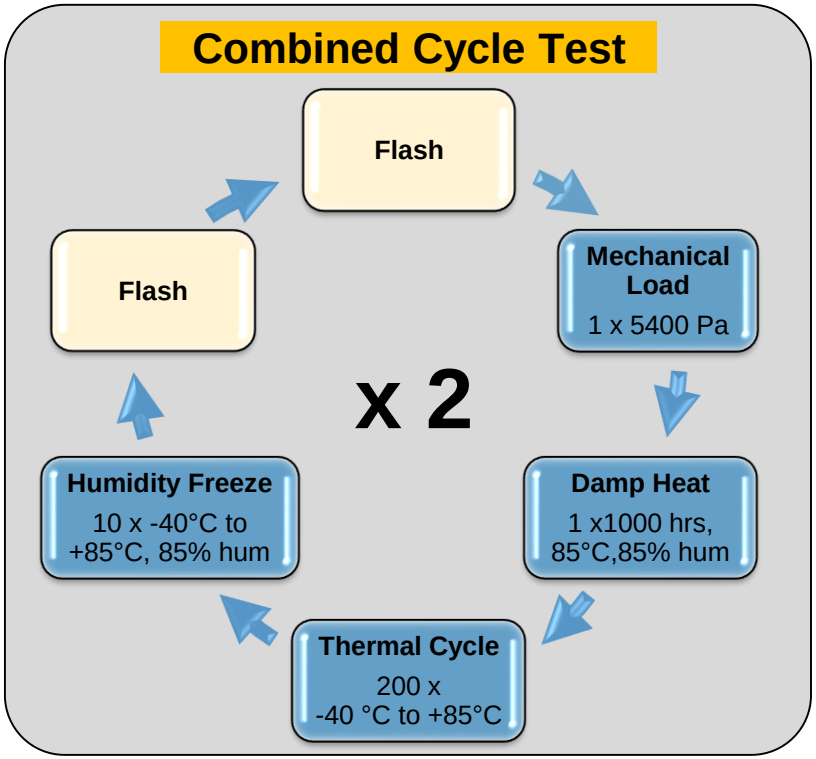
- Top Performer Awards by DNV GL for 4 years in a row
- Solar + Power Award for REC TwinPeak 2 Series
- Made in Singapore Award for REC TwinPeak 2 Series
- Norwegian Climate Business of the Year Award for New Silicon Production Methods
- Intersolar Award for REC TwinPeak Series
- Singapore 1000 Net Profit Growth Excellence Award
- IAIR Awards for Corporate Sustainability and Solar Energy Solutions
- Frost and Sullivan Best Practices Award for Customer Value Enhancement
- Solar Industry Award for Module Manufacturing Innovation

Assuring quality through product development

REC's testing program extends beyond the standards

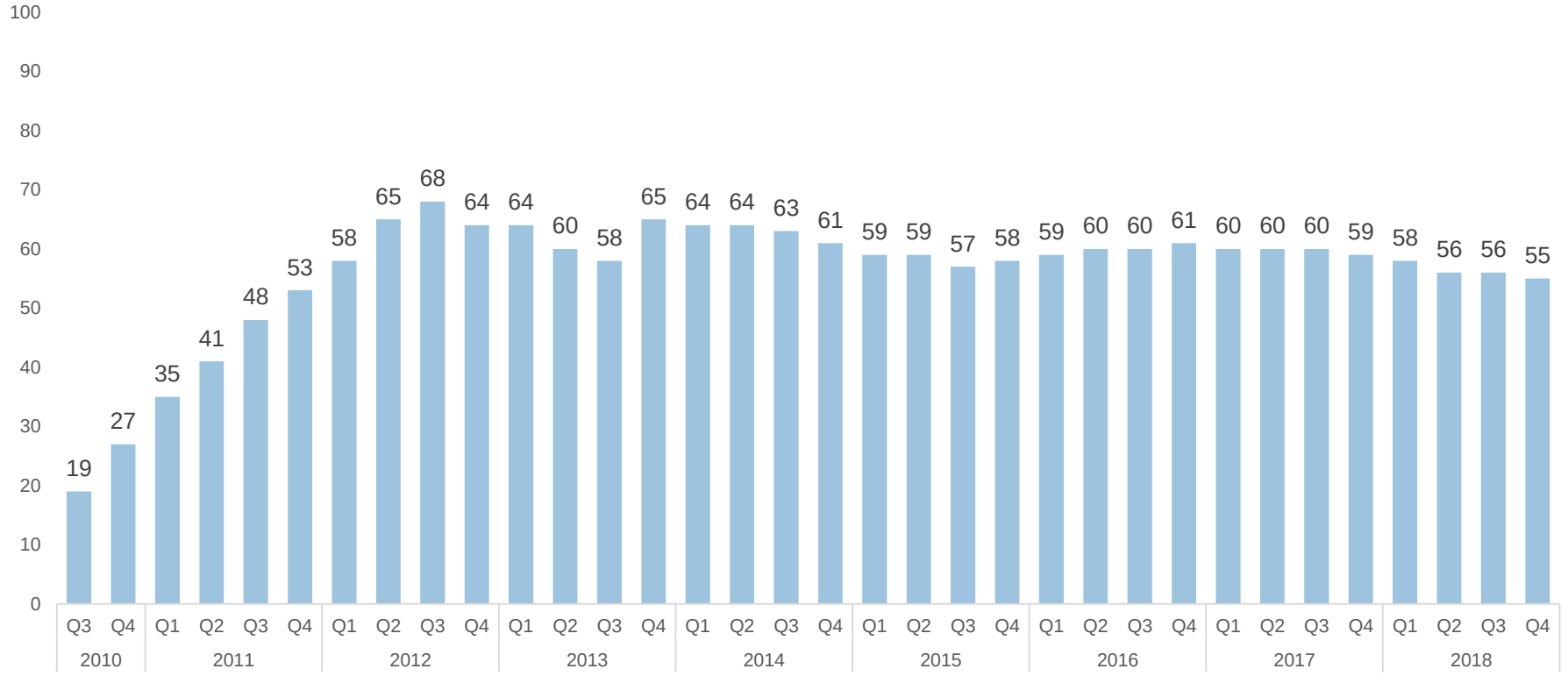
- All design changes at REC go through an extended testing process, where panels are examined at conditions beyond normal industry standards
- Because REC tests its products beyond the pass marks of international standards, an outstanding performance during certification is possible
- Extreme testing ensures performance and reliability in the most severe climates





Warranty claims – High quality demonstrated by very low warranty claim rates

Claims rate at REC (Cumulative PPM – parts per million)



- ➔ Dedicated team handles claims from the field
- ➔ Analysis of claims helps improve product quality
- ➔ Parallel feedback process in place to handle non-claim issues

Lowest claims, leading warranty

REC solar panels come with comprehensive premium warranties that provide long-term and value-adding security you can depend on:

- **20-year product warranty**
  - Promises that the workmanship and materials of the panels themselves maintain their superior quality for 20 years
- **25-year linear power output warranty**
  - Ensures that REC solar panels will perform exactly as they are expected to – every year for 25 years

Serie prodotto	GARANZIA SULLA PRODUZIONE ENERGETICA		
	Anno 1 - potenza minima	Anni 2-25 - degradazione annua max	% della potenza nominale al 25° ANNO
REC Alpha	98,0%	0,25%	92,0%
Serie N-Peak di REC		0,5%	86,0%
REC TwinPeak 2 Mono REC TwinPeak 2	97,5%	0,7%	80,7%
REC TwinPeak 2S Mono 72 REC TwinPeak 2S 72		0,5%	85,5%

Lowest claims, leading warranty

REC solar panels come with comprehensive premium warranties that provide long-term and value-adding security you can depend on:

- **20-year product warranty**
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- **25-year linear power output warranty**
  - Ensures that REC solar panels will perform exactly as they are expected to – every year for 25 years

Tipo di garanzia REC	GARANZIA REC PROTRUST		GARANZIA STANDARD REC LEADER DI SETTORE
Installatore	Solo installatori REC Certified Solar Professional		Tutti gli installatori
Potenza installata	<25 kW	25-500 kW	Qualsiasi
Garanzia sul prodotto (anni)	25*	25*	20
Garanzia sulla produzione energetica (anni)	25	25	25
Garanzia sulla manodopera (anni)	25*	10*	0

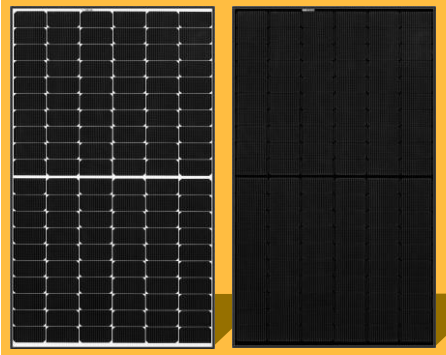
*Gli impianti devono essere registrati tramite l'app SunSnap o il portale REC Solar Professional

Products

REC Product Portfolio

Ensuring highest power coverage for every application

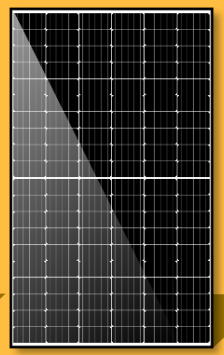
60-cell HJT range



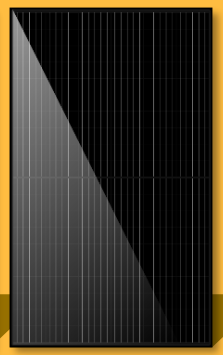
REC Alpha
360-380 W

REC Alpha Black
360-375 W

60-cell n-type mono range

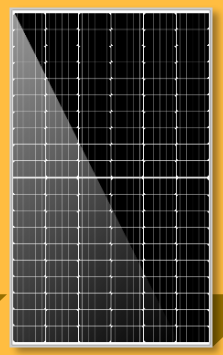


REC N-Peak
320-330 W

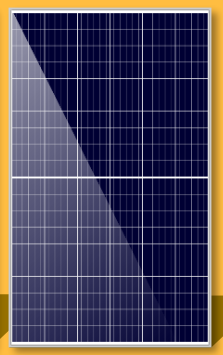


REC N-Peak Black
315-325 W

60-cell p-type PERC range

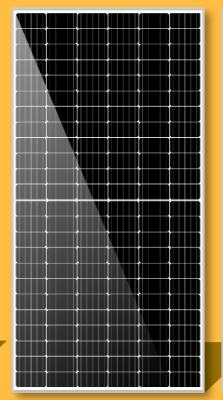


REC TwinPeak 2 Mono
310-320 W

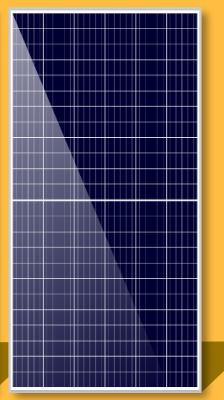


REC TwinPeak 2
285-300 W

72-cell p-type PERC range



REC TwinPeak 2S Mono 72 XV
365-375 W



REC TwinPeak 2S 72
345-355 W

- World's most powerful 60-cell solar panel
- Combines the best of n-type mono and thin film technologies

- World's first n-Type mono solar panel with Twin design
- Full-black variant for best aesthetics

- Pushing 60-cell power to over 300 Wp
- Highest power multi module on market
- Low carbon footprint

- Ideal for large-scale C&I solar power plants
- 1000V and 1500V variants

REC Alphα Series

Revolutionary technology for the world's highest powered 60-cell solar panel

External Use

REC SOLAR'S MOST TRUSTED

REC Alpha Series

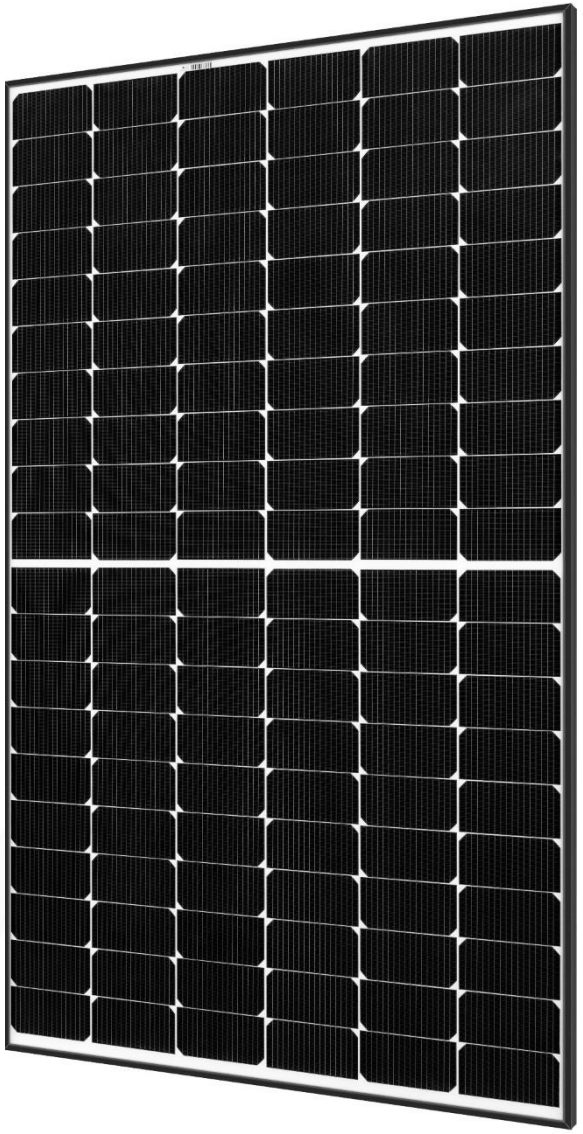
The most power density on a 60-cell module!

Find the movie on Youtube in RECGroup Channel!!

REC Alpha Series

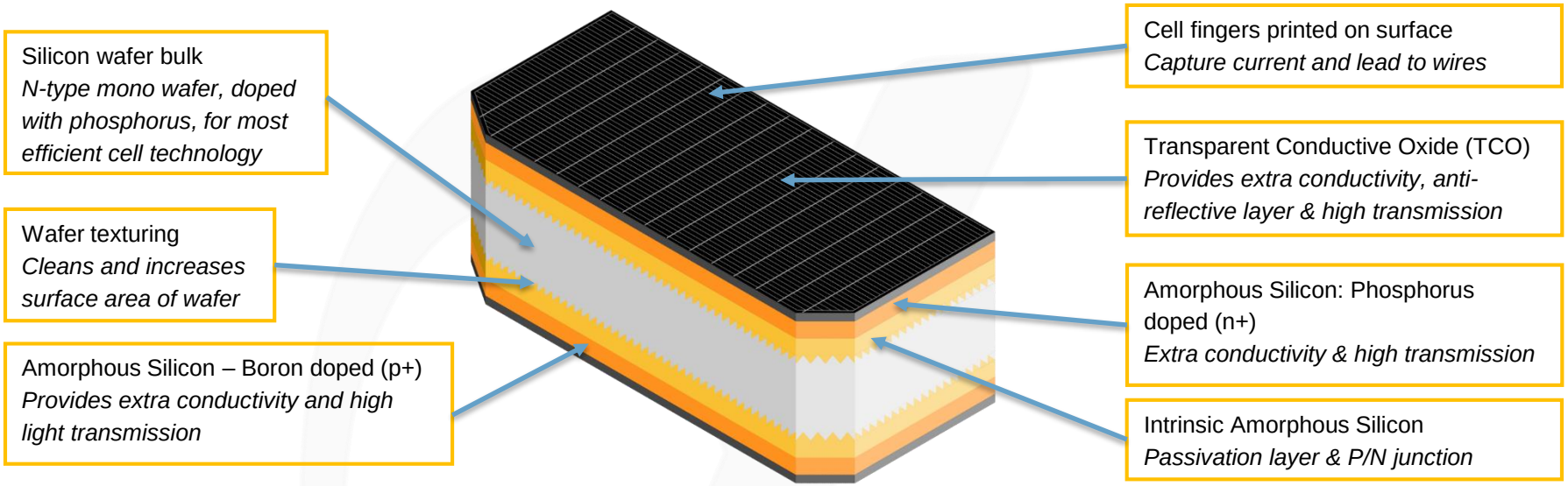
The most power density on a 60-cell module!

- World’s most powerful 60-cell solar panel
  - Up to 380 Wp
- 2 product variants
  - Black frame, white backsheet
  - Full-black variant
- Hetereojunction cell technology
  - Increased efficiency through more light absorption
  - Improved efficiency at higher temperatures
  - Mono-n-type wafers for most efficient cell technology
  - N-type wafer doping for zero LID
- Advanced low temperature connection technology
  - Solder-less cell connections
  - Improved current flow
  - Increased protection of cell
- REC’s unique super-strong frame design
  - Up to 7000 Pa snow load and 4000 Pa wind load
  - Easy installation through wider clamping areas



REC Alpha Series

Heterojunction cell technology for high efficiency

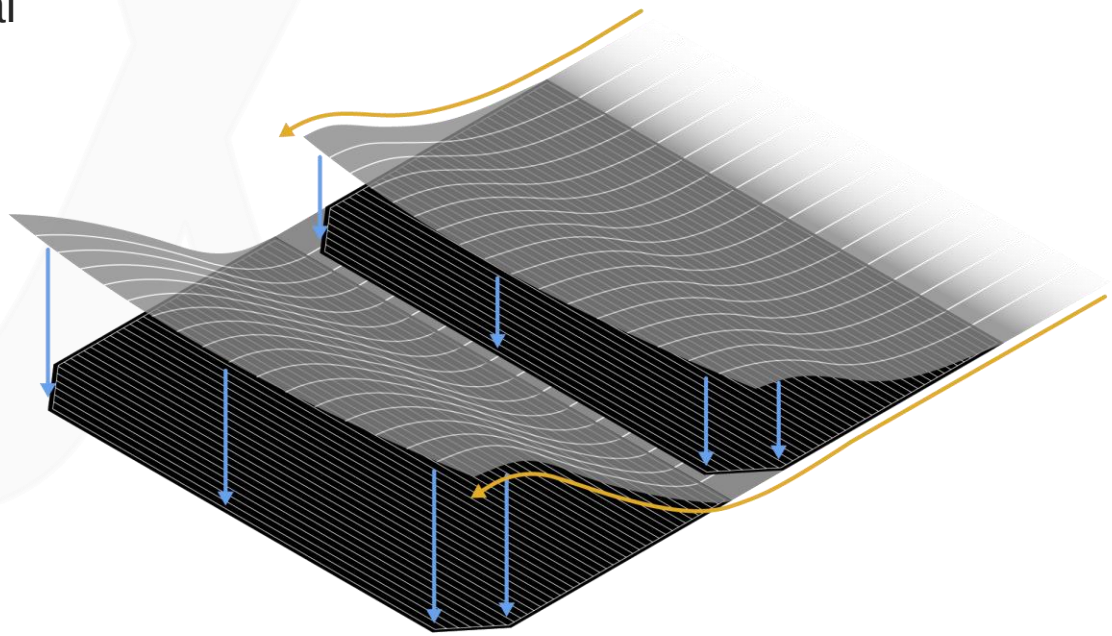


- Combines advantages of crystalline cells and thin film for high efficiency & power
- High efficiency n-type mono wafer between thin layers of amorphous silicon
  - High efficiency cell which produces more energy at higher temperatures
- Amorphous layers are doped with phosphorus and boron to create cell structure
  - Intrinsic amorphous silicon acts as a passivation layer
- The interface between dissimilar layers creates unequal band gaps
  - Minority carriers can better penetrate the passivation layers (intrinsic a-Si)
  - Improved electron flow for a higher collection of the electron/hole pairs

REC Alpha Series

Advanced low temperature technology for improved cell connections

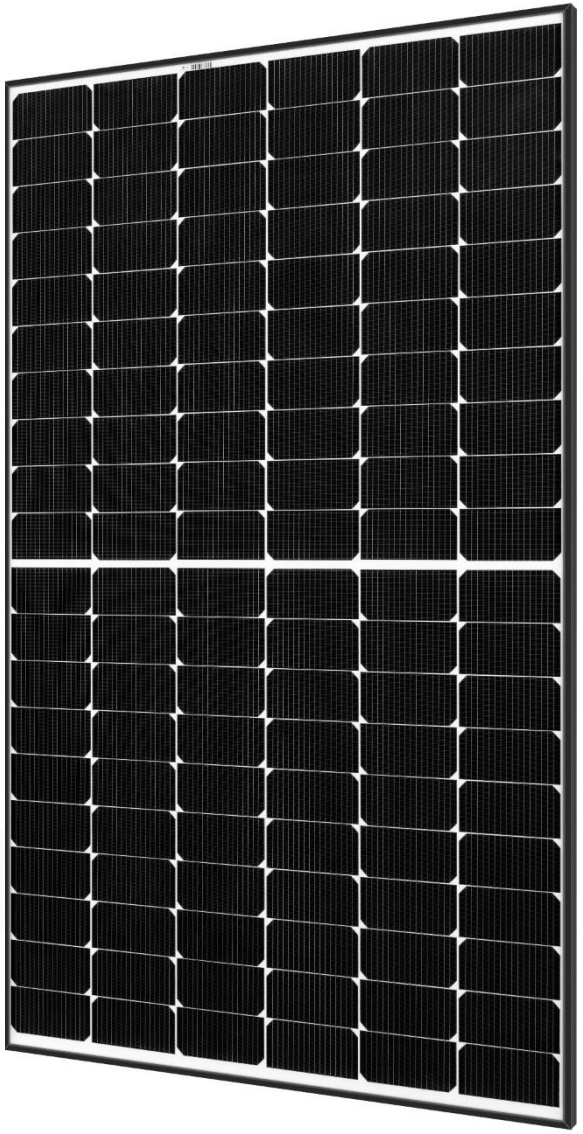
- Cells connected through a wire and film combination that wraps around cells
- Wires fuse to cell to form connections at a much lower temperature
  - Removes soldering from cell-stringing process
  - Reduces thermal stress in cells, reducing likelihood of cell damage
  - Fewer weak points on final cell
- Increased connections between wires and cell to reduce internal resistance
  - Reduces distance current has to flow
  - Improves current flow (less congestion)
- Film acts as extra protection against leakage and mechanical stress



REC Alpha Series

REC's pioneering Twin design for the highest power

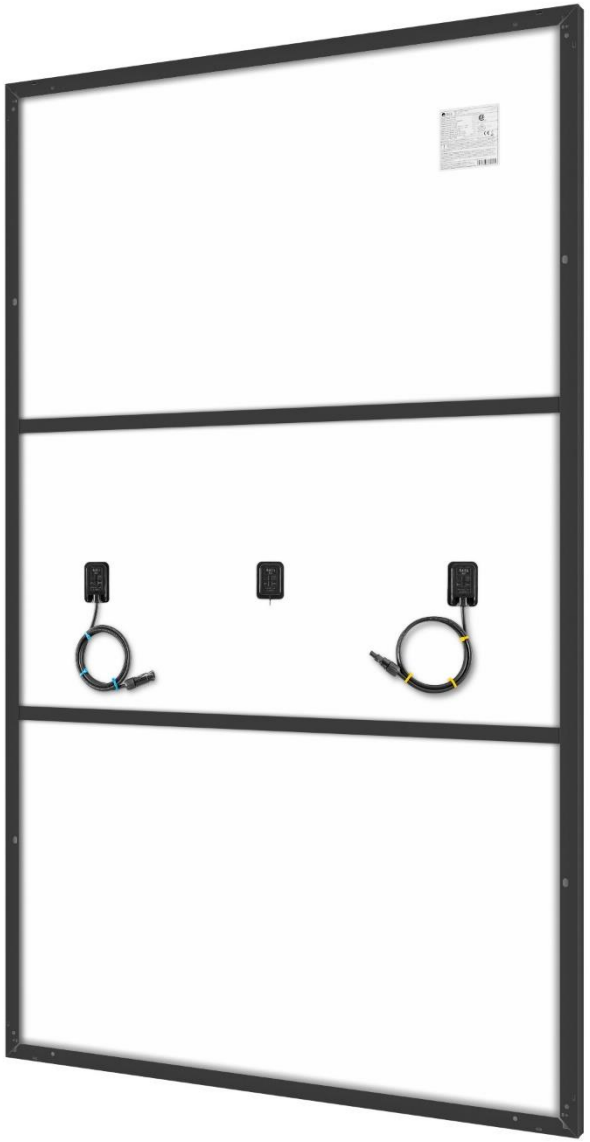
- REC's award-winning Twin design principle
  - Panel split into two sections of 60 half-cut cells
  - Reduces current per cell by 50%
  - Power loss in panel reduced by factor of 4
    - $P_{loss} = R \times I^2$
  - 6 separate strings
  - Continued energy production in shaded conditions for higher energy yields
- Additional larger cell area for higher power
  - Increases surface area to capture light



REC Alpha Series

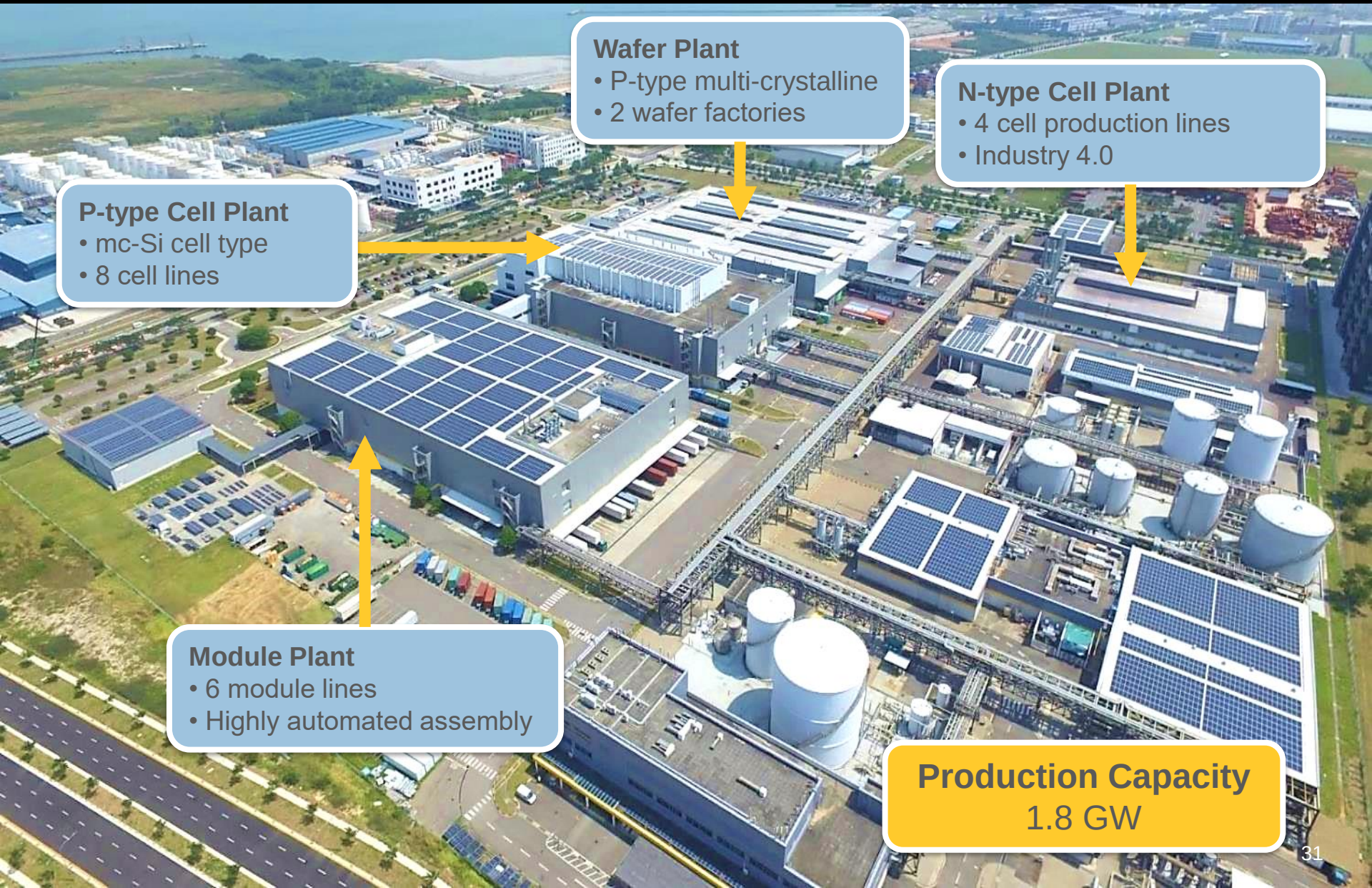
Super-strong frame design for increased durability

- Ensures durability and stability through REC's innovative 2S frame design
  - Only 30 mm high
  - Horizontal support bars on the rear
  - Supports glass from below, preventing it from bending as far under load
  - Increased reliability as risk of cell damage, deformation and glass breakage is greatly reduced
- Allows optimized transportation
  - Reduces amount of transport required and the amount of trucks on the road.
  - 33 panels per pallet
  - 858 panels in a 12 m (40') container



REC Alpha Series

Made in REC's Singapore integrated production facility



REC Alpha Series

Specialist *Industry 4.0* cell production facility

Advanced production lines with smart, highly automated & integrated manufacturing systems

- Autonomous robots used for delivery of wafers & cassettes, communicating and cooperating in real time with each other
- Using advanced sensors, software, and data, robots move along dedicated paths and fulfil tasks, resulting in efficiency and quality improvements
- Advanced architecture and big data analytics for full traceability, in-depth data mining & monitoring, allowing machine learning, fault detection, maintenance forecasting
- Automatic Process Control with advanced in-line measurements allow automated process tuning

Advantages of the REC Alpha Series

Best power density on a 60-cell module

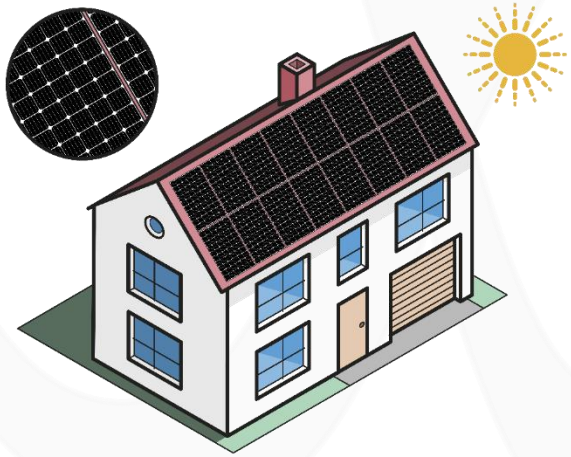
- Power density is the amount of energy you get out of a certain area, expressed in power (Watts) per area (m² [1 sq ft])
  - An important consideration where space is constrained, e.g., on rooftops
- Critical for customers is to fit as much power-generating capacity as possible into the installation
- The REC Alpha Series offers **world-class power density** on a 60-cell platform

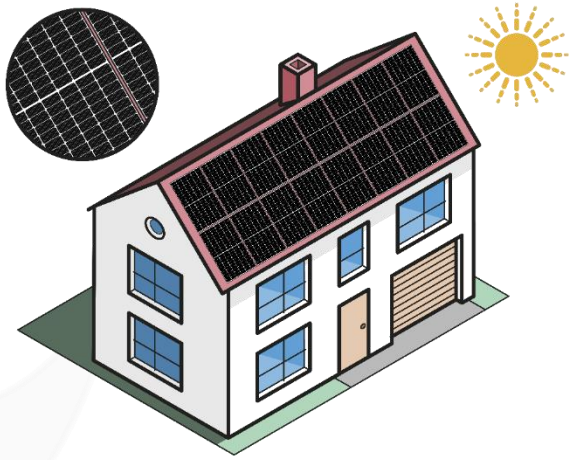
Panel Efficiency	360 Wp	20.6%
	370 Wp	21.2%
	380 Wp	21.7%
Power Density	360 Wp	206 W/m²
	370 Wp	212 W/m²
	380 Wp	217 W/m²

Advantages of the REC Alpha Series

More energy production with the same number of panels: Example

	Residential system with standard mono-PERC	Residential system with REC Alpha Series
Number of panels	16 x 300 Wp panels	16 x 370 Wp panels
System size	4.8 kW	5.9 kW
Power difference		**+23% more power**





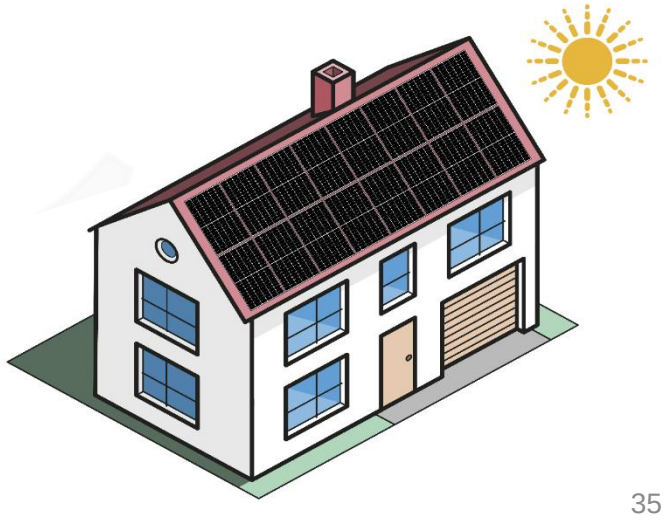
+23% more power installed from the same area and same number of panels by using the REC Alpha Series

Advantages of the REC Alpha Series

Greater than 20% more energy production than conventional panels

Nr. of panels	System power: Conventional 300 Wp	System power: REC Alpha Series 370 Wp	Extra power	Power difference
12	3.6 kW	4.4 kW	**0.8 kW**	**+23%**
16	4.8 kW	5.9 kW	**1.1 kW**	
24	7.2 kW	8.9 kW	**1.7 kW**	
40	12.0 kW	14.8 kW	**2.8 kW**	
100	30.0 kW	37.0 kW	**7 kW**	

Consistently more energy with the REC Alpha Series



Advantages of the REC Alpha Series

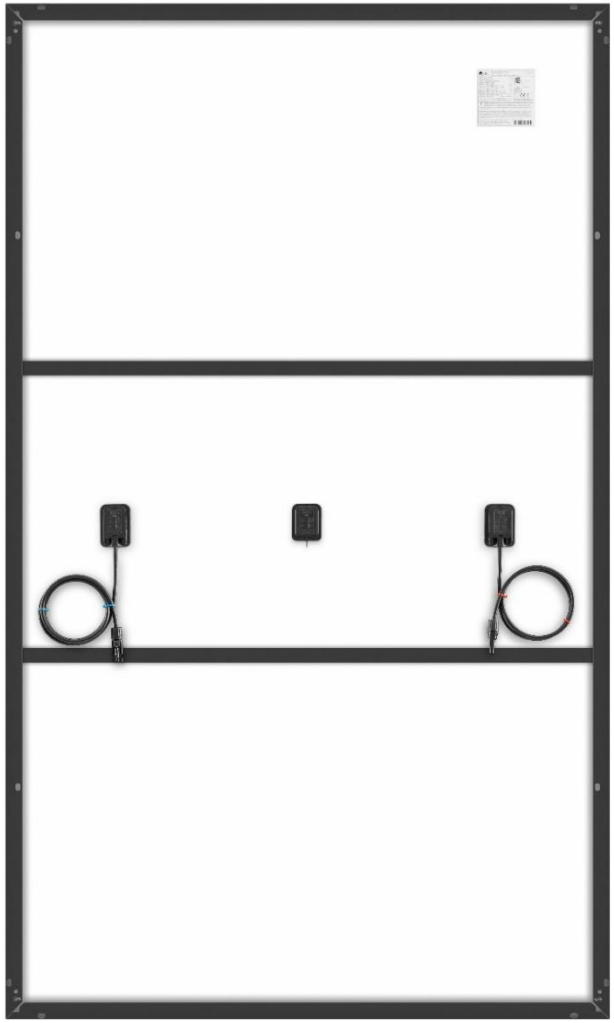
No LID – so no drop in performance immediately after installation

- Light Induced Degradation affects most crystalline solar cells on the market
  - Immediate drop in power over initial exposure to sunlight, i.e., after installation
  - Some panels see losses of up to 3% before stabilizing
  - Caused by interaction of boron and oxygen in the cell
- REC Alpha Series uses n-type doping which prevents the interaction of boron in the cell
  - So no drop-off in power after installation
  - The power purchased is the power customers receive on their installation

Advantages of the REC Alpha Series

Super-strong frame design for increased durability

- REC's innovative 2S frame design adds real performance advantages
- Thinner 30 mm frame with support bars
  - Ensures stability and durability of construction
  - 30 mm frame height makes panel easier to handle and carry
- The extra support prevents the glass layer from bending as far under load,
  - Protects the fragile cells from power loss due to breakage, cracking or hotspots
- Extra durability means cells deliver high power over a longer period for higher long-term energy yields
- Thinner frame allows optimized transportation
  - Reduces amount of transport required and the amount of trucks on the road.
  - 33 panels per pallet
  - 858 panels in a 12 m (40') container



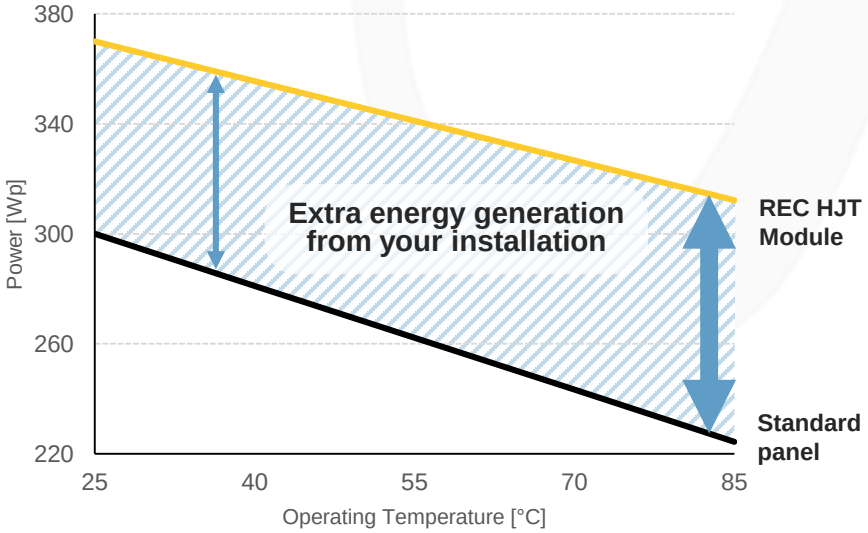
Advantages of the REC Alpha Series

Better performance as temperatures rise

HJT cells perform better than conventional technology for better energy yields

- As cell temperature rises, solar modules lose a certain % of their efficiency
  - This amount is known as the Temperature Coefficient (%/ºC) and shows the % of power lost for every 1ºC above 25ºC
- The REC Alpha Series has a much lower power loss as cell temperature rises
  - Higher light conversion efficiency for more power

Up to 10% more energy production at higher temperatures with the REC Alpha Series!

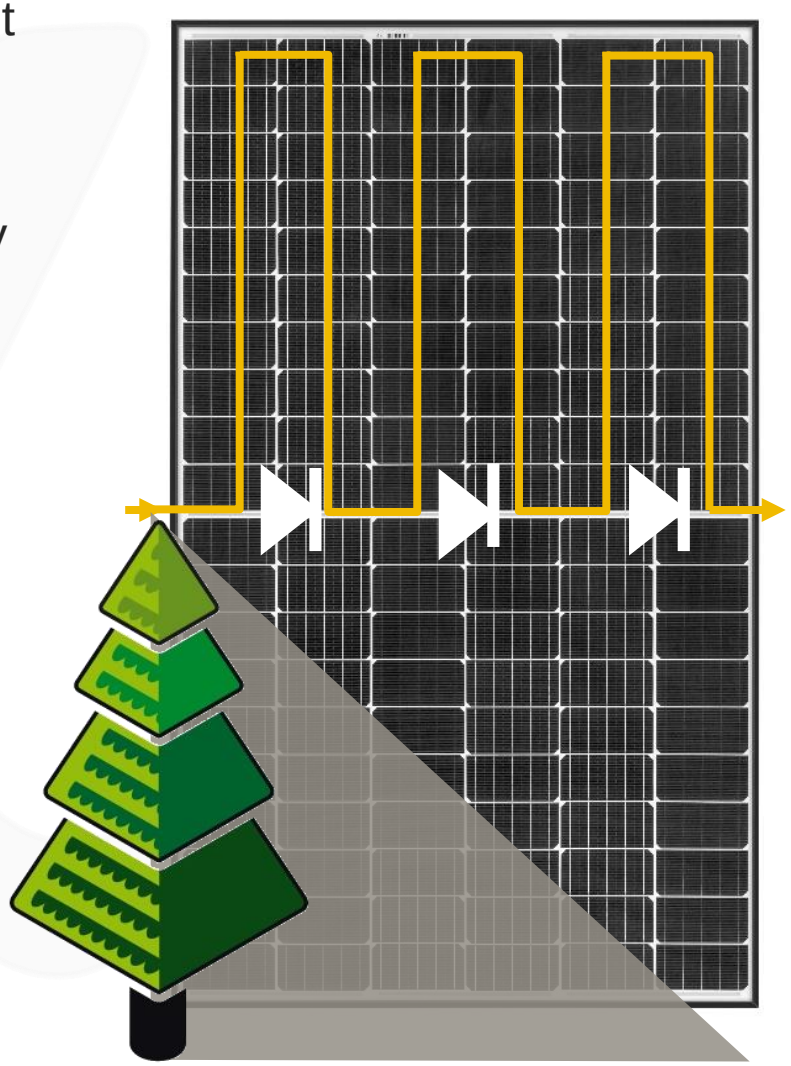


Temp.	Conventional 300 Wp mono		REC Alpha Series		Power difference
Tcoeff	-0.42%/°C		-0.26%/°C		
	% Loss	Power [Wp]	% Loss	Power [Wp]	
25°C	0	300	0	370	**70 Wp**
40°C	6.3	281.1	3.9	355.6	**74.5 Wp**
55°C	12.6	262.2	7.8	341.1	**78.9 Wp**
70°C	18.9	243.3	11.7	326.7	**83.4 Wp**
85°C	25.2	224.4	15.6	312.3	**87.9 Wp**

Advantages of the REC Alpha Series

Better performance in shaded conditions than standard panels

- Solar works best when fully exposed to sunlight
- Any reduction impacts on energy yield and system payback and profitability
- The REC Alpha Series uses proven technology to reduce the impact of shading on energy production
- REC's award-winning Twin design splits each string into two separate sections
  - Reduces current per cell by 50%
  - Power loss in panel reduced by factor of 4
    - $P_{loss} = R \times I^2$
- Result = Continued energy production in shaded conditions for higher energy yields



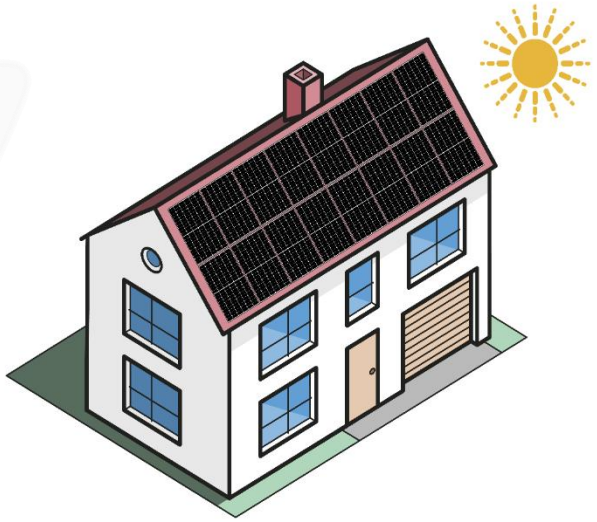
Advantages of the REC Alpha Series

Environmentally-friendly : Reduces your CO_2 footprint

The higher power and yield from the REC Alpha Series help reduce your carbon footprint

An installation 6 kW size (~16 panels):

- Produces more than **7200 kWh of clean energy** per year
- Reduces the CO_2 emissions of a family home by **4.3 tons** per year



This is equivalent to:

Planting **84 trees**	Charging a smartphone **650,000** times
The same amount of CO_2 sequestered by **6 acres** of forest per year	Driving **~20,000 km** (12,500 miles) in standard family car
1.8 tons of waste recycled instead of entering landfill	Saving **2530 kg** (5571 lbs) of coal burnt for power

Production values taken from a PVsol simulation using REC Alpha Series 375 Wp panels located in Munich, Germany, values will vary for different locations
Equivalence calculations using: EPA Greenhouse Gas Equivalencies Calculator (https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator)

Advantages of the REC Alpha Series

Environmentally-friendly: 81% less lead content

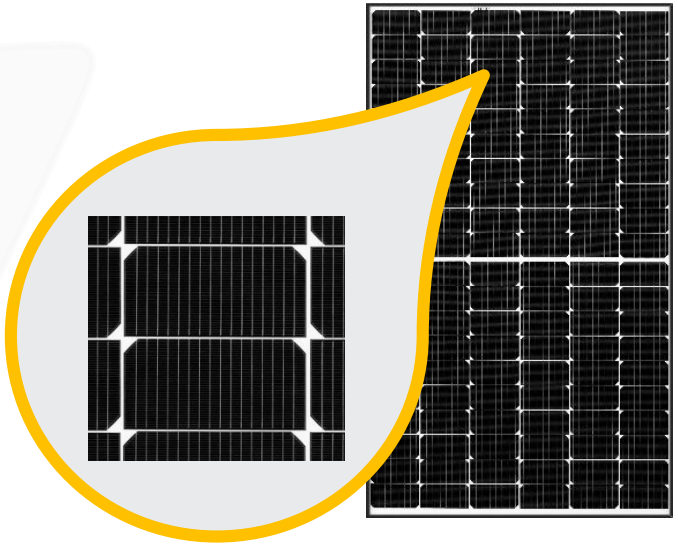
	Standard panel	REC Alpha Series
Module weight (kg)	18.5 kg	19.5 kg
Lead content (g)	23.7 g	4.7 g
% lead content	0.13 %	0.02 %
% reduction lead of content		**81 % reduction**

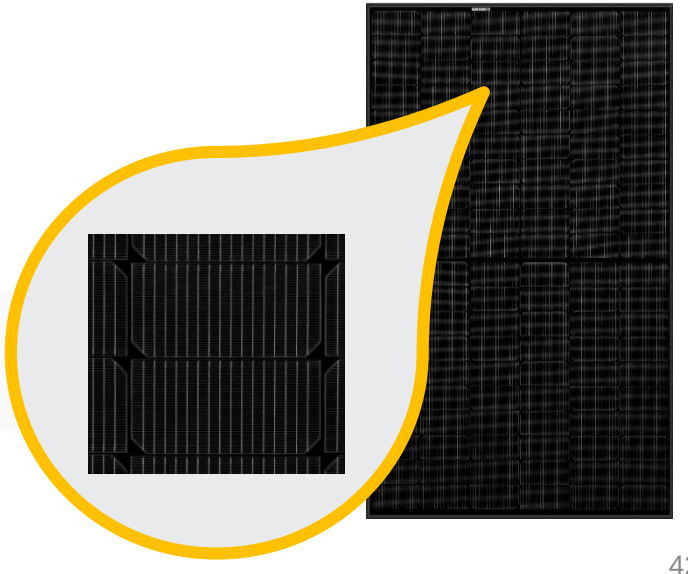
- 81% reduction in lead content
  - Solder-less cell connections eliminate majority of lead
  - Only 0.02% of panel weight
  - Less than 5 grams in 19.5 kg panel weight

Advantages of the REC Alpha Series

Better aesthetics for the best look on the roof

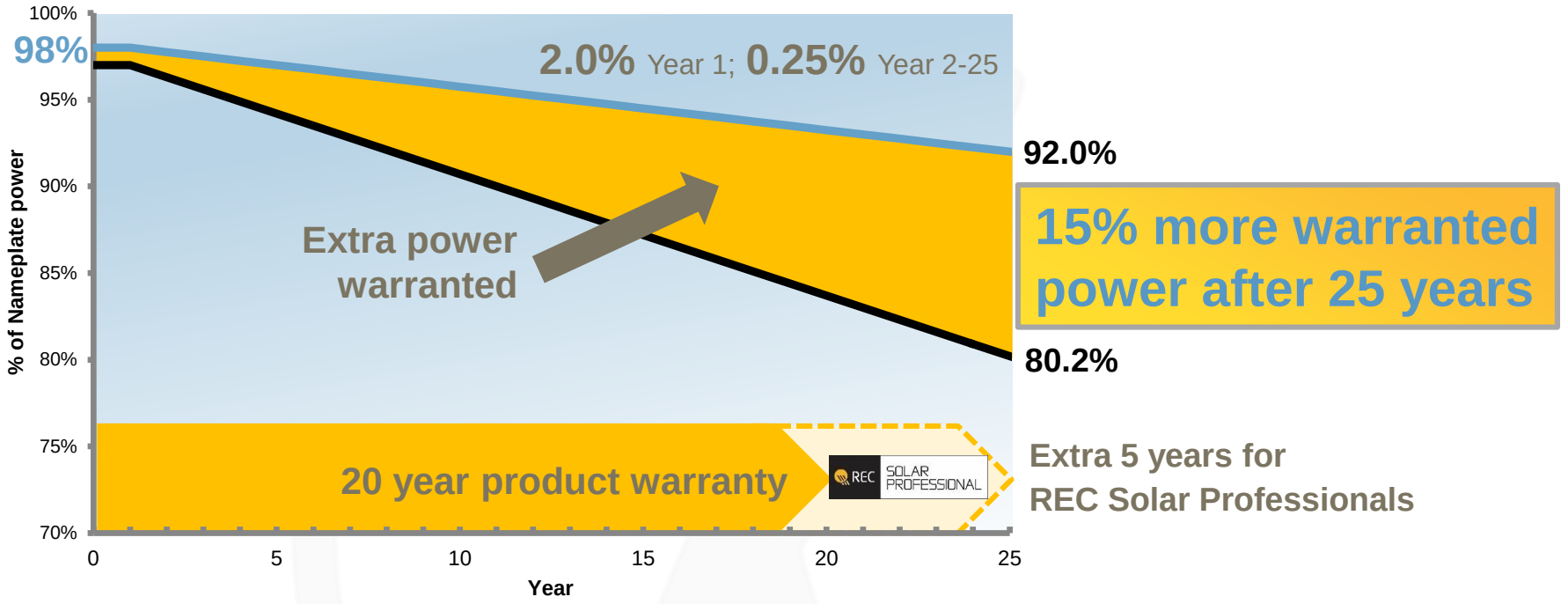
- Black cells with black frame for best optics with highest power
  - Also available as a full black variant
- Reduced width of ‘busbars’ through use of REC’s advanced low temperature cell connection technology
  - Cell metallization less conspicuous
  - Wires invisible from a short distance away
  - Panel interconnections covered up
- Full black variant offers uniform look for a consistent system appearance
  - Fits ideally on installations on dark-colored rooftops, e.g., slate
  - Ideal for installations where minimal visual impact is desired





Advantages of the REC Alpha Series

Market-leading warranty

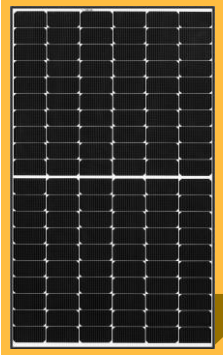
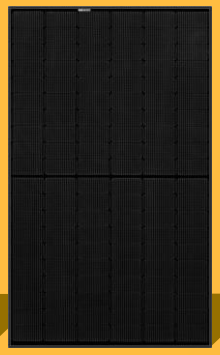
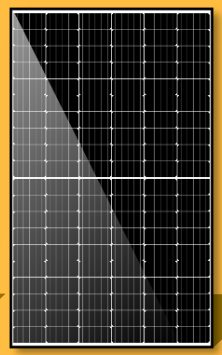
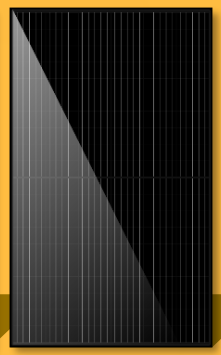
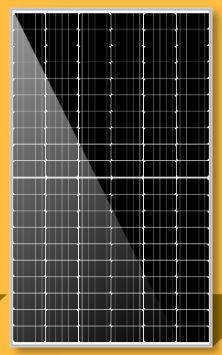
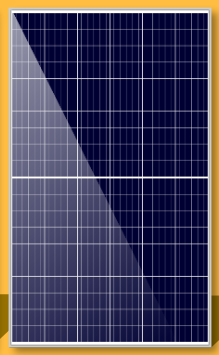
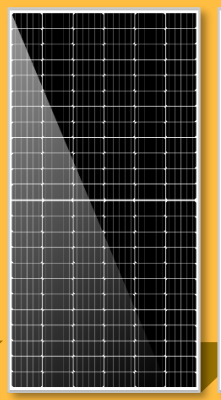
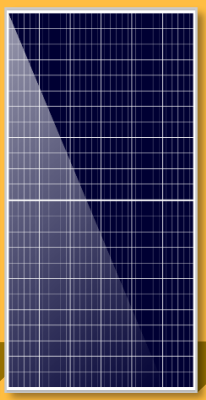


REC's industry leading warranty is also applicable to the REC Alpha Series

- 20 year product warranty (covering workmanship)
  - +5 years extra if installed by an REC Solar Professional (25 years total)
- 25 year power output warranty
  - Starting from only 98% after one year
  - With a minimum of 92% power warranted after 25 years in action

REC Product Portfolio

Ensuring highest power coverage for every application

60-cell HJT range		60-cell n-type mono range		60-cell p-type PERC range		72-cell p-type PERC range	
							
REC Alpha 360-380 W	REC Alpha Black 360-375 W	REC N-Peak 320-330 W	REC N-Peak Black 315-325 W	REC TwinPeak 2 Mono 310-320 W	REC TwinPeak 2 285-300 W	REC TwinPeak 2S Mono 72 XV 365-375 W	REC TwinPeak 2S 72 345-355 W
• World's most powerful 60-cell solar panel • Combines the best of n-type mono and thin film technologies		• World's first n-Type mono solar panel with Twin design • Full-black variant for best aesthetics		• Pushing 60-cell power to over 300 Wp • Highest power multi module on market • Low carbon footprint		• Ideal for large-scale C&I solar power plants • 1000V and 1500V variants	

Advantages of the REC N-Peak Series

Six unique benefits to the REC N-Peak Series

Mono n-type: the most efficient crystalline silicon technology

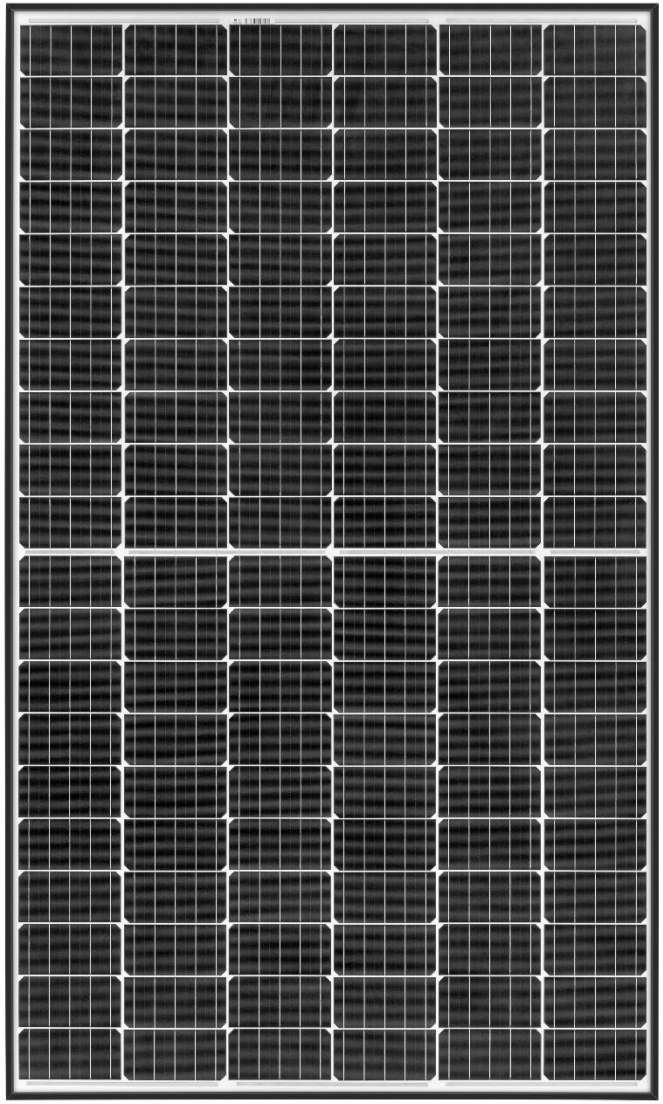
No Light Induced Degradation

Super-strong frame design up to 7000 Pa snow load

Flexible installation options

Improved performance in shaded conditions

Guaranteed high power over lifetime

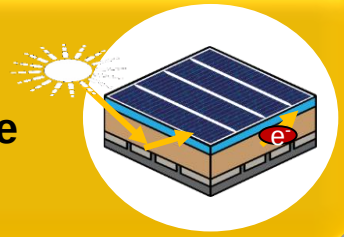


REC Product Portfolio
Explaining REC N-Peak Technology

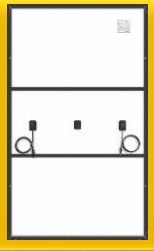
- Builds upon distinctive design of the REC's TwinPeak Technology platform
  - *REC has proven capability and experience in implementing this technical progress*
- Implements design and manufacturing changes on a high power n-type cell platform
  - *Most efficient crystalline silicon technology*
- REC has perfected cell rear-side passivation to lead market in PERT technology
- Introduces an innovative frame design to the 60-cell platform to add strength and durability

Half-cut mono n-type cells

Rearside passivation with total coverage



Super strong frame design

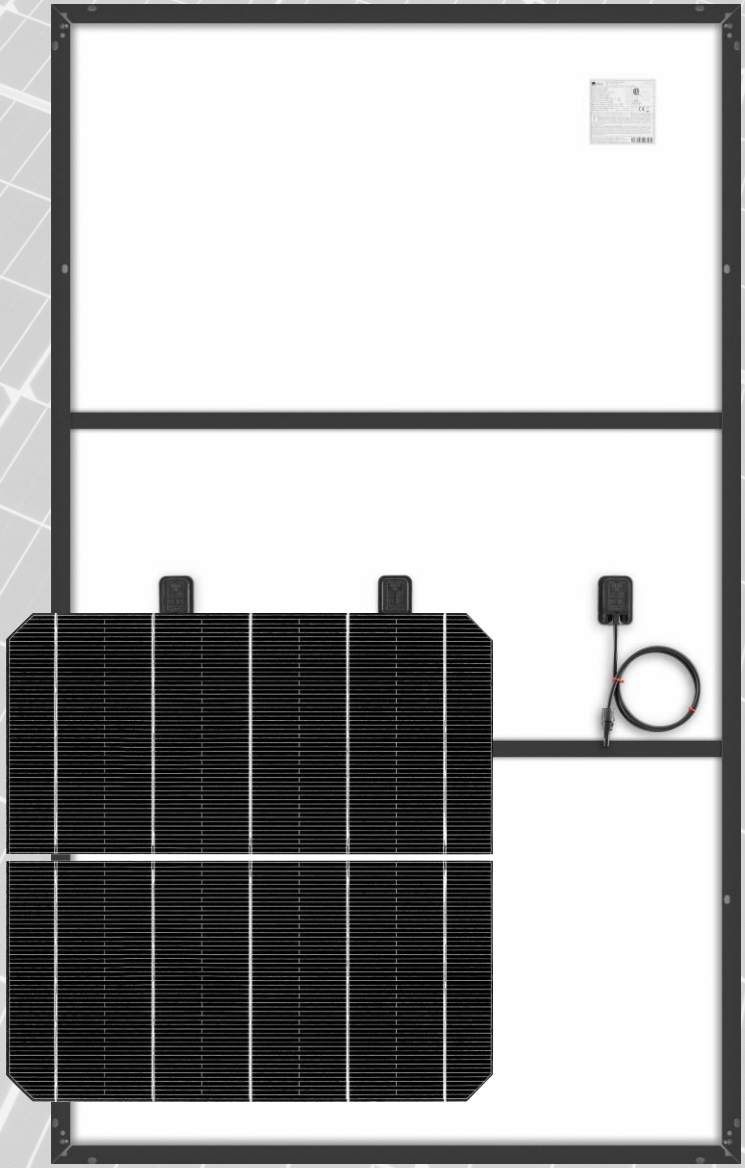


Split junction box

REC Product Portfolio

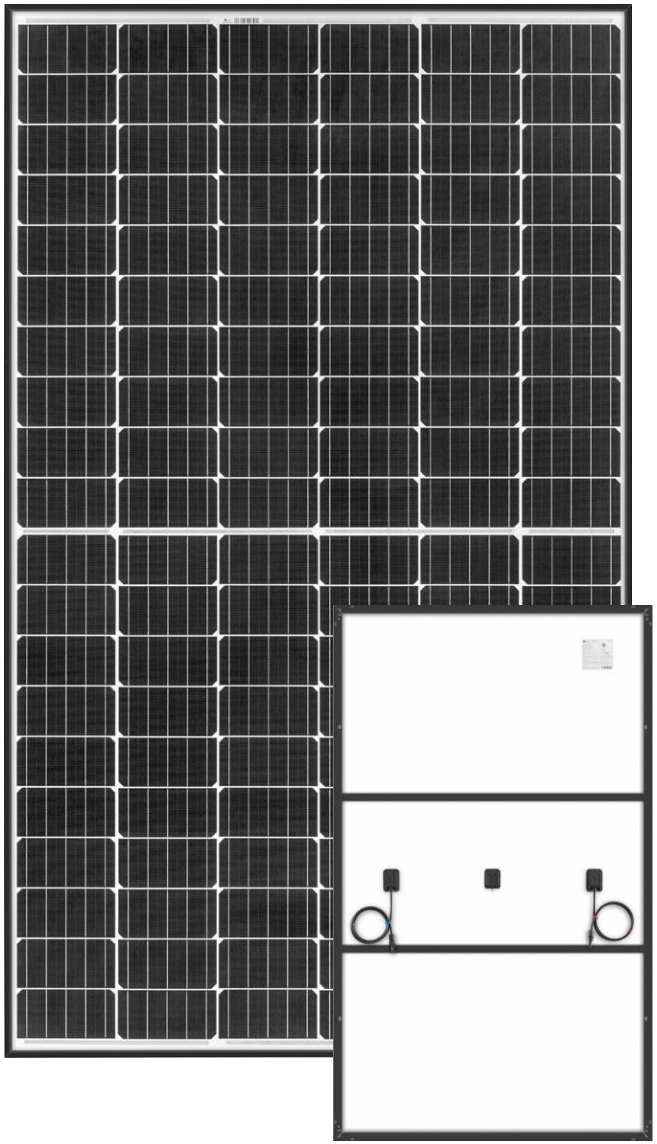
Advantages of REC N-Peak Technology

- No Light Induced Degradation (LID)
  - *No initial power loss after installation*
  - *Higher guaranteed power output*
- Super-strong frame design
  - *Reduces frame deformation under load*
  - *Increased durability and resistance to mechanical degradation*
- High efficiency
  - *N-type technology for most efficient technology on the market*
- Lower operating temperature
  - *Improved reliability through heat reduction*
  - *Avoids build-up of heat, improving cell efficiency*
- Improved performance in shaded conditions
  - *Twin section design allows continued operation when partially shaded*
  - *Increases energy yield when other module types have fully stopped operation*



REC N-Peak

World's first 60-cell half-cut n-type mono module



Key Info

Efficiency:
- 19.8 %

NOCT:
- 44.0°C
- Tcoeff P_{MPP} -0.35%/°C

Warranty:
- 20 year product
- 25 year power output

Dimensions:
- 1675 x 997 x 30 mm

Area:
- 1.67 m²

Weight:
- 18 kg

Cables:
- 1.0 + 1.2 m

Frame:
- Anodized aluminum

Connectors:
- Stäubli MC4

Certifications:
- IEC 61215 / 61730
- UL 1703

Packaging:
- 33 panels/pallet

Watt-classes 2018:
- 315 – 330 Wp

Product Advantages

REC's first 60-cell n-type mono panel

- Cells produced on REC's newly developed and exclusive n-type mono cell production lines
- Ideal for restricted installation areas e.g., rooftops, where high power production is needed in limited space

Uses REC mono-cell technology:

- Most efficient cell technology, n-type mono, for highest watt classes available
- Five bus bars for reduced cell resistance
- Uniform color of monocrystalline cells

More power per m²:

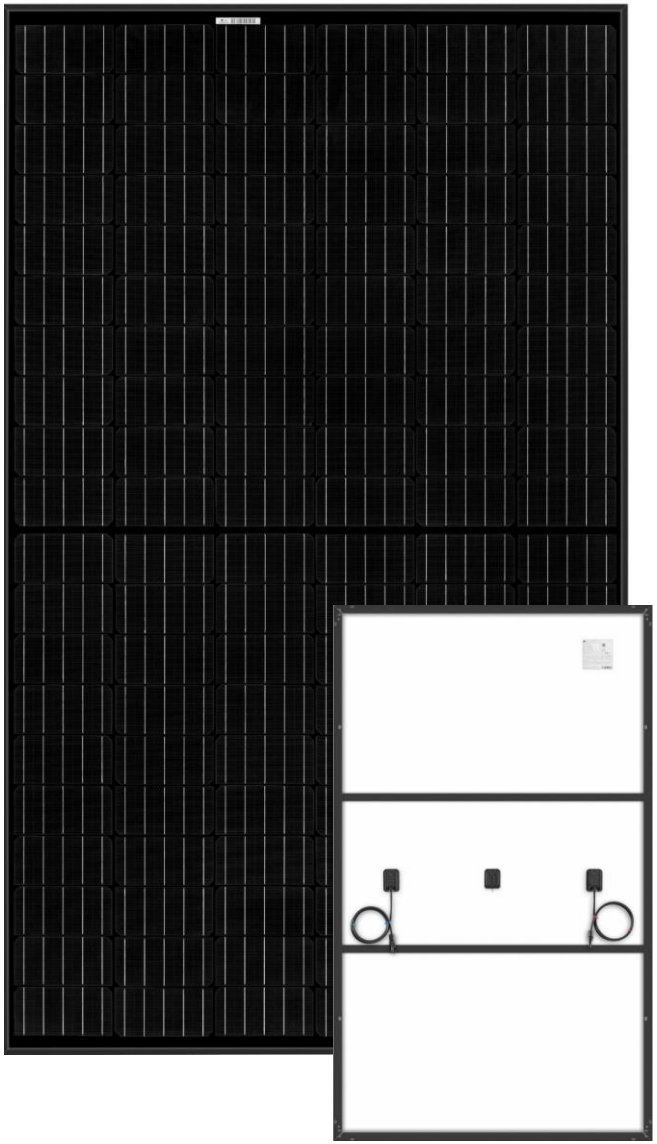
- Higher system yields due to increased power of n-type mono cells
- Super-strong frame design for guaranteed higher power over lifetime
- No light induced degradation (LID)

More cost efficient:

- High efficiency mono cells allow more power production on smaller areas

REC N-Peak Black

REC's first 60-cell monocrystalline module



Key Info

Efficiency:
- 19.5 %

NOCT:
- 44.0°C
- Tcoeff P_{MPP} -0.35%/°C

Warranty:
- 20 year product
- 25 year power output

Dimensions:
- 1675 x 997 x 30 mm

Area:
- 1.67 m²

Weight:
- 18 kg

Cables:
- 1.0 + 1.2 m

Frame:
- Anodized aluminum

Connectors:
- Stäubli MC4

Certifications:
- IEC 61215 / 61730
- UL 1703

Packaging:
- 33 panels/pallet

Watt-classes 2018:
- 310 – 325 Wp

Product Advantages

REC's first 60-cell mono full black panel

- Black cells produced on REC's newly developed and exclusive n-type mono cell production lines
- All 3 cross connectors hidden for a fully uniform black module

Uses REC's n-type mono cell technology:

- Most efficient cell technology, n-type mono, for highest watt classes available
- Five bus bars for reduced cell resistance
- Uniform color of monocrystalline cells

More power per m²:

- Higher system yields due to increased power of N-type mono cells
- Use of 'reflective black' backsheet means less loss of power
- No light induced degradation (LID)

More cost efficient:

- High efficiency mono cells allow more power production on smaller areas
- Ideal for restricted installation areas e.g., rooftops, where high power production and uniform aesthetics are needed in limited space

The best warranty is the one you never have to call on.

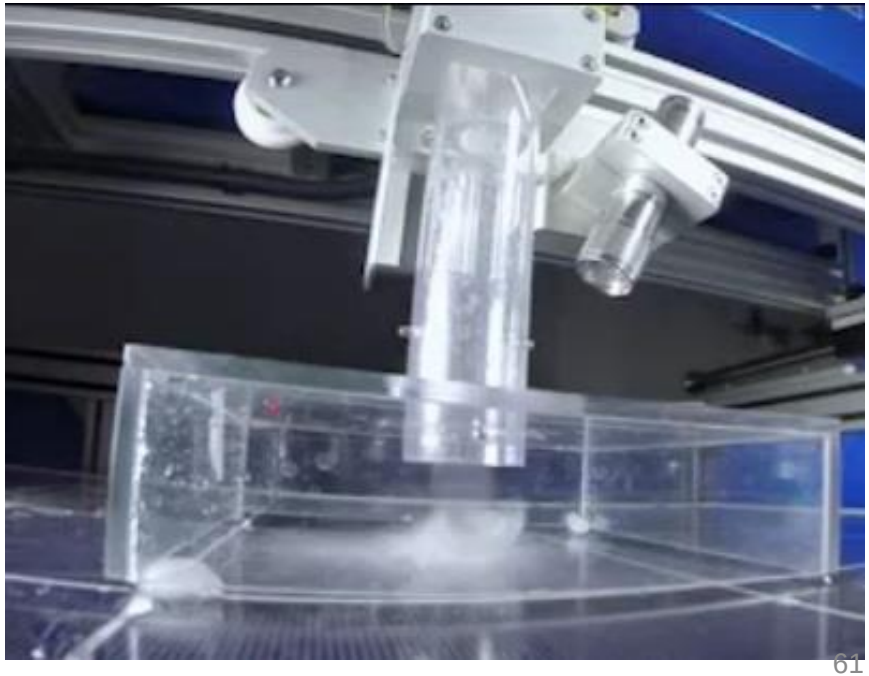
Assuring quality in product development

REC's internal testing exceeds international standards

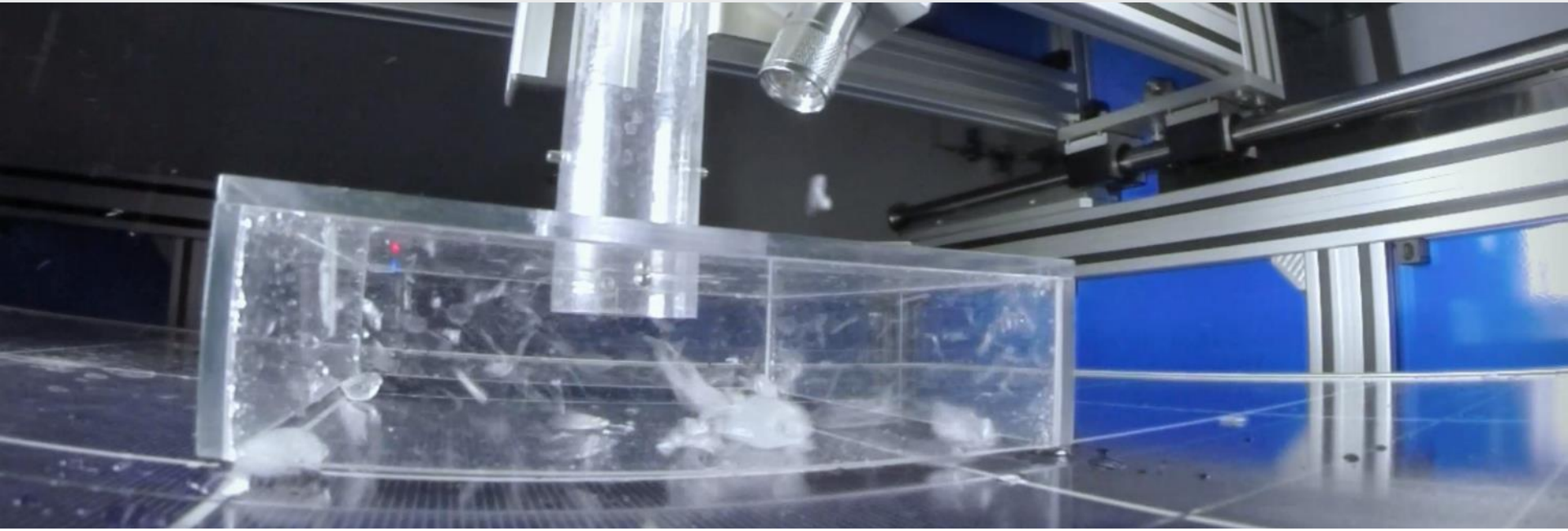
Certification only guarantees customers a certain level of quality.

As a manufacturer which puts product quality first, REC's objective is to bring products to market that exceed the requirements of international standards.

- As a minimum standard, REC panels are certified to:
  - IEC 61215
  - IEC 61730
  - UL 1703
  - UL 61730
- Strict test criteria beyond these standards must be passed before REC releases a product to market



Assuring quality throughout production:
REC's product certifications show quality performance



- REC's range of specific product certifications show a high level of all-round product quality
- Specialized climatic testing shows product resistance to the harshest environments
- Worldwide management and operational standards for consistent quality, environmental protection, and safety for workers and the public

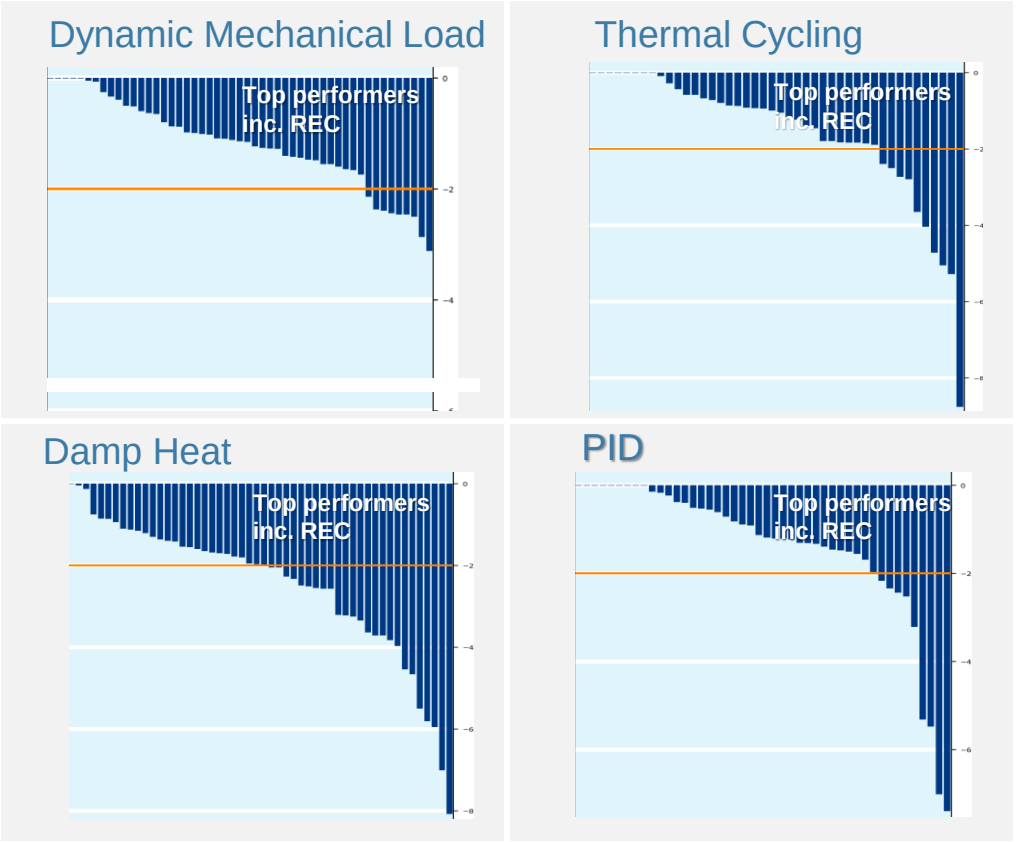
REC Quality is recognized year after year – Top Performer in PV Module Reliability Scorecard by DNV GL

- REC has been named a **Top Performer by DNV GL** in its PV Module Reliability Scorecard – for **4th year in a row**

TOP PERFORMER 2016 DNV·GL PV MODULE RELIABILITY SCORECARD
TOP PERFORMER 2017 DNV·GL PV MODULE RELIABILITY SCORECARD
TOP PERFORMER 2018 DNV·GL PV MODULE RELIABILITY SCORECARD
2019 TOP PERFORMER PVEL | DNV·GL PV MODULE RELIABILITY SCORECARD

- Program compares long term module reliability by vendor quality
- Supplier-specific analysis
  - Ongoing since 2012
  - Testing in excess of IEC standards
  - Accelerated lifetime tests
- All modules tested in the same environment to enable comparison
- Includes 9 of global top 10 brands
- Extended light soaking before testing to better quantify LID

Reliability Test	Duration
Thermal Cycling	600 cycles of -40 to +85°C
Damp Heat	2000 hours at 85°C & 85% RH
Humidity Freeze	30 cycles of 85°C & 85% RH for 20 hours, -40°C for 30 min
Dynamic Mechanical Load	1000 cycles of 1000 Pa then 50 TC cycles + 10 HF
PID	96 hours, 85°C & 85% RH, negative system voltage rating



*DNV GL, the world's largest independent expert & certification body for renewable energy

External assurance of REC quality

REC's quality shown through product certifications

Certification	International standard	Test institute
Ammonia Corrosion Resistance	IEC 62716	
Salt Mist Corrosion Resistance	IEC 61701 Severity Level 1 & 6	
Potential Induced Degradation	IEC 62804	
Blowing Sand	IEC 60068-2-68	
Non-uniform Snow Load	2PfG 2310/11.12.	
Dynamic Mechanical Load	IEC 62782	
Hail Impact	IEC 61215 (35mm)	
Cyclic Strength Wind Loads	BCA 2012 LH	
Ignitability / Fire Resistance	ISO 11925-2; UNI 8457/9174; UL 1703	
Quality, Environmental & Safety	ISO 9001; ISO 14001; OHSAS 18001	

573 kW, Dubai, UAE

Recognitions

Winner of multiple awards

REC efforts have been recognized internationally

- DNV GL Top Performer
  - REC TwinPeak and REC TwinPeak 2
- Solar + Power Award
  - REC TwinPeak 2 in “Silicon Module” category
- Made in Singapore Award
  - REC TwinPeak 2 in “Energy & Power” category
- Norwegian Climate Business of the Year
- Intersolar Award
  - REC TwinPeak Series in “Photovoltaics” category
- Singapore 1000 “Net Profit Growth Excellence Award
  - “Manufacturing” category
- IAIR Award
  - “Best Company for Sustainability; Solar Energy Solutions Global”
- Frost and Sullivan Best Practices Award
  - “Global Solar Power Customer Value Enhancement”
- Solar Industry Award
  - “Module Manufacturing Innovation”

REC has won three international awards in 2017 alone: for technology, design and environment

Norwegian Climate Business of the Year 2017

- Ground breaking and long-term work in the development of new production methods for solar silicon
- **Lowest CO_2 footprint** of all **solar silicon production technologies** (requires 75% less production energy compared to competitors) – which gives **REC modules** one of the **lowest carbon footprints**

Made in Singapore Award 2017

- Recognition for trailblazing products manufactured in the city-state and products conceptualized in Singapore
- The REC TwinPeak 2 Series won the Made in Singapore Awards under the energy & power category

MADE IN SINGAPORE BUSINESS AWARDS 2017

Solar + Power Award 2017

- Category “Silicon Module Award” for its TwinPeak 2 solar panel
- Jury remarks: “REC’s TwinPeak 2 exemplifies efforts to increase multicrystalline silicon efficiency to the point where it rivals that of monocrystalline PV products.”

REC on Stage

REC is recognized as a valuable industry expert

- REC CEO @ SNEC in Shanghai
- REC CEO @ All Energy Australia
- REC CEO @ Clean Energy Leader's Dialogue at Singapore International Energy Week
- REC CEO @ Reuters Energy Transition Panel
- Singapore's Minister for Trade and Industry @ REC's manufacturing site in Singapore
- REC CFO @ CNBC
- REC CEO @ CNBC
- REC sharing expertise @ Singapore's Management University

Sustainability

I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait till oil and coal run out before we tackle that.

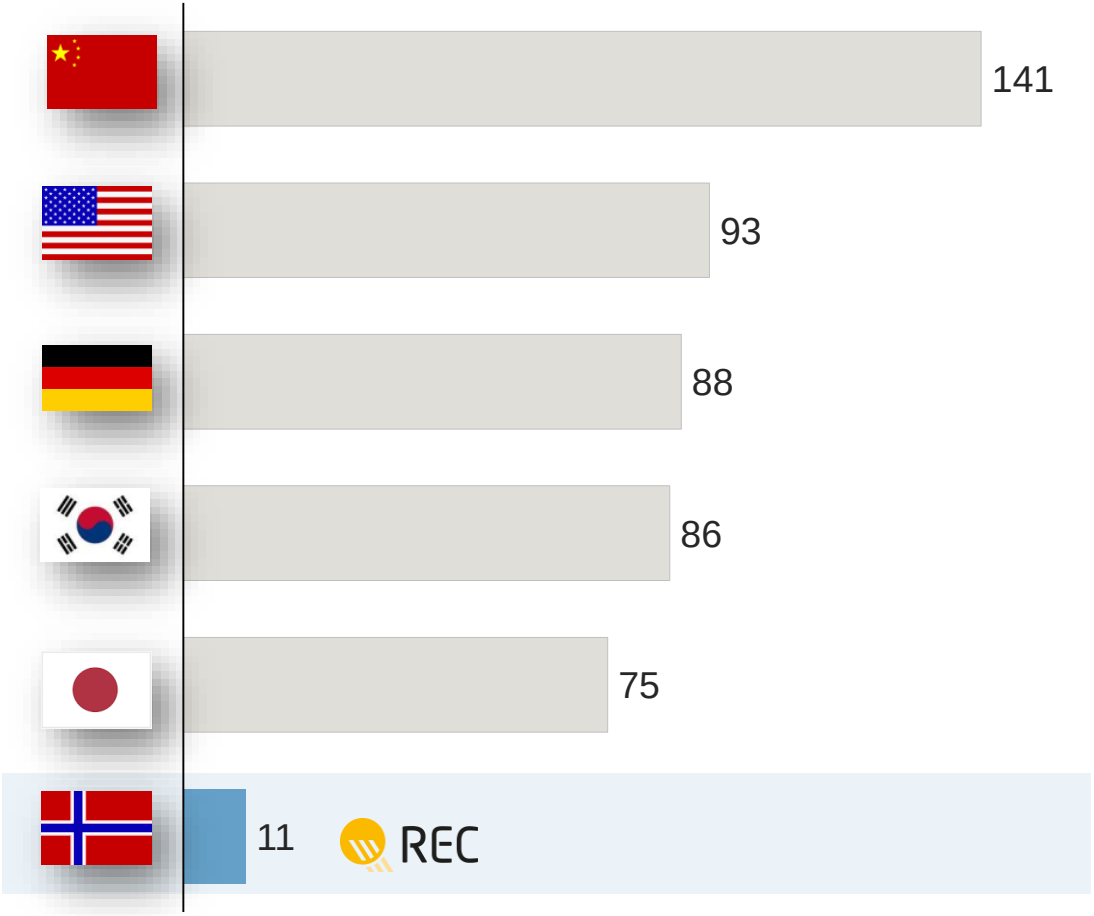
Thomas Edison to his friends Henry Ford and Harvey Firestone (1931)

REC leads the industry in terms of sustainable PV manufacturing

LOWEST CARBON FOOTPRINT
for solar grade silicon
(70% less energy used compared to traditional Siemens method)

Polysilicon CO_2 Footprint based on region of manufacture

Kg CO_2e/kg polysilicon



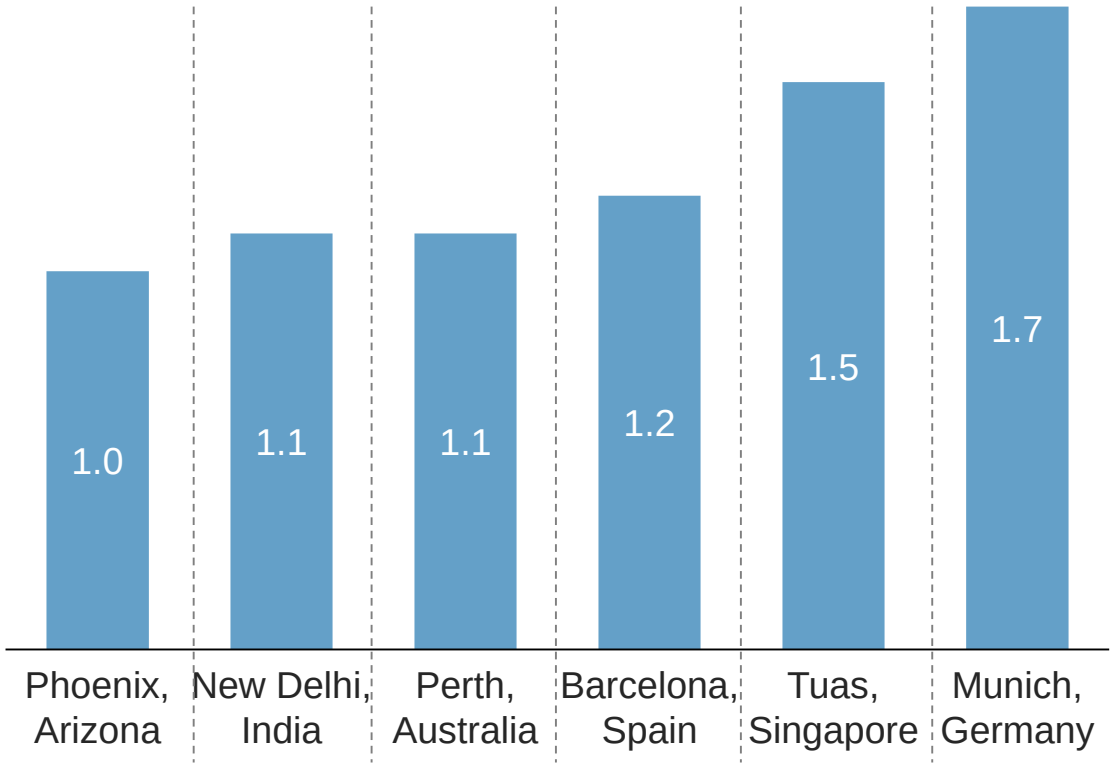
- The polysilicon manufactured by REC in Norway has the **lowest carbon footprint in the industry** thanks to an energy efficient process and hydro powered energy source leading to almost zero emissions - a fact now **validated by ADEME and confirmed by CERTISOLIS certification**
- Cell and module manufacturing is done in Singapore under some of the **most rigorous environmental standards in the World**
- Numerous global certifications for the **highest standards of product quality and production**

Source: Company Reports; ADEME; CERTISOLIS

REC achieves an industry-leading energy payback time thanks to its fully integrated solar value chain

- REC focuses on reducing its primary energy usage in its panel production
- Efforts **throughout the entire value chain** are leading the way in sustainable module production
- REC solar panels achieve an **energy payback[1] time of around 1 year**, which is class-leading
- As the most energy intensive phase of the entire production process is the silicon production, REC benefits from its REC Solar Norway operations

Energy Payback Time by Location[2]
(in Years)



1 One year of energy payback time refers to a time a module needs to generate the amount of electricity which has been required to produce it
2 Data based on REC 290Wp solar module and calculated using Pvsyst simulation software

Recycling contributes to ‘green’ credentials
REC is world leader in recycling through the value chain

- REC has partnered with multi-national electronic waste recycling companies to ensure effective solar module recycling systems
- In 2018, REC introduced a silicon recovery process that will make it the first in the world to use silicon waste to produce solar grade silicon
  - *Unique to REC – not replicable in Siemens or FBR processes*
- REC has a leading carbon footprint
  - *Certified by Certisolis (France)*
- In 2011, REC was the first solar module manufacturer to demonstrate an Energy Payback Time of only 1 year
- In 2012, REC was one of the first manufacturers to make a lead-free module commercially available

With its strong environmental credentials and top performance, REC is the number 1 module choice for eco-friendly investors in solar

REC's CSR Initiatives

- REC solar panels bring clean energy to remote Himalayan communities – 1,500 people powered, 9,000 liters of kerosene and 22.8 tons of CO_2 emissions eliminated
- REC's Climate Action Pledge in Singapore by the company and 500 employees
- Karanda Mission Hospital in rural Zimbabwe – a commitment to treat the needy
- REC's SolarBox Light Up Lives In Philippines – in collaboration with Red Cross, bringing clean power to the Bantayan after Hurricane Haiyan

REC Solar Panels made by the Sun

2.37 MW

2.6m kWh

550 HDB 4RM flats

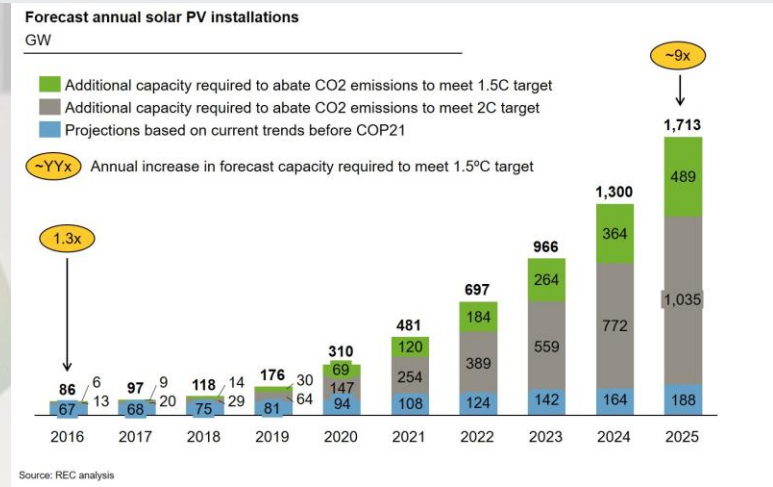
1,400 t CO_2

64,000 trees

~300 cars

REC Salutes COP21 Agreement

- As one of the very first ones, REC highlighted in its Climate Change study right after the Paris Agreement, how solar can be a key pillar in mitigating emissions and supporting in abating climate change.
- To be on track by 2025 to close the emissions gap of the 1.5° C target, the potential solar capacity ramp-up has to be up to 4,800 GW larger than industry analysts have been forecasting before the Paris Agreement.



Reference cases

Real life, real satisfaction

IKEA, Germany	Phenix Power Plant	Redtag (BMA International)
582 kW	24 MW	537 kW
2,476 REC solar panels	100,000 REC solar panels	2,016 REC solar panels
Regensburg & Freiburg, Germany	Canino, Italy	Dubai, UAE

Real life, real satisfaction

Evans family home	Singapore National Stadium	Tomakomai Rinku Kashiwabara Plant
13.4 kW	707 kW	1.7 MW
61 REC solar panels	2,719 REC solar panels	6,528 REC solar panels
Monterey, CA, USA	Singapore	Tomakomai City, Japan

Real life, real satisfaction

Caeremlyn Farm Whitland Plant	Audi Production Plant	BMD Solar Power Plant
18 MW	2.3 MW	5.8 MW
69,252 REC solar panels	9,288 REC solar panels	23,200 REC solar panels
Whitland, UK	Brussels, Belgium	Bikaner, India

Real life, real satisfaction

Sauter family home	Rockville Solar II Project	Nakhon Pathom & Suphan Buri Plants
9.8 kW	3.2 MW	72 MW
42 REC solar panels	12,264 REC solar panels	292,608 REC solar panels
Wain im Allgäu, Germany	Indianapolis, IN, USA	Nakhon Pathom, Thailand

Real life, real satisfaction

NEXTDC Data Centre	Gibelstadt Power Plant	Heineken Wieckse Brewery
402 kW	28 MW	921 kW
1,575 REC solar panels	120,000 REC solar panels	3,683 REC solar panels
Port Melbourne, Australia	Gibelstadt, Germany	Den Bosch, Netherlands

Real life, real satisfaction

Dubai International Airport	Kenns Farm	Rio Tinto Stadium
635 kW	100 kW	2 MW
2,592 REC solar panels	400 REC solar panels	6,414 REC solar panels
Dubai, UAE	East Anglia, UK	Sandy, UT, USA

REC

SOLAR'S MOST TRUSTED