



KGS

Solar Solutions and Beyond

One small step toward solar, one giant leap
toward energy freedom

KGS Residential Solar Energy



About KGS

KGS is a power engineering and consultancy company that believes in the importance of providing Safe creative solutions for a world witnessing a historical transition to more sustainable, green and renewable energy sources.

KGS provides comprehensive solutions:

- Solar
- Hybrid energy services
- Management
- Monitoring & control
- Reliable Customer Services

The road to Energy Freedom

BY INSTALLING SOLAR PV PANELS

Houses owners are able to considerably:

- Cut their overheads
- Improve electricity quality
- Increase their bottom line with up to 100% savings on their daytime electricity costs.
- Ensuring energy supply

“Solar panel prices have dropped more than 80 percent globally since 2011”



BENEFITS OF SWITCHING TO SOLAR ELECTRICITY

Investing in a solar power system for your home means



Replace the generator's
expensive, poor-quality
electricity supply



Get free solar and
Sustainable electricity



Save up to 100 % of the
electricity bill (and more
with the continuous
increase in energy prices)



Providing a **great return**
on the initial cost of the
system



Protect yourself from
rising diesel costs



Manage your house
energy **via smart Apps**

"House owner can reduce overall energy costs by more than 75% by going solar"

Source: EnergySage market data



KGS Designs, Implements and Manages Solar Energy Solutions and Provides Unmatched Experiences

**Smart Solar
Power**

**Hybrid Power
Systems**

**Renewable
Energy
Technologies**

**Systems
Management,
Monitoring &
Control**

"KGS provides a turnkey supply, installation and maintenance service for residential solar systems"

3 Steps to Energy Freedom

"Renewable sources of energy can help countries mitigate climate change, build resilience to volatile prices, and lower energy costs"

Source: World Bank

"KGS teams do not only sell solar projects, they provide solar solutions that fit your lifestyle"

1

Call KGS

2

**Require a Site
Inspection**

3

**Receive a
Comprehensive,
Safe, Sustainable,
and Reliable
Solution**



During the 3 Steps, Our Team Will

01

Receive your request

04

Gather data about the current and future load requirements

07

Suggest a solution that fits best your lifestyle not just a solar system

02

Obtain an idea about your lifestyle

05

Provide a complete design for the system

08

Provide a maintenance plan for the after sale stage

03

Analyze the site conditions

06

Provide a brief about the ROI

09

Facilitate the return and end-of-life management of devices & batteries

"Each kilowatt-hour (kWh) of solar that is generated will substantially reduce greenhouse gas emissions like CO₂, as well as other dangerous pollutants such as sulfur oxides, nitrogen oxides and particulate matter"



Our Partners

European reliable Leaders in the Solar World

1 FuturaSun



FuturaSun was established in 2008 by a team of managers in Veneto, Italy's hub of the photovoltaic industry.

However, FuturaSun is not one of those many solar companies which enjoyed extremely rapid growth during the years of the photovoltaic boom: The team actually started the company just at the time when the first signs of the sector's decline began to show in Italy, only to plummet in the subsequent years. So while several big players disappeared from the photovoltaic scene, FuturaSun has continued along its journey of growth, initially taking small steps and gaining momentum later.

Today FuturaSun sells in over 70 countries, and has achieved double-digit sales growth year on year.

FuturaSun Products



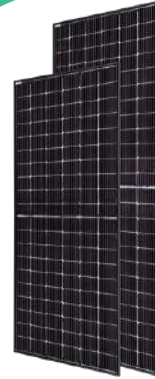
FuturaSun

Multi-Busbar PV Modules



FuturaSun

Back Contact PV Modules



FuturaSun

Glass PV Modules



FuturaSun

BIPV Modules



FuturaSun

Repowering PV Modules

Our Solutions

ELECTRICAL DATA						
MODULE SILK® Premium		FU 490 M SILK® Premium	FU 495 M SILK® Premium	FU 500 M SILK® Premium	FU 505 M SILK® Premium	FU 510 M SILK® Premium
Standard Test Conditions STC: 1000 W/m ² - AM 1.5 - 25 °C - tolerance: Pmax (±3%), Voc (±4%), Isc (±5%)						
Module power (Pmax)	W	490	495	500	505	510
Open circuit voltage (Voc)	V	51.20	51.40	51.60	51.80	52.00
Short circuit current (Isc)	A	12.17	12.24	12.31	12.38	12.44
Maximum power voltage (Vmpp)	V	42.47	42.64	42.85	43.06	43.26
Maximum power current (Impp)	A	11.54	11.61	11.67	11.73	11.79
Module efficiency	%	20.42	20.63	20.84	21.05	21.25
Nominal Module Operating Temperature NMOT 800 W/m ² - T=45 °C - AM 1.5						
Module power (Pmax)	W	371	375	379	382	386
Open circuit voltage (Voc)	V	48.40	48.60	48.80	49.00	49.2
Short circuit voltage (Isc)	A	9.77	9.83	9.89	9.94	9.99
Maximum power voltage (Vmpp)	V	40.00	40.20	40.40	40.60	40.7
Maximum power current (Impp)	A	9.26	9.32	9.37	9.43	9.49
TEMPERATURE RATINGS						
Temperature coefficient Isc	%/°C	0.05				
Temperature coefficient Voc	%/°C	-0.26				
Temperature coefficient Pmax	%/°C	-0.35				
NMOT *	°C	43				
Operating temperature	°C	from -40 to +85				

*Nominal Module Operating Temperature

MECHANICAL SPECIFICATIONS	
Weight	26.3 kg
Cell encapsulation	EVA (Ethylene Vinyl Acetate)
Backsheet	Composite multilayer film
Junction box	Certified according to IEC 62790, IP 68 approved, 3 bypass diodes
Maximum reverse current (Ir)	20 A
Mechanical load (snow)	Design load: 3600 Pa 5400 Pa (including safety factor 1.5)
Mechanical load (wind)	Design load: 1600 Pa 2400 Pa (including safety factor 1.5)
Protection Class	II - accordance to IEC 61730



2

FAAM

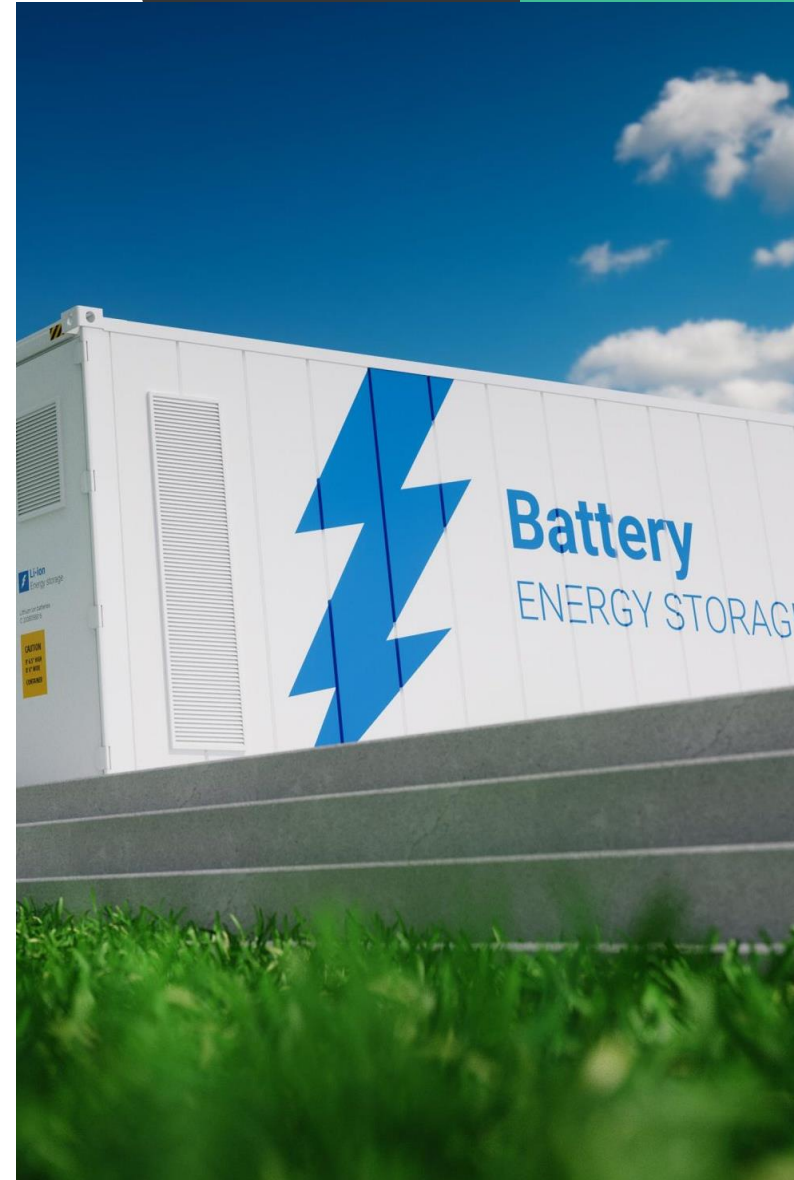


FAAM has been present in the battery market since 1974 with customized solutions and a complete Circular Economy model.

FAAM produces both lead-acid and lithium-ion batteries, with a strong focus on research and development.

In Teverola, FAAM has set up a highly innovative plant for the production of cells, modules and lithium-ion batteries. Again in Teverola, FAAM is building the first Gigafactory in Southern Europe, and the only one in Italy, for the production of high-performance and green lithium cells and batteries.

FAAM investments are strongly pursuing the strategic goal of delivering innovative, safe and eco-friendly products in the market, controlling the entire production value chain.

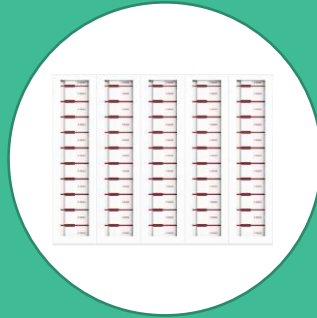


FAAM Products



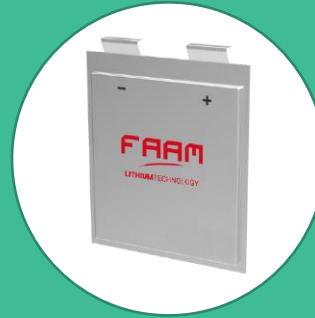
FAAM

*LiHOME Sun Storage
Inverter*



FAAM

Energy Storage Systems



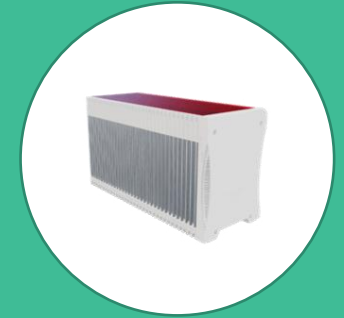
FAAM

Li-ION Cell



FAAM

LC01 CELL



FAAM

Kombi Module



FAAM

LiSTORAGE 10.2



FAAM

LiSTORAGE LSi4880



FAAM

LiSTORAGE LSh4880



FAAM

LiRACK



FAAM

FAAM LiTRACTION



FAAM

Li-BESS 10.2



FAAM

*STA OPzS Flooded
Batteries*



FAAM

HPS Flooded Batteries



FAAM

*STG OPzV VRLA Gel
Batteries*



FAAM

FTG VRLA Gel Batteries



FAAM

FLG VRLA Gel Batteries



FAAM

FLL VRLA AGM Batteries



FAAM

FMR VRLA AGM Batteries



FAAM

*FHP VRLA AGM
Batteries*



FAAM

*FTS VRLA AGM
Batteries*



3

FRIEM

FRIEM has expertise and reliability in the global electric energy converter market. In 1950 Mr. Angelo Pagliai endowed with a tenacious entrepreneurial attitude, laid the foundation of FRIEM. Enhancing experience, reputation and know-how, today the third generation of the shareholders, who wear even the role of managers, is going to organize an industrial group that is intended to evolve with continuity into its own history. Today FRIEM Group, through the affiliated company F&F, provides the market with products and solutions for renewable energies (energy storage). Moreover, the subsidiary Eyes serves the sustainable mobility market with EV charging systems and vehicle electrification.

FRIEM Products



FRIEM

*RECon Line Concept –
Single or Combined*



FRIEM

String Box



FRIEM

*RMS - RECon Monitoring
System*



FRIEM

HYCon-Line converters



FRIEM

*BESS (Battery Energy
Storage Systems)*



FRIEM

Recon Station (RST)



FRIEM

*HYCon Station Plug &
Play solution*

FRIEM RECon 30

200

400

600

800

1000

1200

DC Input

Maximum input voltage (V _{oc})	V	1000					
Input voltage range	V	1,51 x V _{AC} - 885					
Nr of MPPT	-	1	2	3	4	5	6
Maximum input DC current	A	325 ÷ 1950					
Maximum input short circuit current	A	360 ÷ 2160					

AC Output

Voltage Range (Phase-Phase)	V	200 - 400					
Frequency	Hz	50 / 60					
Power @ 200 (Phase-Phase) (1)	kW	100	200	300	400	500	600
Power @ 400 (Phase-Phase) (1)	kW	200	400	600	800	1000	1200
Rated current @40°C	A	290 ÷ 1740					

General Information

Auxillary supply from UPS	V	230					
Standby consumption	W	110	220	330	440	550	660

Auxillary Power

Width	mm	550	1100	1650	2200	2750	3300
Height	mm	2200					
Depth	mm	825					
Weight	kg	350	700	1050	1400	1750	2100
Air Flow	m³/h	850	1700	2550	3400	4250	5100

FRIEM RECon 2.30

DC Input

Maximum input voltage (Voc)	V	1000		
Input voltage range	V	1,51 x VAC - 885		
Nr of MPPT	-	1	2	3
Maximum input DC current	A	650 ÷ 1950		
Maximum input short circuit current	A	720 ÷ 2160		

AC Output

Voltage Range (Phase-Phase)	V	200 ÷ 400		
Frequency	Hz	50 / 60		
Power @ 200 (Phase-Phase) (1)	kW	200	400	600
Power @ 400 (Phase-Phase) (1)	kW	400	800	1200
Rated current @40°C	A	580 ÷ 1740		

Auxillary Power

Auxillary supply from UPS	V	230		
Standby consumption	W	110	220	330

General Information

Width	mm	1100	2200	3300
Height	mm	2200		
Depth	mm	825		
Weight	kg	570	1400	1710
Air Flow	m³/h	1700	3400	5100

FRIEM RECon 75HV

Rated Voltage 570VAC

RECon 75HV	780	1560	2340
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DC Input

Maximum input voltage (Voc)	V	1500		
Input voltage range	V	855 - 1300		
Nr of MPPT	-	1		
Maximum input DC current	A	900	1800	2700
Maximum input short circuit current	A	1200	2400	3600

Voltage Range (Phase-Phase)	V	570		
Frequency	Hz	50 / 60		
Power @ 25, 45, 50°C	kW	770, 740, 688	1540, 1480, 1376	2310, 2220, 2064
Rated current (1)	A	750	1500	2250

General Information

Type of connection	-	IT		
Power factor (2)	-	> 0,99		
Total harmonic distortion (2)	%	≤ 3		

Dimension and Weight

Width, Height, Depth	mm	2750, 2252, 1052	3750, 2252, 1052	4750, 2252, 1052
Weight	kg	1500	2100	3000

FRIEM RECon 75HV

Rated Voltage 600VAC

RECon 75HV	780	1560	2340
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DC Input

Maximum input voltage (Voc)	V	1500		
Input voltage range	V	900 - 1300		
Nr of MPPT	-	1		
Maximum input DC current	A	900	1800	2700
Maximum input short circuit current	A	1200	2400	3600

AC Output

Voltage Range (Phase-Phase)	V	600		
Frequency	Hz	50 / 60		
Power @ 25, 45, 50°C	kW	811, 780, 725	1622, 1560, 1450	2433, 2340, 2175
Rated current (1)	A	750	1500	2250

General Information

Type of connection	-	IT		
Power factor (2)	-	> 0,99		
Total harmonic distortion (2)	%	≤ 3		

Dimension and Weight

Width, Height, Depth	mm	2750, 2252, 1052	3750, 2252, 1052	4750, 2252, 1052
Weight	kg	1500	2100	3000

FRIEM RECon 75HV

Rated Voltage 630VAC

RECon 75HV	780	1560	2340
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DC Input

Maximum input voltage (Voc)	V	1500		
Input voltage range	V	945 - 1300		
Nr of MPPT	-	1		
Maximum input DC current	A	900	1800	2700
Maximum input short circuit current	A	1200	2400	3600

AC Output

Voltage Range (Phase-Phase)	V	630		
Frequency	Hz	50 / 60		
Power @ 25, 45, 50°C	kW	851, 818, 761	1702, 1636, 1522	2533, 2454, 2283
Rated current (1)	A	750	1500	2250

General Information

Type of connection	-	IT		
Power factor (2)	-	> 0,99		
Total harmonic distortion (2)	%	≤ 3		

Dimension and Weight

Width, Height, Depth	mm	2750, 2252, 1052	3750, 2252, 1052	4750, 2252, 1052
Weight	kg	1500	2100	3000

FRIEM HYCon 10

HYCon 10	70	140	210	280	350	420
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AC Side

Voltage range (Phase-Phase) (1)	V	200 - 400 (±10%)					
Frequency	Hz	50 / 60					
Power @ 400 V (Phase-Phase)	kW	70	140	210	280	350	420
Rated current @ 40°C	A	100	200	300	400	500	600

DC Side

Charging Voltage Range @ VnAC	V	1,51 x VAC - 885					
Maximum current @ 40°C	A	110	220	330	440	550	660
Maximum number of DC connections	-	1	2	3	4	5	6

General Information

Weight (1)	kg	290	580	870	1160	1450	1740
Width	mm	550	1100	1650	2200	2750	3300
Height		2200					
Depth		825					
Air Flow	m3/h	700	1400	2100	2800	3500	4200
Standby consumption	W	50	100	150	200	250	300



FRIEM HYCon 30

HYCon 30	200	400	600	800	1000	1200
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AC Side

Voltage range (Phase-Phase) (1)	V	200 - 400 ($\pm 10\%$)					
Frequency	Hz	50 / 60					
Power @ 400 V (Phase-Phase)	kW	200	400	600	800	1000	12000
Rated current @ 40°C	A	290	580	870	1160	1450	1740

DC Side

Charging Voltage Range @ VnAC	V	1,51 x VAC - 885					
Maximum current @ 40°C	A	325	650	975	1300	1625	1950
Maximum number of DC connections	-	1	2	3	4	5	6

General Information

Weight (1)	kg	350	700	1050	1400	1750	2100
Width	mm	550	1100	1650	2200	2750	3300
Height		2200					
Depth		825					
Air Flow	m3/h	850	1700	2550	3400	4250	5100
Standby consumption	W	110	220	330	440	550	660

FRIEM HYCon 2.30

HYCon 2.30		400	800	1200
AC Side				
Voltage range (Phase-Phase) (1)	V	200 - 400 (±10%)		
Frequency	Hz	50 / 60		
Power @ 400 V (Phase-Phase)	kW	400	800	1200
Rated current @ 40°C	A	580	1160	1740
DC Side				
Charging Voltage Range @ VnAC	V	1,51 x VAC - 885		
Maximum current @ 40°C	A	650	1300	1950
Maximum number of DC connections	-	1	2	3
General Information				
Weight (1)	kg	570	1140	1710
Width	mm	1100	2200	3300
Height		2200		
Depth		825		
Air Flow	m3/h	1700	3400	5100
Standby consumption	W	110	220	330

FRIEM HYCon D84

HYCon D84		1	2	3	
STEP-DOWN MODE	DC Input				
	Voltage range	V	1,1 x VMAXOUT ÷ 885		
	DC Output				
	Voltage Rangev	V	120 ÷ VminIN / 1,1		
	Maximum Current	A	84	168	252
	Max. DC Ripple (pk-pk)	%	< 3 (@ Max. DC Voltage)		
	Efficiency				
	Maximum efficiency	%	99		
STEP-UP MODE	DC Input				
	Voltage range	V	120	÷ VminOUT	/ 1,1
	Maximum Current	A	84	168	252
	DC Output				
	Voltage Range	V	1,1 x VMAXIN ÷ 885		
	Max. DC Ripple (pk-pk)	%	< 3 (@ Max. DC Voltage)		
	Efficiency				
	Maximum efficiency	%	99		
Weight & Air Flow					
Weight	kg	180	210	240	
Air flow	m3/h	700			

HYCon D168

HYCon D168		1	2	3
STEP-DOWN MODE	Voltage range	V	$1,1 \times V_{MAXOUT} \div 885$	
	Voltage Range	V	$120 \div V_{minIN} / 1,1$	
	Maximum Current	A	168	336 504
	Max. DC Ripple (pk-pk)	%	< 3 (@ Max. DC Voltage)	
	Maximum efficiency	%	99	
STEP-UP MODE	Voltage range	V	$120 \div V_{minOUT} / 1,1$	
	Maximum Current	A	168	336 504
	Voltage Range	V	$1,1 \times V_{MAXIN} \div 885$	
	Max. DC Ripple (pk-pk)	%	< 3 (@ Max. DC Voltage)	
	Maximum efficiency	%	99	
Weight		kg	220	250 290
Air flow		m3/h	850	

FRIEM HYCon D-Line

DC Protections & Switching

Over voltage protection	-	Surge arrester type II (Optional)
Switch	-	DC load break switch
Other protection	-	Insulation monitoring system (Optional)

Auxiliary power

Auxiliary supply from UPS	-	230
Auxiliary supply voltage range	-	195 - 253
Standby consumption	W	50

General Information

Dimension (WxHxD)	mm	550x2200x825
Protection class	-	IP 20
Operating temperature range (1)	°C	-10 ÷ + 40
Cooling system	-	Forced air
Maximum altitude a.s.l (2)	m	4500 (for installation over 1000 m, please contact FRIEM)

Interfaces

Local user interface	-	Touch screen display (Optional)
Communication protocol	-	Modbus RTU or TCP/IP
PC communication port	-	RS232 - RS485
Remote communication port	-	Ethernet

Standards

Product standard	-	2004/108/EC - 2006/95/EC - CEI EN 62109-1 (2010) - CEI EN 62109-2 (2012) - IEC 60730 (2010)
EMC	-	EN 61000 - 6 - 2 / EN 61000 - 6 - 4
Euro Efficiency		IEC 61683: 1999-11

Functions

Grid Support Functions	-	On-Demand Production, Ramp Rate Control, Frequency Regulation, Active Power Reserve, Energy Time Shifting, Peak Shaving, Reactive Compensation, Power Factor Control, Automatic Voltage Regulation, Voltage Drop Control, Black Start Capability, Power Stability
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“KGS believes that having a solar system is not a solution by itself, what is important is having a solar solution that serves your lifestyle requirements”

Experiences that Matter

Our experience-led approach to solar residential and systems includes design, project management, installation and after sale services based on CRM.

This allows you to benefit from industry-leading advice and delivery from the best-experienced installer. When you have a solar system at home, it will automatically feed the power you've generated to your home appliances, and the power you use from sun-light will be free.

When you use more energy than you produce, your power supply will switch back to the grid if available or to the batteries. No disruption or change will be noticed.

KGS Believes In

- **Providing** solutions-oriented projects that give an exceptional experience in the world of solar energy
- **Promoting** on/off Grid solar systems with the high-quality brand image
- **Supplying** safe and reliable solar solutions with high quality and efficient PV modules, high-efficiency inverters and high tech. batteries in addition to using reliable and renowned equipment while leveraging a wide range of products
- **Becoming** the "Partner of choice" by our customers
- **Entering** into synergy with our business partners
- **Motivating** employees and increasing their engagement



"Many factors affect the price of a residential solar system, please contact KGS today for a competitive quote for your home and find out how much you could save every year with solar PV"



KGS

Comprehensive Expertise



KGS employs a dedicated team of professionals, specializing in financial and technical feasibility studies of power projects and their conceptual design

Engineering

**Supervision of
construction**

**Power project
evaluation**

**Commissioning and
O&M of energy
generation plants**

**Value engineering
design**

**Transmission and
distribution (T&D)
systems**

Optimization review

**Oil & Gas consultancy
services**



Residential Solar energy



THANKS

One small step toward solar, one giant leap
toward energy freedom

The road to Energy Freedom

"KGS team do not only sell solar projects, they provide solar solutions that fit
your lifestyle"