

/ Perfect Welding / Solar Energy / Perfect Charging



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WITH FRONIUS ON THE SUNNY SIDE.
TODAY AND TOMORROW.

/ Perfect Welding / Solar Energy / Perfect Charging



REGIONS - BENJAMIN FISCHER, AREA SALES MANAGER



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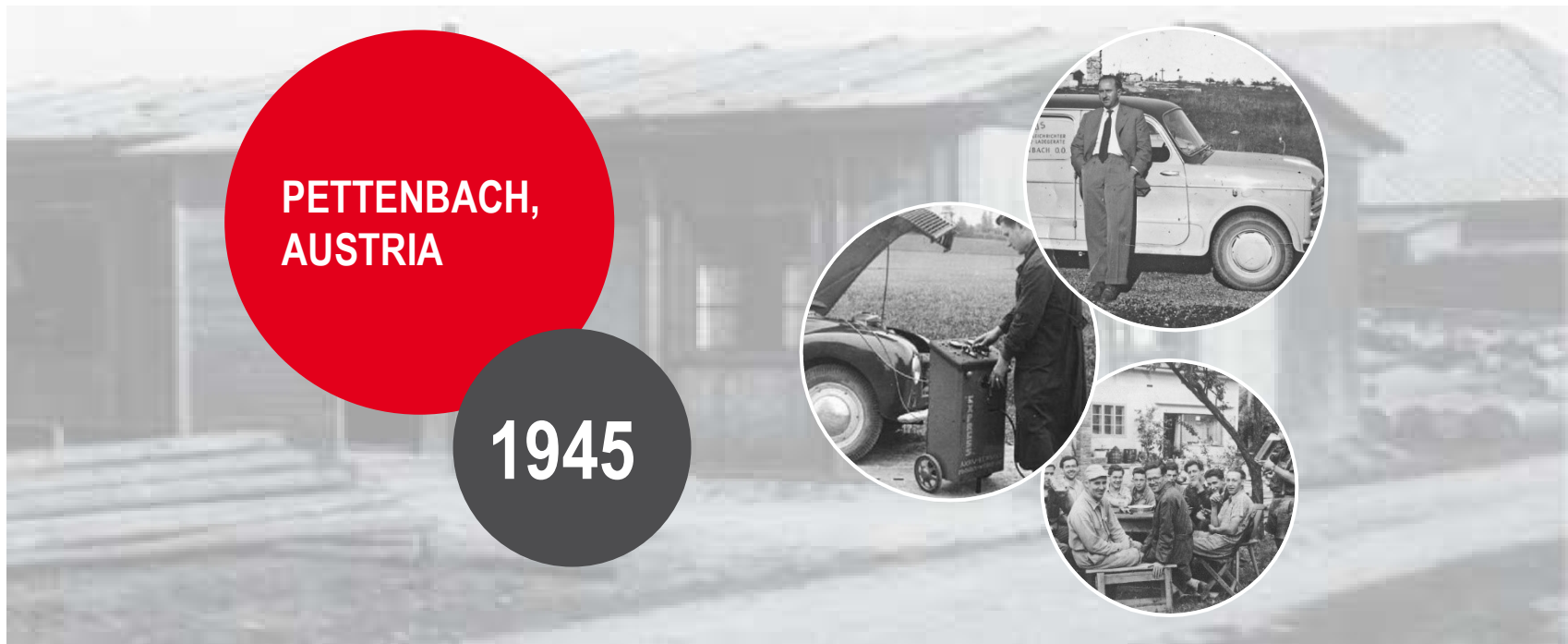


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MANUFACTURER CHECK:

**WHY CHOOSE
FRONIUS?**

LEADING THE WAY FOR OVER 70 YEARS



STABILITY ACROSS THE GENERATIONS

YESTERDAY,
TODAY AND
BEYOND

GLOBAL
FAMILY-RUN
ENTERPRISE





FRONIUS IN NUMBERS



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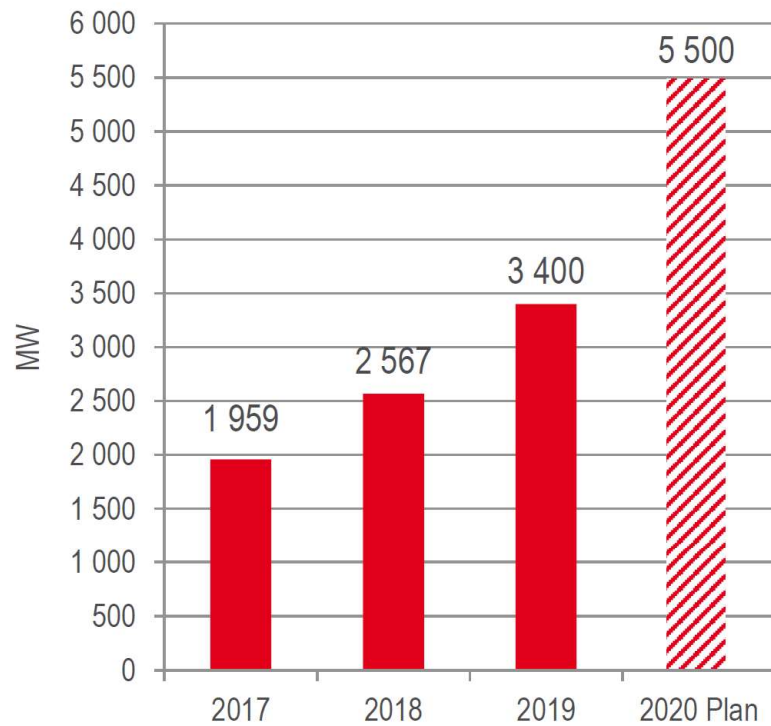


DESIGNED & PRODUCED IN AUSTRIA



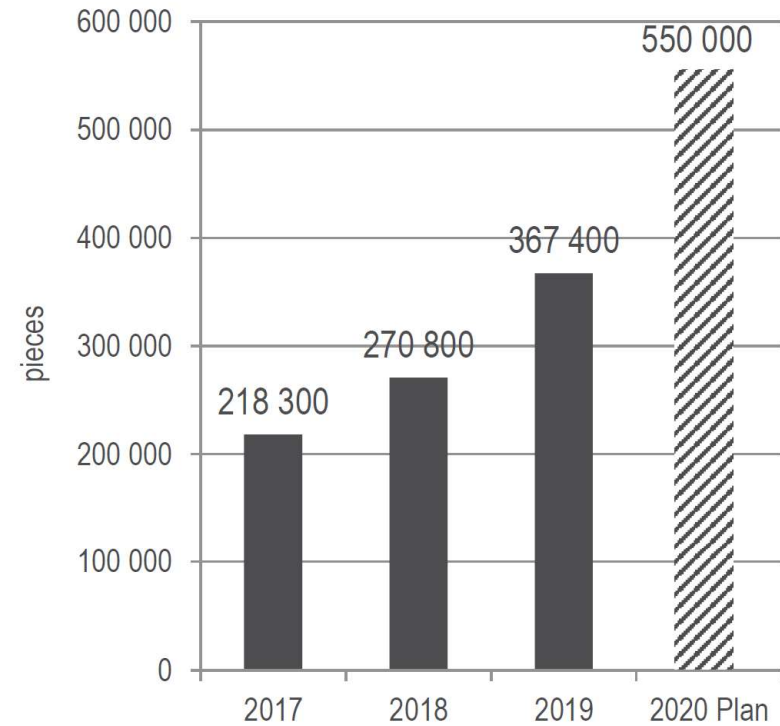


MW OUTPUT / YEAR



68

SOLD INVERTER / YEAR



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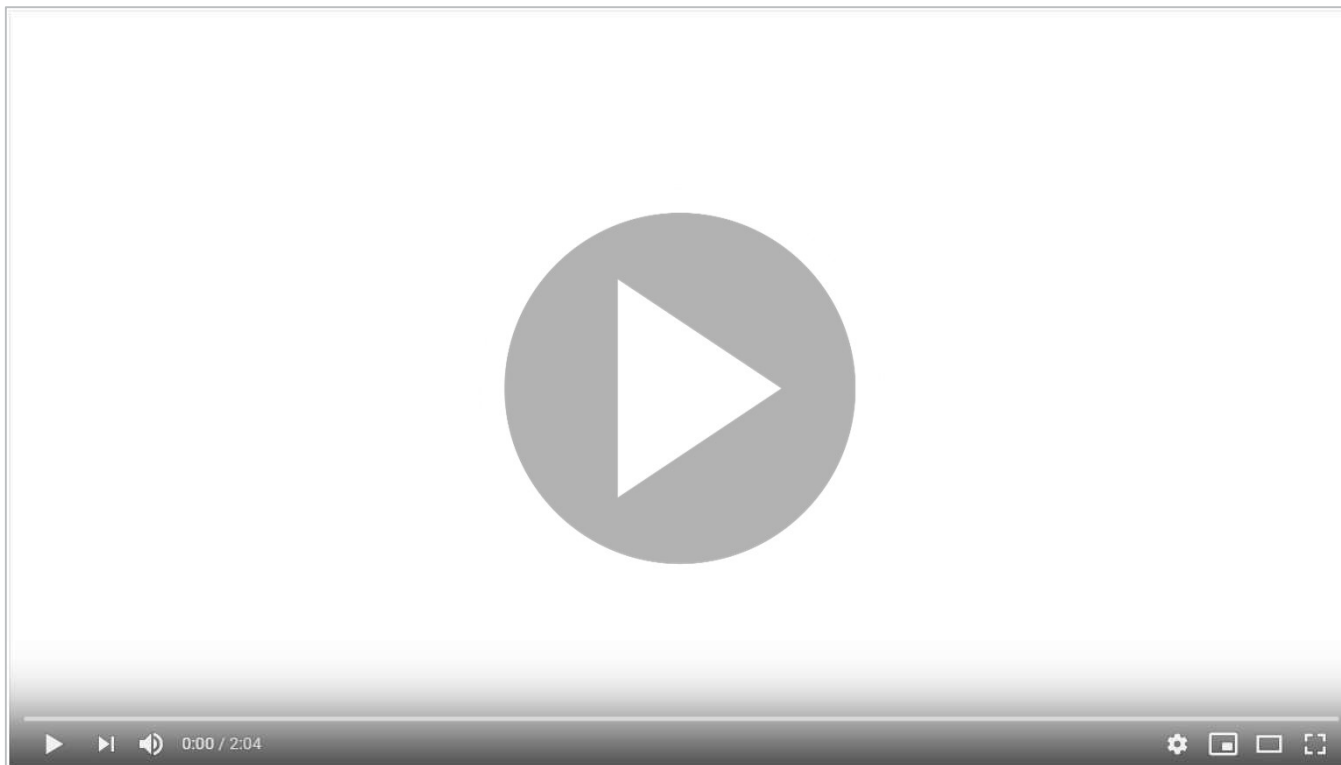


3 BUSINESS UNITS – ONE GOAL





100% RENEWABLE ENERGY IS POSSIBLE TODAY

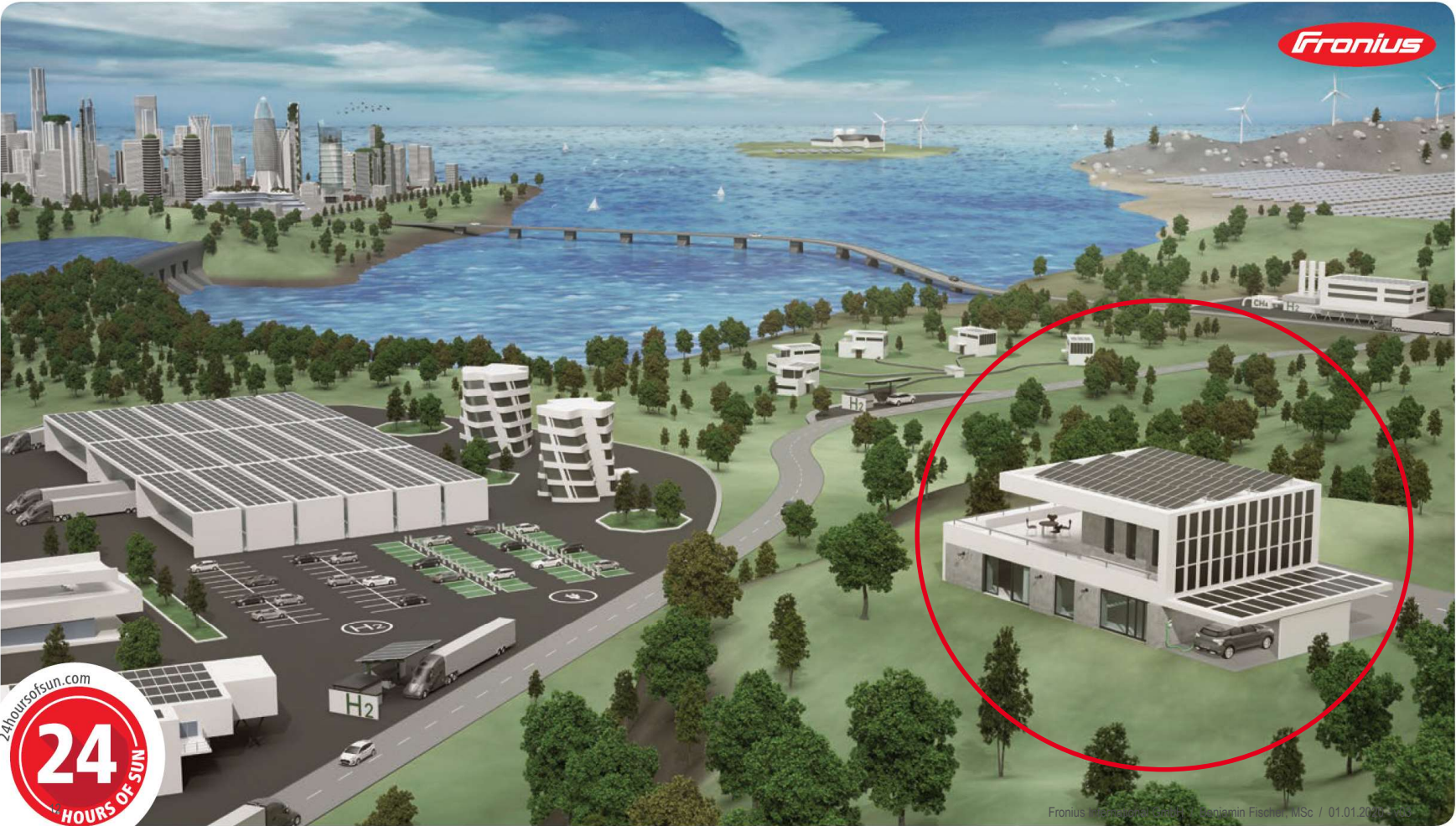


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WE THINK ABOUT TOMORROW ...

24 HOURS OF SUN

Fronius



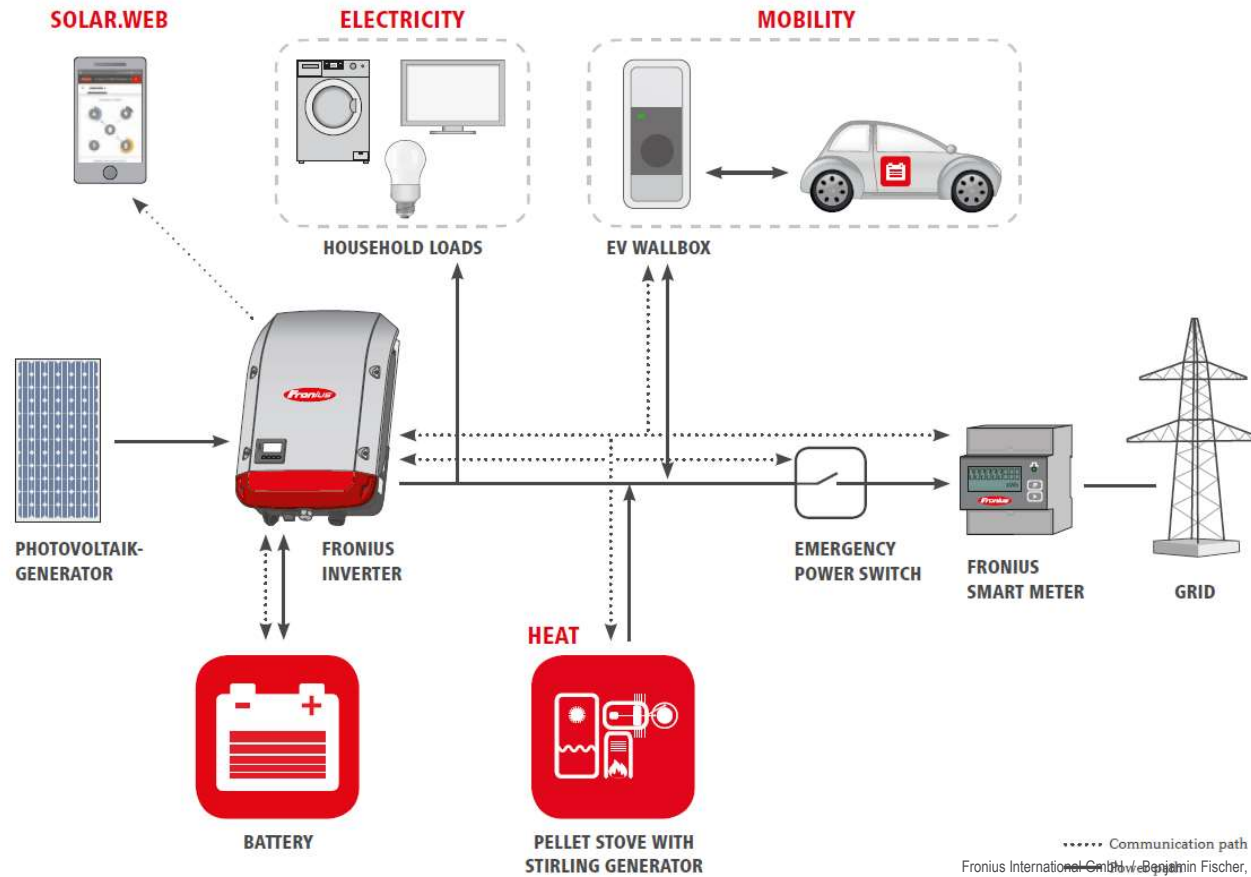
24hoursofsun.com
24
HOURS OF SUN

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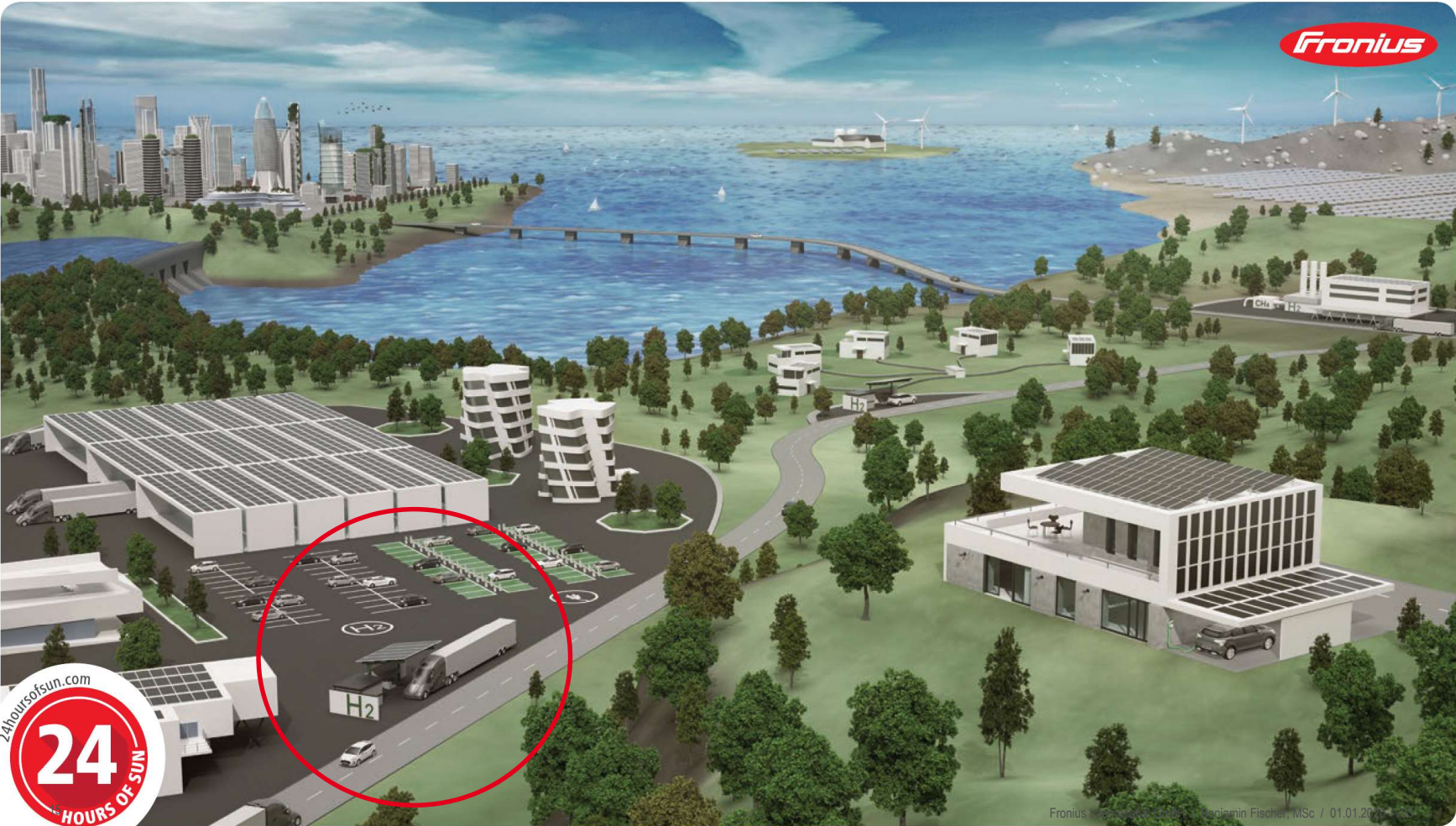


ENERGY SECTOR INTEGRATION





Fronius

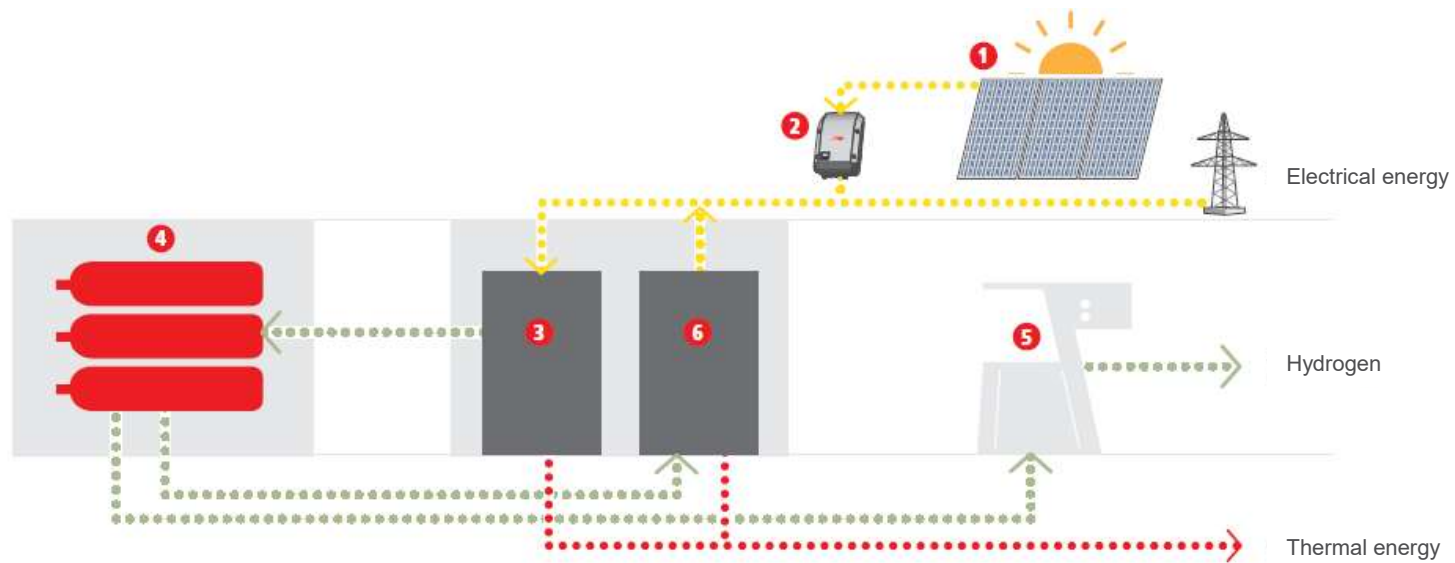


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24
HOURS OF SUN

HYDROGEN: ENERGY SOURCE OF THE FUTURE

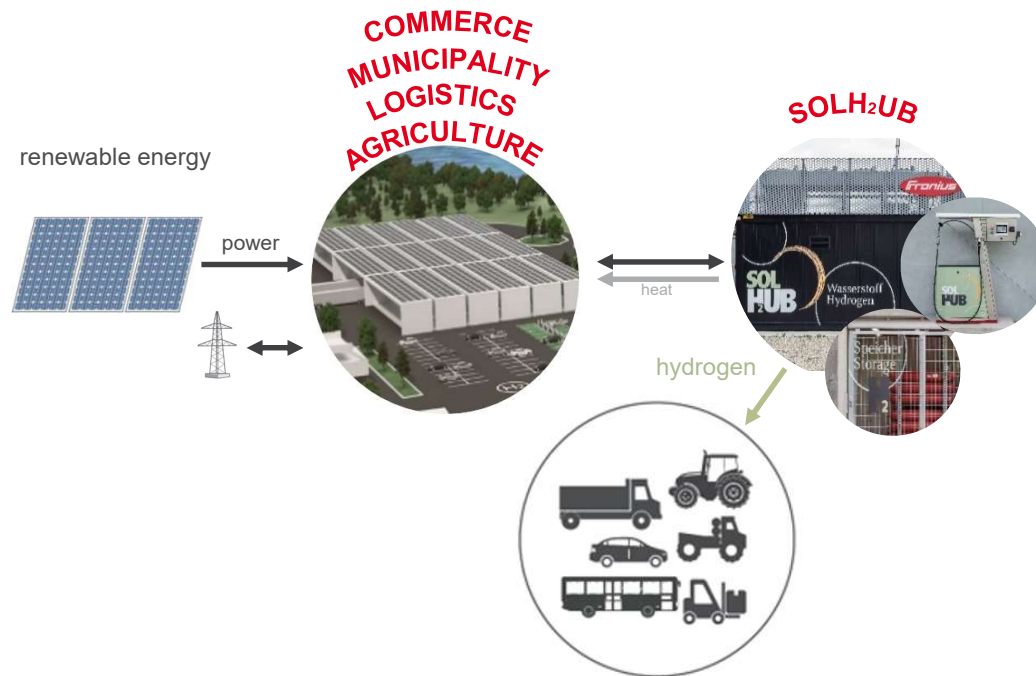


SOLH₂UB – HOW IT WORKS



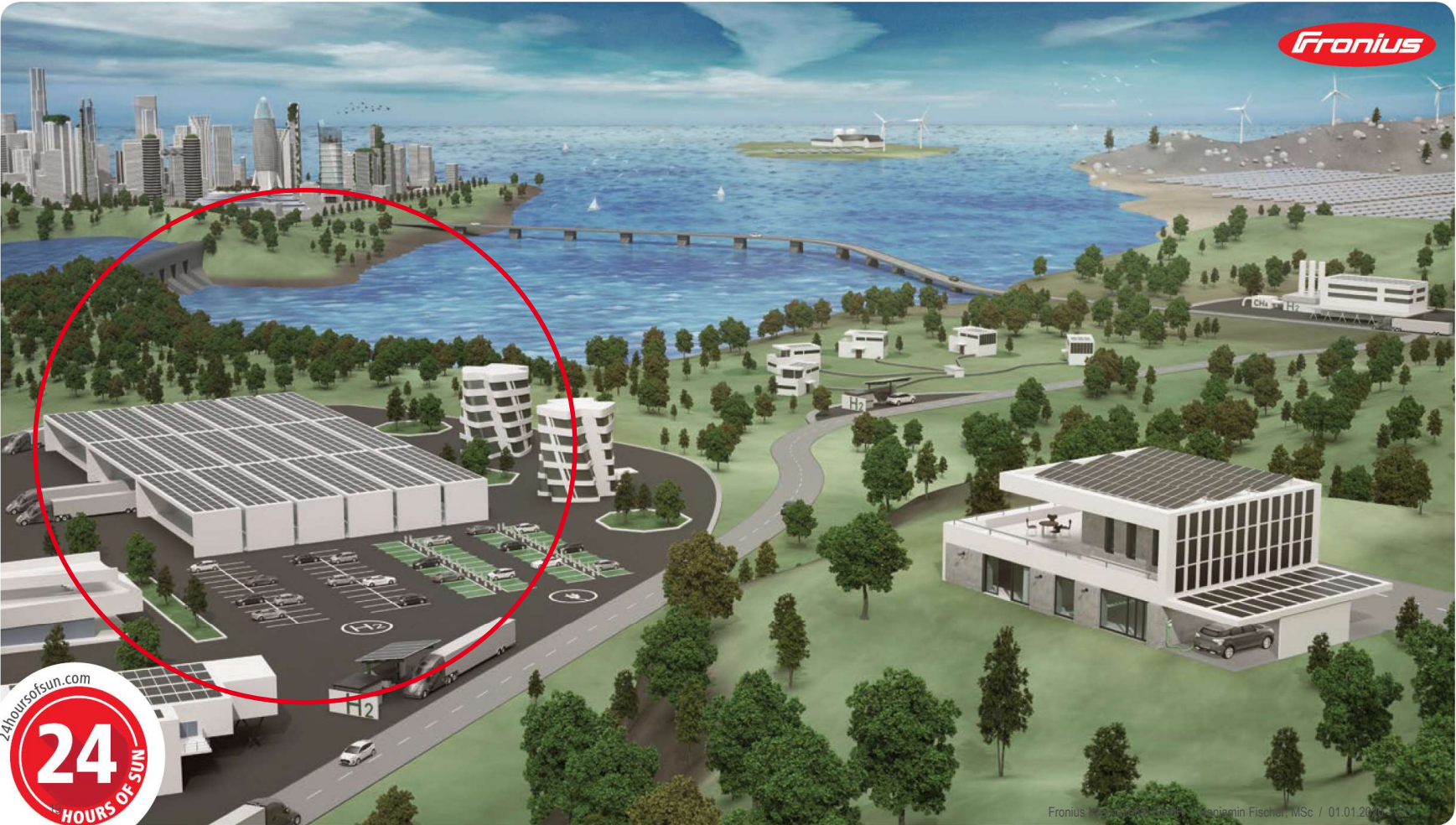
- (1) PV modules
- (2) Inverter
- (3) Elektrolyzer
- (4) H₂ storage
- (5) Dispenser
- (6) Fuel Cell

APPLICATION AREAS SOLH₂UB



- / On-site surplus energy production
- / On-site surplus hydrogen production
- / Local need for emission free mobility & transport
- On-site heat use

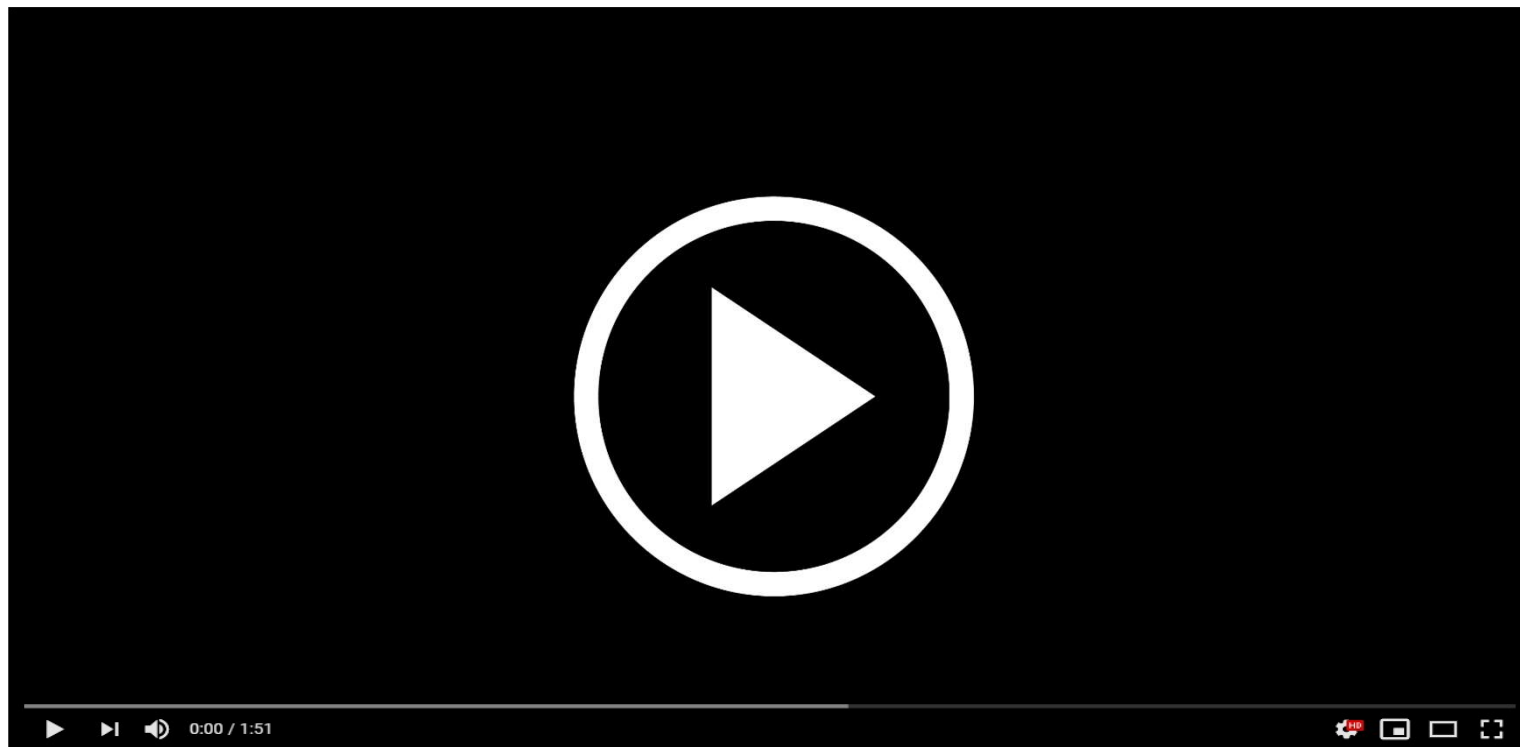
Fronius



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HOURS OF SUN



LARGE SCALE COMMERCIAL SYSTEMS



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WE HAVE DONE THIS **MILLION** TIMES.

1 Million SnapInverter - June 2019



2 Million Fronius Inverter – 1992-2019



...will be reached on December 4th 2019



WE HAVE DONE THIS

1 MILLION TIMES



THE FRONIUS SNAPINVERTER SERIES

1-phase



Galvo
1.5–3.1 S

Primo 3.0–8.2 M

3-phase



Symo Hybrid 3–5.0 S

Symo 3–4.5 S
Symo 3–8.2 M

Symo 10–20 M

Eco 25.0-S / 27.0 S



SNAPINVERTER - RESIDENTIAL

Galvo 1.5-3.1



- / 1.5 / 2.0 / 2.5 / 3.0 / 3.1 kW
- / 1 MPP Tracker
- / 1 – phase Inverter
- / **Topology: HF-Transformer**
- / Efficiency: 96%
- / Protection class IP65

Symo/Primo 3.0 – 8.2-3 S / M



- / 3.0 / 3.7 / 4.5 / 5.0 / 6.0 / 7.0 / 8.2 kW
- / 1-2 MPP Trackers
- / Symo 3 – phase Inverter
- / Primo single phase inverter
- / **Topology: transformerless**
- / Efficiency: 98%
- / Protection class IP65

Symo Hybrid 3.0 – 5.0 S



- / 3.0 / 4.0 / 5.0 kW
- / 1 MPP Tracker
- / 3-phase Inverter
- / **Topology: transformerless**
- / Efficiency: 97,6%
- / Protection class IP65



SNAPINVERTER - COMMERCIAL

Symo 10.0 – 20.0-3-M



- / 10.0 / 12.5 / 15.0 / 17.5 / 20.0 kW
- / **2 MPP Trackers – 2 x 3 strings**
- / Min. Input voltage 200V_{DC} max 1000V_{DC}
- / Topology: transformerless
- / Higher Efficiency: 98,1%
- / Protection class IP66

Eco 25.0 – 27.0-3-S



- / 25.0 / 27.0 kW
- / **1 MPP Tracker – 1 x 6 strings**
- / Min. Input voltage 580V_{DC} max 1000V_{DC}
- / Topology: transformerless
- / Higher Efficiency: 98,3%
- / Protection class IP66



BATTERY STORAGE SYSTEMS



Fronius Symo Hybrid + Fronius Smart Meter



BYD Battery-Box HV



LG Chem RESU

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PARTNERSHIP WITHOUT EXPIRY DATE!

Quality & Service



WHAT DO THESE PRODUCTS HAVE IN COMMON?





PARTNERSHIP WITHOUT EXPIRY DATE!



Rudolf Mitter
PV system owner

„Our PV system has been running with a Fronius Sunrise 2000 inverter since 1996. The Sunrise stopped working once when it was hit by lightning, but even that was quickly repaired.”

- / Fronius Sunrise in operation since 1992
- / End customer still can rely on our strong After-sales service support



TESTED ABOVE NORM

Vibration test



Salt spray test



Infrared test



Shipping test



Freezing test



Reliability test





A FRONIUS WARRANTY CAN BE RELIED UPON ...

/ Register your product on solar.web.com and benefit from additional 3 or 5 years of warranty

WARRANTY WITHOUT REGISTERING	WARRANTY MODELS THAT CAN BE ACTIVATED AFTER REGISTERING
2 YEARS FRONIUS WARRANTY PLUS	+ 3 YEARS FRONIUS WARRANTY PLUS = 5 YEARS
	+ 5 YEARS FRONIUS WARRANTY = 7 YEARS

Different terms of warranty depending on location, find more on www.fronius.com

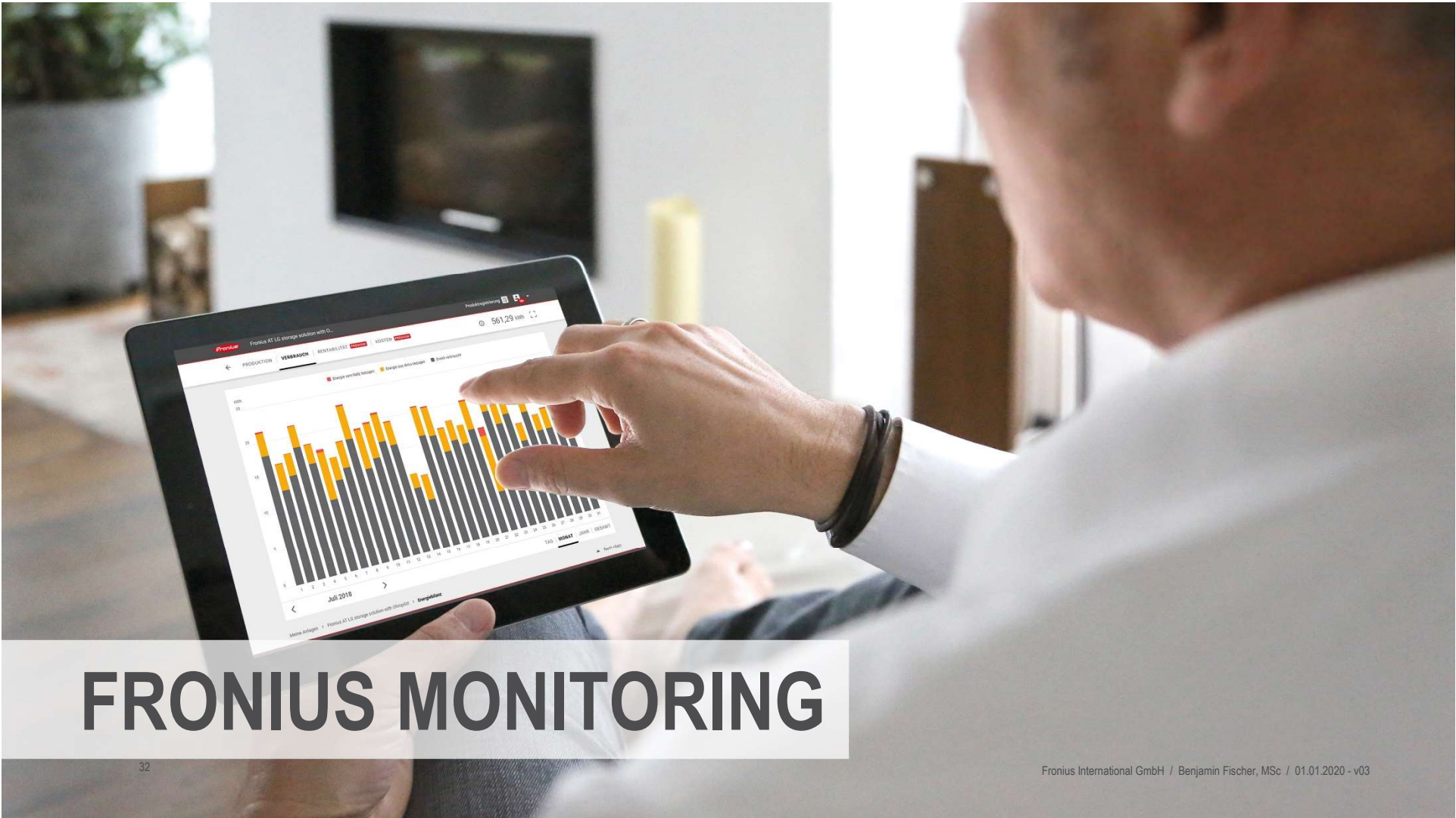
FRONIUS SOLAR.WEB

GET YOUR FREE MONITORING
Kostenlose Anlagenüberwachung
Surveillance d'installation gratuite
Monitorización gratuita de instalaciones
Monitoraggio gratuito dell'impianto

REGISTER YOUR WARRANTY
Registrieren Sie Ihre Garantie
Enregistrez votre garantie
Regístrase la garantía
Esegui la registrazione di garanzia

FIND YOUR USER MANUAL
Bedienungsanleitung herunterladen
Téléchargez vos Instructions de service
Descargar y abrir el manual de instrucciones
Scarica e leggi le istruzioni per l'uso

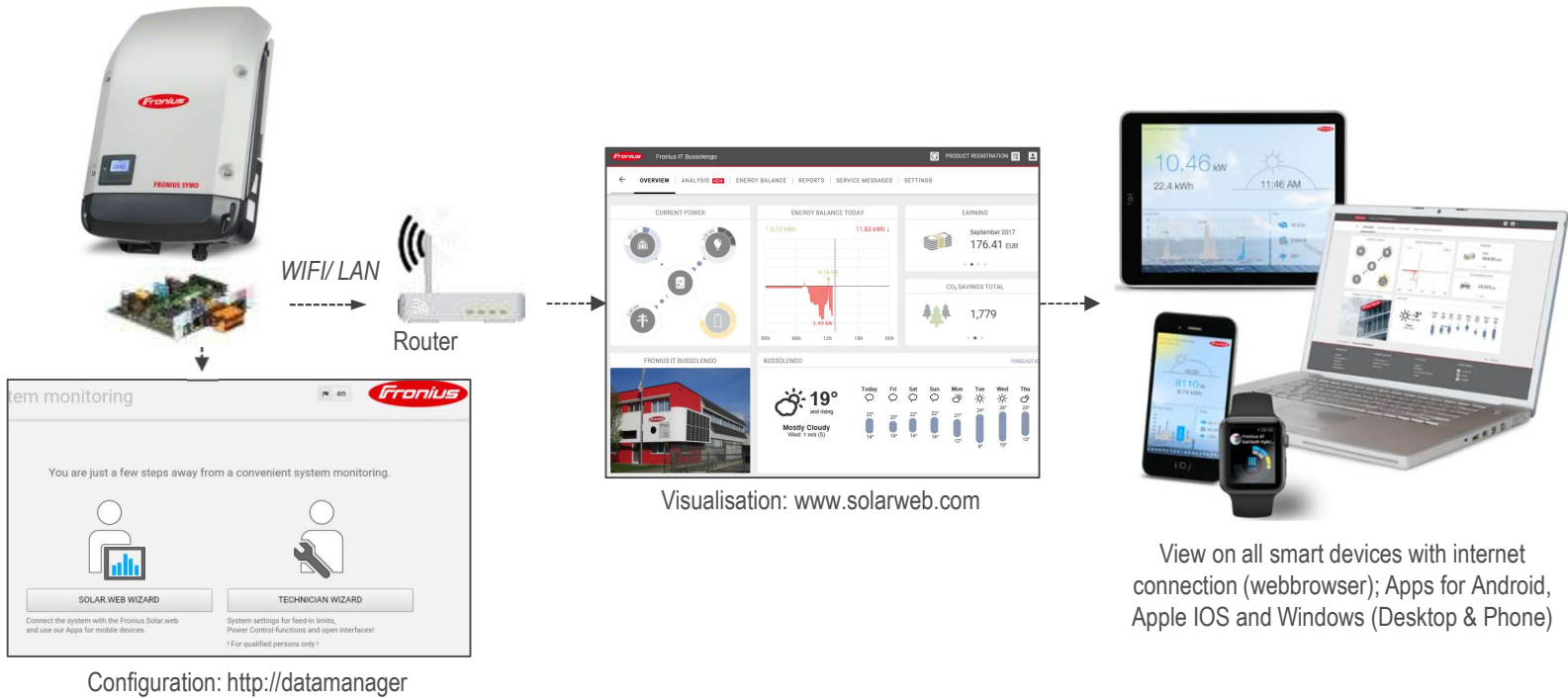
WWW.SOLARWEB.COM



FRONIUS MONITORING



FRONIUS DATAMANAGER FOR SOLAR.WEB



FRONIUS DATAMANAGER

- / Fronius Datamanager – plug-in card = Datalogger, Web server, Wifi card
- / Monitoring of up to 100 inverters
- / Visualisation via Fronius Solar.web portal, Fronius Solar.web App, Fronius Solar.TV

- / Open interface
 - / Modbus TCP SunSpec (Ethernet)
and Modbus RTU SunSpec (RS-485)
 - / Fronius Solar API (JSON)
 - / Fronius Smart Meter (RS-485)
 - / Energy management output



FRONIUS SMART METER

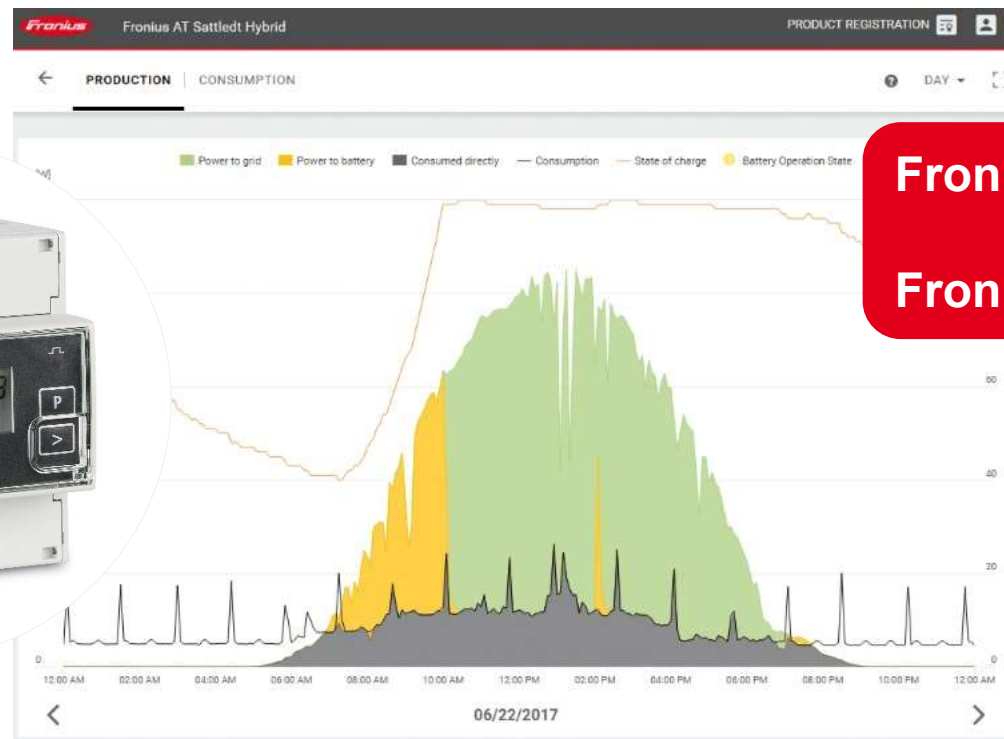
- / Base for Fronius Solar.web
 - / Analysis and visualization of consumption and production data

- / Bidirectional meter
 - / Measures consumption and production
 - / Differs between own-consumption and power from the grid





BEST VISUALIZATION



Fronius Smart Meter
Fronius Solar.web

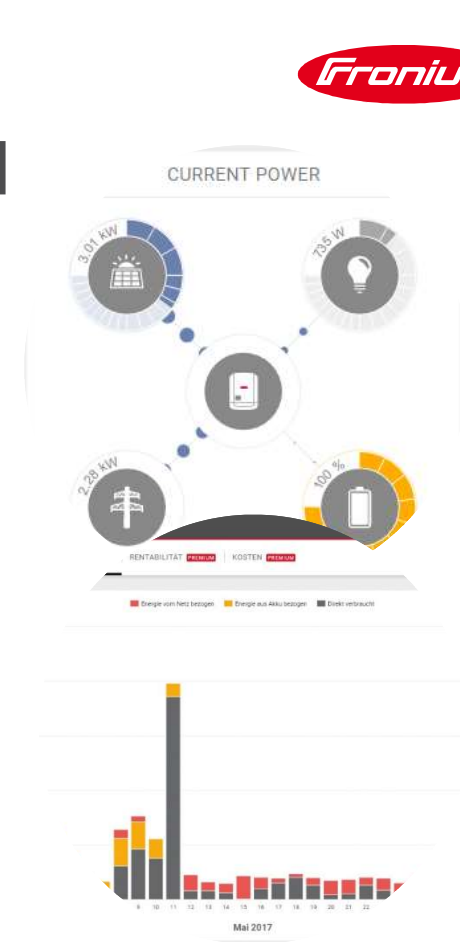


FRONIUS SOLAR.WEB FREE / PREMIUM

	FREE	PREMIUM
Basic monitoring and analysis of pv data	✓	✓
Automatic reporting and messaging	✓	✓
Remote inverter update	✓	✓
Daily production and consumption curves *	3 days	∞
Custom reports on demand	-	✓
Return of investment chart *	-	✓
Yield and costs overview *	-	✓
PV production forecast **	-	2 days
Comprehensive weather widget **	-	✓

* only possible in combination with a Fronius Smart Meter

** Currently available for selected countries (www.solarweb.com)





SOLAR.WEB – WEATHER AND YIELD FORECAST

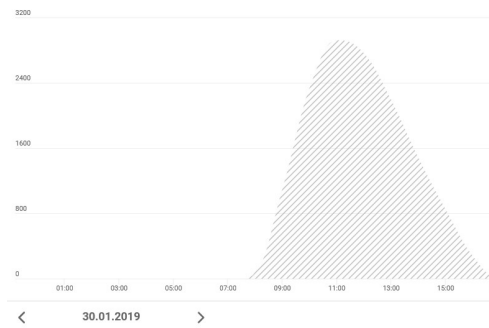
COMPREHENSIVE WEATHER WIDGET

/ Energy meteorology systems get new weather widget



PREDICTING YOUR PV PRODUCTION

/ Forecast of the expected yield for the current and the next day will be displayed





FRONIUS SOLAR.WEB – LIVE DEMO



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FRONIUS SOLAR.CONFIGURATOR 4.0

/ Use our Solar.Configurator 4.0

<https://fronius.solarconfigurator.de/solar.configurator/quick>

/ Visit our trainings!

<https://www.fronius.com/en/photovoltaics/infocentre/events>



FRONIUS VIDEO TUTORIALS

/ How-to videos

/ www.fronius.com

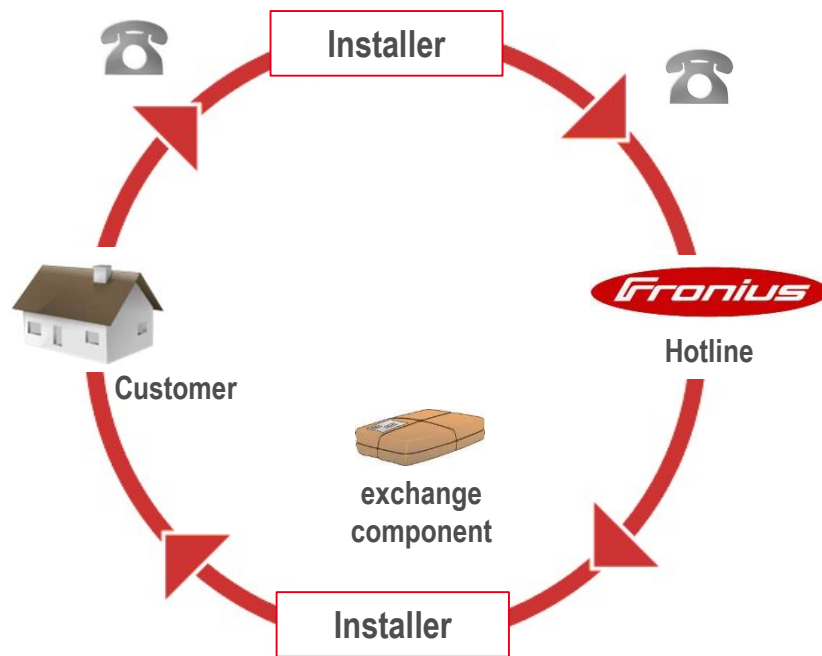


SOLAR ONLINE SUPPORT – TOOL – LIVE DEMO



Login

SERVICE ONLY WITH ONE TRIP











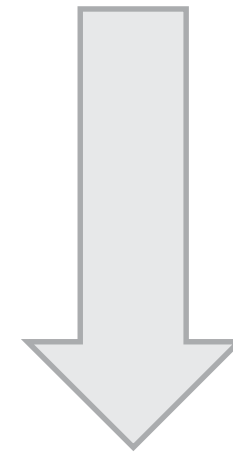
Service process of the installer:

1. Customer calls or Error message via Fronius Solar.web
2. Login in Fronius Solar.web – Error analysis
3. Using **SOS online** tool or **Priority hotline**
Troubleshooting via Solar.web
4. Order replacement device or component
5. Troubleshooting by device or component replacement
6. Returning defective device (DHL-delivery note)
7. Credit note for device and service lump sum (warranty case)



TECHNICAL SUPPORT AREA FOR INSTALLERS

<p>HOW TO INSTALL</p>  <p>Learn how to install Fronius products and solutions like our SnapInverters or the Fronius Energy Package.</p>	<p>SOFTWARE & UPDATES</p>  <p>Repository of updates, software and drivers.</p>	<p>MANUALS & INSTRUCTIONS</p>  <p>Operating manuals and installation instructions for our products & solutions.</p>	<p>MONITORING & SERVICE</p>  <p>Links to Fronius Solar.web, Fronius SOS and the warranty downloads.</p>
<p>TRAINING & EDUCATION</p>  <p>Find Webinars, trainings and further expertise here.</p>	<p>CERTIFICATES & DATASHEETS</p>  <p>Get an overview of the certificates & datasheets of our products.</p>	<p>OPEN COMMUNICATION (MODBUS, API, FTP PUSH)</p>  <p>Discover the open interfaces to integrate our products into third-party systems.</p>	<p>SYSTEM DESIGN & RURAL ELECTRIFICATION</p>  <p>Get to know the Fronius Solar.configurator, PV-Genset solutions and MicroGrid solutions.</p>



<https://www.fronius.com/en/photovoltaics/infocentre/tech-support>

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TOGETHER FOR 100% RENEWABLE ENERGY

MEET THE NEW HEROES



**Power classes
50 kW and 100 kW**

FRONIUS TAURO



TECHNICAL DATA- TAURO ECO

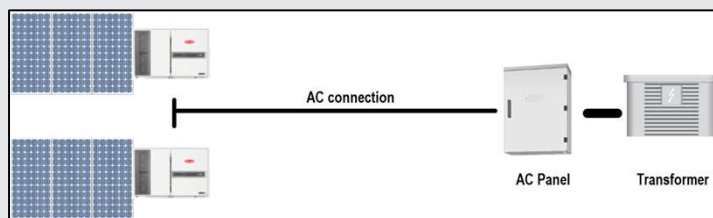
Technical Data	FRONIUS TAURO ECO
Power classes	50 / 100 kW
Max. PV generator power	75 / 150 kWp
DC MPP voltage	580 - 930 VDC (max 1.000V)
Protection class	IP 65
Dimensions (h x w x d)	644 x 1.038 x 316 mm
Weight	80 - 105 kg
MPPT	1

VERSIONS OF TAURO ECO

TAURO ECO D

/ D for **direct DC connection**

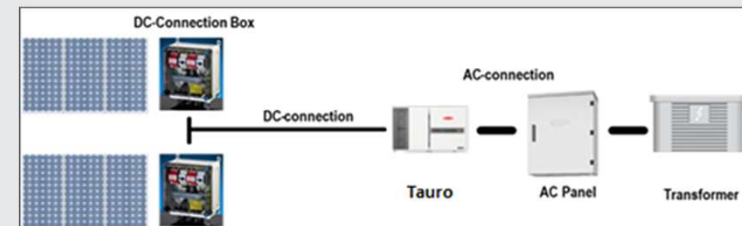
- / MC4 connection plugs (14 / 22 strings)
- / String monitoring
- / String fuses as option integrated



TAURO ECO P

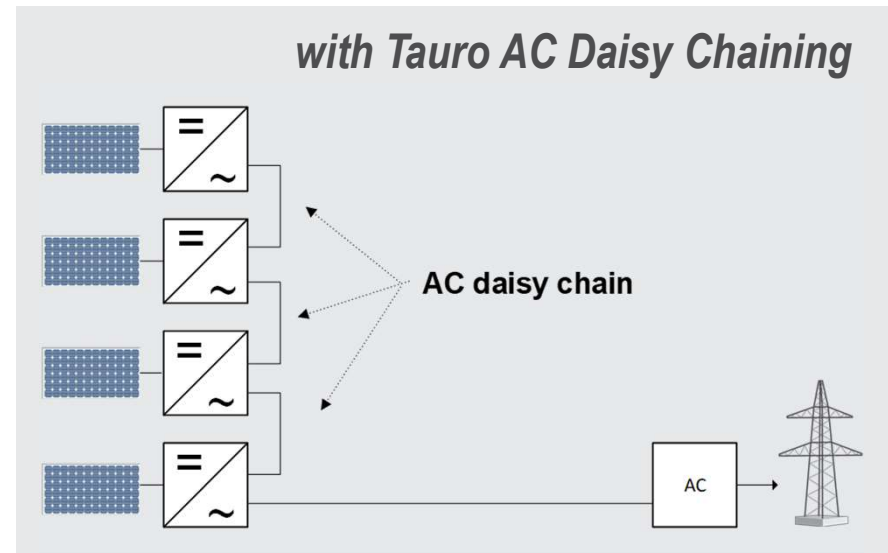
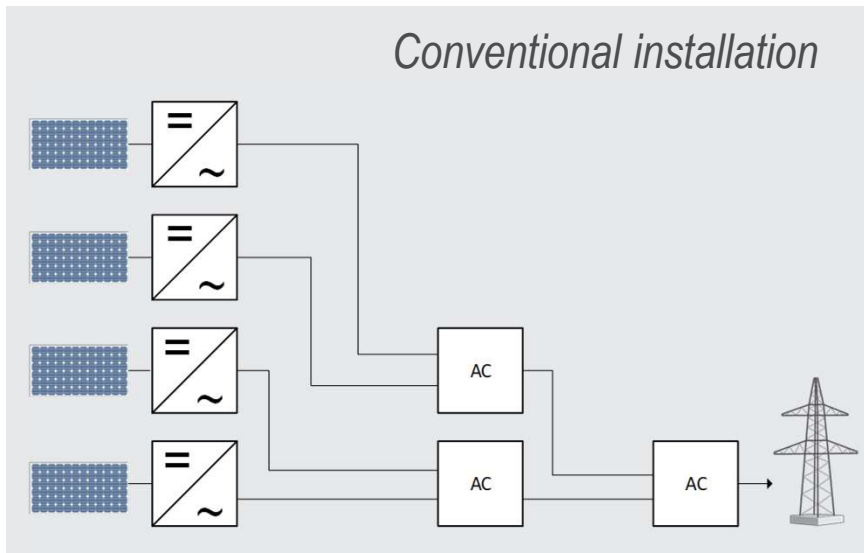
/ P for **precombined DC connection**

- / DC 3-times up to 90 mm² cables
- / V-clamps



BOS COST REDUCTION: **AC DAISY CHAINING**

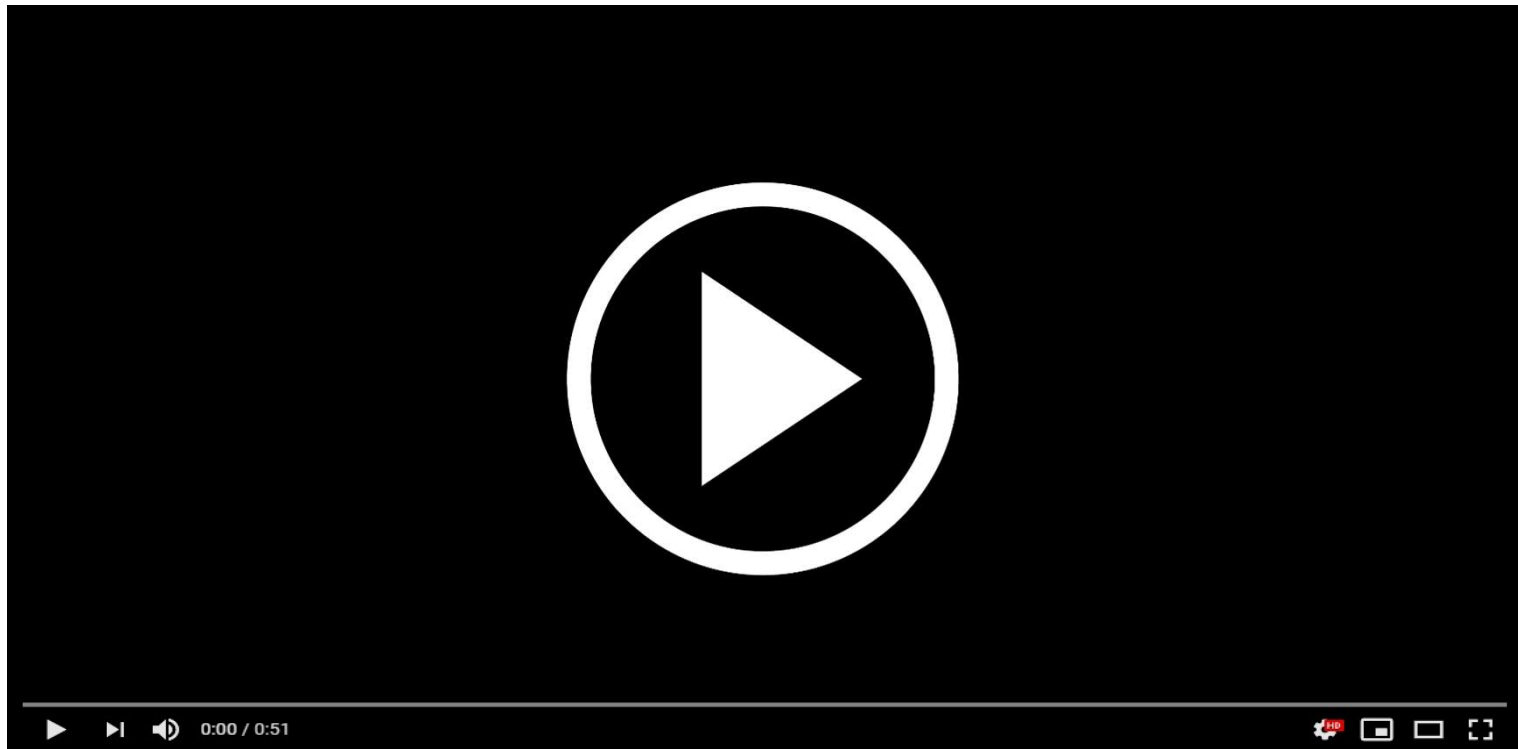
- / Savings for cabling and AC connection boxes (→ AC connection integrated)
- / Up to 4 Tauro 50kW or 2 Tauro 100kW



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FRONIUS TAURO





FRONIUS GEN24 PLUS

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FRONIUS GEN24 PLUS

Fronius Primo GEN24 Plus

1-phase 230 V

2 MPP-Trackers

IP 66 protection class

Power classes: 3-6 kW

1 battery input: 22 A



/ PV POINT

Fronius Symo GEN24 Plus

3-phase 230 / 400 V

2 MPP-Trackers

IP 66 protection class

Power classes: 6-10 kW

1 battery input: 22 A

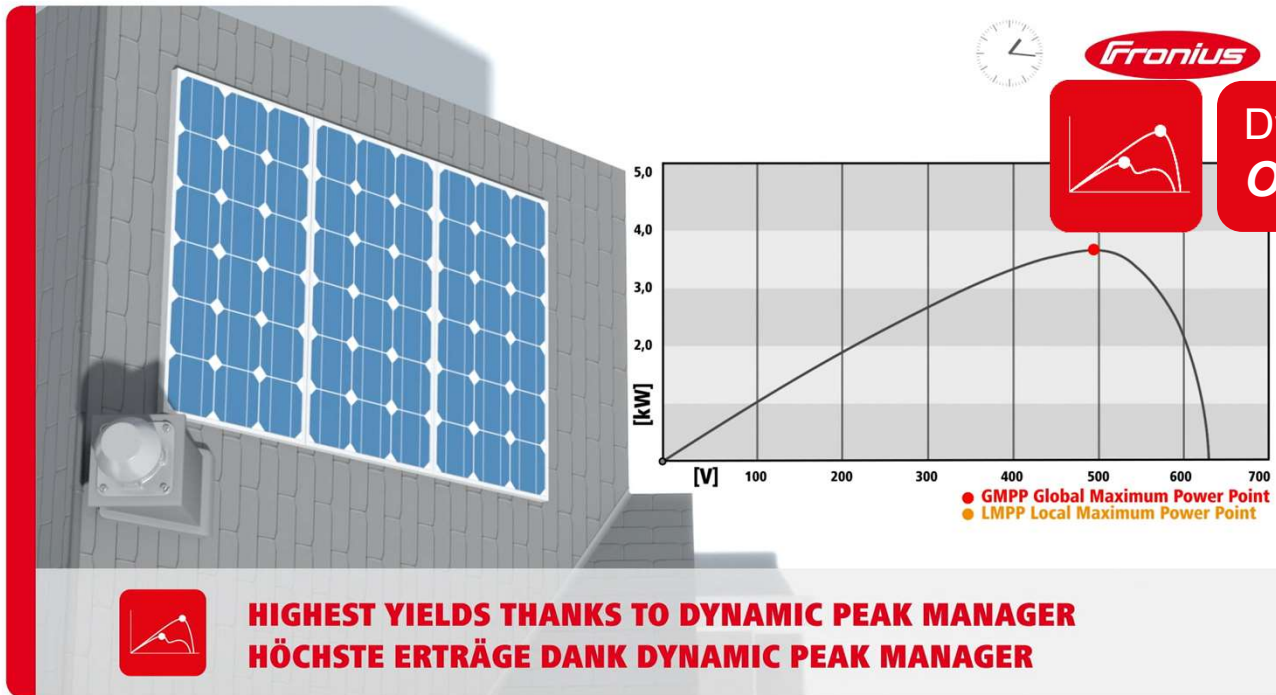


CHALLENGE

PARTIAL SHADING



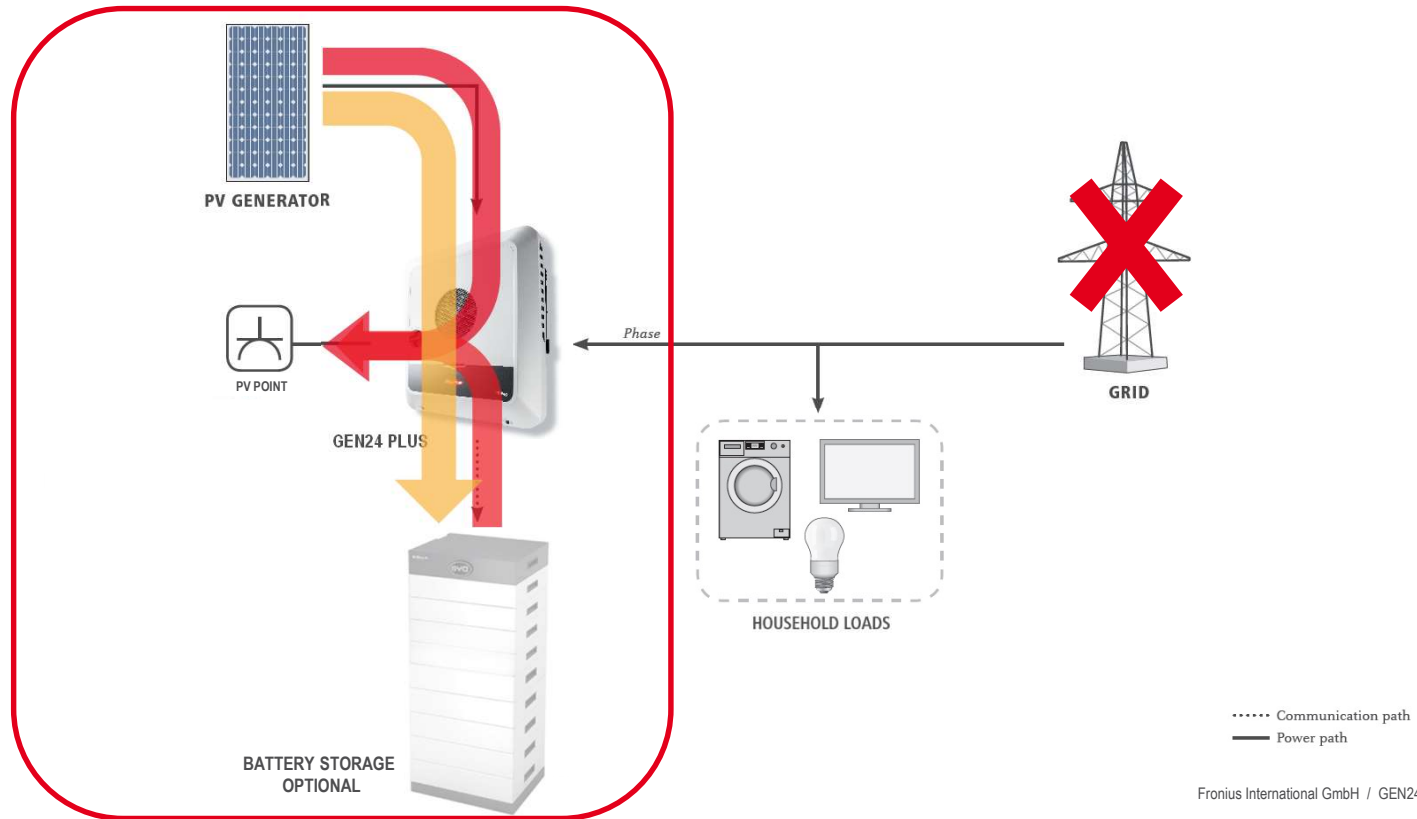
HIGHEST YIELD





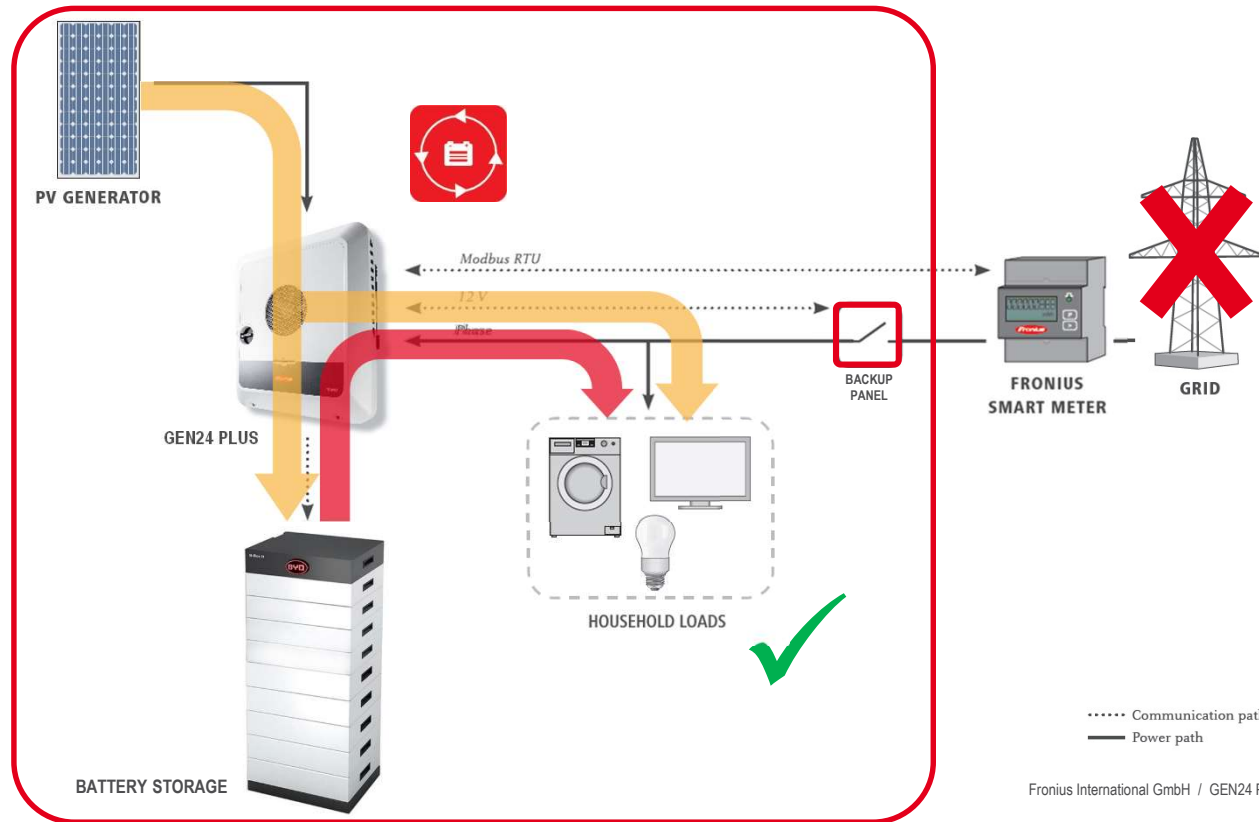
CHALLENGE
GRID OUTAGE

PV POINT → OPPORTUNITY POWER





FULL BACKUP





ANY MORE QUESTIONS?



FRONIUS TRAINING COURSES



FRONIUS WEBINARS

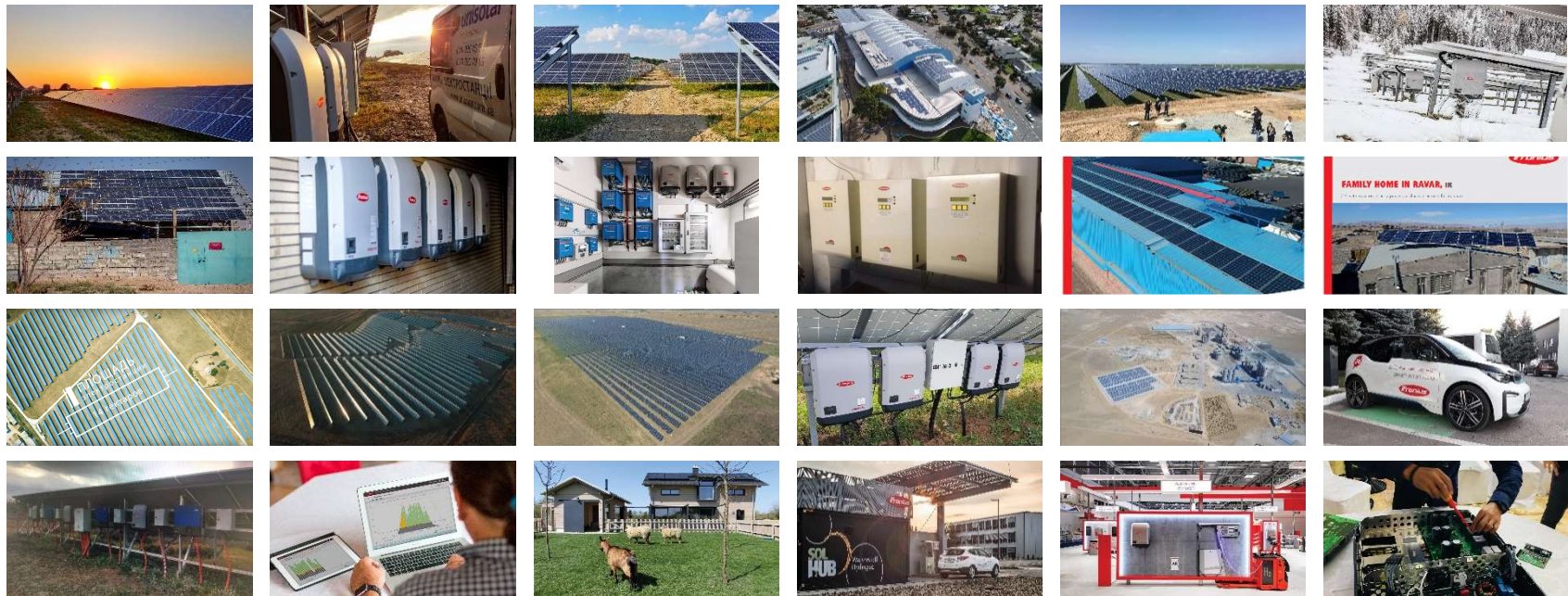


FRONIUS SOLAR YOUTUBE

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EXPERIENCE SINCE 28 YEARS IN SOLAR



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5MW UKRAINE



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50MW WITH FRONIUS ECO



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AUSTRIA, FLACHAU 3.5MW



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SHAHREKORD 1.5MW IRAN



**HIGHEST YIELDS EVEN IN
COMPLEX ENVIRONMENTS**
1.5 MWP PV SYSTEM ON
THE ROOF OF IRAN



THE CHALLENGE:

- / Over 2,300 m above sea level
- / Isolated region
- / Extreme climate conditions and high dust levels

OUR SOLUTION:

- / Fronius inverters function at full capacity even in complex environments, and in ambient temperatures from -40°C to +60°C
- / Well-trained Fronius Service Partners are in the region and can find solutions quickly should servicing be required
- / The integrated Dynamic Peak Manager ensures continuous, intelligent yield optimisation

SYSTEM HIGHLIGHTS:

- / Payback time of less than six years
- / Option to install the system outdoors thanks to the high IP 66 protection class, which saves on installation costs

SYSTEM DATA	SHAHREKORD, IRAN
Size of installation	1.52 MWp
System type	Field installation
Inverter	76 Fronius Symo 20.0-3-M
Commissioned	November 2017
Annual yield	Approx. 2,953 MWh
CO ₂ savings / year	Approx. 2,423 t
Special feature	2,300 m above sea level and extreme climate conditions



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SHOPPING CENTRE IN SAN FERNANDO CITY, PH



Reasons for purchasing Fronius products

- / Easy to install
- / Installers get invaluable support
- / One of the largest rooftop systems to be installed on a shopping centre
- / Surplus energy will be supplied to Filipino energy providers



MICROGRID-SYSTEM IN LAIKIPIA, KENYA



- / In Kenya, a constant power supply is not something that can be taken for granted
- / Public grid is unstable and in a poor condition
- / To ensure a constant supply of electricity a source of power independent of the public grid is advisable

System size	80 kWp AC-coupled, 20 kWp DC-coupled
Type of system	Commercial field installation, MicroGrid
Inverter	4 Fronius Symo 20.0-3-M
Inverter Charger	Victron Quattro
Charge Controller	Victron BlueSolar MPPT 150/85
Battery	Sunlight Opzs
Special feature	MicroGrid 100% self-consumption

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FRONIUS PV-GENSET SOLUTION, NORTHERN LEBANON



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