

Certificate of Performance

for Bi-facial & Mono-facial System in Outdoor Test Conditions

After experimental outdoor test of PV systems we will issue this certificate of performance to the Bi-facial modules of company

GTC Güneş Sanayi ve Ticaret A.Ş.

at the site of

Organize Sanayi, 11. Cadde, No: 21, Adıyaman/Türkiye

This certificate of performance confirms that the below presented. Similar and having two technically specified photovoltaic system, mono-facial and Bi-facial are interconnected to the grid tested together. The system of Bi-facial having standard stated sand conditions of 181 days gives the following: The difference between the performance of these two systems is about **%7,37** higher for the bifacial.

Installed capacity of Mono-facial PV system: 1500,93 Wp*

Installed capacity of Bi-facial PV system: 1470,75 Wp*

Module Type: Mono-Si PERC, 72 cell, 4 bus bar, (GTC-GG1H-72)

Tilt angle: 32°

Test locations: METU-GUNAM – Department of Physics, Ankara

Test Period: 04 July – 31 Dec 2020

Report Number: GUNAM-MTG-2021-04

Report Date: 09 Feb 2021

Months	Incoming energy of tilted front surface (kW/m ²)	Incoming energy of tilted back surface (kW/m ²)	Yield of Bi-facial System (kW/m ²)	Yield of Mono-facial System (kW/m ²)	Yield difference (%)
July	211,94	21,80	35,70	33,07	7,98
August	235,05	21,11	39,50	36,90	7,05
September	200,69	15,47	34,72	32,59	6,54
October	164,62	11,25	29,24	27,45	6,51
November	133,81	8,99	24,96	23,32	7,07
December	86,23	6,29	16,54	15,16	9,13
AVERAGE	172,06	14,15	30,11	28,08	7,37

Prof. Dr. Raşit Turan
Director of GUNAM

*: These power values were obtained by using measurements at the firm from production line.