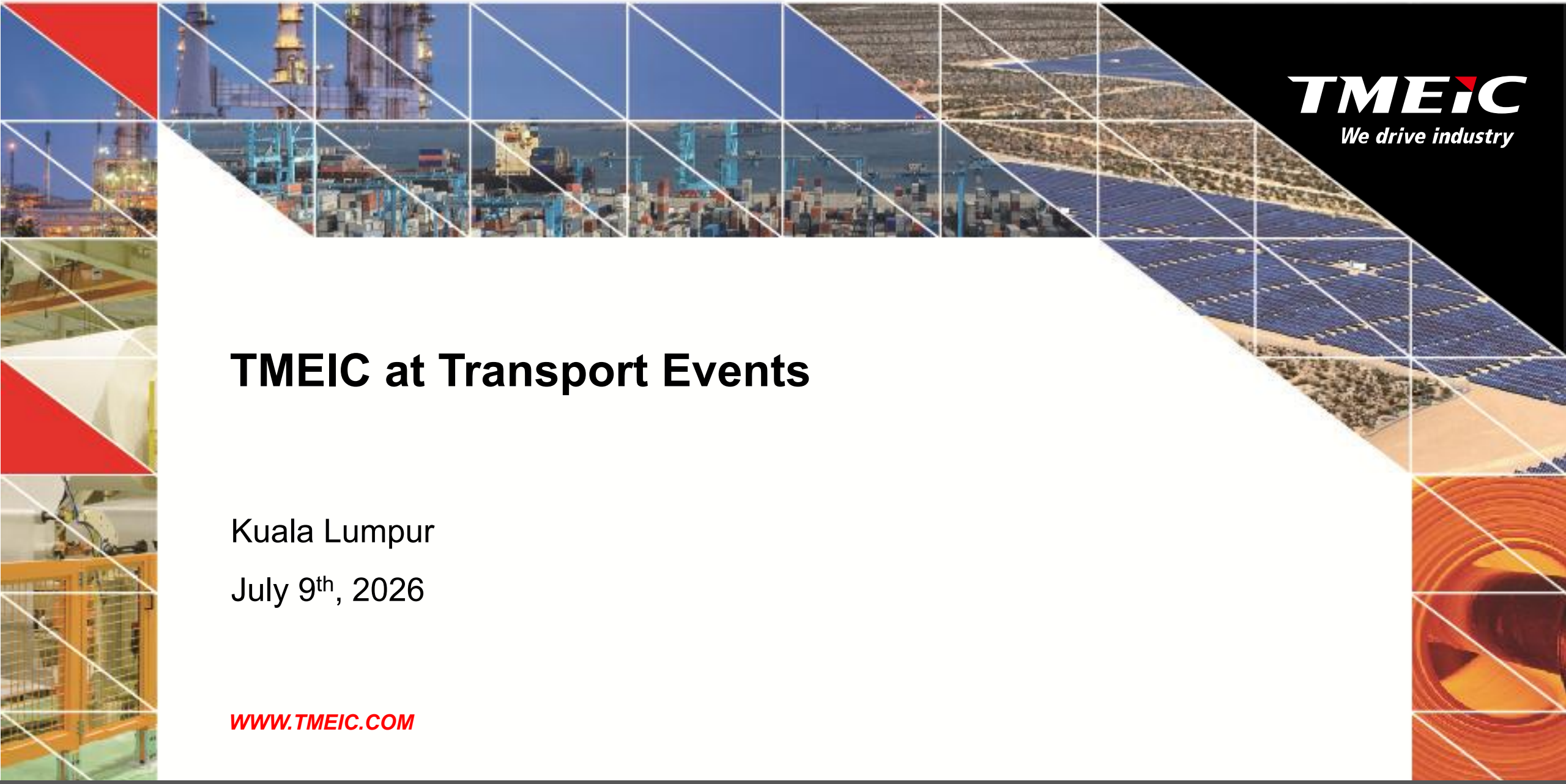


TMEIC at Transport Events

Kuala Lumpur

July 9th, 2026

WWW.TMEIC.COM

Who is TMEIC?

TMEIC

TOSHIBA
Leading Innovation

MITSUBISHI ELECTRIC
Changes for the Better

Industrial Corporation

TMEIC is a global drive and automation systems supplier with manufacturing, engineering, sales, and service facilities around the World.

TMEIC Portfolio

- Hot & Cold Mills
- Rolling Mills
- Process Lines
- Long Products
- Energy Saving
- Waste Heat Recovery

- Maxspeed Crane Systems
- Automated Crane Systems
- Maxview Smart Landing Systems
- Crane Modernizations

- Conveyors
- Grinding Mills
- Draglines
- Shovels

- Separators
- ID Fans
- Conveyors
- Kilns
- Testing

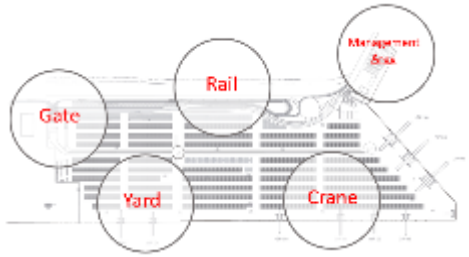
- LNG
- Offshore Production
- Refining
- Pipelines, Transportation & Storage
- Refining & Petrochemicals

- ID Fans
- FD Fans
- BFP's
- Pumps

- Renewable Energy
- Photovoltaic
- Energy Storage

TMEIC Portfolio – One Partner, one Team

Smart Vision



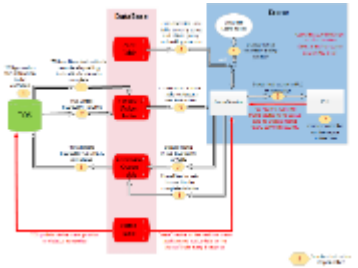
Hardware / Products

ASC

A-CRMG

QC

ECS / TOS Interface

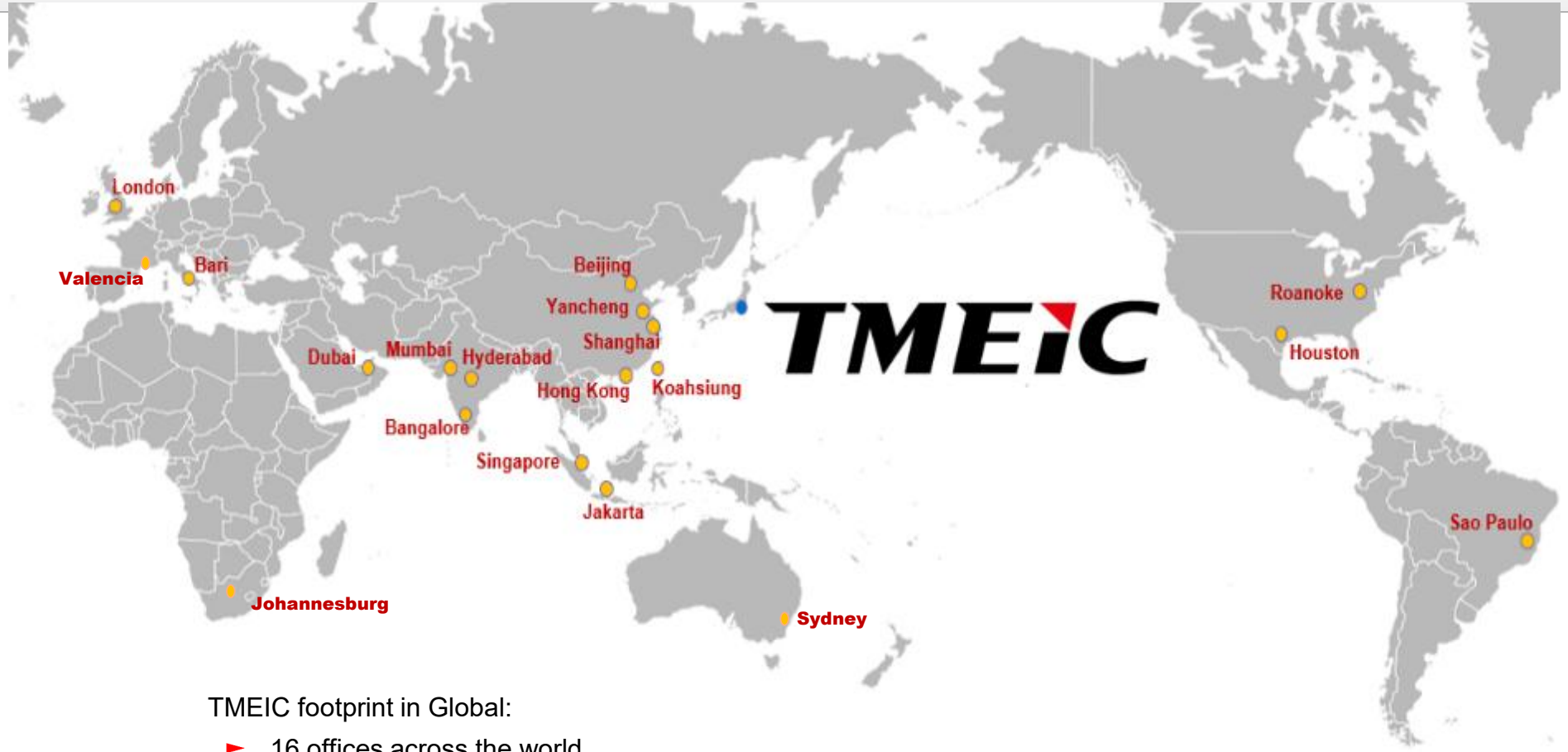


Yard & Terminal Automation

ROS

Energy Management / net zero

TMEIC Global Footprint

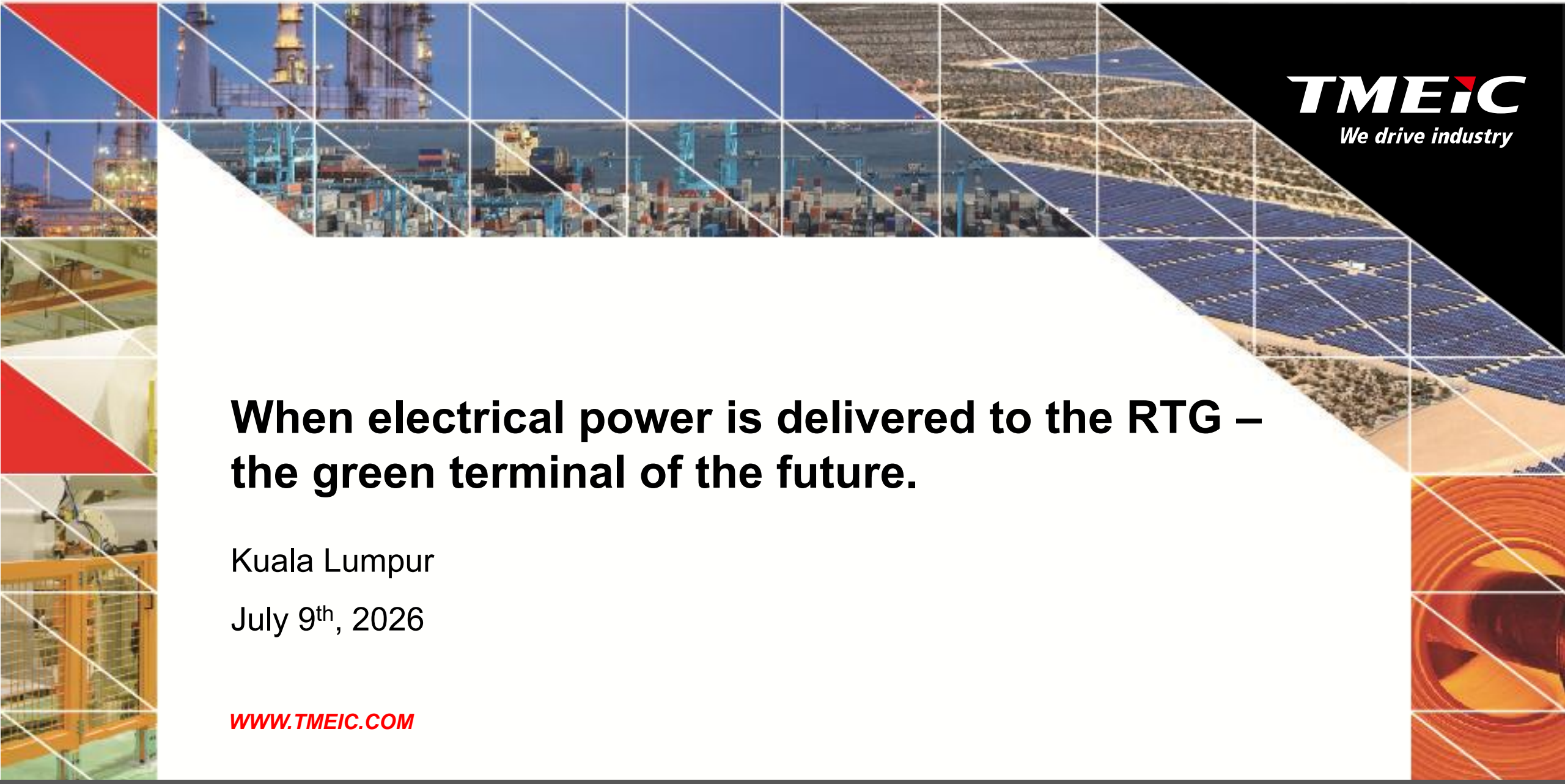


TMEIC footprint in Global:

- 16 offices across the world
- Engineering Technology Offices at Japan, USA, Italy, India, China, Spain
- 6 factories
- An extensive service network

TMEIC footprint in Japan:

- 13 sales offices In Japan
- 4 factories
- An extensive service network



When electrical power is delivered to the RTG – the green terminal of the future.

Kuala Lumpur

July 9th, 2026

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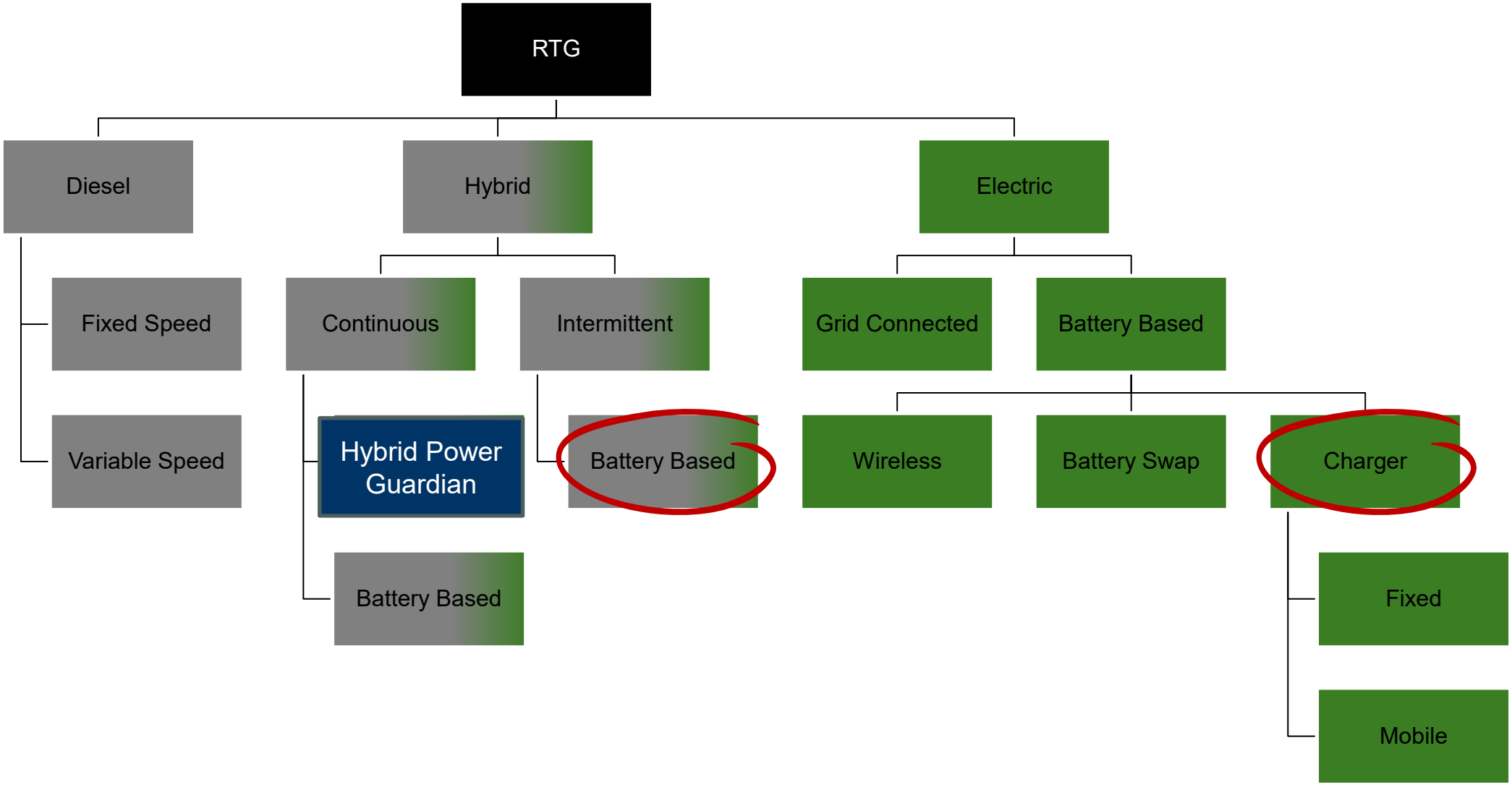
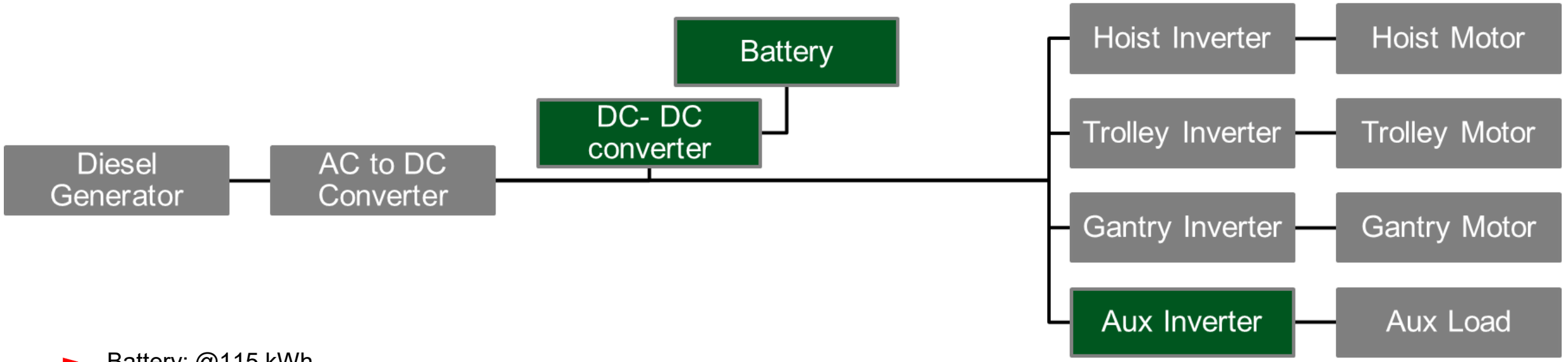
Path to RTG Electrification

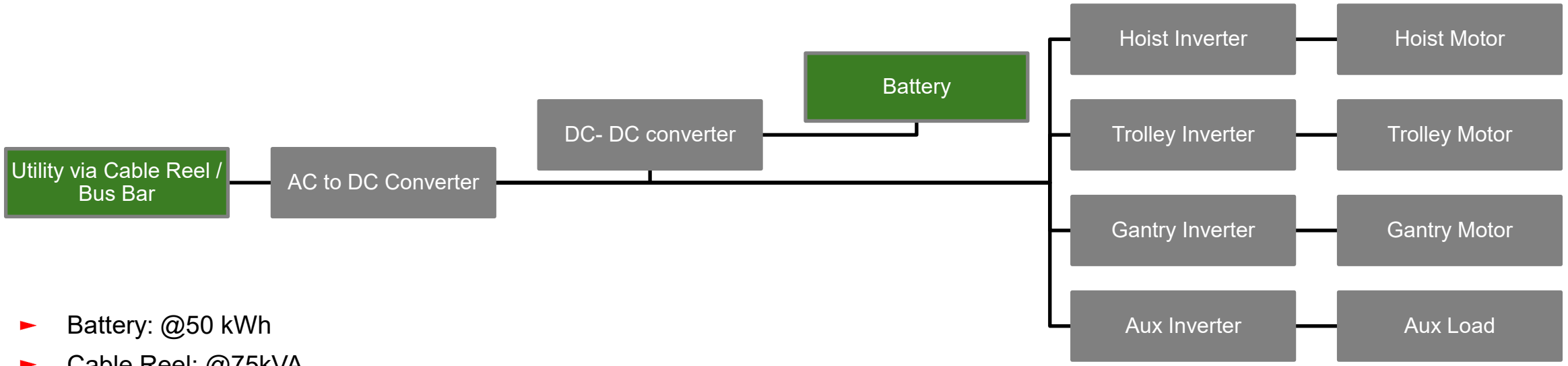


Battery + Intermittent DG



- Battery: @115 kWh
- DG: @90kW
- DG will operate at the highest efficiency point, 35.4% - longest life.
- Bigger battery allows several hours of operation without DG

Battery + Fixed continuous charger

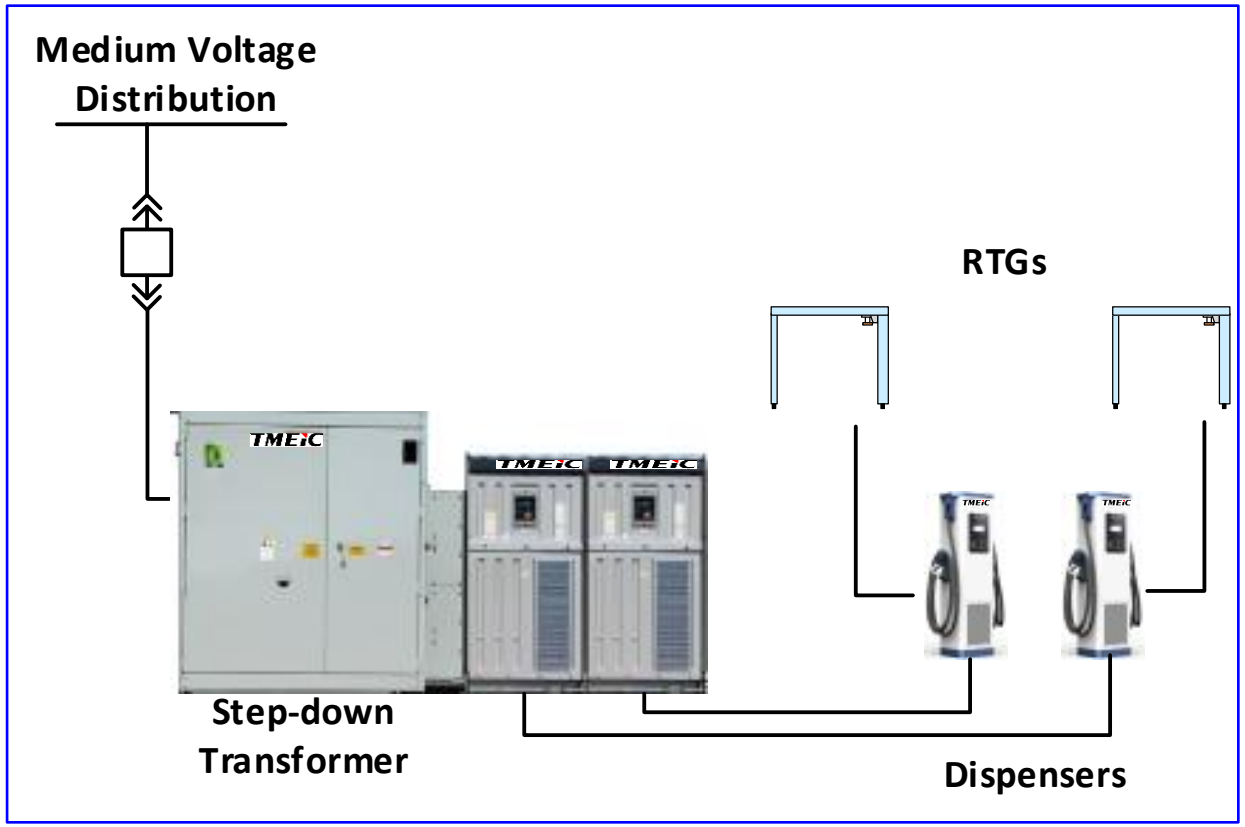


- Battery: @50 kWh
- Cable Reel: @75kVA
- Regenerative energy is captured and used locally resulting in smallest sized cable reel and batteries
- Cable reel also allows future automation of RTGs via fiber optic data link

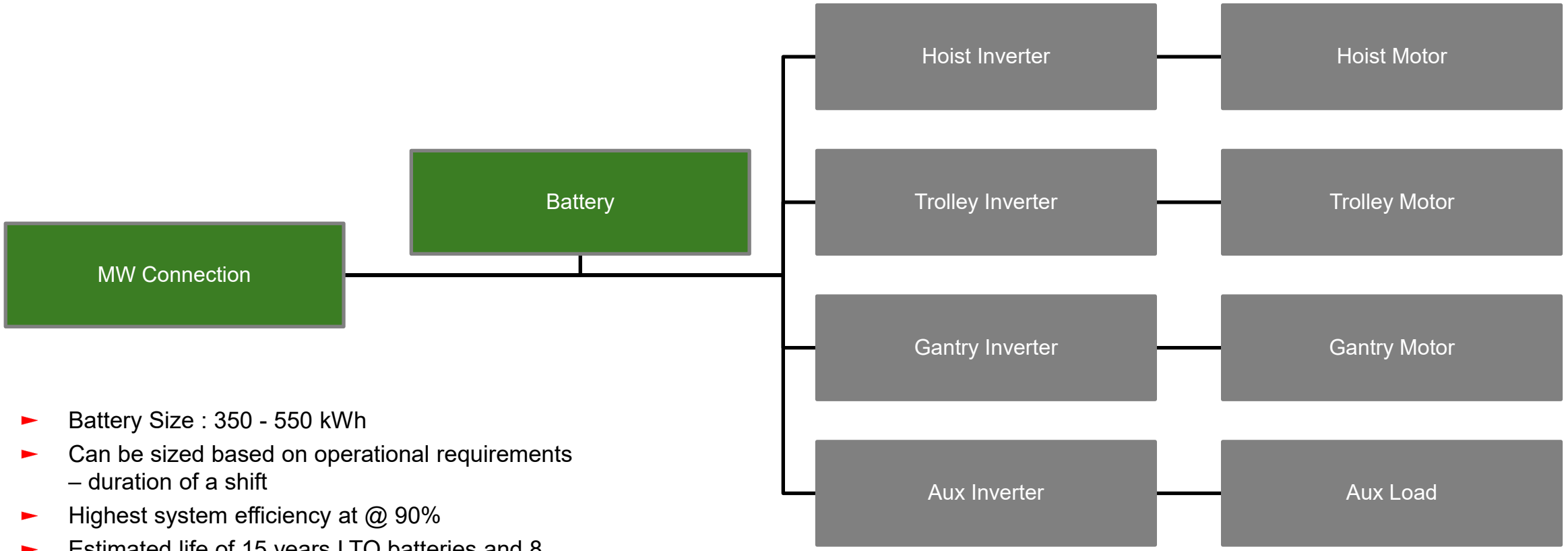
Battery + DC Dispensers

In-yard charging

- MV switchgear
- Charger Skid
  - Step-down transformer
  - AC-DC converter
  - DC-DC converter
- DC Dispensers



Battery + Mobile charger



- Battery Size : 350 - 550 kWh
- Can be sized based on operational requirements – duration of a shift
- Highest system efficiency at @ 90%
- Estimated life of 15 years LTO batteries and 8 years with LFP batteries.
- Future automation possible based on wireless network, currently under study

Battery + Mobile charger

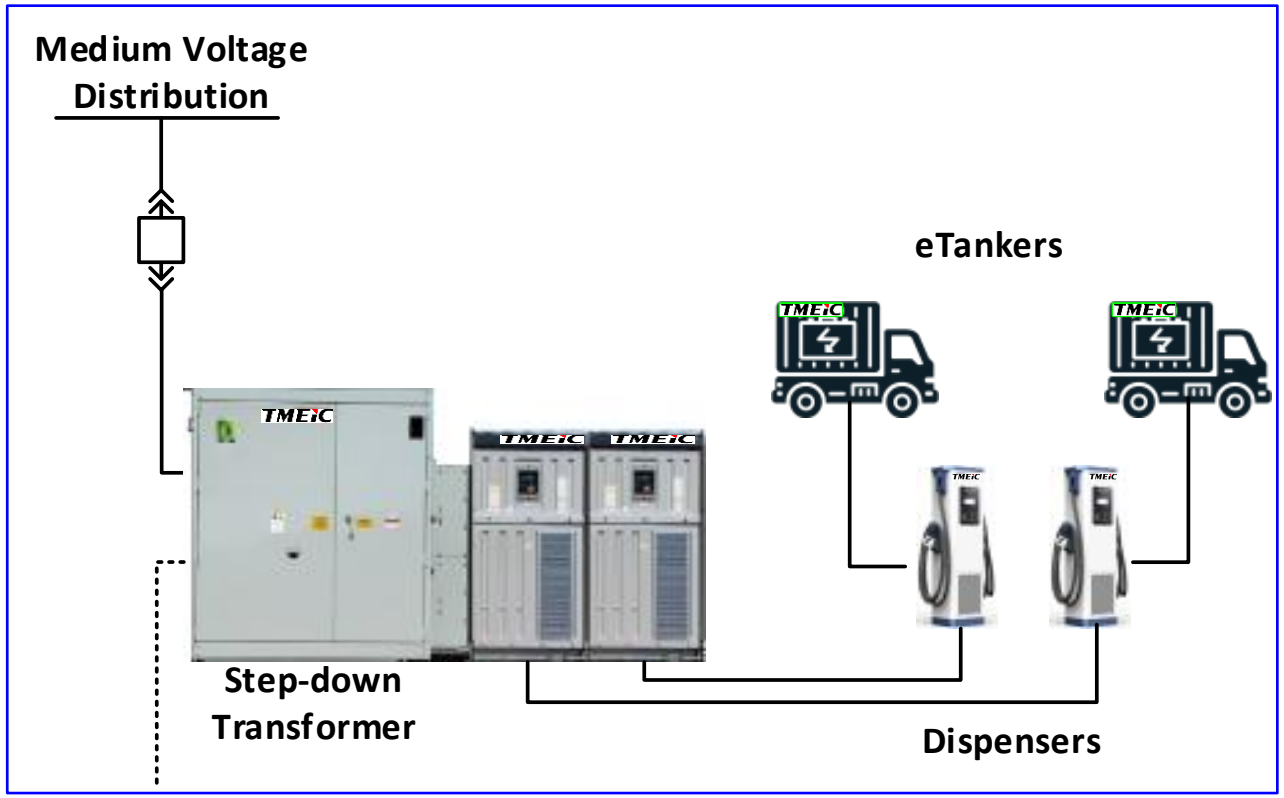
Off-yard/Off-site charging

MV switchgear

Charger Skid

- Step-down transformer
- AC-DC converter
- DC-DC converter

DC Dispensers



Crane parameters

eRTG system is sized considering the following crane parameters.

Crane parameters	Value	Units	Comments
Hoist rated load	41	t	50 t cranes requires a different design
Hoist base speed	26	m/min	
Hoist top speed	52	m/min	
Trolley speed	70	m/min	
Gantry speed, w/o load	135	m/min	
Operating wind speed	25	m/s	
Min ambient temperature	-10	C	TM10e2/3 products require 0 C min. temperature
Max. ambient temperature	45	C	TM10e2/3 products require 40 C max. temperature. From 40 C to 50 C with derate.

System parameters

System parameters	Value	Units	Comments
Battery energy capacity	310	kWh	At BoL
Battery SoH at EoL	80	%	
Battery nominal voltage	579	Vdc	
Crane DC bus voltage	680	Vdc	
Auxiliary loads inverter peak power	100	kVA	Peak at sinewave filter terminal, 460 Vac
DC-DC converter nominal power	405	kW	At 579 V nominal battery voltage
Battery cooling system	liquid		Water and glycol, 50% / 50%
Battery chemistry	LFP		Requires periodic BMS recalibration by charging at 100 % SoC
Enclosure weight	6000	kg	Approximate

eTanker parameters

System parameters	Value	Units	Comments
Battery energy capacity	2.2	MWh	At BoL
Battery SoH at EoL	70	%	
Life	20	years	
Battery nominal voltage	832	Vdc	
eTanker charger inlet type	CCS2		Rated for 1000 V, 800 A
eTanker charging time	~2.5	h	From 20 % to 90 % SoC at BoL
eTanker to eRTG charger cable	CCS2		Rated for 1000 V, 800 A
eRTG charging time	~45	min	From 20 % to 90 % SoC at BoL
Auxiliary loads inverter peak power	119	kVA	Peak at sinewave filter terminal, 460 Vac
eRTG charger nominal power	430	kW	At 579 V nominal battery voltage
Battery cooling system	liquid		Water and glycol, 50% / 50%
Battery chemistry	LFP		
Enclosure size	40	ft	Container

TMEIC MW Charger

Power Converter

- AC to DC Converter - Ninja ESS
- DC to DC Converter - a MW outdoor type DC to DC converter under development

DC Dispenser

- Communication
- Cable Cooling
- Mechanical Enclosure
- Protection

Control Card

- a control card for the power converter is under development

High-level Solution Architecture of Mobile Charged ERTG

Terminal Operating System (TOS)
Inventory Management • Terminal-wide Optimization • Job Scheduling

Energy Management System (EMS)
Grid Energy • Terminal-wide Energy management

TMEIC E-RTG Solution

Fleet Management System (FMS)
Monitoring • Optimization • E-Tanker Dispatching

Charging Station
Grid • MV/LV • MW Chargers

E-Tanker (Mobile Charger)
BESS • DC Fast Charging

RTG (Battery-Electric)
SoC • Drive Power

E-Tanker for upgrades / expansions

- No civil work for Bus Bar & Cable Reels
- No losage of stacking area
- No downtime of whole block for retrofit
- Turnkey upgrade crane by crane
- Parallel operation of Diesel-RTG and Battery-RTG possible
- Dispensers and e-tanker-parking can be anywhere in the terminal, even outside of the terminal

Thank you