Cable Management for Shore Power
What You Get is What You See

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Electric & Hybrid Marine Virtual Conference
13-15 September 2021

/// What‘s the Challenge? Zero emission latest in 2050 According to COP21 in Paris

NEWS | 09 August 2021

IPCC climate report: Earth is warmer than it’s been in 125,000 years

Landmark assessment says that greenhouse gases are unequivocally driving extreme weather – but that nations can still prevent the worst impacts.

UNITED NATIONS NATIONS UNIES

POSTAL ADDRESS—ADRESSE POSTALE: UNITED NATIONS, N.Y. 10017
CABLE ADDRESS—ADRESSE TELEGRAPHIQUE: UNATIONS NEWYORK

Reference: C.N.735.2016.TREATIES-XXVII.7.d (Depositary Notification)

PARIS AGREEMENT
PARIS, 12 DECEMBER 2015

ENTRY INTO FORCE

The Secretary-General of the United Nations, acting in his capacity as depositary, communicates the following:

On 5 October 2016, the conditions for the entry into force of the above-mentioned Agreement were met. Accordingly, the Agreement shall enter into force on 4 November 2016, in accordance with its article 21, paragraph 1, which reads as follows:

"This Agreement shall enter into force on the thirtieth day after the date on which at least 55 Parties to the Convention accounting in total for at least an estimated 55 per cent of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval or accession."

5 October 2016

APAC SEPTEMBER 16, 2020 / 11:21 PM / UPDATED 4 DAYS AGO

EU parliament votes to make ships pay for their pollution

By Kate Abnett 3 MIN READ

BRUSSELS (Reuters) - The European Parliament on Tuesday voted in favour of including greenhouse gas emissions from the maritime sector in the European Union’s carbon market from 2022, throwing its weight behind EU plans to make ships pay for their pollution.

FILE PHOTO: Shipping containers are being loaded onto Xin Da Yang Zhou ship from Shanghai, China at Pier J at the Port of Long Beach in Long Beach, California, U.S., April 4, 2018. REUTERS/Bob Riha Jr/File Photo

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/// What to Do for Going Green?

Emission
- Electronic Engine Control
- Scrubber (SOx and PM)
- SCR Catalysts (Nox)

Fuel
- Electric
- Amonium
- Biofuel
- Fuel cell
- Hydrogen

Engine Technology
- Peak Shaving
- Fuel Cell
- Hybrid

Shore Power
- **Shore Power or Cold Ironing**
- **Ship-side installations**
- **Land-side installations**

Design
- Propeller
- Hull
- Drives
- Rudder
-

Logistic
- Industry 4.0
- Digitalisation
- Intermodal integration
- Integration into port operations

Operations
- Schedule planning
- Lower speed while driving
- Weather and current routing

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/// Reason for Going Green with Shore Power?

I must

- Defined by law/regulations (f.e. California, Norway, IMO, EU)

I want

- It is cheaper (price kw/h, taxes, port fees)
- Corporate target: i.e. going on zero emissions until 2040
- Practical advantage (i.e. 24h work)

I should

- Pressure from various stakholders (local/national politics, NGO‘s local residents)
- I get quite some money for funding

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/// What is Shore Power - Definition

Shore power or **shore supply** is the provision of shoreside electrical power to a ship at berth while its main and auxiliary engines are shut down. Shore power and its handling is defined in IEC/IEEE 80005

IEC/IEEE 80005-1 for high voltage	IEC/IEEE 80005-3 for low voltage (draft)
	

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/// All Men are Created Equal – All Ports are Created Different: No Average, no Norm

Even within one port berths will be different

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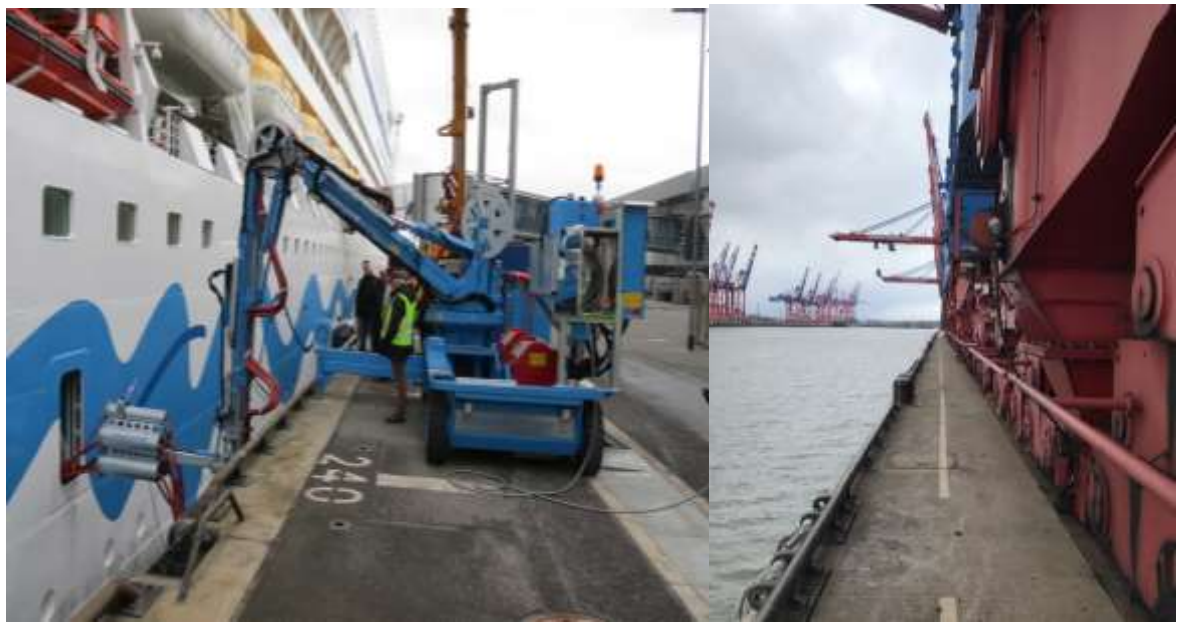
/// All Men are Created Equal – All Ports are Created Different : What's so different?

It is allways the details



- Where to store junction boxes
  - On top of quay
  - Inside the quay
  - No junction boxes

- Cables during operations
  - On top of quay
  - Inside the quay

- Distance to cover by CMS
  - Along the quay
  - Between vehicle and edge of quay
  - Between edge of quay and hatch of vessel (size of fenders)
  - Hatch above the quay, hatch below the quay
  - Tidal range
  - Maximum and minimum position of hatch above the water (size of vessels)
  - Distance between hatch and socket (inside the vessel)

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/// Cable Reel Container Systems

…for container vessels with fixed in the ground or mobile socket

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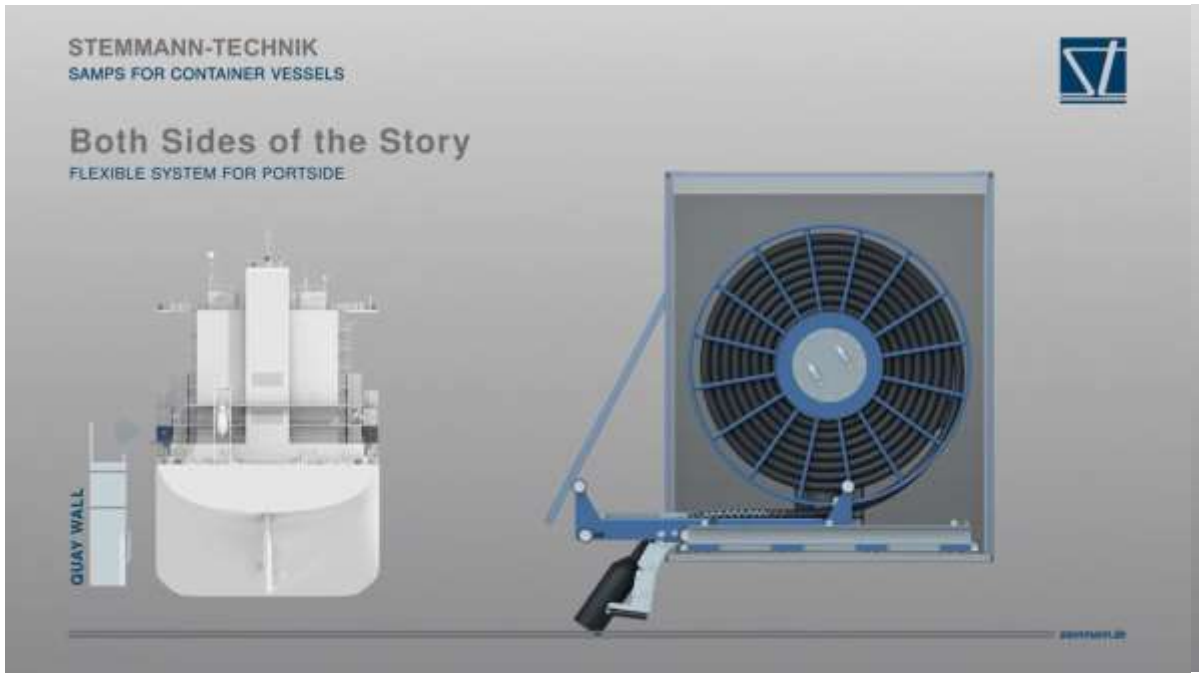
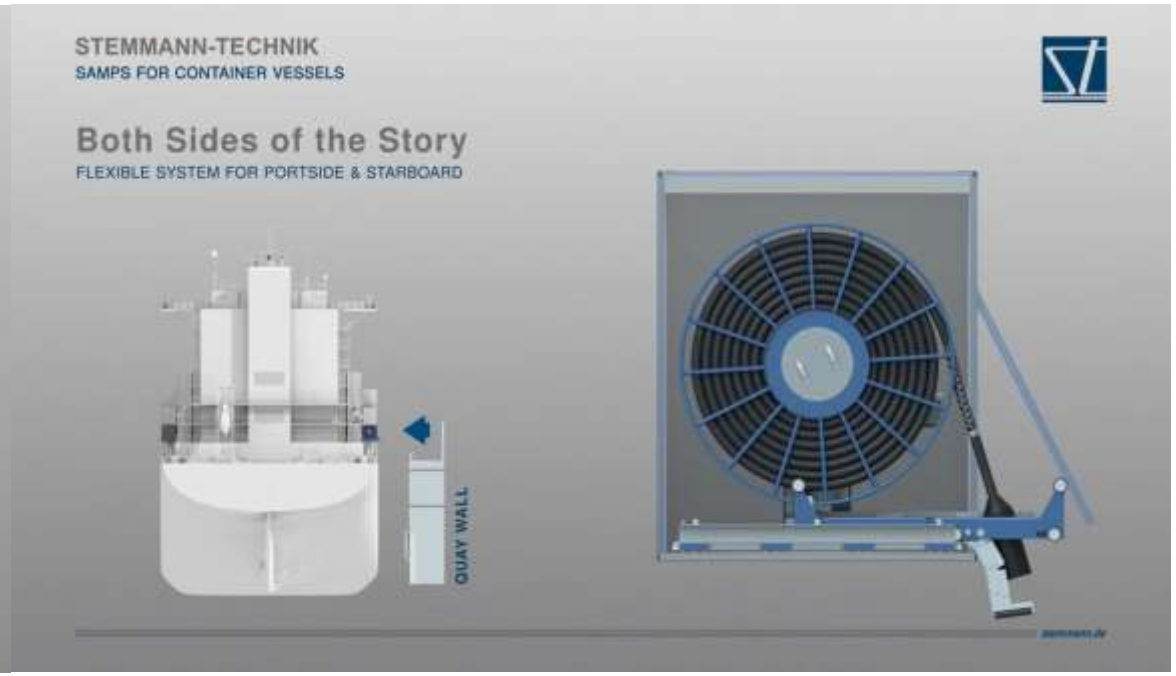
/// Cable Reel Container Systems

…roller track works in both directions: starboard and port side





Rated power: 2x 350 A @ 6,6 kV
Scope of supply:
Cable reel incl. cable, Plug incl. plug cover
Roller track (output in two directions)

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/// ShoreCONNECT – Cable Dispensers

…for various vessels

/// ShoreCONNECT Variants – Cable Dispenser Low Voltage

…for various vessels types – low voltage

Customer
Acciona, Spain
Stemmann-Technik scope
- 1 cable dispenser LV
- 5 cables

Technical Information
- 50 Hz
- Up to 1 MVA
- 1750 A / 400 V

Working range
- Working range vertical plus hatch: +7 to +1m
- Working range horizontal: 5m
- Rotation range: +/- 107°out of the resting position

Operations
- 1 person needed to handle dispenser
- No physical power needed to handle on shore

© Rodritol, La Gomera

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/// ShoreCONNECT Variants – Cable Dispenser Low Voltage

…for various vessels types – low voltage

Customer
Acciona, Spain
Stemmann-Technik scope
- 1 cable dispenser LV
- 5 cables

Technical Information
- 50 Hz
- Up to 1 MVA
- 1750 A / 400 V

Working range
- Working range vertical plus hatch: +7 to +3m
- Working range horizontal: 2m
- Rotation range: +/- 95°out of the resting position

Operations
- 1 person needed to handle dispenser
- No physical power needed to handle on shore

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/// Project Rotra Vente ShoreCONNECT Cuxhaven - RoRo

Customer
Niedersachsen Ports, Siemens Gamesa
Stemmann-Technik scope
- 1 cable dispenser LV
- 3 cables

Technical Information
- 50 Hz
- Up to 750 kVA
- 440 V

Working range
- Working range vertical plus hatch: +6,2m to -5m ???
- Working range horizontal: 4m

Operations
- 1 person needed to handle dispenser
- No physical power needed to handle on shore

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/// ShoreCONNECT Variants – Cable Dispenser High Voltage

…for various vessels types – high voltage

Customer
Port of Kiel, Germany
Stemmann-Technik scope
- 1 cable dispenser 11 kV

Technical Information
- 50/60 Hz
- Up to 5 MVA
- Max 11 kV

Working range
- Working range vertical plus hatch:
  +4 to -1m
- Working range horizontal: 2m
- Rotation range: +/- 95°out of the resting position

Operations
- 1 person needed to handle dispenser
- No physical power needed to handle on shore

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/// ShoreCONNECT – Cable Dispensers

…for cruise vessels vessels

/// ShoreCONNECT for Cruise Liners – reference „Hamburg-Altona“, Germany

…land side procedure can be handled by one person

Customer
- Port of Hamburg, Germany for Siemens

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- 1 vehicle
- Energy chain in the ground – no junction box

Technical Information
- 50/60 Hz
- 12 MVA
- Max 11 kV

Working range
- Working range vertical plus hatch: +3,8 to -6m
- Working range horizontal: 300m
- Rotation range: +/- 95°out of the resting position

Vehicle
- Fully electric, zero-emission, self-propelled
- 5.000mm x 2.500mm x 3.800mm (L x W x H)
- Speed: 3 km/h

Operations
- 1 person needed to handle vehicle when connected with junction box
- No physical power needed to handle vehicle

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/// ShoreCONNECT for Cruise Liners – reference „Kiel“, Germany

Customer
- Port of Kiel, Germany

Stemmann-Technik scope
- 1 vehicles / 1 cable dispenser 11 kV
- 6 junction boxes (Ostsee Quai with 2 different berths) daisy chain with life-end caps

Technical Information
- 50/60 Hz
- 16 MVA
- Max 11 kV with 4 x 350 Amp

Working range
- Working range vertical plus hatch: +4 to -1m
- Working range horizontal: 35m
- Rotation range: +/- 95°out of the resting position

Vehicle
- Battery-driven, zero-emission, self-propelled
- 10.000mm x 3.000mm x 4.200mm (L x W x H)
- Speed: 4 km/h, 1 km/h when reeling/unreeling

Operations
- 1 person needed to handle vehicle when connected with junction box
- No physical power needed to handle vehicle

IEC ISO IEEE

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/// ShoreCONNECT for Cruise Liners – reference „Tianjin“, China

Customer
- Tianjin Cruise Port, China - RXPE

Stemmann-Technik scope
- 1 vehicle
- 2 junction boxes

Technical Information
- 50/60 Hz
- Up to 20 MVA @ 11 kV
- 6,6 kV/11 kV with 4 x 350 Amp

Working range
- Working range vertical: 7,5 m
- Working range horizontal: +/- 35m (70m)
- Rotation range: +/- 95°out of the resting position

Vehicle
- Battery-driven (3 km range), zero-emission, self-propelled
- 10.000mm x 3.000mm x 4.200mm (L x W x H)
- Speed: 4 km/h, 1 km/h when reeling/unreeling

Operations
- 1 person needed to handle vehicle when connected with junction box
- Only 2 people to connect vehicle with junction box
- No physical power needed to handle vehicle

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/// ShoreCONNECT for Cruise Liners – reference „Rostock“, Germany

Customer
- Port of Rostock, Germany

Stemmann-Technik scope
- 2 vehicles
- 4 junction boxes

Technical Information
- 50/60 Hz
- 16 MVA @ 11 kV
- 6.6 kV/11 kV with 4 x 350 Amp

Working range
- Working range vertical plus hatch: +4 to -1m
- Working range horizontal: 35m
- Rotation range: +/- 95°out of the resting position

Vehicle
- Battery-driven, zero-emission, self-propelled
- 10.000mm x 3.000mm x 4.200mm (L x W x H)
- Speed: 4 km/h, 1 km/h when reeling/unreeling

Operations
- 1 person needed to handle vehicle when connected with junction box
- Only 2 people to connect vehicle with junction box with less than 20 kg/person
- No physical power needed to handle vehicle

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/// ShoreCONNECT for RoPax ferry – reference „Gdynia“, Poland, 2021

Custome
- Port of Gdynia, Poland

Stemmann-Technik scope
- 1 vehicle
- 1 double ended junction box and 2 single ended junction boxes

Technical Information
- 50/60 Hz
- 3,75 MVA @ 11 kV
- 11 kV with 200 Amp

Working range
- Working range vertical plus hatch: +12,5m to +13,5m
- Working range horizontal: +/- 50m (100m)
- Rotation range: +/- 110°out of the resting position

Vehicle
- Battery-driven, zero-emission, self-propelled
- 10.000mm x 3.000mm x 3.700mm (L x W x H)
- Speed: 4 km/h, 1 km/h when reeling/unreeling

Operations
- 1 person needed to handle vehicle when connected with junction box
- Only 2 people to connect vehicle with junction box with less than 20 kg/person
- No physical power needed to handle vehicle

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/// Conclusion

- World is facing ecological problems – it is **time to act**:
  not more than +1.5° celsius -> go down with CO_2 to zero asap
- **Governments** all around the globe **are acting** (money & law)
- **All men are created equal – each port is created different.**
  Even within one port things are different
- **Technical solutions are available** – more and more
- You **can not copy paste solutions** from one port to another
- But you shall **create solutions for each berth**

- It‘s not easy being green but it‘s worth it

Georg Franz Matzku

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