Reducing Carbon Emissions
Managing Energy Transition
Green Initiatives

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WWW.TMEIC.COM

Who are we?

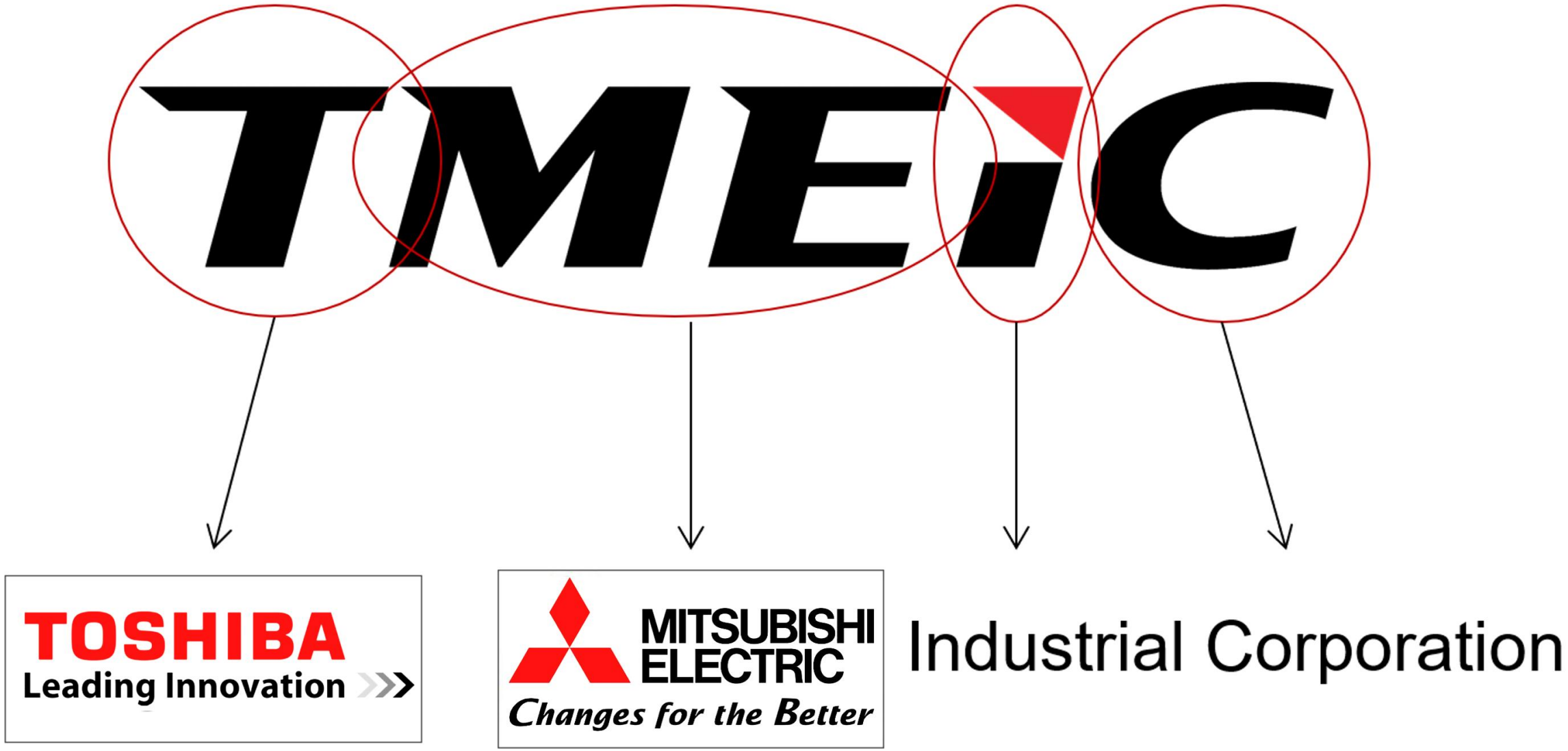
Who we are

- Corporation established by Toshiba Corporation & Mitsubishi Electric
- Operation & trading began 1st October 2003
- Headquartered in Tokyo, Japan

TOSHIBA MITSUBISHI ELECTRIC

- Business Turnover : ¥166.5 Billion (US$2.1 Billion)
- Employees : 4,300
- Head office : Tokyo, JAPAN
- President & CEO : Akira Kawaguchi

Our name


TMEiC
TOSHIBA
Leading Innovation
MITSUBISHI
ELECTRIC
Changes for the Better
Industrial Corporation

TMEIC – Core Technologies

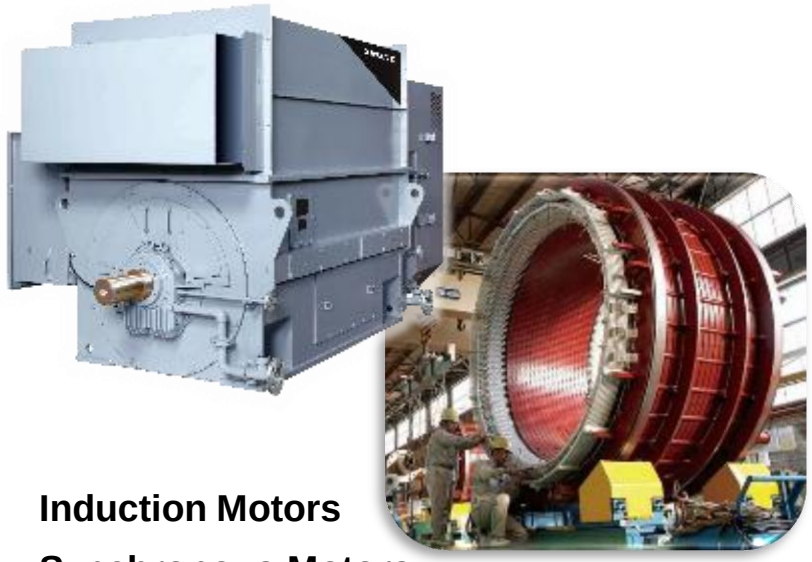
POWER ELECTRONICS

Variable Frequency Drives

Photovoltaic Inverters

Energy Storage

ROTATING MACHINERY



Induction Motors

Synchronous Motors

Generators

CONTROL SYSTEMS

System engineering

Network technology

Electromechanical engineering

Intelligent sensor systems

TMEIC – Global Locations

GLOBAL PRESENCE

17 OFFICES

9 FACTORIES

TOTAL **26** LOCATIONS

4,255+ EMPLOYEES

300+ SERVICE ENGINEERS

Barcelona Europa South Terminal - SPAIN

68 Semi - Automated Stacking Cranes

HUTCHISONPORTS BEST

Virginia International Gateway (ex.APMT) - USA

116 Semi-Automated Stacking Cranes

12 Quay Cranes

Abu Dhabi - DUBAI

127 ASC

6 STS Cranes

Port Liberty, Bayonne - USA

16 Semi - Automated Stacking Cranes

Qingdao, Shandong - CHINA

38 Semi - Automated
Stacking Cranes

青岛港国际股份有限
QINGDAO PORT INTERNATIONAL CO.,

Yangshan Deep Water Port - CHINA

50 Semi - Automated Stacking Cranes

28 Automatic Cantilevered RMGs

SIPG SHANGHAI INTERNATIONAL PORT (GROUP) CO.,LTD.

Haifa - ISRAEL

2020 -

SIPG SHANGHAI INTERNATIONAL PORT (GROUP) CO.,LTD.

30 Semi - Automated Stacking Cranes

Industry-Decarbonization

Energy Challenges Faced by Ports & Terminals

Decarbonization of grid

- Variability in available energy – less ‘inertia’ in the grid

Electrification of equipment

- Immense increase in electricity demand – new demand patterns

Rising / unpredictable costs

- Reducing penalties and cost avoidance is even more critical

Decarbonization-Solutions

TMEIC is Playing a Key Role in Green Transition

Ports & Terminals

On-Shore Power Supply
RTG Hybrid Power
Smart Grids

Green Energy Production

Inverters for Grid-Scale Solar
Energy Storage Systems

Power Quality & Grid Support

VAR Compensation
Peak Shaving
Energy Management & Control

Hydrogen

Rectifier Systems
for Hydrogen Electrolysis

Motors & Drives for
Compression and Liquification

TMEIC in Renewable Energy & Port Electrification/Automation

Renewable Energy

45+
GW Worldwide

30+
GW in North America

330+
Installations in North America

Photovoltaic Inverters / Energy Storage Systems
Energy Management & Controls

Container Ports & Terminals

68+
Ports

625+
Automated Stacking Cranes

410+
Quay Cranes

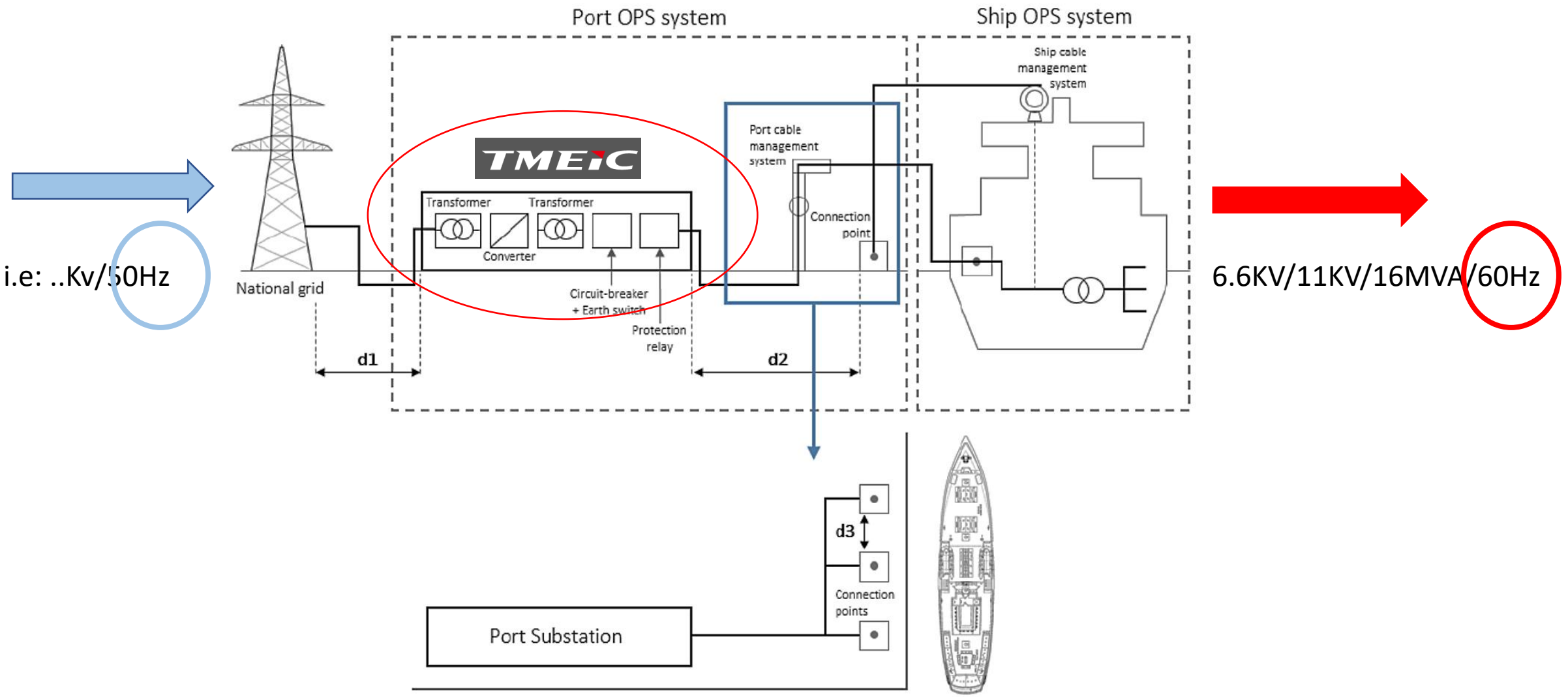
20+
Cantilevered Gantry Cranes

40+
Rail-Mounted Gantry Cranes

Onshore Power Supply or Cold Ironing

Power Conversion 50-60Hz

Onshore Power Supply - Components

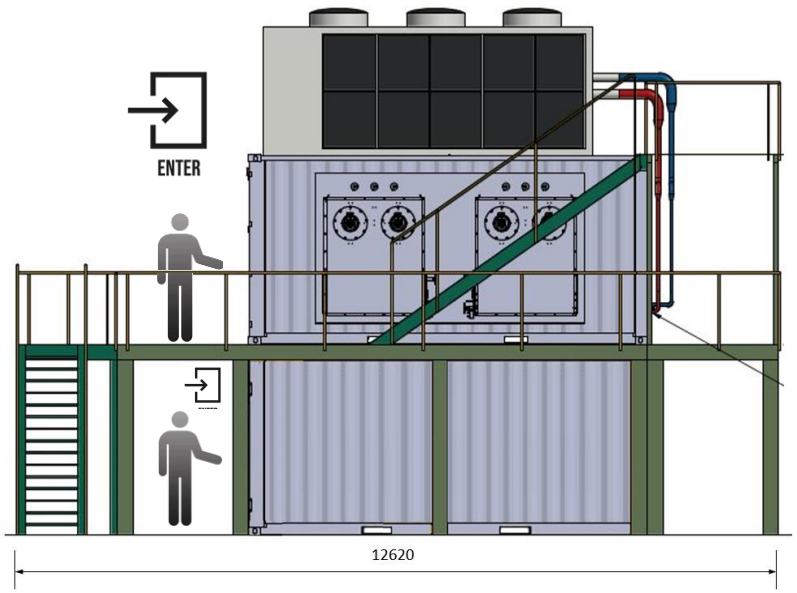


OPS Components

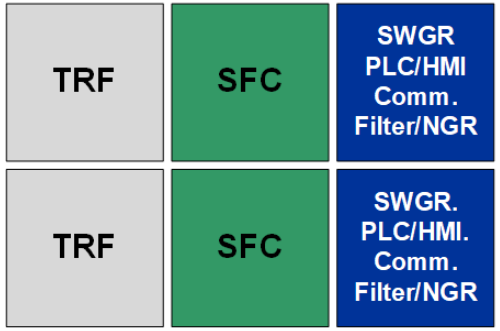
MaxShorePower™. 6.6kV/8.0MVA, 60-50Hz

Rear View

Right Side



Rear View



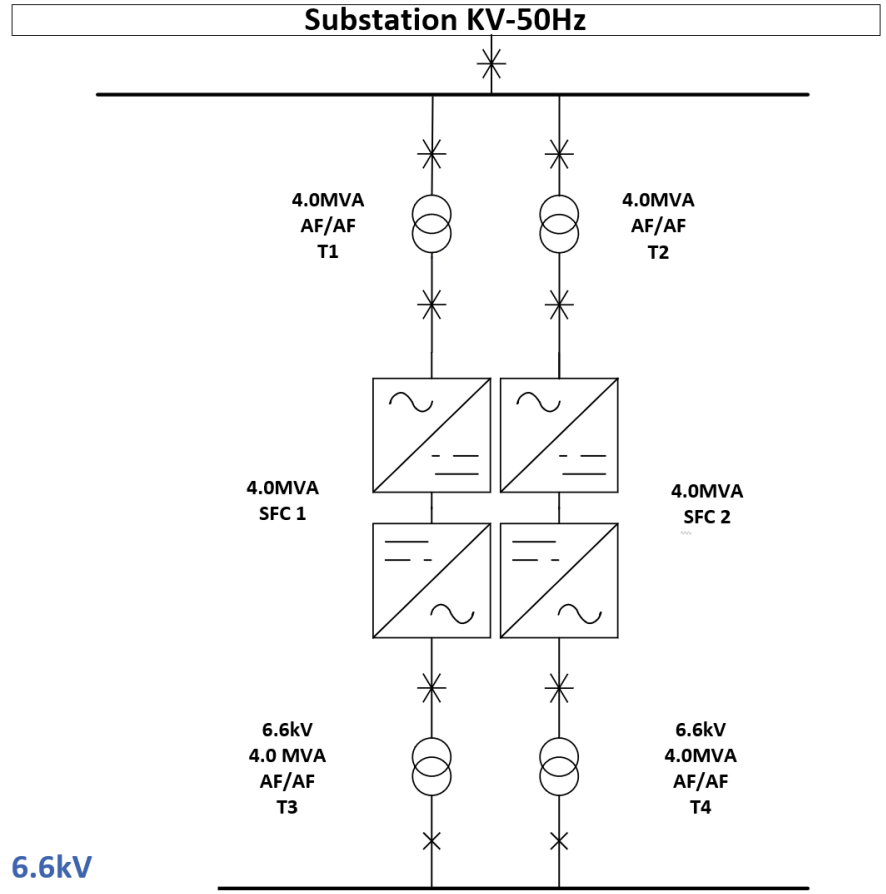
Notes:

The proposed solution consists of three 20ft high cube containers for the 2x4 MVA block, arranged in two rows.

TMEIC does not provide the structural arrangement shown in the image.

The cooling system is designed based on the ambient temperature requirements provided for the specific location. A discussion with the customer is necessary to confirm these details.

The images shown are for illustration purposes only and may not exactly represent the final solution. A discussion with the customer is expected to finalize the scope.

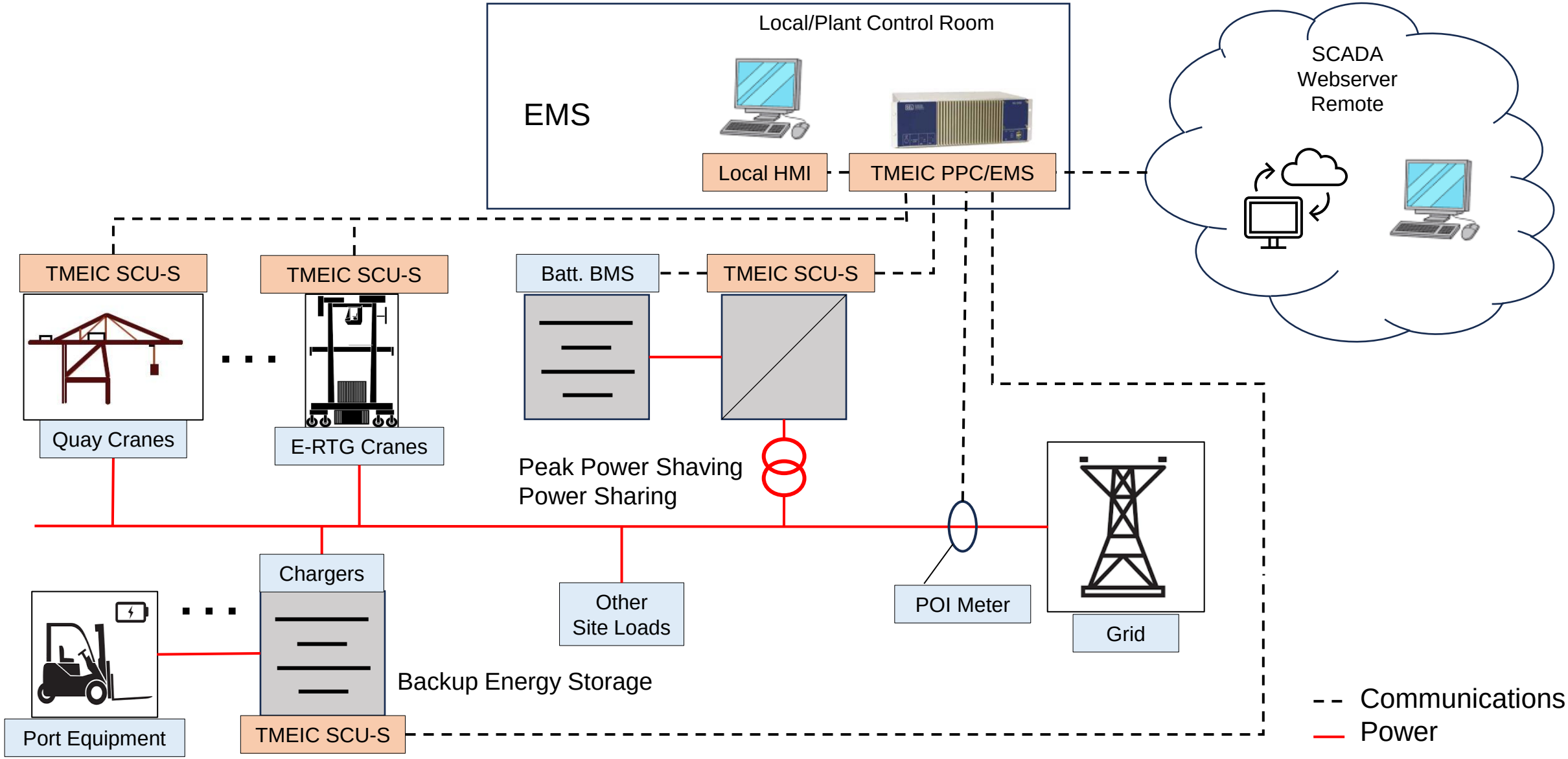


IEC/IEEE 80005-1 Edition 2.0 2019-03 INTERNATIONAL STANDARD
Utility connections in port –Part 1: High voltage shore connection (HVSC) systems – General requirements

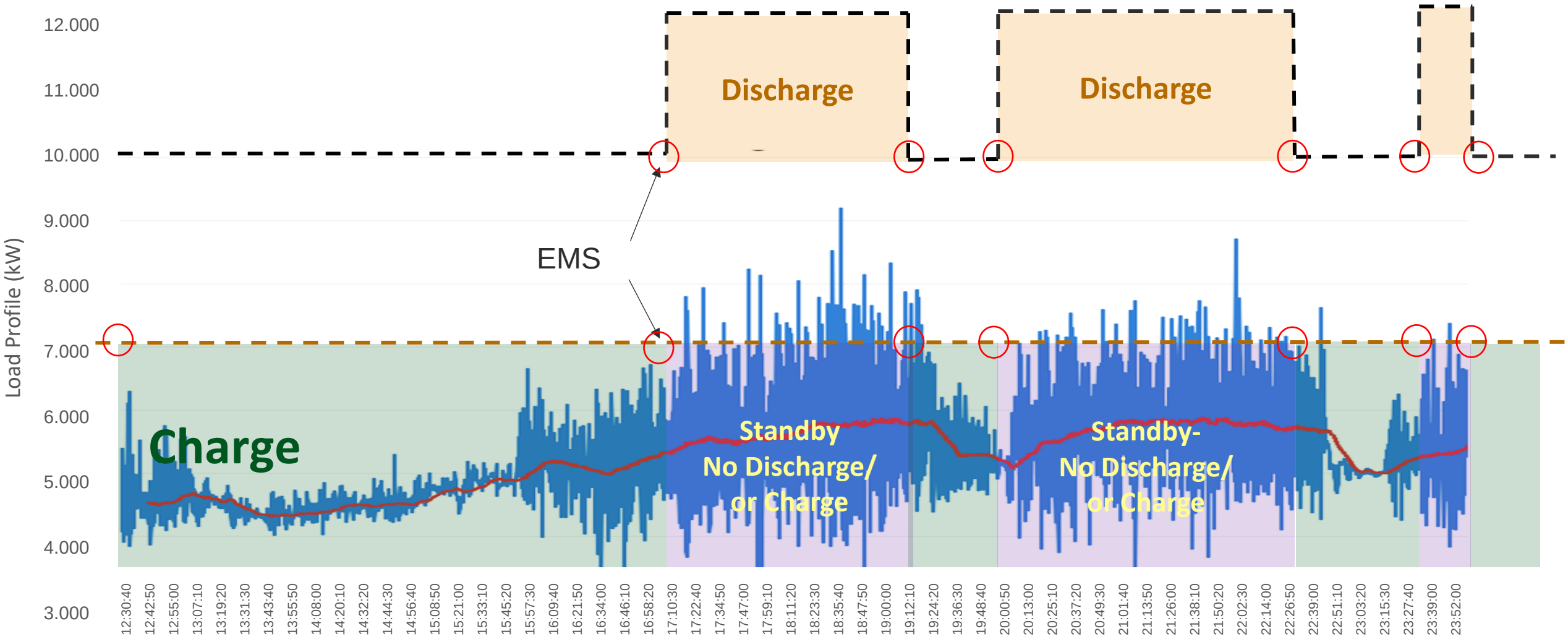
EMS + Backup Energy Storage

Efficient Backup EMS and Energy Storage Solutions for Container Port Terminals

EMS + Backup Energy Storage



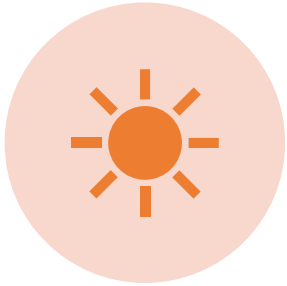
Solution: EMS + Backup Energy Storage



Conclusions: Decarbonization's Solutions

Proposed Solution: Use Ultracapacitors or Battery Energy Storage Systems (**BESS**) for:

Backup Energy Storage: Balance the load on the grid, reduce energy costs, and support decarbonization goals.



Peak Power Shaving: Store energy during off-peak times and use it during peak demand.

EMS or Energy Management System: Optimize energy usage and reduce operational costs. Enhance Operational Reliability.

Thank you