Trinasolar | TrinaPro Mega

Lowering Risk and Enhancing Renewable Project Returns for the Mining Industry

Andrew Gilhooly
Assistant Director TrinaPro Business APAC Region
Energy and Mines Australia Virtual Summit
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Declining Trends in Solar LCOE

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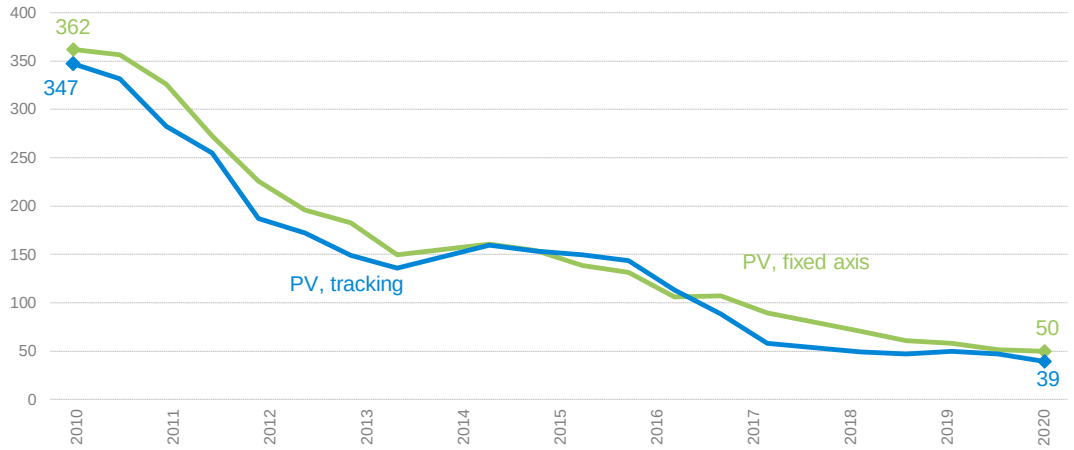
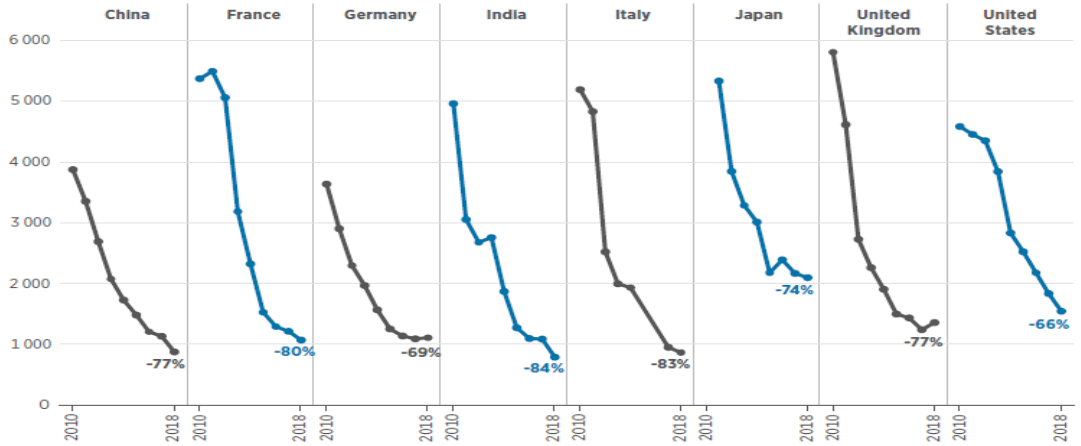
Global average LCOE $/MWh



Precipitous LCOE reduction is trending globally



Bid price- 2019

Country	Capacity	2019 Bid price（cent/kWh）
Greece	143MW	6.970
Germany	162.554MW	6.160
Zambia	120MW	3.999
India	500MW	3.410
Brazil	401MW	1.750
Portugal	862MW	1.695
China		3.600

2009-Worldwide LCOE of PV project reduce from
0.32$/kWh to 0.04$/kWh

The bidding model is
gradually popular in the world

Changes in PV design and technology selection

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Reduce LCOE

Non-technology	Project Management	Exploration	Approach	Delivery	Installation	Commission	…
Technology	O&M	AI	Diagnosis method	Big data	Cloud	…	
		Alarm	Trouble shooting	UAV	Cleaning Robot		
	Communication	PHC	PLC	LORA	Modbus		
	Installation	Horizontal	Vertical	One row	Two row	…	
	Oversize	1.0	1.1-1.3	>1.3			
	1500V inverter	String	Central	Distributed	…		
	Tracker	Single-row	Multi-row	Bi-row	Clearance	Pitch	Shading factor
	Frame	Partial frame	Frameless	White board	…		
	Module	Large	Half-cut	MBB	…		
	Cell	TOPCon	PERC	HJT	Bifacial		

More technologies came to market

Owner &EPC

Product selection is more complicated

More suppliers participate in design

The design is more complicated

Operation and maintenance are more complicated

Complex Terrain and Application Scenarios Challenges System Design and O&M

Complex terrain and application scenarios

Place higher requirements on product adaptability and reliability

Operation and maintenance costs are rising

System costs are squeezed, intelligent operation and maintenance solutions promotes power generation

Value of Trinapro-Solution

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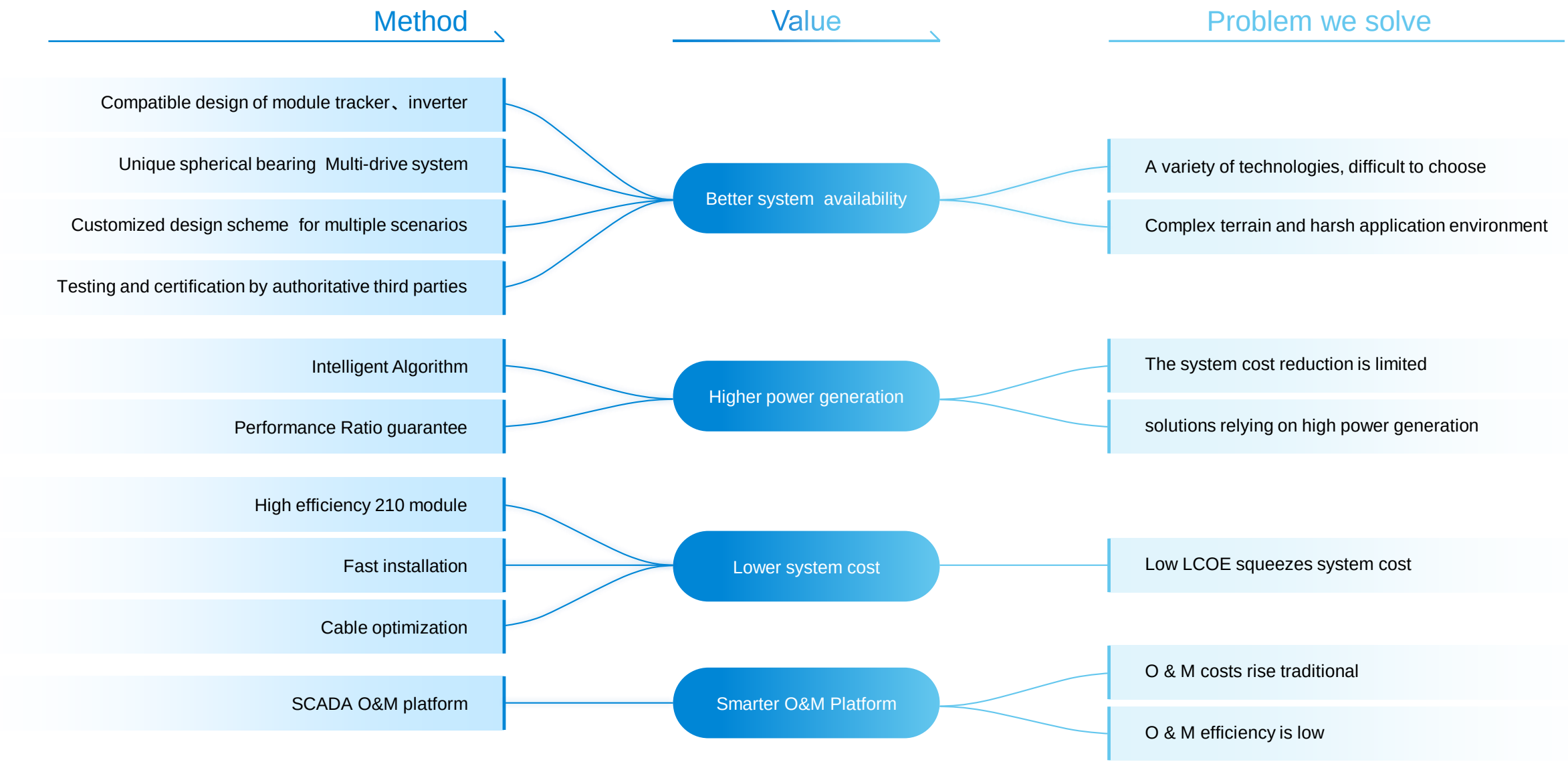

TrinaPro Overview

TrinaPro is a one-stop smart photovoltaic solution developed by Trina Solar for large-scale power stations.

Covering different terrain, different slopes, different wind speeds speeds and other complex application scenarios.

The system integrates three core products: high-efficiency PV modules, intelligent tracking system and reliable inverter. The system innovatively provides customers with hardware system design, software function integration, integrated services and intelligent operation and maintenance services .

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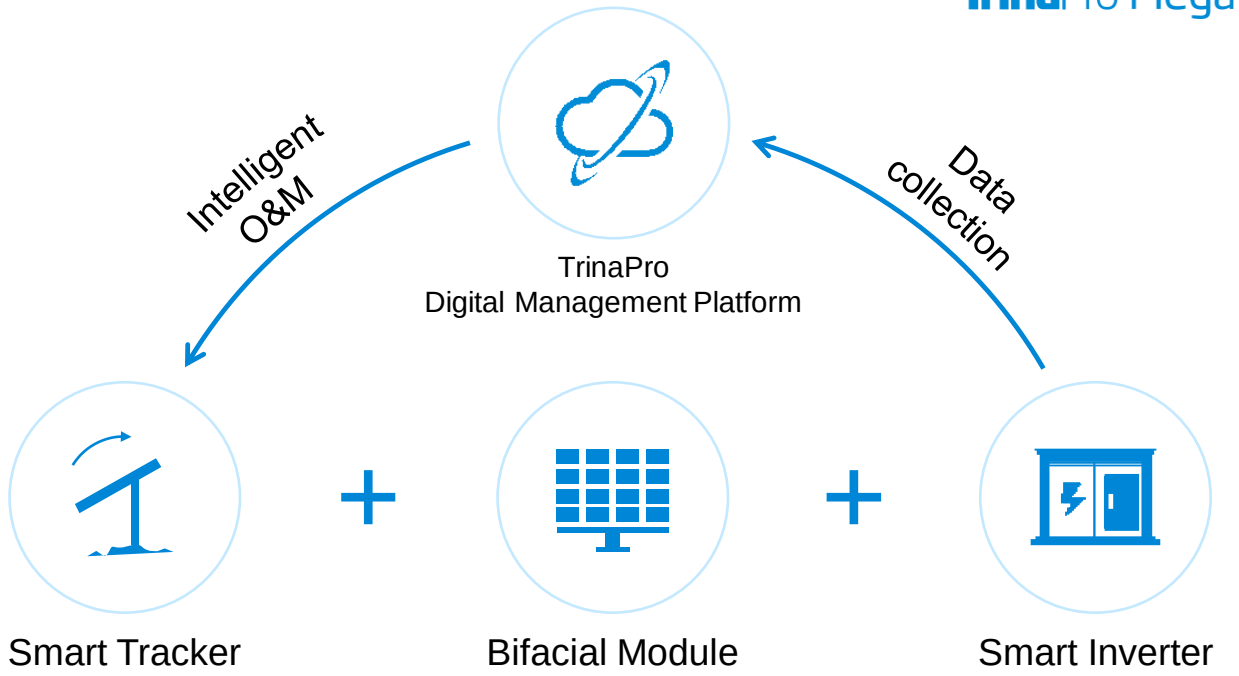


Hardware-software integration

Reduce BOS cost

8-15%

Intelligent tracking

Increase power generation

3-8%

Customized design

System Availability

99.9%

One Stop solution

Delivery efficiency increase

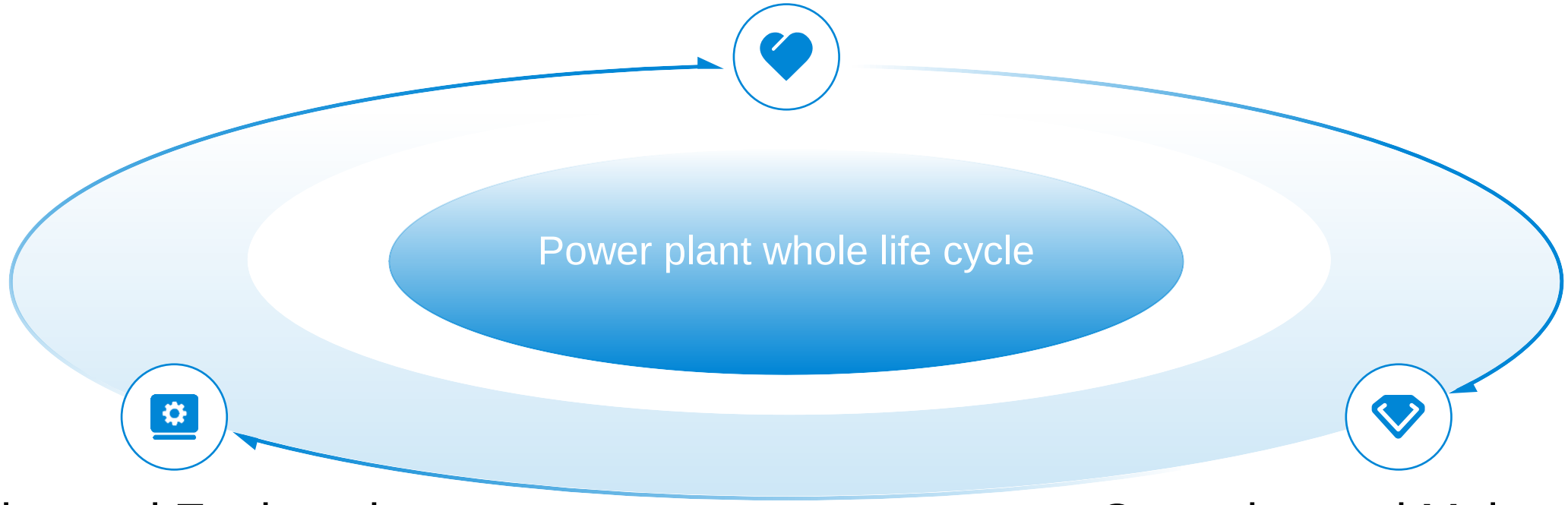
15%

Integrative System Unlocks Value Add Support

TrinaPro Mega

Streamlined Contracting | Arrival in stages | Pre-sales installation training | On-site installation | Device connection debugging

Delivery and Service



Design and Engineering

Layout Optimisation | Yield Assessment

IRR calculation | Topo and Geotech Support

Operation and Maintenance

Cloud based Monitoring | Remote Control

Remote Fault Alarm | Robotic Cleaning | Drone Inspection

TrinaPro Provide solution for Multi-Scenarios

TrinaPro Mega

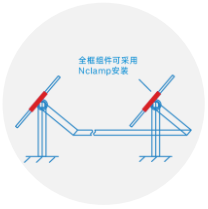
TrinaPro Mega EZ serie

Easy

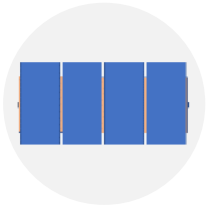
The most cost-effective plan for flat land

Overall slope
≤ 6%

Mid-high wind speed
＞45m/s



SP1000
multi-row



1V

Mono-facial
400~500Wp

Bifacial
400~500Wp

MV Turnkey Solution
4-7MWp\180-250kW

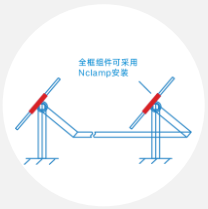
TrinaPro Mega Plus serie

Plus

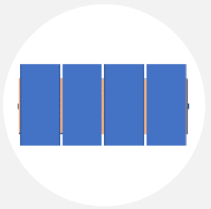
High slope adaptability high wind resistance

SN slope≤ 16%
NW slope ≤ 8%

Mid-high wind speed
>45m/s



SP240
（2 rows）



1V

Mono-facial
400~500Wp

Bifacial
400~500Wp

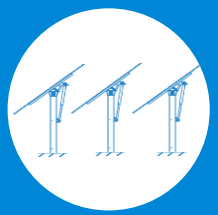
String inverter
180-250kW

TrinaPro Mega

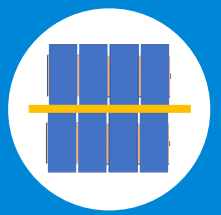
Ultra High Power Solution under Grid Parity Era

SN slope
≤16%

Mid-low wind speed
>45m/s



SP160 LIZA
（1 row）



2V

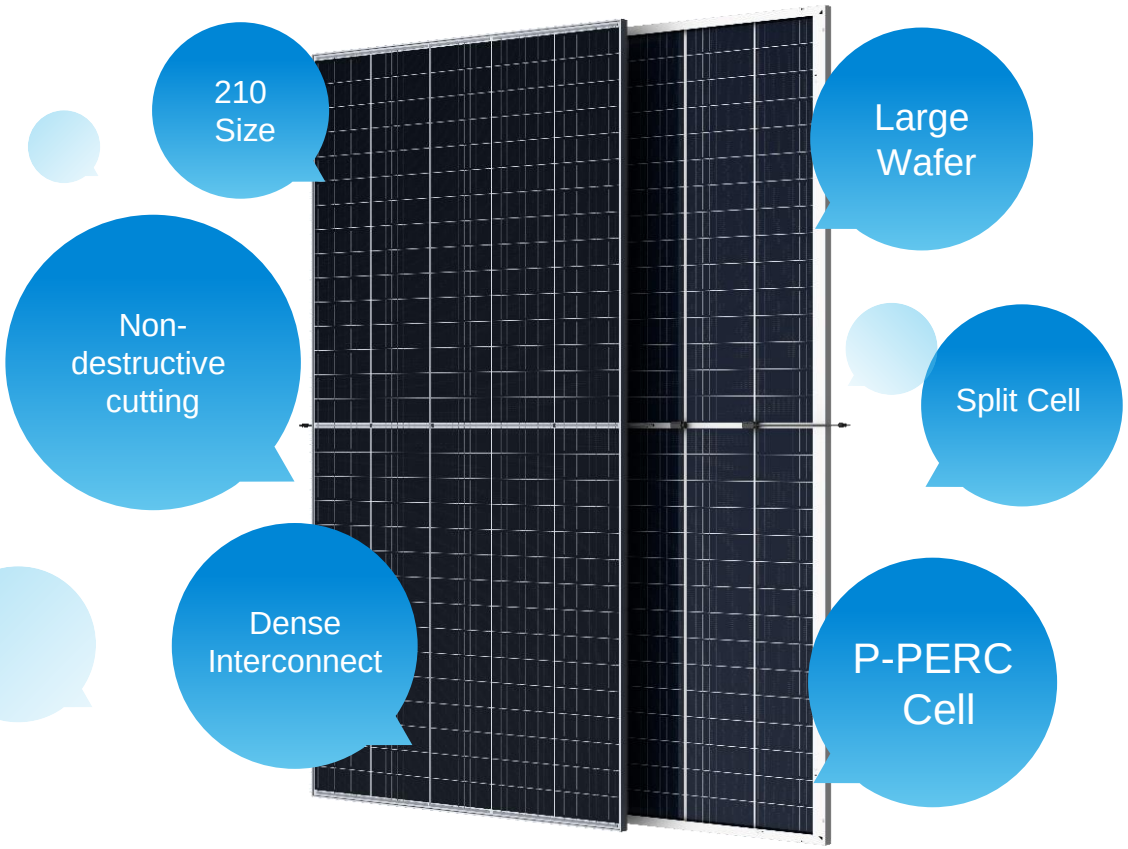
High efficient Bifacial Module
400~500Wp

String inverter
180-250kW

Trina Vertex Modules

TrinaPro Mega

High-power module: power boost



Increase power generation, reduce BOS

500W vs. 410W

Mount	Piles	Installation
-8.4% ▼	-15.6% ▼	-15.6% ▼

Cables	Cable laying	Total BOS
-13% ▼	-16.7% ▼	-6% ▼

Location： CHN Heilongjiang　　Capacity：100MW

Module VS 410W	Mount	Fundation	INnstallation	Cables	Cablelayling	BOS
440W Bifacial	4.4%	8.0%	8.0%	5.8%	8.3%	3.0%
500W Vertex	8.4%	15.6%	15.6%	13.0%	16.7%	6.0%

Trina Vertex 600W Bifacial Modules

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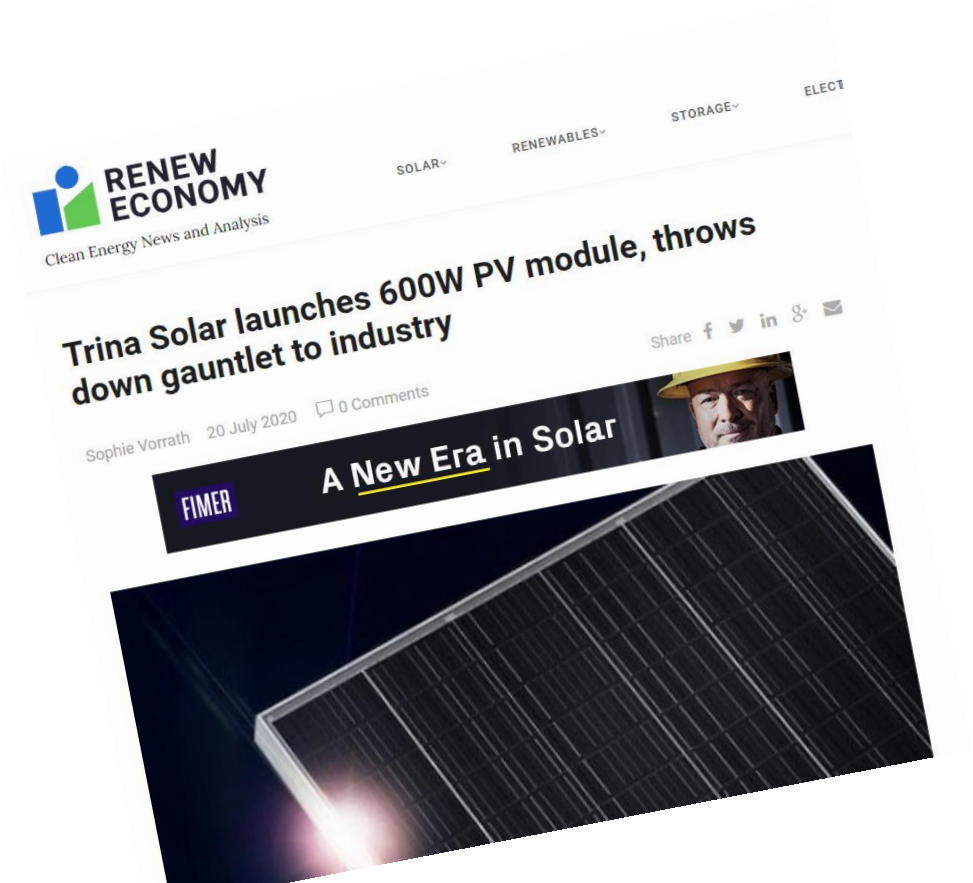
- High Wattage
- 21.2% peak efficiency
- Low Voltage = longer strings
- BOS and installation savings of >0.5c/Wp vs Competitor 535W Module



SunMining with Tracking + Bifacial – Stacking the Value

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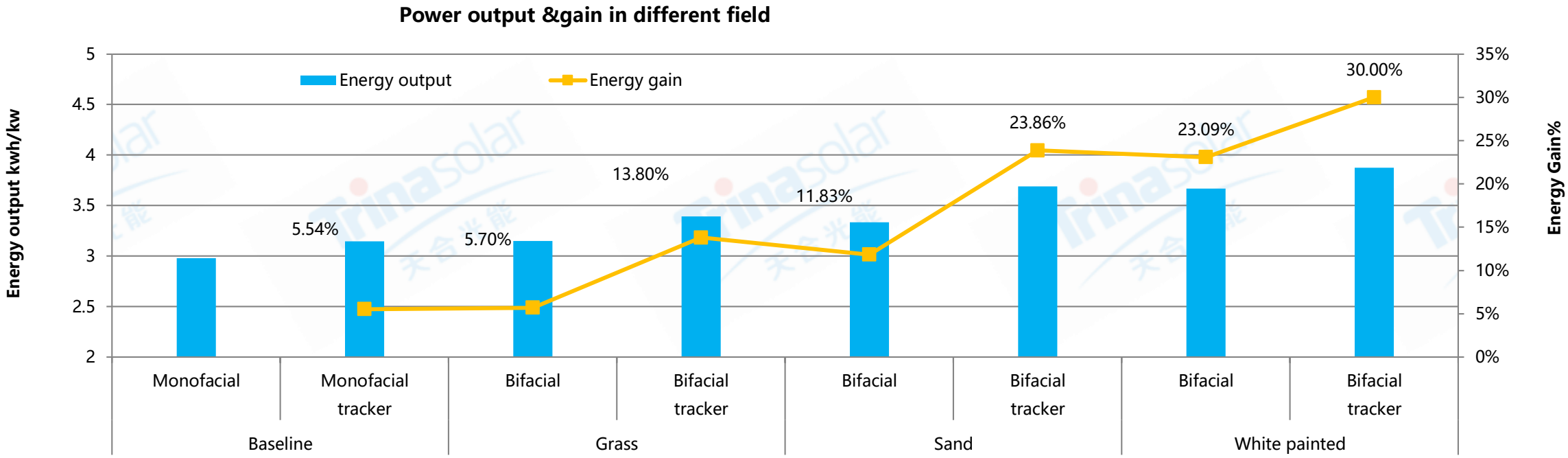

Project information
Location: Changzhou, China; 31° north latitude
Surroundings: Grass & Sand & White painted
Sample: 5pcs each installation method
Installation Angel: 27° fixed & Single axis
Data time: 2017.02-2017.12

10~20%Albedo: 20~30% 80%

Strong limbs ：Core components-Tracker Liza

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Smart-tracking extra
power gain3~8

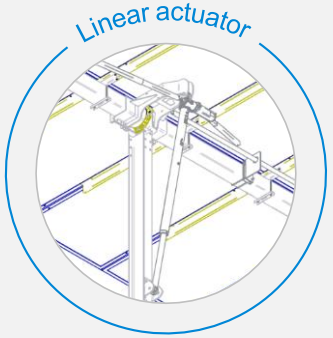
Up to Wafer
210mm size

Unique cable arrangement
Reduces cable usage and labor

Compared with traditional installation
It saves 5% of installation cost

Patented ball bearing + special bracket
Adapt to more terrain

Up to 120 Module per Tracker
16% fewer piles



Multi- drive
more stable

Area efficiency increases the MW
Increases 26% land usage per MW

More options of driving system
More flexible

Strong limbs ： Core components Reliability design

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Finite Element Analysis

Finite element analysis of overall load on module and tracker and overall test to ensure perfect match

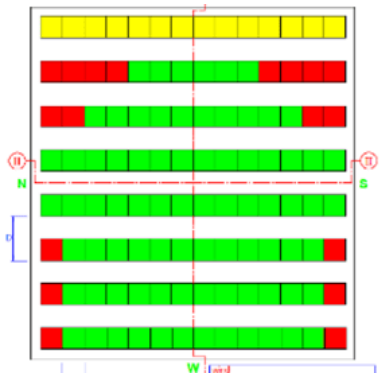
Reliability Test

Reliability test done by self or authoritative third party, to avoid directly adopting the data from agencies

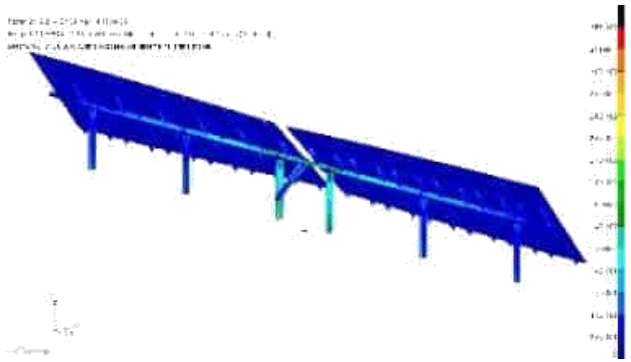
Wind Tunnel Test

Custom design based on wind tunnel test and project environment and use 1.5 times load design standards to ensure reliability

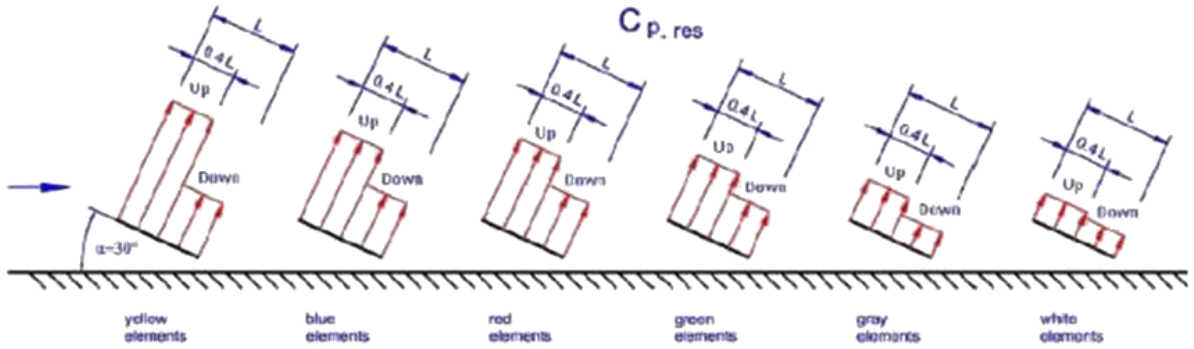
Wind tunnel test



Strength check of structural design



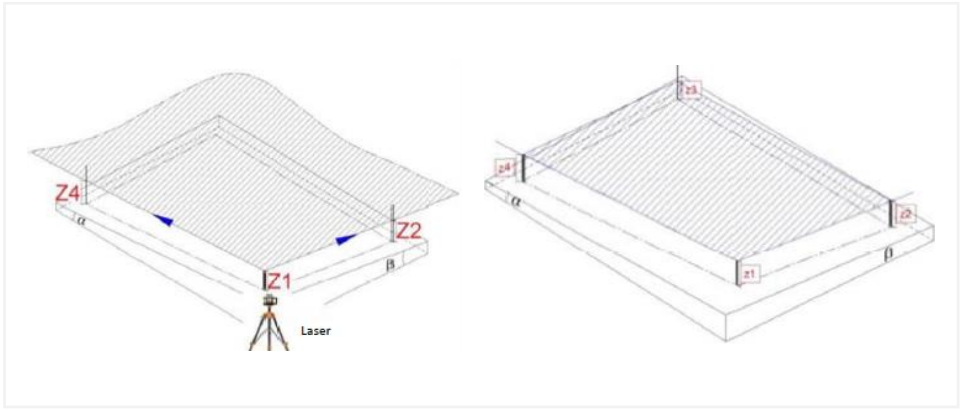
Calculations of different array types



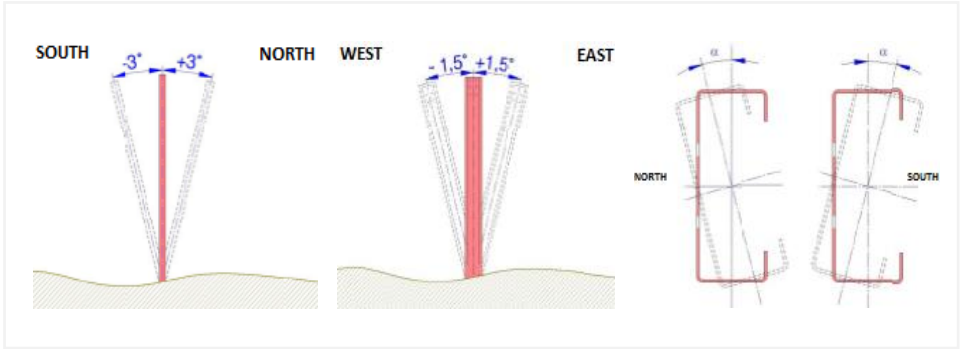
Strong limbs: core component-patented bearing upgraded design

Nclave patented spherical bearing: up to 30% angle adjustability, globally unique

Tracker contained in the plane that best fits the terrain



Wide tolerances for ramming



Smarter brain ： Smart tracking-Bifacial algorithm

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Bifacial is new thing for tracking algorithm!
Standard tracking algorithm not suit for the bifacial system.

$E_{total} = E_{front} + E_{back}$

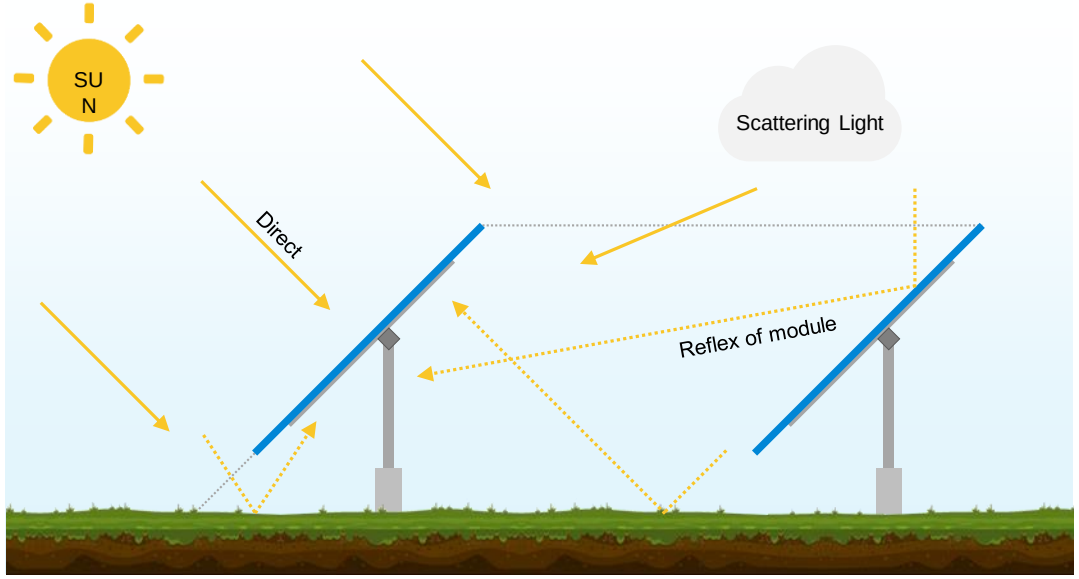
TrinaPro Optimum tracking

Two parts
Scattering and Reflection

Traditional tracking algorithms

Only focus on
Maximum power generation in front

Is not considering.
Maximum power generation on the front and back

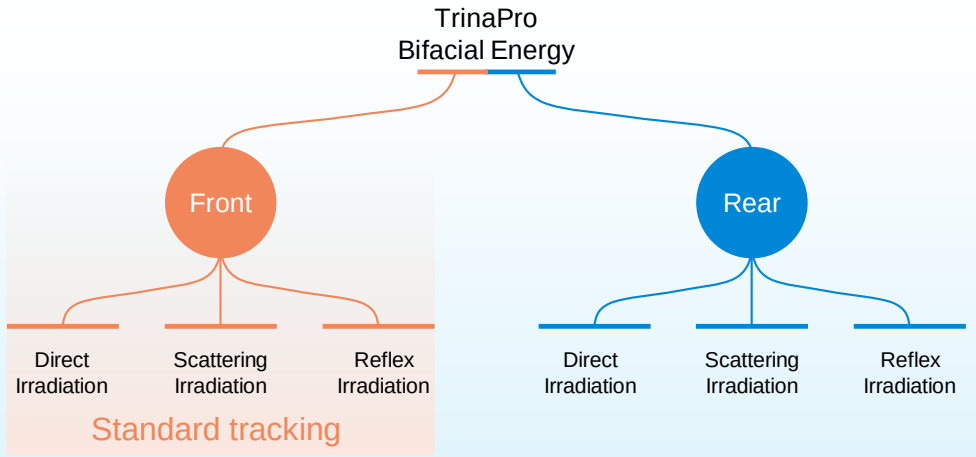


tracking algorithms

Positive power generation + Scattering on the back + Back Reflection

This algorithm can increase power generation by

Improve 1%-2% Generation



TrinaPro Optimum tracking

Smarter brain ：Trinapro SCADA

Sturdy back ： QA-Self verification and validation

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Albedo test

ChangZhou

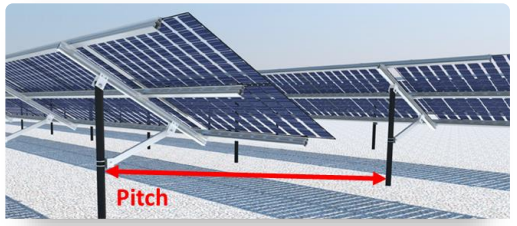
Tracker type

ChangZhou

Shading factor

ChangZhou,Spain

Installation configuration



ChangZhou

Optimum tracking for bifacial

Spain,Golmud,China,EU

2017

2020

Sturdy back: QA- Third-party certification and testing

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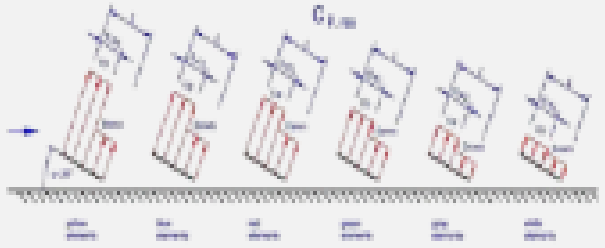
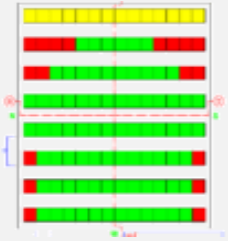
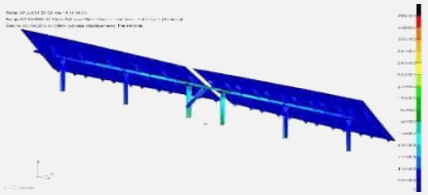
World-renowned
third-party certification

Wind tunnel test in
industry leading standards

Customized
structural design







Sturdy back ： QA-Bankability

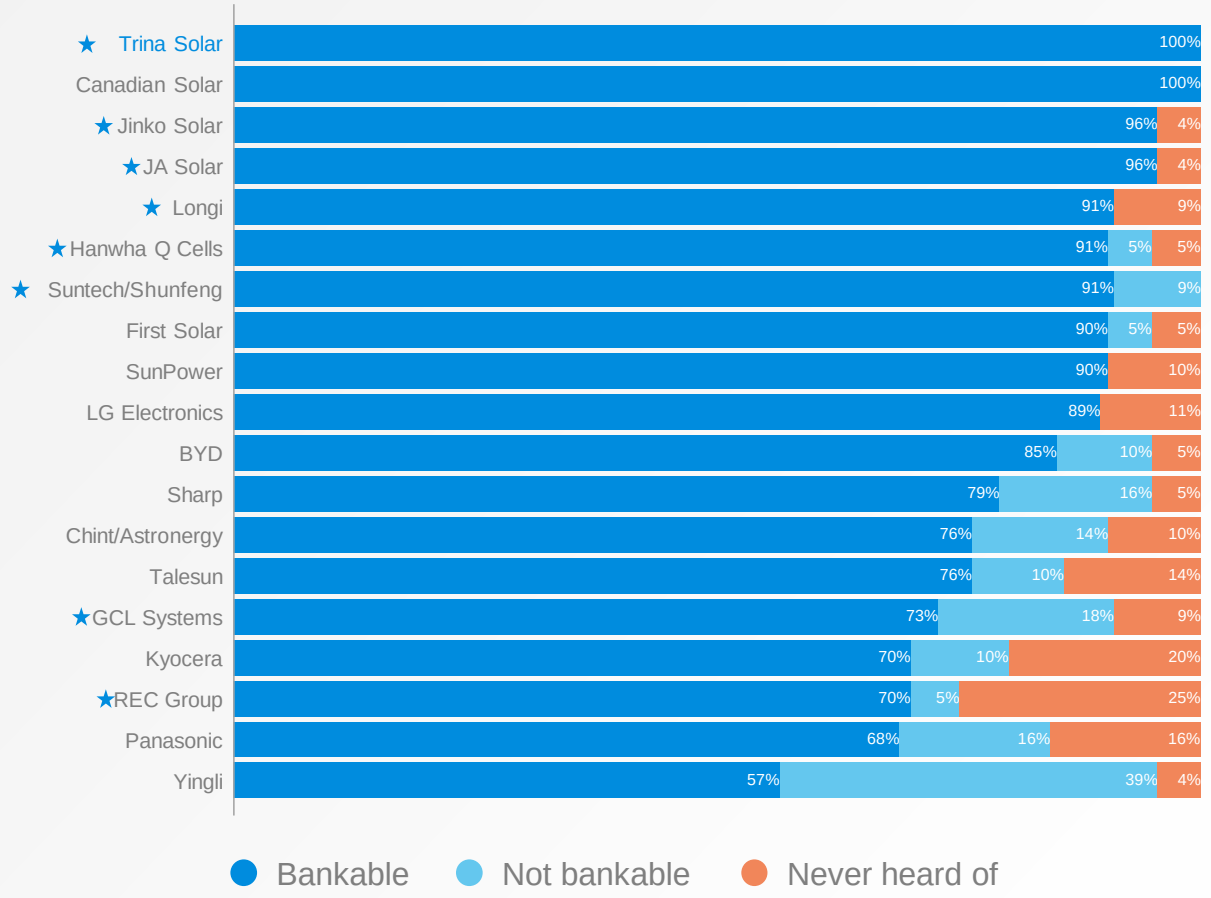
TrinaPro Mega

Top Bankable Module Supplier

2016 — 2019

System-level endorsement

DNV·GL

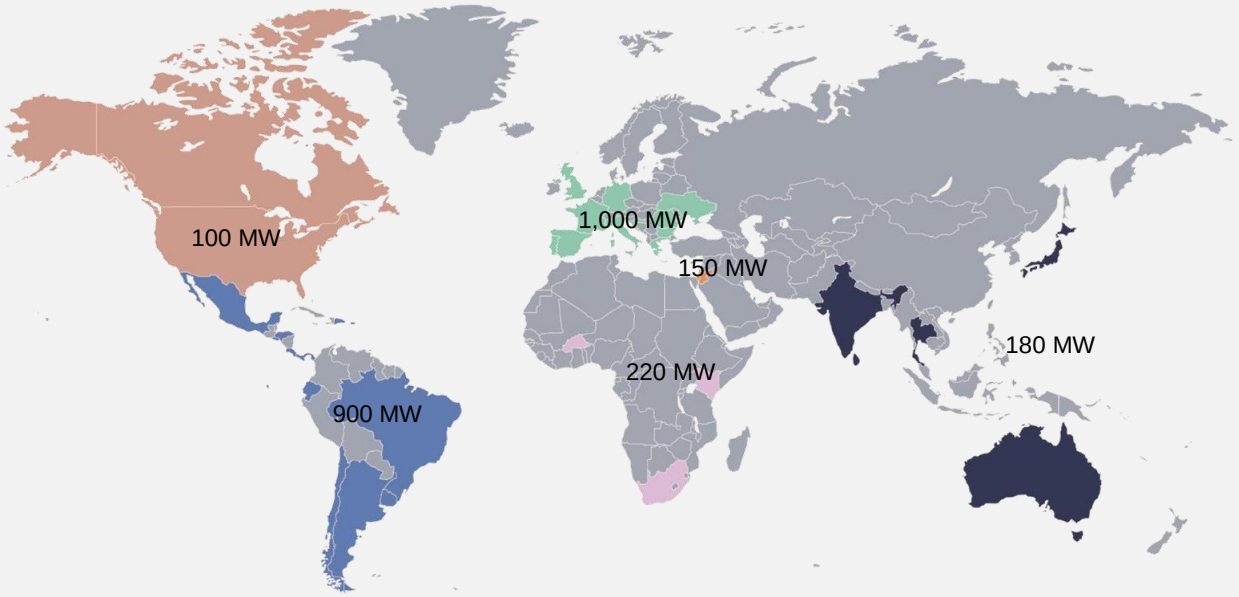


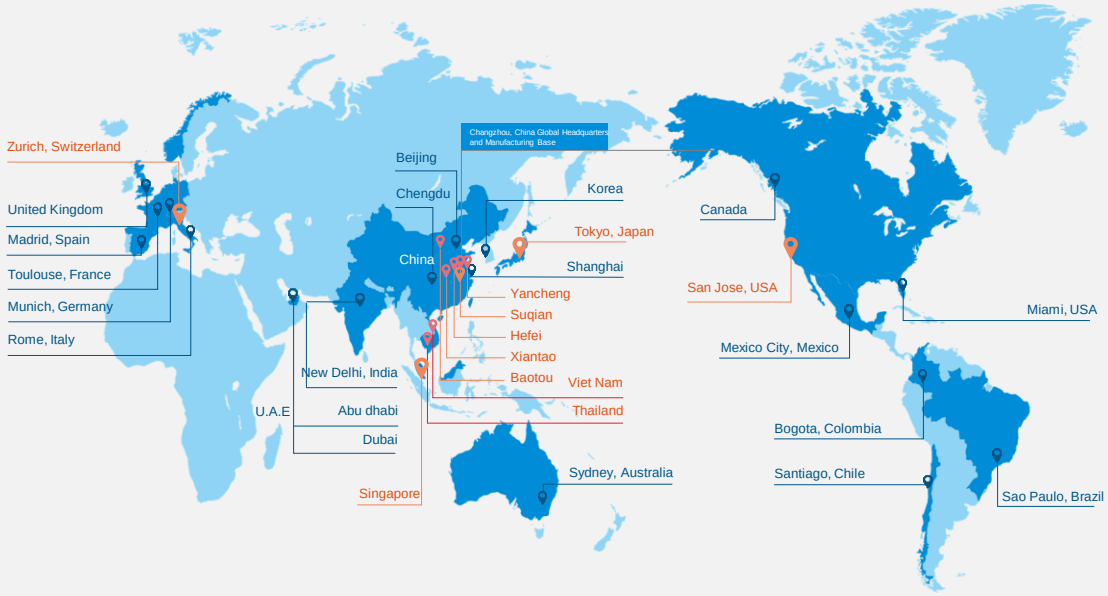
Souce: BloomberoNEF

TrinaPro Accomplishment

TrinaPro Mega

Global projects planning , Global service capability





+ 4 GW
Global Installation
+ 1 GW signed projects in 2019

+ 300
Tracker projects

+ 200
Countries

+ 13,000
employee

Case Studies

TrinaPro Mega

China | 2019 | 30MW

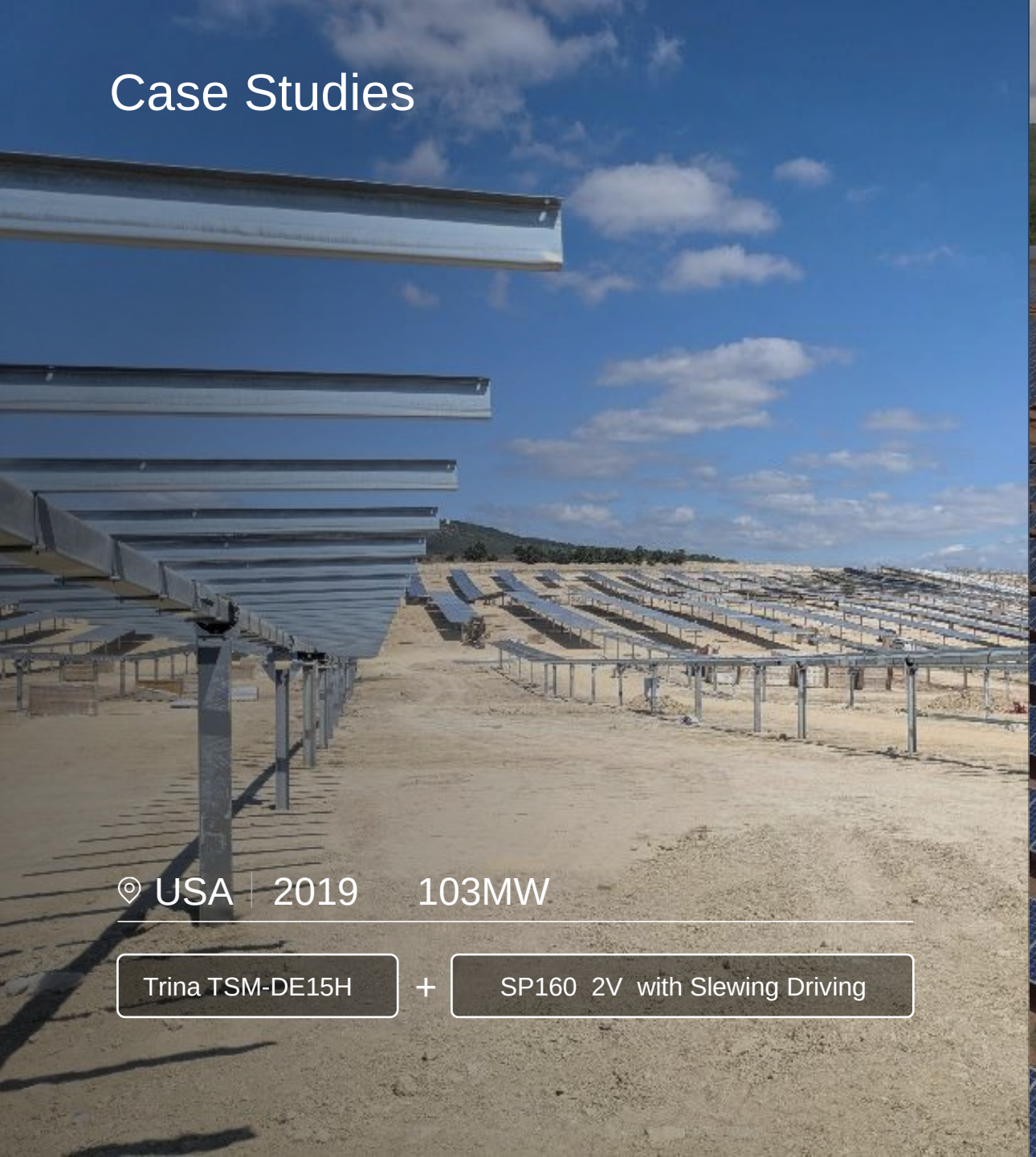
N Bifacial + SP160 + String Inverter

Golmud,China 2018 5MW

Bifacial + SP1000 + String Inverter

Case Studies

TrinaPro Mega



USA | 2019 103MW

Trina TSM-DE15H + SP160 2V with Slewing Driving

Mexico | 2019 23MW

Trina TSM-DEG14H.20(II) + SP1000

Project case

TrinaPro Mega

Chile 2019 3MW

Trina TSM-PE14A + SP160 2V

Brazil 2019 15MW

Trina + SP160 2V

Chile 2019 100MW

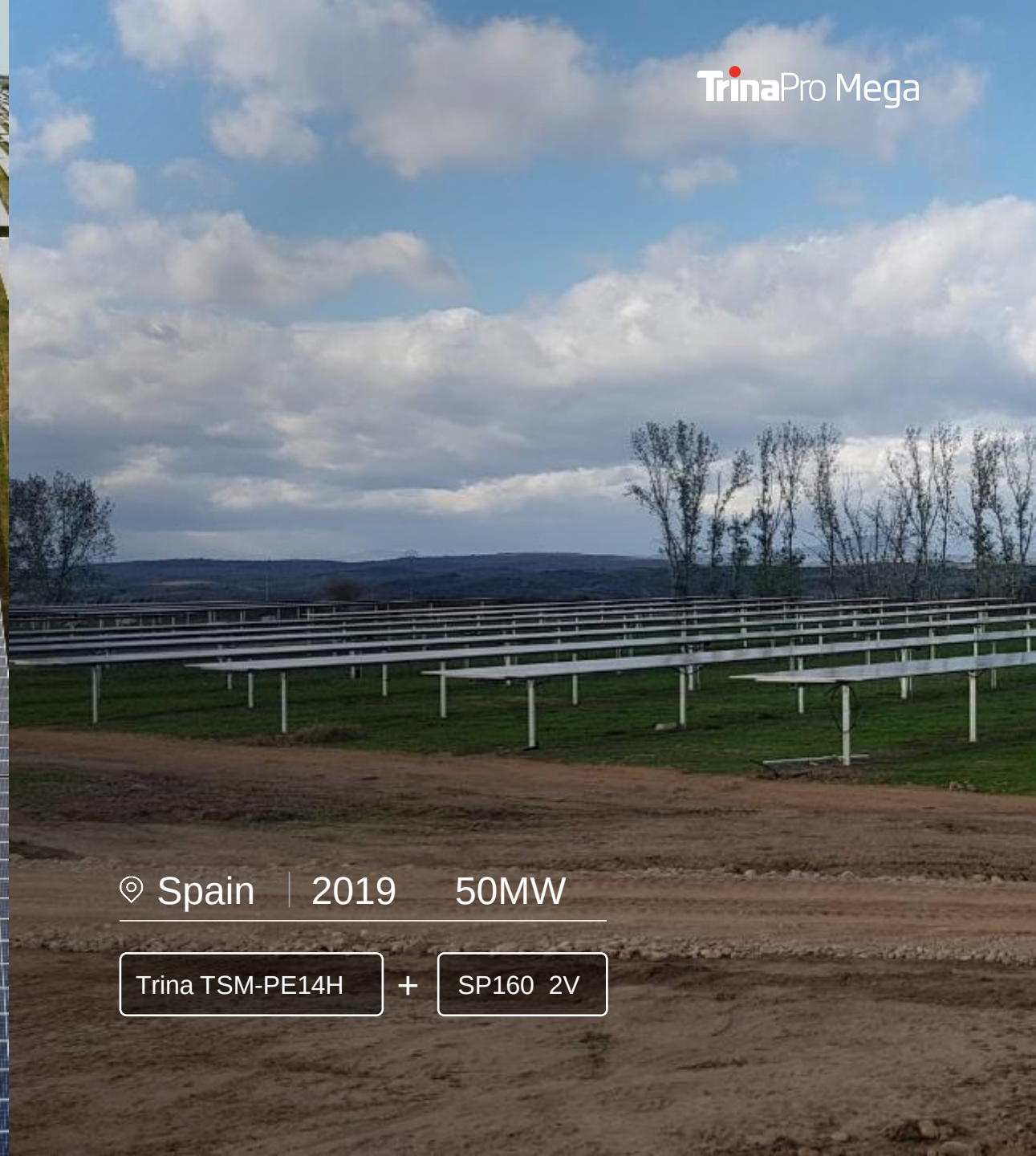
Trina TSM-PE15H + SP160 2V

Project case

TrinaPro Mega

Spain | 2018 | 190MW

Trina + SP160 2V

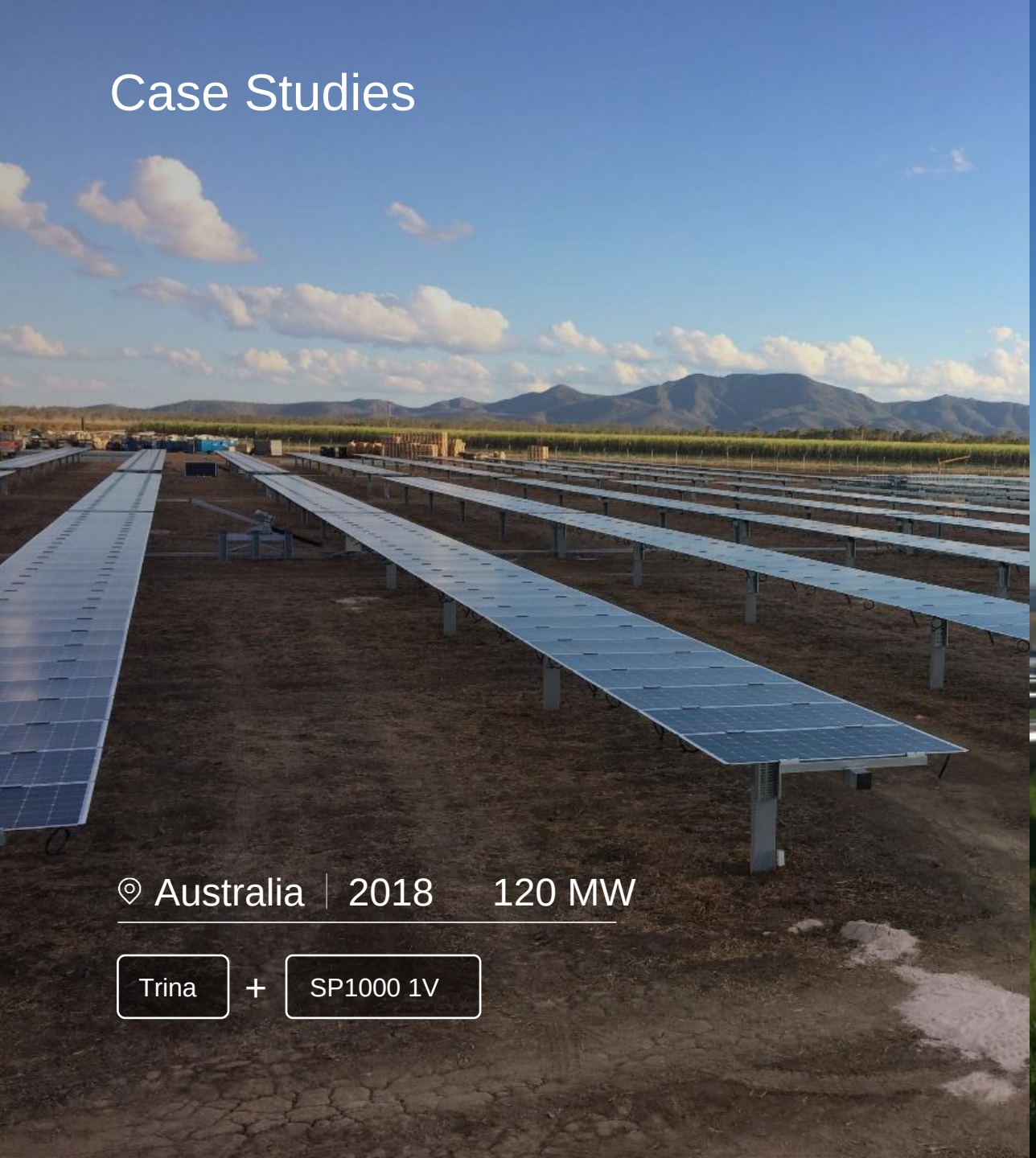


Spain | 2019 | 50MW

Trina TSM-PE14H + SP160 2V

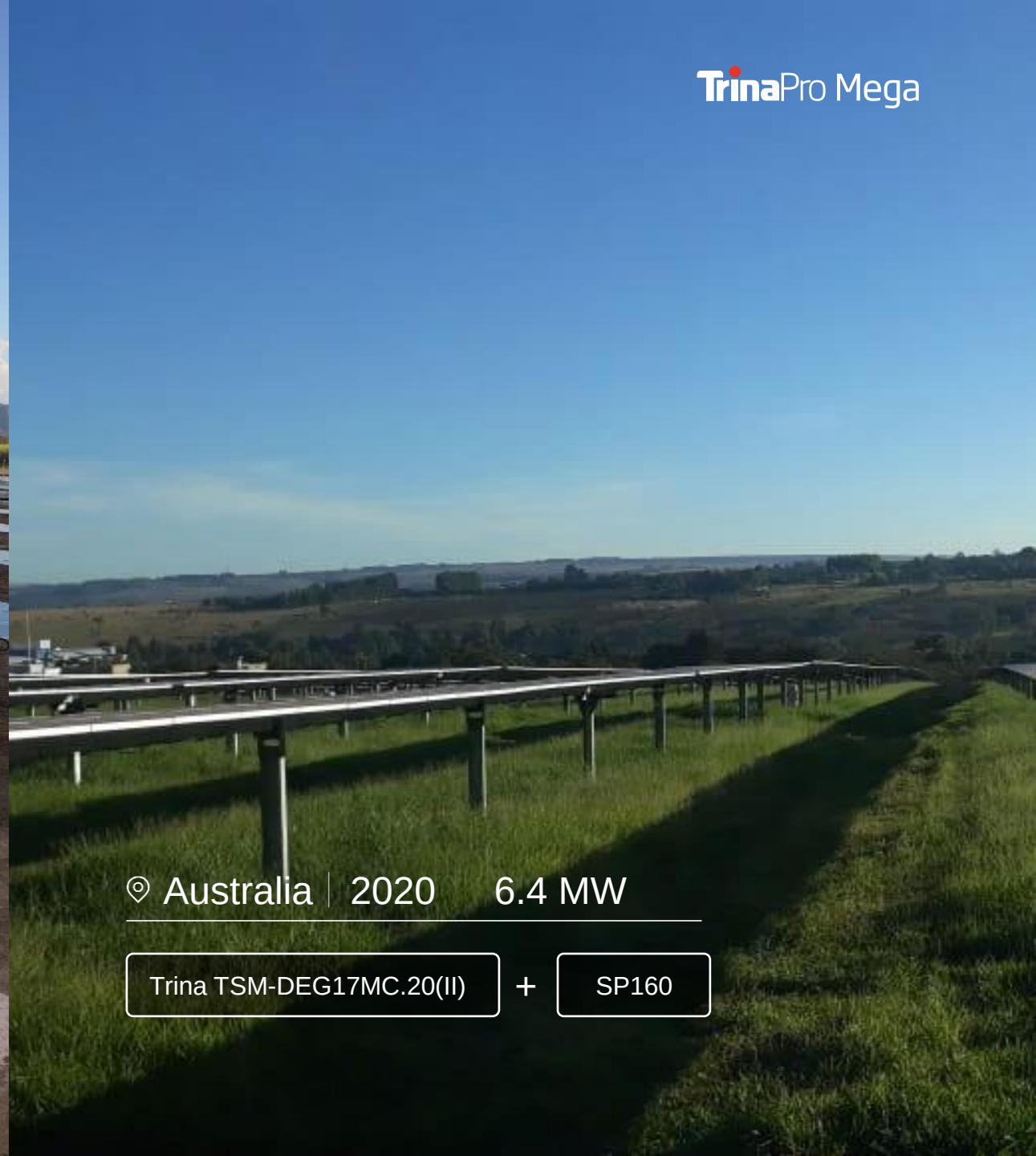
Case Studies

TrinaPro Mega



Australia | 2018 120 MW

Trina + SP1000 1V



Australia | 2020 6.4 MW

Trina TSM-DEG17MC.20(II) + SP160

TrinaPro Mega

The Highest, Most Assured Long Term Energy Outcome for IPPs

Andrew.Gilhooly@trinasolar.com