

Trinasolar | TrinaPro Mega

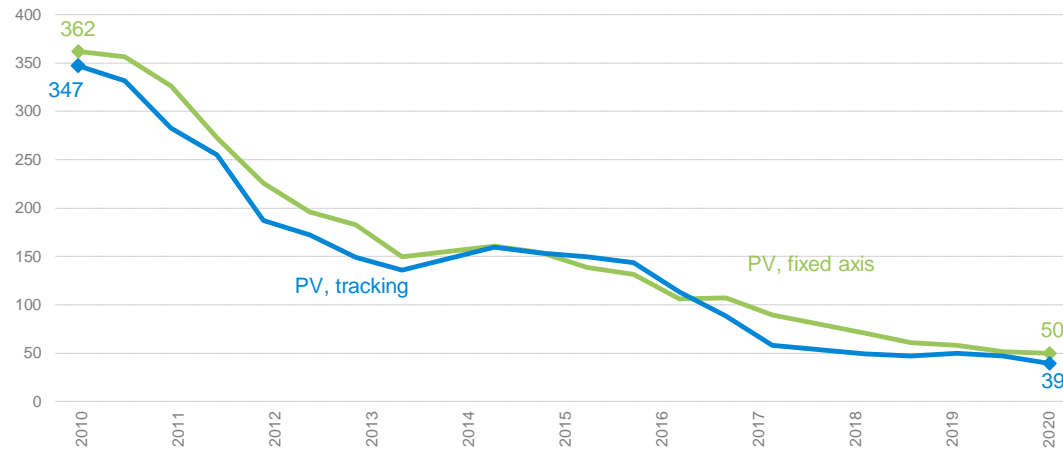
pV magazine

TrinaPro Mega Introduction

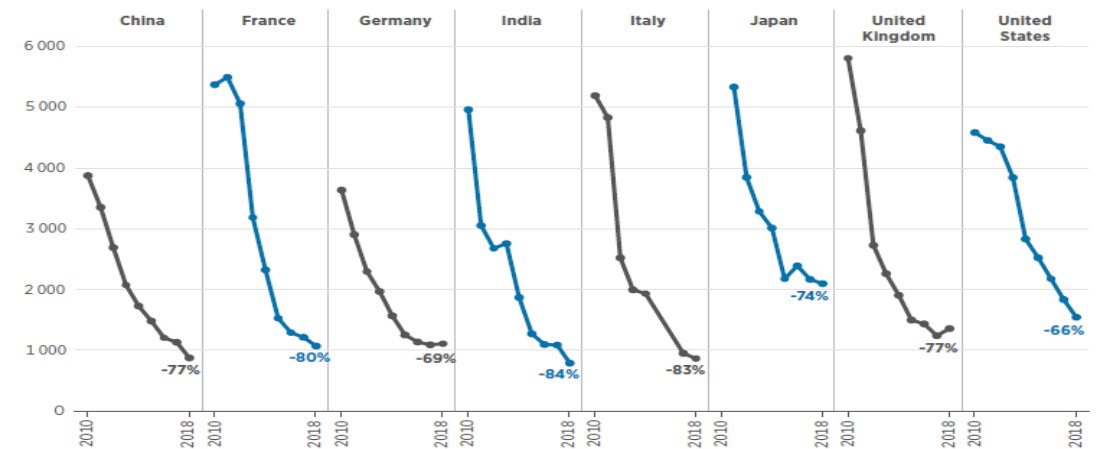


LCOE reducing

Global average LCOE \$/MWh



LCOE reduction is becoming trend globally



Bid price- 2019

Country	Capacity	2019 Bid price (cent/kWh)
Greece	143MW	6.970
Germany	162MW	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

Challenges in Australian Big Solar

Long read: Faltering grid curtails, delays, stalls solar

Australia's surge in utility-scale solar and wind – some 4.4 GW in 2020 – has overwhelmed the grid. Further 3.5 GW expected in 2021 – has overwhelmed the grid. Innovations spurred by a recent drought in New South Wales will help crack the grid.



SOLAR ▾ RENEWABLES ▾ STORAGE ▾

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.

Covid-19 to pause gigawatts of solar project in Australia

The pandemic will postpone or cancel the wind in Australia, according to Norwegian consultancy Rystad Energy. Australian dollar renders projects uncompetitive. The project will be New South Wales.



SOLAR ▾ RENEWABLES ▾ STORAGE ▾

Lawyers' picnic, and \$47m at play, as Sunraysia solar farm faces further delays

Covid-19 to wreck economics of new solar and wind projects

While the full extent of the impact of the Covid-19 pandemics on the renewable energy market is yet to reveal itself, Norwegian consultancy Rystad Energy predicts new solar and wind projects will grind to a halt this year and experience a ripple effect in the years beyond as currencies across the globe continue to fall against the US dollar.

- EPCs transferring connection risks back to IPPs/Developers
- Sites becoming increasingly challenging - EPCs becoming more selective
 - Geotech
 - Topography
 - Flood
 - Remote location
 - Schedule (Covid, union issues etc)

UK infrastructure investor suffers big losses from two Australia solar farms

Giles D... Bloomberg

the post COVID-19 economy. Enable desktop notifications.

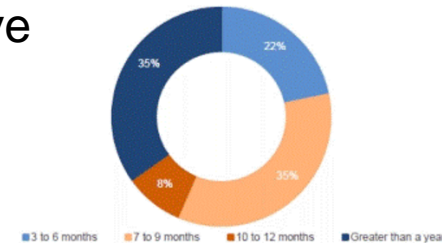
Share f t in g+ e

Economics

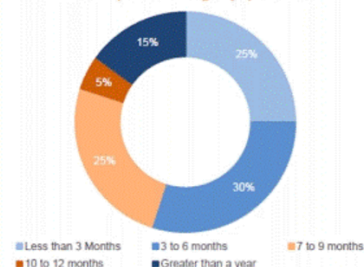
Australians Love Rooftop Panels. That's a Problem for Big Solar

CONNECTION DELAYS

Typical timeframe from Connection Application to Offer to Connect



Typical timeframe from Construction Completion to passing 100% hold-point and being fully operational



A Considerable Opportunity still remains



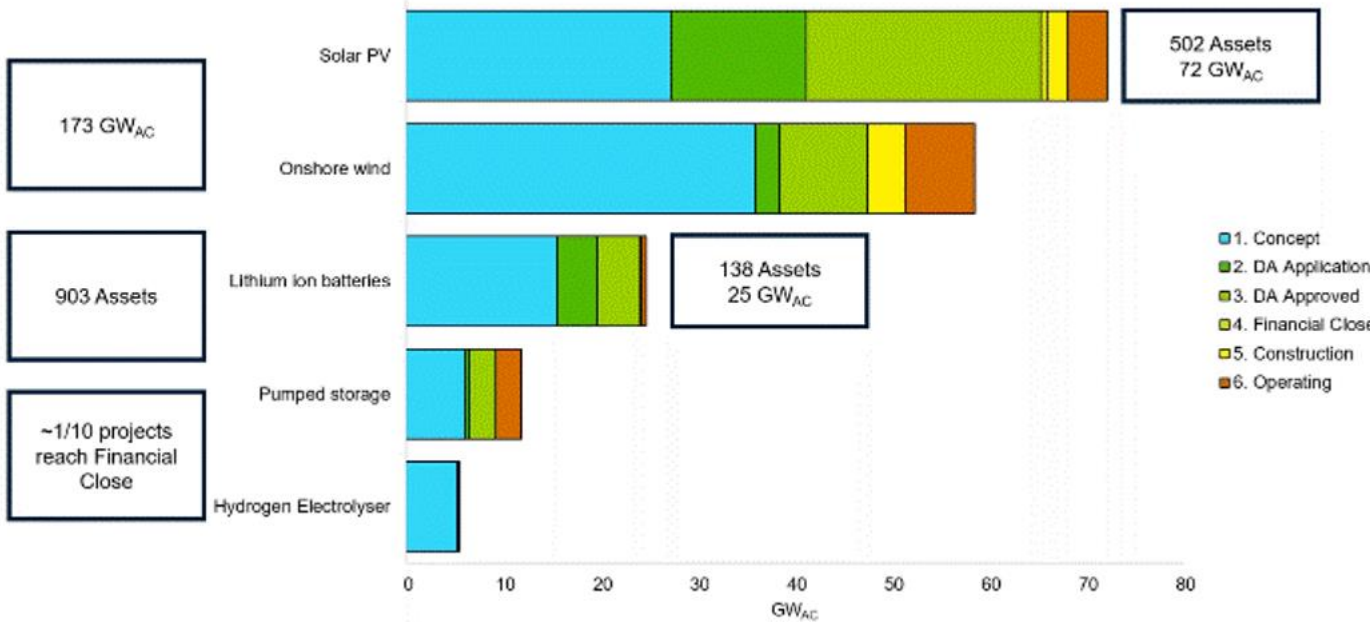
NSW first renewable zone attracts stunning 27GW of solar, wind, storage proposals

Australia utility PV, wind and storage pipeline: 9/7/2020

Australia's renewables pipeline continues to grow at record speed led by solar PV

NSW to go 'even bigger' with second, 8GW renewable energy zone

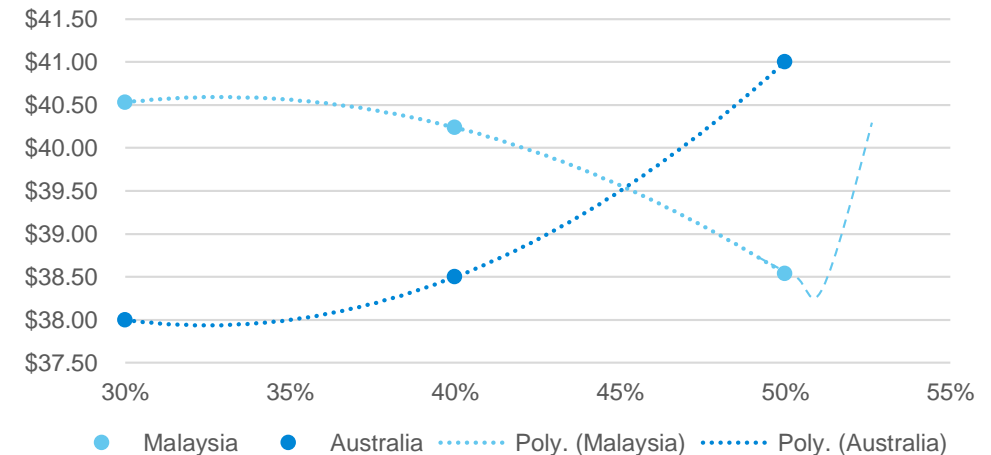
By Jules Scully | Jul 13, 2020 11:46 AM BST



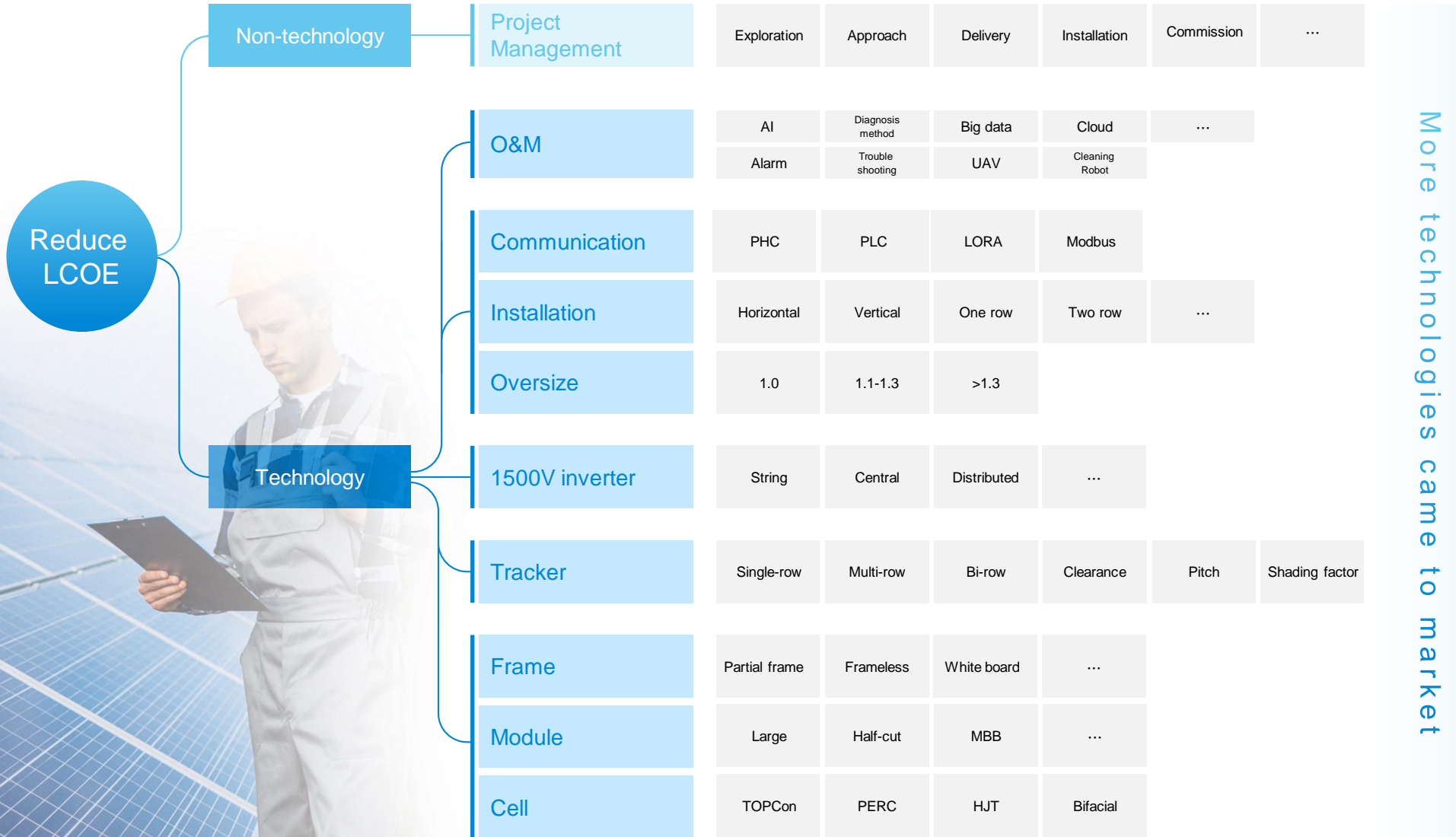
Source: Rystad Energy RenewableCube

- To unlock this pipeline, aside from solving connection/grid and investor misgivings we need to continue to innovate to simplify engineering and de-risk construction
- Tracking at wide GCR exacerbates site risk

Chart of GCR vs LCOE - Australia vs Malaysia



Making the Complex Simple



Owner & EPC

Product selection is more complicated

More suppliers participate in design

The design is more complicated

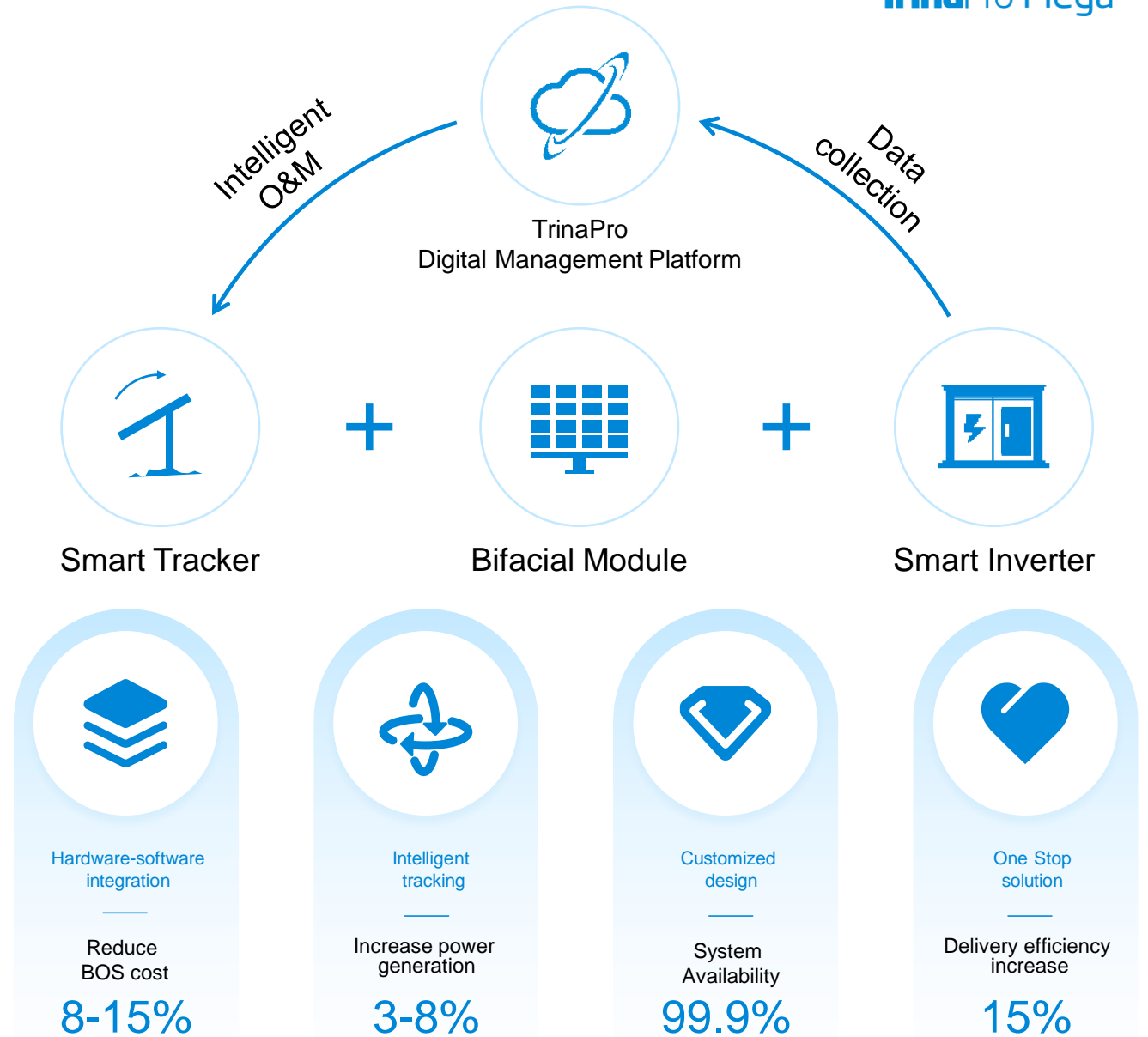
Operation and maintenance are more complicated

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 .



TrinaPro Provide solution for Multi-Scenarios

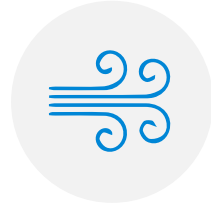
TrinaPro Mega
EZ serie

Easy

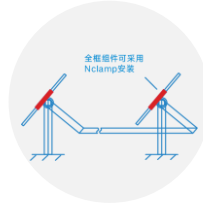
The most cost-effective
plan for flat land



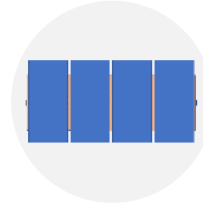
Overall slope
 $\leq 6\%$



Mid-high wind speed
 $> 45\text{m/s}$



SP1000
multi-row



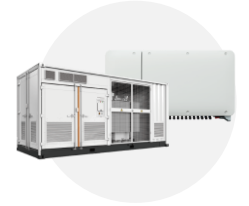
1V



Mono-facial
400~605Wp



Bifacial
400~600Wp



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

TrinaPro Mega
Plus serie

Plus

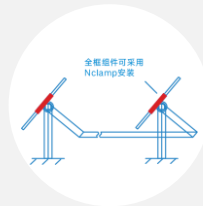
High slope adaptability
high wind resistance



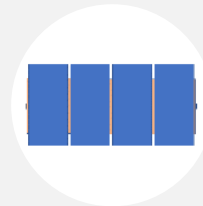
SN slope $\leq 16\%$
NW slope $\leq 8\%$



Mid-high wind speed
 $> 45\text{m/s}$



SP240
(2 rows)



1V



Mono-facial
400~605Wp



Bifacial
400~600Wp



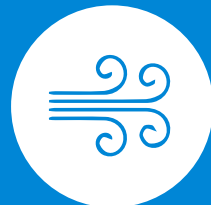
String inverter
180-250kW

TrinaPro Mega

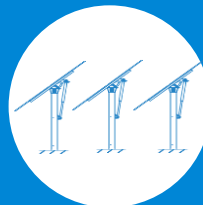
Ultra High Power
Solution under Grid
Parity Era



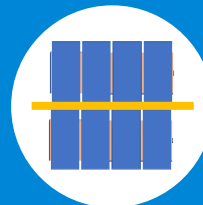
SN slope
 $\leq 16\%$



Mid-low wind speed



SP160 LIZA
(1 row)



2V



High efficient Bifacial Module
400~600Wp



String inverter
180-250kW

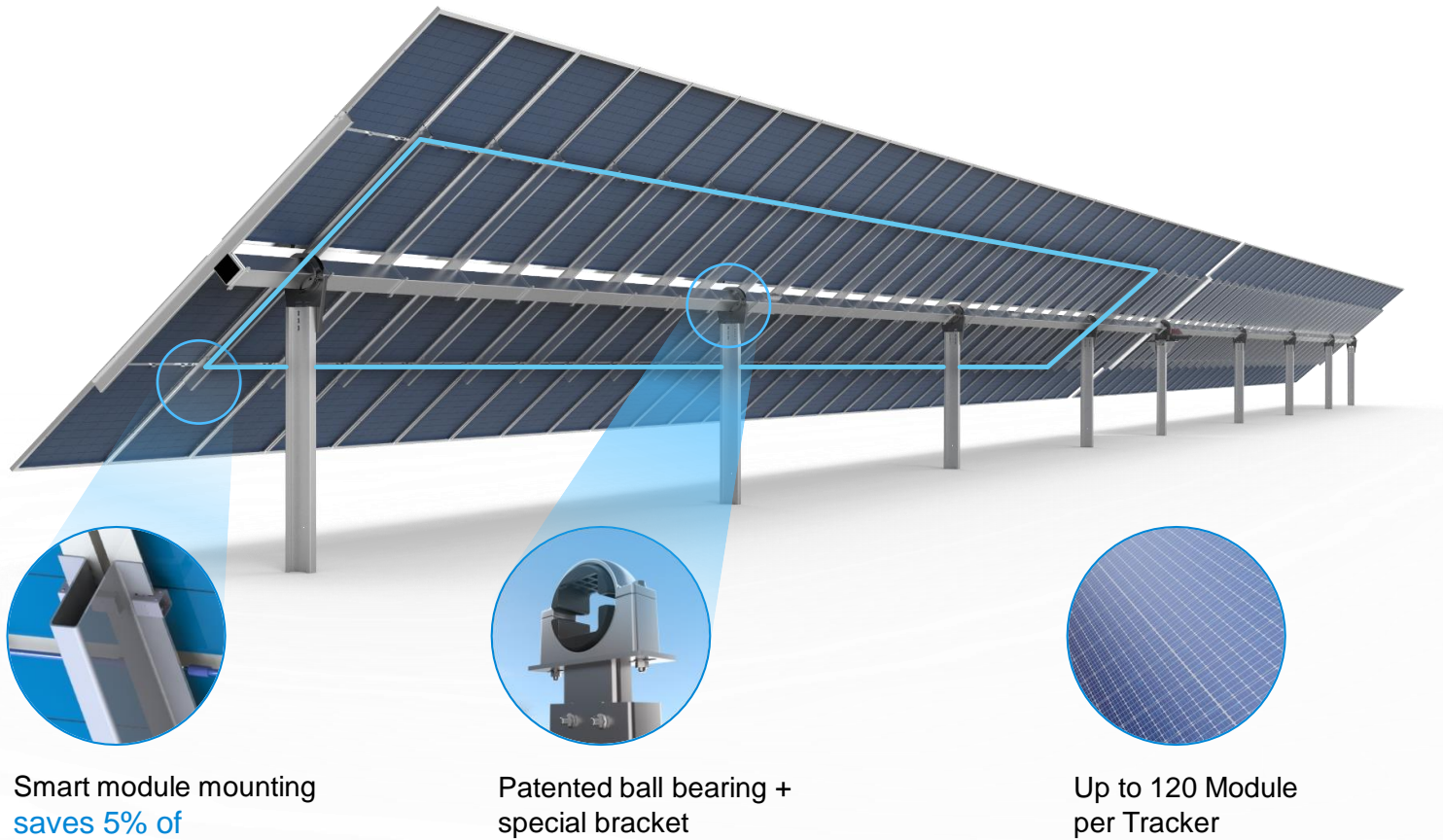
Core components-TrinaPro Mega (SP160)

TrinaPro Mega

Smart-tracking extra power gain 3~8%

Larger Modules 210mm wafer size

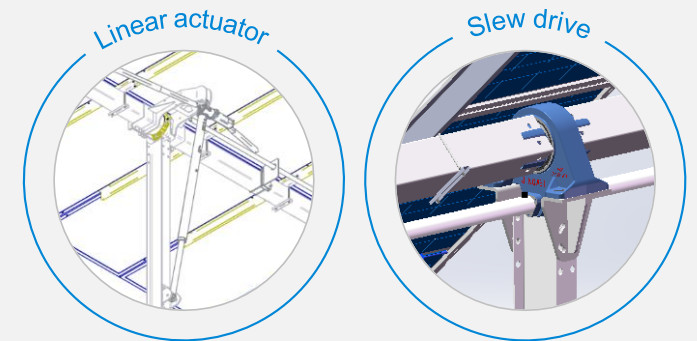
Unique cable arrangement Reduces cable usage and labor



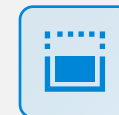
Smart module mounting saves 5% of installation cost

Patented ball bearing + special bracket Adapt to more terrain (16% NS)

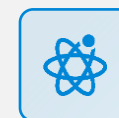
Up to 120 Module per Tracker >20% fewer piles



Multi- drive more stable in galloping/flutter



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



More options of driving system More flexible

Extensive Verification for 210mm Wafer modules

Increased module size and weight requests higher static mechanical bearing capacity and dynamic running stability of the tracker system



Higher static mechanical bearing capacity



Dynamic running stability



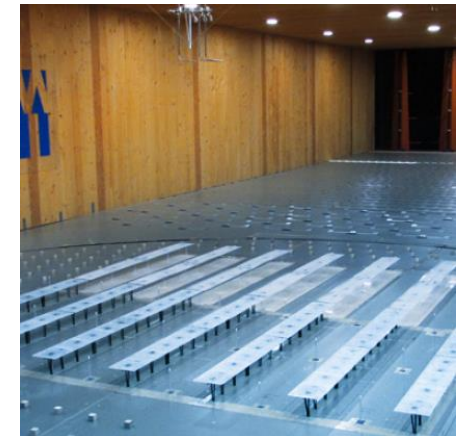
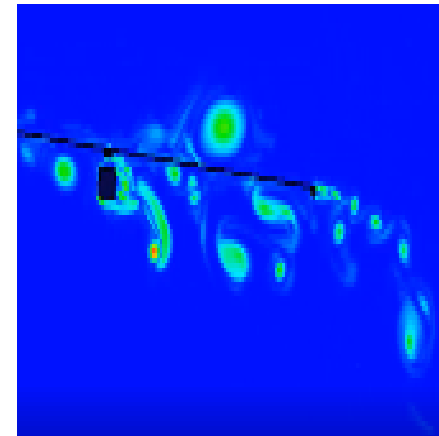
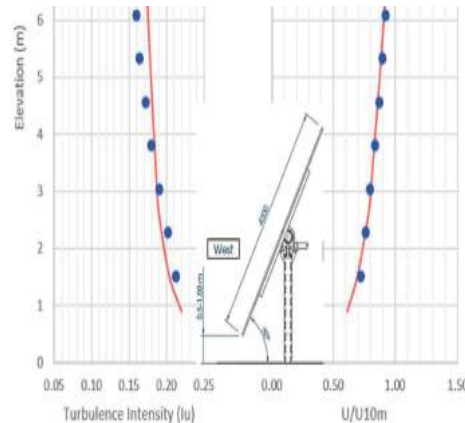
Multiple drive, Accurate synchronization
More stable



wind tunnel test of a world-renowned laboratory
More trustworthy

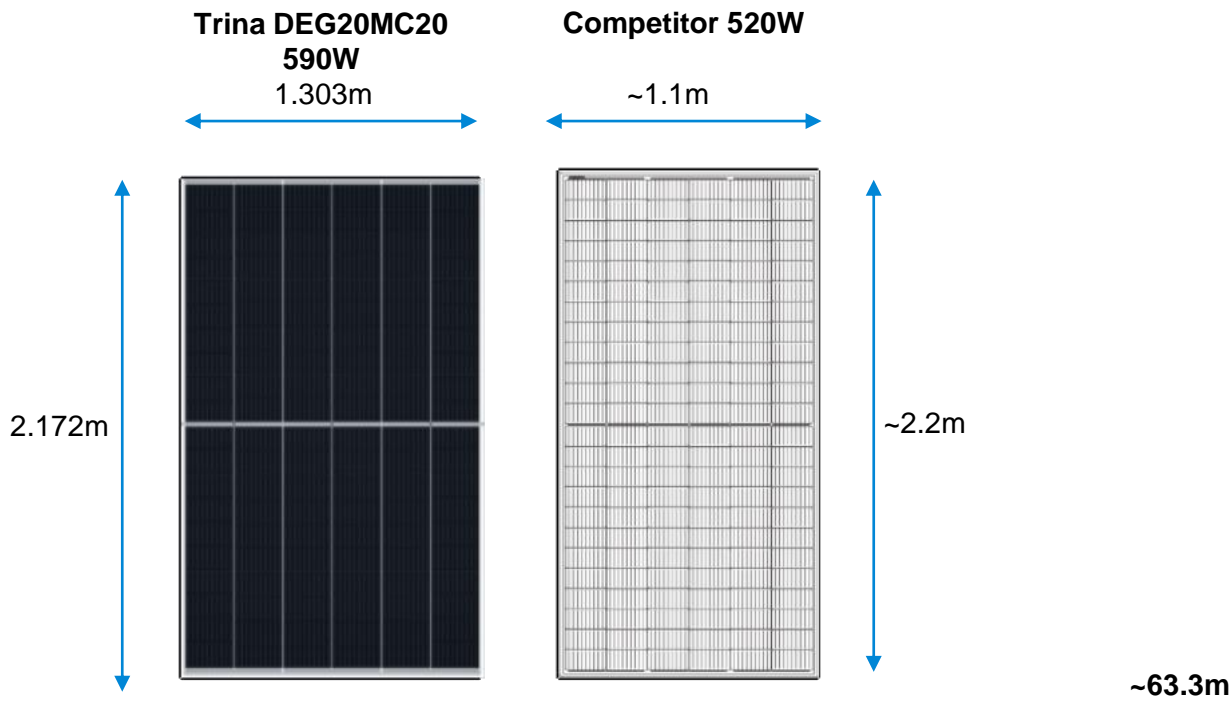


Adapt to 1.5 times load and test standards
Ensure structural reliability

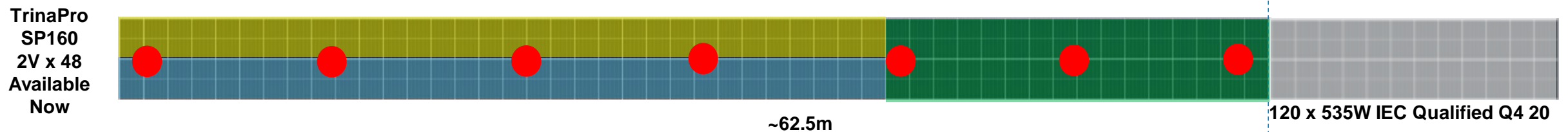
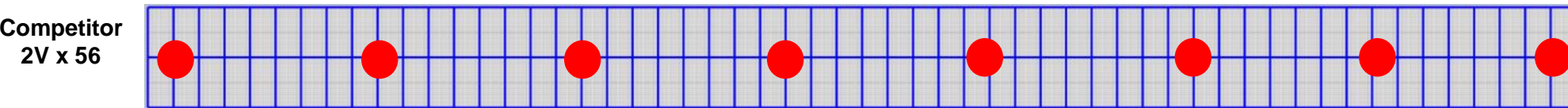


Laboratory test

Impact of Higher Module Wattage and Low Voc on BOS

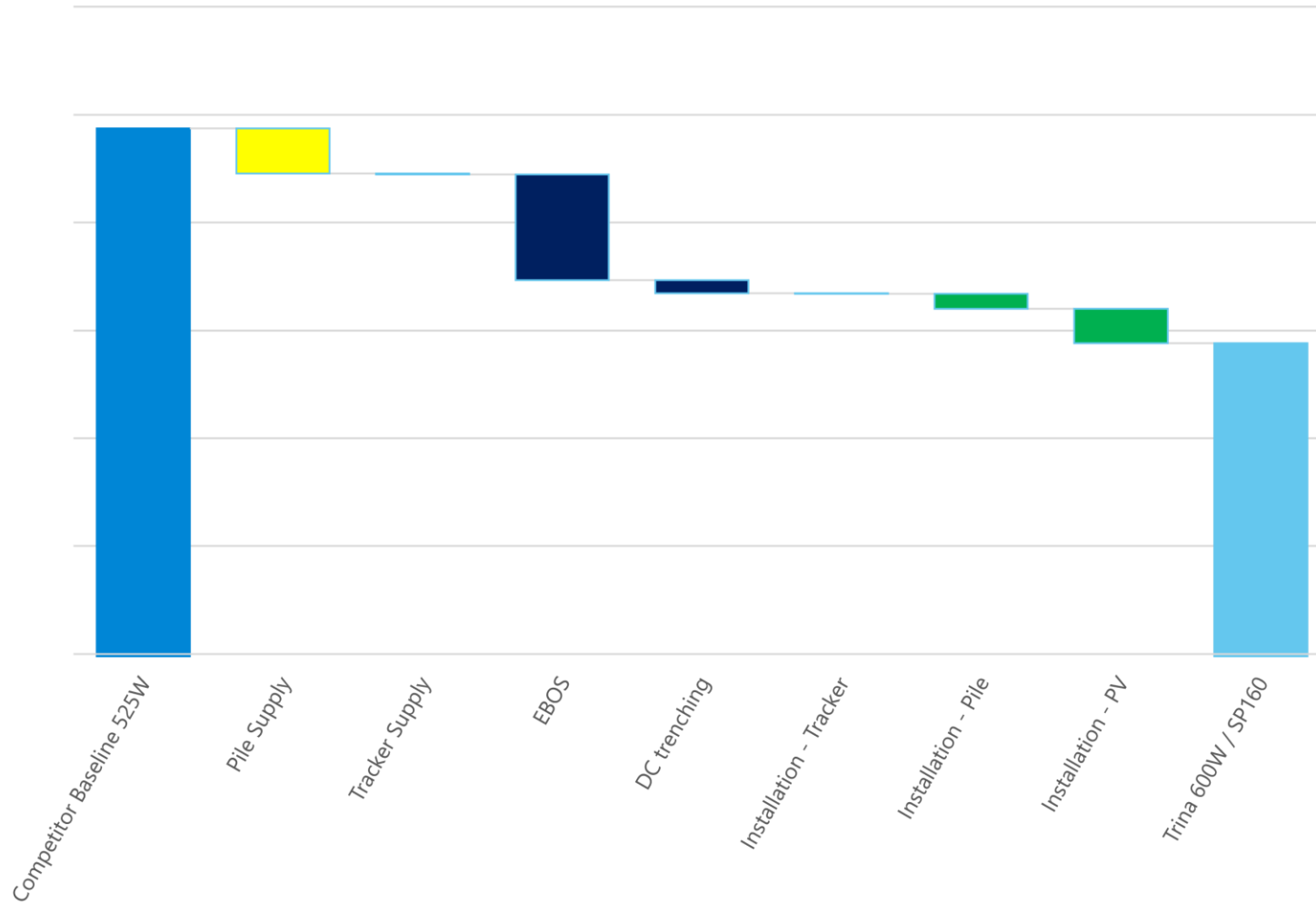


	Trina 500W	Competitor 520W	Trina 590W
Module Wattage	500	520	590
Module Voc	51.7	48.9	41.3
Module Area sqm	2.41	2.50	2.83
Power Density W/m2	207.5	208	208
Modules per String	28	28	32
Strings per Tracker	3	4	3
Modules per Tracker	84	112	96
kWp per tracker	42.0	58.2	56.6
Piles per MWp	169	137	124
Piles per Tracker	7	7 inner / 9 outer	7
100MWp SA Project			
Total Piles	16,900	13,736	12,359
Total Strings	7,143	6,868	5,297
Capex Saving USD/Wp		-\$0.0094	-\$0.0199
Capex Savings		-1.37%	-2.90%



Up to 160 x 590W per tracker 2H 2021...

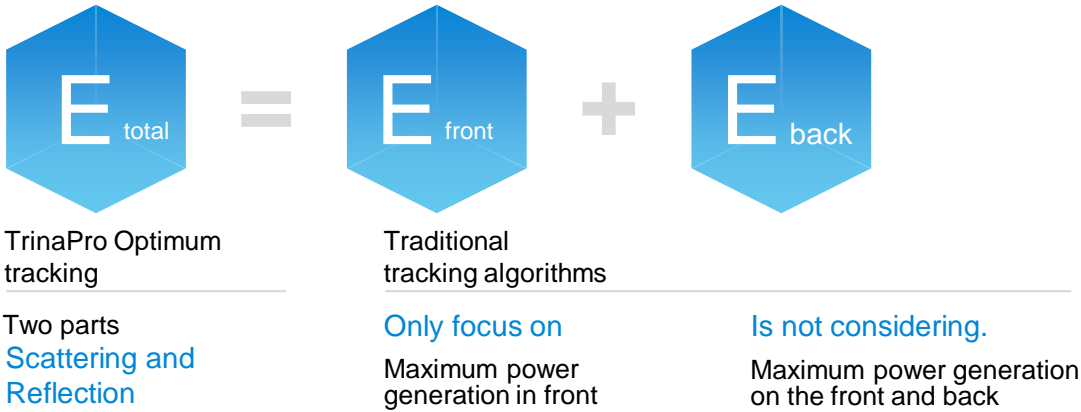
Impact of Higher Module Wattage and Low Voc on BOS



- Total capex saving USD1.05c/Wp
 - Component cost 21%
 - EBOS and Trenching 55%
 - Installation 23%
- 1.4% lower Capex
- Reference Project 128MWp Australia, 50% predrill/backfill piles

Smart tracking-Bifacial algorithm

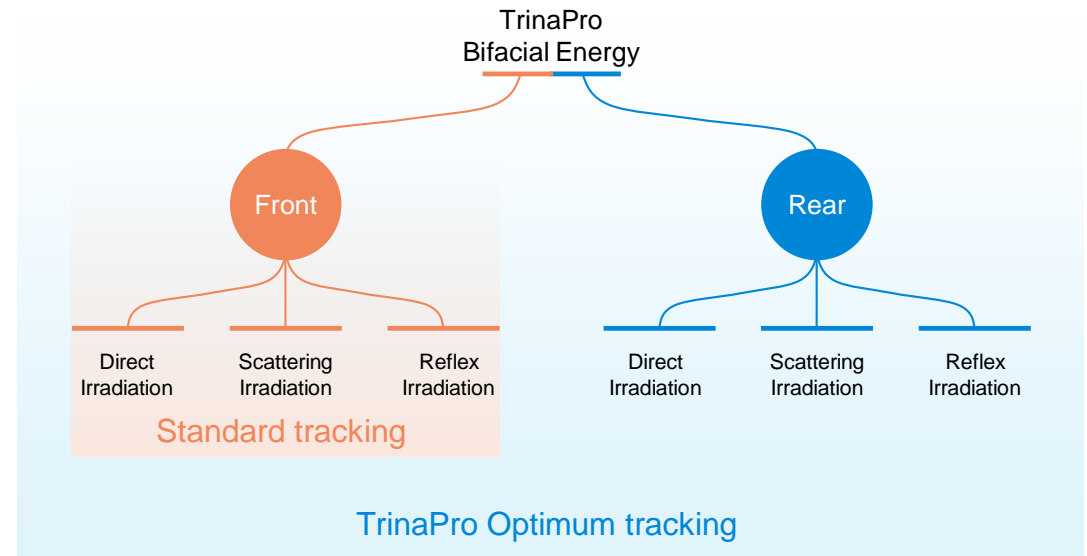
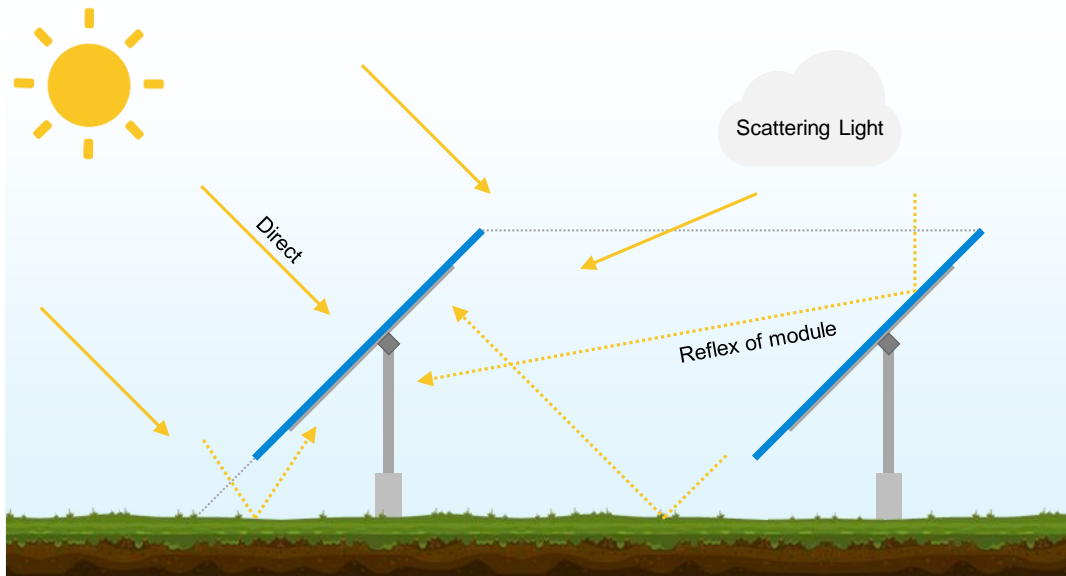
Standard tracking algorithms are not optimised for bifacial systems



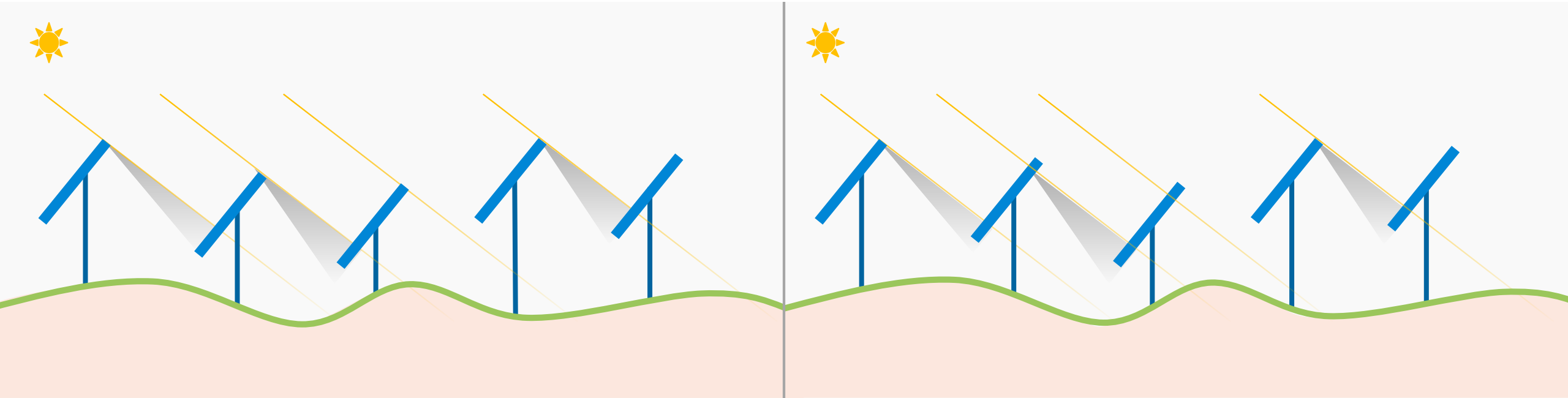
tracking algorithms



The TrinaPro AI Machine Learning algorithm can increase power generation by **1%-2%**



Smarter brain : Smart tracking-Backtracking



Smart backtracking

Self-adjusting according to terrain
Adapting to different slope

Avoid front and back
Shadow masking

VS Conventional Design



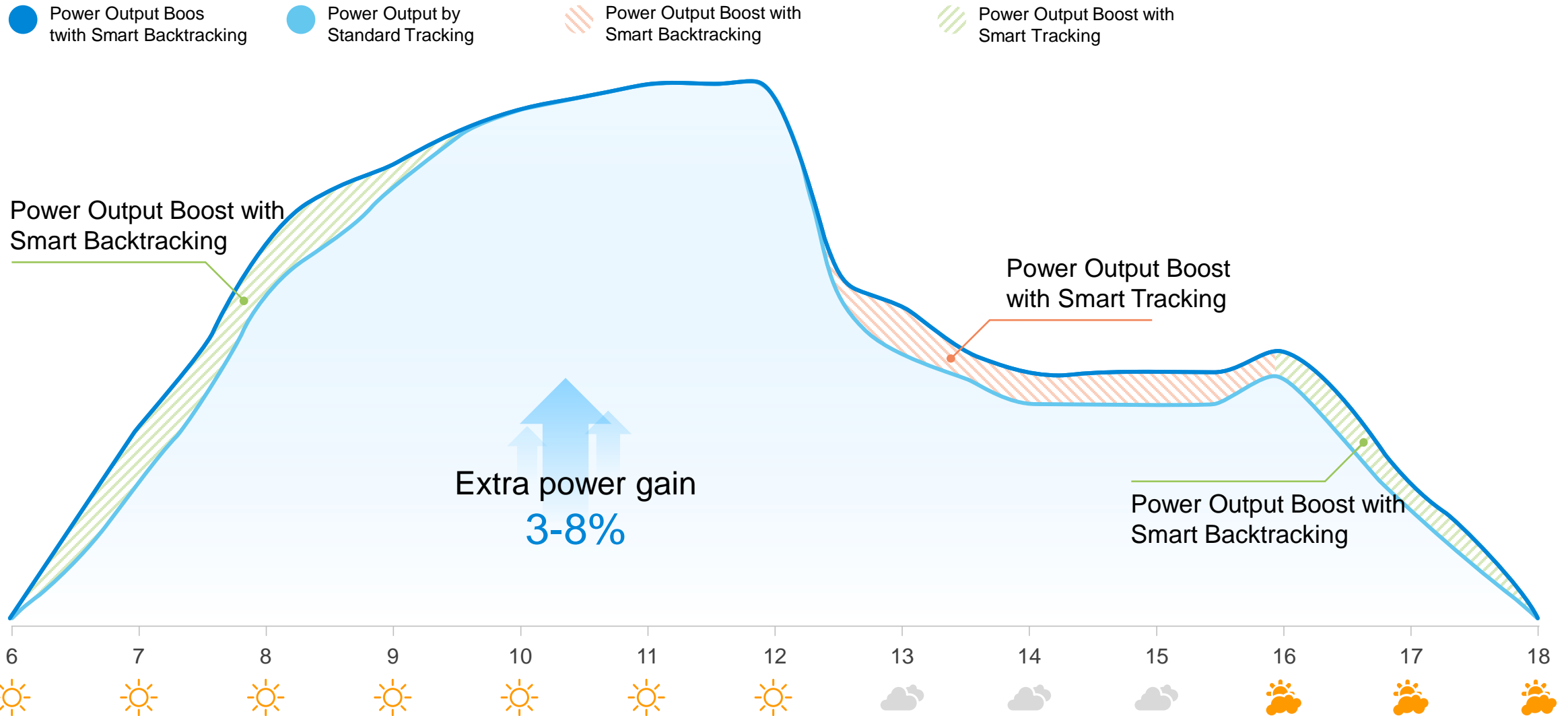
Further reduce LCOE
\$0.6/kWh



Increase power generation
2.7%+

TrinaPro smart tracking algorithm

TrinaPro Boosts the Energy Production With Smart Tracking & Smart Backtracking

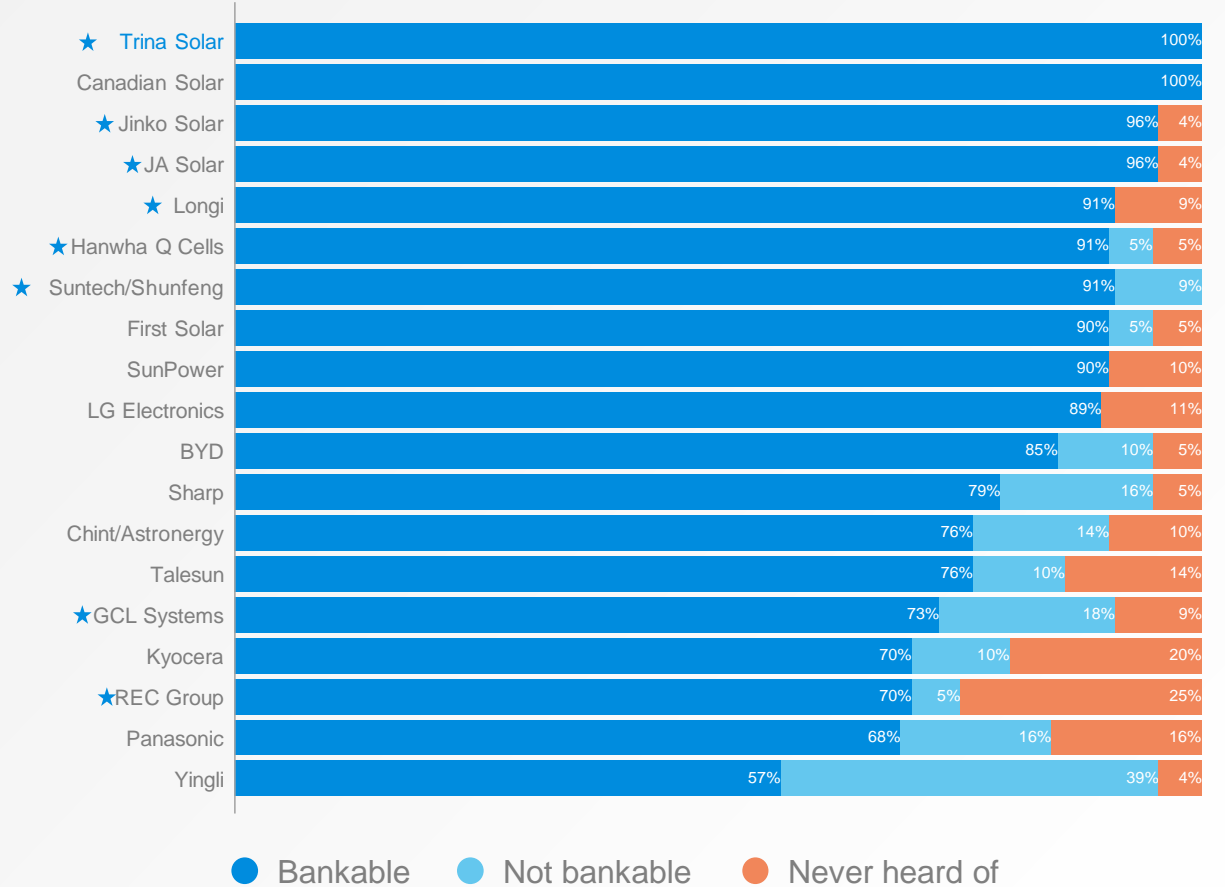


Unrivalled Bankability of Holistic Solution

Top Bankable Module Supplier

2016 — 2020

System-level endorsement

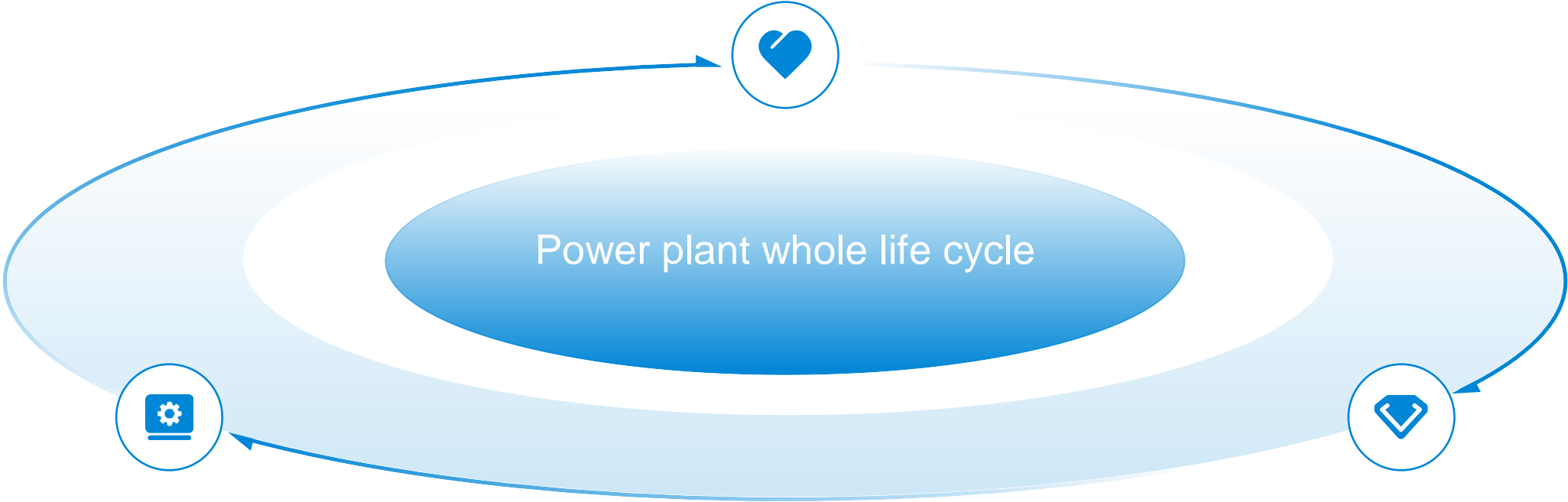



Source: BloomberNEF 2019

Integrative System Unlocks Value Add Support

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

Delivery and Service



Design and Engineering

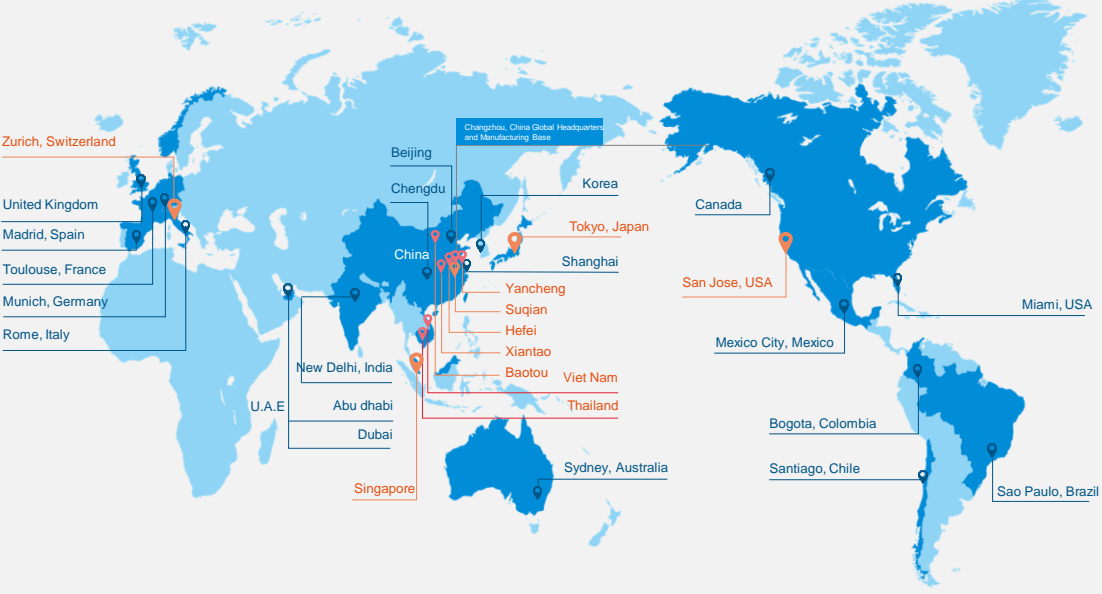
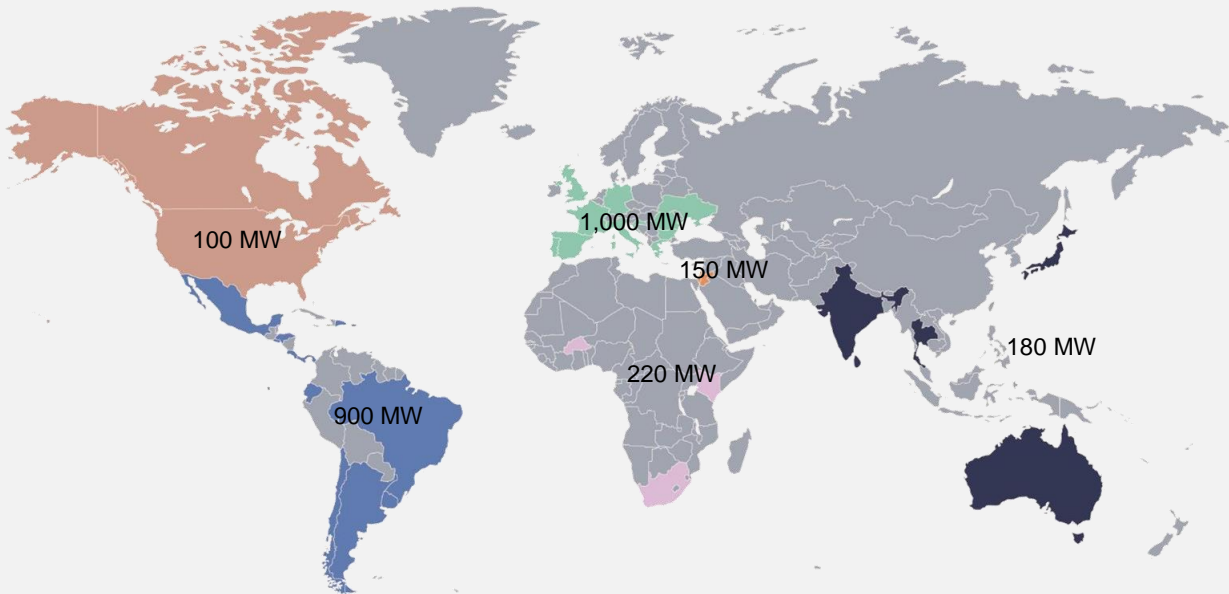
- Layout Optimisation
- Yield Assessment
- IRR calculation
- Topo and Geotech Support

Operation and Maintenance

- Cloud based Monitoring
- Remote Control
- Remote Fault Alarm
- Robotic Cleaning
- Drone Inspection

TrinaPro Accomplishment

Global projects planning , Global service capability



>5 GW
Global Installation
+ 1 GW signed projects in 2019

+ 300
Tracker projects

+ 200
Countries

+ 13,000
employee

Project case



📍 China | 2019 30MW

N Bifacial + SP160 + String Inverter



📍 Golmud,China 2018 5MW

Bifacial + SP1000 + String Inverter

Project case



📍 USA | 2019 | 103MW

Trina TSM-DE15H

+

SP160 2V with Slewing Driving

TrinaPro Mega



📍 Mexico | 2019 | 23MW

Trina TSM-DEG14H.20(II)

+

SP1000

Project case

TrinaPro Mega

📍 Spain | 2018 | 190MW

Trina + SP160 2V

📍 Spain | 2019 | 50MW

Trina TSM-PE14H + SP160 2V

Project case

TrinaPro Mega



📍 Australia | 2018 120 MW

Trina + SP1000 1V



📍 Australia | 2019 6.4 MW

Trina TSM-DEG17MC.20(II) + SP160

TrinaPro Mega

Maximise your Energy Generation and Adaptability
For enquiries 10MW and above please contact
andrew.gilhooly@trinasolar.com

