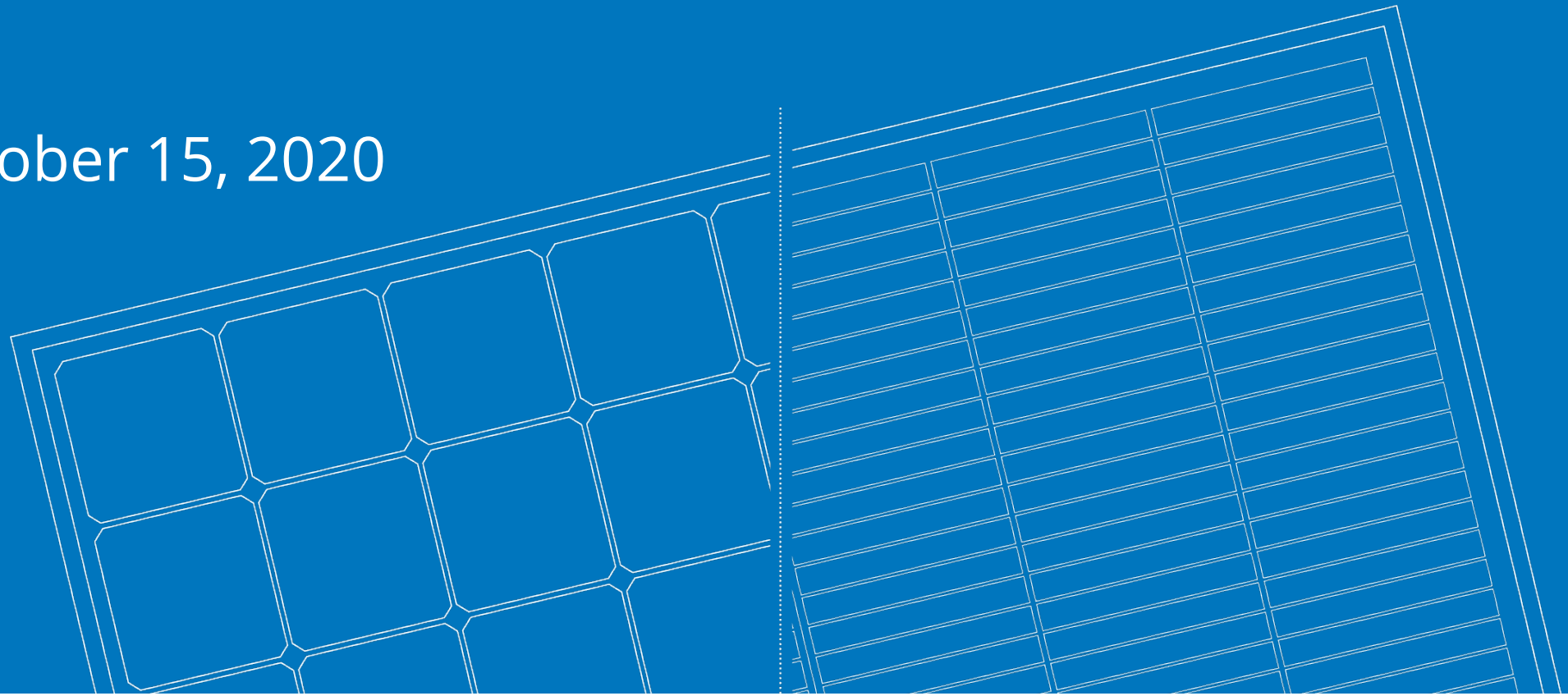
MAXIMISING RETURNS OF LARGE-SCALE SOLAR INSTALLATIONS

October 15, 2020



SUNPOWER | FROM MAXEON SOLAR TECHNOLOGIES

AGENDA

- Introduction: Maxeon Solar Technologies
- Impacts of reliability and quality
- Impacts of larger, more powerful solar panels
- Let’s crunch the numbers
- Conclusion

Sevi Gultes
Application Engineer - Maxeon Solar Technologies

MAXEON SOLAR TECHNOLOGIES

SUNPOWER | FROM MAXEON SOLAR TECHNOLOGIES

COMPANY OVERVIEW

HQ in Singapore
NASDAQ (MAXN)

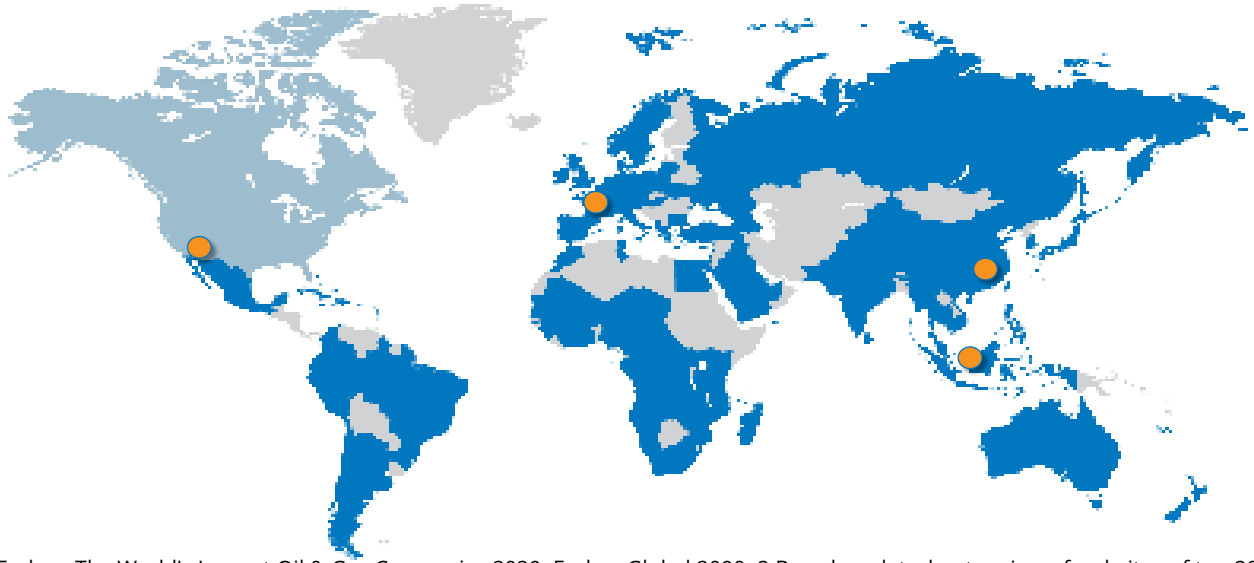
5,000 Employees
In 14 Countries

$1.2 Billion
Net Revenue (2019)

2.75 GW Manuf. Capacity
France, Mexico, China, Malaysia, Philippines

SunPower brand
Outside of the USA

#1 Shareholder is Total S.A.,
a $150 Billion energy company.[1]



Residential Solar

Commercial Solar

Solar Power Plants

1 Source: Forbes, The World's Largest Oil & Gas Companies 2020. Forbes Global 2000. 2 Based on datasheet review of websites of top 20 manufacturers per IHS, as of Jan, 2020.

MAXEON BENEFITS FROM STRONG STRATEGIC PARTNERSHIPS

SUNPOWER® Corporation

maxeon

Industry-Leading Solar Manufacturer with Global Customer Base

- Capital to accelerate scale-up of Maxeon 5
- Strong access to low-cost Asia-based solar supply chain
- Strategic supply relationships - New SunPower, TZS
- Differentiated product platforms with compelling future roadmap
- Strong global channels and brand

TOTAL

- Strong support for SPWR since 2011
- Deep commitment to renewable energy
- Growing downstream global presence

Nasdaq

Public investors

TZS ZHONGHUAN SEMICONDUCTOR

- Leading global wafer supplier – 40GW
- Innovation leader - larger wafers (G12)
- China supply chain and market access

MAXEON HAS A DEEP GLOBAL POWER PLANT LEGACY

- Maxeon has extensive large-scale solar system domain experience
- More than 5GW of SunPower panels installed across 6 continents
- Deep understanding of value chain drivers — from EPCs and developers, to financiers, IPPs and investors
- Legacy downstream experience informs Maxeon product development & design

Bavaria Solar One, 2004

One of the industry's first power plants

10 MW, 1-axis tracking arrays

Solar Star, 2015

Largest solar project in the USA at 747 MW

1.7 million SunPower Maxeon panels installed

Santa Isabel, 2020

190 MW SunPower Performance panel project owned by Total

Limondale, 2020

Largest solar power plant in Australia at 349 MW

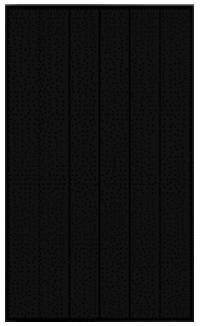
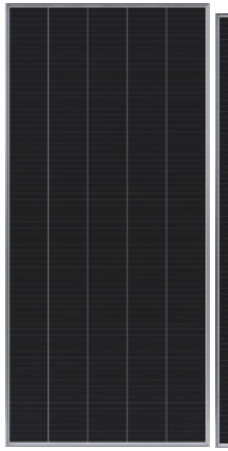
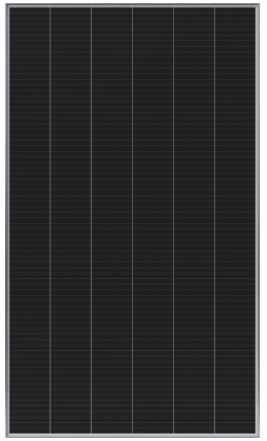
872,000 SunPower Performance panels installed

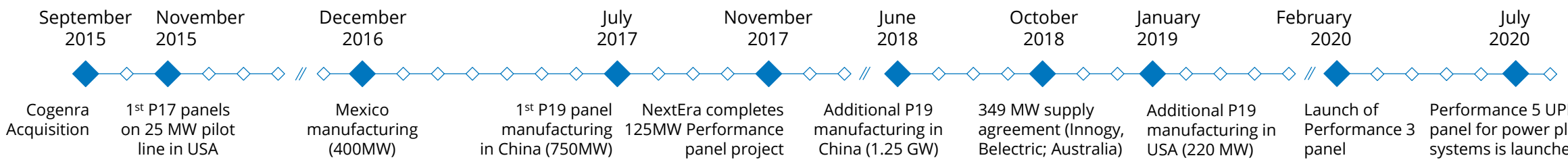
Note: Not an exhaustive illustration of SunPower PP projects

SUNPOWER | FROM MAXEON SOLAR TECHNOLOGIES

SUNPOWER PERFORMANCE PANELS

Proven in the field

2015	2018		2020			2021	
PERFORMANCE P17	PERFORMANCE P19		PERFORMANCE 3			PERFORMANCE 5	
							
P17 COM	**P19 COM**	**P19 BLK**	**P3 COM**	**P3 BLK**	**P3 UPP**	**P5 UPP**	**P5 UPP**
340-360 W	390-410 W	315-330 W	405-420 W	320-335 W	460-500 W	520-545 W	600 - 635 W



SUNPOWER | FROM MAXEON SOLAR TECHNOLOGIES

SUNPOWER | PERFORMANCE

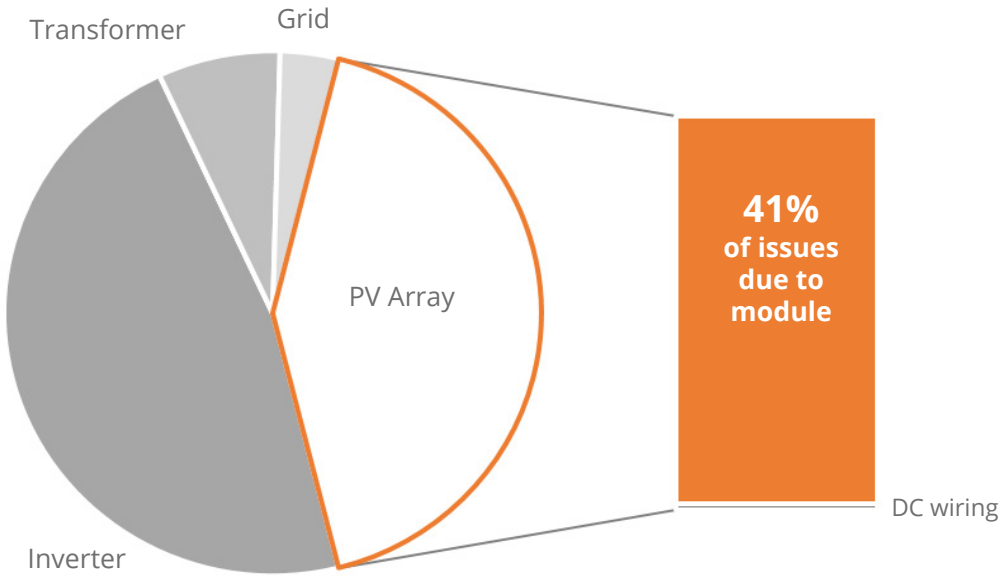
PANEL RELIABILITY IMPORTANCE IN LARGE SCALE SOLAR

RELIABILITY OF SOLAR POWER PLANTS

Panel reliability is an ongoing issue in the field

A recent study of EU powerplants found **41% of issues were caused by panels.**[1]

Power Plant Failures that Affect Production[1]

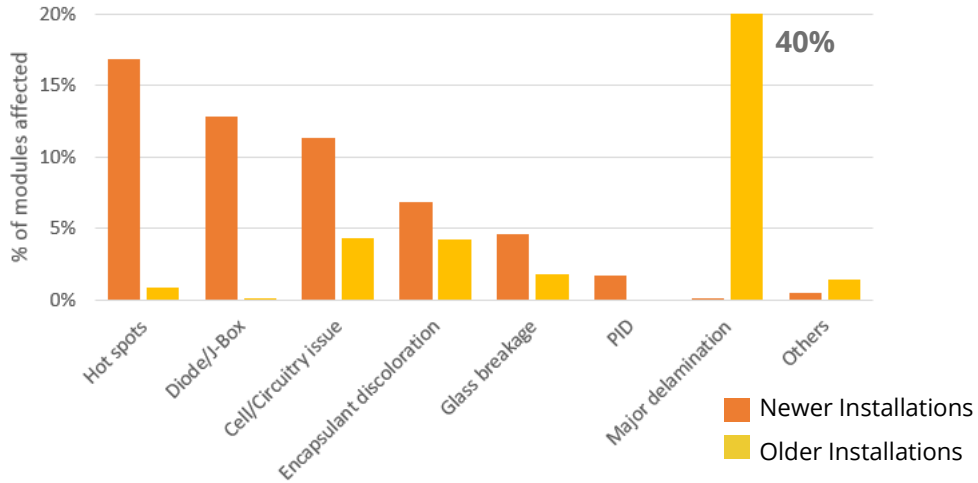


Newer panels show a higher occurrence of major panel issues like hotspots and diode failure.

The youngest group of panels, built during a period of intense cost pressure, shows:

- Increased hotspots
- Increased diode and J-box issues
- Increased cell circuitry issues
- Increased encapsulant issues
- Increased PID

Change in Degradation Mode by Module Age[1]



[1] Lillo-Bravo, et. al. "Impact of Energy Losses Due to Failures on Photovoltaic Plant Energy Balance." *Energies.* 2018.

[1] Jordan, et. al. "Photovoltaic Failure and Degradation Modes." PiP, 2017.

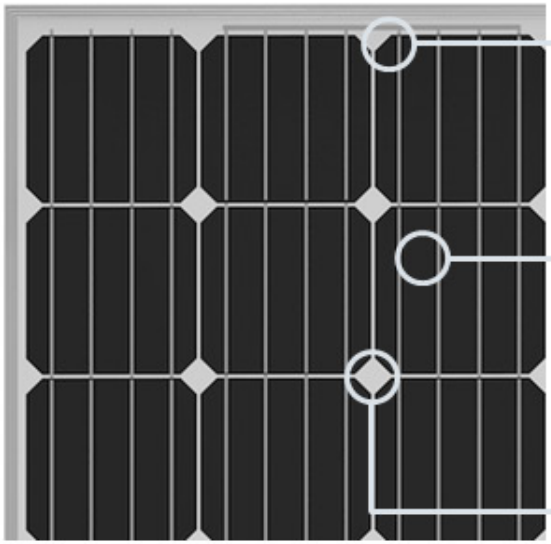
MAKING THE CONVENTIONAL, EXCEPTIONAL

Innovative shingled cell design uniquely engineered for the reliability and durability needs of power plant installations

Conventional

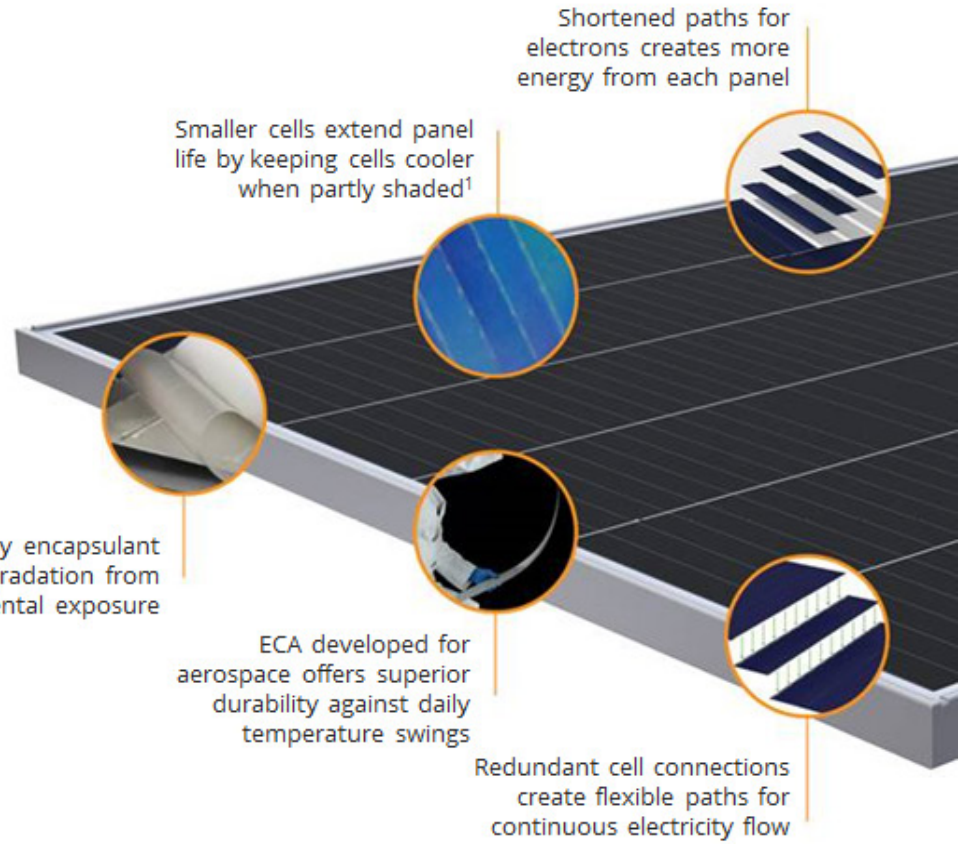
Vulnerable to Breakage & Corrosion

2x the connections in half cell panels



VS.

SUNPOWER® | PERFORMANCE

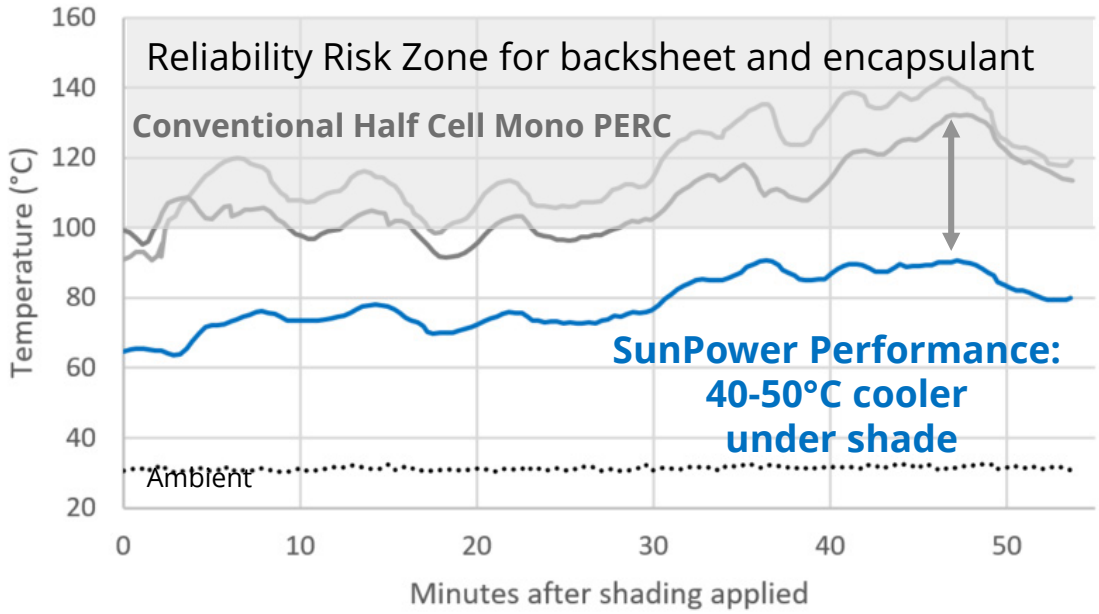


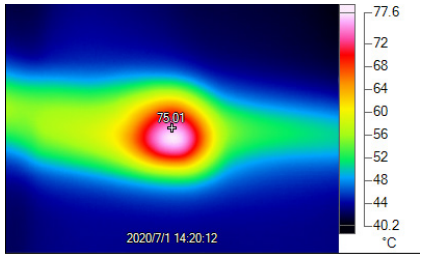
1 SunPower Performance Series – Thermal Performance, Z.Campeau 2016.

HOTSPOT PROTECTION THROUGH BETTER DESIGN

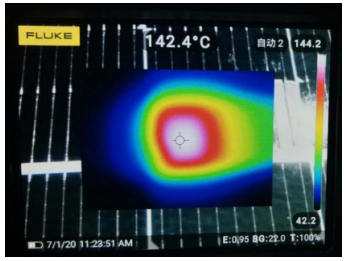
Performance panels reduce the risk of temperature-related failures through crack mitigation and unique circuitry

Under severe cell cracking or worst-case shading conditions, Performance panels operate at **40-50°C lower temperature.**[1]

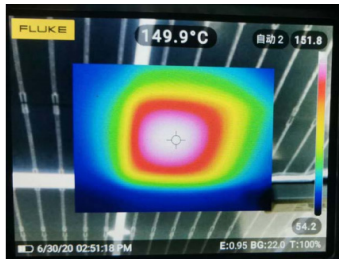




75.01°C



142.4°C



149.9°C

[1] SunPower internal study, 2020.

[1] SunPower internal study, 2020.

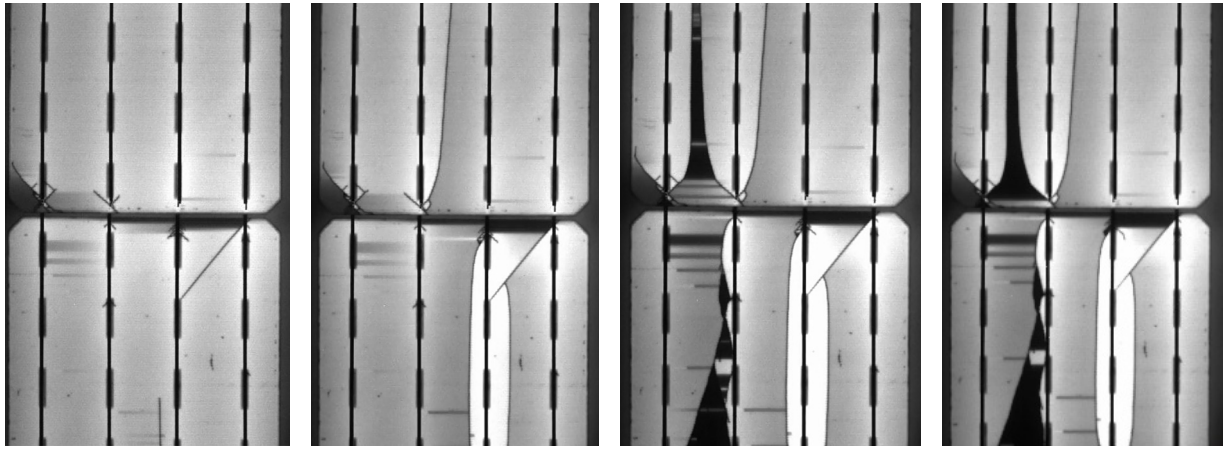
ENGINEERED TO STAND UP TO THE ELEMENTS

Minimising power loss from cell damage

Conventional front-contact mono PERC

VS.

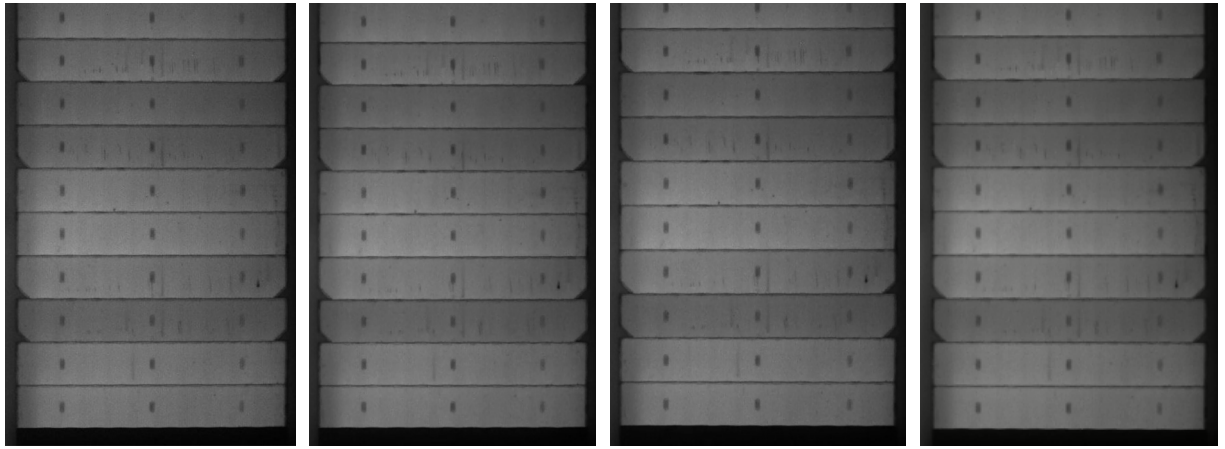
SUNPOWER | PERFORMANCE



0 N | 150 N | 300 N | 390 N

FORCE APPLIED IN NEWTONS

Demonstration shows brittleness of typical conventional cells



0 N | 150 N | 300 N | 390 N

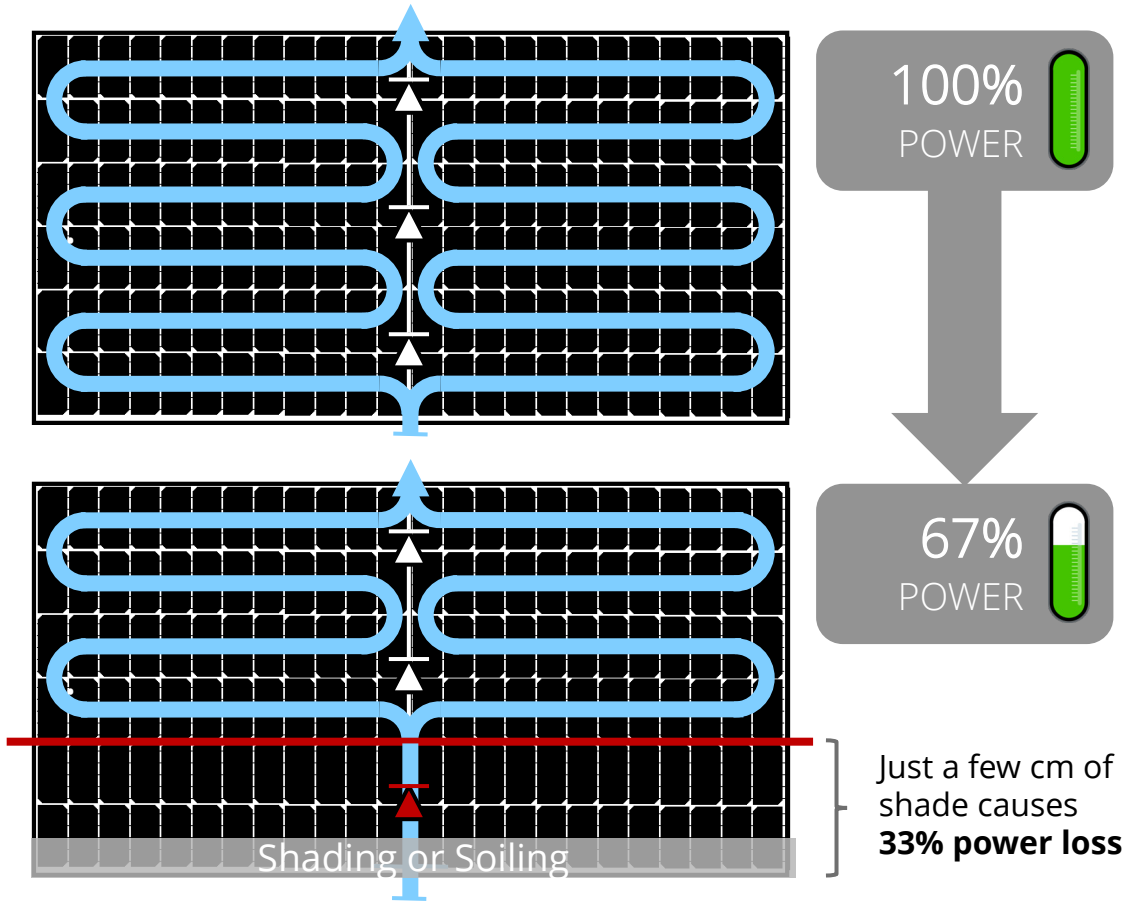
FORCE APPLIED IN NEWTONS

Smaller cells are less susceptible to breakage

Confines cracks to a smaller portion of the panel

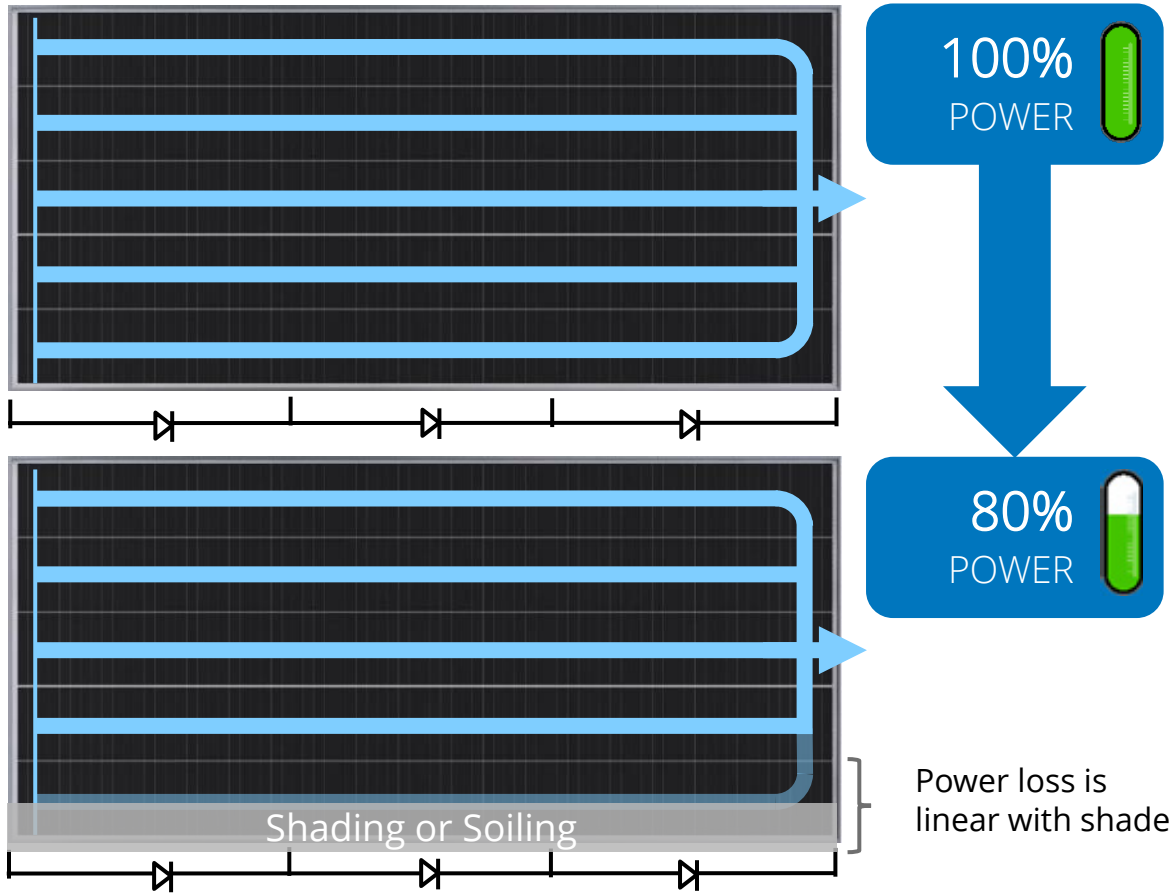
UNIQUE DESIGN MITIGATES INTER-ROW SHADING (LANDSCAPE)

Conventional Panel



Just a few cm of shade causes **33% power loss**

SUNPOWER | PERFORMANCE

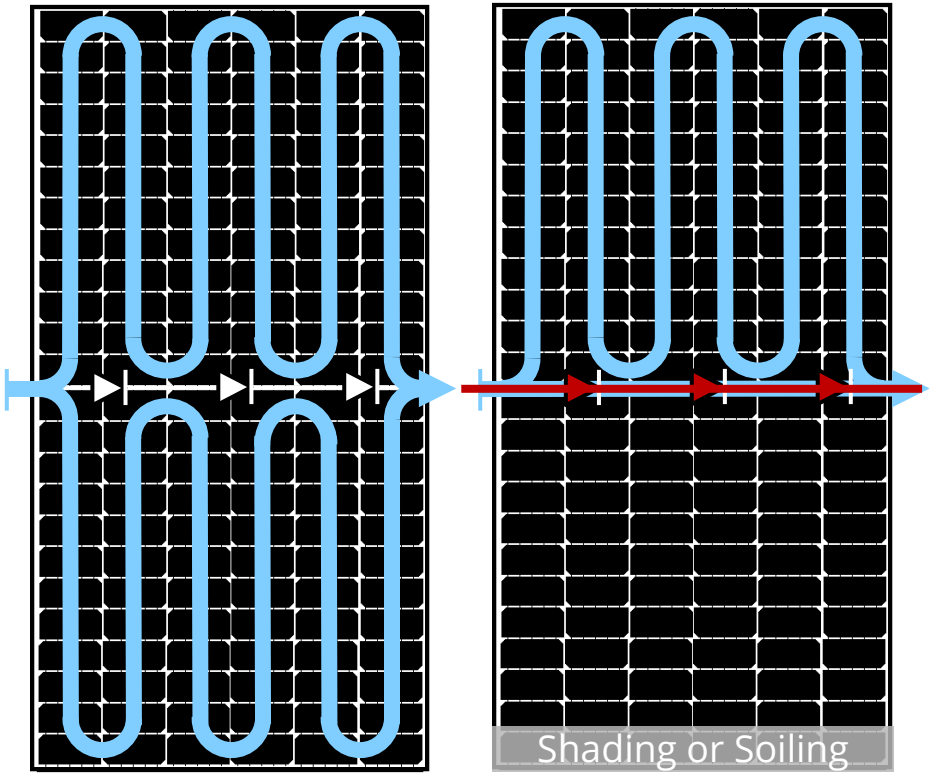


Power loss is linear with shade

UNIQUE DESIGN MINIMISES SHADING LOSS (PORTRAIT)

Conventional Panel

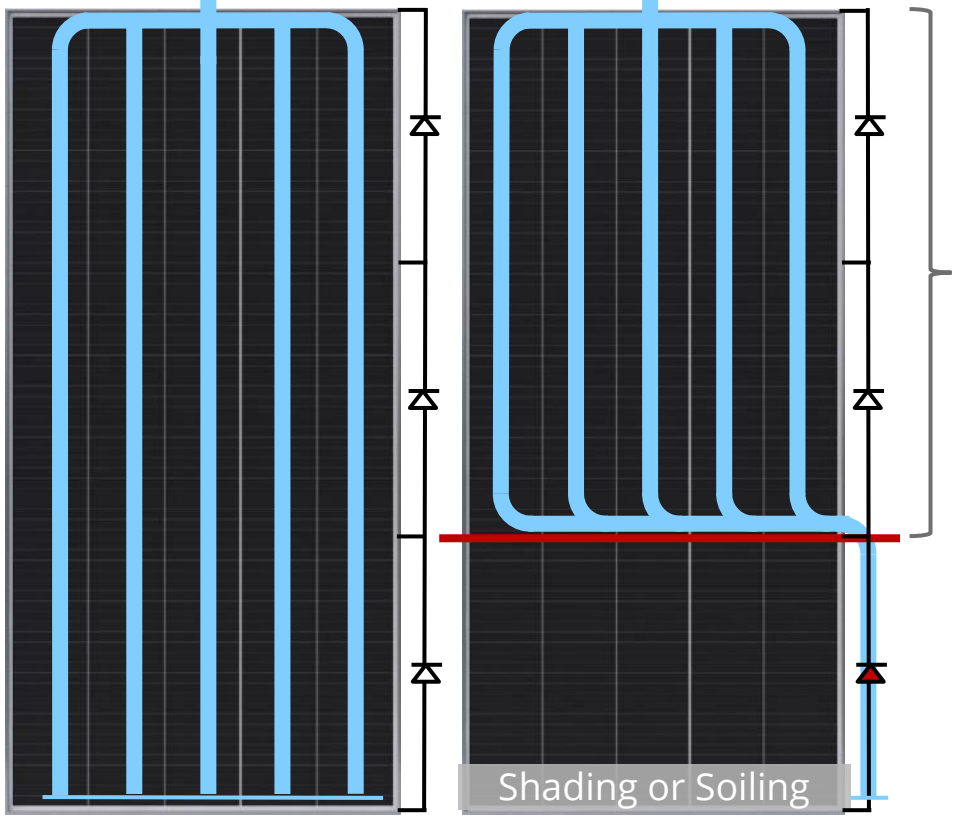
100% POWER → 50% POWER



50% power due to shade along the bottom

SUNPOWER | PERFORMANCE

100% POWER → 67% POWER



Retains 67% power with shade along the bottom

SUNPOWER PERFORMANCE PANEL LINE FEATURES

Performance 5 UPP (Utility and Power Plant)

SUNPOWER | PERFORMANCE 5

NEW Larger, full square G12 cells

NEW Bifacial power generation

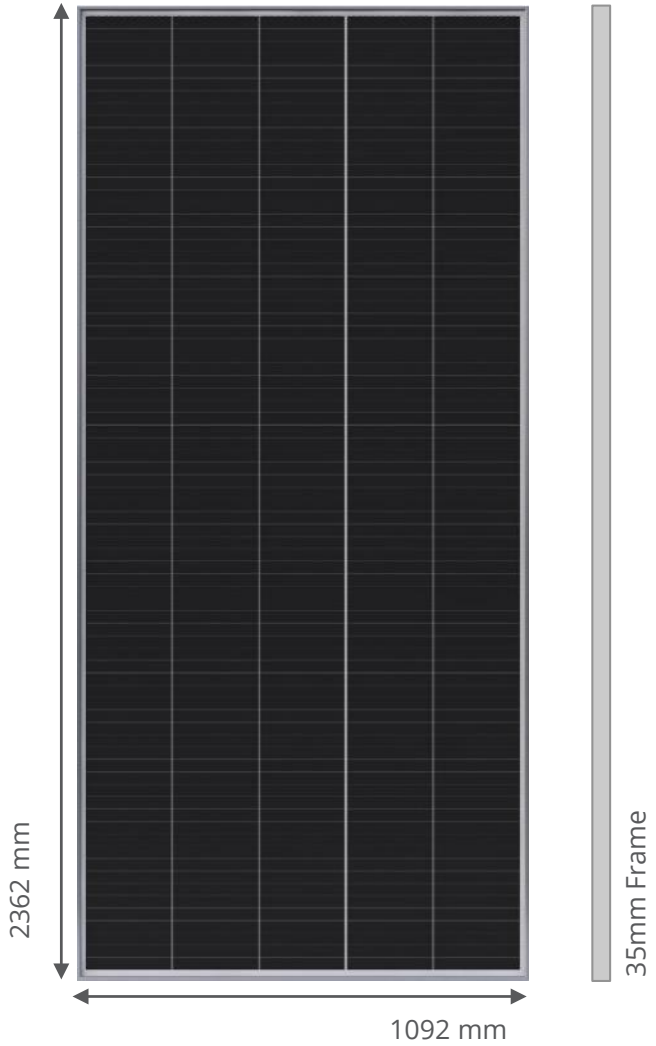
NEW Framed glass/glass construction

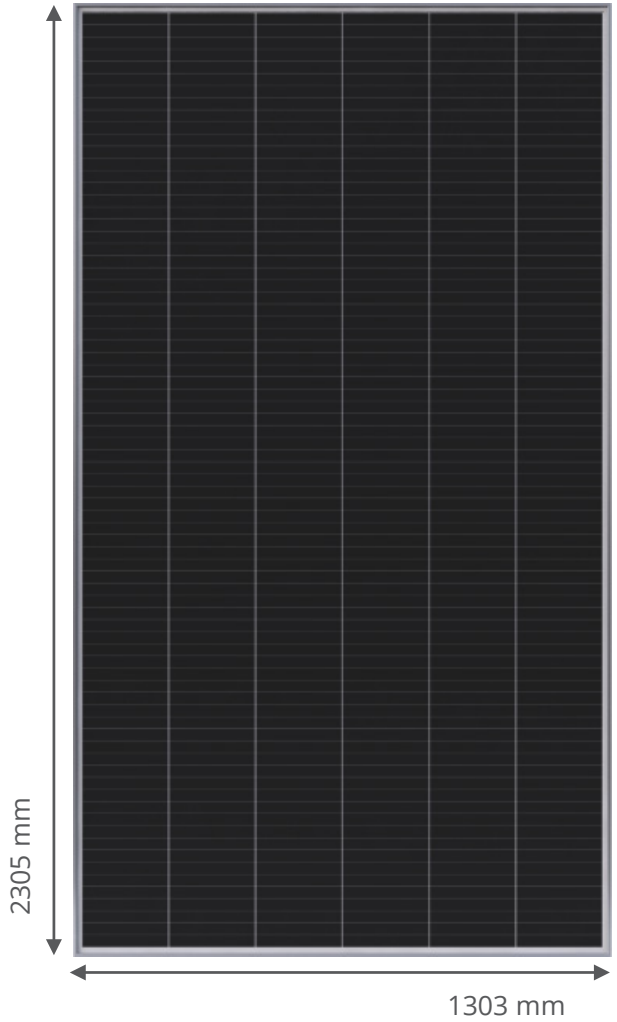
3 Junction boxes, 3 Diodes (1 each)

Warranty	P5 UPP
Power (years)	30
Start	98.0%
Deg rate	0.45%

Power
Up to 545 W

Efficiency
Up to 21.1%





Power
Up to 635 W

Efficiency
Up to 21.2%

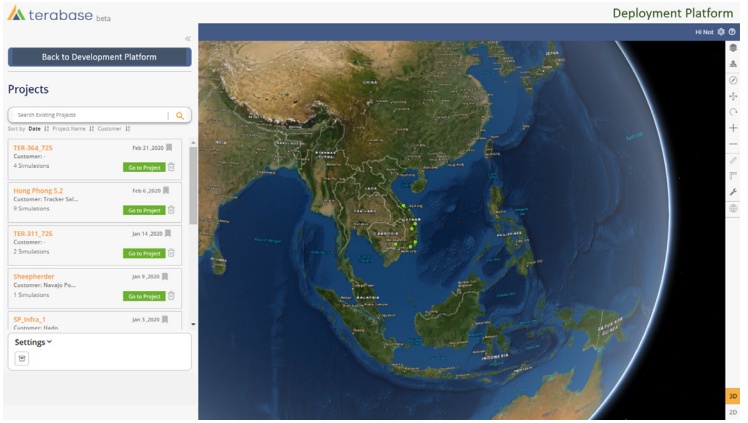
terabase

Impacts of larger, more powerful solar panels

Pierre Gousseland
Co-Founder and VP for
Business Development & Partnerships
Terabase Energy

Terabase Energy

Terabase Energy is developing the digital & automated development and installation platform to achieve $0.01/kWh solar power by 2025



Significant momentum & milestones since launch early 2019:

1. IP and team spin-out of a major public solar company
2. Seasoned team with deep solar industry experience
3. $8M raised from leading cleantech investors
4. Platform Phase 1 released; 200+ companies registered in 25 countries
5. US DOE R&D grant awarded for construction automation
6. Headquartered in California with teams in EMEA and APAC

What we do:

1. **Development platform** – GIS & AI based design platform to assess technology/project fit and optimize projects
2. **Development phase services** – evaluation of complex engineering, technology, and financial parameters with the full project lifecycle in mind
3. **Engineering Services** – from conceptual to IFC drawings
4. **Procurement Services** – from supplier qualification to EPC tenders
5. **Deployment platform** – Logistics, fulfillment, QC & automated installation

Contact Info:
Pierre Gousseland
VP, Business Development & Partnerships, Co-Founder
pgousseland@terabase.energy

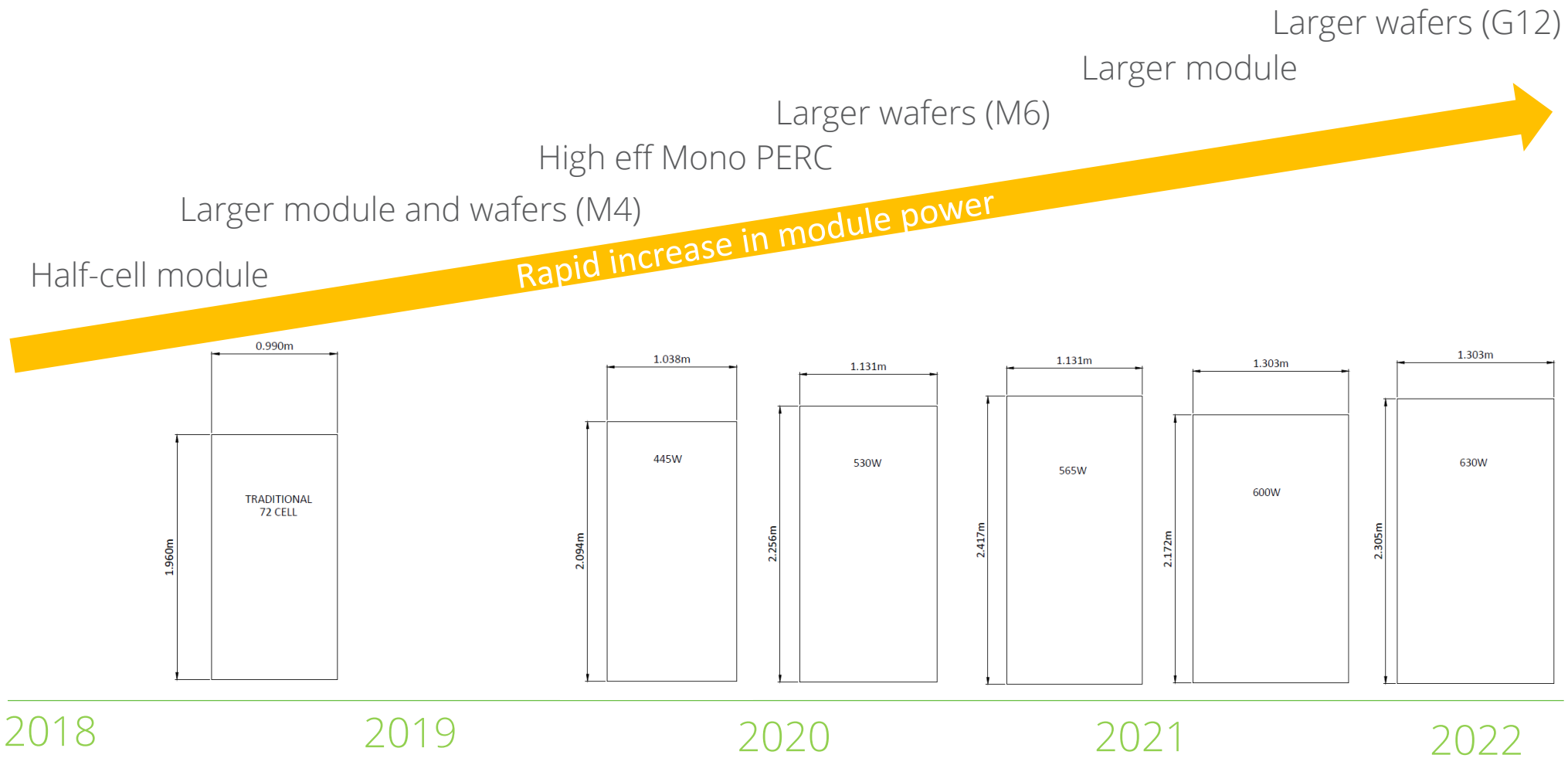
The 72-cell form factor

- Utility solar dominated by the 72-cell form factor for ~10 years
- Mounting and electrical systems optimized around this form factor
- Commoditization of utility solar panels facilitated by standard 72-cell design since:
  - Entire ecosystem from development to BOS to construction has been designed around it
  - Modules have been largely plug-compatible
- 72-cell module very rapidly becoming obsolete being replaced by half-cell or shingled bifacial panels in different form factors and increasing in size

72-cell panel

23kg

Utility Module Competitive Trends

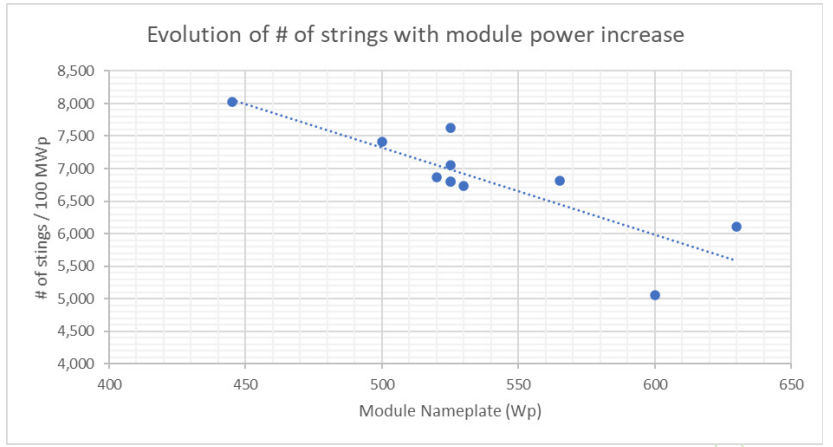


System Levels Benefits and Trade-Offs

- Module Installation
  - **Installation unit cost increased** (by 0% to 20% depending on size, weight and installer) due to productivity loss from bigger/heavier modules; BUT
  - **Overall net positive due to lower module count**

- Electrical BOS Impacts
  - Cost of DC hardware is subject to the length (m) of the string; BUT
  - Higher string power resulting in **savings due to lower string count**
  - Potentially some hardware optimization required by string inverter manufacturers for higher current

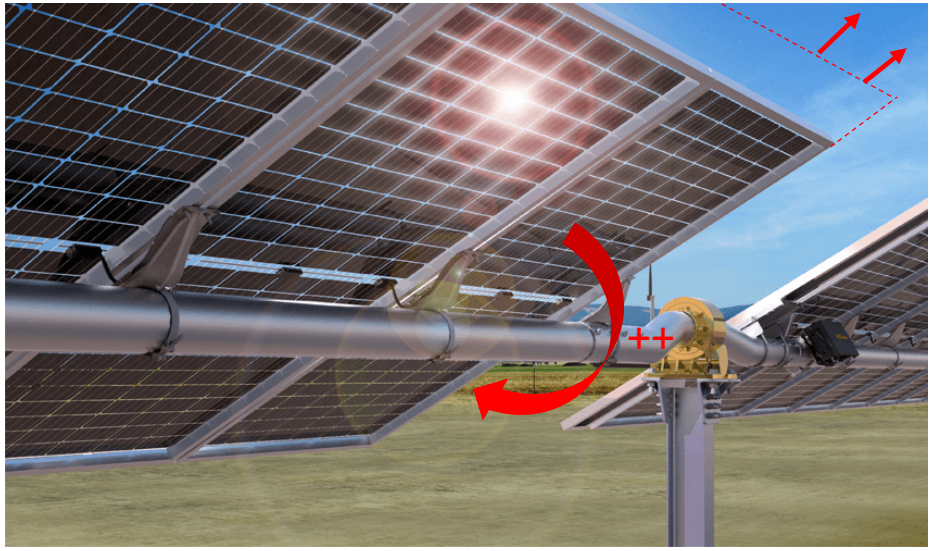
- Shipping Benefits
  - **Higher shipping density** in most cases but might vary based on form factor

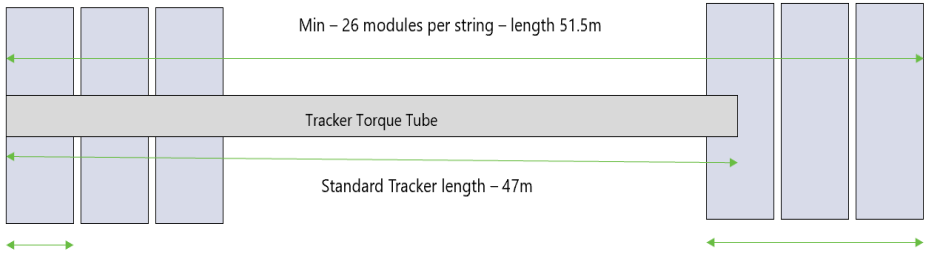


Note: String lengths calculated based on a Min Site Temp of -20C

Mechanical Impacts to be Considered

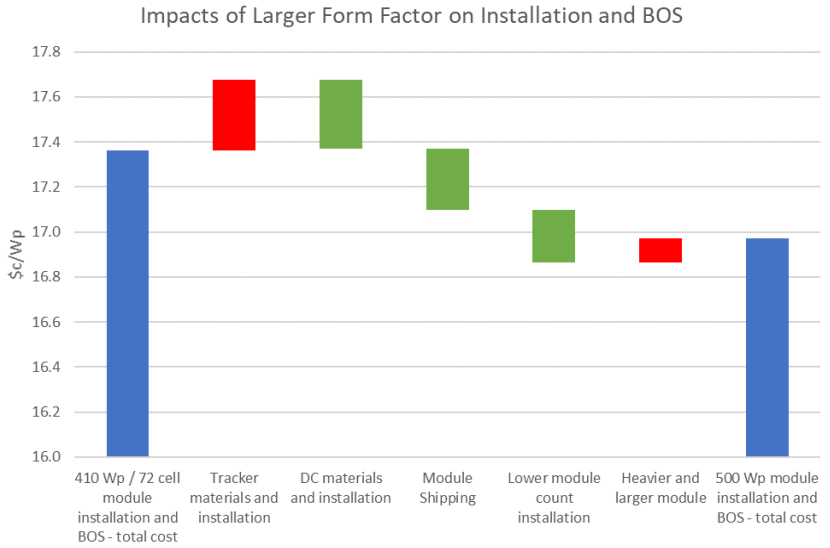
- Increased wind loads on racking due to bigger “sail area” and heavier modules:
  - May require more steel, increasing racking costs
  - May need to shorten tracker or reduce number of rows, decreasing total tracker power
  - For most trackers, increasing module width preferable as opposed to module length to reduce force on torque tube components
- Increased pile loading -> increase in pile length -> increase in material and potentially installation costs
- Published max tracker wind speed on datasheets based on traditional 72-cell modules. May be inadequate for larger form factors
- Optimal string length for wider modules may not exceed max allowable tracker length
- Strong coordination with racking vendors is needed and will address most of the above challenges



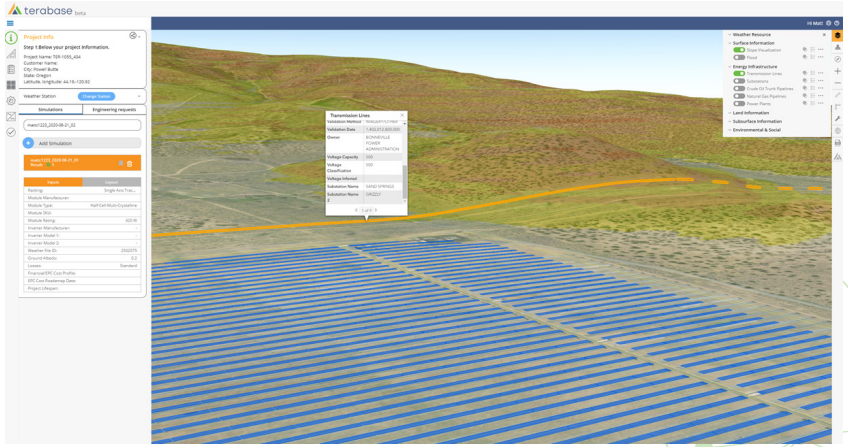


Impacts Summary

- Overall a **net positive impact on project LCOE**
- Benefit varying project by project. Need to **carefully assess the impact** on mechanical/electrical BOS and installation on a project specific basis
- Impacts to be further assessed and mitigated with racking suppliers and installers
- Some impacts to be further studied:
  - Do larger modules endure more stress during shipping, installation, operation causing PV modules reliability concerns? (e.g. microcracks)
  - Tracker wind tunnel test carried out with traditional 72-cell modules. Using larger form factor modules might lead to change in tracker natural frequency
- As the industry moves towards larger form factor modules, the careful qualification and selection of **compatible, high performance, high reliability PV modules** become **more critical than ever**.



Note: same efficiency for 410 and 500 Wp modules, based on project in Spain, based on 1P unganged tracker



Robert Chew
Application Engineer - Maxeon Solar Technologies

IS BIGGER ALWAYS BETTER? LET'S CRUNCH THE NUMBERS

EXAMPLE CASE STUDIES

Project: 50MWp 1P & 2P Tracker

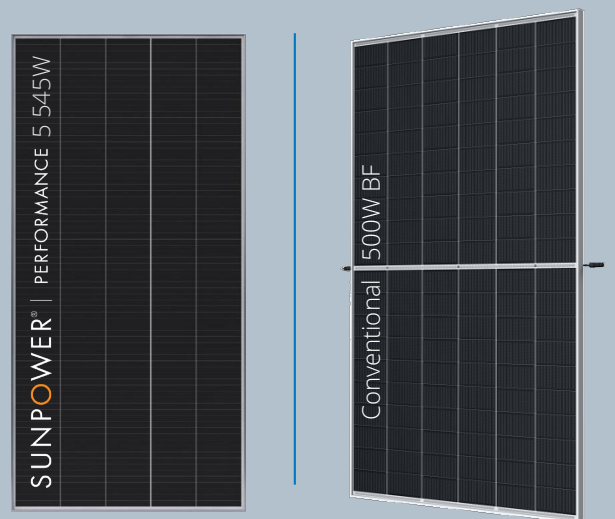
Site Albedo: 0.2 avg
GCR: 0.4

Inverter: SMA SC 4600 UP
PPA: Country Dependent
Discount Rate: Region Dependent
O & M Cost: $2.4-8k/MWp/Yr

Yield Simulation: PVSyst Ver7.XX

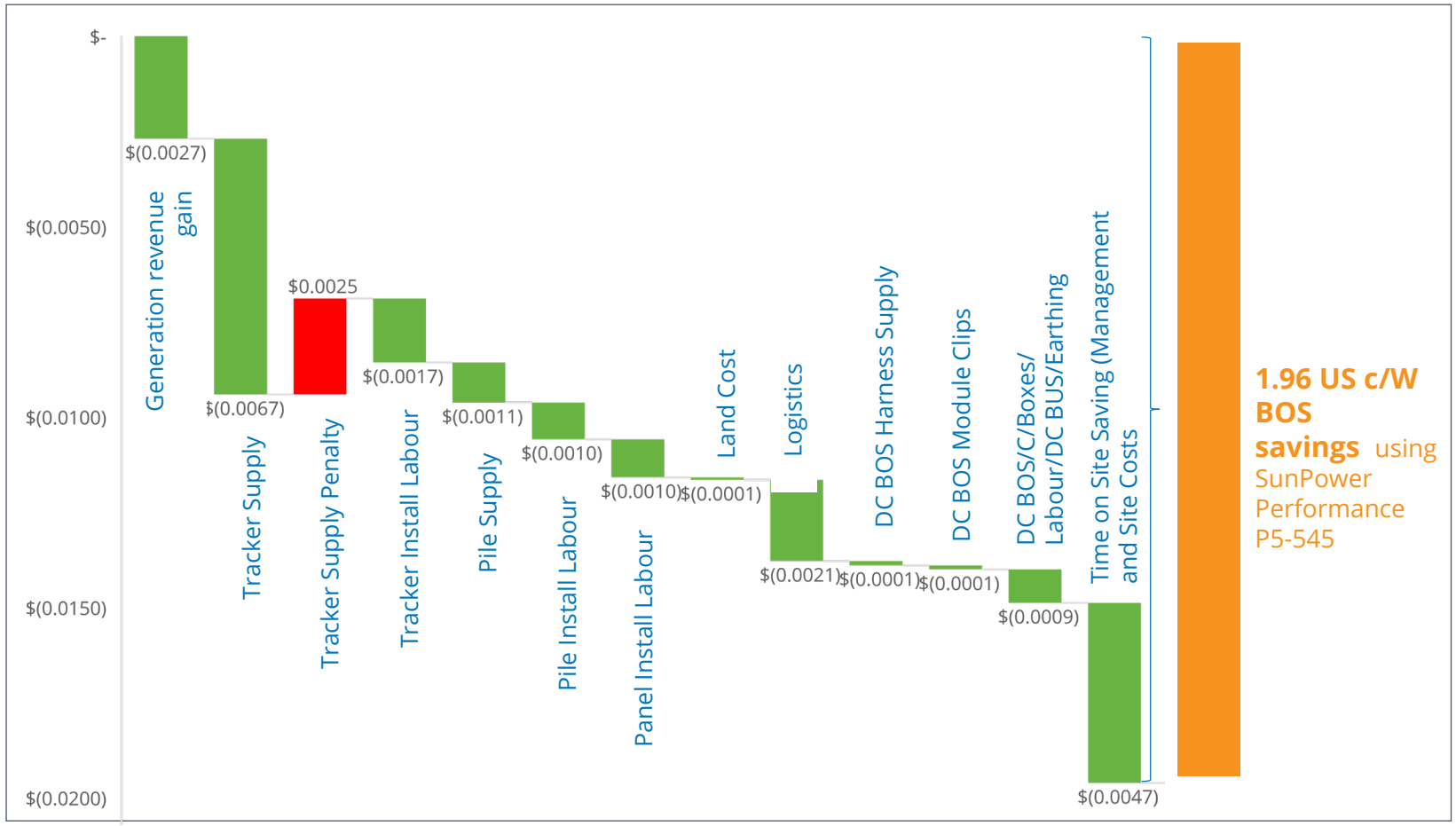
Inflation: Region Dependent

CASE STUDY 1: 50MW 2P TRACKER | VIETNAM

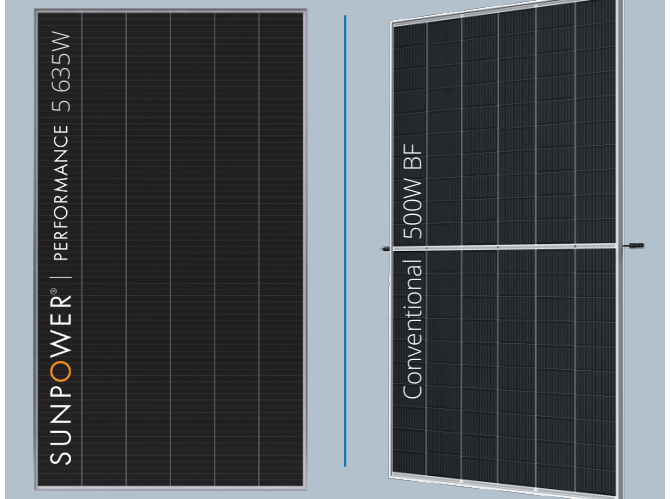


545W	Power (Front Side)	500W
26	Modules/String	28
3529	No. of Strings	3572
14.17	Power/string (kW)	14.00
91,754	No. of Modules	100,016
2042	Specific Yield (kWh/kWp)	2010
998	Tracker Power Density (W/m)	907

Understanding the balance of system reductions

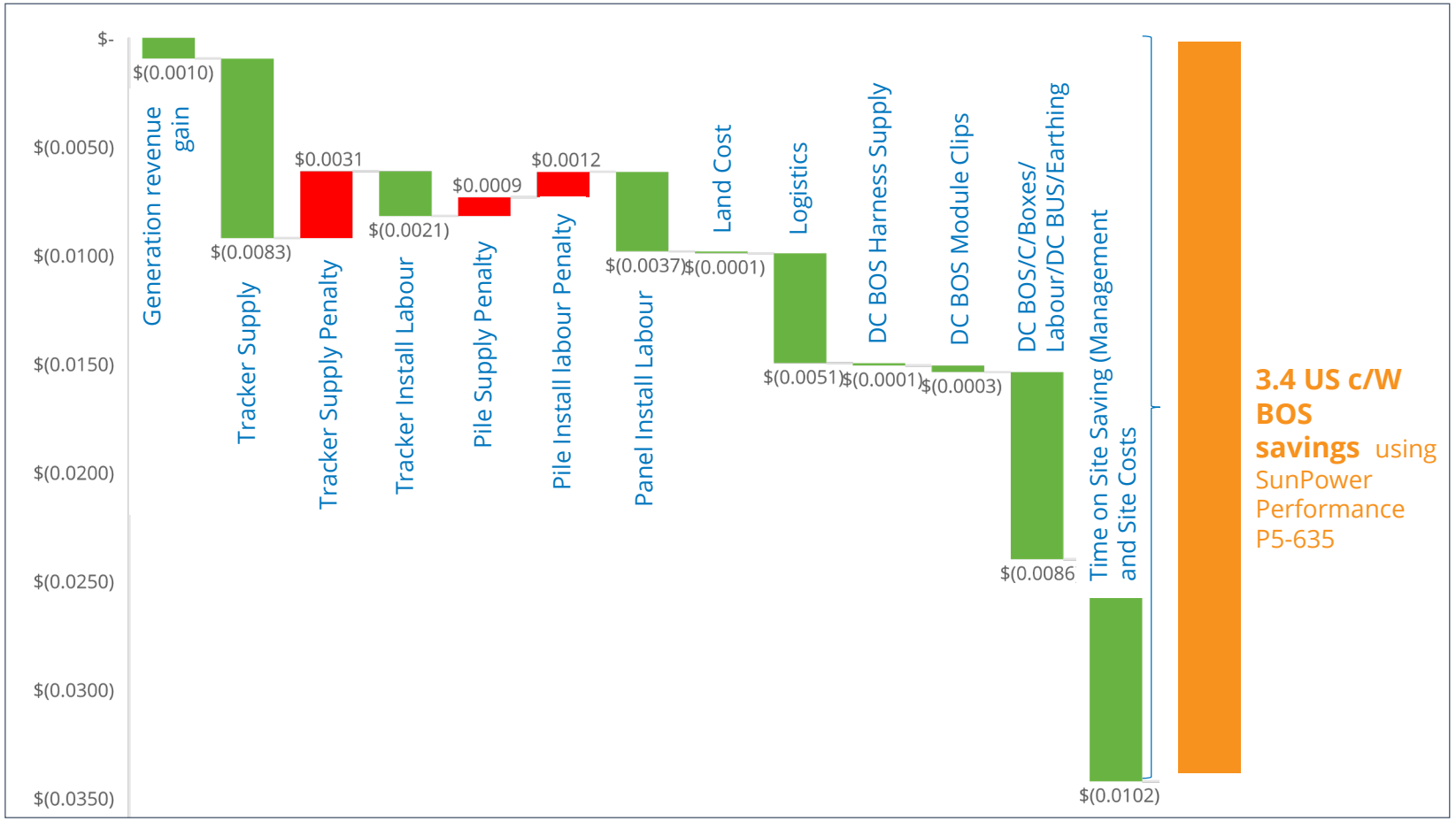


CASE STUDY 2: 50MW 1P TRACKER | AUSTRALIA

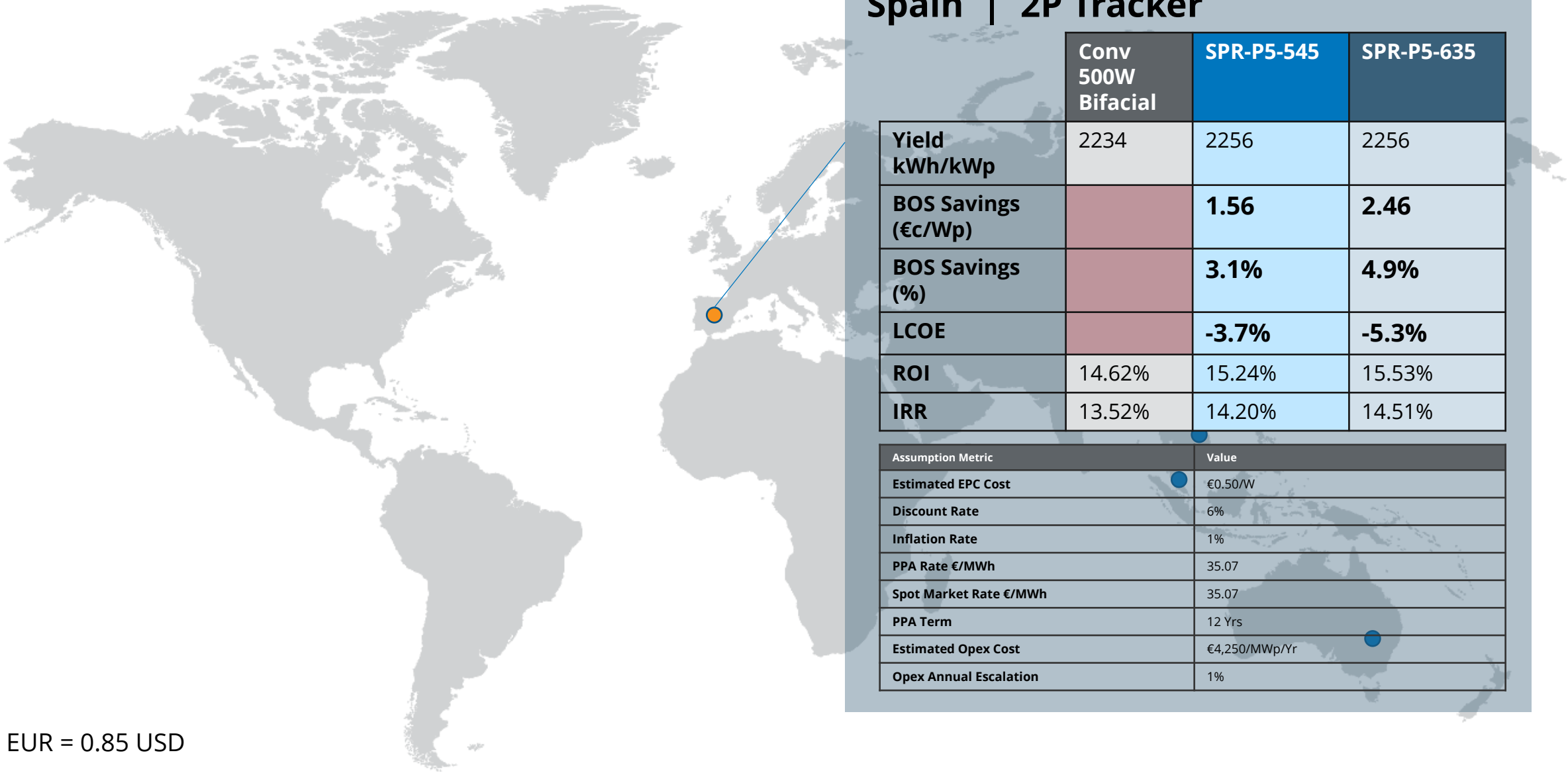


635W	Power (Front Side)	500W
27	Mod/String	28
2917	No. of Strings	3572
17.15	Power/string (kW)	14.00
78,759	No. of Modules	100,016
2042	Specific Yield (kWh/kWp)	2010
487	Tracker Power Density (W/m)	453

Understanding the balance of system reductions



CASE STUDY: 50MW SUMMARIES



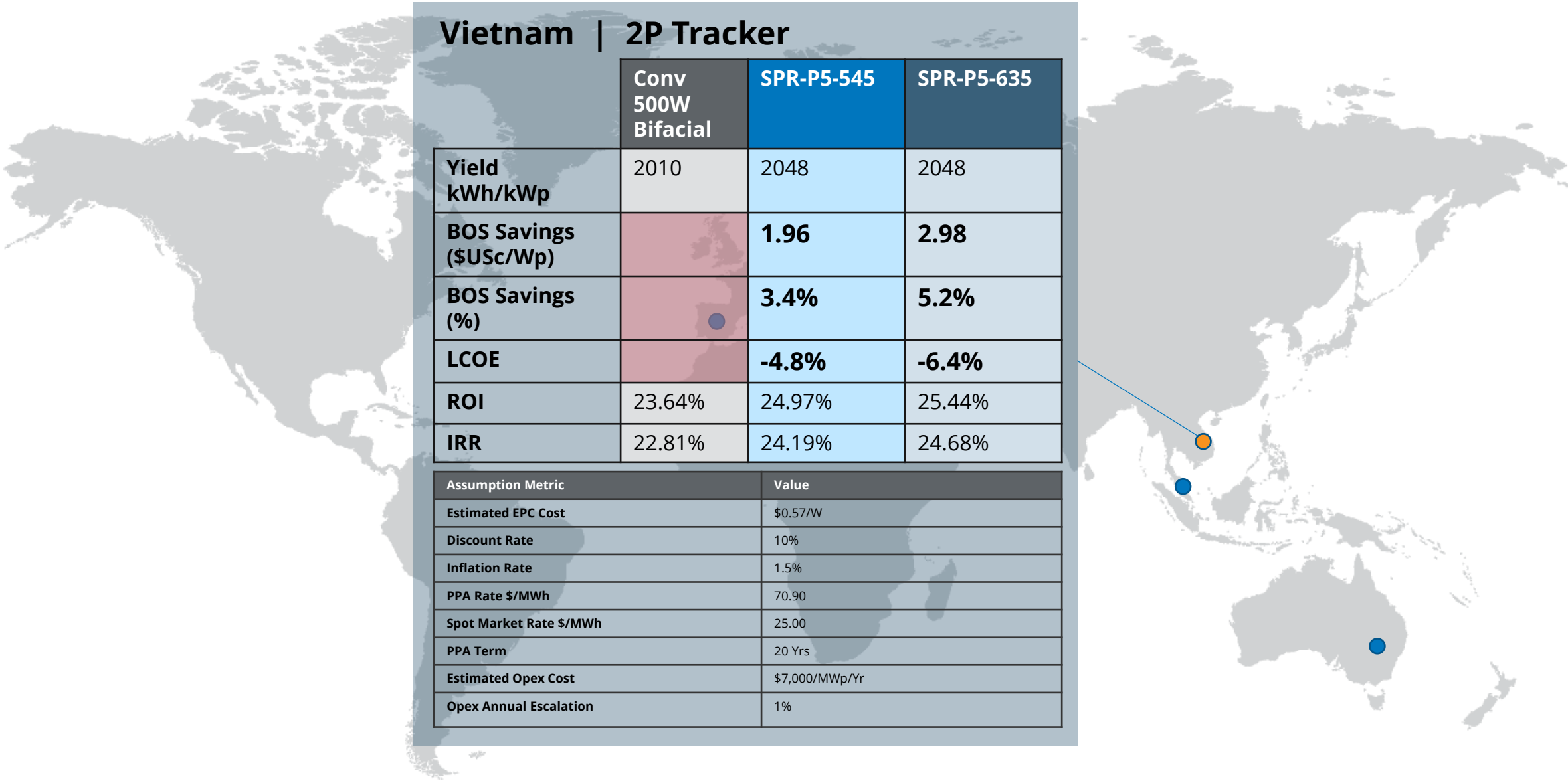
Spain | 2P Tracker

	Conv 500W Bifacial	SPR-P5-545	SPR-P5-635
Yield kWh/kWp	2234	2256	2256
BOS Savings (€c/Wp)		**1.56**	**2.46**
BOS Savings (%)		**3.1%**	**4.9%**
LCOE		**-3.7%**	**-5.3%**
ROI	14.62%	15.24%	15.53%
IRR	13.52%	14.20%	14.51%

Assumption Metric	Value
Estimated EPC Cost	€0.50/W
Discount Rate	6%
Inflation Rate	1%
PPA Rate €/MWh	35.07
Spot Market Rate €/MWh	35.07
PPA Term	12 Yrs
Estimated Opex Cost	€4,250/MWp/Yr
Opex Annual Escalation	1%

* 1 EUR = 0.85 USD

CASE STUDY: 50MW SUMMARIES



Vietnam | 2P Tracker

	Conv 500W Bifacial	SPR-P5-545	SPR-P5-635
Yield kWh/kWp	2010	2048	2048
BOS Savings ($USc/Wp)		**1.96**	**2.98**
BOS Savings (%)		**3.4%**	**5.2%**
LCOE		**-4.8%**	**-6.4%**
ROI	23.64%	24.97%	25.44%
IRR	22.81%	24.19%	24.68%

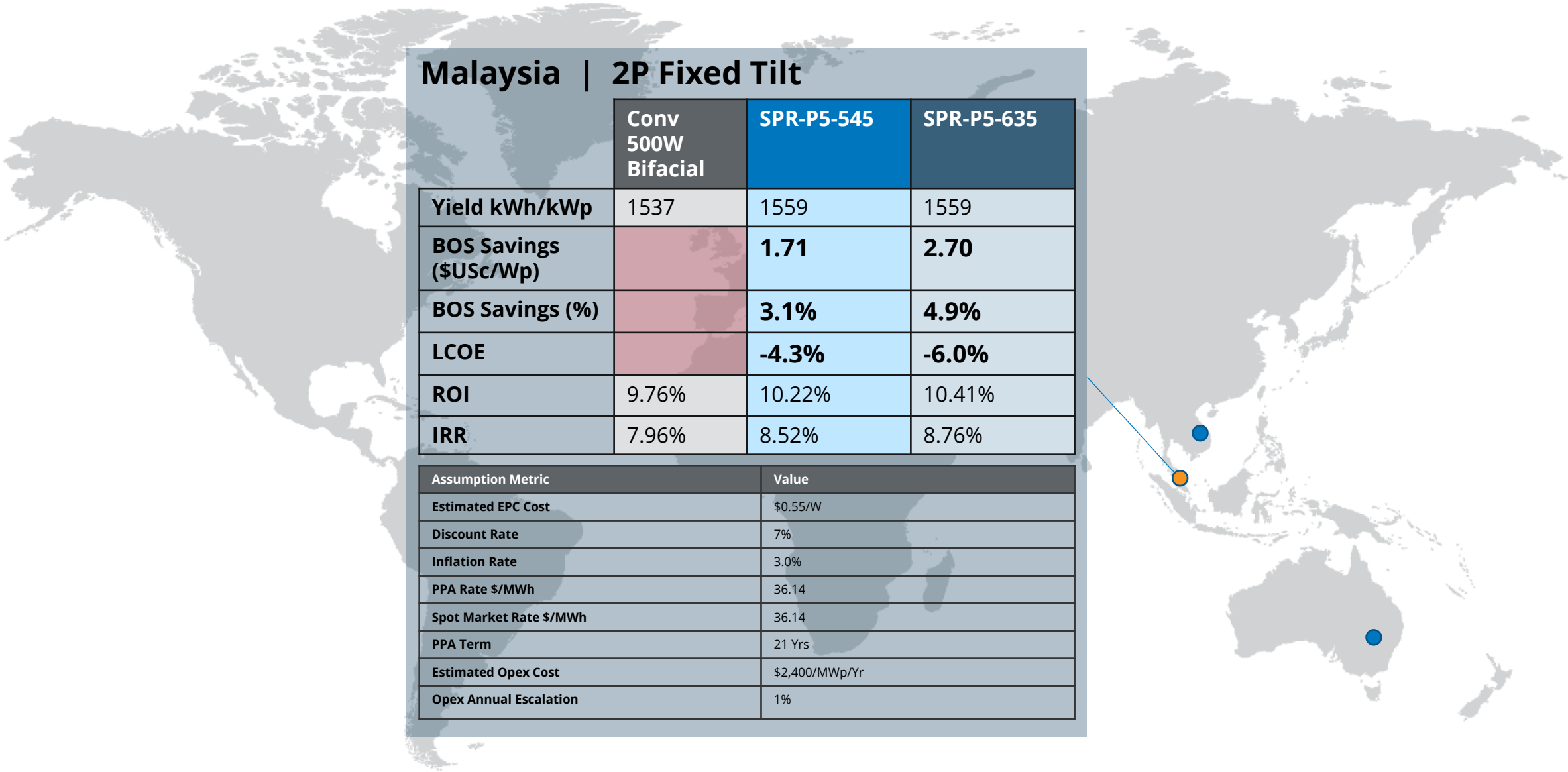
Assumption Metric	Value
Estimated EPC Cost	$0.57/W
Discount Rate	10%
Inflation Rate	1.5%
PPA Rate $/MWh	70.90
Spot Market Rate $/MWh	25.00
PPA Term	20 Yrs
Estimated Opex Cost	$7,000/MWp/Yr
Opex Annual Escalation	1%

CASE STUDY: 50MW SUMMARIES

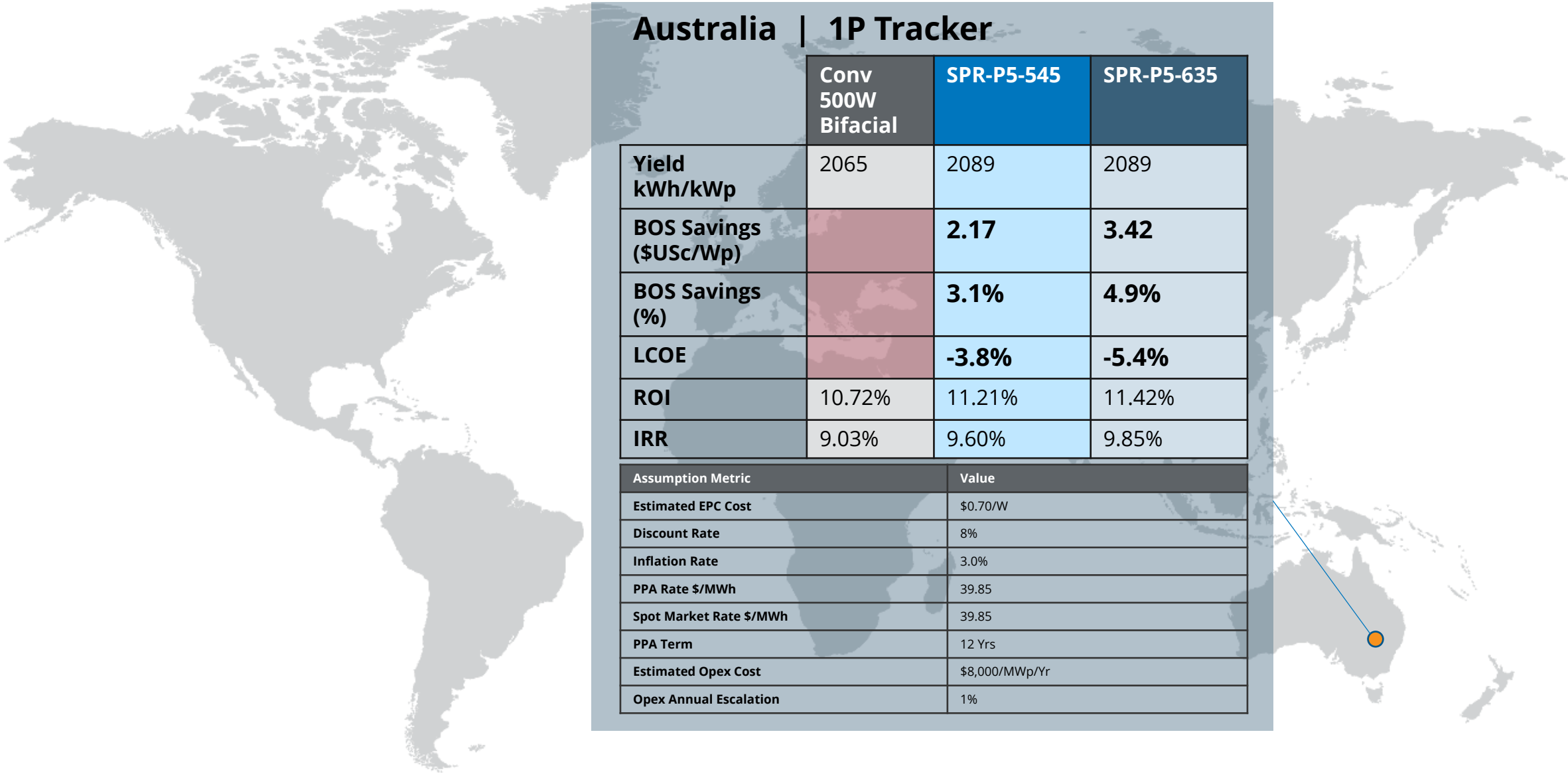
Malaysia | 2P Fixed Tilt

	Conv 500W Bifacial	SPR-P5-545	SPR-P5-635
Yield kWh/kWp	1537	1559	1559
BOS Savings ($USc/Wp)		**1.71**	**2.70**
BOS Savings (%)		**3.1%**	**4.9%**
LCOE		**-4.3%**	**-6.0%**
ROI	9.76%	10.22%	10.41%
IRR	7.96%	8.52%	8.76%

Assumption Metric	Value
Estimated EPC Cost	$0.55/W
Discount Rate	7%
Inflation Rate	3.0%
PPA Rate $/MWh	36.14
Spot Market Rate $/MWh	36.14
PPA Term	21 Yrs
Estimated Opex Cost	$2,400/MWp/Yr
Opex Annual Escalation	1%



CASE STUDY: 50MW SUMMARIES



Australia | 1P Tracker

	Conv 500W Bifacial	SPR-P5-545	SPR-P5-635
Yield kWh/kWp	2065	2089	2089
BOS Savings ($USc/Wp)		**2.17**	**3.42**
BOS Savings (%)		**3.1%**	**4.9%**
LCOE		**-3.8%**	**-5.4%**
ROI	10.72%	11.21%	11.42%
IRR	9.03%	9.60%	9.85%

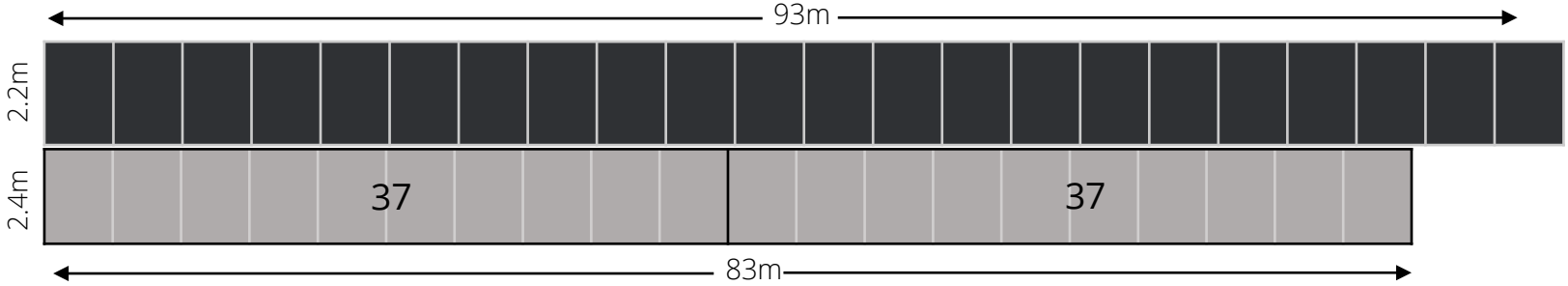
Assumption Metric	Value
Estimated EPC Cost	$0.70/W
Discount Rate	8%
Inflation Rate	3.0%
PPA Rate $/MWh	39.85
Spot Market Rate $/MWh	39.85
PPA Term	12 Yrs
Estimated Opex Cost	$8,000/MWp/Yr
Opex Annual Escalation	1%

TRACKER COMPATIBILITY

The keys to ensuring a high installed capacity per tracker

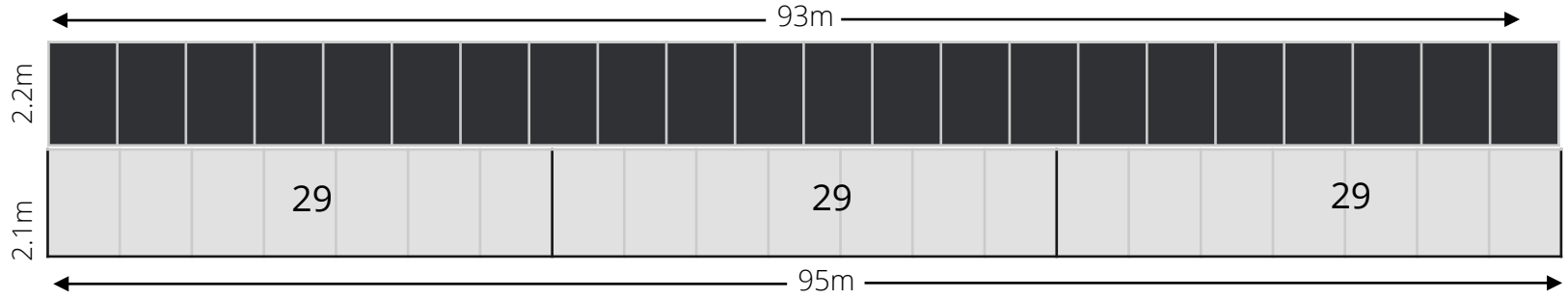
Optimal
1P Module Area: 215-220m2

G12 Cell: 540W typ



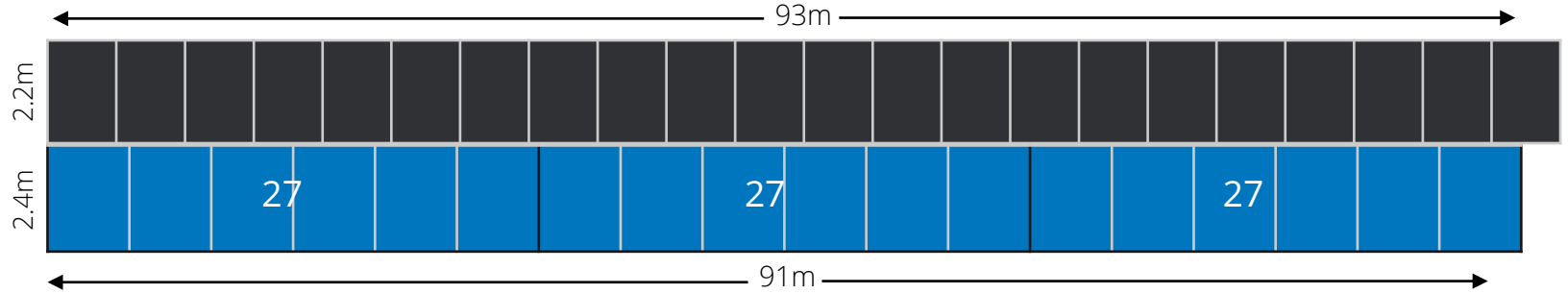
Module Area: 193m2
Power: 39.9kW
Imp: 17.2A
Ploss: 366W

G1 Cell: 445W typ



Module Area: 190m2
Power: 38.8kW
Imp: 10.8A
PLoss: 213W

SUNPOWER
P5-540W



Module Area: 209m2
Power: 42.1kW
Imp: 11.5A
PLoss: 229W

SUNPOWER | PERFORMANCE

CONCLUSION

THE BIGGER THE BETTER, DEPENDS ON DETAILED ASSESSMENT

Conclusion

Large form factor modules drive the balance of system costs down by:

☑ More power per module (We physically install modules not watts) - Less overall DC Strings.
☑ Reduced Tracker quantities and piles in most cases
☑ Reduced Logistical movements
☑ Reduced time on site (Less modules & trackers to install)

However, the level of BOS savings depends on:

- Individual assessment of each project site
- Tracker, BOS & Inverter full compatibility check
- Assessment of electrical losses
- OH&S

Reliability & Durability is Key:

- Large modules mean more force and movement. Maxeon Solar Technologies has engineered durability and reliability into their modules designs.

SUNPOWER

FROM MAXEON SOLAR TECHNOLOGIES

Thank You

