

# TMEIC Advanced Power Supply for Green Hydrogen



[WWW.TMEIC.COM](http://WWW.TMEIC.COM)

# TMEIC Solutions for the Hydrogen Economy

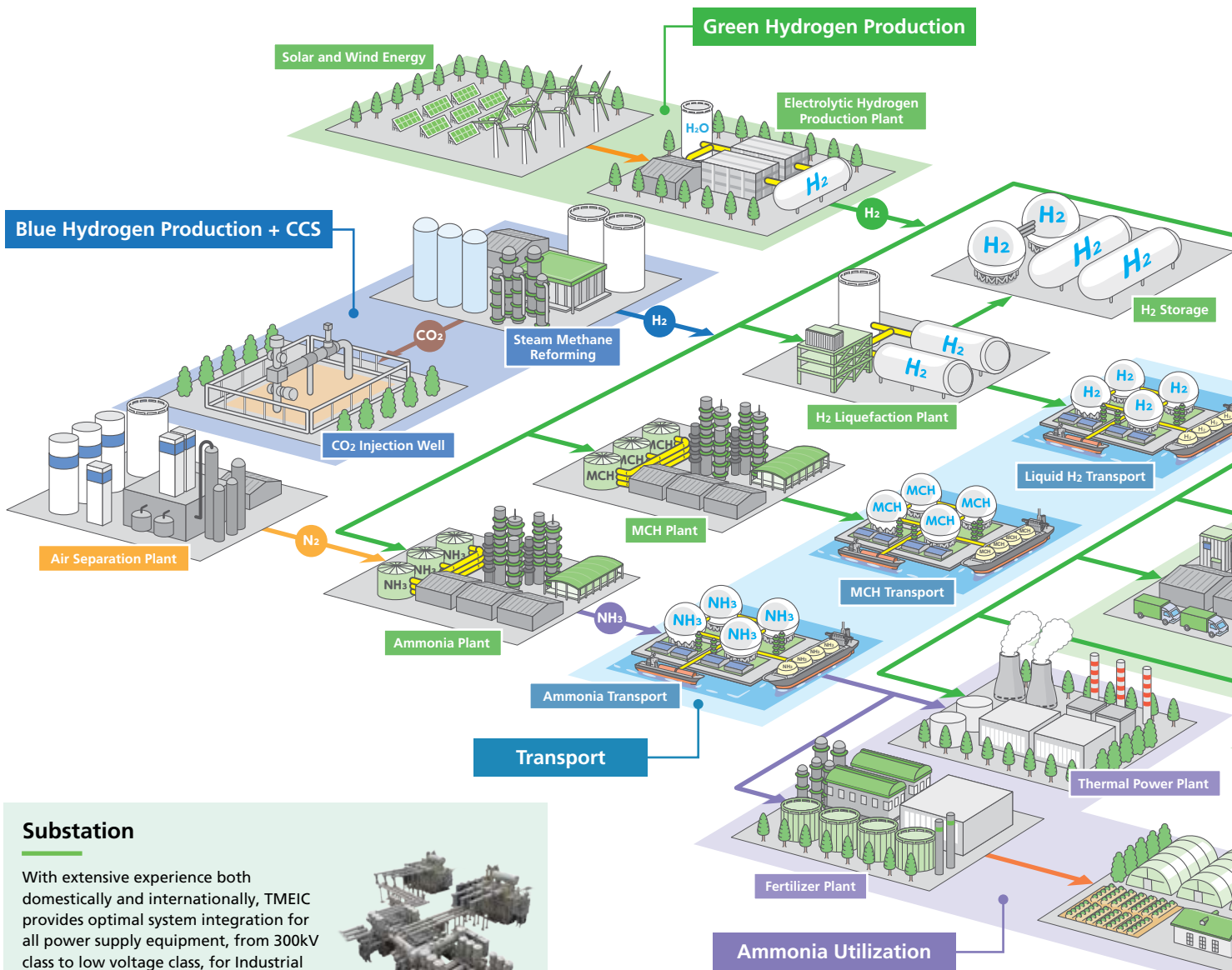
## Photovoltaic Power Conditioning System(PV-PCS)

TMEIC is a global leader and a manufacturer of utility scale and industrial grade inverters used for solar power generation with an installed base of over 50GW.



## Large Storage Battery System: TMBCS

TMEIC battery energy storage systems are used to stabilize the grid, generate revenue for providers, and reduce electricity costs for users. TMEIC has extensive experience as an integrator of energy storage systems in installations in Asia, Europe, and North America.



## Substation

With extensive experience both domestically and internationally, TMEIC provides optimal system integration for all power supply equipment, from 300kV class to low voltage class, for Industrial applications.



## Static Var Compensator: SVC

TMEIC's static var compensator effectively stabilizes voltage fluctuations resulting from renewable energy generation and optimizes the use of green power, playing a vital role in achieving carbon neutrality.



## Motor & Drive

TMEIC is recognized globally as a leader in high-power electric drive systems. Our solutions span low to medium voltage AC, with capacities up to 100MW, delivering the performance and efficiency needed for the transition to cleaner industrial operations.



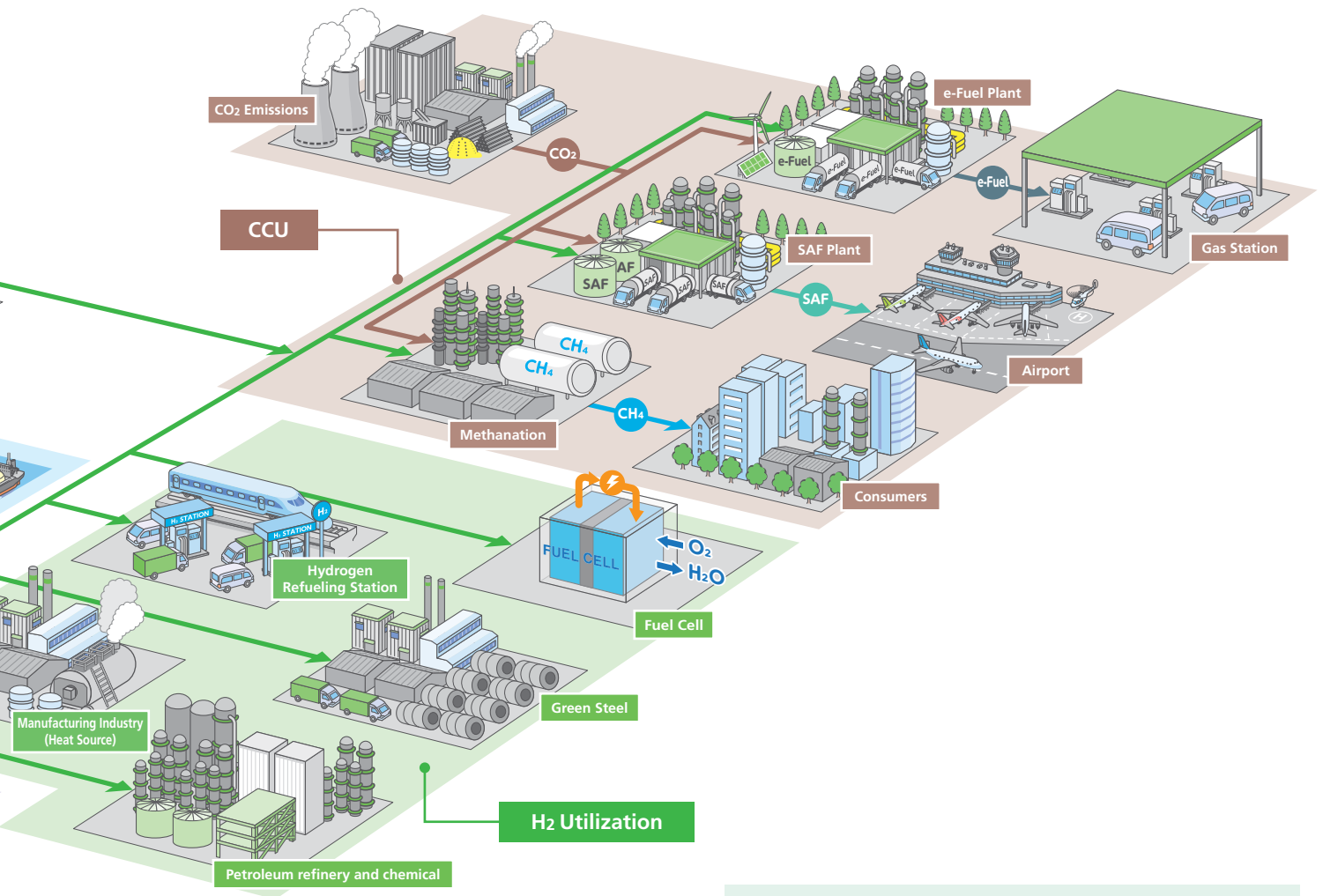
## TMEIC's IGBT Rectifier

TMEIC IGBT rectifiers for hydrogen production achieve low harmonics, low DC ripple, high power factor, and high efficiency, reducing stress on electrolyzers and minimizing impact on power systems, making them an ideal solution for green hydrogen production.



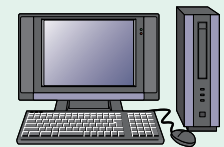
## Hydrogen Reciprocating Compressor Motor

TMEIC hydrogen compressor motors range from small 37kW-class units to large models exceeding 10MW. We offer a diverse lineup, from standard models to customized options, ensuring the best fit for hydrogen compression facilities.



## Energy Management System: EMS

TMEIC's Energy Management System (EMS) not only coordinates grid power, solar generation, and battery storage, but also manages the production and supply of hydrogen from water electrolysis systems-enabling comprehensive, integrated energy management for clean energy applications.



## Premium Efficiency Motor

TMEIC super premium efficiency motor achieves IE4/IE5 efficiency without using permanent magnets, offering excellent cost performance and realizing world-class energy savings.



## Turbine Generator

TMEIC turbine generators have a lineup of up to 170 MVA class and can be applied to a wide range of power generation for Industrial applications.



# Advanced Model - TMEIC IGBT Hydrogen Rectifier

## TMEIC Advanced IGBT Hydrogen Rectifier

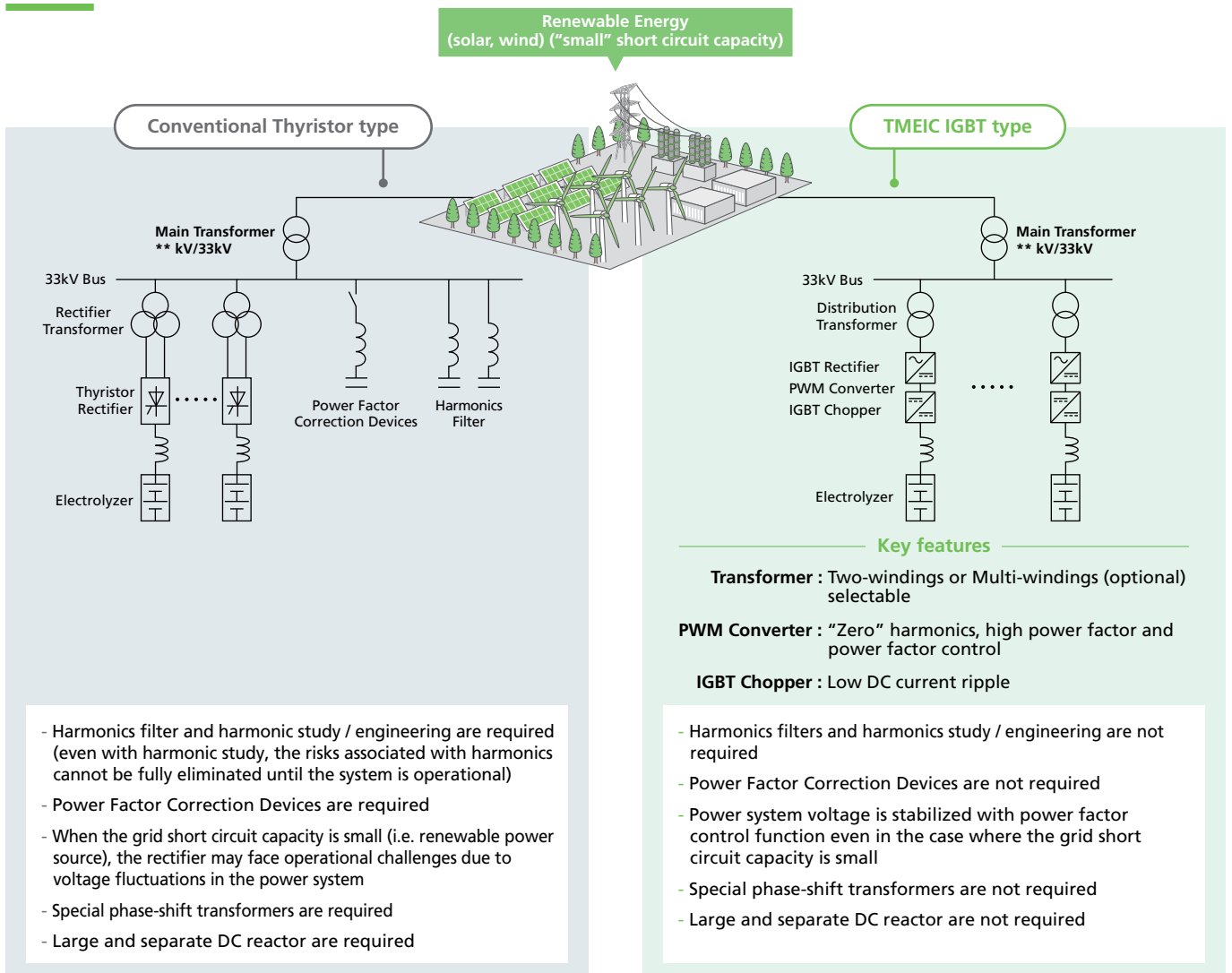
- High efficiency
- High power factor
- Low harmonics
- Low DC ripple

	Conventional Thyristor Type	TMEIC Advanced IGBT Model
Main circuit		
Efficiency	○	○
Power factor	× (less than 0.85)	◎ (more than 0.99)
Harmonics	×	◎
DC ripple	× (more than 20%)	◎ (less than 5%)

\*Note: × indicates poor, ○ indicates good, ◎ indicates excellent

Project success depends on minimizing risk, and TMEIC’s advanced IGBT rectifiers are designed to do just that. Leveraging cutting-edge technology, our solutions help reduce project uncertainty by addressing common electrical challenges-eliminating the hidden costs associated with poor power factor and harmful electrical harmonics.

## Rectifier key technology - Comparison "Thyristor" and "IGBT" for Green Hydrogen



# Standard Specification

	Type10	Type11	Type11+	Type12	Type12+	Type22	Type22+	Type23+
Number of PWM Converter panel	0.5	1		1		2		2
Number of IGBT Chopper panel	0.5	1		2		2		3
Rated DC output	650kW	1800kW	3000kW	1800kW	3000kW	3600kW	6000kW	6000kW
Rated DC current	1kA	3.75kA	4kA	7.5kA	8kA	7.5kA	8kA	12kA
Rated AC input (Hz)	50/60Hz ±2%							
Rated AC input (V)	AC420/440/500V(*1), AC690V(*2)							
Rated DC output (V)	DC50-720V(*1) / DC50-1000V(*2)							
Rectifier type	PWM (IGBT) Converter + IGBT Chopper							
Power factor	more than 0.99							
Harmonics	IEEE519 Compliant (THDi: less than 3%)							
DC current ripple	less than 5% (rms)							
Control	Constant Current							
Cooling method	Main circuit: Water-cooled, Others: Air-cooled							
Ambient temperature	5 to 40°C							
Humidity	85% or less (no dew condensation)							
Altitude	less than 1000 m							
Installation	Indoor							
Auxiliary power supply	Cooling fan	3 phase-AC210V						
	Cooling water system	3 phase-AC200V						
	Control circuit	1 phase-AC200V (UPS)						

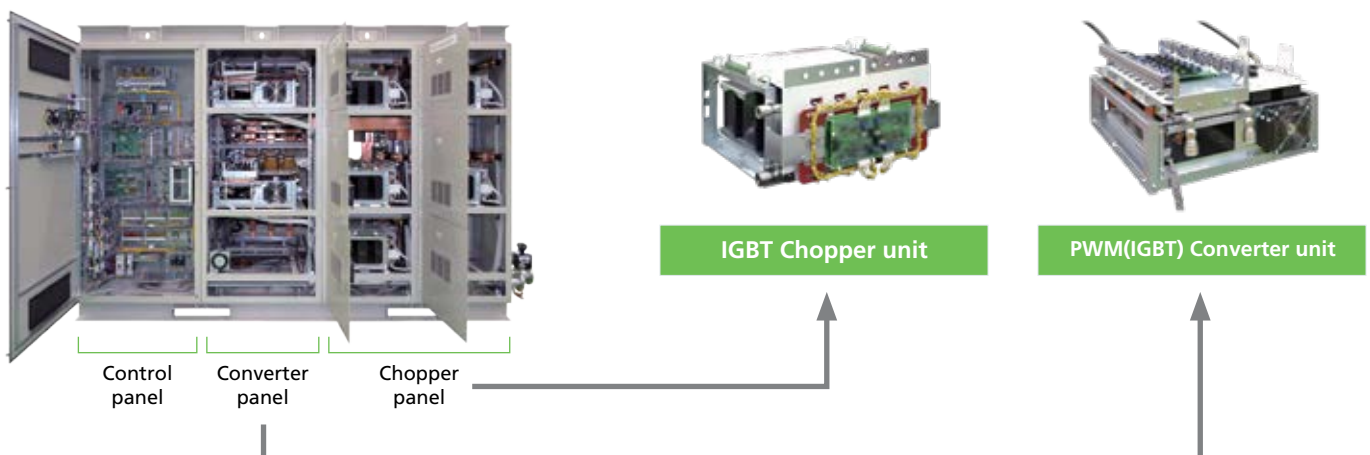
\*1 : Type10, Type11, Type12, Type22

\*2 : Type11+, Type12+, Type22+, Type23+

## Modular Design

TMEIC offers a product lineup that includes Type 11, Type 12 and Type 22. By adopting a modular design, the output power can be tailored by adjusting the number of IGBT chopper units and PWM converter units installed in the rectifier. TMEIC advanced IGBT hydrogen rectifiers are tailored to provide optimal compatibility and efficiency, ensuring seamless integration with all electrolyzers.

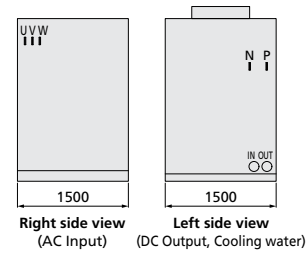
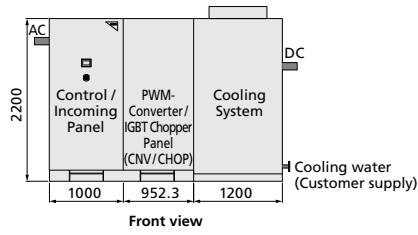
### Type 12



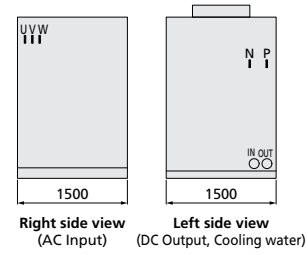
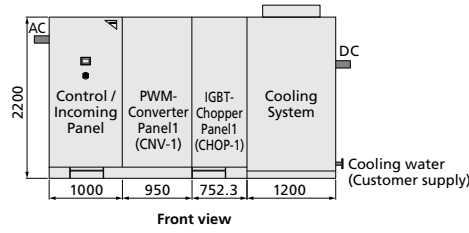
# Standard Outline

Unit: mm

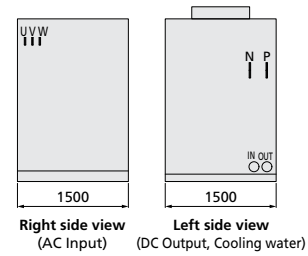
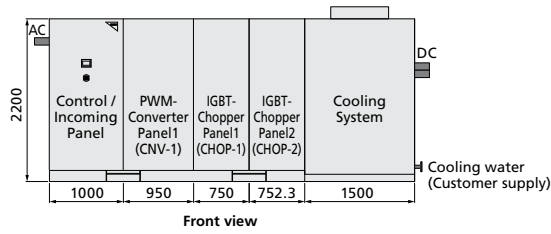
## Type 10



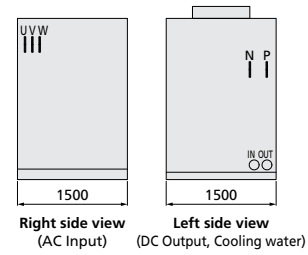
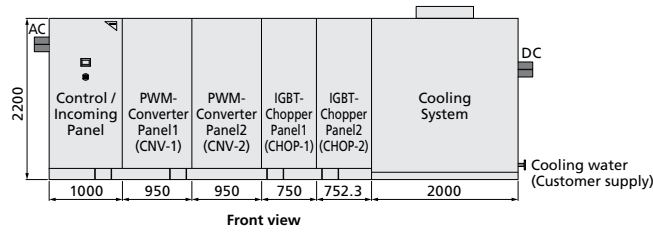
## Type 11/11+



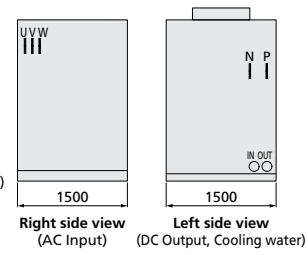
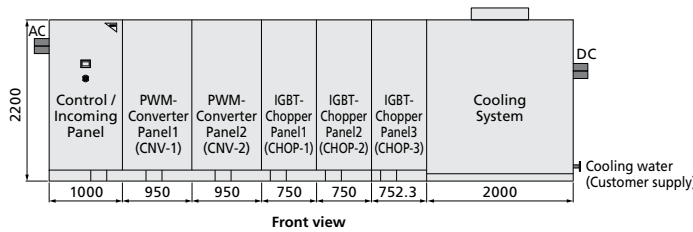
## Type 12/12+



## Type 22/22+



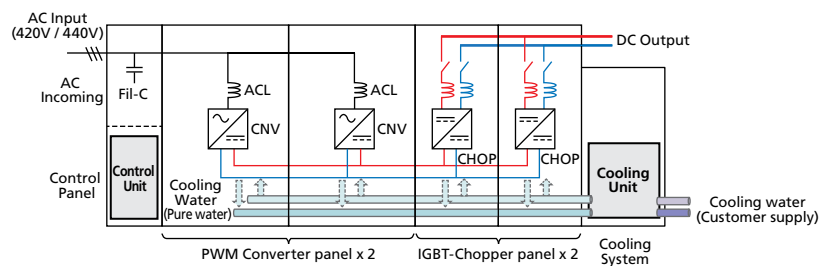
## Type 23+



# Standard Configuration - Modular Design

## Type 22+

DC 6000kW, DC 8kA(max)



# Containerized Solution



**Type 12 in 20ft container**



**20ft container (transformer outside)**



**20ft container (transformer inside)**



**30ft container (transformer outside)**



**30ft container (transformer inside)**

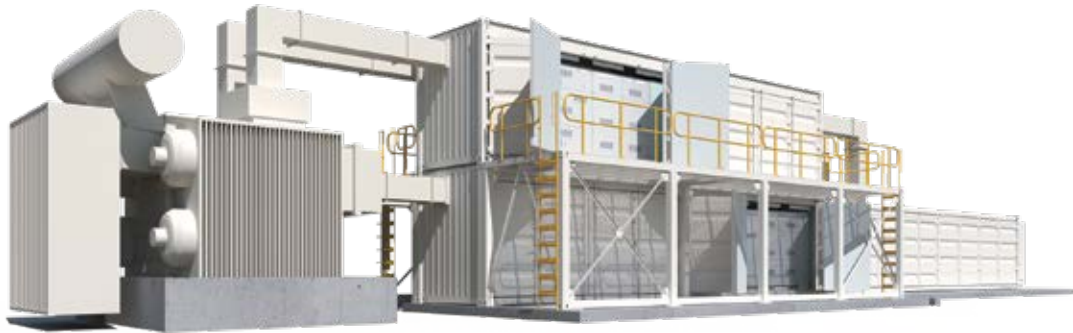
Container type	20ft High-Cube Container	30ft High-Cube Container	40ft High-Cube Container	45ft High-Cube Container
Size [mm]	L6058 x W2438 x H2896	L9144 x W2438 x H2896	L12129 x W2438 x H2896	L13716 x W2438 x H2896
Protection	IP54 or equivalent			
Ambient temperature	-10 to 40 °C Cooling water does not freeze			
Humidity	100% or less			
Snowfall	less than 50 cm			
Seismic class	1.0G (Horizontal) 0.5G (Vertical)			
Altitude	less than 1000 m			
Installation	Outdoor			



**Type 11 in 20ft container**

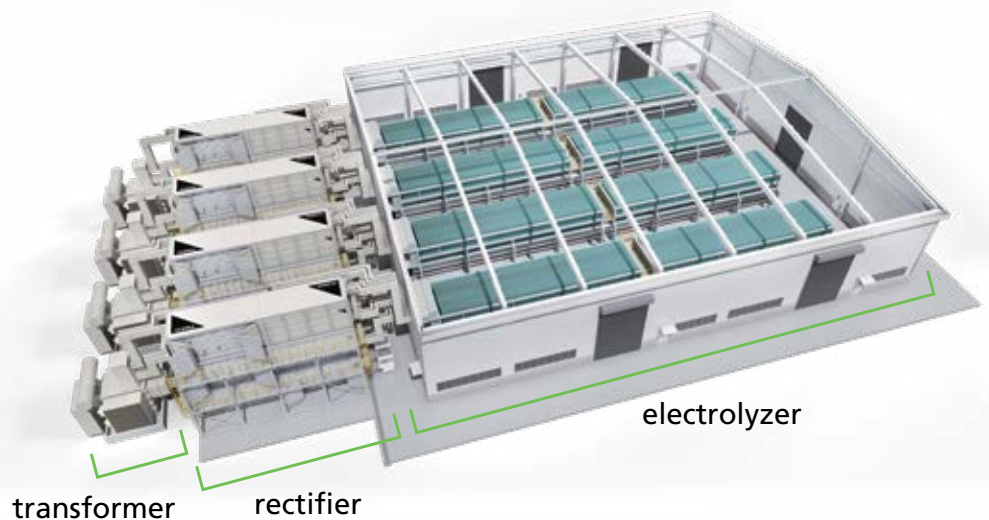
# Stacked Containerized Solution

TMEIC's "stacked containerized solution" is a cutting-edge approach aimed at optimizing space in projects where site area is limited. This innovative design features equipment arranged in a compact, modular format, significantly reducing the footprint of the Balance of Plant (BOP).



# TMEIC Solution for Large-Scale Project

The capacity of electrolyzers is anticipated to expand significantly in response to the growing demand for green hydrogen in the coming decades. To ensure the efficient operation of large-capacity electrolyzers, TMEIC is dedicated to developing and providing the most advanced and reliable rectifier systems, prioritizing both performance and safety in line with the future energy requirements.



# Hydrogen Production Projects with TMEIC's IGBT rectifier

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- Adopted by hydrogen production projects that utilizes alkaline, PEM and SOEC electrolyzers
- Extensive project experience (from small to large-scale projects)



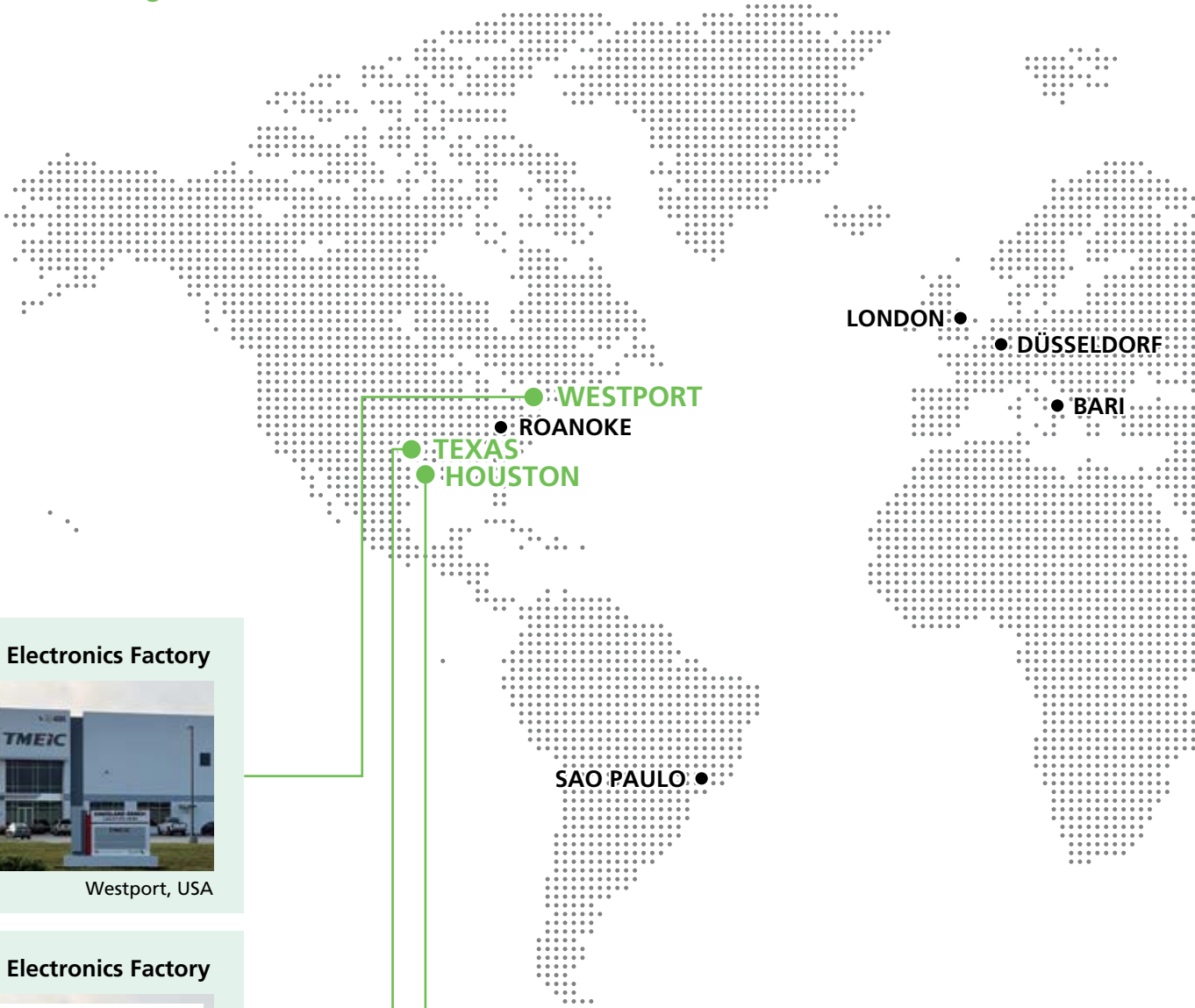
## TMEIC's Offerings / Solutions and Service:

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- Designed to meet the voltage and current ratings of all electrolyzers
- Compact footprint
- High efficiency, low harmonics and low ripple
- Flexibility for indoor or outdoor installation
- Comprehensive Support (from initial consultation to after-sales support)  
... and more upon request!

# Global Network

- Sales bases
- Manufacturing bases



Power Electronics Factory



Westport, USA

Power Electronics Factory



Texas, U.S.A.

Power Electronics Factory



Houston, U.S.A.

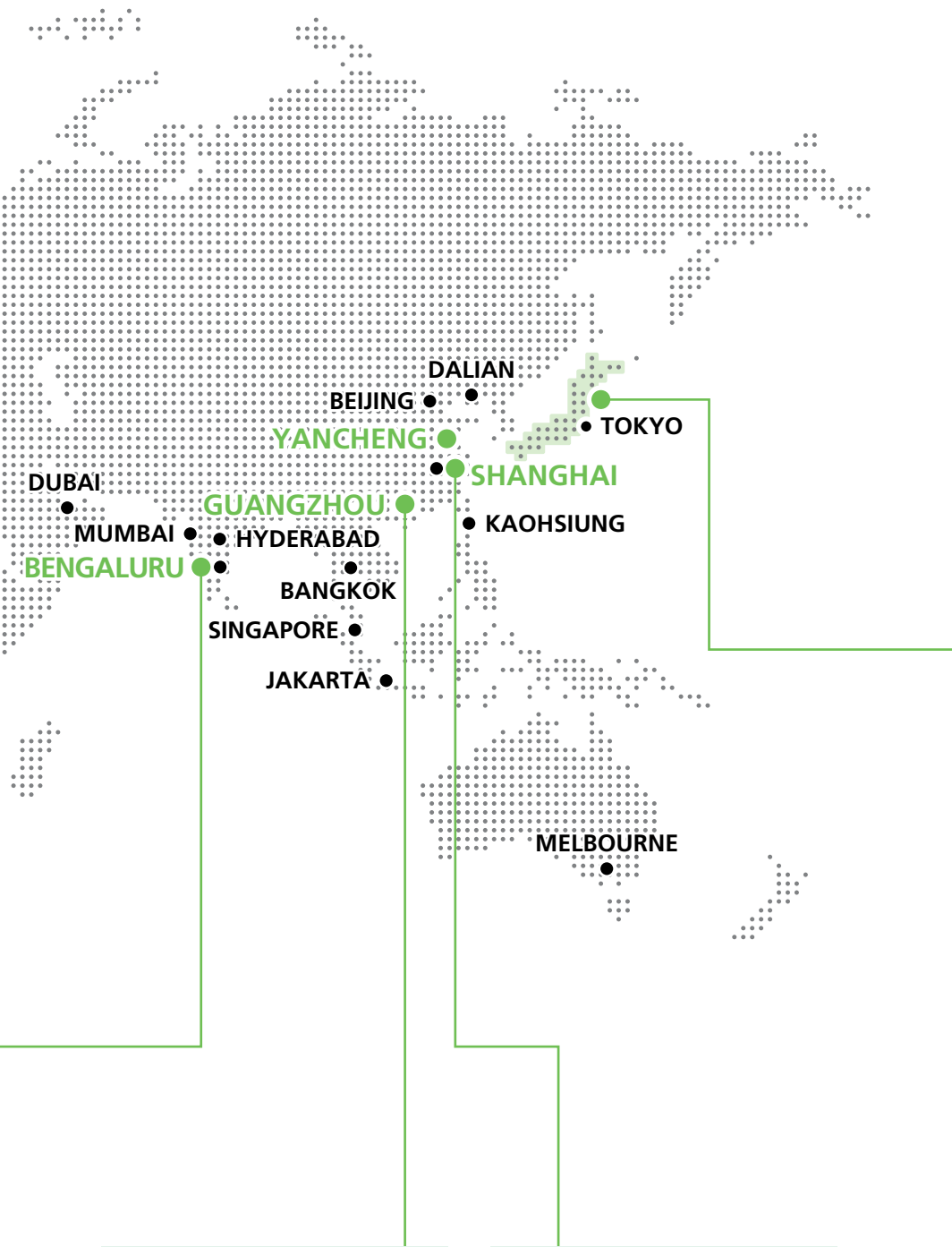
Motor Factory



Power Electronics Factory



Bengaluru, India



**Manufacturing base in Japan**

**Power Electronics Factories**



Fuchu (Tokyo)



Kobe

**Motor Factories**



Keihin (Yokohama)



Nagasaki

**Magnetic Field Generator Factory**



Ako

**Kobe Technology Center (KTC)**



Kobe

**Power Electronics Factory**



Guangzhou, China

**Power Electronics Factory**



Shanghai, China

# Supporting a Carbon-Neutral Society



TMEIC's advanced power electronics technology supports the realization of a carbon-neutral society.



## Production: Power generation

Efficient and stable power generation from diverse sources



Large-scale Solar Power Generation System



Modular Power Conditioner: SOLAR WARE U



## Distribution: Transmission·Storage

Convert power to ensure smooth transmission across various application scenarios



Large Storage Battery System: TMBCS



## Utilization: High efficiency

Utilize the generated power efficiently



Large-scale Rectifier for Industry



Motor Drive Equipment: TMdrive-MVe3



## Support: Reliable

Supply stable, high quality, and reliable power



Uninterruptible Power Supply: TMUPS



Multiple Power Compensator: MPC



Static Var Compensator: SVC

All specifications in this document are subject to change without notice. This brochure is provided free of charge and without obligation to the reader or TMEIC, and is for the purpose of information only. TMEIC neither accepts nor implies any liability regarding the information provided herein.

### TMEIC Corporation

TOKYO SQUARE GARDEN, 3-1-1 Kyobashi, Chuo-ku, Tokyo 104-0031, Japan  
Tel: +81-3-3277-5511 Fax: +81-3-3277-5533  
www.tmeic.co.jp



#### Caution about Safety

●For the correct and safe use of the products, be sure to carefully read the operation manual in advance.