



E-RTG™

RTG Electrification

CONDUCTIX
wampfler

Ⓞ DELACHAUX GROUP



“What if an investment of approximately 150.000 € per RTG

would reduce diesel fuel costs nearly 125.000 € per year?”





We add the “E” to your RTG

Electrification of Rubber-Tired Gantries

Modern rubber-tired gantry cranes (RTGs) are equipped with diesel generators that transform diesel fuel into electrical energy. This energy powers the electric motors that are necessary for the smooth movement and positioning of containers at the port.



Converting a conventional RTG into a fully electric RTG (E-RTG™) means shutting down the diesel generator and powering the RTG with electric power only.

The **E-RTG™** conversion is made possible with one of two different unique electric power systems developed by Conductix-Wampfler:

Motorized Cable Reel System or **Conductor Bar System.**

Conductix-Wampfler's core competency is in the development, production, consulting, and installation of tailor made, engineered solutions that provide energy supply and data transmission for our customers' moving machinery.

If you seek a turnkey solution to add the “E” to your **RTG**, look no further than Conductix-Wampfler - we have the answers!



RTG Electrification with the **Motorized Cable Reel System** or the **Conductor Bar System** - by Conductix-Wampfler

Motorized Cable Reel Systems

Speed and Performance for the E-RTG™

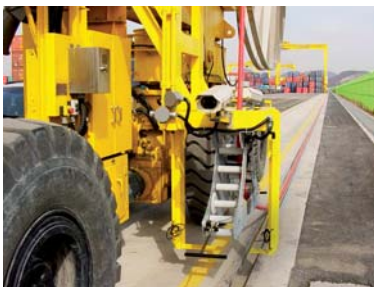
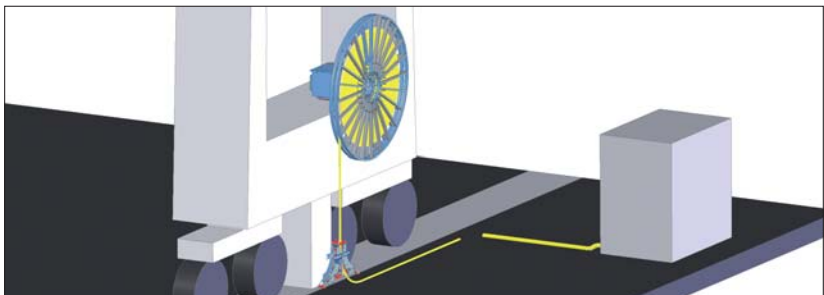
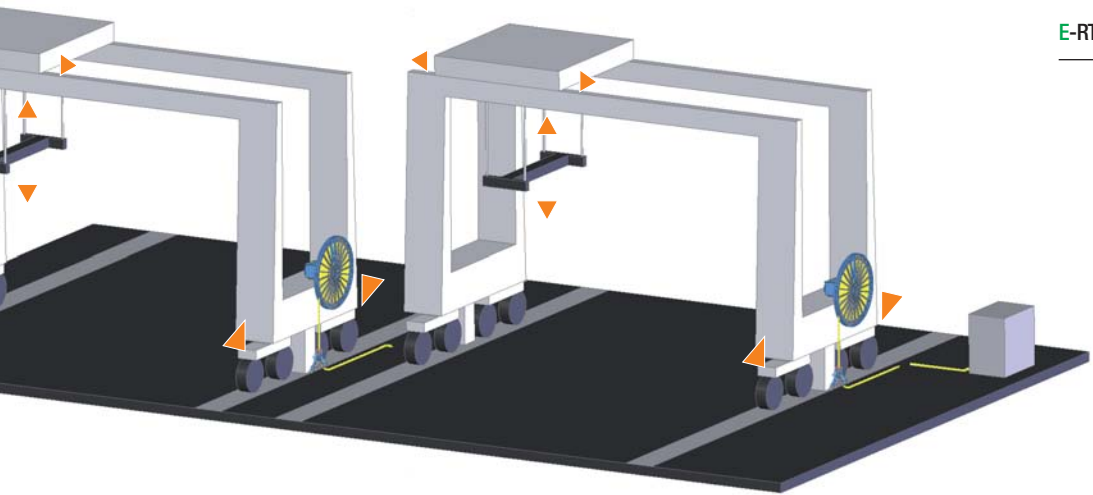
To add the “E” using an electric cable system, a motorized cable reel is mounted on the RTG. Each RTG has its own system and each operates independently. For this approach, Conductix-Wampfler offers two different technologies:

- Modular Motorized Cable Reel with a Permanent Magnetic Coupler. Conductix-Wampfler offers a unique “plug & play” system based on interchangeable electrical and mechanical components.
- Frequency Controlled Motorized Cable Reel. Conductix-Wampfler offers an extensive array of control units, either as hardware with pre-programmed controls mounted on a panel or in a control cabinet, or as a software program designed to integrate with existing PLC units.

Our range of systems covers both low voltage and high voltage applications. A fiber optic core and transmitter can be integrated into the reel and cable. Both technologies are precisely adjusted to the dynamic requirements of the storage applications in container terminals. One to several blocks in the same lane can be covered by the same reel system.

Most worldwide operators already use our systems on RMG and STS cranes.





Video cameras monitor the cable trench to assure that the cable remains free to pay out and wind up

A special “wide” cable guide is used, designed to accommodate lateral movements of the RTG

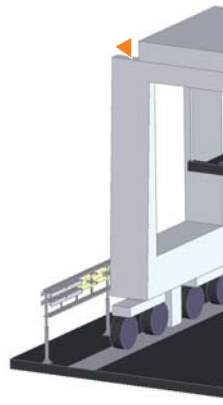


Since there are no guiding beams, two **optical sensors**, one on each side of the trench, control the travel deviation of the crane

Safety devices at the front and rear of the crane prevent accidental collisions with misaligned containers

Conductor Bar Systems

High Flexibility for the E-RTG™



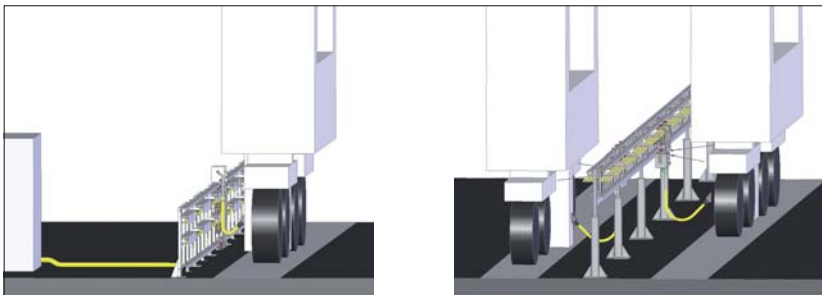
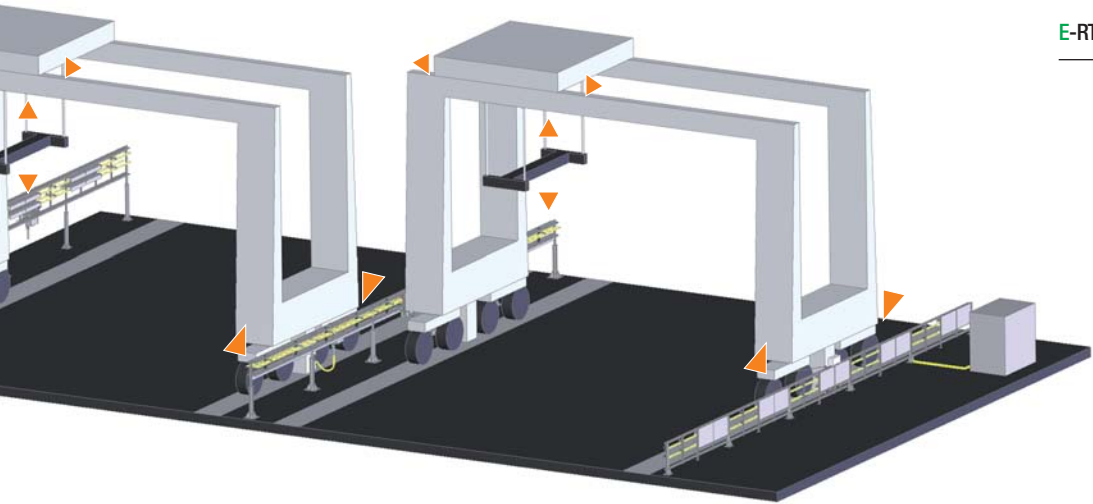
Conductor bars are mounted on a steel frame system which is bolted on top of a concrete base. Depending on the terminal operation or customer requirements, this base is either put on top or imbedded into the terminal surface. Electrical energy is picked up from the conductor bars using a collector trolley which is connected to the RTG crane using a steel cable that runs along the steel framing.

A power cable and a plug and socket connector link the collector trolley to the RTG.

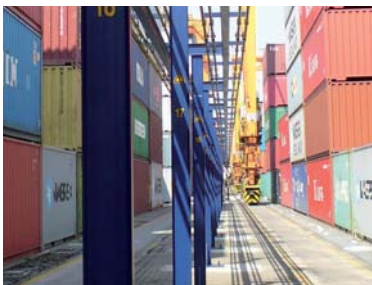
Safety is of paramount importance. Several pilot pins are used to assure that the plug will remain powerless during the unplugging process. Two sockets are installed on either side of the RTG to enable flexible crane operation when changing blocks. Limit switches are installed on the collector trolley to prevent the crane operator from leaving the block while still connected to the conductor bars.

The steel framing which holds the conductor bars may be installed at various predetermined heights. This allows access to the RTG with a forklift or a small crane during maintenance, service or repair procedures.

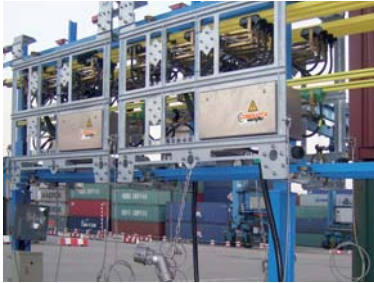




Steel framing and conductor bars for **one RTG crane** to pick up electrical current - the **2+2 version**



Steel framing and conductor bars for **two RTG cranes** to pick up the electrical current - the **4 parallel version**



Collector trolley including cable and plug for connection to the RTG crane. The socket connector is mounted on the crane side



Standardized concrete base and **steel framing** to mount conductor bars



Summary

RTG Electrification – the Only Low Emission Solution

Background

- RTGs will remain the primary way to move containers in terminal yards worldwide
- RTGs represent more than 50% of the total fuel consumption for a typical port

Electrification of the RTG

Low energy costs and minimal environmental impact are key concerns of modern port logistics. With the consumption of many gallons of diesel fuel per day and rising diesel fuel prices, powering RTGs represents a substantial cost factor for port operators.

Driving Factors for Developing Ecological RTGs

- Environmental: Reducing both air and noise pollution
- Economical: Reducing fuel costs and maintenance costs
- Technological: Optimizing productivity and performance

Example

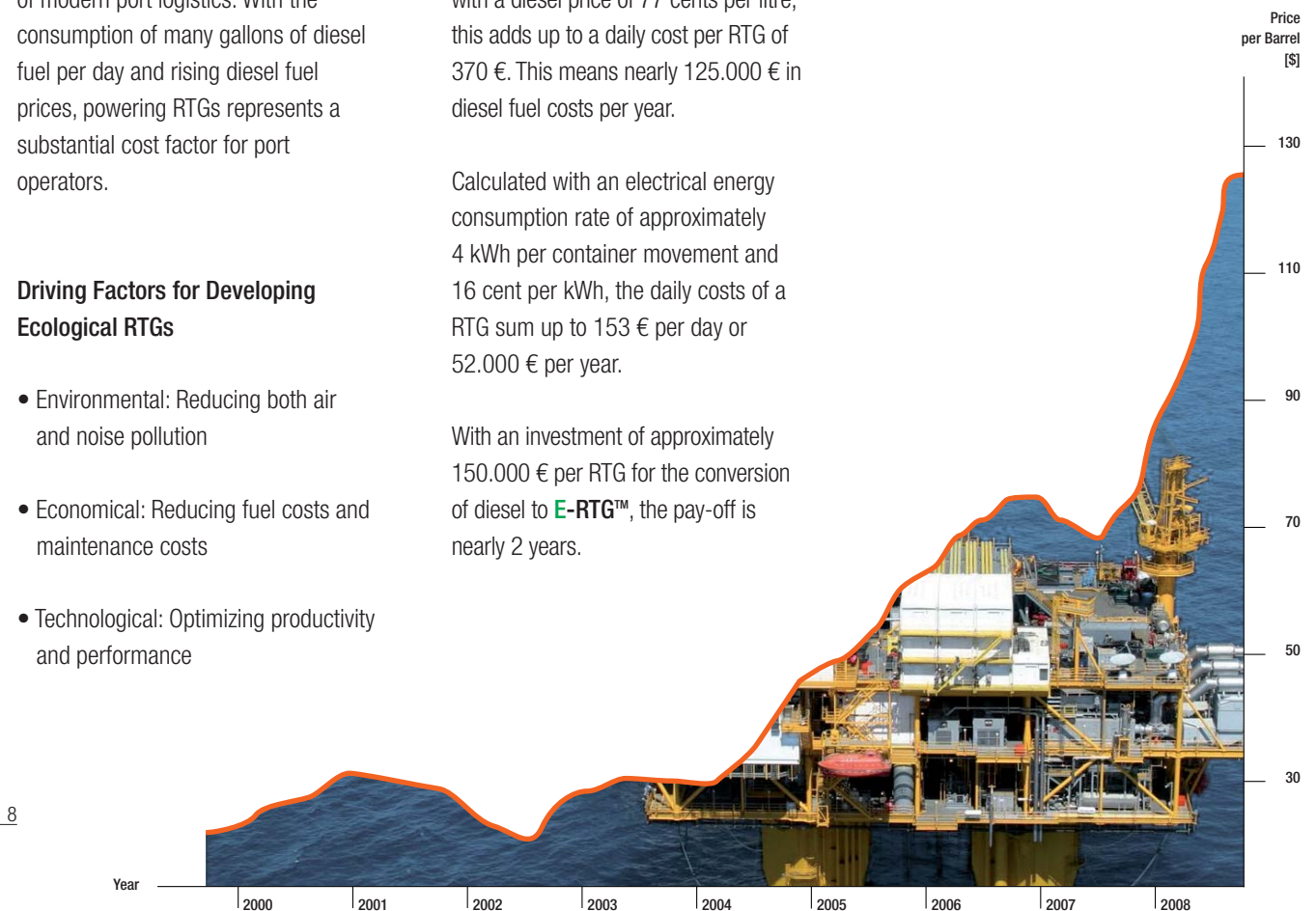
The following technical parameters and examples are based on our **E-RTG™** installations in China. The specific values for other port situations might vary. The average fuel consumption of a RTG depends on various factors, such as size, speed, and load, with each playing a substantial role. However an assumed consumption of 2 litres of diesel fuel per container movement is realistic. Given this estimate, a full load a RTG needs about 20 litres of diesel fuel per operating hour. If calculated with a diesel price of 77 cents per litre, this adds up to a daily cost per RTG of 370 €. This means nearly 125.000 € in diesel fuel costs per year.

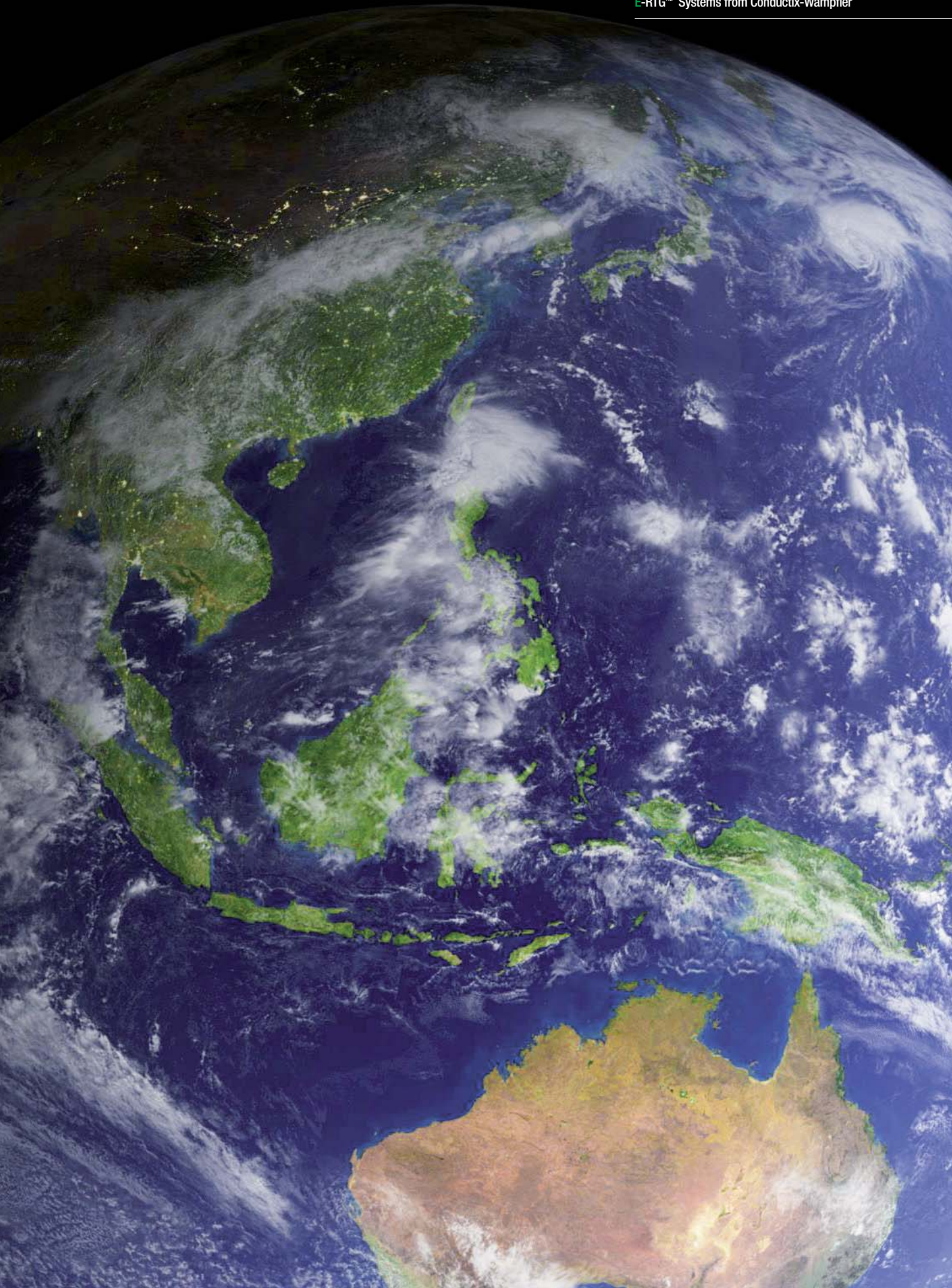
Calculated with an electrical energy consumption rate of approximately 4 kWh per container movement and 16 cent per kWh, the daily costs of a RTG sum up to 153 € per day or 52.000 € per year.

With an investment of approximately 150.000 € per RTG for the conversion of diesel to **E-RTG™**, the pay-off is nearly 2 years.

E-RTG™: A Crucial Contribution to Clean Ports!

The conversion of diesel to electric powered RTGs results in a reduction in diesel fuel consumption of about 95%. The remaining diesel engines are only used to transfer of the RTG from one container lane to another, or from the container lane to the maintenance area. During normal operation they remain switched off. The emission of greenhouse gases such as CO₂ or NO_x into the port environment is therefore drastically reduced.







Custom Services!

Our customers can count on us to meet their specific service needs and requirements. With Conductix-Wampfler everything is possible - from initial design and development to long term service contracts.

The more complicated your system is, the greater your expectations are in terms of service life and operational reliability - and the more sense it makes to take advantage of our after-sales service.

When it comes to service, you can count on Conductix-Wampfler to perform!

The Turnkey Solution

As a system supplier, Conductix-Wampfler offers a complete turnkey solution to all customers. This includes the delivery of all necessary parts to complete the project.

We consider qualified consulting, project engineering of the complete system, the choice and selection of the right components, optimizing the accessories, the adequate logistic concept, and the commissioning on site to be important elements of Conductix-Wampfler's business activities.



Planning and Development

- Definition of the application parameters
- Selection of the proper components for the required system - optimized to our customers' requirements, application parameters, and environmental factors
- Selection of the optimum energy supply solution in cooperation with our customers, as a function of all considerations including cost, service life, operating parameters, installation, and the site

Final Assembly

- Supervision of construction, assembly, and mounting on site, or
- Complete installation by our trained specialists

Service Agreement

- Regular maintenance and inspections to increase the operational life of the facility, ensuring long-term performance and availability
- All services required on site in the event of an incident, including spare parts and replacement materials
- Conductix-Wampfler service agreements: The "Worry-Free Package"



Conductix-Wampfler's specialists provide complete support from the initial programming and design to the final assembly on site - worldwide!

Your Applications – our Solutions

E-RTG™ from Conductix-Wampfler represents only one of the many solutions made possible by the broad spectrum of Conductix-Wampfler components for the transport of energy, data and fluid media. The solutions we deliver for your applications are based on your specific requirements. In many cases, a combination of several different Conductix-Wampfler systems can prove advantageous. You can count on all of Conductix-Wampfler's Business Units for hands-on engineering support - coupled with the perfect solution to meet your energy management and control needs.



Cable Reels

Motorized reels and spring reels by Conductix-Wampfler hold their own wherever energy, data and media have to cover the most diverse distances within a short amount of time - in all directions, fast and safe.



Festoon Systems

It's hard to imagine Conductix-Wampfler cable trolleys not being used in virtually every industrial application. They're reliable and robust and available in an enormous variety of dimensions and designs.



Conductor Rails

Whether they're enclosed conductor rails or expandable single-pole systems, the proven conductor rails by Conductix-Wampfler reliably move people and material.



Non-insulated Conductor Rails

Extremely robust, non-insulated conductor rails with copper heads or stainless steel surfaces provide the ideal basis for rough applications, for example in steel mills or shipyards.



Cable Chains

The "Jack of all trades" when it comes to transferring energy, data, air and fluid hoses. With their wide range, these energy guiding chains are the ideal solution for many industrial applications.



Slip Ring Assemblies

Whenever things are really "moving in circles", the proven slip ring assemblies by Conductix-Wampfler ensure the flawless transfer of energy and data. Here, everything revolves around flexibility and reliability!



Inductive Power Transfer IPT®

The no-contact system for transferring energy and data. For all tasks that depend on high speeds and absolute resistance to wear.



Reels, Retractors and Balancers

Whether for hoses or cables, as classical reels or high-precision positioning aids for tools, our range of reels and spring balancers take the load off your shoulders.



Jib Booms

Complete with tool transporters, reels, or an entire media supply system - here, safety and flexibility are key to the completion of difficult tasks.



Conveyor Systems

Whether manual, semiautomatic or with Power & Free – flexibility is achieved with full customization concerning layout and location.

www.conductix.com

Conductix-Wampfler has just one critical mission: To provide you with energy and data transmission systems that will keep your operations up and running 24/7/365.

We add the „E“ to your **RTG**!

E-RTG@conductix.com

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