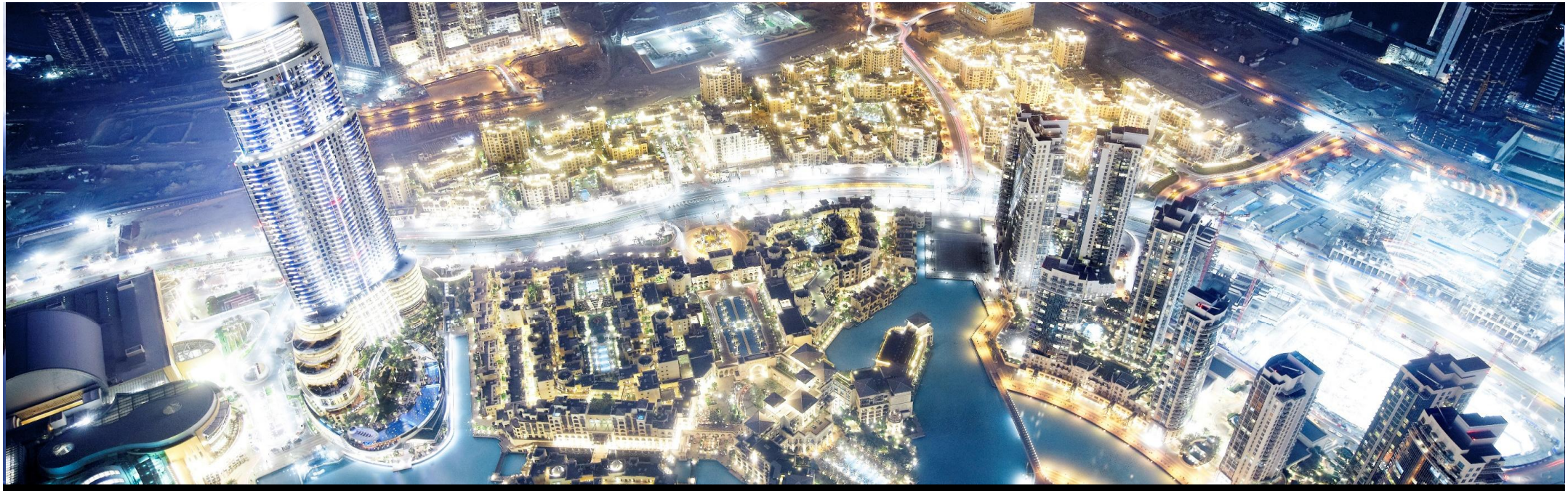


ABB Medium Voltage Days MEA 2016

UniPack-G

Benefits of glass fiber reinforced polyester (GRP) enclosure in compact secondary substations (CSS)

Technical session 9

Benefits of glass fiber reinforced polyester enclosure in compact secondary substations

Speaker:	Andrea Meroni
Speaker title:	Compact Secondary SubStation (CSS) - Global Product Marketing Manager
Company:	ABB
Location:	Dalmine, IT

Overview

- What is a CSS and GRP?
- UniPack-G introduction
- Main components
- UniPack-G benefits
- Summary/key takeaways
- Question and answer
- Product demonstration

What is a Compact Secondary Substation (CSS)?

Description

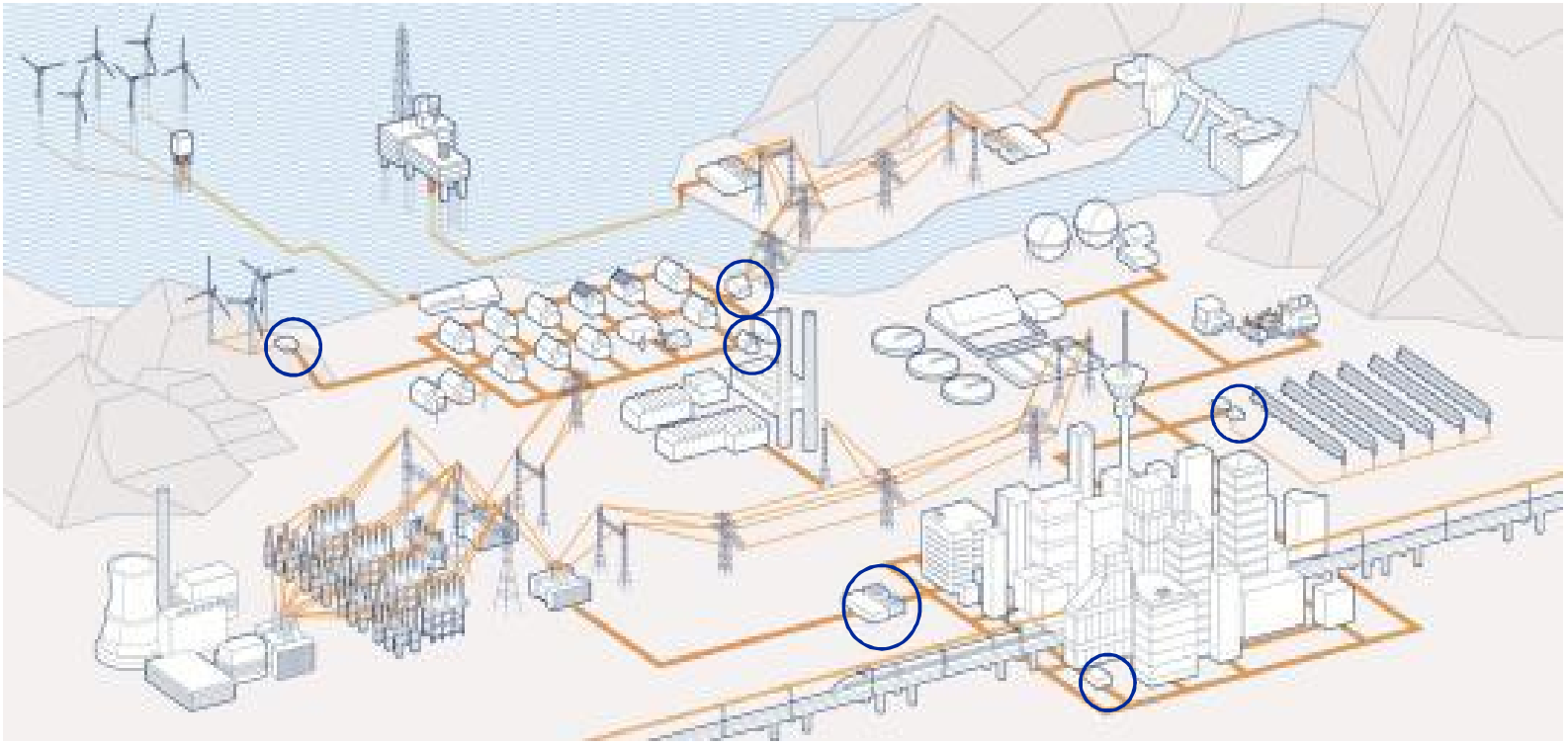
CSS is a type tested enclosure containing:

- Medium voltage switchgear
- Distribution transformers
- Low voltage switchboard
- Natural ventilation

Features:

- Energy transformation in distribution networks
- Installed in public locations
- Steel and concrete were the most common enclosure materials

Where are the CSS applications?



- Installed in public areas
- High reliability
- Installation usually outdoors, can be in harsh environment

What is Glass fiber Reinforced Polyester (GRP)?

Glass fiber reinforced polyester (GRP) is:

- Composite material
- Made of a polyester with high content of glass inside
- Lightweight
- Easily shapeable
- Extremely strong

Common industries, applications:

- Wind turbines
- Marine
- Cars
- Enclosure for electrical equipment

UniPack-G
ABB latest CSS product

Description

- Use GRP as enclosure material
- Patented double layer design
- Combines benefits of steel and concrete into one solution

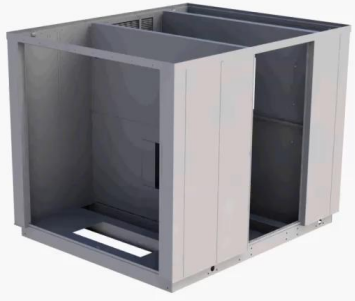
- Main Features:
  - Fully type tested design, including Internal arc fault
  - Lightweight
  - Corrosion resistance
  - Thermal insulated enclosure
  - Smart grid compatibility

UniPack-G
Components specifications

ABB components

- Gas or air insulated MV switchgear up to 40.5 kV
- Dry or oil transformers up to 3500 kVA
- Various number and ratings of outgoing feeders depending

UniPack-G video:



UniPack-G
Robust

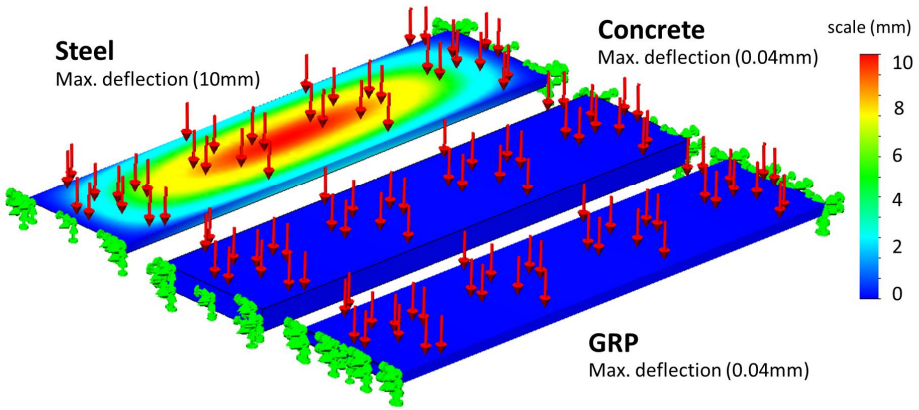
Description

Robust, double layer design

- Strength of concrete
- Tolerates impacts

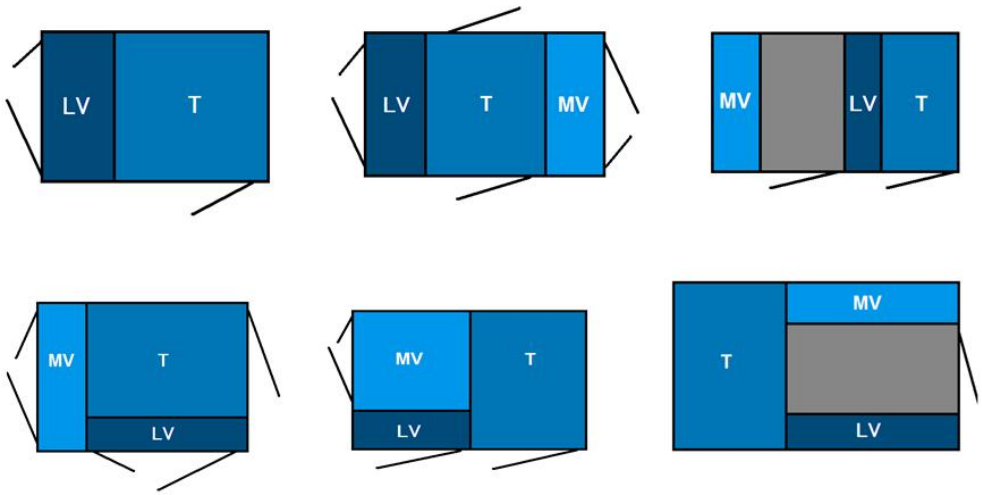
Benefit

- No cracking and deformation
- High level of strength



UniPack-G
Several layouts

Several layouts already type tested



Benefit: Footprint and layout flexibility to match customer requirements

UniPack-G
Safe

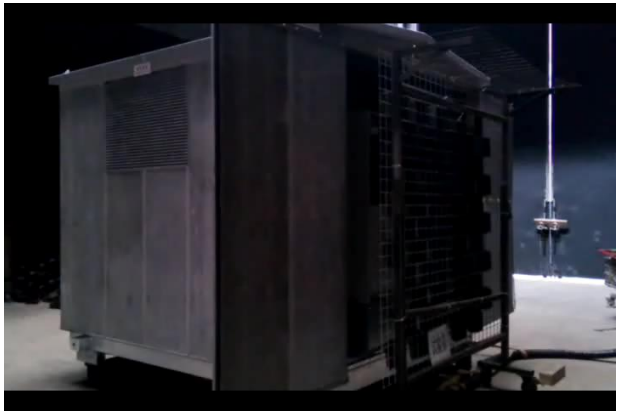
Safety

- AlreadyInternal tested according to IEC 62271-202 Ed.: 2.0
  - Arc Classification (IAC-AB) test
  - IP protection
  - Enclosure Thermal Class
- Fire retardant enclosure

Benefit

- Ensures safety for the public and operating personnel
- Safe for components installed inside

UniPack-G
Safe for operator and public



Safety

- Internal Arc Classified per IEC 62271-202 Ed. 2.0
  - Operator - A
  - Public – B
  - Unipack-G is rated AB, 20 kA for 1 sec

UniPack-G
Fire retardant

Description

Safety

- Fire test done according to ISO 834-1
  - Integrity = E60
  - No collapse, visible cracks or sustained flaming on the external surface
  - External surface exceeds 140ºC

UniPack-G
Ideal for harsh environment

Description

Corrosion resistance

- UniPack-G can be installed in remote and environmentally harsh locations
- Salt, humidity or other harsh environmental conditions do not influence enclosure materiel external finish

Benefit

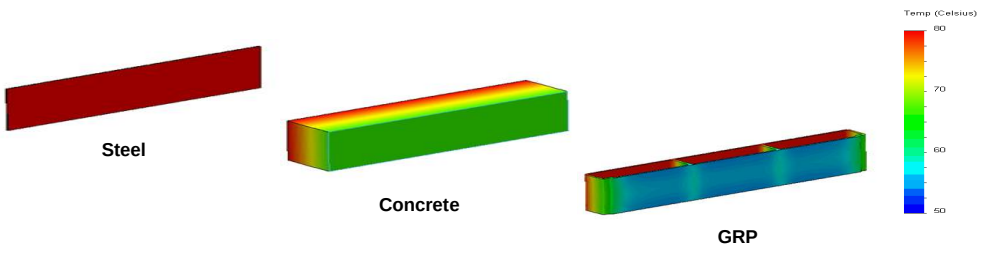
- Longer lifetime than steel
- Less maintenance (no repainting)

UniPack-G
High level of insulation

Description

Double layer design

- Allows thermal insulation
- Hot climate example



Benefit: Ambient conditions do not impact internal equipment

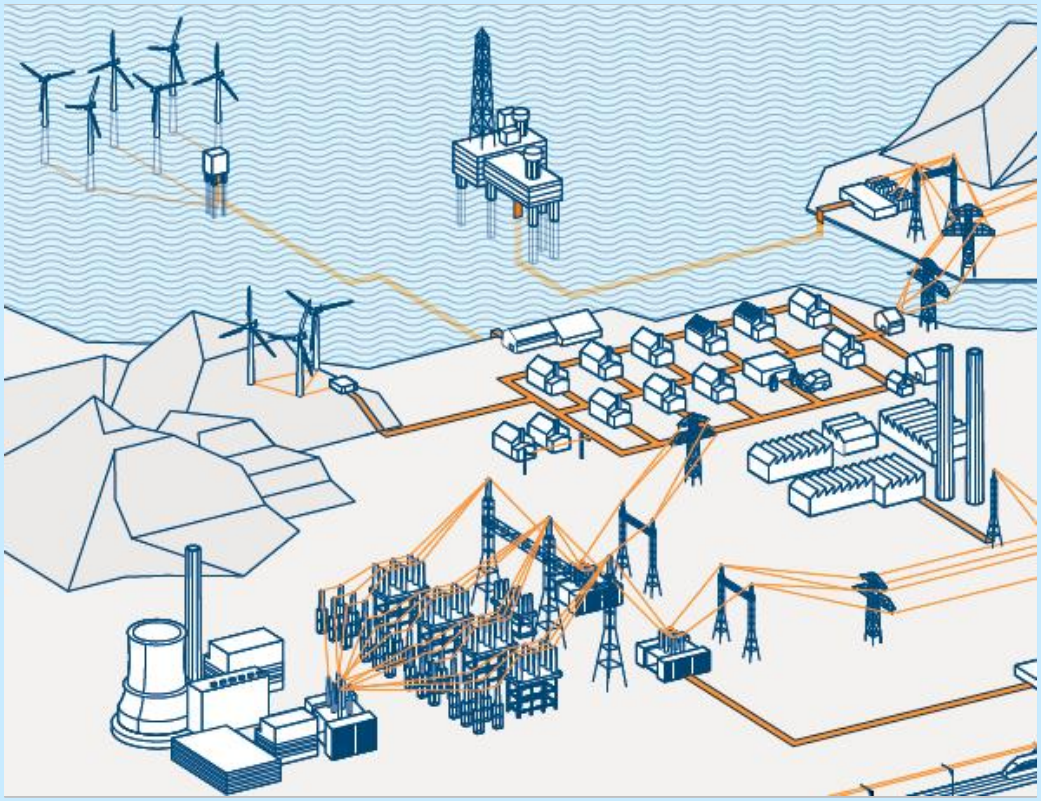
UniPack-G
Smart grid compatible

Description

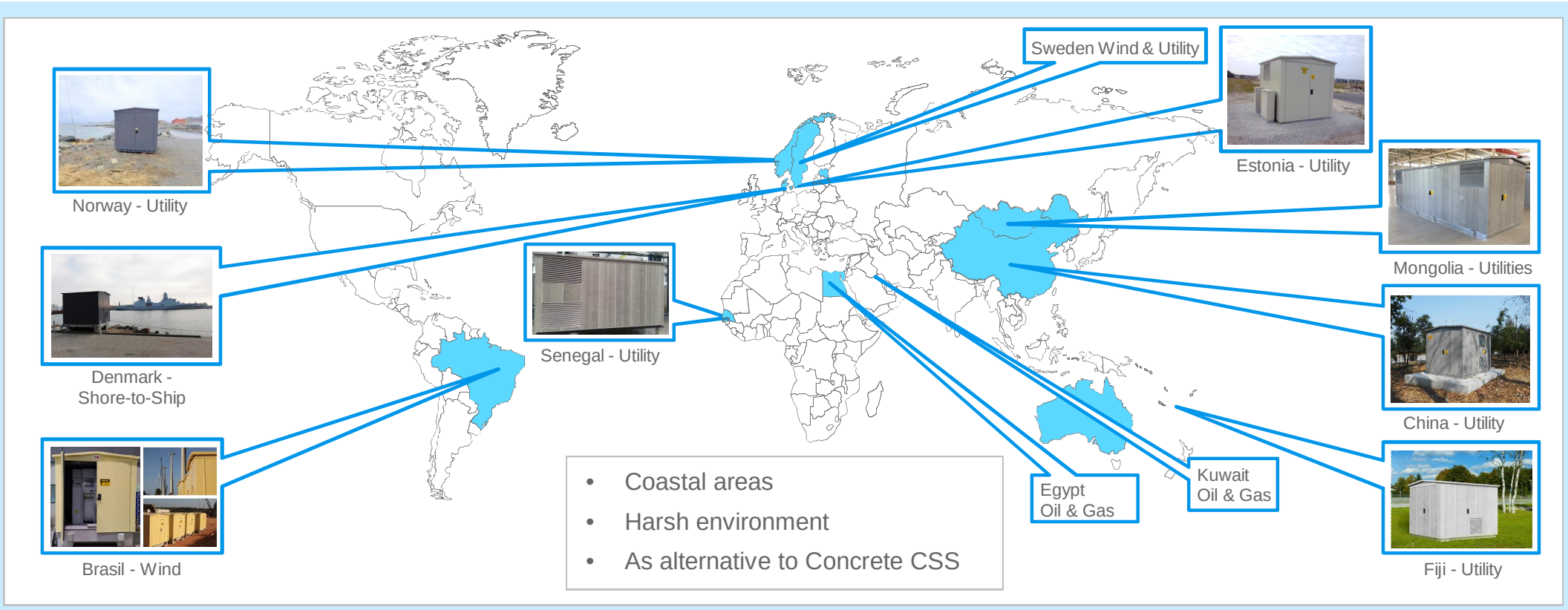
GRP enclosure does not dampen radio waves

Benefit

- Communication antennas can be installed internally
- Protects antennas from damage and vandalism



Global reference map
UniPack-G



Summary, takeaways
UniPack-G, features & values

- Specifically designed for CSS applications
- Double layer design (ABB patented)
- High safety for personnel and public
- Safe working condition for installed equipment
- Long life cycle & minimal maintenance cost
- Easy and fast installation, commissioning and relocation

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