



# BIFACIAL TESTING AT PV USA LATEST DATA AND FINDINGS

PV Evolution Labs (PVEL)

Tristan Erion-Lorico, Head of PV Module Business

[tristan.erion-lorico@pvel.com](mailto:tristan.erion-lorico@pvel.com)

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# PVEL is the Independent Lab of the Downstream Solar Market

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**Our mission is to support the worldwide PV buyer community by generating data that accelerates adoption of solar technology.**



**10+**

Years of experience

**400+**

Bills of materials tested

**400+**

Global downstream partners

**30+GW**

Annual project pipelines supported



# PVEL's Outdoor Bifacial Study

- › 10 Nextracker Horizon rows
- › 2 albedos
- › 9 PV module brands
- › 1,500V inverters

## Study Participants:

- › Astronergy
- › ET Solar
- › First Solar
- › GCL S.I.
- › Jinko Solar
- › LONGi
- › Morgan Solar
- › Q CELLS
- › Trina



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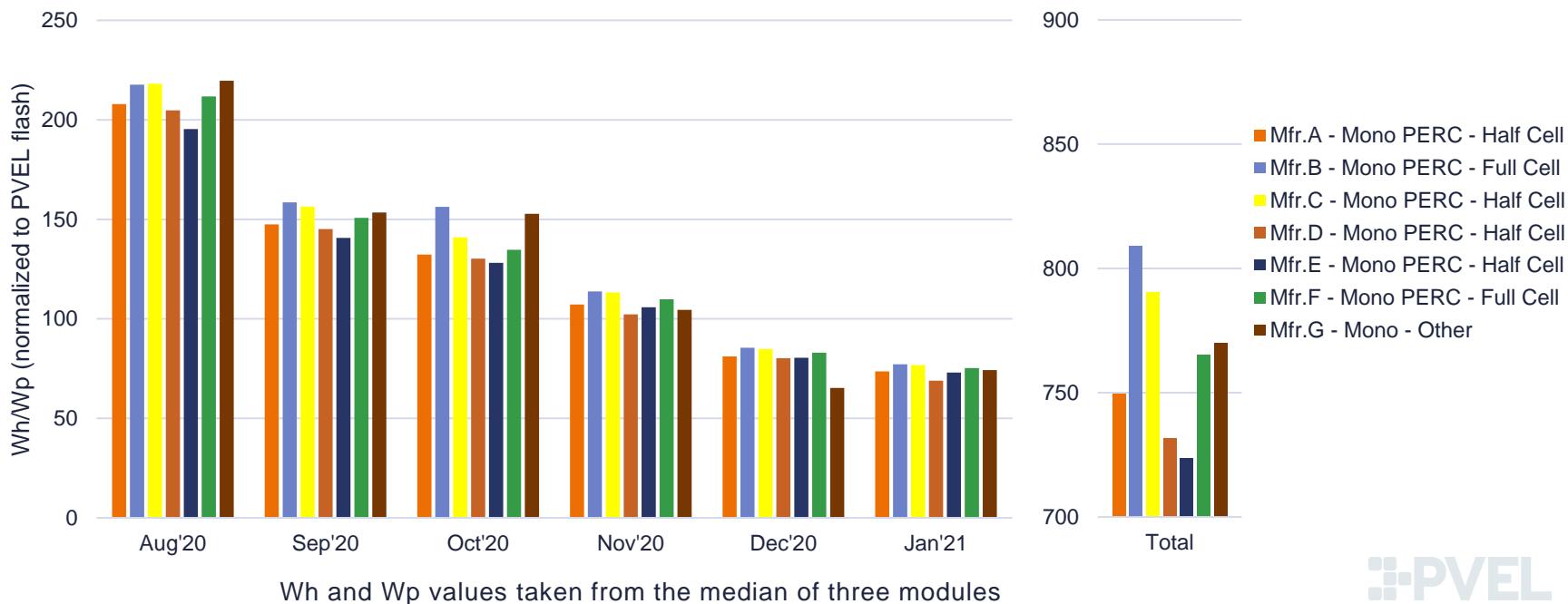
# PVEL's Flash Value vs. Nameplate

- › Normalizing energy harvest data to nameplate can result in different values versus normalizing to PVEL's pre-lightsoak flash measurement.
- › Mfr.A had the largest spread between the two module types, with a monofacial flash result 0.6% lower than nameplate and a bifacial flash result 1.8% higher than nameplate.



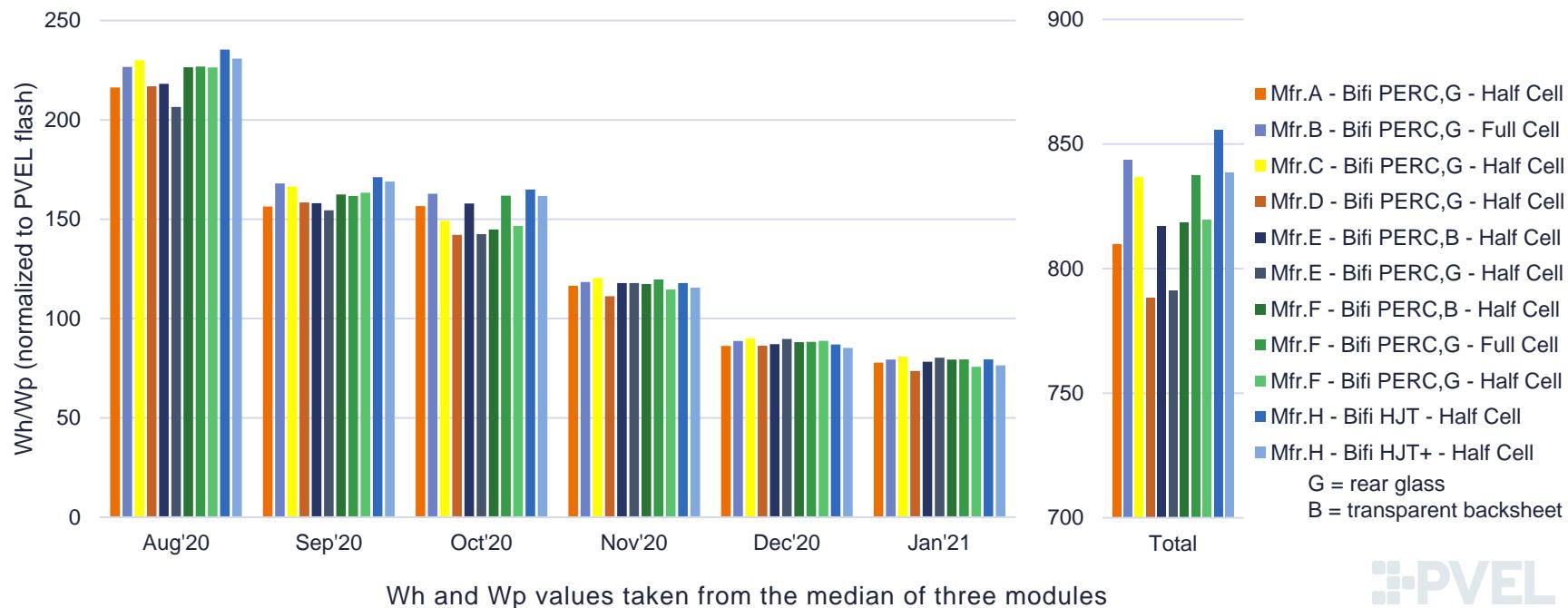
# Monthly Specific Yield – Monofacial

- › Focusing on monofacial, the monthly and total Wh/Wp values, normalized to PVEL's flash (not nameplate), reveal a surprisingly wide range of performance.
- › From Aug. to Jan. the highest performer (Mfr.B, Mono PERC, Full Cell) is **11.8%** higher than the lowest performer (Mfr.E, Mono PERC, Half Cell), and 6.1% higher than the average.



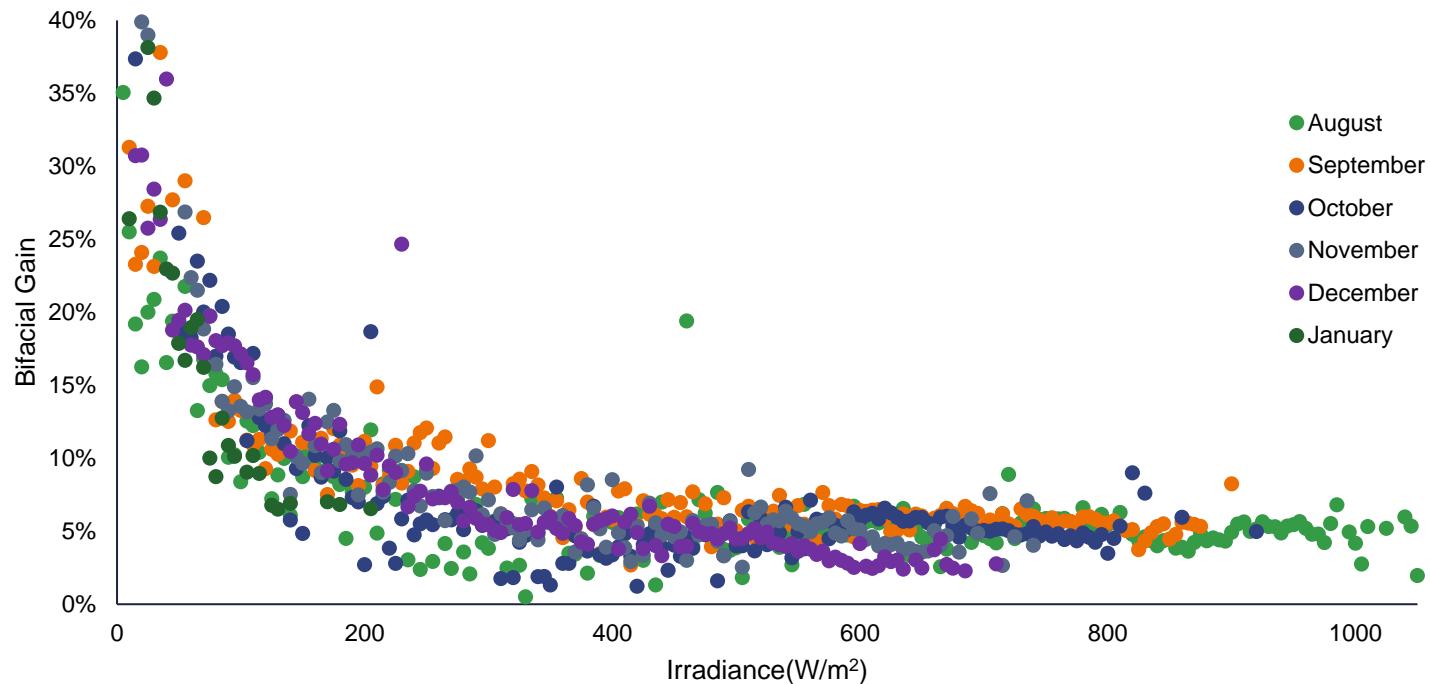
# Monthly Specific Yield – Bifacial on Natural Groundcover

- › The monthly Wh/Wp values for bifacial modules over natural groundcover (normalized to PVEL's flash) also show a significant range of performance.
- › From Aug. to Jan. the highest performer (Mfr.H, HJT, glass//glass) is **8.5%** higher than the lowest performer (Mfr.E, PERC, glass//glass), and 4.0% higher than the average.



# Bifacial Gain vs. Irradiance (Monthly)

- › Plotting Mfr.C's bifacial gain versus irradiance each month provides interesting insights into how the bifacial gains are higher at low irradiance.
- › Locations with more diffused light will provide higher bifacial gains, however above 600 W/m<sup>2</sup> the bifacial gain does not vary.





THANK YOU

**Tristan Erion-Lorico**  
Head of PV Module Business  
[tristan.erion-lorico@pvel.com](mailto:tristan.erion-lorico@pvel.com)



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