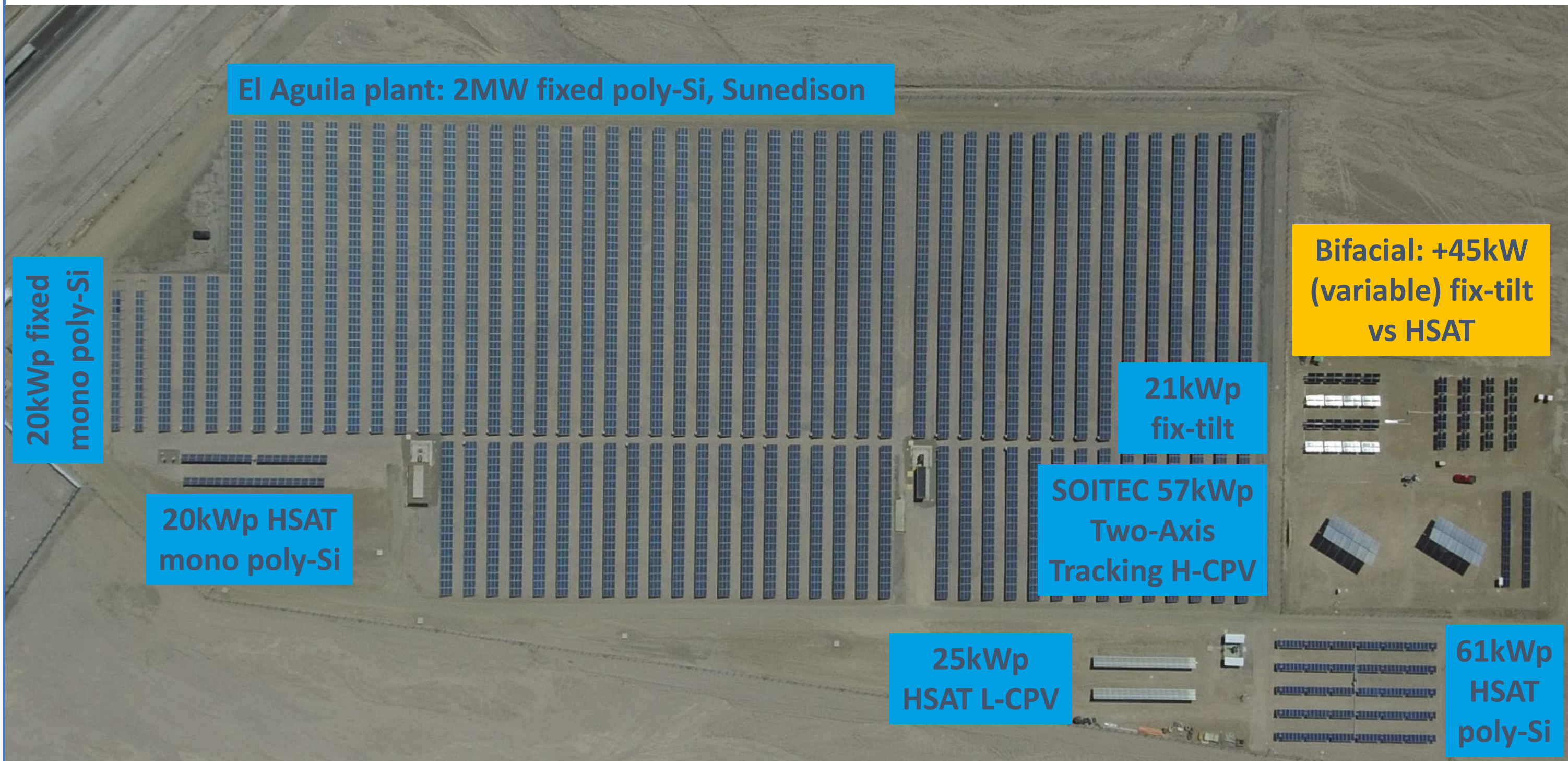


Field testing of utility scale bifacial PV in the Atacama Desert

Thore Müller, Elias Urrejola,
Arnaud Lambert, Byungkeun Song, Stijn Scheerlinck

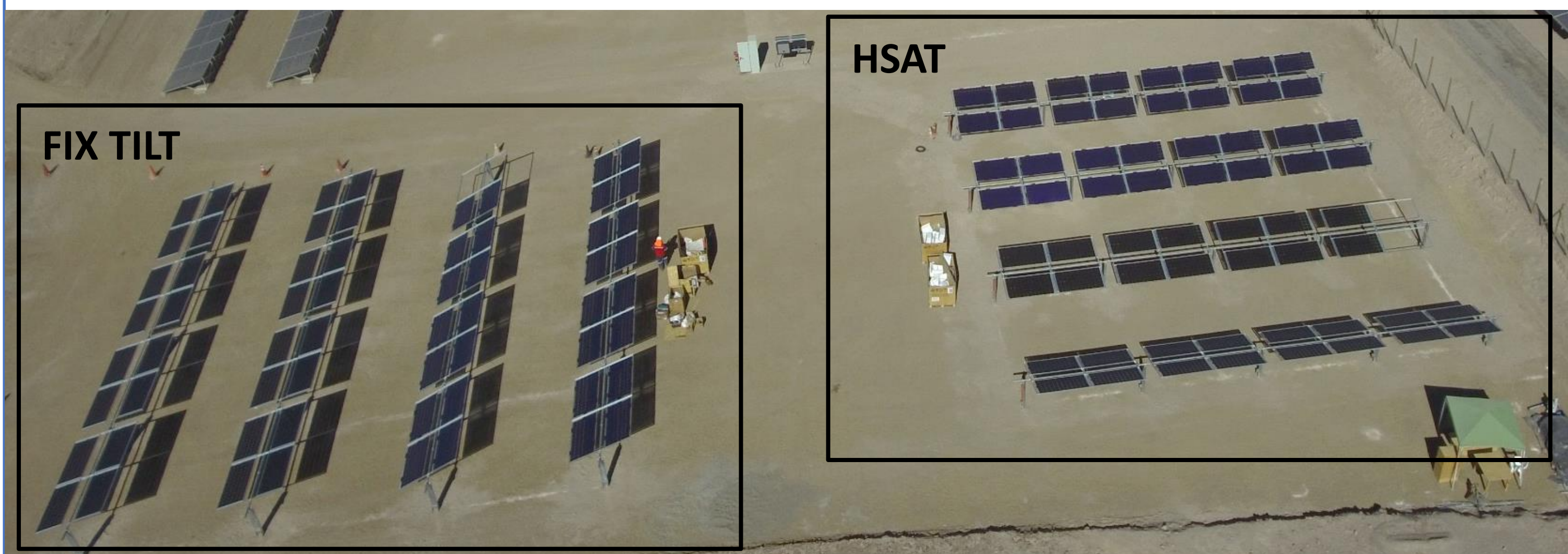
FIELD TESTING

At El Aguila 2MW PV power plant in Arica, northern Chile, ENGIE Laborelec has a unique outdoor laboratory for utility scale, real-life testing of different kinds of technologies at real system level in real operational and environmental conditions.

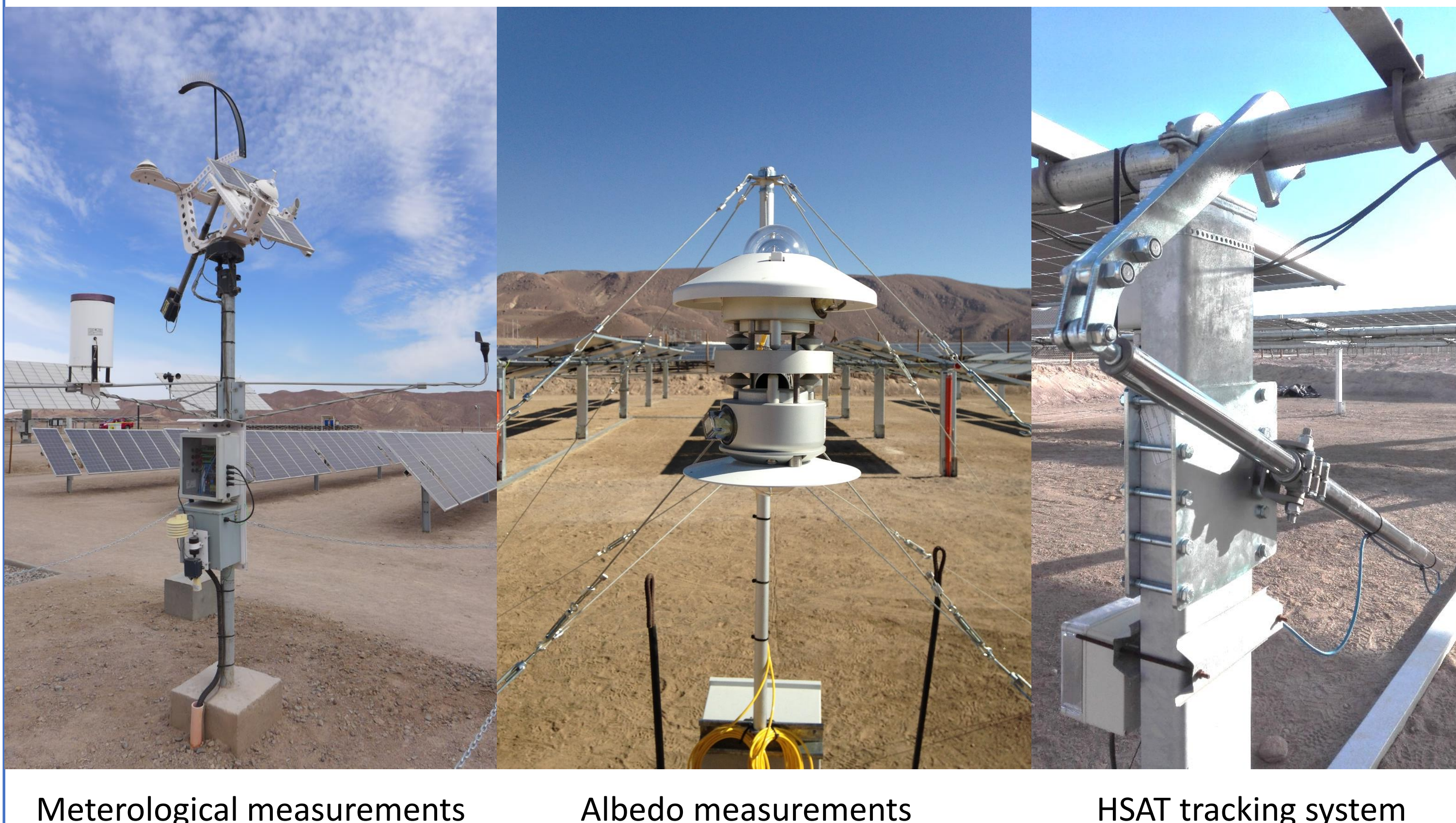


BIFACIAL PILOT

The bifacial pilot consists of eight strings of 16 panels each, arranged in two configurations (fix tilt and HSAT). Each string has its own MPPT, irradiance, albedo and yield are measured redundantly. Our measurement campaigns aim to compare different types and technologies of bifacial panels, understand which factors influence the bifacial gain and to find measures to increase the total yield.



- Realized in 2017
- HTJ n-type (with optimizer boxes), glass/glass, no frame
- PERC p-type, glass/ transparent backsheet, frame
- Other technologies



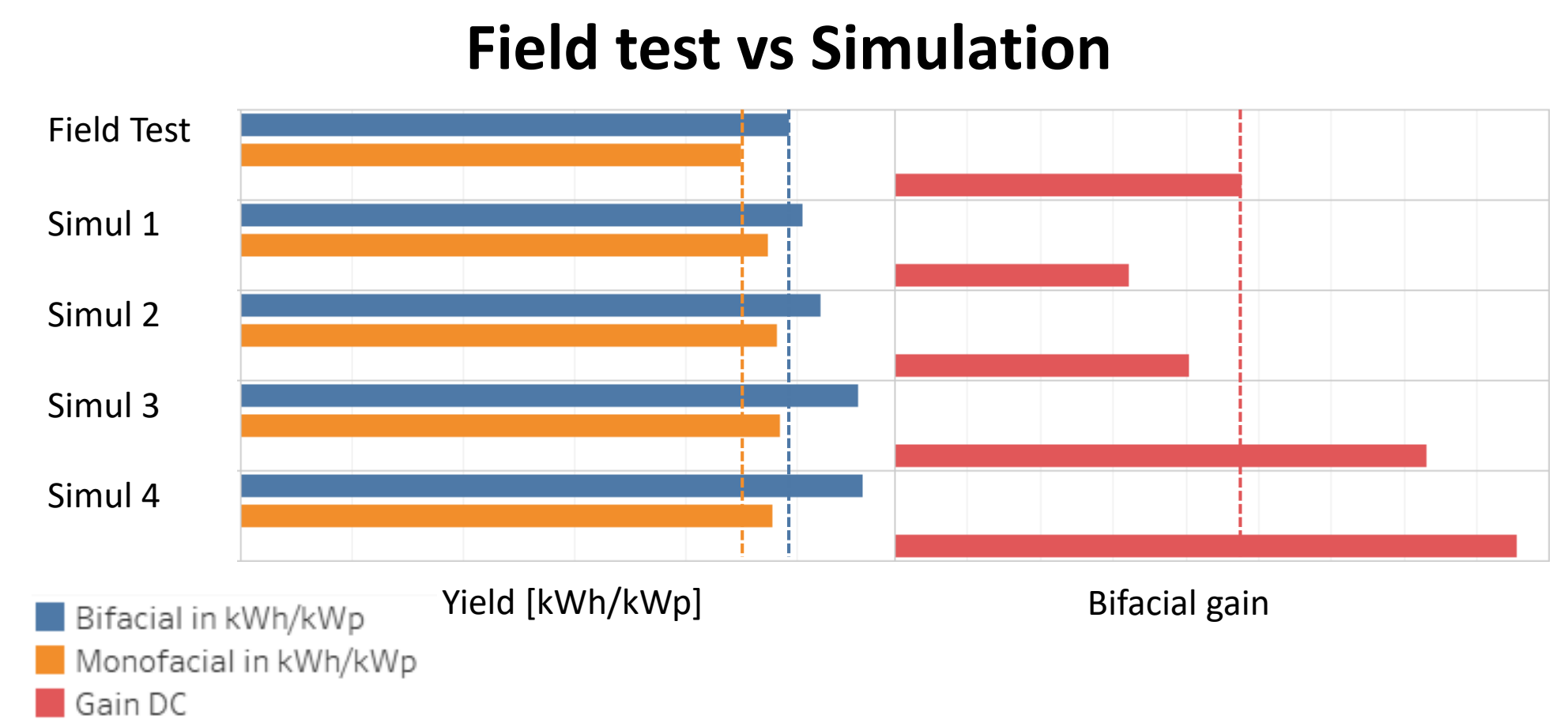
Meteorological measurements

Albedo measurements

HSAT tracking system

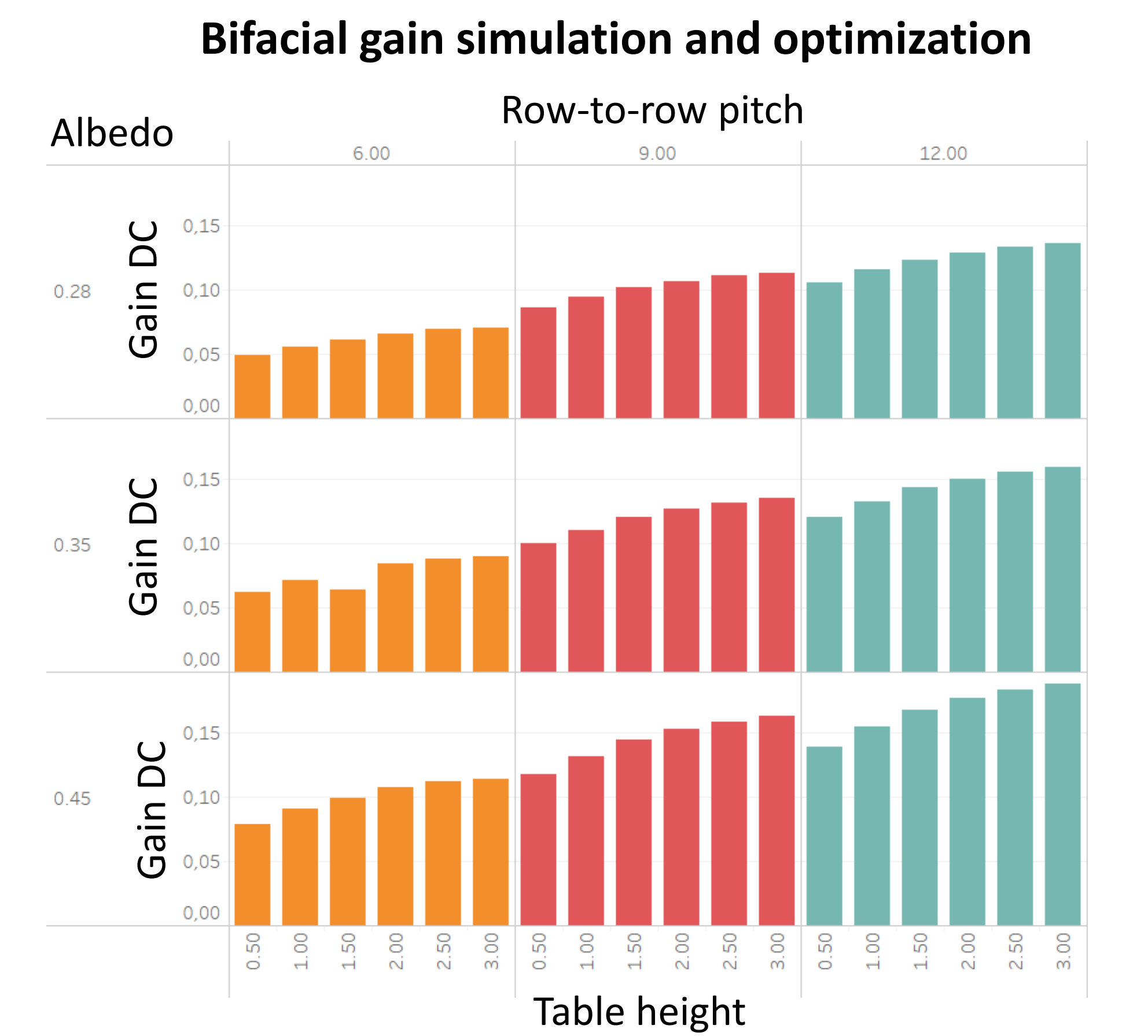
VALIDATION OF SIMULATION TOOLS

Comparison of different simulation tools available for bifacial PV:



GAIN OPTIMIZATION

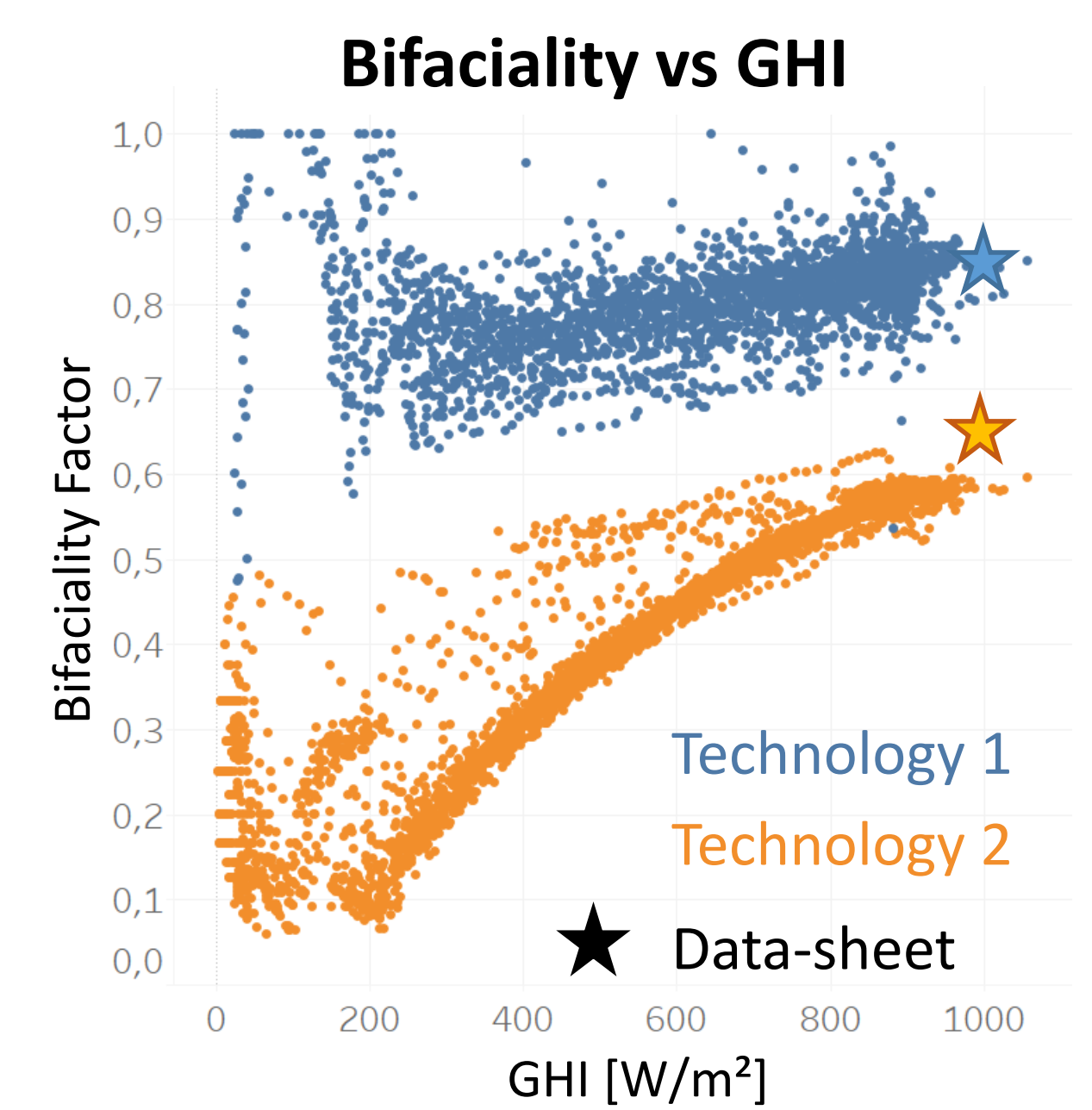
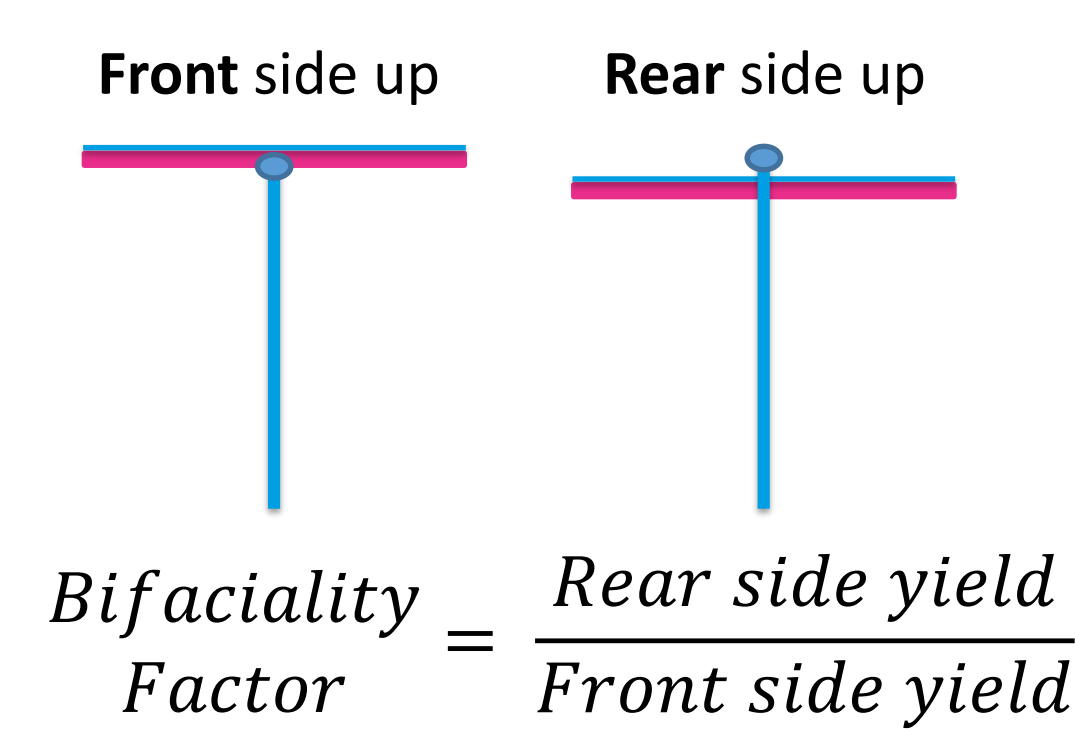
Optimization analysis performed with PVSyst: Ongoing experiments aim to confirm if predicted increase of bifacial gain is realistic.



BIFACIALITY FACTOR

Determination of bifaciality factor by comparing two horizontal strings: one string front side up and one string rear side up, both lower sides covered to exclude albedo boost.

Graphs show behaviour of PERC p-type and HTJ n-type (with optimizer boxes) panels. Stars indicate bifaciality factor at STC.



BIFACIAL GAIN

Comparing two tilted strings, one string with the rear side covered and one string without cover to determine the bifacial gain in function of the incident angle, etc. for different technologies.

