



## MPP tracking with string inverters in bifacial plants

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PeiJun Shen studied Metallurgy at Shanghai University, before beginning the career in the renewable energy as a visiting scholar for A\*Star in Singapore. Over the next eight years, his roles there varied from research engineer to product manager, Photovoltaic area. In 2010, PeiJun relocated to Shanghai, China, as the senior scientist for high efficiency N type solar cell including Bifacial and IBC. In Oct 2015, PeiJun join Huawei as the principle engineer of system solution. PeiJun has now taken on the role as director of Product Portfolio & Life Cycle management, Utility Business, Huawei Solar.



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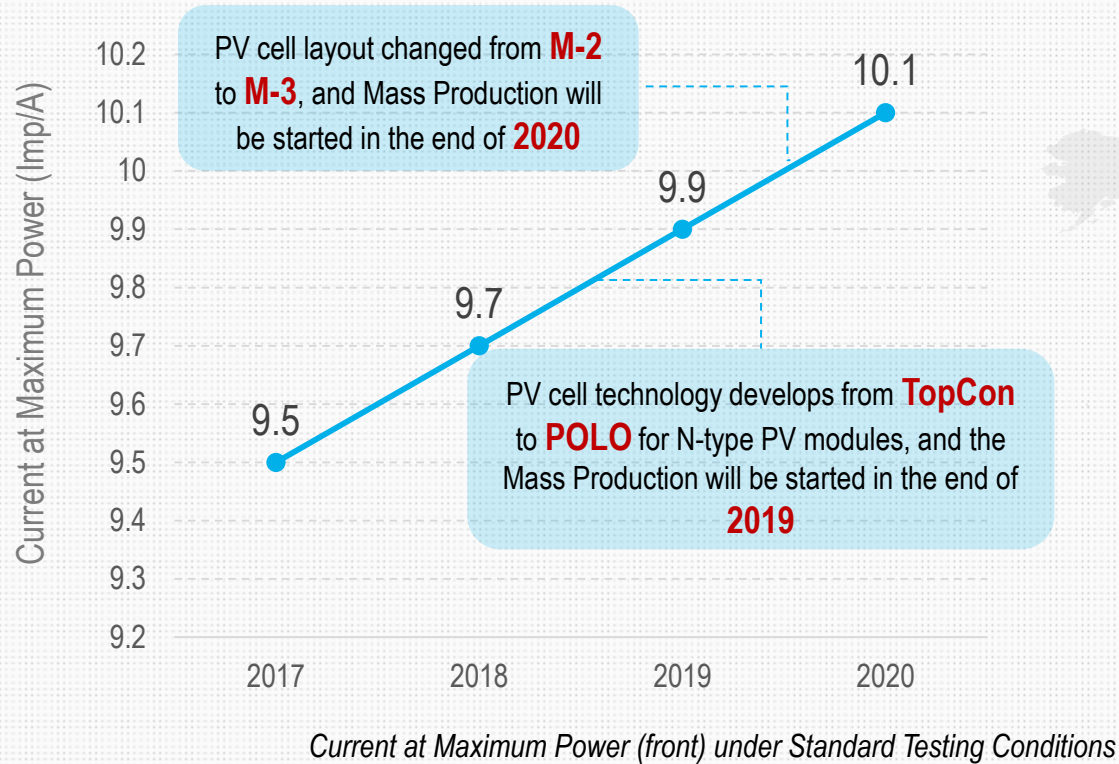
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# 25 A Max. Input Current Design, Best Fitting for Bifacial Modules

The Current at Maximum Power (Imp) will rise by **0.2 A/year** with further PV module technologies developing.

Global experimental data to prove Maximum Input Current of **25 A** best fitting for bifacial modules system design



**25 A**, Max. Current per MPPT

**USA, Texas**

DC/AC Ratio: 1.3  
Irradiance: 1650

**Mexico**

DC/AC Ratio: 1.2  
Irradiance: 2000

**Spain**

DC/AC Ratio: 1.25  
Irradiance: 1600

**Saudi**

DC/AC Ratio: 1.3  
Irradiance: 2100

**China, Golmud**

DC/AC Ratio: 1  
Irradiance: 1900

**Australia**

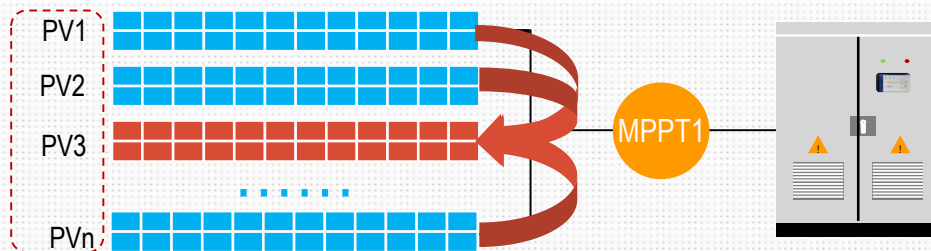
DC/AC Ratio: 1.3  
Irradiance: 1600

The data is simulated based on sand ground scenario.

# Bifacial PV Plants Benefit From String Inverters due to Multiple MPPT and Fuse Free Design

## Central Solution

Reverse Current > 15 A

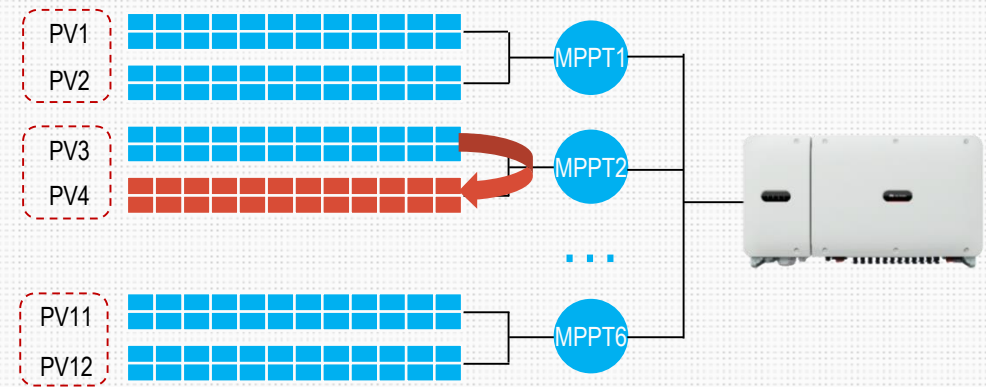


≥ 3 strings into 1 MPPT

- Fuse failure rate ≈ 1%,
- Inspection every 6 months

## Smart PV Solution

Reverse Current < 10 A



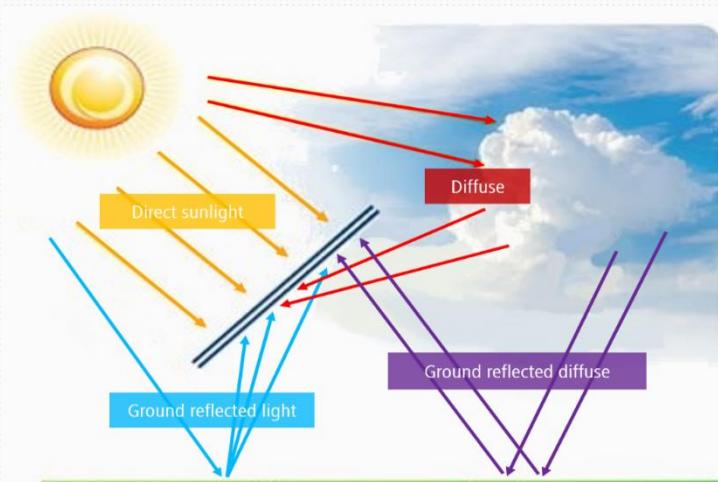
Only 2 strings into 1 MPPT  
NO fuse needed

Simple O&M & Cost Saving

# Multi-MPPT Works Better in Bifacial Modules System

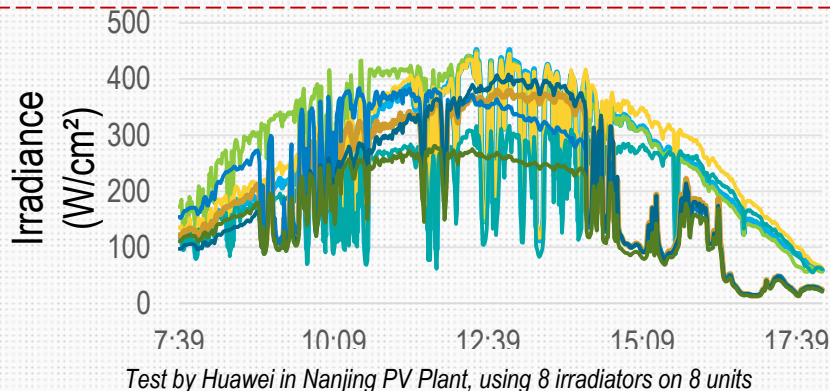
## By Reducing String Mismatch, 2.6% Yield Increases are Achieved

Non-uniform illumination on the rearside due to different irradiation conditions

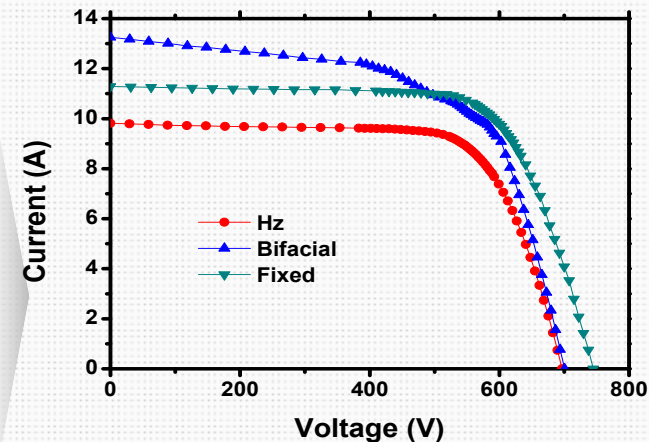


RMS of current increased from **2%** on monofacial module, compared to **5~15%** on a bifacial module

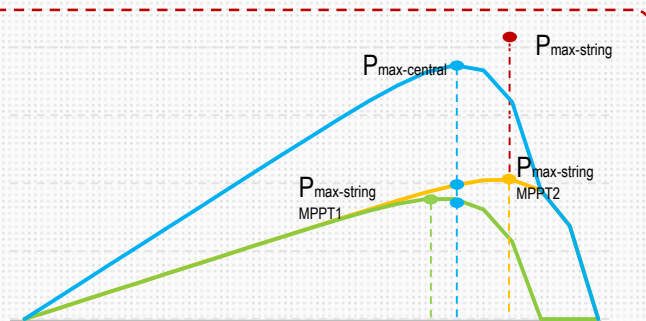
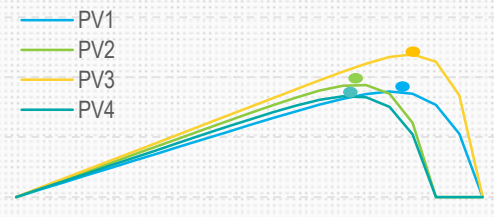
Illumination of bifacial modules at eight measuring points on one module, during working hours



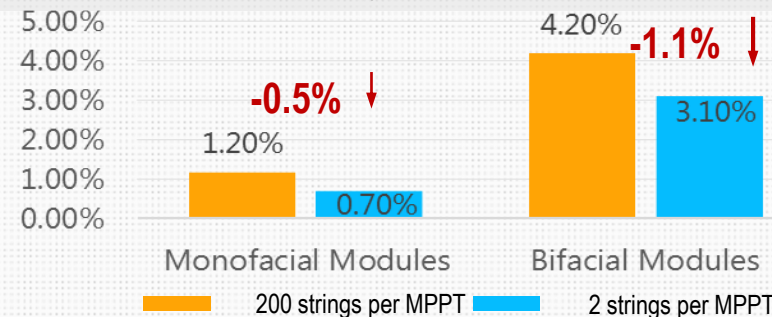
The I-V curve is disturbed by the irradiation at the rear



Example of P-V Curve for Four Strings



Mismatch Loss Greatly Reduced with More MPPTs



# Huawei's Smart Design Tool helps Optimise Bifacial PV Plants to Achieve Highest Yields and IRR)

**>65 GW**

FusionSolar Smart PV Solution  
deployed worldwide



Hot & Sandy  
130MW, Golmud, China



Water Surface & Floating  
2MW, Saga, Japan



High altitude of 4300 m  
50MW, Luhuo, China

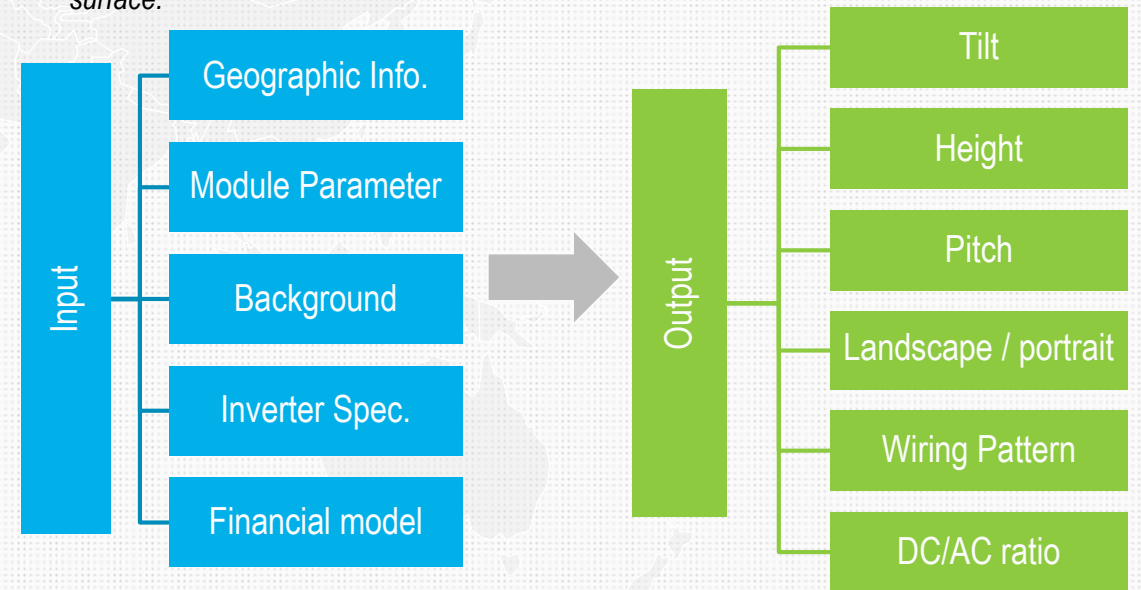


Extreme Cold & Snowfield  
40MW, Hulunbuir, China

## Smart Design Tool

*\*Only compatible with Huawei Inverter*

- *Perez model & view-factor method, based on the algorithm of NREL, Fraunhofer ISE etc.*
- *No presumption on bifacial gain. Only use intrinsic properties and strict physical model.*
- *Hourly analysis based on Solar zenith and the relation between incident light and rear surface.*



# Thank You

