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Trina Solar

pv magazine webinars

Delivering value in the APAC region

7 July 2022

4:00 pm – 5:00 pm | AEST, Sydney
2:00 pm – 3:00 pm | CST, Beijing
1:00 pm – 2:00 pm | Hanoi
8:00 am – 9:00 am | CEST, Berlin

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Asia Pacific region - Trina Solar

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Asia Pacific region - Trina Solar

Welcome!

Do you have any questions? ❓

Send them in via the Q&A tab. 👉 We aim to answer as many as we can today!

You can also let us know of any tech problems there.

We are recording this webinar today. 📹

We‘ll let you know by email where to find it and the slide deck, so you can re-watch it at your convenience. 👀 💡

25TH ANNIVERSARY

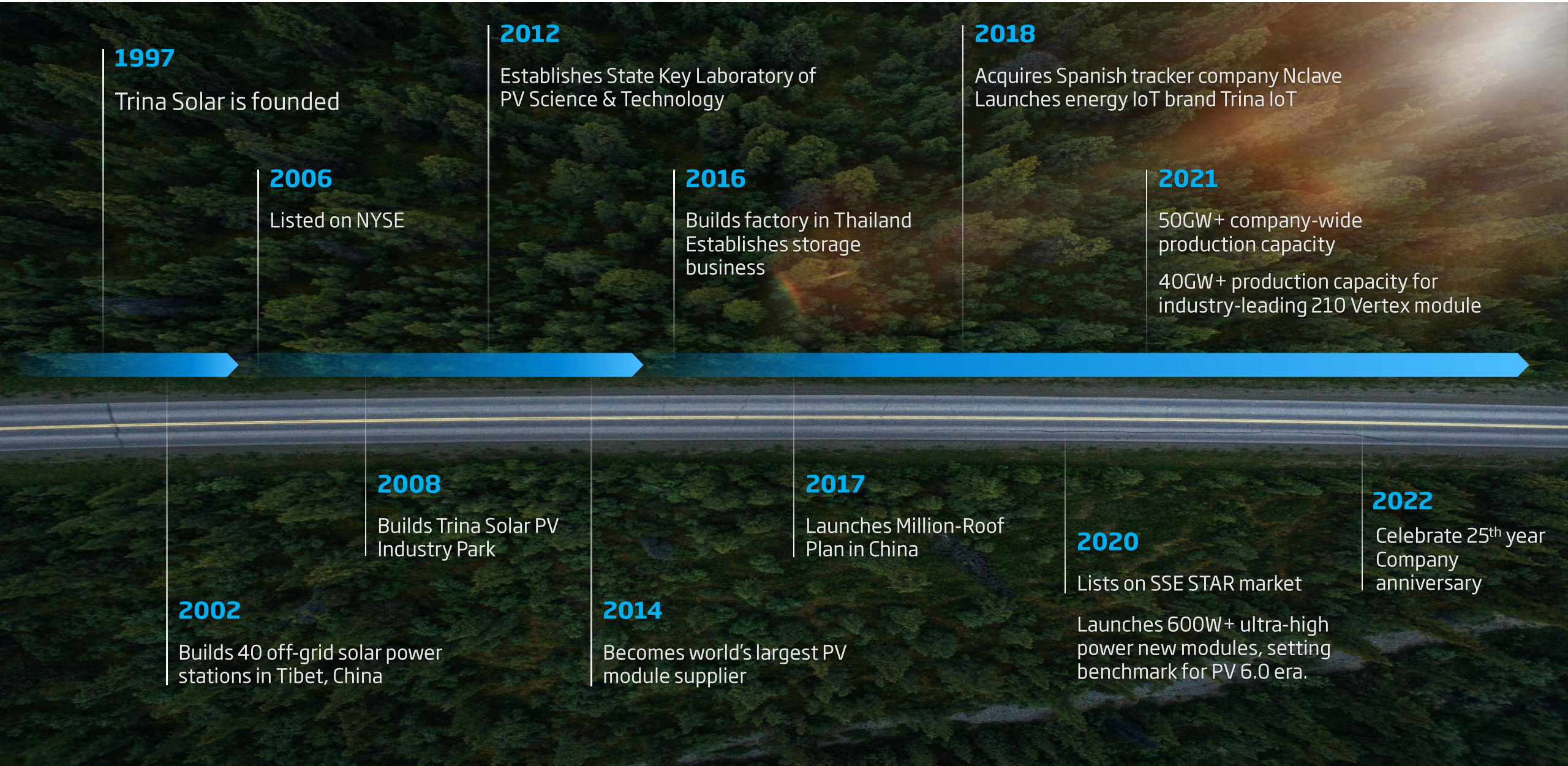
2022

Trina Solar

July

Power beyond solar

Milestones



1997

Trina Solar is founded

2002

Builds 40 off-grid solar power stations in Tibet, China

2006

Listed on NYSE

2008

Builds Trina Solar PV Industry Park

2012

Establishes State Key Laboratory of PV Science & Technology

2014

Becomes world's largest PV module supplier

2016

Builds factory in Thailand
Establishes storage business

2017

Launches Million-Roof Plan in China

2018

Acquires Spanish tracker company Nclave
Launches energy IoT brand Trina IoT

2020

Lists on SSE STAR market

Launches 600W+ ultra-high power new modules, setting benchmark for PV 6.0 era.

2021

50GW+ company-wide production capacity

40GW+ production capacity for industry-leading 210 Vertex module

2022

Celebrate 25th year Company anniversary

Globalization

100GW+
Shipments

5.5GW+
Grid-connected

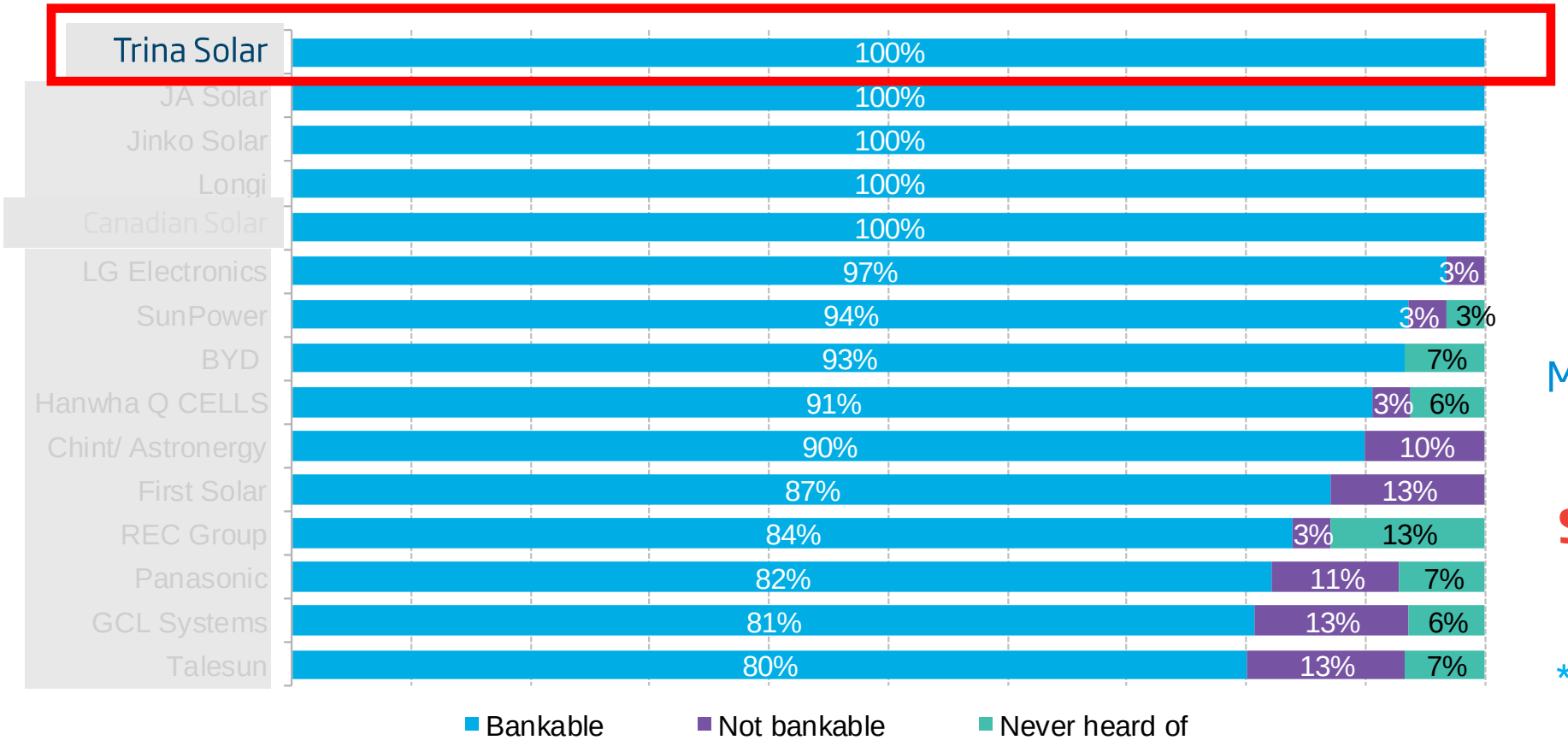
100+
Worldwide Customers

17,000+
Employees

As of March 31 2022

Reliable Brand

BloombergNEF's PV module bankability results



Source: BloombergNEF Oct 2021

"Top Bankable Module Supplier" 2016 -- 2021

Six times in a row

* BNEF 2Q 2022 - Tier 1 list

Fast Growing in APAC

2017 to **2021**

Trina Solar have achieved

~13 GW+ module shipment

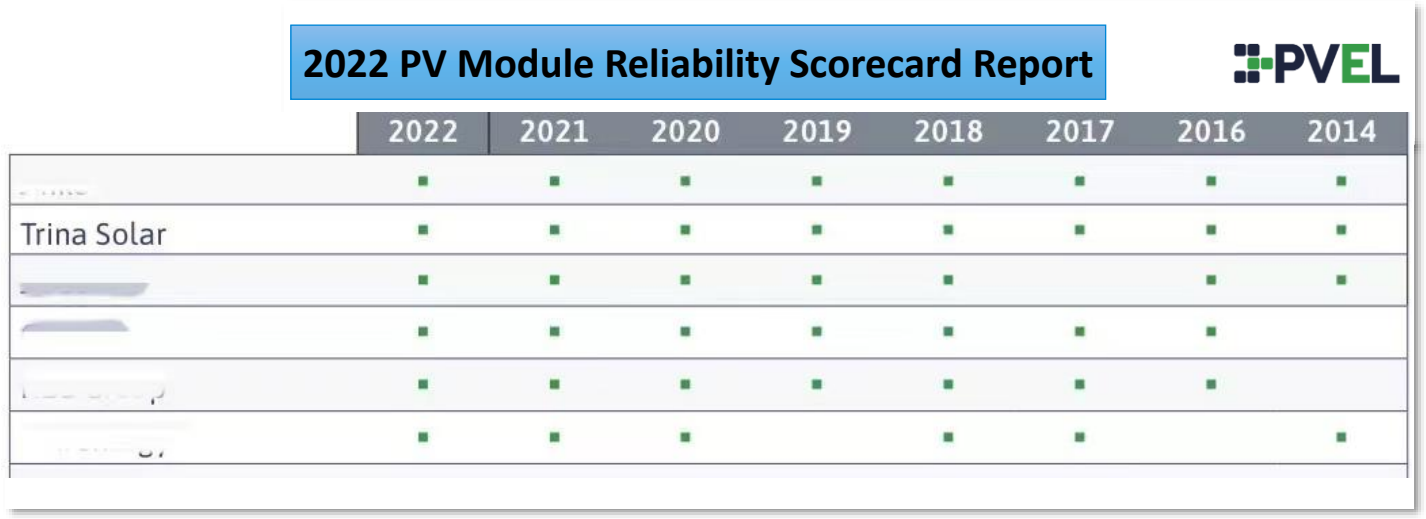
One of the Top 3

in APAC

PVEL Score card

With this 8th consecutive win, Trina Solar is now the Company with the most PVEL Top Performer Wins.

TOP PERFORMER 2022 PVEL PV MODULE RELIABILITY SCORECARD



2022 PV Module Reliability Scorecard Report

PVEL

	2022	2021	2020	2019	2018	2017	2016	2014
[redacted]	■	■	■	■	■	■	■	■
Trina Solar	■	■	■	■	■	■	■	■
[redacted]	■	■	■	■	■		■	■
[redacted]	■	■	■	■	■	■	■	
[redacted]	■	■	■	■	■	■	■	
[redacted]	■	■	■		■	■		■

-The annual PV module reliability scorecard report released by PVEL, an international authoritative certification body, provides the most comprehensive public comparison of PV module reliability test results.

New Leading Technology

210 Vertex UHP modules

- 210mm silicon wafer
- Multi-busbar (MBB)
- Innovative arrangement and nondestructive cutting mode
- High-density packing

N-type i-TOPCon large-scale mass production

N-type i-TOPCon cell mass production
average efficiency up to 25%

Applied in China's first batch of
Technology Leader Bases

New world record for
Frontside efficiency 25.5%

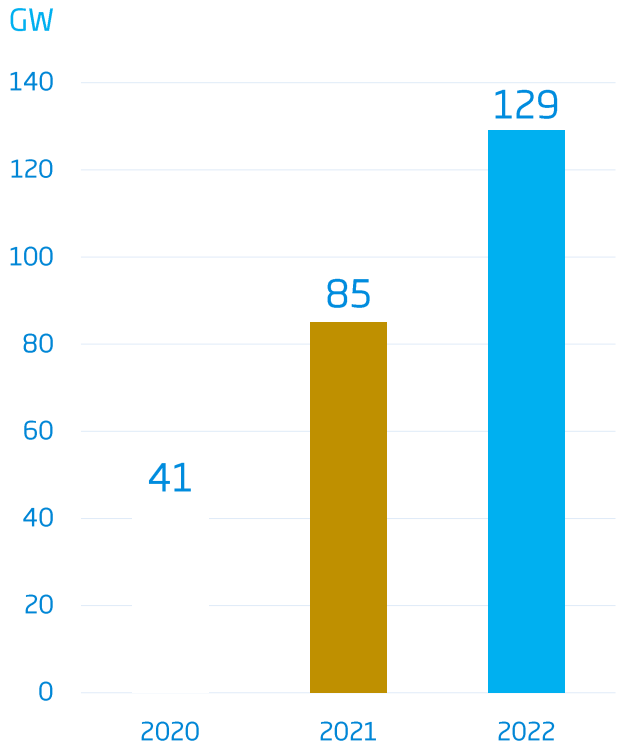
Advanced HJT technology reserves

Actual efficiency of HJT cells in mass production
24.6% or above

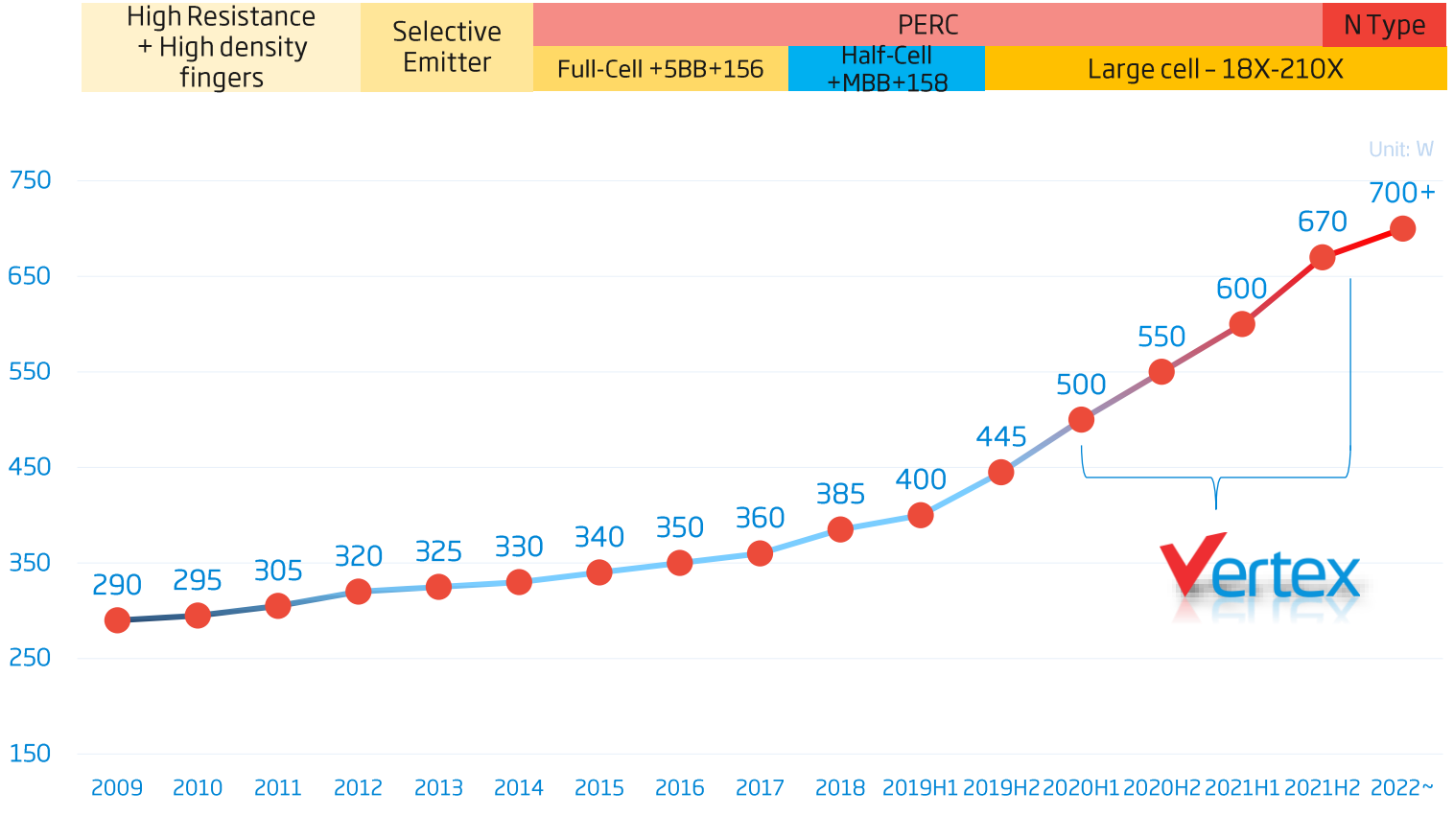
Working on
863 national projects

TüV certification of HJT products
awarded in first half of 2021

MODULE POWER TREND
LEADING THE ERA OF PV 6.0 into 7.0



Global High power module capacity estimate

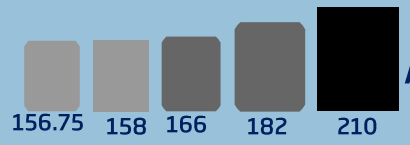


Solar module power trend

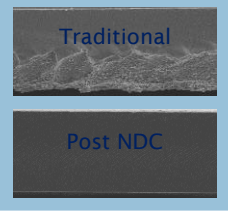
Characteristics of Vertex Modules

Trinasolar

210mm Wafer — Advanced Wafer Size

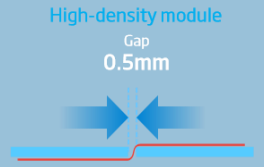


Non-destructive Cutting — Reducing the power loss and the micro-crack, increasing the mechanical strength



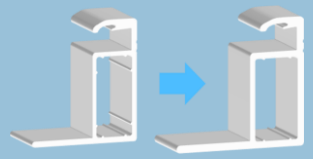
Low Open Circuit Voltage — Lower open circuit voltage increases the string power by **34%**

High-density Interconnect — Narrowing the interval between cells, which increases the module efficiency by **0.2~0.3%**



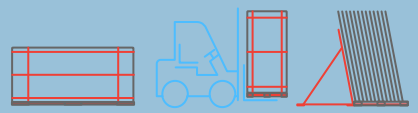
Vertex

Reinforced Structure — Reliable mechanical load performance



MBB (Multi-Busbar) — Increasing the optical efficiency and the current generation capacity，which increases the power output by **2~3%**

Integrated Delivery Solution — Including packing, logistics, transferring, unpacking, etc.

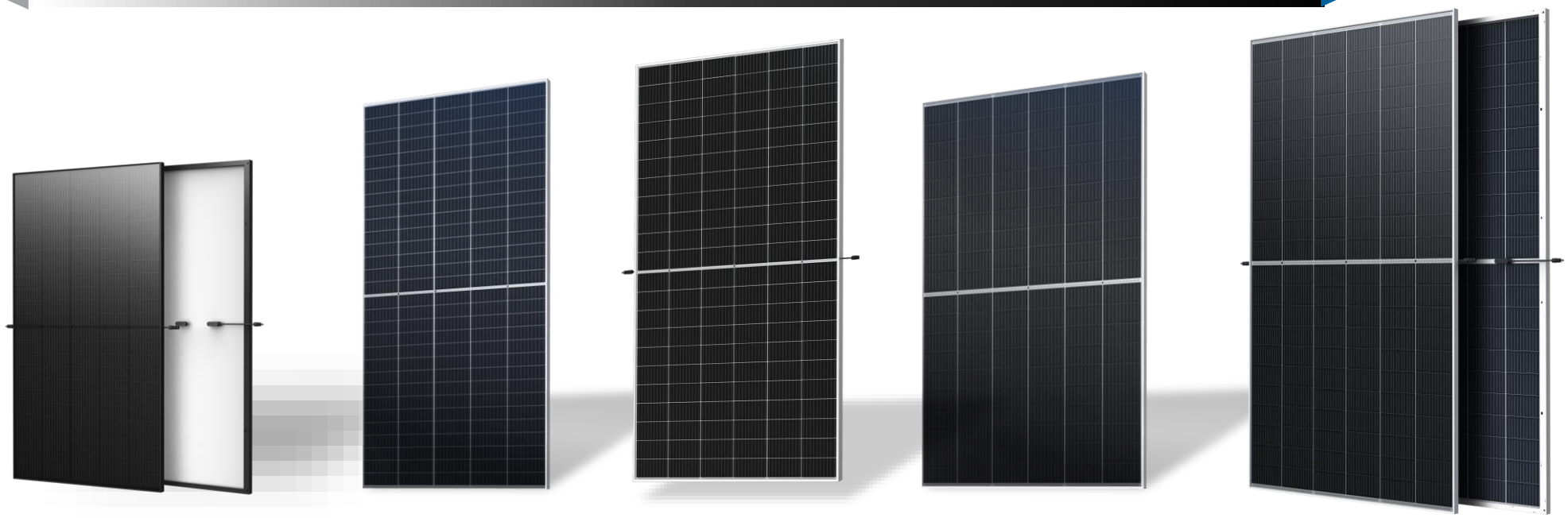


Quick Installation — Innovative design of the structure can simplify the installation process and shorten time spent for the same installation capacity

Trina Vertex Family
Leading Technology, Exceed Expectation!

Residential, commercial & Industrial

Utility



Vertex

Vertex S — UP to 435W

18 series(1/3) — UP to 510W

19R series(1/2) — UP to 580W

20 series (1/2) — UP to 600W

21 series (1/2) — UP to 670W

Others

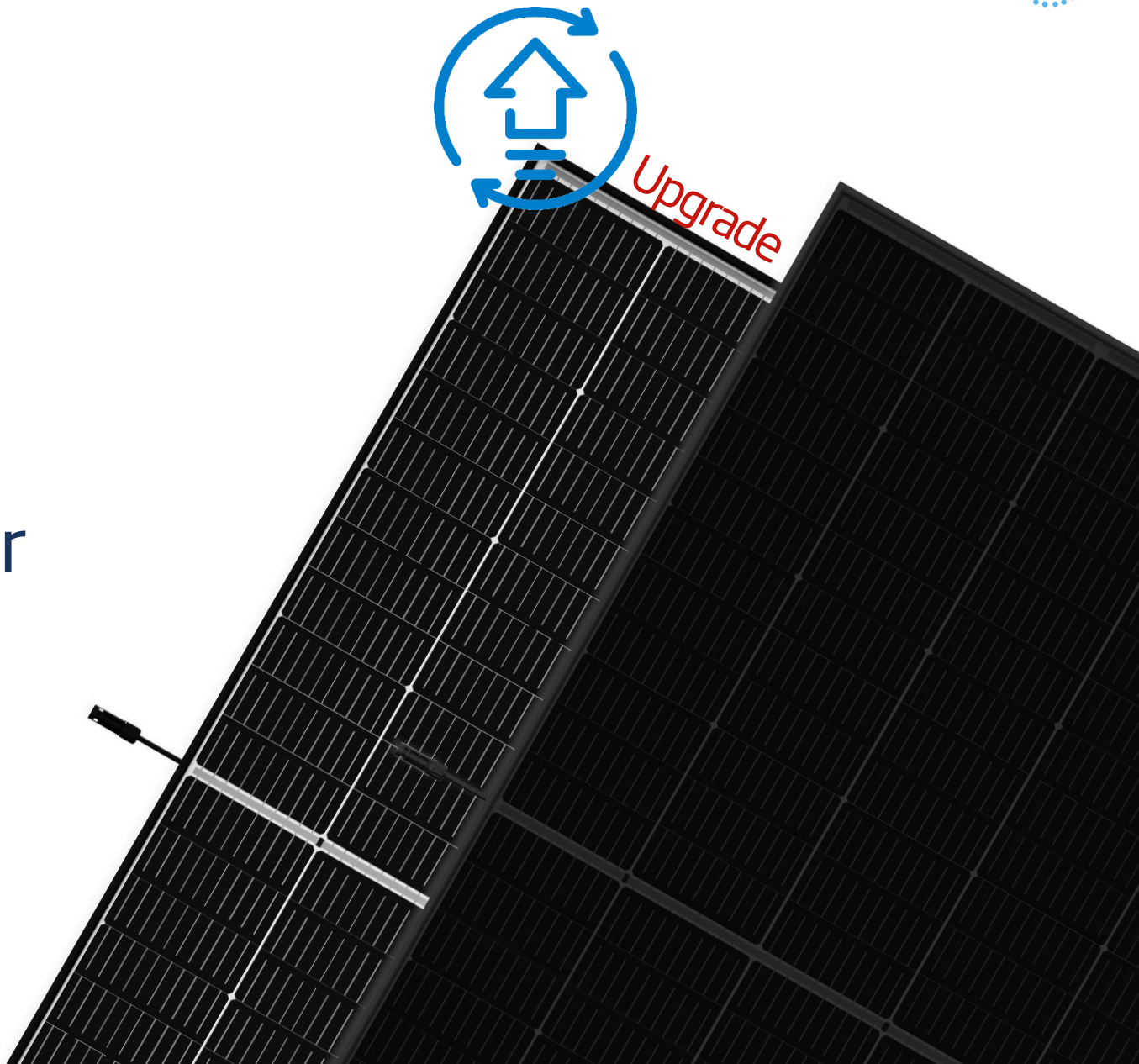
370W | 450W | 540W | 580W | 600W+

- Vertex series can be applied to various scenarios, such as residential, industrial & commercial rooftops, Agricultural complementary PV project ,fishing complementary PV project and large utility, etc.
- Compared to competitors, 210 modules have 35-90W power increase, bringing more values to customers.

Trinasolar

Vertex S

Small in size, big on power



435W Module: DE09R.08

Vertex S

Maximum Power Output

Up to **435W**

Maximum Efficiency

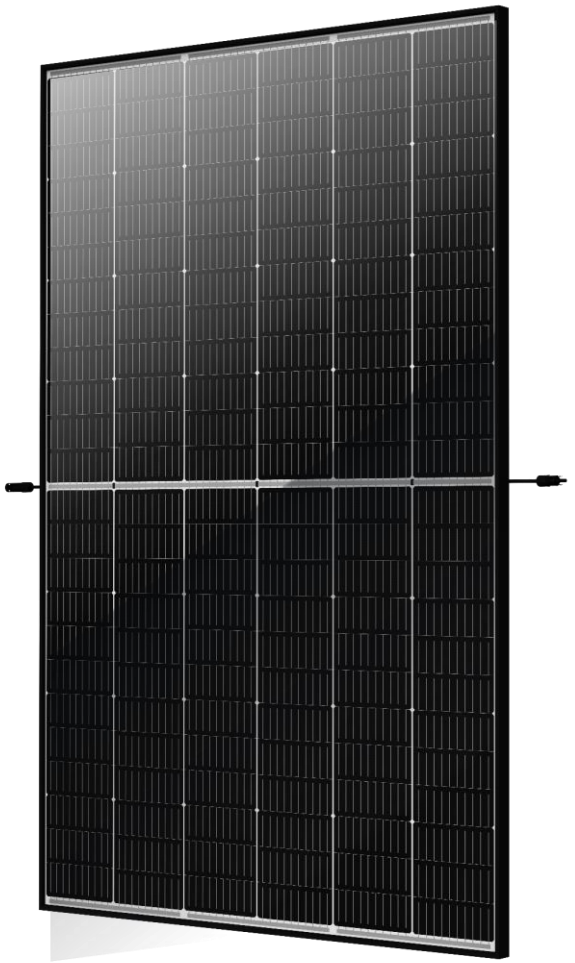
Up to **21.8%**

Electrical Parameters

- Open Circuit Voltage：50.4V
- Short Circuit Current：10.67A

Mechanical parameters

- Dimensions：1762*1134*30mm
- Weight：21.8kg



430W Module: DE09R.05/B5

Vertex S

Maximum Power Output

Up to **430W**

Maximum Efficiency

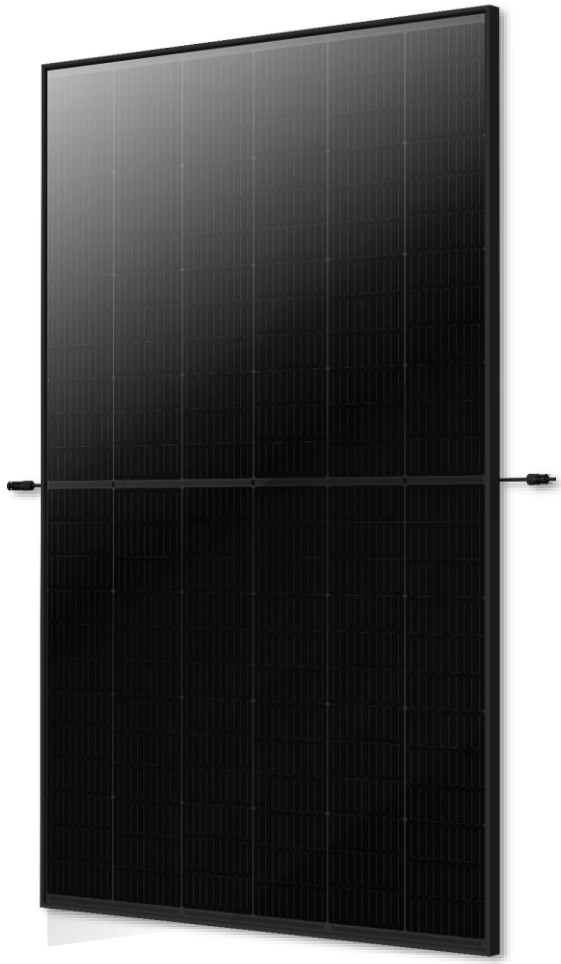
Up to **21.5%**

Electrical Parameters

- Open Circuit Voltage：50.3V
- Short Circuit Current：10.64A

Mechanical parameters

- Dimensions：1762*1134*30mm
- Weight：21.8kg

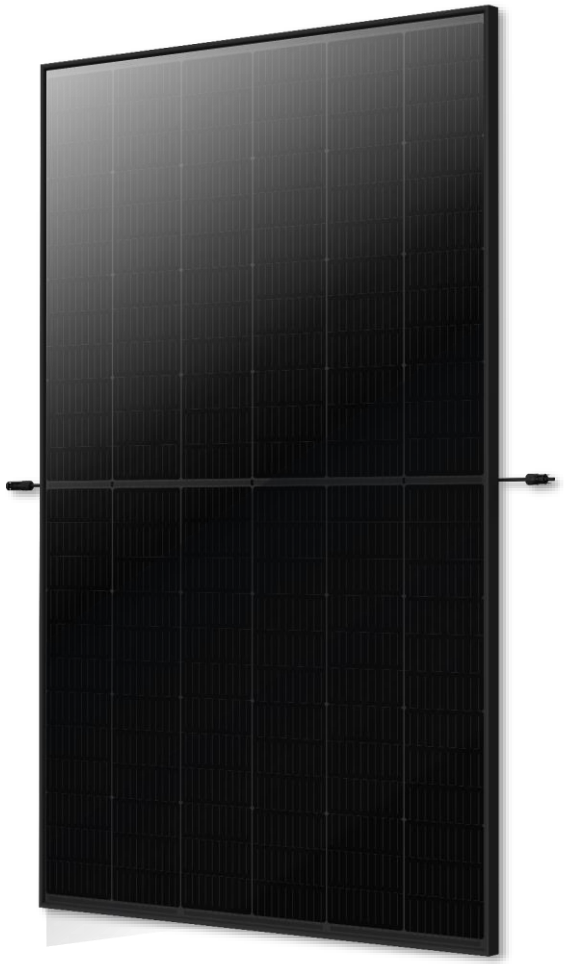


2022 Red Dot Product Design Award

Ultimate Aesthetics

reddot design award

- Excellent Roof Appearance
- Good Industry design
- Cutting edge technology



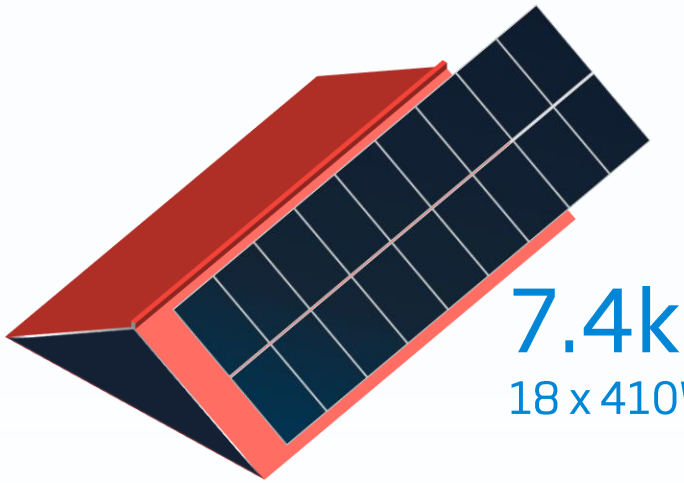
Small in size, big on power

Case study

Residential project

Comparing Vertex S
with a 410 W module

Reference 410W modules

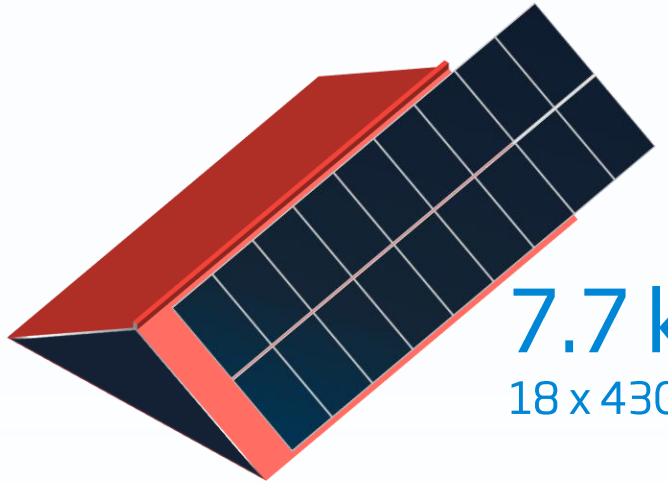


7.4kW
18 x 410W

Energy generated during 25 years

207,575 kWh -5%

Vertex S



7.7 kW
18 x 430W

Energy generated during 25 years

218,500 kWh

Upgraded Vertex S Warranty

Vertex S

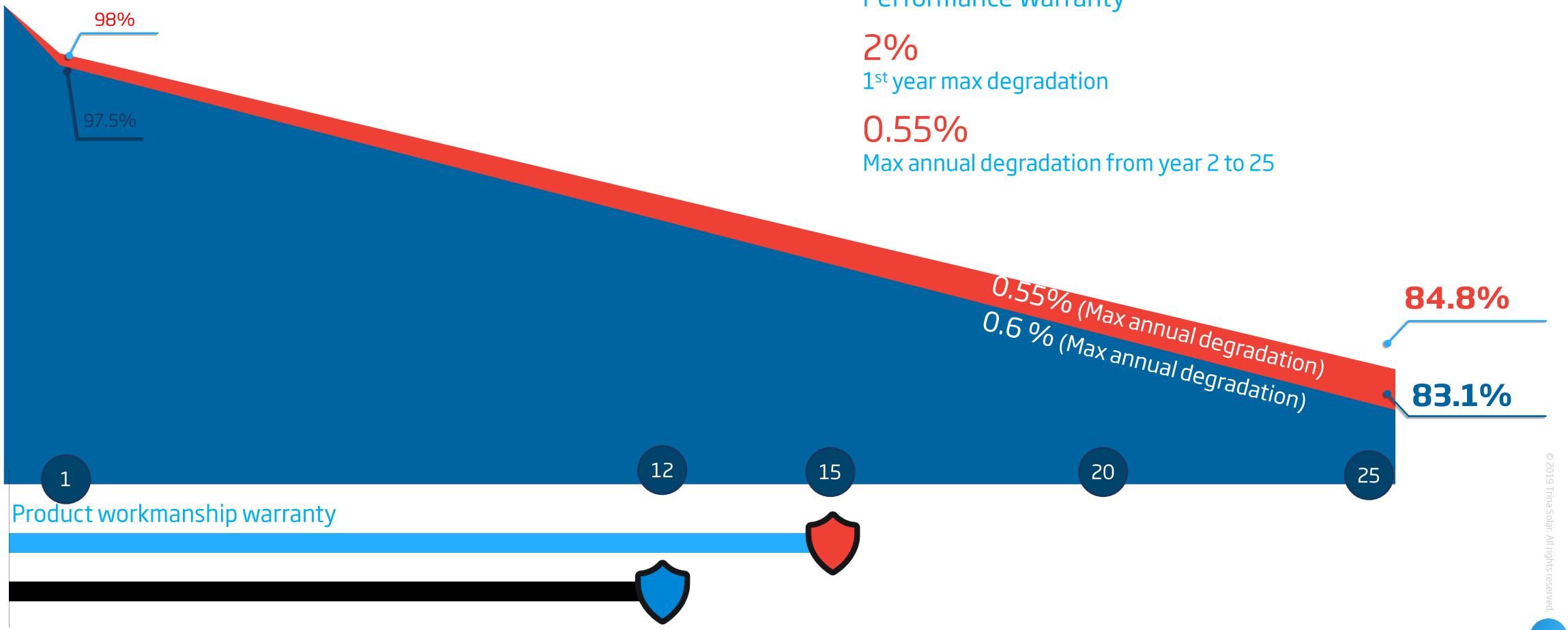
Previous products

15 Years
Product Workmanship Warranty

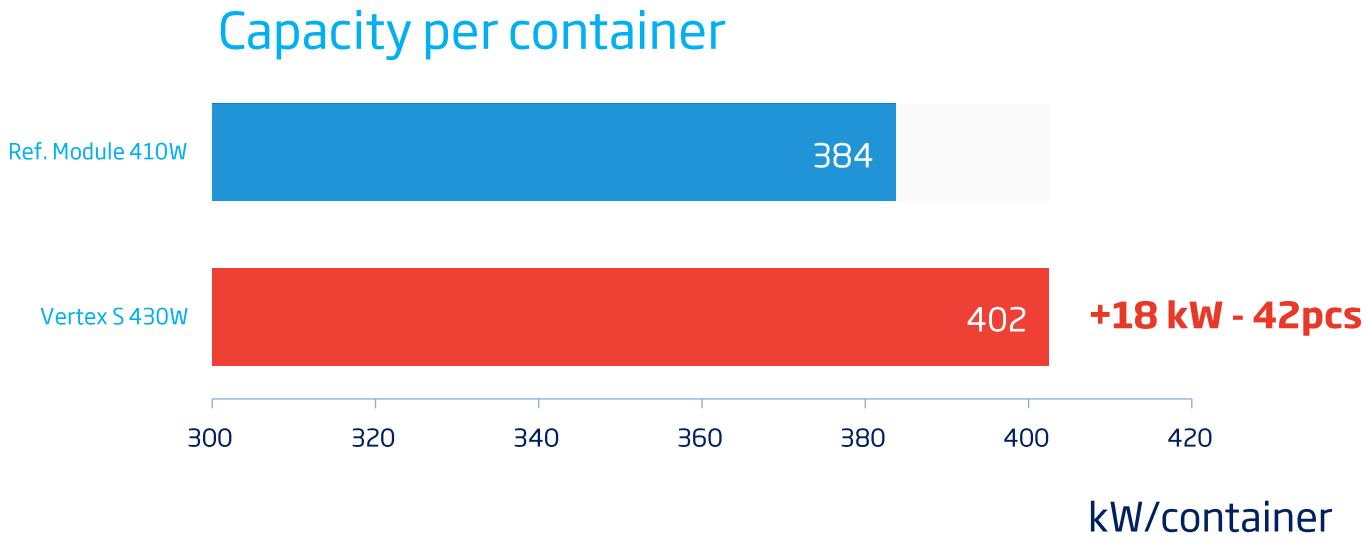
25 Years
Performance Warranty

2%
1st year max degradation

0.55%
Max annual degradation from year 2 to 25



Lower carbon footprint and costs for transportation



~4% more power / container

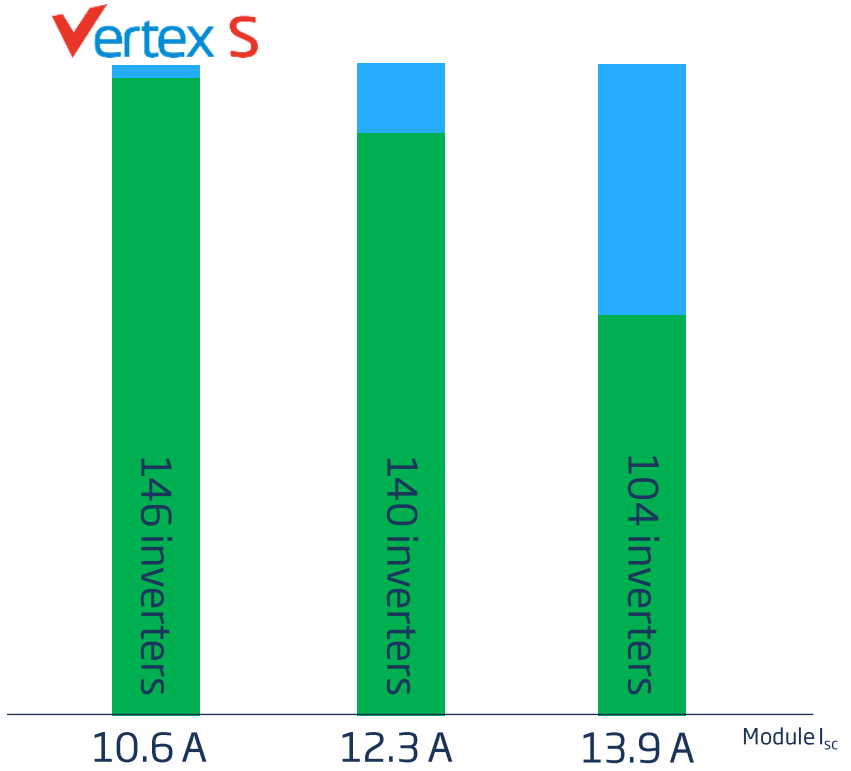
Improved inverter compatibility

Trinasolar

solaredge GROWATT GOODWE your solar engine Fronius solis SUNGROW Clean power for all HUAWEI SMA And more more

Vertex S

P_{max}	:430 W
I_{sc}	:10.6 A
V_{oc}	:50.3 V



Universal Solution for Residential and C&I Roofs

Diverse Installation Solutions. Flexible for System Deployment

Positive load tested up to

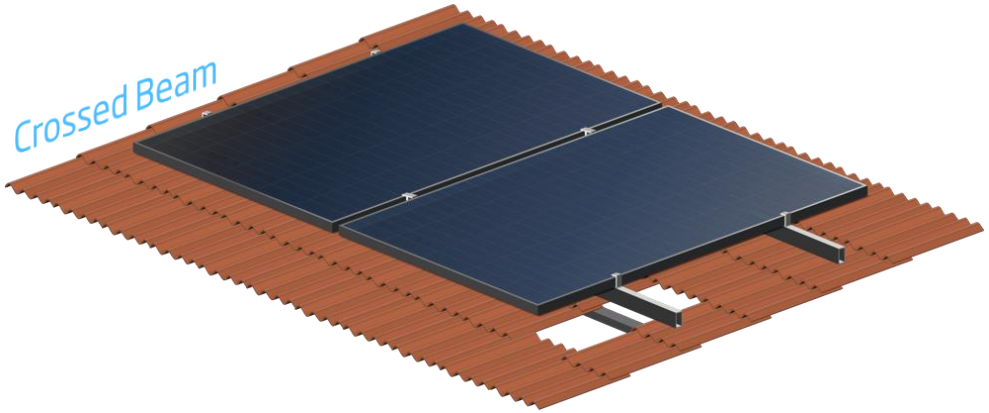
+6000 Pa

Negative load tested up to

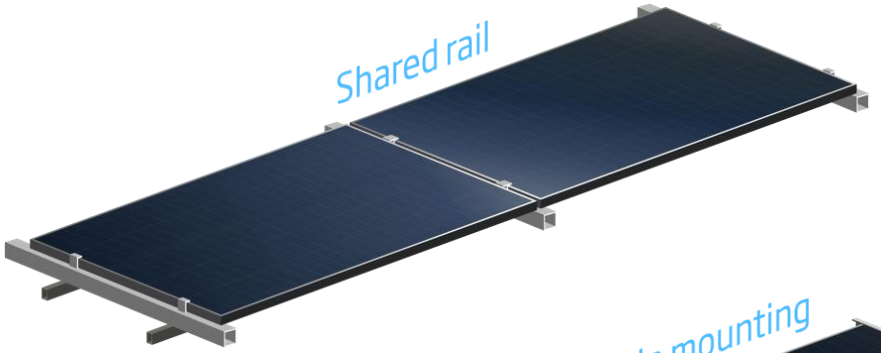
-4000 Pa

4 points short side mounting

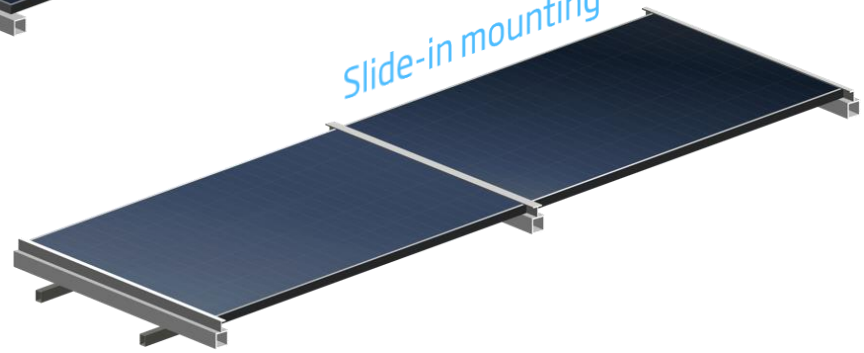
4 points long side mounting



Crossed Beam



Shared rail



Slide-in mounting

PVSYST PHOTOVOLTAIC SOFTWARE

PV PV*SOL®

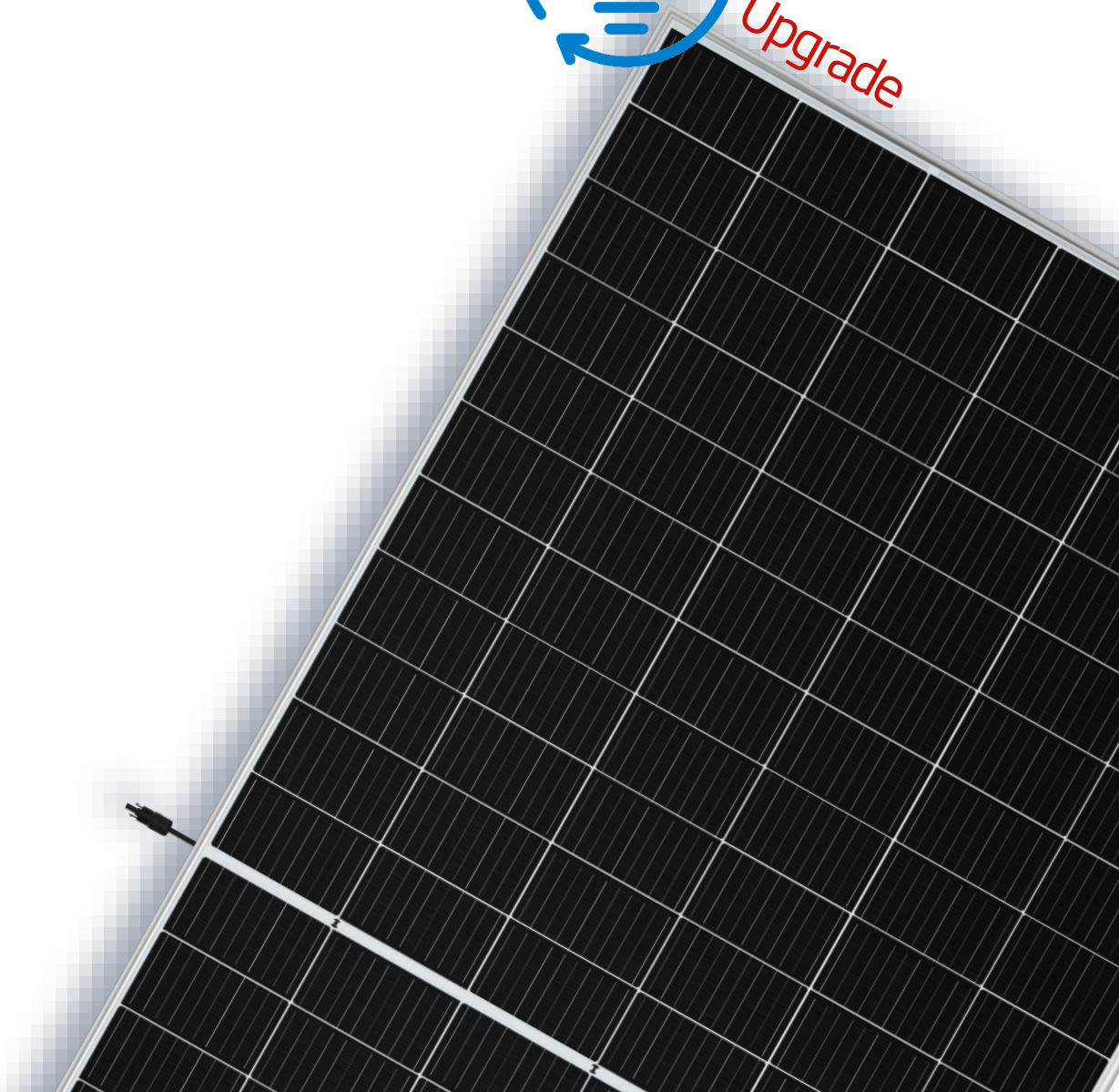
System Planning Tools ready for Vertex S

Trinasolar

Upgrade

Vertex

For C&I Project



580W Module: DE19R

Vertex

Maximum Power Output

Up to **580W**

Maximum Efficiency

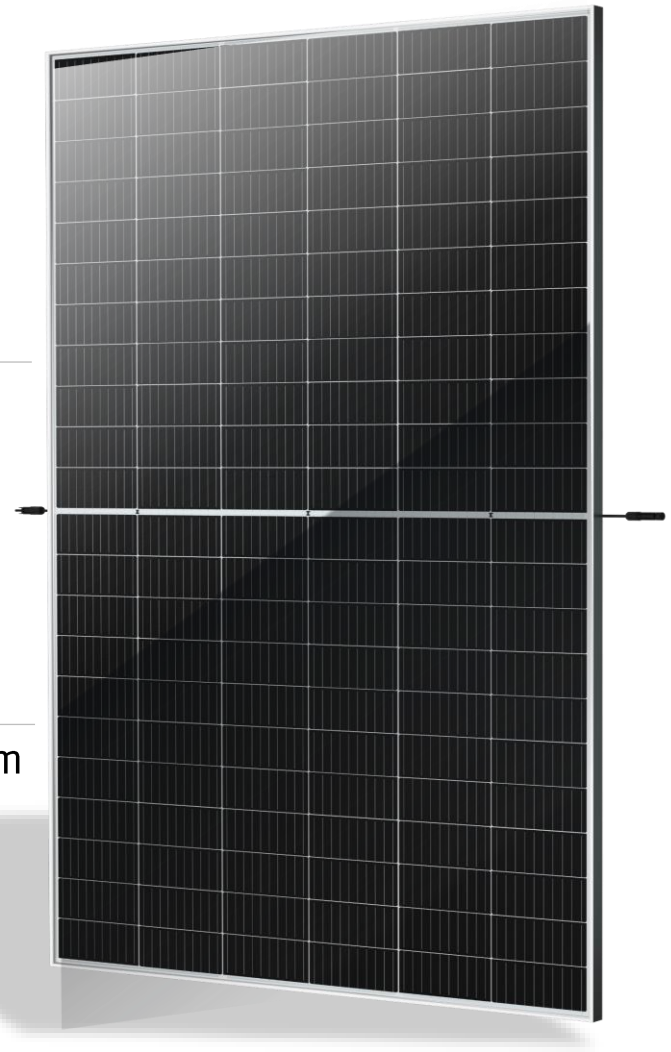
Up to **21.5%**

Electrical Parameters

- Open Circuit Voltage：46.0V
- Short Circuit Current：16.11 A

Mechanical parameters

- Dimensions：2384*1134*35mm
- Weight：29.6kg



575W Module: DEG19RC.20

Vertex

Maximum Power Output

Up to **575W**

Maximum Efficiency

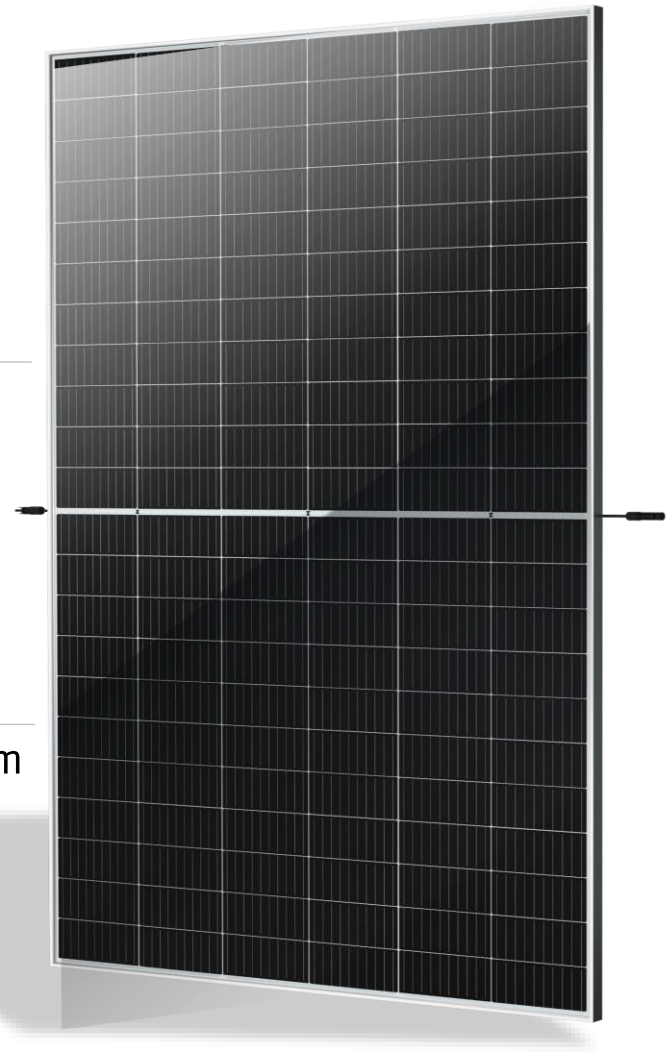
Up to **21.3%**

Electrical Parameters

- Open Circuit Voltage：46V
- Short Circuit Current：15.97 A

Mechanical parameters

- Dimensions：2384*1134*35mm
- Weight：33.4kg



Lower system cost and payback time

Case study

400 kW industrial rooftop

Comparing Vertex 580W with 545W and 450W modules

Vertex 580W can potentially save 0.001 - 0.0025 US/Wp

Optimized logistics, more kW per container

Less modules to handle and install

Lower structure cost

Less strings, shorter DC cabling

Summary of New Products

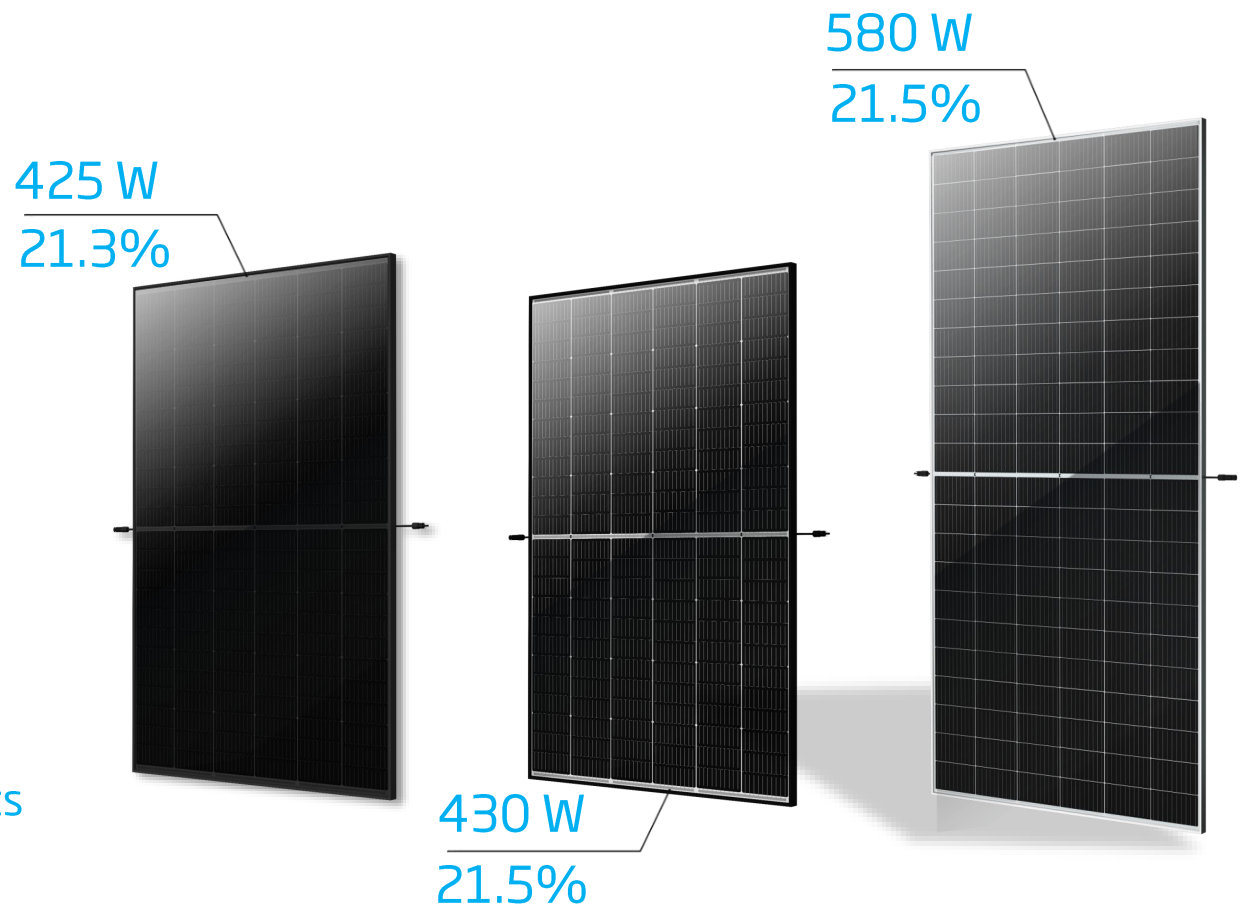
Vertex

+20-30W module power output

+5% capacity on the same roof

~-12% I_{sc} for higher inverter compatibility

5-8% lower CO_2 emissions and logistics costs



Thank you

TrinaTracker

pv magazine

Lowering Risk and LCOE

For Utility Solar Projects in

Asia Pacific

COMPANY DEVELOPMENT

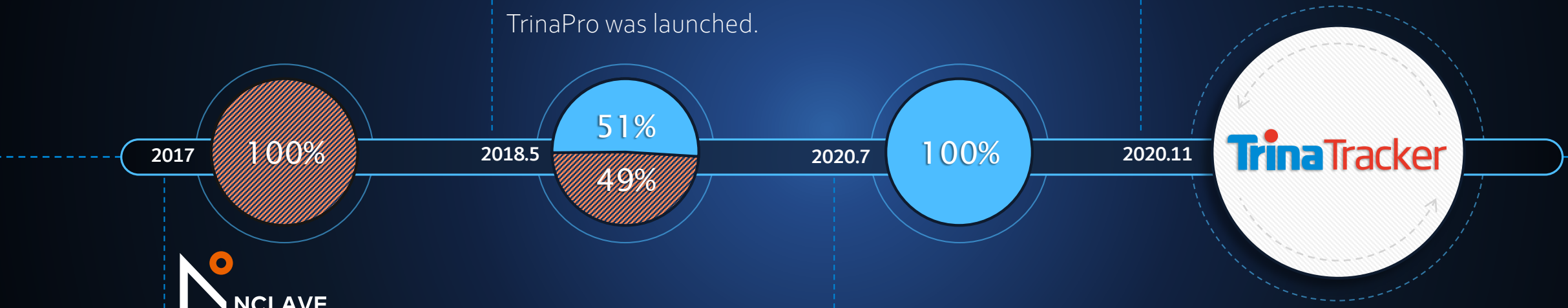
TrinaTracker

TrinaPro

Trina Solar acquired 51% of the company Nclave in May;

TrinaPro was launched.

The brand name was renewed and renamed as "TrinaTracker";



NCLAVE

Clavijo acquired MFV solar:

Established Nclave, ranking among the Top 10 in global shipments.

Trina Solar 100% acquired Nclave;

GLOBAL FOOTPRINT, EXTENSIVE TRACK RECORD

Over **12** Years

Experience

40 COUNTRIES

Across 5 continents

7GW+

GLOBAL INSTALLATIONS

Offices & Branches

Spain / France / UAE / United States / Mexico / Brazil / Chile / Australia / China

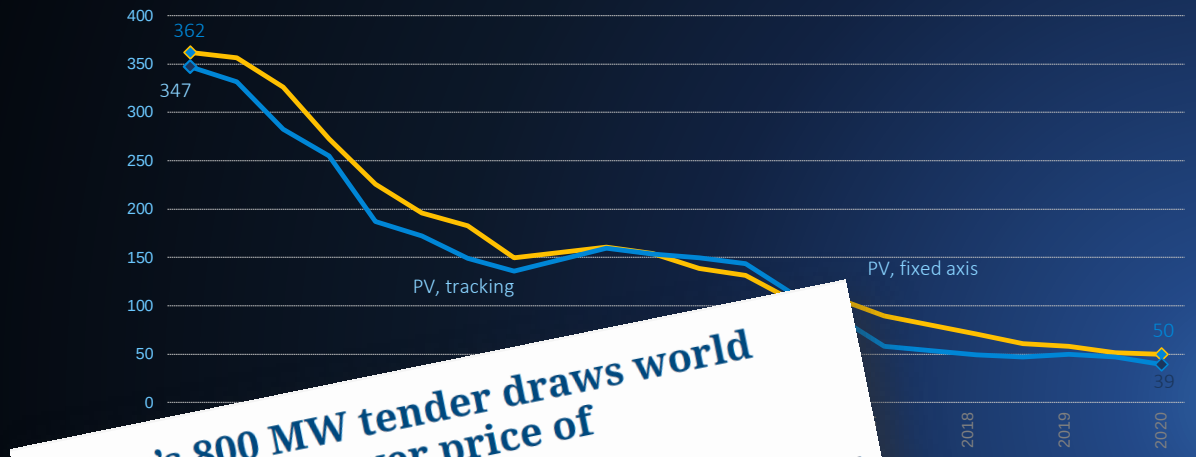
Production center

Spain / Brazil / Argentina / China / India / Australia

LCOE IS REDUCING GLOBALLY

TrinaTracker

Global average LCOE $/MWh



Qatar's 800 MW tender draws world record solar power price of $0.01567/kWh

Utility Kahramaa has revealed ... with the price then reduced b...

JANUARY 23, 2020 EMILIANO ...

...ium initially offered $0.01745/kWh ...dices.

India draws new record-low solar tariff of INR 2/kWh

A recent SECI auction secured ... 2.36/kWh record-low ... previously.

...kWh, 15% lower than the INR ...er Solarpack in a 2 GW auction

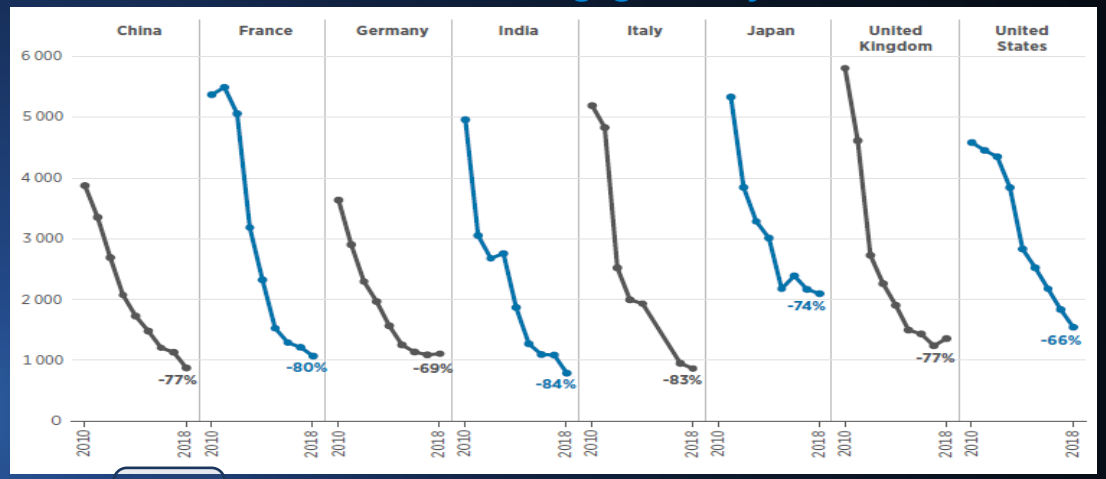
RENEW ECONOMY
Clean Energy News and Analysis

SOLAR RENEWABLES

Solar, wind and battery storage now cheapest energy options just about everywhere

Giles Parkinson 28 April 2020 0 Comments Share

LCOE reduction is trending globally



2009-Worldwide LCOE of PV project reduce from

0.32$/kWh to <<0.04$/kWh

Bifacial with single-axis trackers is low-cost king for global solar – SERIS

By José Rojo Martín | Jun 05, 2020 10:38 AM BST | 0 | Share

	China (Zhongba)	USA (Yuma)	Japan (Mine)	Germany (Dornstetten)	India (Kavalanahalli)
Monofacial-Fixed	2.9 ± (0.5)	4.8 ± (0.7)	5.0 ± (0.7)	6.9 ± (1.0)	4.8 ± (0.9)
Bifacial-1T	2.4 ± (0.4)	3.9 ± (0.5)	4.3 ± (0.6)	5.6 ± (0.7)	4.1 ± (0.7)

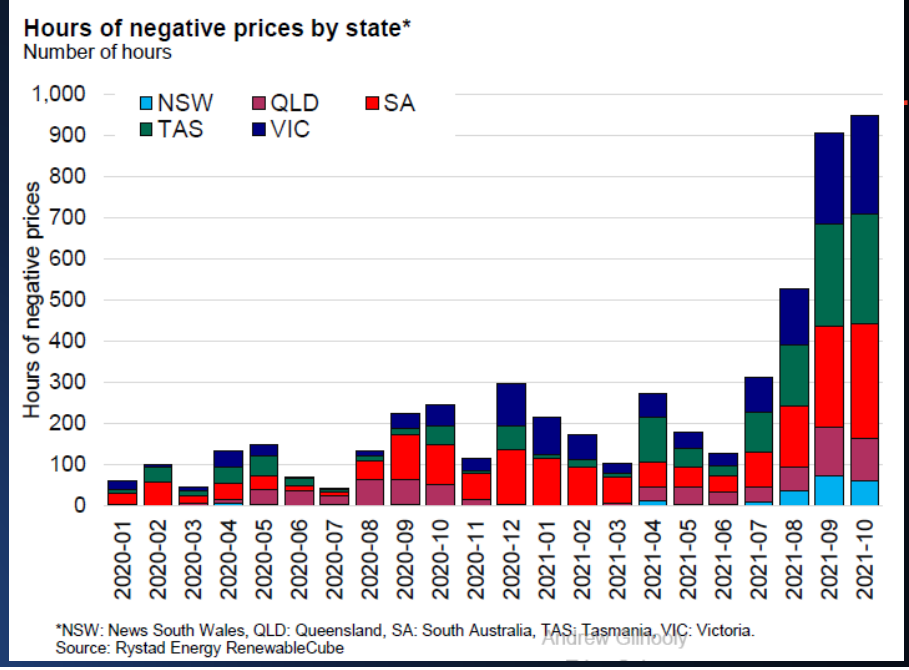
CHALLENGES IN BIG SOLAR

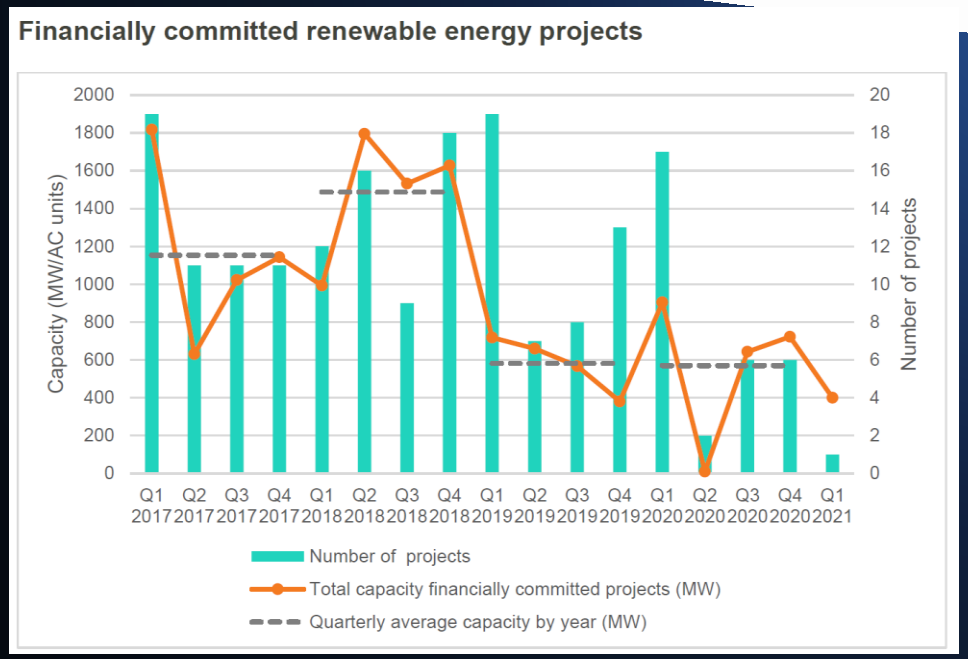
AEMO suspends new wind and solar projects as it battles to deal with market crisis

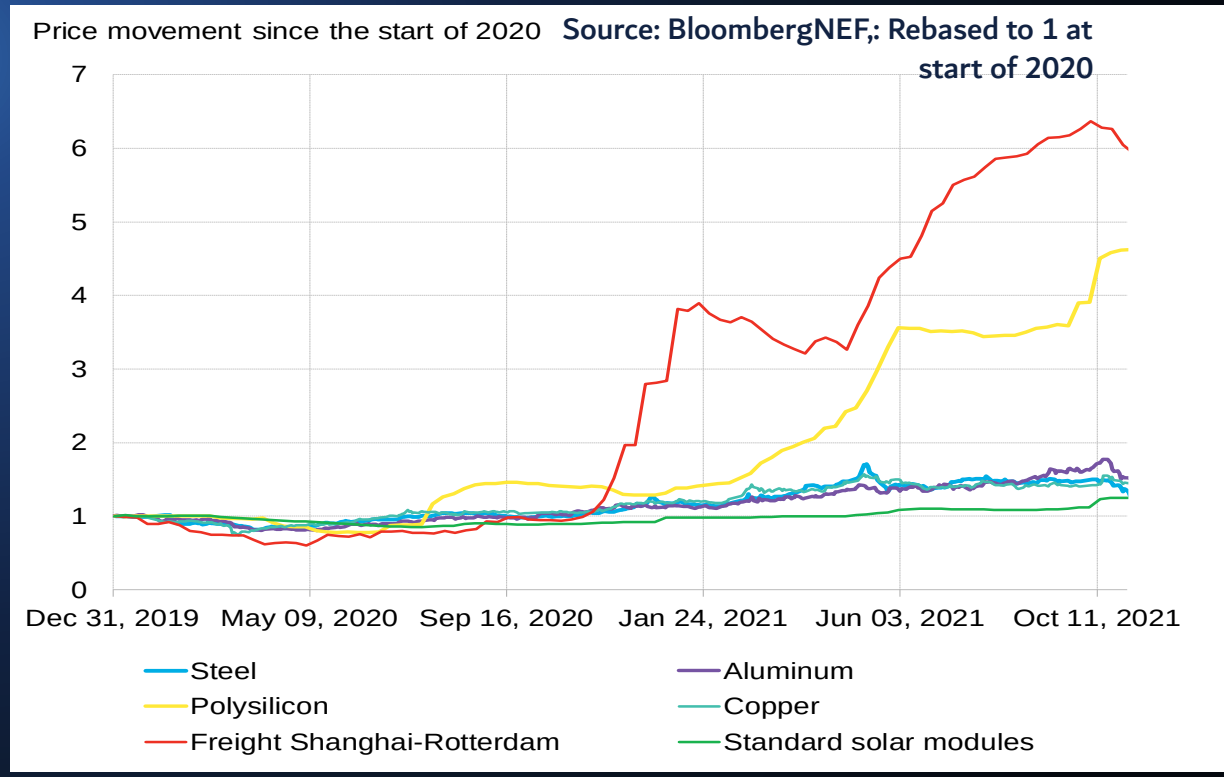
Giles Parkinson 19 June 2022 51

WoodMac: Grid congestion chokes renewables investments in Australia

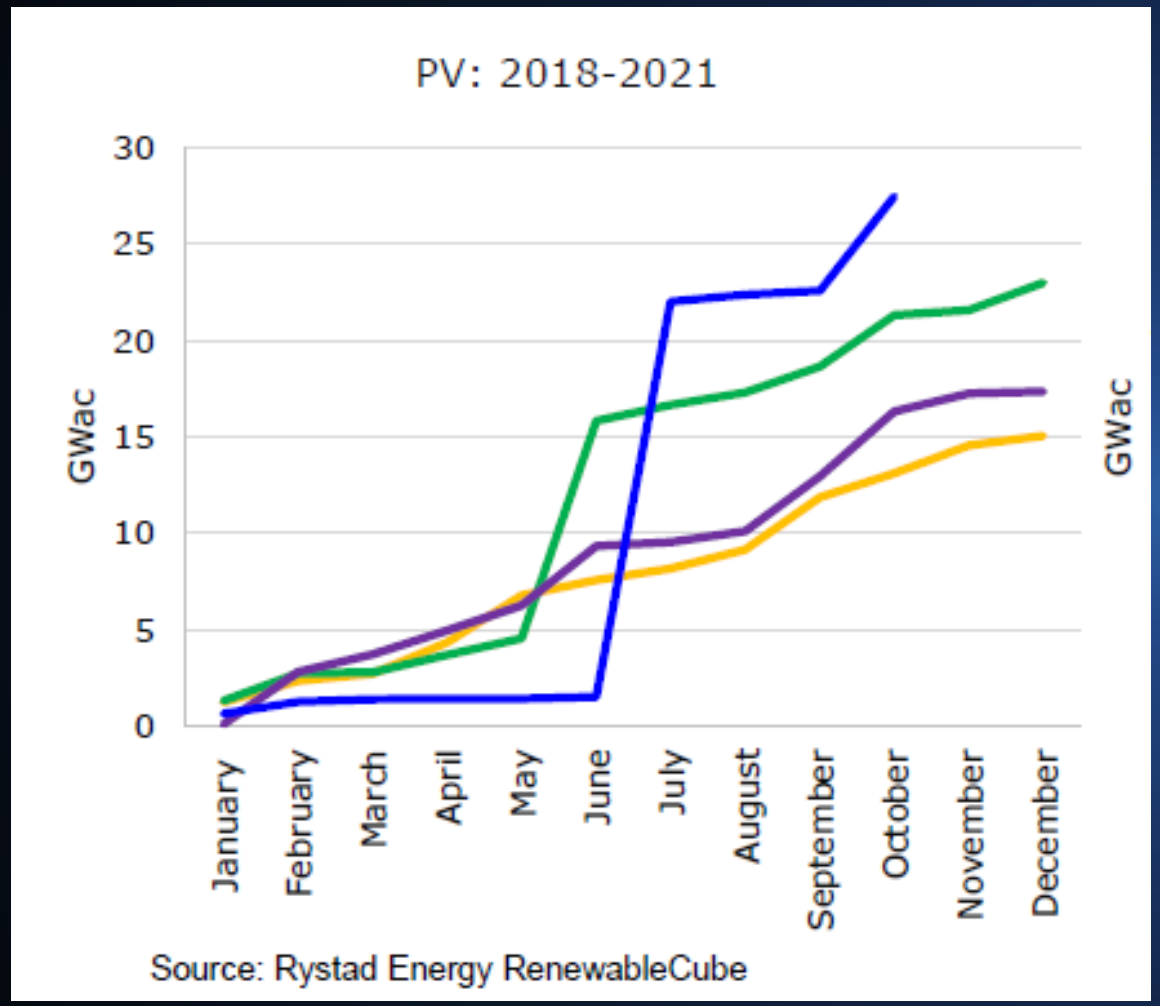
Wood Mackenzie analysts have expressed concern over deteriorating renewable energy investment conditions in Australia, noting that greater clarity on transmission investment is needed to support the sector.



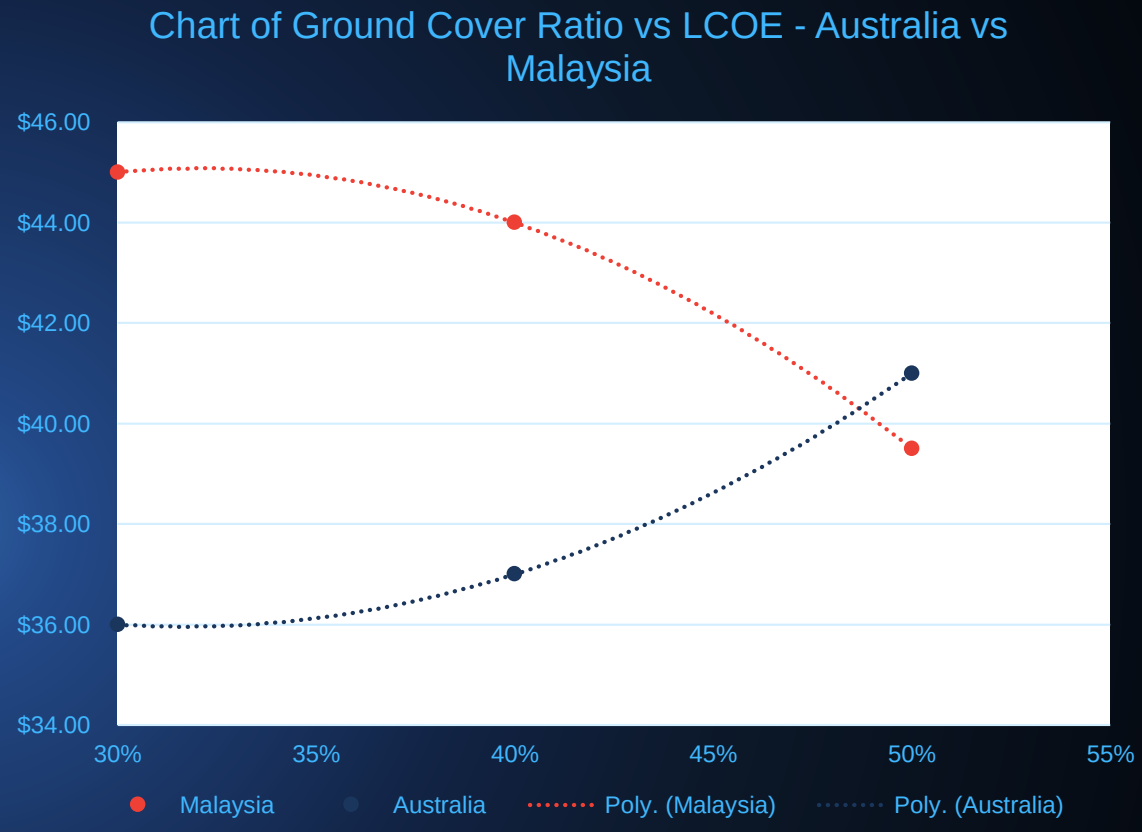




BUT AN INCREDIBLE OPPORTUNITY REMAINS



Australia Pipeline Additions 2018-2021



- To unlock this pipeline we need to continue to innovate to simplify engineering and de-risk construction
- Tracking at wide GCR lowers LCOE but uses more land so increases construction risk

TRINATRACKER

BORN FOR CHALLENGING CONDITIONS

Irregular Site Layout

Uneven Terrain & Remote Location

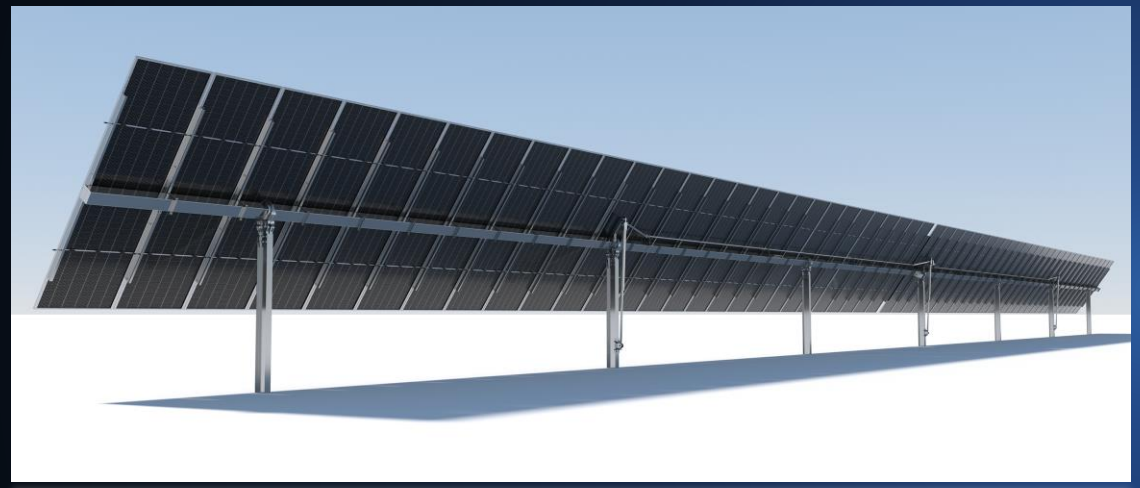
Strong Wind Region

Difficult Soil

Flood Inundation

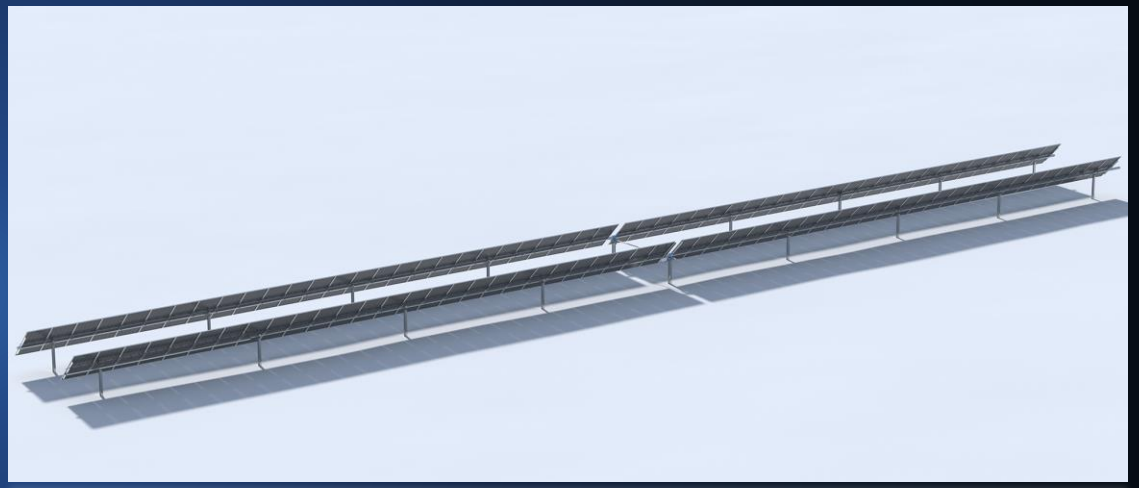
TRINATRACKER FAMILY

Vanguard™ 2P



Independent Row Tracker

Agile™ 1P

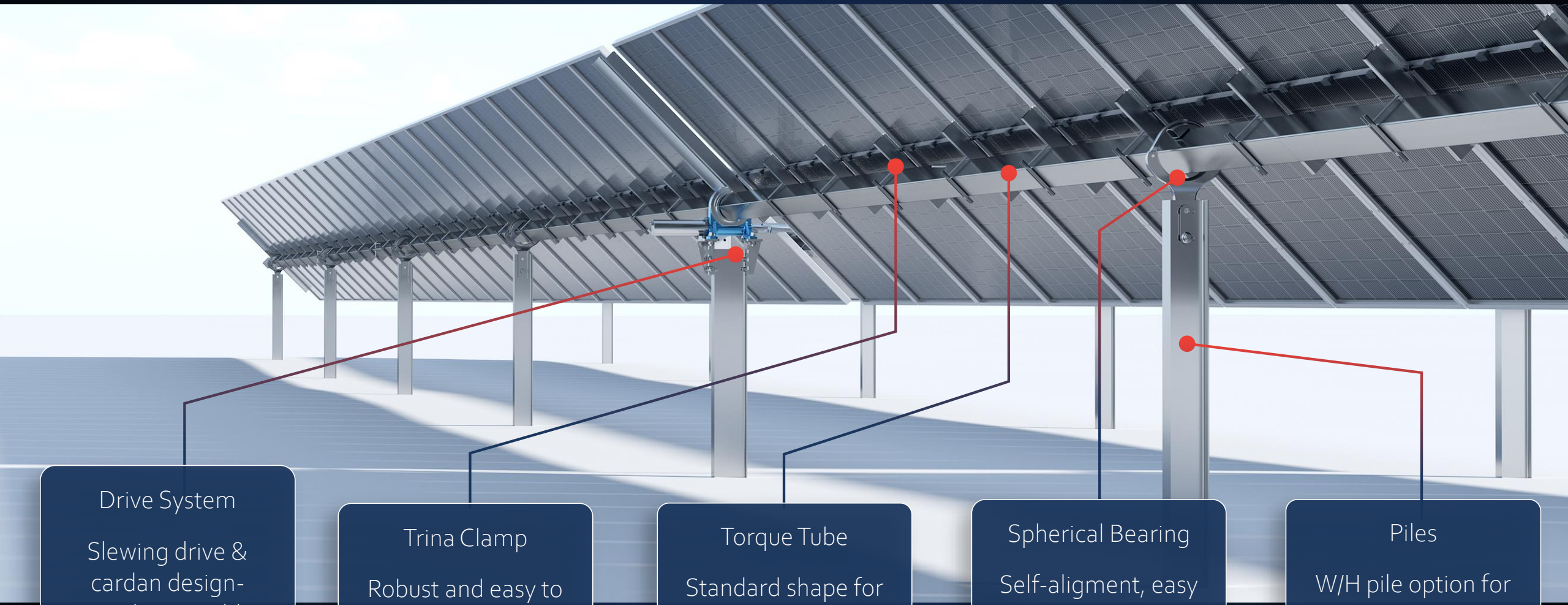


Dual Row Tracker

Agile™ 1P

Approved for region C Cyclonic Zone in AU

TrinaTracker



Drive System

Slewing drive & cardan design- simple assembly process

>30% Motor/Drive reduction

Trina Clamp

Robust and easy to assemble

Reduce PV Fixation man hours by >50%

Torque Tube

Standard shape for supply chain efficiency

Spherical Bearing

Self-aligment, easy to assemble

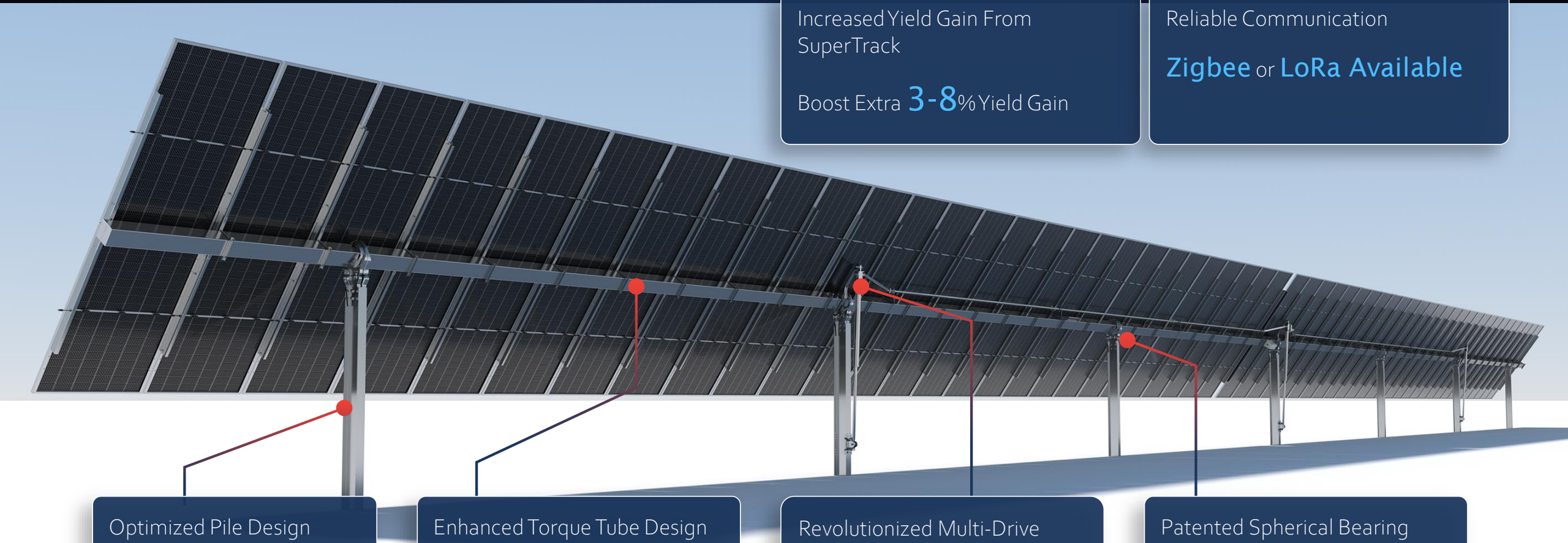
20% NS / 10% EW

Piles

W/H pile option for difficult ground conditions

Vanguard™ 2P

TrinaTracker



Increased Yield Gain From SuperTrack

Boost Extra 3-8% Yield Gain

Reliable Communication

Zigbee or LoRa Available

Optimized Pile Design

Only 7 Piles Per Tracker, as low as 100 piles/MWp

Enhanced Torque Tube Design

170mm Robust Tube for 2P Operation

Revolutionized Multi-Drive System with offset actuator for **enhanced torque resistance**

Full aeroelastic wind tunnel test delivers higher Critical Wind Speed and guards against dynamic issues

Patented Spherical Bearing Design

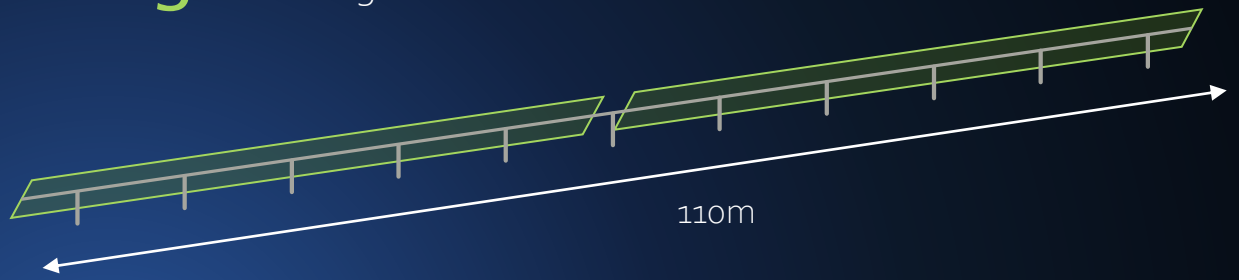
Angle Adjustability Up To 30%

SHORTER LENGTH, MORE LAND UTILISATION

TrinaTracker

Shorter - Agile dual row 1P

Longer - Single row 1P



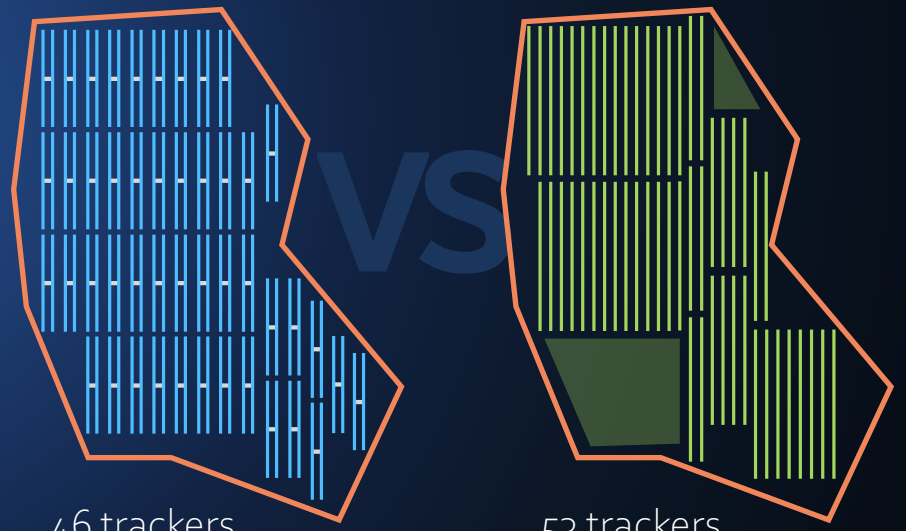
Per MW

12.6 trackers

>60kWp

Per Tracker

-33% Trackers per MW	-45% Shorter. Less grading	-9% DC cable	Optimized BOS



46 trackers
3036kW
(46*60*2*550W)

53 trackers
2625.5kW
(53*90*550W)

PATENTED SPHERICAL BEARING

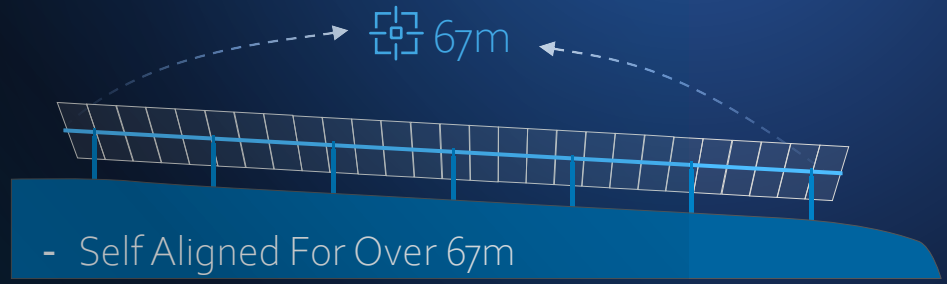
Lower Settlement Risk, Greater Slope Tolerance

TrinaTracker

- Up to 30% Angle Adjustability

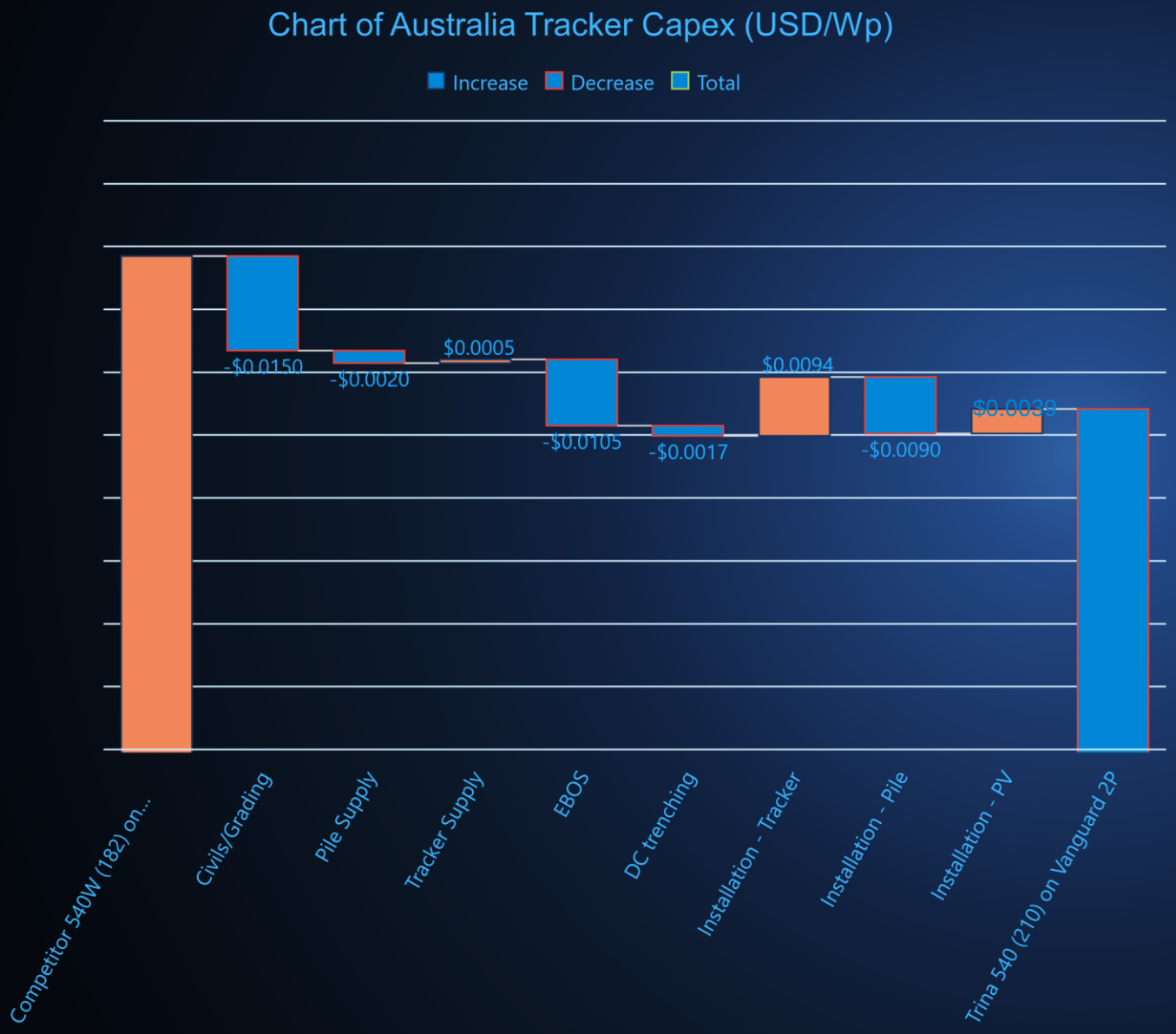
- Extra Stress Release During Tracker Deformation

- Foundation Settlement Damage Alleviation



- Self Aligned For Over 67m

IMPACT ON BOS COSTS - AUSTRALIA

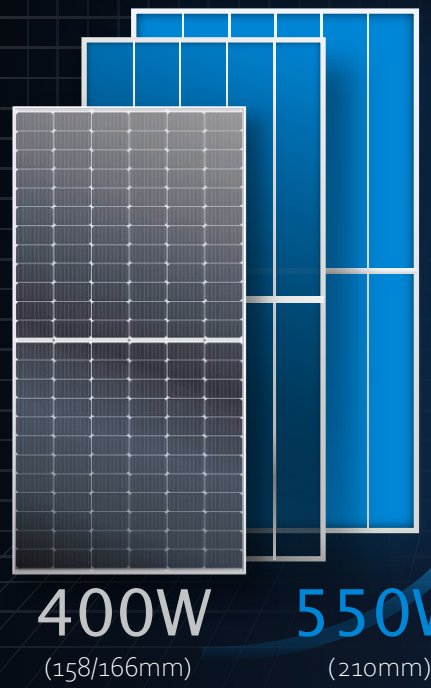


- Total capex saving ~USD 2.7c/Wp
- >3% lower Capex absolute
- Recent AU 300MWp project
  - 220,000m3 avoided cut/fill @ USD20/m3 = USD0.015/Wp saving
  - 50/50 Predrill @ $100and direct ram @ USD 50 = USD2.7M or 0.9c saving

	Competitor 540W 1P	Trina 540W 2P	Delta
Module Wattage	540	540	-
Module Voc	49.9	37.7	-24.5%
Module Area sqm	2.60	2.61	+0.3%
Power Density W/m2	208	207	-0.7%
Modules per String	28	38	+35.7%
Strings per Tracker	3	3	
Modules per Tracker	84	114	+35.7%
Motors per MW	22	16	-27.3%
kWp per tracker	47.9	62.7	+30.9%
Piles per MWp	222	110	-50.5%
Piles per Tracker	11	7	
Total Piles	29,440	14,080	-52.2%
Total Strings	8,466	6,238	-26.4%
Capex Saving USD/Wp			-$0.027

INTEGRATED DESIGN FOR LARGE FORMAT MODULE

TrinaTracker



400W (158/166mm)

550W (210mm)

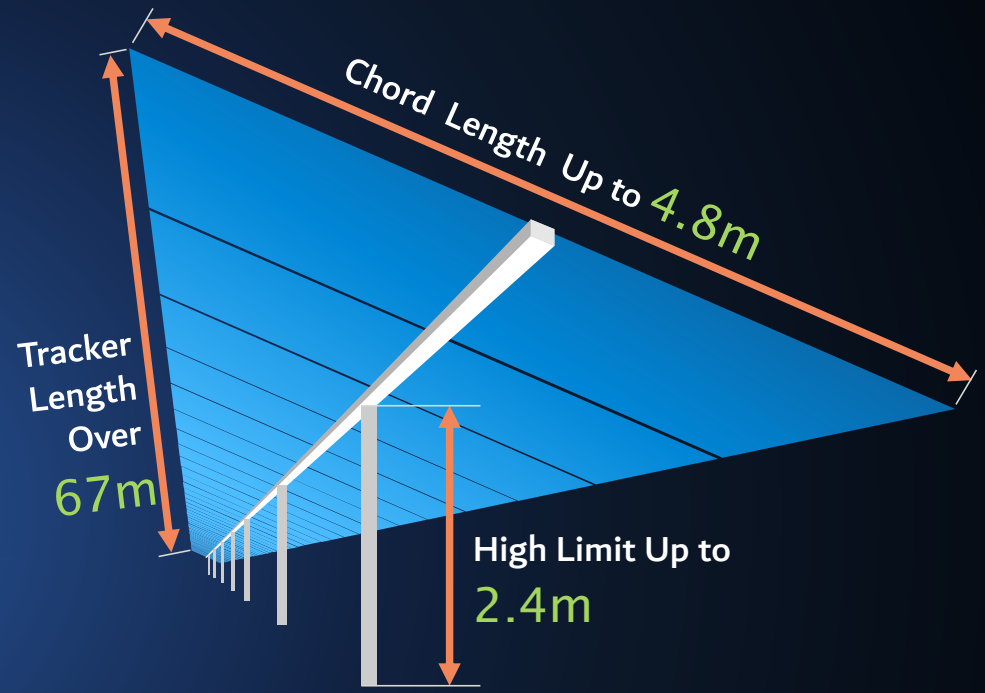
670W (210mm)

Module Size Increase → Chord Length / Torque Tube Height Increase

More Modules Per String → Tracker Length Increase

More Strings → Tracker Length Increase

Optimal 7 Piles Design → Stronger Torque Tube



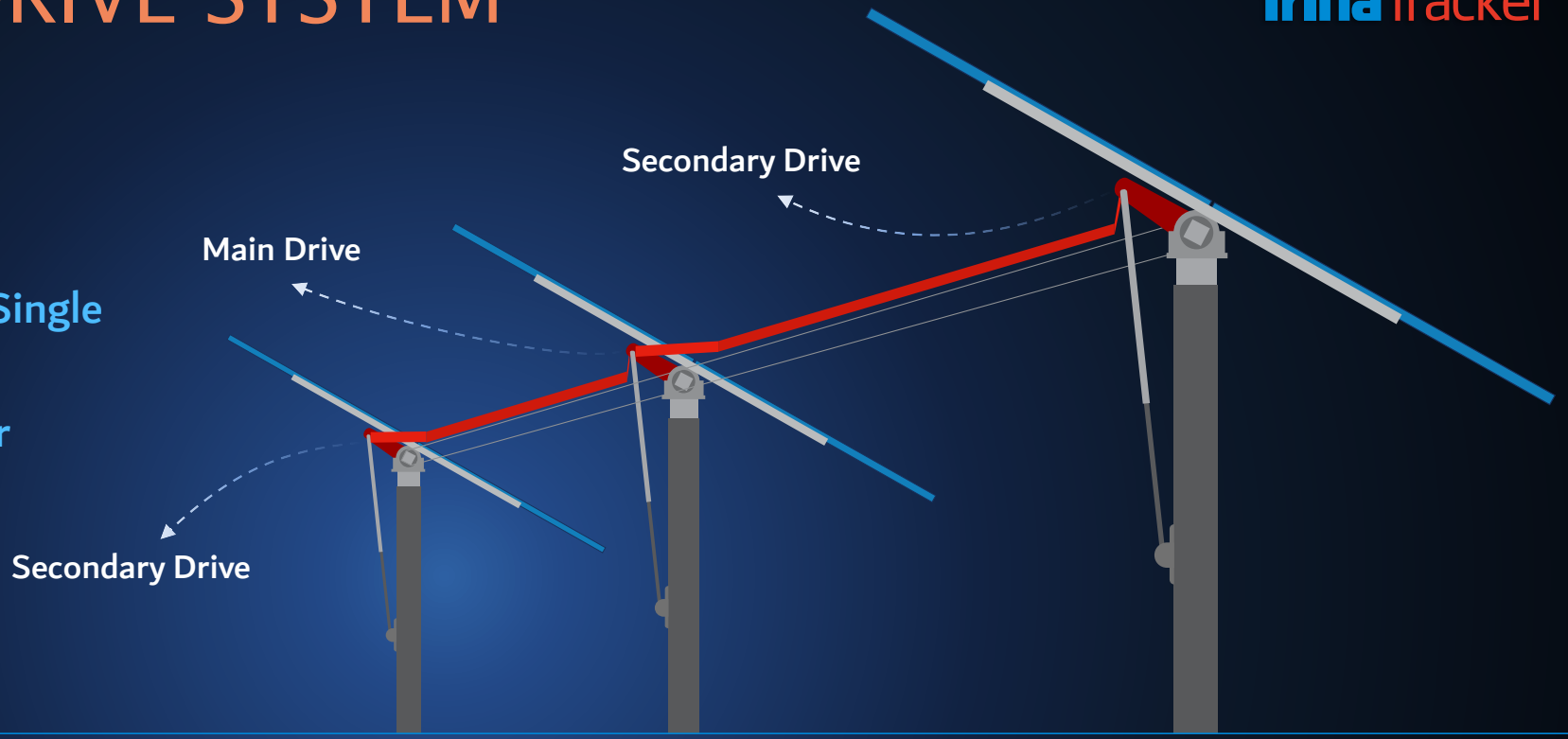
Module	Module Size (mm)	2P Chord Length	Normal Tracker Length	Torque Tube Height @500mm Ground Clearance	Torque Tube
400W+	2111*1046	√ (4.32m)	√ (66.47m, 4 strings)	√ (1.75m)	√ (170mm)
550W	2384*1096	√ (4.77m)	√ (63.81m, 3 strings)	√ (1.91m)	√ (170mm)
670W	2384*1303	√ (4.77m)	√ (62.43m, 3 strings)	√ (1.91m)	√ (170mm)

Note: Vanguard is also compatible with 540W (182mm) and 580W (182mm) modules

ROBUST MULTI-DRIVE SYSTEM

TrinaTracker

- 3 Linear Actuators Per Tracker
- All Drives Are Synchronized By Single Transmission Bar
- Offset actuator delivers superior holding torque for large format modules



Single Drive:
Higher Torsional Fluttering

Multi Drive:
Lower Torsional Fluttering

- Higher Critical Wind Speed
- Higher Power Density
- Lower Failure Rate

Multi-point drive has self-locking function for
MAXIMUM WIND STABILITY

SMART O&M: SCADA SYSTEM

TrinaTracker

TrinaSCADA = Tracker Monitoring & Alarm + System Diagnosis + Intelligent Control

STOW CONTROL PRIORITIZATION

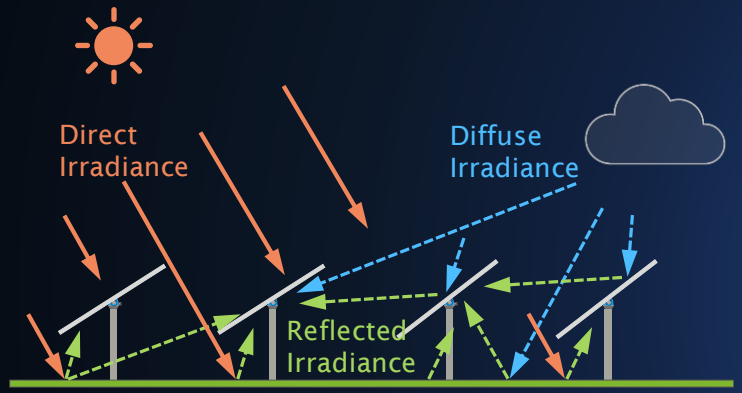
	LOW BATTERY	COMMS ALARM	FLOOD STOW	HAIL STOW	WIND ALARM	SNOW ALARM
Description	Stow position is command if the battery energy is not enough to stay tracking	Stow position is command if no communications with NCU are available	Flood Stow position is command by the plant operator or in case of any extreme risk	Hail Stow position is command in case of hails storms	Wind Stow position is command in case of wind alarms	Snow Stow position is command in case of wind alarms
Activation / deactivation	Automatically by the TCU SOC* estimation	Automatically by the TCU	Manually by the operator or Automatically by the weather station	Manually by the operator	Automatically by the weather station	Automatically by the weather station
Priority	1	2	3	4	5	6

SUPERTRACK

BIFACIAL ENHANCEMENT + INTELLIGENT BACKTRACKING

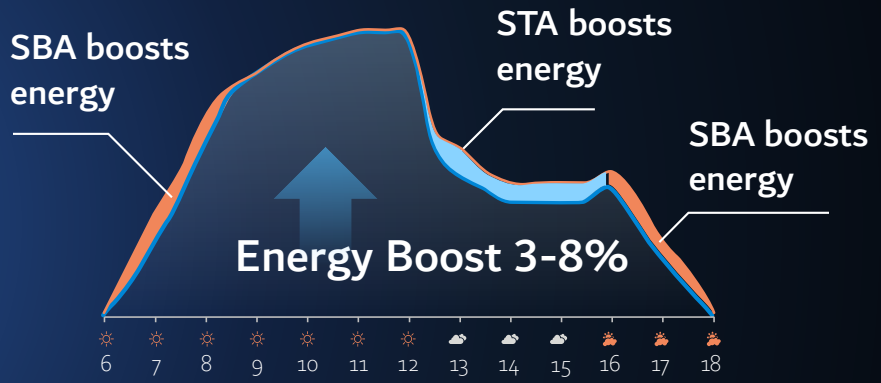
TrinaTracker

SuperTrack = Smart Tracking Algorithm + Smart Backtracking Algorithm



Smart Tracking Algorithm (STA)

Smart Backtracking Algorithm (SBA)



SuperTrack is developed to increased yield gain in:

- Sunrise and Sunset
- Cloudy Weather
- Overcast Weather
- Uneven Terrain

CLOSE SUPPORT AT EVERY STEP

FULL MECHANICAL ASSEMBLY

(As an optional service)

- Structure assembly
- Modules assembly
- Motors and electrical boxes
- Delivery control
- Quality control

PULL OUT TESTING

Design and supervision of pull out test campaign

- Final design of foundation
- Trina Tracker take the risk of the foundation design and guarantee it





GEOTECHNICAL REPORT

- International geotechnical consultant partners
- Evaluation of feasibility of the installation

COMMISSIONING

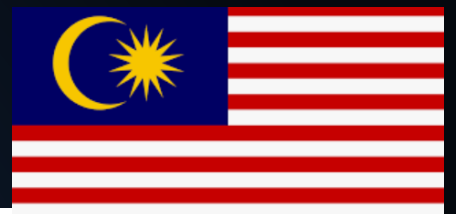
- Tracker commissioning
- Communication commissioning

ON SITE SUPERVISION

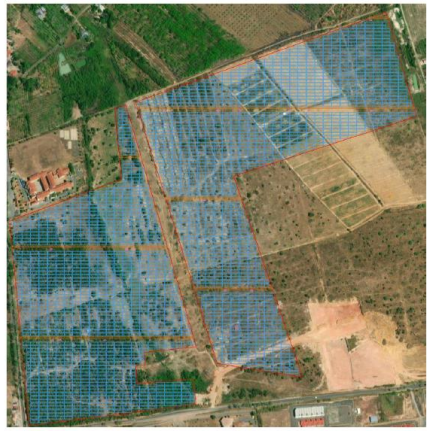
- Supervision of assembly
- Delivery supervision
- Quality control
- Certification of installation

PROCUREMENT: ONE STOP SHOP MODULE & TRACKER
AFTER SALES/O&M: SINGLE POINT ACCOUNTABILITY

TRACKER VALUE PROPOSITION FOR MALAYSIA



	Monofacial
Pitch	9m
Tilt	5 deg
DC:AC	1.3
MW dc	71.6
MW ac	54.9
Module Qty	132608
Yield (kWh/kWp)	1471.3
Generation Yr1 (MWh)	105358



	Tracker 3.9m Unaligned
Pitch	3.9m
DC:AC	1.25
MW dc	60.2
MW ac	48.1
Module Qty	94080
Yield (kWh/kWp)	1697.4
Generation Yr1 (MWh)	102199.2

1 4 2 3 4

Module	MWp	MW AC	DC AC Ratio	Capex (USD/Wp)	Delta	Land Required (acre)	Delta	Land	Land Cost (USD/Wp)	Yield (kWh/kWp)	Delta	Yield Abs (MWh/yr)	Delta	IRR	LCOE (USD/MWh)	Delta
550	71.6	50	143%	$ 34,289,509		147		Leased	$ 0.014	1,471	0%	105,345	0%	4.6%	$ 42.43	0%
545	60.2	50	120%	$ 32,146,800	-6.2%	176	20%	Leased	$ 0.020	1,748	19%	105,249	-0.1%	5.1%	$ 40.59	-4.3%
545	52.0	50	104%	$ 26,900,140	-21.5%	176	20%	Leased	$ 0.024	1,783	21%	92,731	-12.0%	5.7%	$ 38.94	-8.2%

1. A 60MW Bifacial/Tracker versus a 72MW monofacial fix tilt…
2. Delivers >20% more kWh/kWp…
3. So absolute MWh energy outcome is equivalent but with 14% fewer MWs, modules, steel, BoS etc…
4. Resulting in 6% lower overall capex….
5. Which drives 4% lower LCoE

TRACKER PLUS STORAGE VALUE PROPOSITION

DC Capacity: SAT 4.0MWp, EW 8.41MWp
4ha with 3.33MW AC capacity (1.2ha/MW AC)

DC Capacity: SAT 13.79MWp, EW 16.45MWp
11.5 hectare with 7.77MW AC capacity (~1.5ha/MW AC)

Summary of Results

Constrained Site

No Storage

Option	Structure	Module	MWp	MW AC	DC AC Ratio	GCR	Capex (USD)	Delta	Capex (USD/Wp)	Delta	Land Required (hectare)	Discounted Land Lease Cost (USD/Wp)	Yield (kWh/kWp)	Delta	Yield Abs (MWh/yr)	Delta	IRR	LCOE (USD/MWh)	Delta
1	EW Bifacial 255%	540	8.4	3.3	255%	87%	$ 4,085,055	-	$ 0.486	-	4	$ 0.026	1,621	-	13,633	-	21.6%	$ 37.27	-
2	FTS Bifacial 178%	540	5.9	3.3	178%	64%	$ 2,889,915	-29.3%	$ 0.492	101.4%	4	$ 0.038	1,762	9%	10,343	-24%	23.1%	$ 37.81	1.5%
3	SAT Bifacial 129%	540	4.3	3.3	129%	64%	$ 2,282,250	-44.1%	$ 0.537	110.6%	4	$ 0.052	2,173	34%	9,237	-32%	27.0%	$ 34.47	-7.5%

Storage Included

Option	Structure	Module	MWp	MW AC	DC AC Ratio	GCR	Capex (USD)	Delta	Capex (USD/Wp)	Delta	Land Required (hectare)	Discounted Land Lease Cost (USD/Wp)	Yield (kWh/kWp)	Delta	Yield Abs (MWh/yr)	Delta	IRR	LCOE (USD/MWh)	Delta
1	EW Bifacial 255%	540	8.4	3.3	255%	87%	$ 6,725,055	-	$ 0.800	-	4	$ 0.026	1,621	-	13,633	-	11.2%	$ 60.58	-
2	FTS Bifacial 178%	540	5.9	3.3	178%	64%	$ 5,529,915	-17.8%	$ 0.942	117.8%	4	$ 0.038	1,762	9%	10,343	-24%	9.6%	$ 66.88	10.4%
3	SAT Bifacial 129%	540	4.3	3.3	129%	64%	$ 4,922,250	-26.8%	$ 1.158	144.8%	4	$ 0.052	2,173	34%	9,237	-32%	9.5%	$ 67.02	10.6%

Unconstrained Site

No Storage

Option	Structure	Module	MWp	MW AC	DC AC Ratio	GCR	Capex (USD)	Delta	Capex (USD/Wp)	Delta	Land Required (hectare)	Discounted Land Lease Cost (USD/Wp)	Yield (kWh/kWp)	Delta	Yield Abs (MWh/yr)	Delta	IRR	LCOE (USD/MWh)	Delta
1	EW Bifacial 249%	540	16.5	6.6	249%	90%	$ 8,294,349	-	$ 0.504	-	11	$ 0.013	1,872	-	30,794	-	25.5%	$ 32.60	-
2	FTS Bifacial 177%	540	11.7	6.6	177%	75%	$ 6,047,949	-27.1%	$ 0.519	103.0%	11	$ 0.019	1,976	6%	23,020	-25%	26.0%	$ 34.18	4.9%
3	EW Bifacial 249%	540	13.8	6.6	209%	64%	$ 7,516,950	-9.4%	$ 0.545	108.1%	11	$ 0.016	2,211	18%	30,495	-1%	28.2%	$ 32.44	-0.5%

Storage Included

Option	Structure	Module	MWp	MW AC	DC AC Ratio	GCR	Capex (USD)	Delta	Capex (USD/Wp)	Delta	Land Required (hectare)	Discounted Land Lease Cost (USD/Wp)	Yield (kWh/kWp)	Delta	Yield Abs (MWh/yr)	Delta	IRR	LCOE (USD/MWh)	Delta
1	EW Bifacial 249%	540	16.5	6.6	249%	90%	$ 13,574,349	-	$ 0.825	-	11	$ 0.013	1,872	-	30,794	-	13.6%	$ 51.49	-
2	FTS Bifacial 177%	540	11.7	6.6	177%	75%	$ 11,327,949	-16.5%	$ 0.972	117.8%	11	$ 0.019	1,976	6%	23,020	-25%	11.3%	$ 60.31	17.1%
3	EW Bifacial 249%	540	13.8	6.6	209%	64%	$ 12,796,950	-5.7%	$ 0.928	112.5%	11	$ 0.016	2,211	18%	30,495	-1%	14.1%	$ 52.16	1.3%

- Even for constrained sites SAT is better for IRR and LCOE not considering battery cost
- Amortising battery cost over higher energy outcome of EW means financials are superior on constrained sites
- For less constrained sites (>~1.5ha/MW AC capacity) SAT gets much closer or better to EW economic outcome
  - Also similar absolute MWh outcome and lower overall capex…
- SAT also unlocks possibility of dual land use solar/agriculture/fisheries

UNLOCKING SOLAR AND AGRICULTURAL CO-LOCATION

TRINA PRODUCT SOLUTION-FIX ORIGIN

TrinaTracker

Compatible with modules up to 670W+

- Designed to support ultra-high power modules
- Reduction of LCOE without compromising the structure's stability

Stability verified

- Wind tunnel test performed by a wind engineering consultancy leader
- Analysis of wind loads on the structural behaviour
- Tailor-made design for individual site's characteristics

Easy assembly and O&M

- Reduced installation time
- Minimun O&M
- Adjustable height and inclination
- No cutting, drilling or welding required

Foundation compatibility

- Compatible with different foundation solutions: direct ramming, pre-drilling + ramming, micropile, and footing foundation

Minimum shades with bifacial modules

- Optimal landscape configuration when using bifacial modules
- Limited shade caused by profiles

Top quality materials

- Top-quality materials and durability ensured by **Trina**Tracker's internal high quality standards
- Reduction of lead time due to company's supply network
- Weight optimized by **Trina**Tracker engineering team according to markets' regulations

FixOrigin's Added Value

- ✓ Compatible with modules up to 670W+
- ✓ Lower LCOE
- ✓ Stability tested and ratified
- ✓ Tailor-made foundations
- ✓ Reduced shading with large format modules
- ✓ Easy assembly
- ✓ High quality
- ✓ No maintenance required

TRINA PRODUCT SOLUTION-FIX ORIGIN

TrinaTracker

Guaimbè, Brazil

Location
Guaimbè (Brazil)

Capacity
180 MW

Environment

- ✓ Temperature range from 12°C to 36°C.
- ✓ Rain season with 200 mm monthly precipitations.
- ✓ Highly humid due to the proximity of the Amazon rainforest.
- ✓ Average wind speed of 12-19 km/h.

Curbans, France

Location
Curbans (France)

Capacity
33 MW

Environment

- ✓ Temperatures go down to -5°C in winter time.
- ✓ Cloudy and rainy weather conditions for 6 months of the year.
- ✓ Average wind speed of 19-27 km/h.
- ✓ Average slope of 15%.

Jasper, South Africa

Location
Jasper (South Africa)

Capacity
100 MW

Environment

- ✓ Average temperature of 36°C.
- ✓ Monthly precipitations above 150 mm.
- ✓ Average wind speed of 12-19 km/h.

TRINA PRODUCT SOLUTION-FIX ORIGIN

TrinaTracker

FixOrigin™ Mounting System

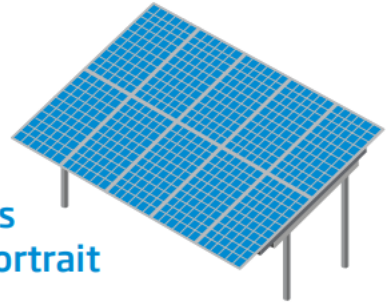
Structure type	Monopost and Bipost
Configuration	Monopost 2P and 4L Bipost 2P, 3P, 4L and 6L
Ground clearance	Up to 1200 mm (1)
Inclination	Up to 25°
Terrain adaptability	20% E-W, 30% N-S (2) per row (1500 V string)
Structure material	S350-S420 GD or higher
Coating	HDG, Pre-galvanized & ZM (3) Micropile and PHC piles
Module fixation	Clamps, rivets, bolts
Inverter support	Optional
Ramming options	Direct ramming Pre-drilling Micropile Screw foundation Concrete footing
Warranty	10 years: structure 5 years: commercial components

(1) Standard up to 800mm.
For higher loads, contact TrinaTracker

(2) Standard conditions up to 10%.
For higher slopes, contact TrinaTracker

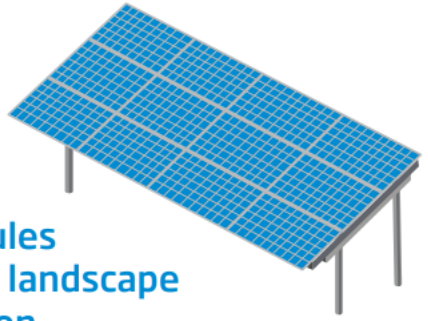
(3) Standard configuration.
Other coating by request

The structure's design depends on the terrain's characteristics and space availability.



2 or 3 modules mounted in portrait configuration (vertical)

Portrait configurations are recommended for high east-west slopes terrains.



4 or 6 modules mounted in landscape configuration (horizontal)

Landscape configurations are recommended for bifacial modules to minimize shading on the rear part of the solar panels.

TrinaStorage

Introduction to Trina Storage

Leading the Energy Transition through Storage

Flexible, safe, and high-performance BESS solutions

2022

Our solution platform

Gen0: Fully integrated solution

GUARANTEES & LONG-TERM SERVICE AGREEMENT

We deliver an optimized system with guarantees establishing ourselves as a long-lasting partner.

Power Conversion

State-of-the-art power electronics, DC- and AC-coupled solutions, high efficiency DC/DC and DC/AC

Battery Rack/Cabinet

High quality, Tier 1 LFP modules, 0.25C to 1C chemistries, liquid cooled cells, state-of-the-art BMS

Software and Control

Integrated battery and PCS controls, power plant controller, energy management system, SCADA

Our solution platform

Gen1: building our own battery cell and smart cabinet solution

TrinaStorage

VERTICAL INTEGRATION & SECURITY OF SUPPLY

better control over the battery value chain and sound ability to tackle market volatility

COST SAVING

5 – 10% lower on CAPEX & OPEX compared to Tier-1 market average

SAFETY FEATURES

Advanced fire mitigation and suppression strategies. Equipped with heat & smoke detectors and an aerosol-based extinguisher as well as active ventilation system

INCREASED BATTERY PERFORMANCE

Increased battery cycles up to 10,000 cycles with advanced LFP battery chemistry and sophisticated thermal management system

SPEED OF INSTALLATION

70% installation time saving and related cost savings

Cell / Module

System

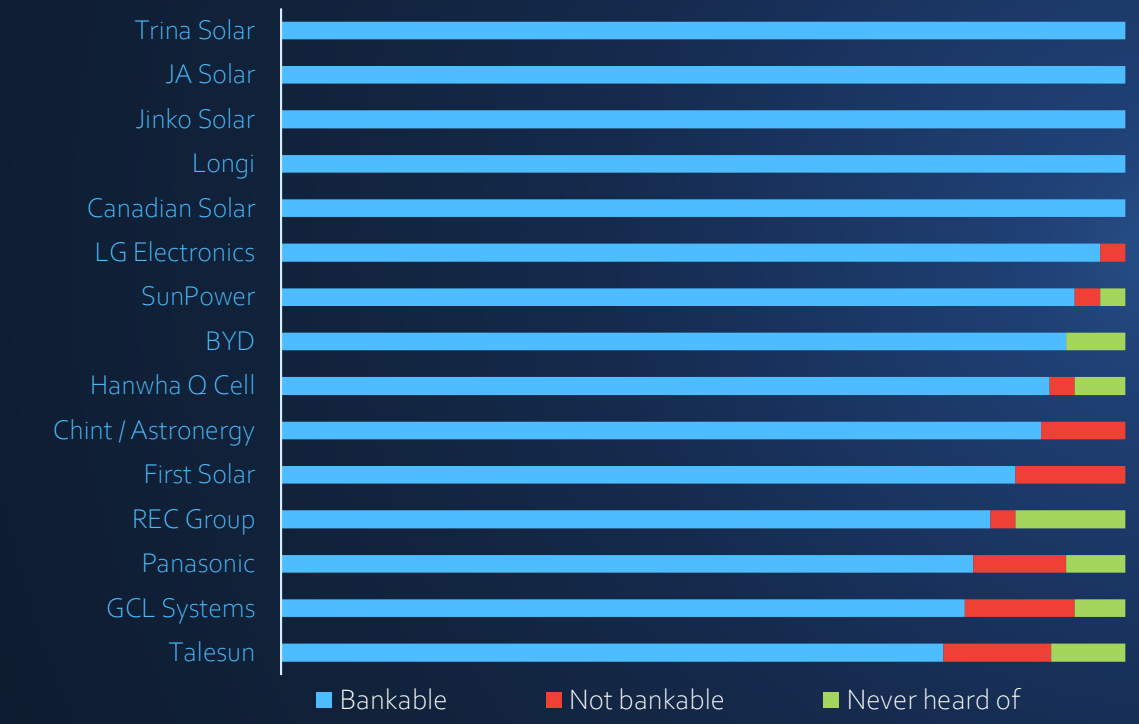
Solution

A modular and smart storage solution, tailored for grid-scale installations in the key storage markets. Fully integrated and pre-fabricated with the-state-of-the-art LFP batteries, liquid cooling system, BMS and fire suppression system, it is optimized for flexibility, smooth installation, and efficient maintenance.

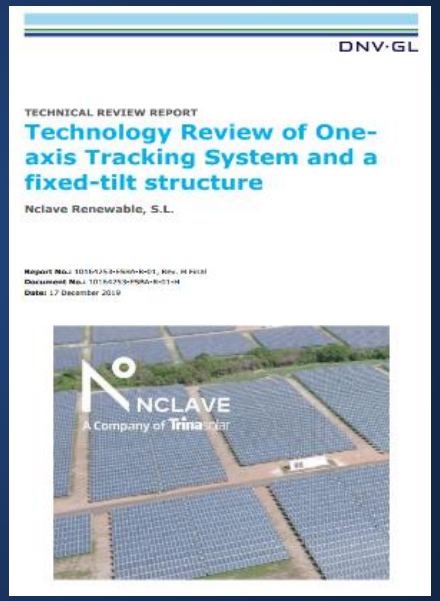
SUPERB BANKABILITY

TrinaTracker

Public Listed Trina recently maintained its 100% bankability record with Bloomberg New Energy Finance for the 6th consecutive year



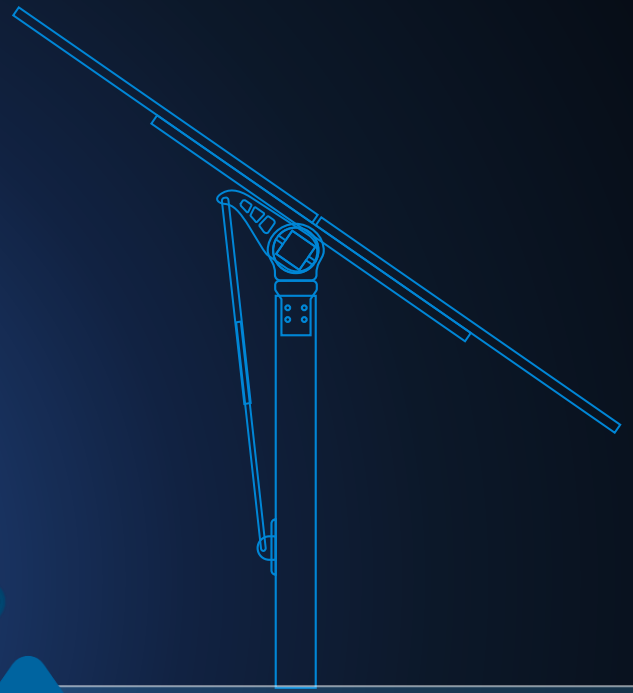
Source: Bloomberg Module Manufacturer Bankability Ratings 2020



DNV-GL has continually provided valuable endorsement to TrinaTracker

PRODUCT RECAP

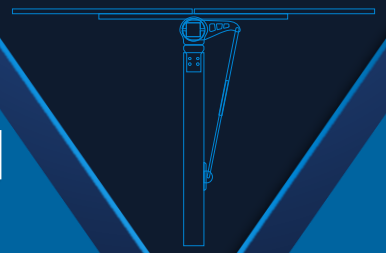
TrinaTracker



- Wind Tunnel Testing
- Extreme Weather Mitigation
- Multidrive System
- Low Failure Rate

More Reliable Tracker

TrinaTracker



More Energy Yield

Lower Capex

- Optimal SuperTrack Algorithm
- SCADA Smart Monitoring
- High Plant Uptime

- Lower BOS Cost
- Fewer Piles= lower piling cost
- Spherical Bearing = lower civils cost

THANK YOU !

Please visit our booth in the Main Exhibition

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Trina Solar

pv magazine webinars

Delivering value in the APAC region

Q&A

7 July 2022

4:00 pm – 5:00 pm | AEST, Sydney
2:00 pm – 3:00 pm | CST, Beijing
1:00 pm – 2:00 pm | Hanoi
8:00 am – 9:00 am | CEST, Berlin

Bella Peacock
Editor
pv magazine Australia

Andrew Gilhooly
Head of C&I and utility solutions
Asia Pacific region - Trina Solar

Lim Cheong Boon
Head of product and marketing
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