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Making the Most of Every Ray

Embracing Intelligence, Active Safety, and Grid Forming to Integrate PV+Wind+ESS, and Accelerating PV+ESS as the Main Energy Source

pv magazine roundtables EUROPE

Agrivoltaics: Between promises and performance

5th of December 2024

Agenda

1. Short introduction HUAWEI FusionSolar
2. Overview about drivers and classifications for Agrivoltaics
3. Requirements for PV inverter selection in Agrivoltaics & HUAWEI solution
4. Project examples in Germany

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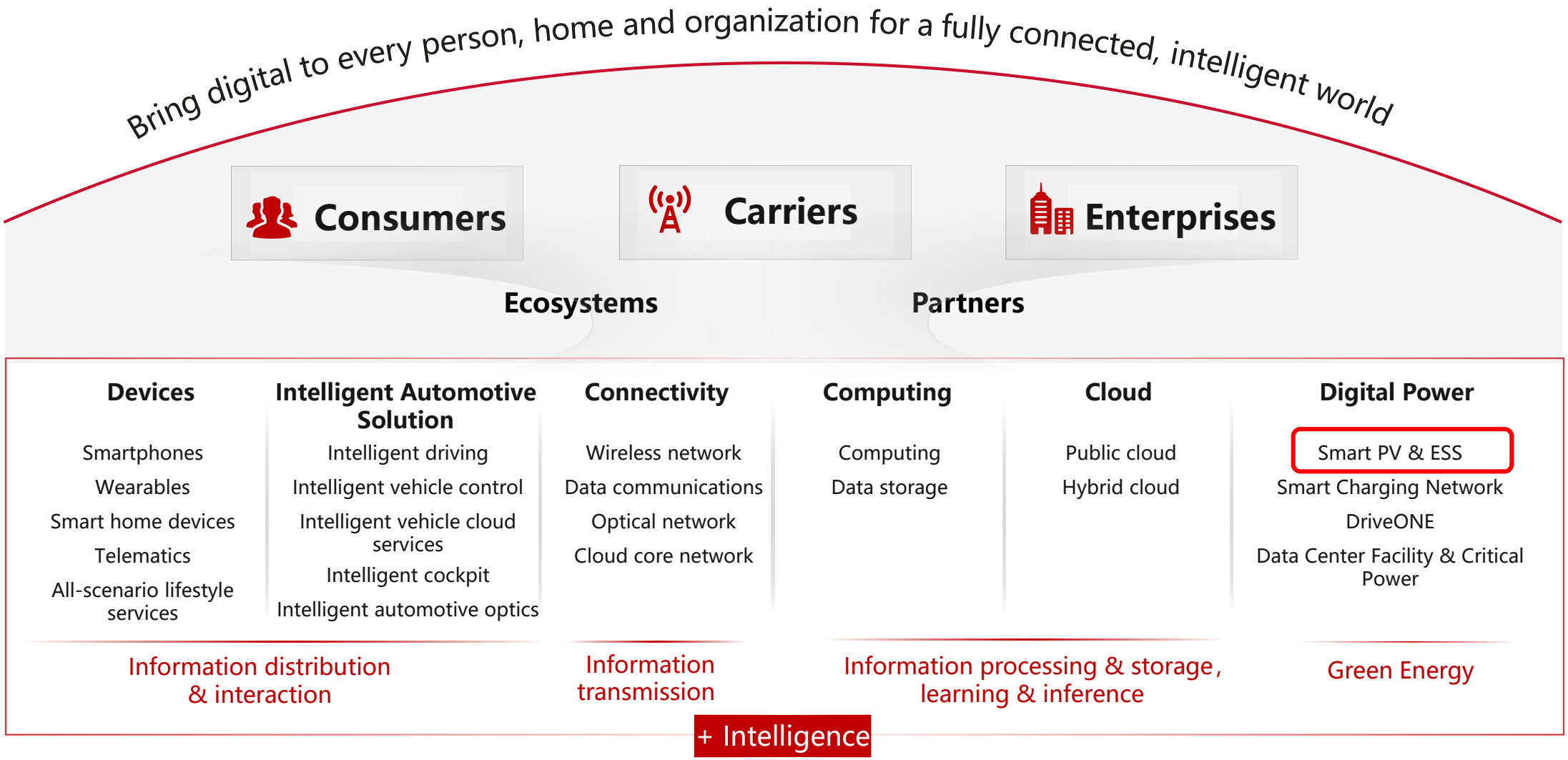
Focusing on ICT to provide products, solutions, and services to three customer groups alongside ecosystems and partners



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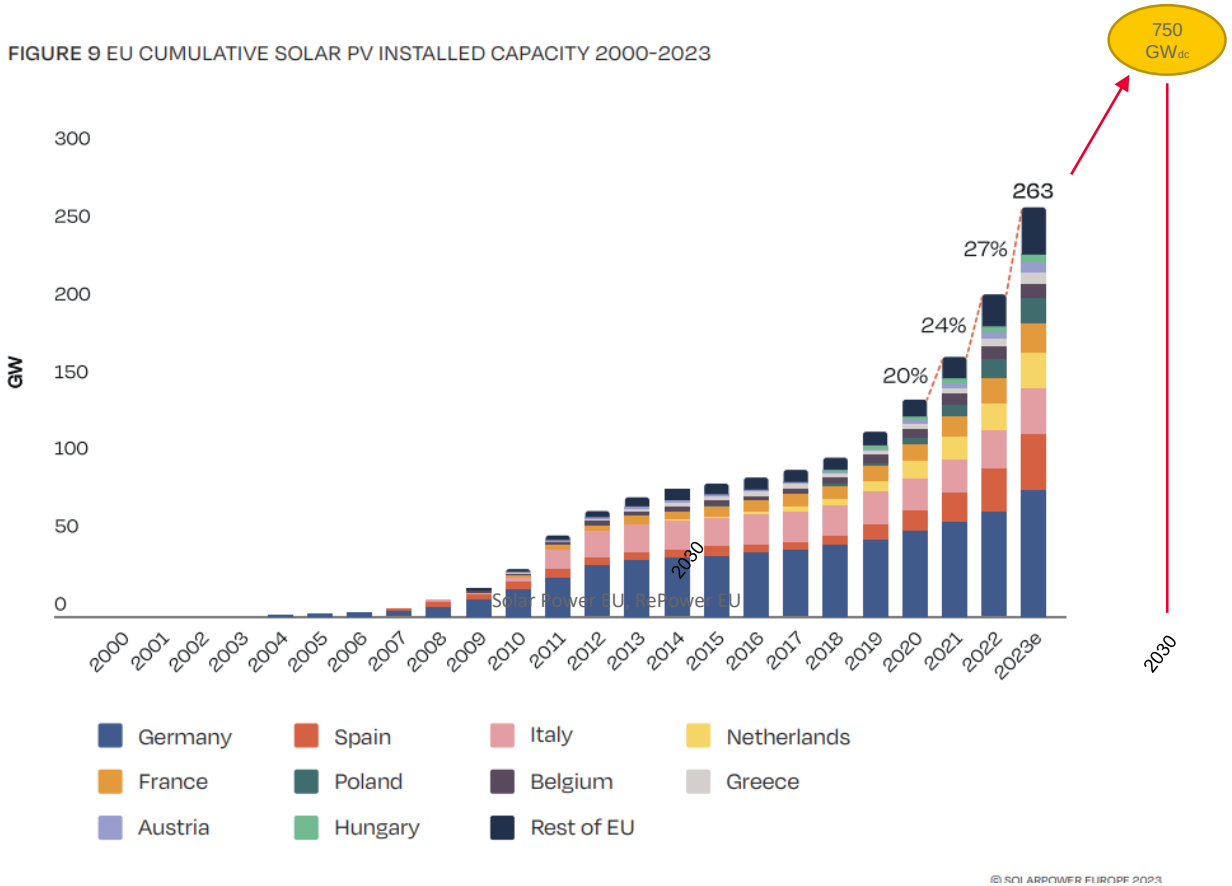
Overview about drivers and classifications for Agrivoltaics (1/2)

LAND SHORTAGE is the main driver for Agrivoltaics since PV installations targets require substantial land

EU PV Targets conflicts with available land and land use targets

REPower EU: 2024-30 = 470 GW_{dc}

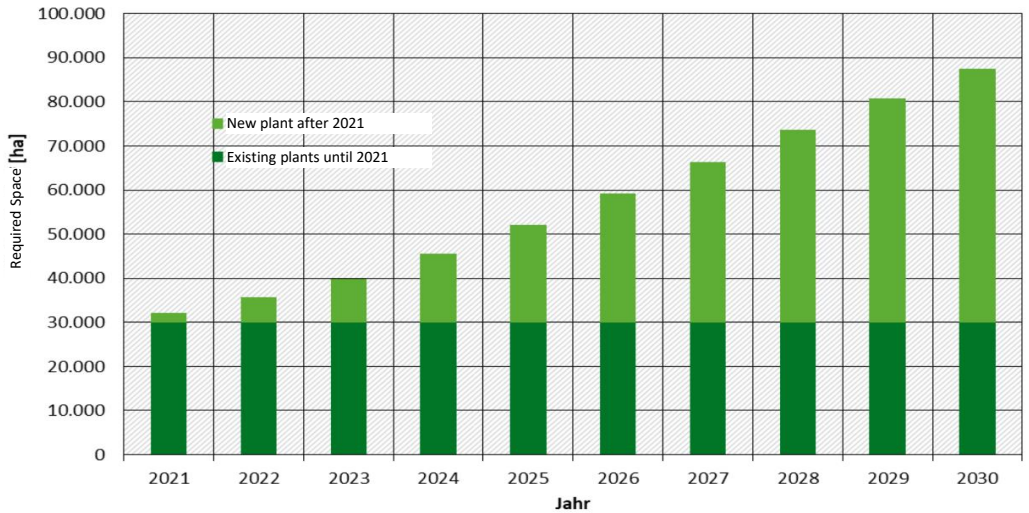


Source: Solar Power EU, RePower EU

Germany´s PV expansion goal to 215 GW by 2030 is in direct conflict with the daily land use reduction goal

Year	Total land use incl. buildings, roads, and PV* ha/day	Est. land use for solar GM PV only ha/day
2021	54	5 to 5.5 (related to ~1.8 GW/year)
2030	<30	16 to 20 (related to ~8-10 GW/year)**

Projected space requirements up to 2030



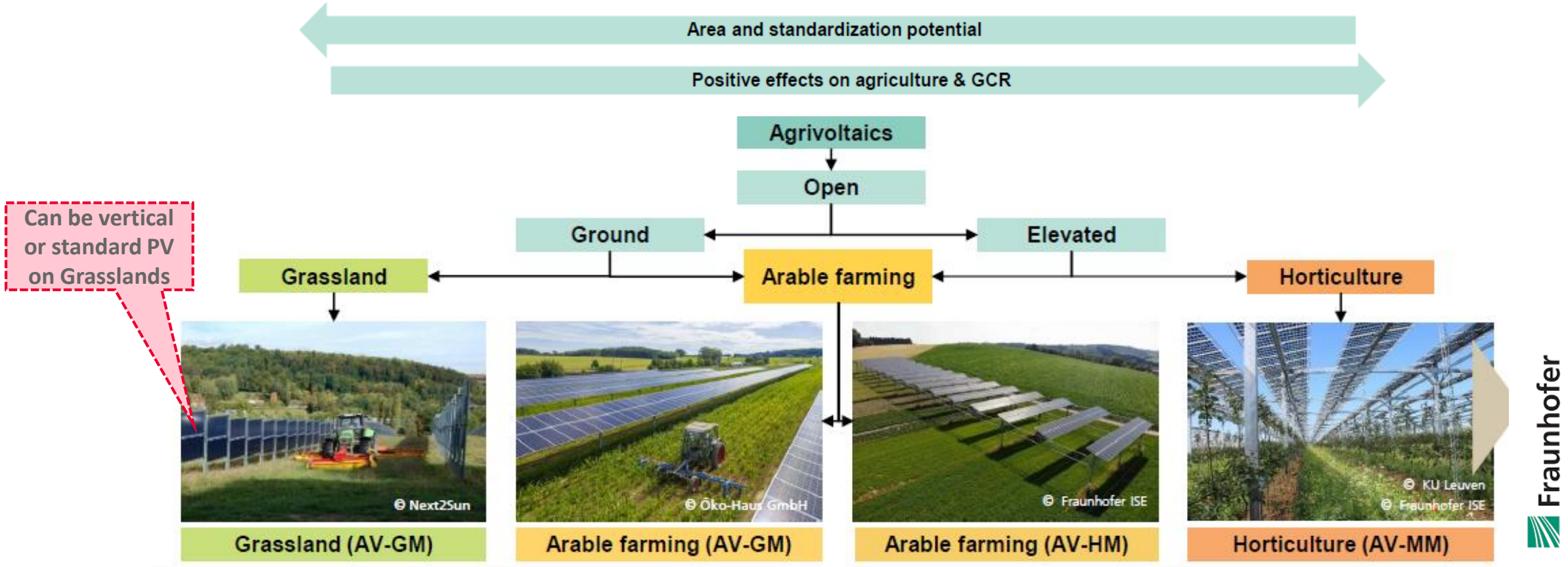
Source: ZSW 2022

* National Sustainable Strategy, by Federal Govt. of Germany

** 16 ha/day was based upon 2021 PV expansion target, in 2023 target revised to 215 GW. Area strongly Depends upon efficiency of PV Panel, Assuming 1.3 MW/ Ha

Overview about drivers and classifications for Agrivoltaics (2/2)

Fraunhofer Institute defines 4 AgriPV scenarios, keeping the DIN specification as reference



AV = Agrivoltaics | GM = Ground Mounted | HM = High Mounted (height > 2.1 m, typically 4 m)| MM = Medium Mounted (height < 2.1 m)

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Requirements for PV inverter selection in Agrivoltaics & HUAWEI solution (1/4)

Selected typical requirements for Agrivoltaics applications

Feature	Requirement
Robustness	Inverter experiences high dust/muddy conditions in Agrivoltaics
Noise	Agrivoltaics projects near settlements and/or for the sake of animal welfare prefer inverters with low noise emissions
Inverter power class	The usage of semi-transparent PV modules and the space constraints demands shorter row length and hence a smaller inverter
Safety	Higher safety requirements due to hot dry and even wet conditions of Agrivoltaics projects
Flexible plant layout	Multi-MPPT to tackle mismatch between rows by connecting each row to an MPPT

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Requirements for PV inverter selection in Agrivoltaics & HUAWEI solution (2/4)

Overview of HUAWEI FusionSolar solution portfolio for Agrivoltaics applications

Commercial & Industrial – 400 V AC

Smart Optimizer

SUN2000-1100 / 1300

Monitoring/Control

SmartLogger 3000A

Smart Inverter

SUN2000-12-25KTL-M5

Smart Inverter

SUN2000-30 / 36 / 40KTL
50KTL-M3

Smart Inverter

SUN2000-100 / 115 KTL-M2

NEW

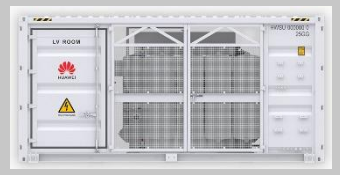
Smart Inverter

SUN2000-150K-MG0
SUN5000-150K-MG0

Smart PCS & ESS

LUNA2000 – 97 / 129 / 161 / 193kWh
LUNA2000-100KTL

Utility-Scale – 800 V AC



Smart Transformer Station

3000 /6000 / 9000 / 10 – 35 kV

Smart ESS

LUNA2000 2.0 MWh 0,5C / 1,0C

Smart PCS

LUNA2000-200KTL (+ DC LV panel)

Smart Inverter

SUN2000-330KTL-H1

Smart Inverter

SUN2000-215KTL-H0 / H3

Requirements for PV inverter selection in Agrivoltaics & HUAWEI solution (3/4)

The new 150kW inverter matches quite well to the Agrivoltaics requirements

SUN2000 – without optimizer

SUN2000-150K-MG0

- **The largest 400V inverter in the world**
- Better applicable to large roof-top projects (MW class) as well small ground-mount projects (e.g. Agrivoltaics).

SUN5000 – Only with optimizer

SUN5000-150K-MG0
MERC-1100/1300W-P

- **the only 100kW+ inverter with optimizer**
- More complex and nested installations and/or for projects with rapid shutdown requirements

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Requirements for PV inverter selection in Agrivoltaics & HUAWEI solution (4/4)

Specs of SUN2000/SUN5000-150K-MG0 Series

Rated output power: 150 kW

Maximum apparent power: 165 kVA

Maximum DC input voltage: 1100 V DC

Max. Current per MPPT/per String：48A / 16A

Output voltage: 380/400/480 V AC

	Features	SUN2000-150K	SUN5000-150K
Efficiency	Max. efficiency	98.6% @400V, 98.8% @480V	98.6% @400V, 98.8% @480V
Input	Max. input number	21 (7*3)	12
	Max. Current per MPPT	48A	/
	Max. Short Circuit Current	66 A	66 A
	Operating Voltage Range	200 V ~ 1,000 V	200 V ~ 1,000 V
Output	Maximum apparent power	165 kVA	165 kVA
	Rated output power	150 kW	150 kW
	Nominal Output Voltage	380V/400V/480Vac	380V/400V/480Vac
General	Dimensions (W x H x D)	1,000 x 710 x 395 mm	1,000 x 710 x 395 mm
	Weight (with mounting plate)	98 kg	100 kg

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Project examples in Germany

Source: AgrarEnergie GmbH & Co. KG

Thank you.

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每个组织，构建万物互联的智能世界。

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