

**Maritimes Cluster Norddeutschland
2025 nachhaltig & innovativ in See stechen!**

Landstrom: Erfahrungen und Konsequenzen aus zehn Jahren

Georg Matzku

Director Shore Power

15. Januar 2025

- Facts & Figures Stemmann-Technik
- Going Green: Wieso, Weshalb, Warum?
- Denn sie wissen nicht was sie wollen?
 - Grundsätzliche Fragen (welche Schiffe, welche Liegeplätze, Timing, Ressourcen und wofür mache ich das überhaupt?)
 - Realistische Ziele setzen (Budget, Timing, Inhalte, verfügbare Arbeitskraft)
- Wer sagt denn sowas: Verlässliche Quellen
- Beispiele aus der Praxis
- Fazit

/// Facts & Figures Stemmman-Technik

Gründung:

1912 in Luxemburg
seit 1950 in Schüttorf · Niedersachsen · Germany

Rechtsform:

GmbH

Eigner:

Seit 2014 Teil der **Wabtec Corporation**

Wabtec (**W**estinghouse **Air Brake Technology**) Hersteller von Komponenten für Lokomotiven, Anhänger und Passagierfahrzeugen, Hersteller von Lokomotiven und aktiv in diversen anderen Industriesegumenten, z.B. im Bereich der Maritimen Wirtschaft

NYSE: WAB, S&P 500

ca. 28k Mitarbeiter, 10 Mrd. US\$

Mitarbeiter:

ca. 460 [Schüttorf]

ca. 150 [Wroclaw, Polen]

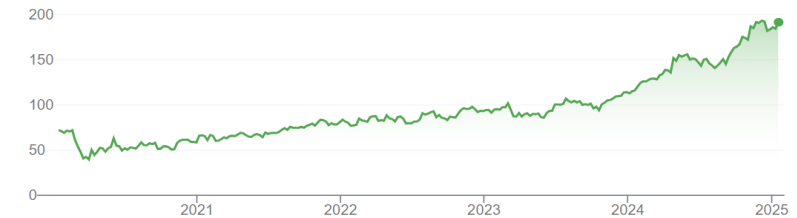
Marktbericht > Wabtec

191,35 EUR

+119,35 (165,76 %) ↑ in den letzten 5 Jahren

15. Jan., 08:16 MEZ · Haftungsausschluss

1 T. 5 T. 1 M. 6 M. YTD 1 J. 5 J. Max.



/// Facts & Figures Stemmann-Technik – Produktübersicht an Land

Spreader Cable-Reels

STS Cable-Reels

ShoreCONNECT

Inclination Tower FerryCHARGER

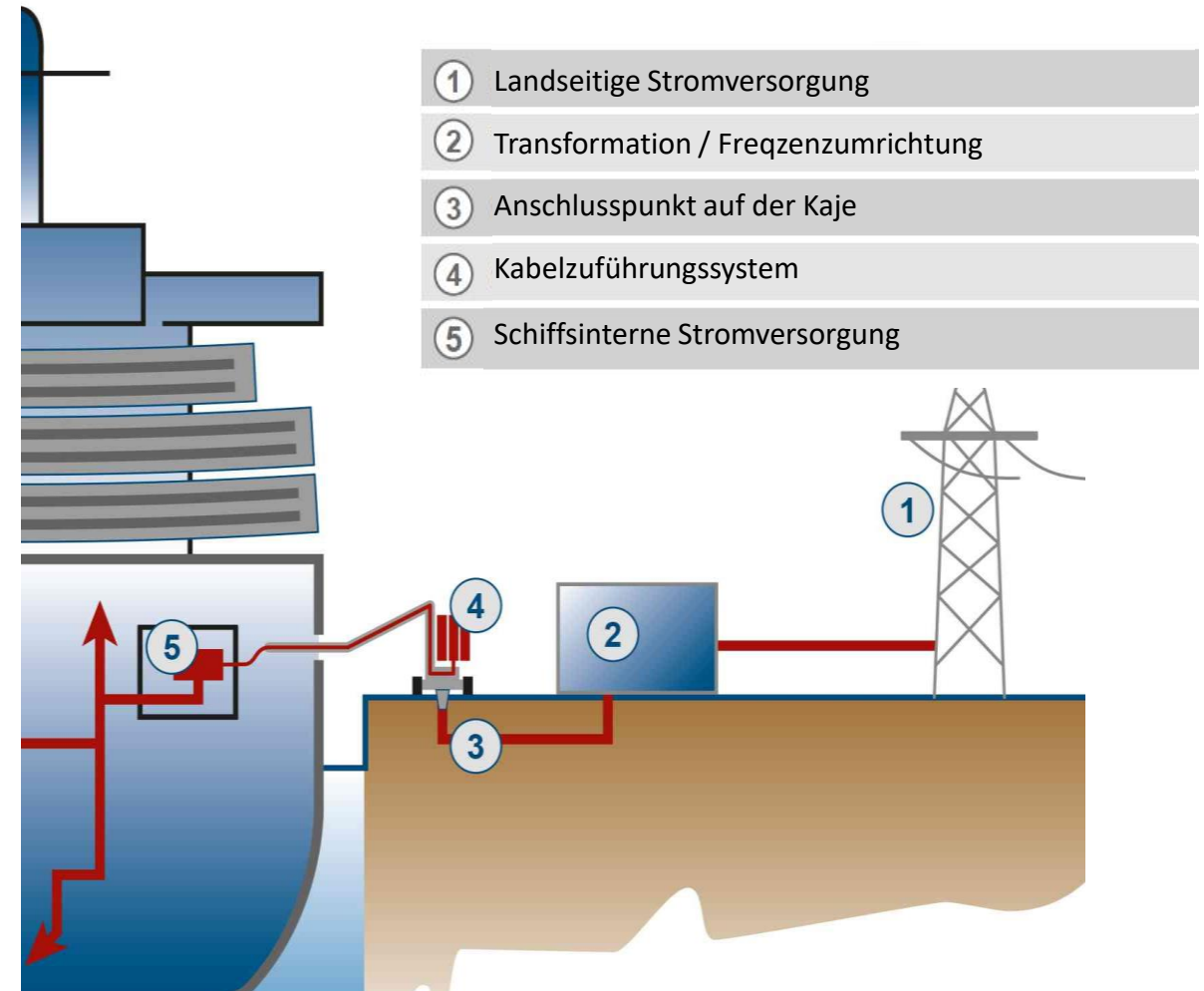
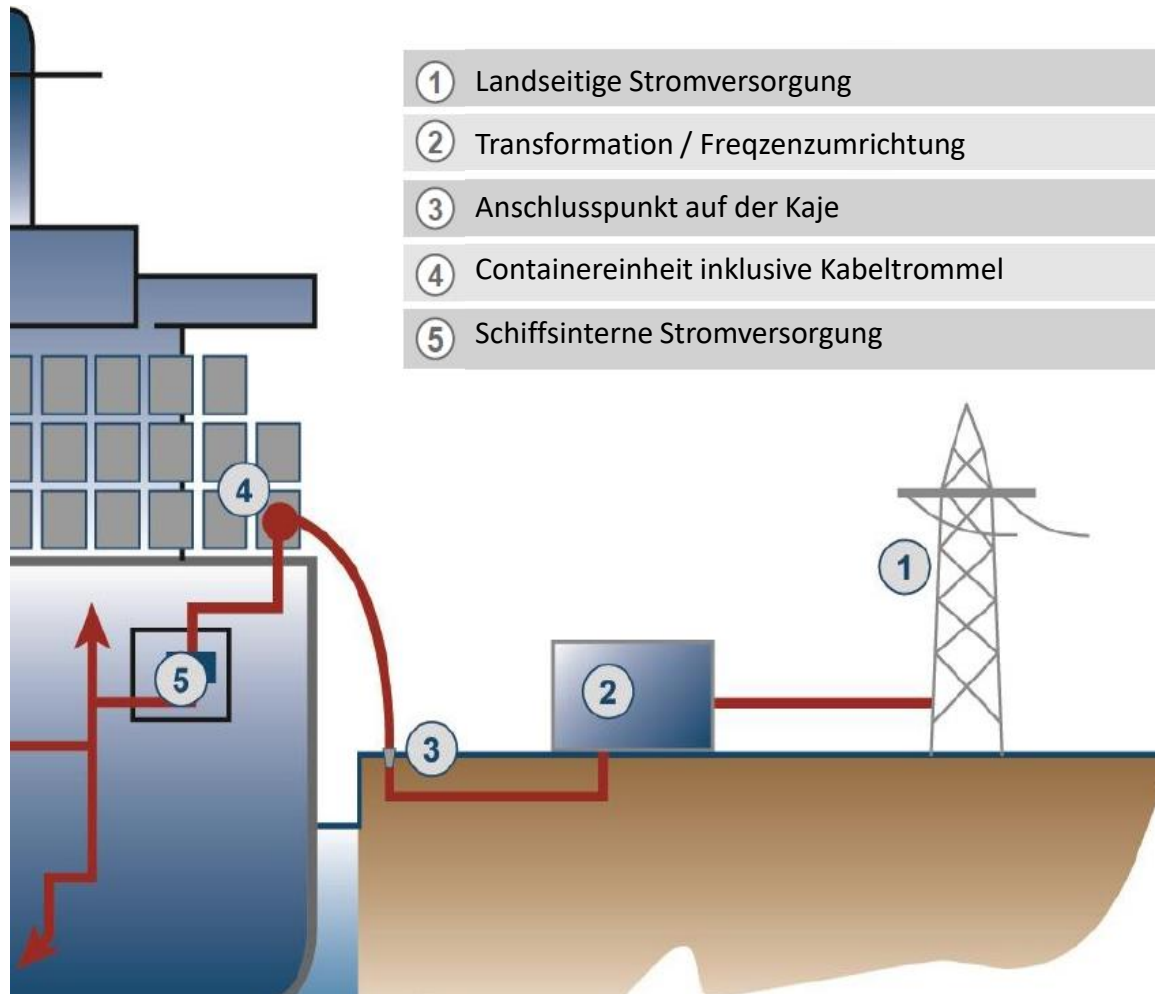
Tower Type FerryCHARGER

Bowtype FerryCHARGER

To offshore view >

/// Landstrom für jegliche Form von Schiffen

Als Landstrom bezeichnet man die zur Verfügungstellung von landseitiger Energie zwecks gleichzeitiger Abschaltung der schiffsseitigen Verbrennermotoren.



/// Das Haben Sie Jetzt Davon

...für unterschiedlichste Schiffstypen gemäß Norm IEC/IEEE 80005-1 HVSC or 80005-3 LVSC (draft)



Containerschiffe	Kreuzfahrtschiffe	RoRo/RoPax Fähren	Tanker and LNG Schiffe (manchmal auch Bulk)	Andere Schiffstypen (Offshore supply vessels, Ölbohrplattformen und Militär etc.)
up to 7,5 MVA @ 6,6kV	up to 20 MVA @ 11kV & 16 MVA @ 6,6 kV	up to 6,5 MVA @ 11kV & LV versions up to 1 MW @ 400V – 690V	10,8 MVA @ 6,6 KV	Different HV and LV applications
50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
<ul style="list-style-type: none"> Cable reeling system on ship side inside a container Movable or fixed socket in the port 	<ul style="list-style-type: none"> Movable CMS in the port Socket on ship side 	<ul style="list-style-type: none"> Fixed or movable CMS in the port Socket on ship side Alternative: Fully automatic connectin with FerryCharger up to 8MW 	<ul style="list-style-type: none"> Fixed or movable CMS in the port Socket on ship side Sometimes ship side cable reels are requested 	<ul style="list-style-type: none"> Fixed or movable CMS in the port Socket on ship side Sometimes ship side cable reels are requested

/// Going Green – Wieso, Weshalb, Warum?



Die globale Temperatur darf nicht mehr als +2° über dem vorindustriellen Niveau ansteigen



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



Es ist äußerst wahrscheinlich, dass der menschliche Einfluss zwischen 1951 und 2010 die Hauptursache für die globale Erwärmung war



WMO confirms 2024 as warmest year on record at about 1.55°C above pre-industrial level

● PRESS RELEASE

10 January 2025

The World Meteorological Organization (WMO) has confirmed that 2024 is the warmest year on record, based on six international datasets. The past ten years have all been in the Top Ten, in an extraordinary streak of record-breaking temperatures.



Fit for 55 ist der Plan der Europäischen Union, die Treibhausgasemissionen bis 2030 um 55% zu reduzieren

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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.

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 7 at the Port of Long Beach in Long Beach, California, U.S., April 4, 2018. REUTERS/Bob Riba Jr/File Photo

/// Going Green – Wieso, Weshalb, Warum?

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

Emission

Fuel

- Elektrik
- Amonium
- Biofuel
- Brennstoffzelle
- Wasserstoff

Engine Technology

- Peak Shaving
- Brennstoffzelle
- Hybrid

**It's not easy
being green**

- Landstrom
- Schiffsseitige Installation
- Landseitige Installation

Shore Power

Design

- Propeller
- Hülle
- Antrieb
- Ruder

Logistic

- Industry 4.0
- Digitalisierung
- Intermodale Integration
- Integration in Port Operationalisierung

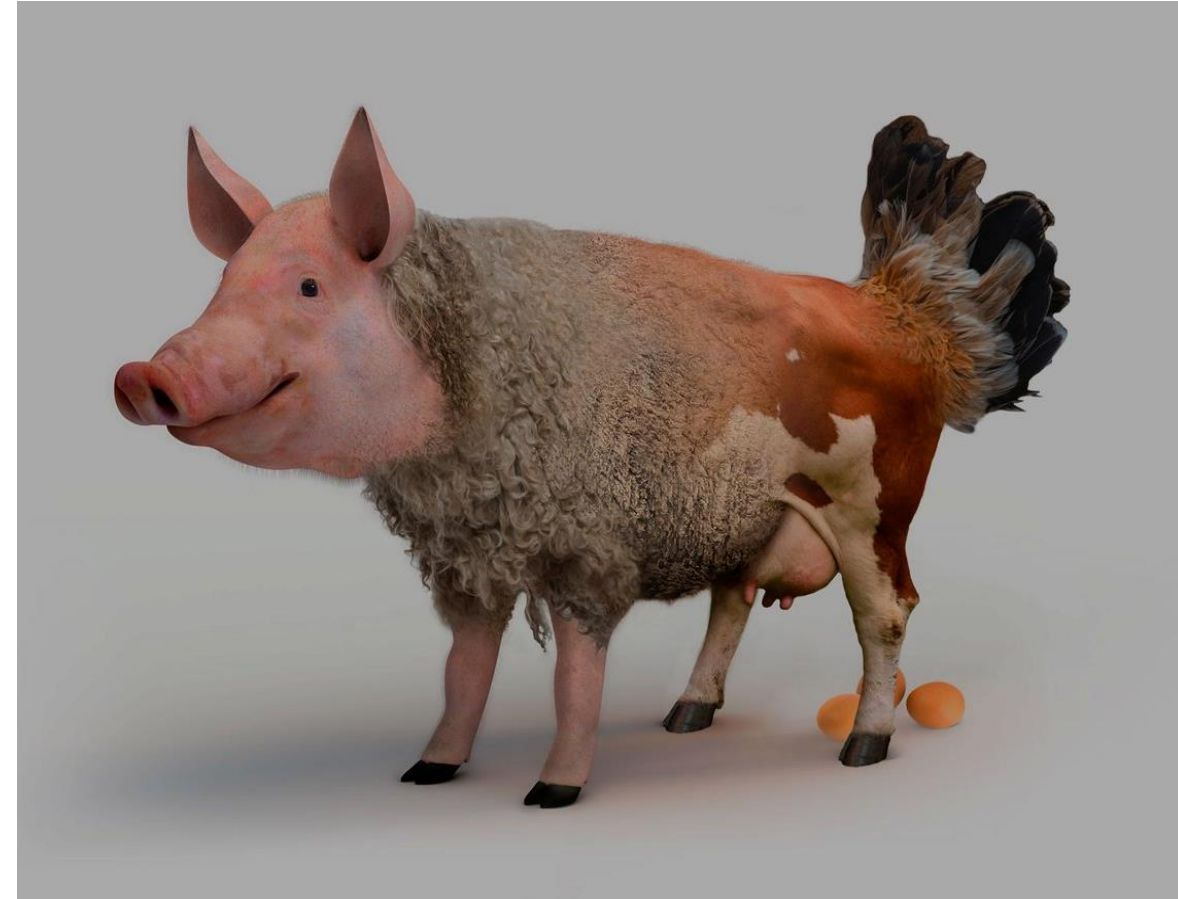
Operations

- Terminplanung
- Reduktion der Geschwindigkeit
- Wetter und aktuelle Routenplanung



/// Denn Sie Wissen Nicht Was Sie Wollen

1. Grundsätzliche Fragen
 - Verfügbarkeit von Ressourcen
 - Energie
 - Finanzierung
 - Menpower (intern / extern)
 - Warum soll ich Landstrom nutzen?
 - Mit welcher Art Schiff sollte ich anfangen?
 - Welche Lösung passt zu meinem Hafen?
 - Lieferumfang:
Schlüssel fertig vs. separate Lose
2. Realistische Ziele setzen in Bezug auf
 - Timing (Finanzierung, Öffentlichkeit, Politik, CEO, Consultant, Lieferanten, ...)
 - Budget (Krieg, Inflation...)
 - One size fits not all
 - Anzahl der Bieter
3. Zuverlässigkeit und Lebenszeit der Anwendung



/// Warum ich Landstrom nutzen sollte

Weil ich es sollte

- Druck verschiedener Stakeholder (lokale/nationale Politik, NGO's, Anwohner)
- Ich bekomme aktuell eine Menge Subventionen
- Stickstoffoxide (NO_x) Sauerer Regen, Lunge
- Feinstaub (PM_{10}) <10 Mikrometer (1:100.000m: lungs & blood)
- Kohlendioxid (CO_2) Treibhausgas – Globale Erwärmung
- Geräuschlevel, Vibrationen – negative impact on people and animals



Weil ich es möchte

- Business Case
 - Weil es billiger ist (Preis kw/h, Steuern, Hafengebühren)
 - Kunde fragen danach
- Unternehmensziele: z.B. zero emission bis 2040 -> Nachhaltigkeitsreport
- Praktische Vorteile (z.B. 24h arbeiten können)

Weil ich es muss

- Definiert mittels Gesetz (z.B. Kalifornien, Norwegen, EU)
- Definiert mittels Regulierung/Norm (z.B. IEC/IEEE 80005-1 /-3)



/// Wer sagt denn sowas: Verlässliche Quellen

You can't always get what you want – aber vielleicht zumindest nahe dran

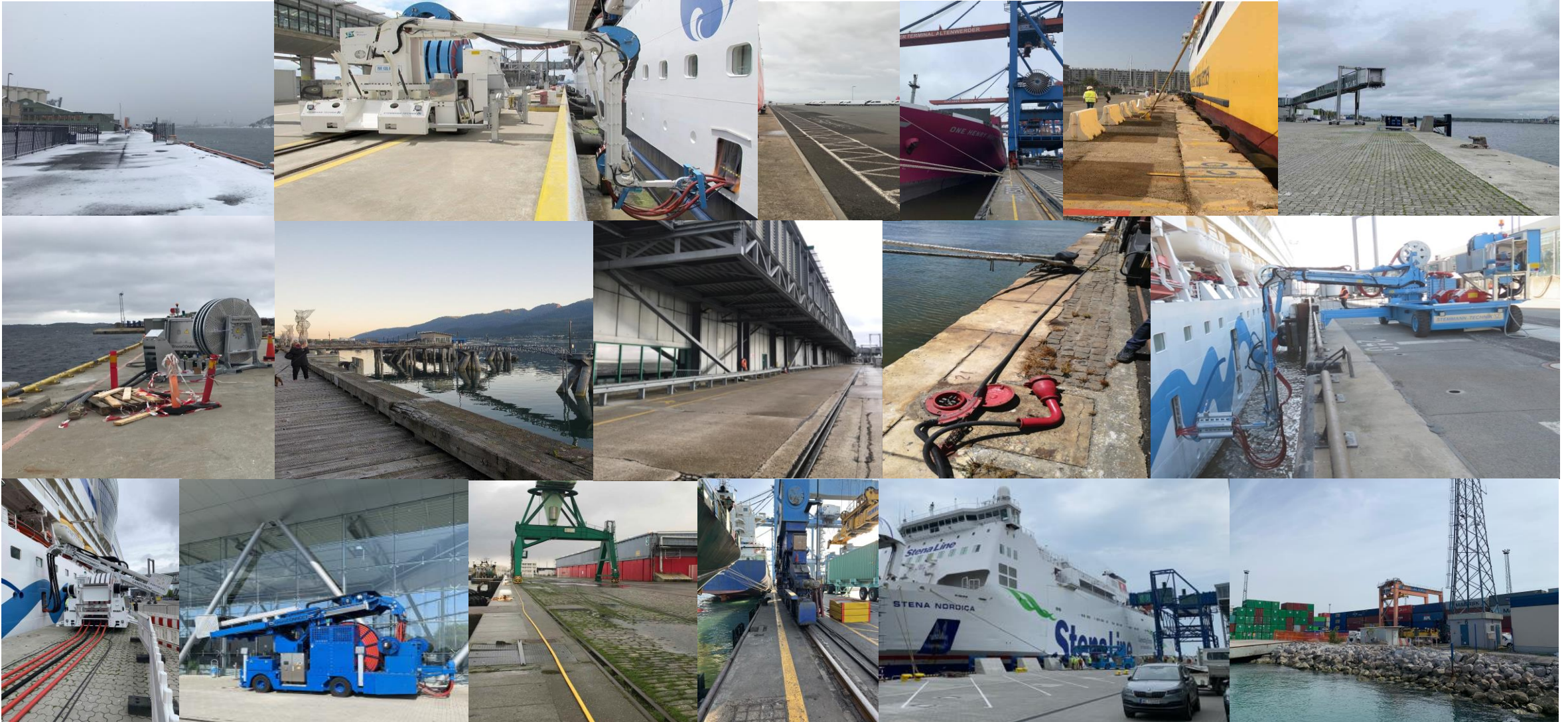
- Häfen mit aktuellen Referenzen
- Consultants mit aktuellen Referenzen
- Experten mit aktuellen Referenzen
- Ausstellungen (z.B. SMM, E&HM, NorShipping, TOC)
- Konferenzen (z.B. Greenport)
- Vereinigungen (z.B. EOPSA)
- Normenausschüsse (IEC Ausschuss Deutschland: [NA 132-03-16 AA Elektrischer Landanschluss](#))
- Verlässliche Empfehlungen von relevanten Teilnehmern der Landstrom-Industrie

Was ist mit:

- Social Media, Google, Webseiten, Marktforschung/Studien?

/// Alle Menschen Sind Gleich – alle Häfen sind Unterschiedlich: Kein Durchschnitt, keine Norm

Selbst innerhalb eines Hafens können Begebenheiten unterschiedlich sein und somit auch Lösungen



/// ShoreCONNECT – Fahrzeuge für Kreuzfahrtschiffe und Fähren

...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

Stemmann-Technik scope

- 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



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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 Cruise Liners – reference Hamburg „Steinwerder“, Germany

...land side procedure can be handled by one person

Customer:

- Port of Hamburg, Germany – PowerCon

Stemmann-Technik scope:

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

Technical Information:

- 50/60 Hz
- 16 MVA
- Max 11 kV

Working range

- Working range vertical plus hatch: +5,6 to -7,6m
- Working range horizontal: 275m
- Rotation range: +/- 105° out of the resting position

Vehicle

- Fully electric, zero-emission, self-propelled
- 12.200mm x 3.174mm x 4.314mm (L x W x H)
- Speed: 3 km/h

Operations

- Only 1 person needed to handle vehicle
- No physical power needed to handle vehicle



Confidential & Proprietary

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/// ShoreCONNECT for Cruise Liners – reference „Southampton“, UK – under construction

Customer:

- Port of Southampton, United Kingdom – PowerCon

Stemmann-Technik scope:

- 1 vehicle
- 10 junction boxes, daisy-chain version

Technical Information:

- 50/60 Hz
- 16 MVA
- Max 11 kV

Working range

- Working range vertical plus hatch: +4 to -3,5m
- Working range horizontal: +/- 50m
- Rotation range: +/- 95° out of the resting position

Vehicle

- Fully electric, zero-emission, self-propelled
- 10.000mm x 3.000mm x 4.200mm (L x W x H)
- Speed: 4 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 RoPax ferry – reference „Gdynia“, Poland, 2021

Customer

- 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



/// ShoreCONNECT – Krane und Trommeln

...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

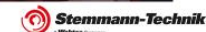


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/// ShoreCONNECT Variants – Cable Dispenser Low Voltage

...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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/// ShoreCONNECT Variants – Low Voltage Cable Reel, Double Spiral LV Reels

...for various vessels types

- Customer**
- Diverse
- Stemmann-Technik scope**
- Double spiral HV reel on mounting plate
 - Plugs, plug covers and cable
 - Electrical control
 - Telescopic roller guide
- Technical Information**
- 60 Hz
 - 7.5MVA
 - 2x350 A / 6.6kV
- Working range**
- Up to 2x43m inside container
 - Cable output speed: 10m/min
- Operations**
- 40 ft. HC container in bottom storage
 - 2 person needed to handle application



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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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/// 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



16 /// Stemmann-Technik GmbH

/// ShoreCONNECT Variants – Low Voltage Cable Reel, Double Spiral LV Reels

...for various vessels types

- Customer**
Technisk Bureau for NorSea Group in Hammerfest, Kristiansund, Tananger, Stavanger – Norway
- Stemmann-Technik scope**
- Double spiral LV reel with 2 cables
 - Mobile and stationary versions
- Technical Information**
- 60 Hz
 - 750kVA
 - 350 A / 690 V
- Working range**
- 14 x 30m and 2 x 40m versions
- Operations**
- 2 person needed to handle application



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/// Landstromfahrzeuge – Referenzen für Kreuzfahrer und Fähren

Similar vehicles in operations or to come:

- **Hamburg** Altona Cruise Terminal, Germany (seit 2015)
- **Shanghai** Baoshan Cruise Terminal, China (seit 2016),
- **Tianjin** Cruise Port, China (seit 2019)
- **Rostock-Warnemünde**, Germany (zwei Fahrzeuge) – 2020
- **Kiel** Ostseekai Cruise Terminal, Germany – 2020
- **Gdynia** RoPax Terminal, Poland – 2021
- **Southampton** Mayflower Terminal & Terminal 5, United Kingdom – 2022
- **Hamburg** Steinwerder CC3 Terminal, Germany – November 2023
- **Kiel Ostuferhafen, Germany** – November 2023
- **Swinoujście RoRo, Poland** – Juli 2024
- **Amsterdam**, Cruise Center, the Netherlands – Dezember 2024, Inbetriebnahme Q1 2025
- **Bremen** *Columbuskaje, Germany – 2025 – noch zu übergeben*
- **Hamburg**, *Hafencity Cruise Center (zwei Fahrzeuge), Germany – 2025 – noch zu übergeben*
- **Kiel**, *Ostseekai Cruise Terminal, Germany – 2025 – noch zu übergeben*

/// ShoreCONNECT – Containerhafen – Verfahrbare Systeme in Barcelona

...landseitig im Containerhafen (200m & 100m)



Technische Kernpunkte:

- Maximal horizontale Verfahrbarkeit:
100m Mitteneinspeisung (Summe: 200 m)
- **System hat eigenen Antrieb und Führung**
- Fernbedienung
- System kann über Poller und Lücken von Rettungsleitern fahren
- **Entfernbar** mittels Stapler oder Reach Stacker
- Kann an **verschiedenen Orten im Hafen eingesetzt** werden



- Wir stehen vor großen ökologischen Veränderungen – Zeit zu handeln: **max +2° Celsius**
- **Diverse Regierungen und Vereinigungen agieren** (Geld & Gesetze)
- **Alle Menschen sind gleich – alle Häfen sind anders**
- Setze **realistische Ziele**
- **Am Ende dauert es doch irgendwie länger und es ist mehr Arbeit als gedacht**
- Passende Lösungen können nicht von einem zum anderen Hafen blind übernommen werden
- Wenn Sie es richtig machen wollen, dann arbeiten Sie mit Profis

It's not easy being green but it's worth it





Stemmann-Technik

A **Wabtec** Company

Georg Franz Matzku

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