

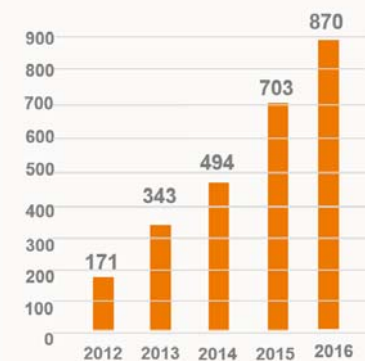
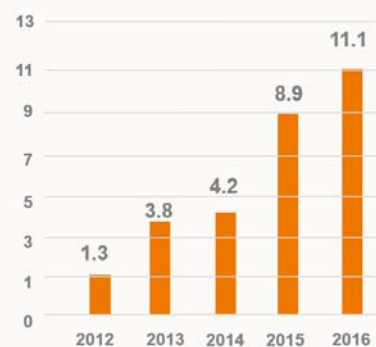
New 1500V DC String Inverter for Utility-Scale Power Plants



About Sungrow



- ▶ **Headquartered: Hefei, China**
- ▶ **Production Capacity: 3GW / Month**
- ▶ **Shipment 2016: 11.1 GW (40 GW total)**



Annual Shipments (in GW)

Annual Sales Revenue (Million USD)

Sungrow Quality Management



4MW Testing PV Plant



PV Inverter Test Platform



Alternating temperature humidity test



LVRT



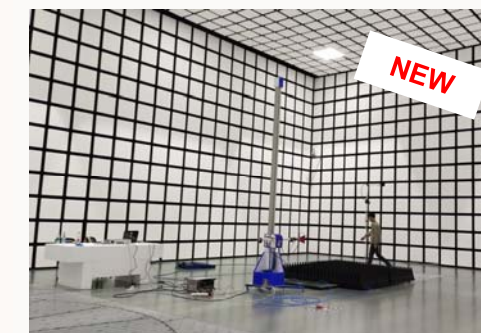
Waterproof Test(IEC 60529:2001)



Sand & Dust Test(IEC 60529:2001)



Drop Test(IEC 68-2-32)



EMC Test Chamber

Sungrow Testing Facilities are approved by:



Utility String Inverter Evolution to 1500V



SG60KTL

60kWp
 DC: 1000V
 AC: 400V
 60kg
 RS485
 Active Cooling

SG80KTL

80kWp
 DC: 1100V
 AC: 400V
 65kg
 RS485
 Active Cooling

SG125HV

125kWp
 DC: 1500V
 AC: 600V
 72kg
 RS485
 Active Cooling

Potential
 System Size



SG125HV Specification



SG125HV

Electrical Data

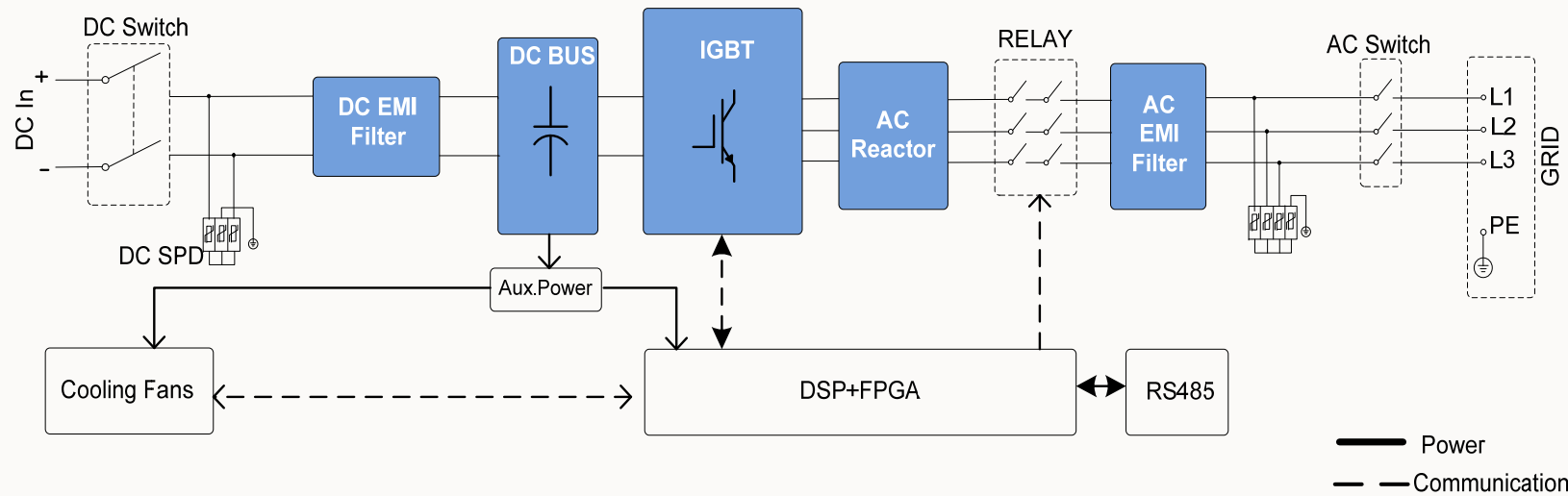
Max. input voltage	1500 V
MPPT voltage range	860 ... 1450 V
MPPT voltage range for nominal power	860 ... 1250 V
No. of MPPTs /	1
Max. No. of Inputs per MPPT	1
Nominal AC output active power	125 kW
Max. AC output active power	125 kW
Max. AC output apparent power	125 kVA
Rated grid voltage	600 V
Rated grid frequency	50 Hz / 60 Hz \pm 5 Hz
Adjustable power factor	0.8 (lagging) ~ 0.8 (leading)
Max. / European efficiency	98.90 % / 98.70 %

General Data









Dimensions (W × H × D)	670 x 890 x 296 mm
Weight	72 kg
Operating temperature range	-25 to 60° C (> 50° C derating)
Cooling concept	Smart forced air cooling
Degree of protection	IP65
Max. permissible value for relative humidity	0 ~ 100 %
Max. altitude	4000 m (derating > 3000 m)
Communication	RS485

SG125HV Architecture

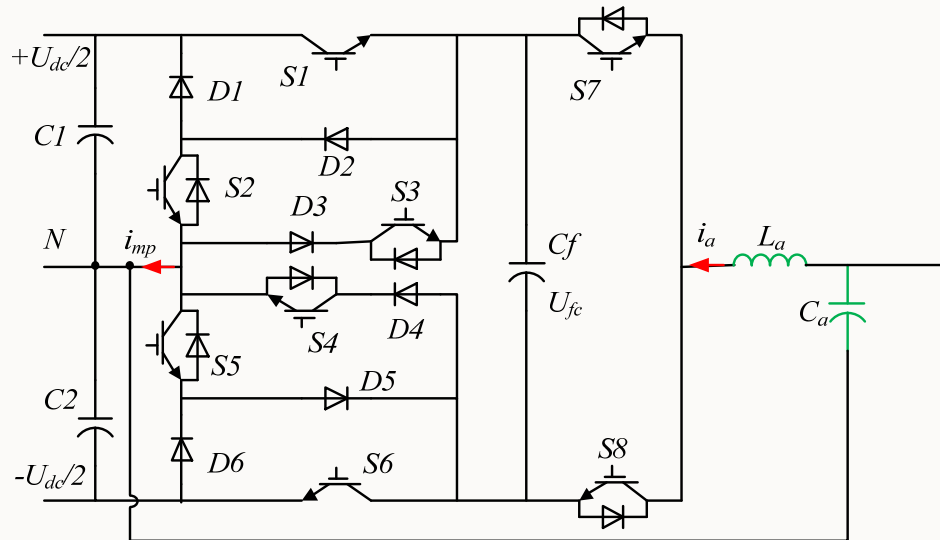
1500Vdc → 600Vac



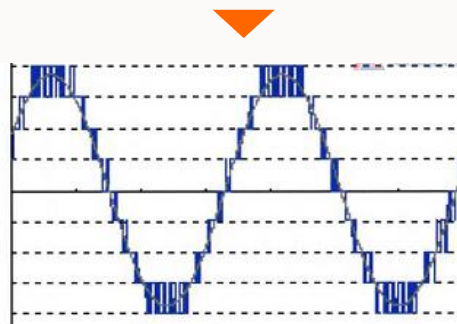
Component Supplier

	DC SPD (rail mounted)		IGBT
	DC Switch		AC Switch
	Fan		Current Sensors
	DSP		FPGA

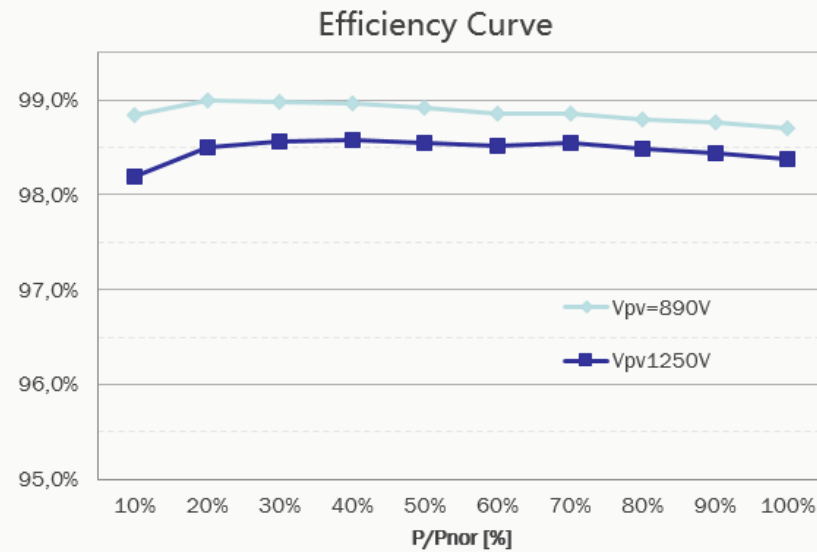
SG125HV 5-Level Topology



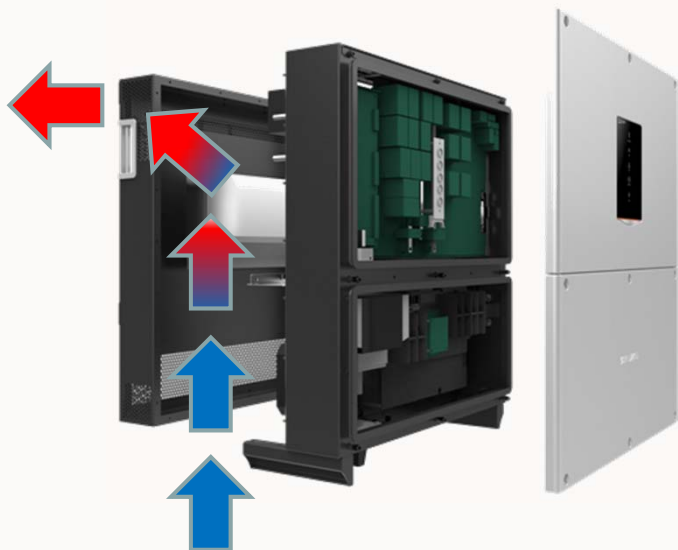
- ▶ Cost efficient IGBT 1200V block voltage
- ▶ Lower switching losses
- ▶ Lower harmonics / Less Filtering
- ▶ Higher Efficiency



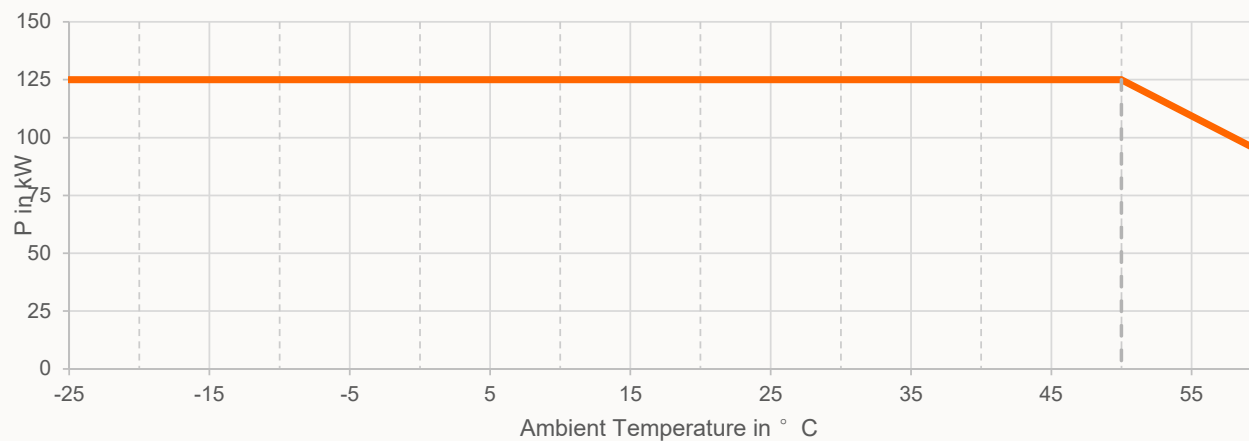
5 - Level topology (patent pending)



SG125HV Cooling Concept



SG125HV Temperature Derating Curve



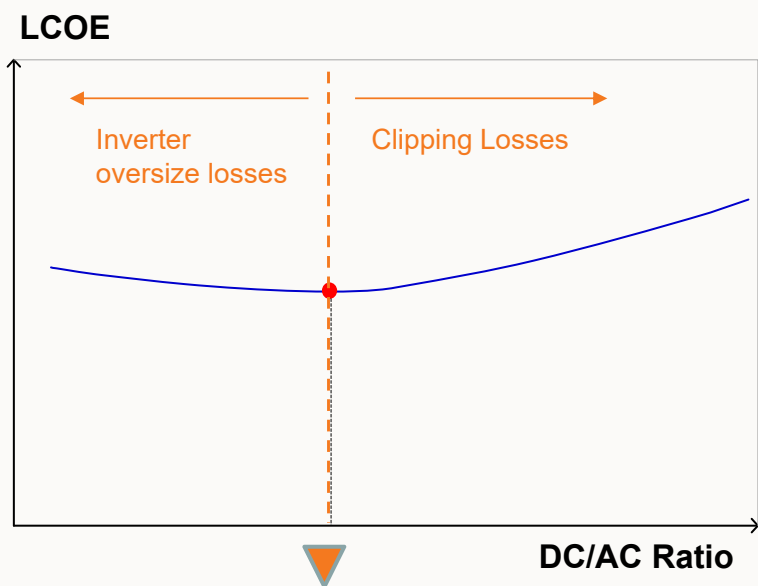
Max. output power at continuous operation up to 50°C



SANYODENKI

- ▶ IP68 Fan
- ▶ 80.000h lifetime

DC/AC ratio



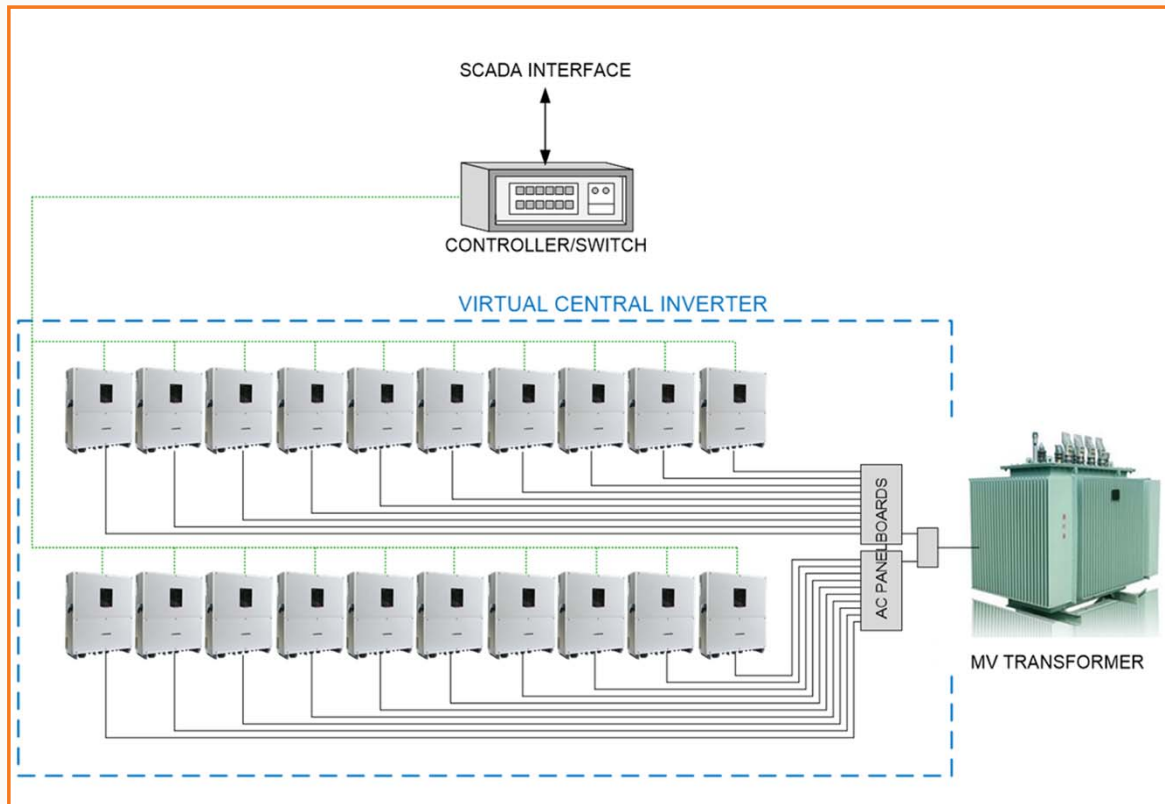
Efficient DC/AC Ratio lowers LCOE

Module	Module/ String	String/ Inverter	Inverter/ 2.5MW	Max. Total AC	Total DC Wp	DC/AC
315	30	16	20	2,500,000	3,024,000	1.21
315	30	17	20	2,500,000	3,213,000	1.29
315	30	18	20	2,500,000	3,402,000	1.36
315	30	19	20	2,500,000	3,591,000	1.44
315	30	20	20	2,500,000	3,780,000	1.51
315	29	16	20	2,500,000	2,923,200	1.17
315	29	17	20	2,500,000	3,105,900	1.24
315	29	18	20	2,500,000	3,288,600	1.31
315	29	19	20	2,500,000	3,471,300	1.39
315	29	20	20	2,500,000	3,654,000	1.46

DC/AC Ratio is site and customer specific

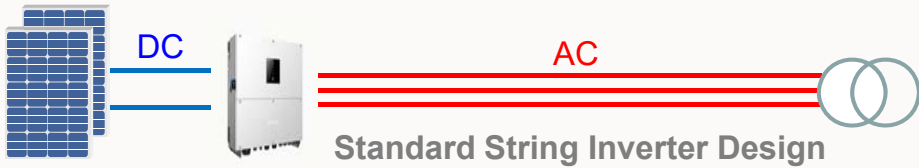
The SG125HV has been designed for a maximum DC/AC up to 1.5

SG125HV Virtual Central Inverter



- ▶ SG125HV as “power module”
- ▶ Flexible System Sizing: $n * 125\text{KVA}$
- ▶ Single Scada Interface
- ▶ Easy swapping of “power module”
- ▶ Multi MPPT
(e.g. 20MPPT / 2,5MVA Station)

“Virtual Central Inverter”: Centralized Design with SG125HV



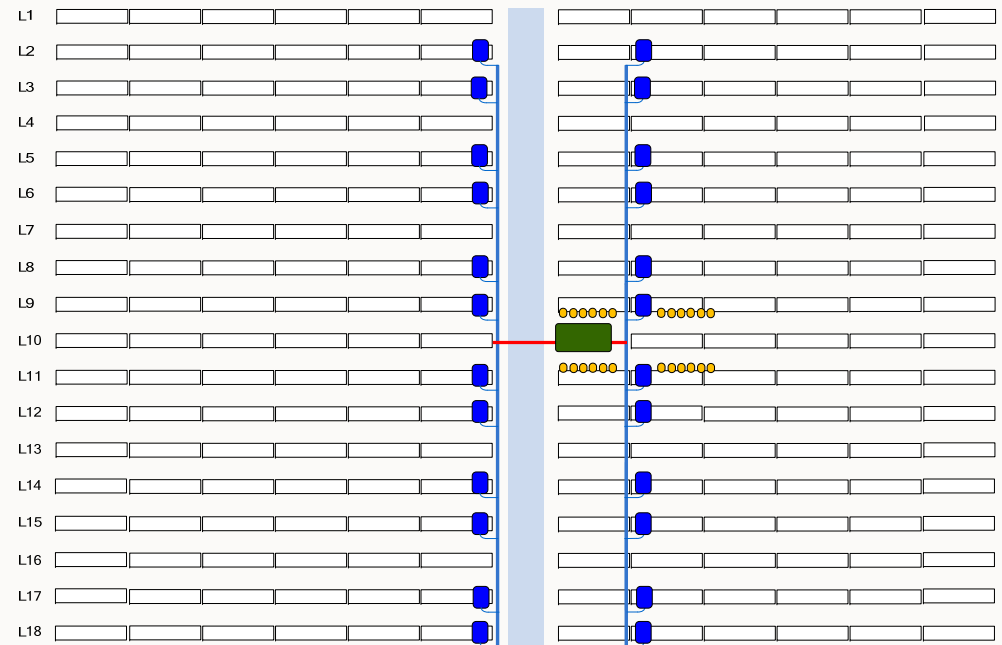
ALUMINIUMPREIS CHART IN EURO - 1 JAHR

Währung: EUR Optionen



1,72€/kg
+ 27,5%
1,34€/kg

Centralized String Inverter Design:



DC Combiner

MV Kiosk

SG125HV

O&M

Maintenance

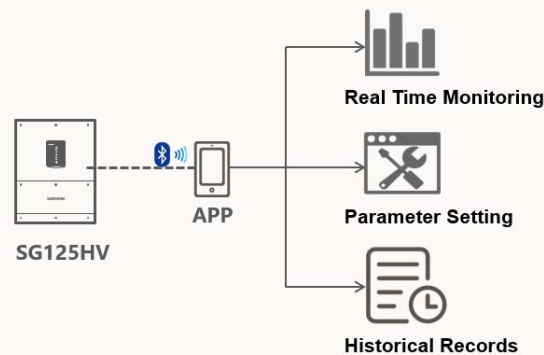
Easy Access to all components

Short distances for Routine Maintenance

Easy fault pinpointing for quick troubleshooting

Onsite Monitoring

Bluetooth APP for local parameter settings and historical records



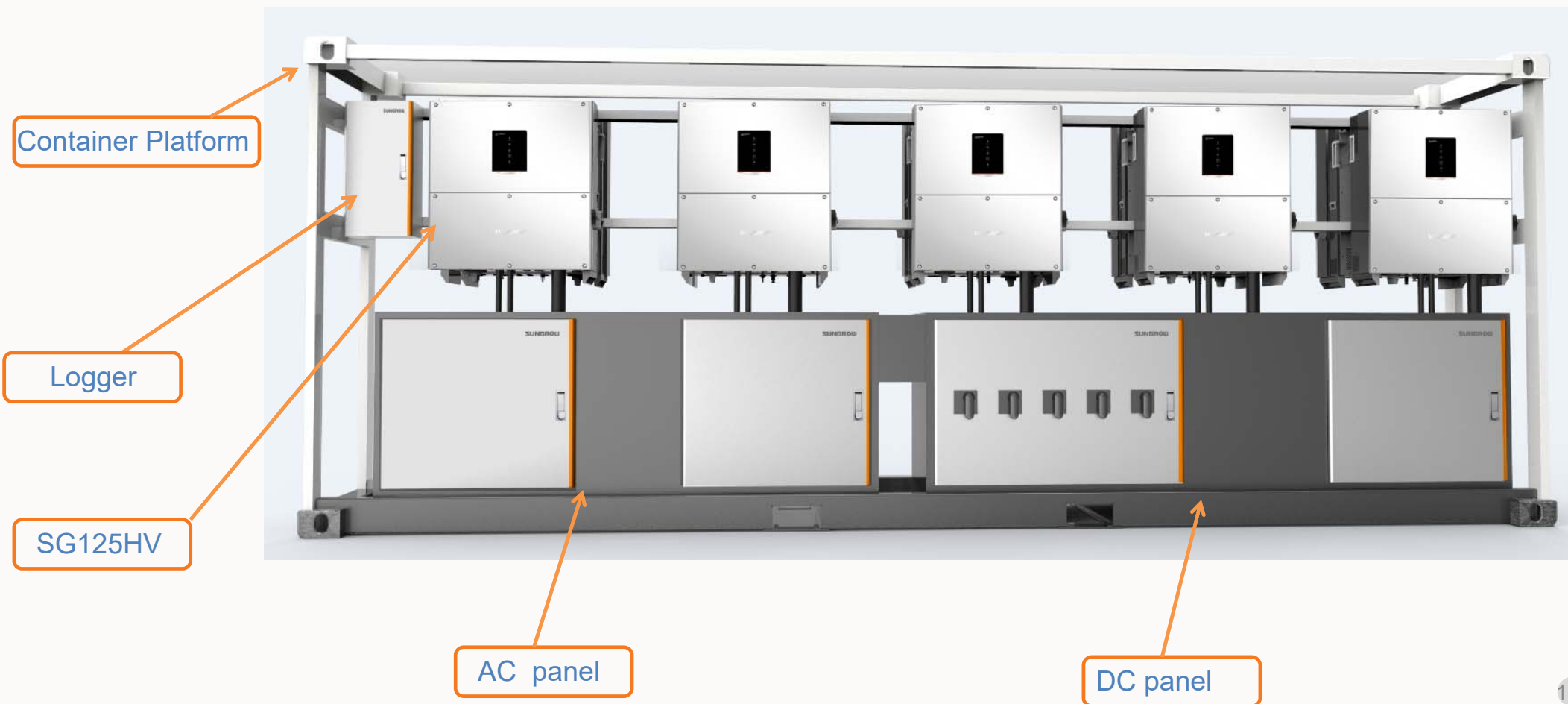
Remote Monitoring

Open communication protocol for remote monitoring through Sungrow portal or any other portal

Remote Firmware Update

Easy Maintenance ensures high inverter availability

Virtual Central Inverter Concept



THANK YOU!

Green and Effective