

# SUNPOWER PERFORMANCE PANELS

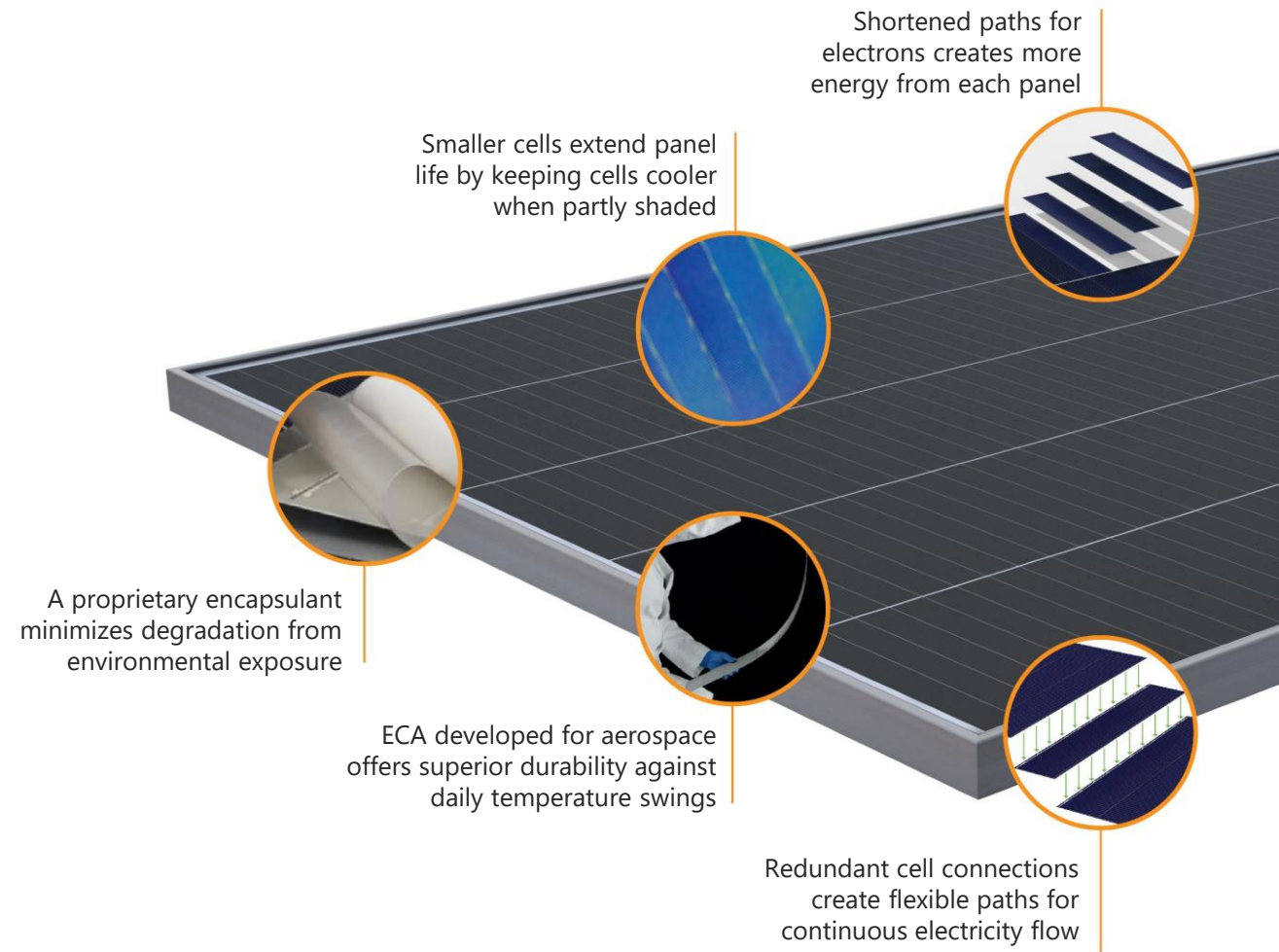
2020

SUNPOWER

FROM MAXEON  
SOLAR TECHNOLOGIES





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  - Efficiency
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# SUNPOWER PERFORMANCE PANELS

## Summary of features & benefits

Feature	Benefit
<b>Leadership</b>	Innovation backed by more than 35 years of industry-leading technology, warranty, research & development, and cell & panel efficiency.
 <b>Technology</b>	Patented shingling process and P type, mono PERC, tiled cells offer greater panel efficiency and strength.
<b>Warranty</b>	Backed by an industry-leading product and performance warranty.
 <b>Aesthetics</b>	The SunPower Performance 3 is a true all black panel—and <a href="https://techau.com.au">according to techau.com.au</a> , is the best looking panel on the market.
<b>Proprietary encapsulant</b>	A proprietary encapsulant minimizes degradation from water ingress, humidity and corrosion.
<b>Aero-space grade adhesive</b>	The proprietary conductive adhesive connect cells with more flexibility than bus bars, while reducing the strain of expansion and contraction.
 <b>10 cell connections</b>	Redundant cell connections create flexible paths for continuous electricity flow.
 <b>Better performance in the shade</b>	Three bypass diodes and parallel circuitry provide better performance in partial shade.
<b>More inverter options</b>	Added flexibility due to compatibility with string inverters (DC) or micro inverters (AC).

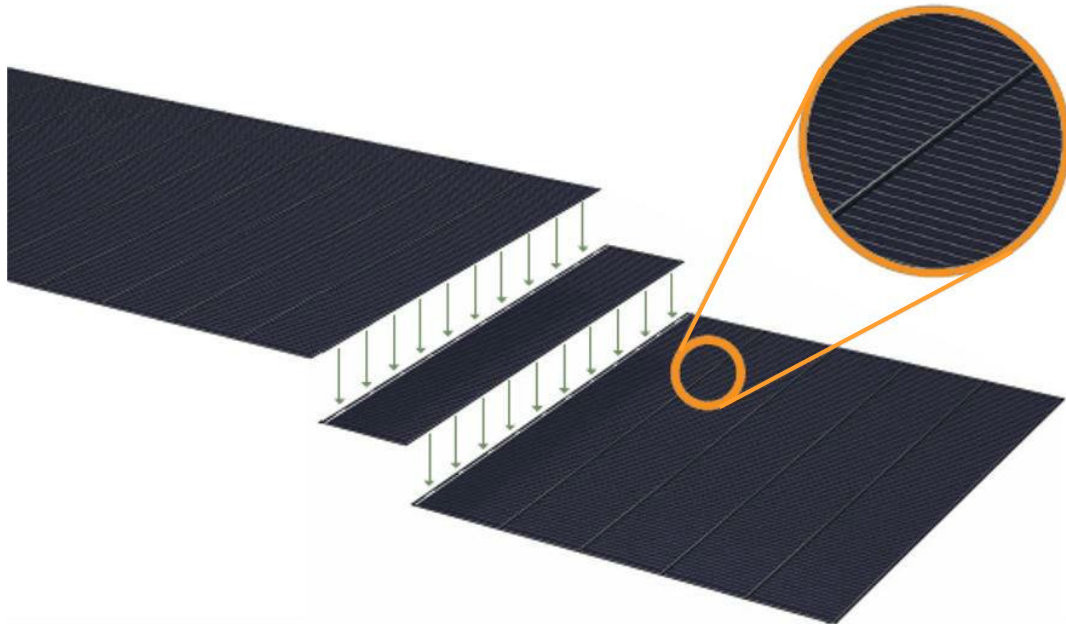
# RELIABILITY

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# RELIABILITY

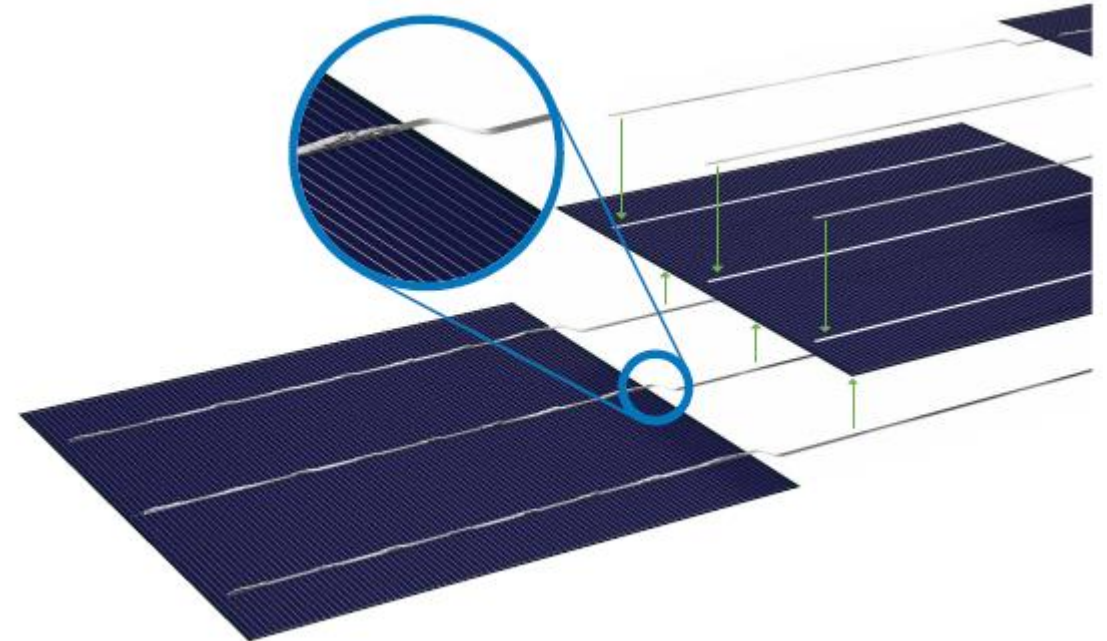
## Shingling design approach

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1. **No soldered ribbons** along the length of the cell – one of the major failure modes of using traditional cells has been designed out of the panel.
2. Cells are connected across their length, creating many **redundant paths for electricity**, and no single point of failure.
3. Thin screen-printed metal lines on the front of the cells are **protected from corrosion** by our specially engineered encapsulant

## Conventional Solar Cell



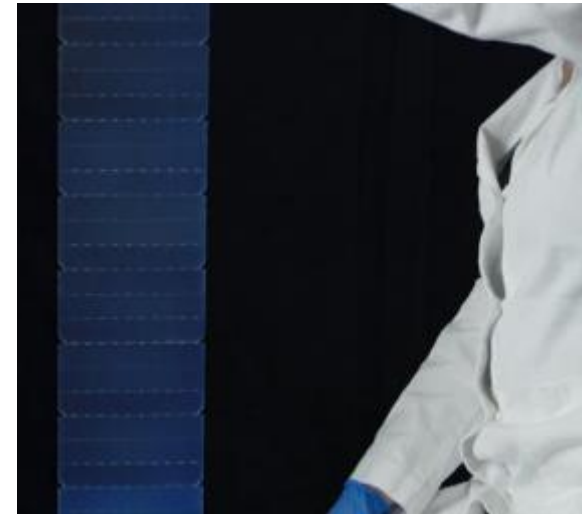
1. **High-stress solder joints** between the long copper ribbons and crystal solar cell
  - As the panels get hot in the day and cold at night the copper expands but the silicon cell does not.
  - Over time, this repeated stress causes cells to crack and solder bonds to break.
2. **Single points** of failure on copper ribbons between cells.
3. Very thin screen-printed metal lines on the front of the cell are **susceptible to corrosion over time**

# THE SUNPOWER PERFORMANCE PANEL HYPERCELL

**An innovative backbone that provides added strength and durability**



- Bending, where others break
- Delivering continuous electricity flow
- Enhancing energy output
- Extending panel life



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# WARRANTY

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# WARRANTY

## Overview for SunPower Performance panels for distributed generation

SunPower Performance –BLK and –COM panels offer one of the leading warranties in solar:

- **25 year product and power coverage:** Ensure the power warranty is backed by coverage for defects.
- **Higher start and lower annual power degradation rate** – 25% slower annual degradation<sup>2</sup>.

		Core countries and SunPower Dealers	Components	Industry Standard <sup>2</sup>
	Product (years)	25		12
	Power (years)	25		25
	Start	97.5%		97.0%
	Deg rate	0.5%		0.6%
	Shipping (to/from)	Yes		Varies
	Labor stipend <sup>1</sup>	Yes	No	No
	Product Warranty Reimbursement	Purchase price (100% 5 yrs, -4.75%/yr thereafter)		Market price at time of claim

<sup>1</sup> Some restrictions apply. Please review the warranty at [sunpower.com](http://sunpower.com) or talk to your representative.

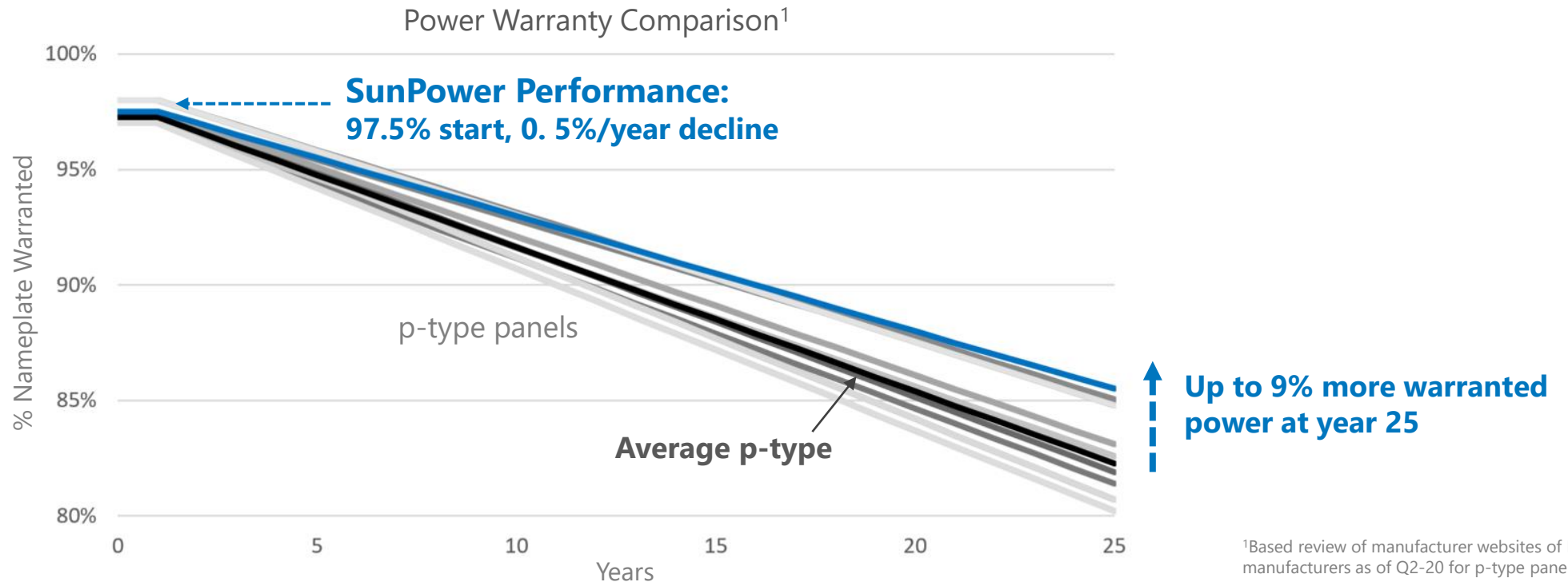
<sup>2</sup>Based review of manufacturer websites of IHS top 20 manufacturers as of Q2-20. Representative of average commodity glass-foil panels.

# WARRANTY

## Power Warranty for SunPower Performance panels for distributed generation

SunPower Performance 3 –BLK and –COM have a high power warranty, for more bankable power every year.

- **~20% slower annual degradation** – 0.5%/year versus industry standard of ~0.60%
- **0.5% higher start** point than industry standard of ~97%
- Backed by a **25 year product warranty**.



# ENERGY YIELD

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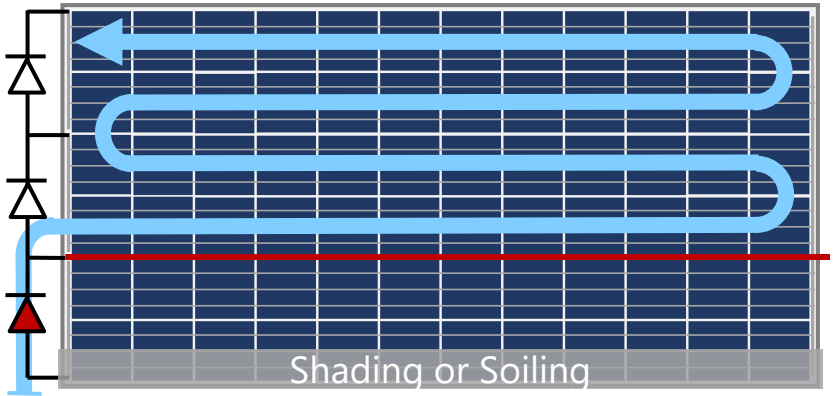
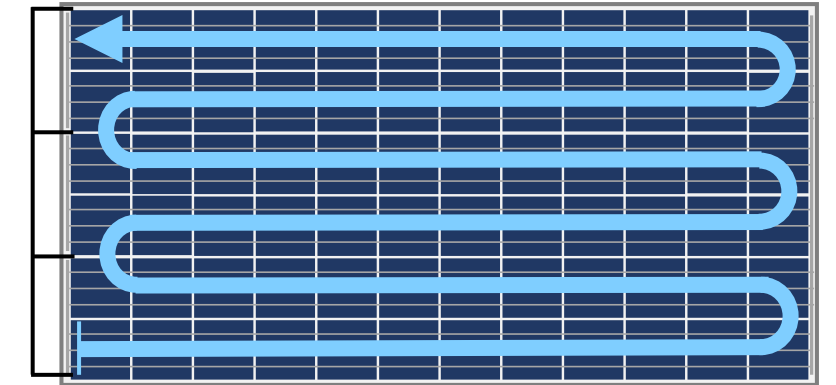


# ENERGY YIELD

## Unique design mitigates inter-row shading

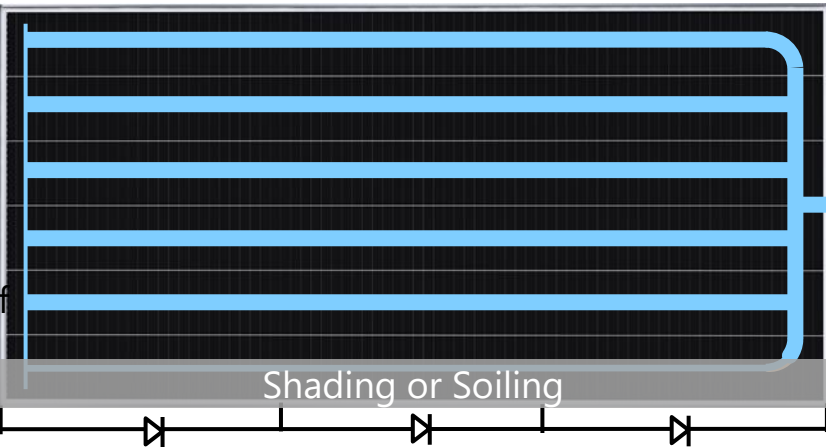
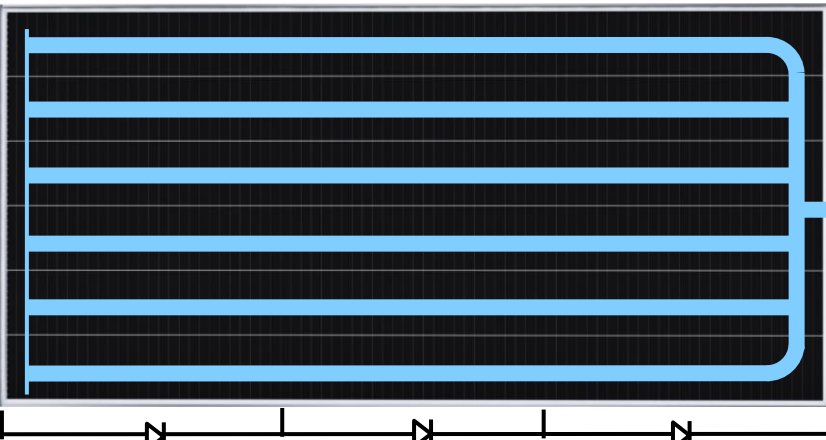


Conventional Panel



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

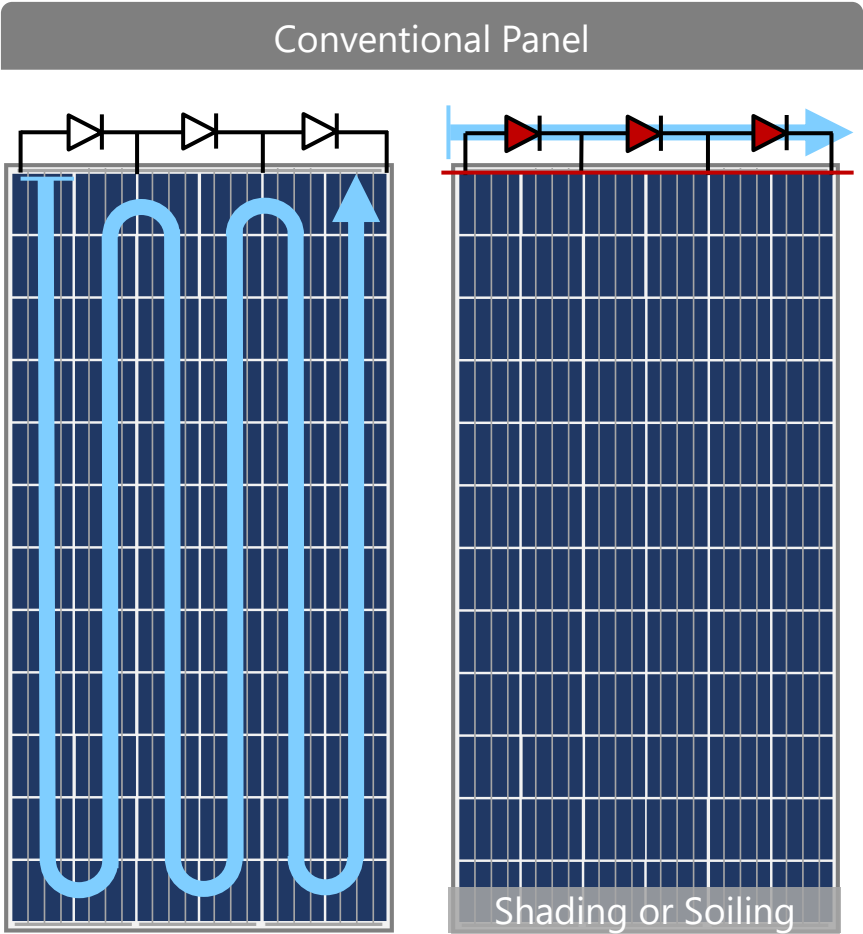
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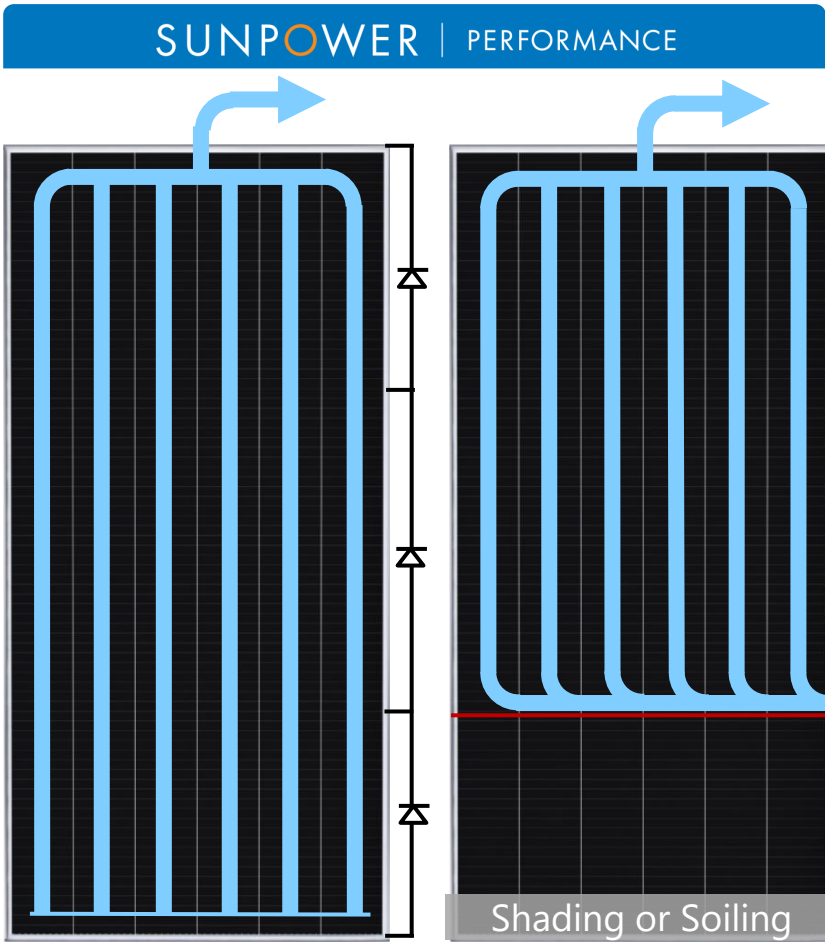
Power loss is linear with shade

# ENERGY YIELD

## Portrait with Inter-row Shading



0% power  
due to shade  
along the bottom



Retains 66%  
power with  
shade along  
the bottom

# SUSTAINABILITY AND INNOVATION

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# LEADERSHIP IN SUSTAINABLE MANUFACTURING

We strive to continue to produce panels as clean as the energy they produce. SunPower technology was recognized with the first annual Sustainability Award from pv magazine.

