

# Impulsar la Eficiencia Energética, la Descarbonización y la Digitalización

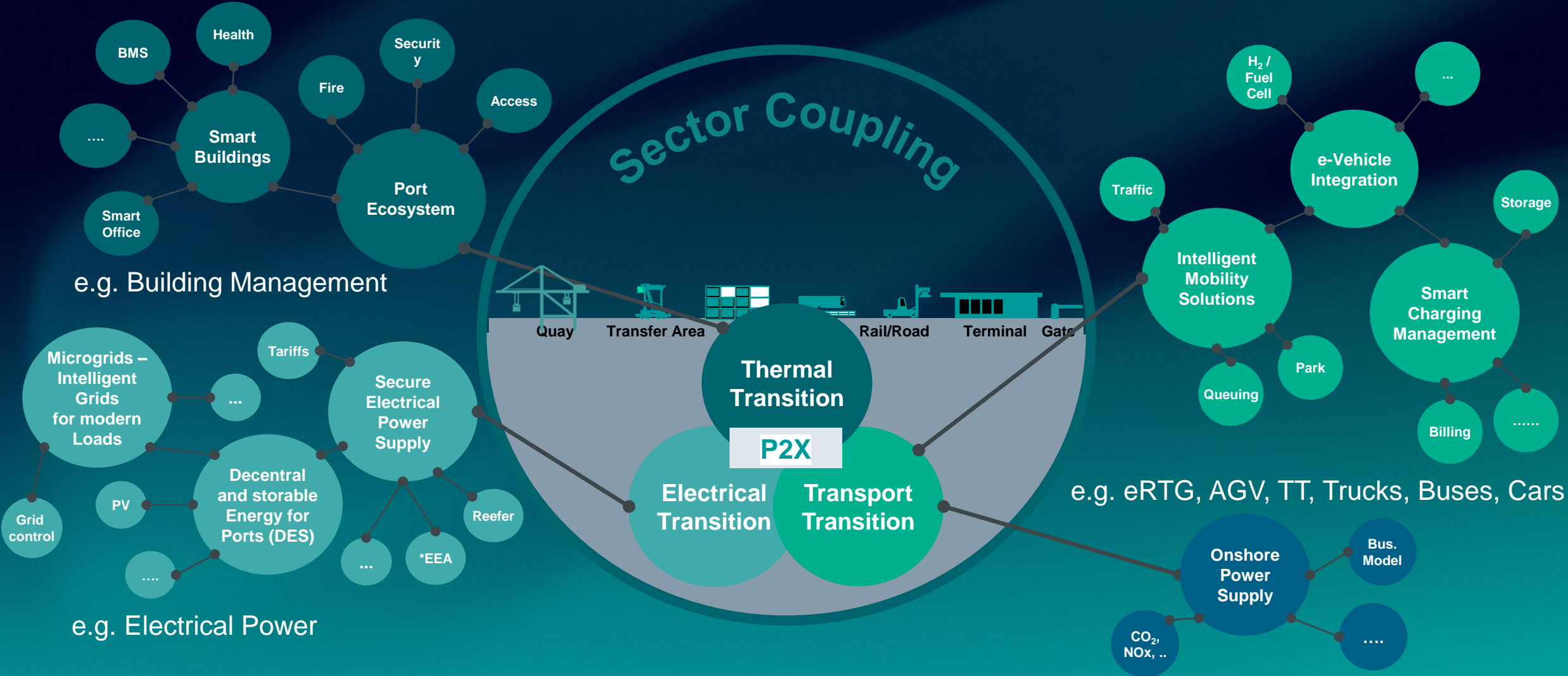
Abril 2023

**SIEMENS**

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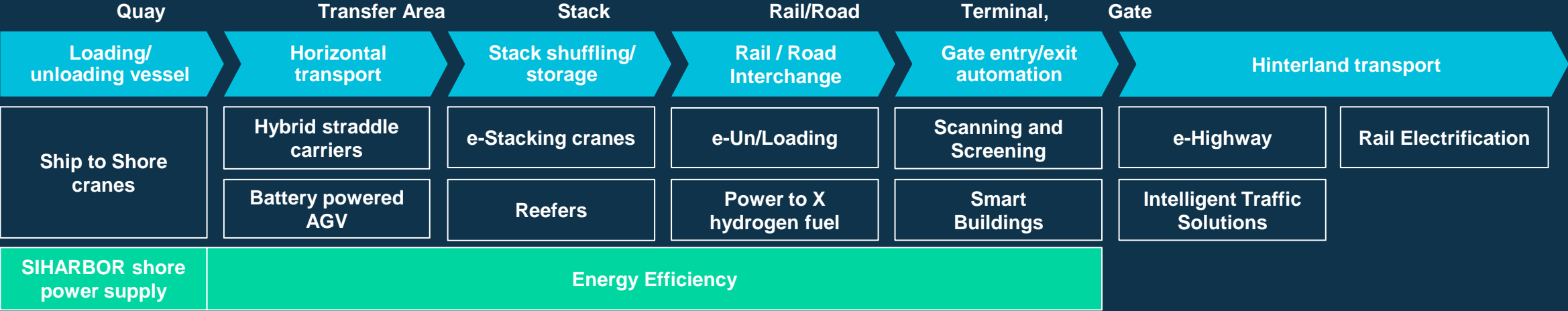
# Sector Coupling in the Smart Infrastructure of Terminals



\*EEA – Energy Efficiency Analytics

# The Smart Infrastructure in Terminals

## Enabling efficient and resilient processes



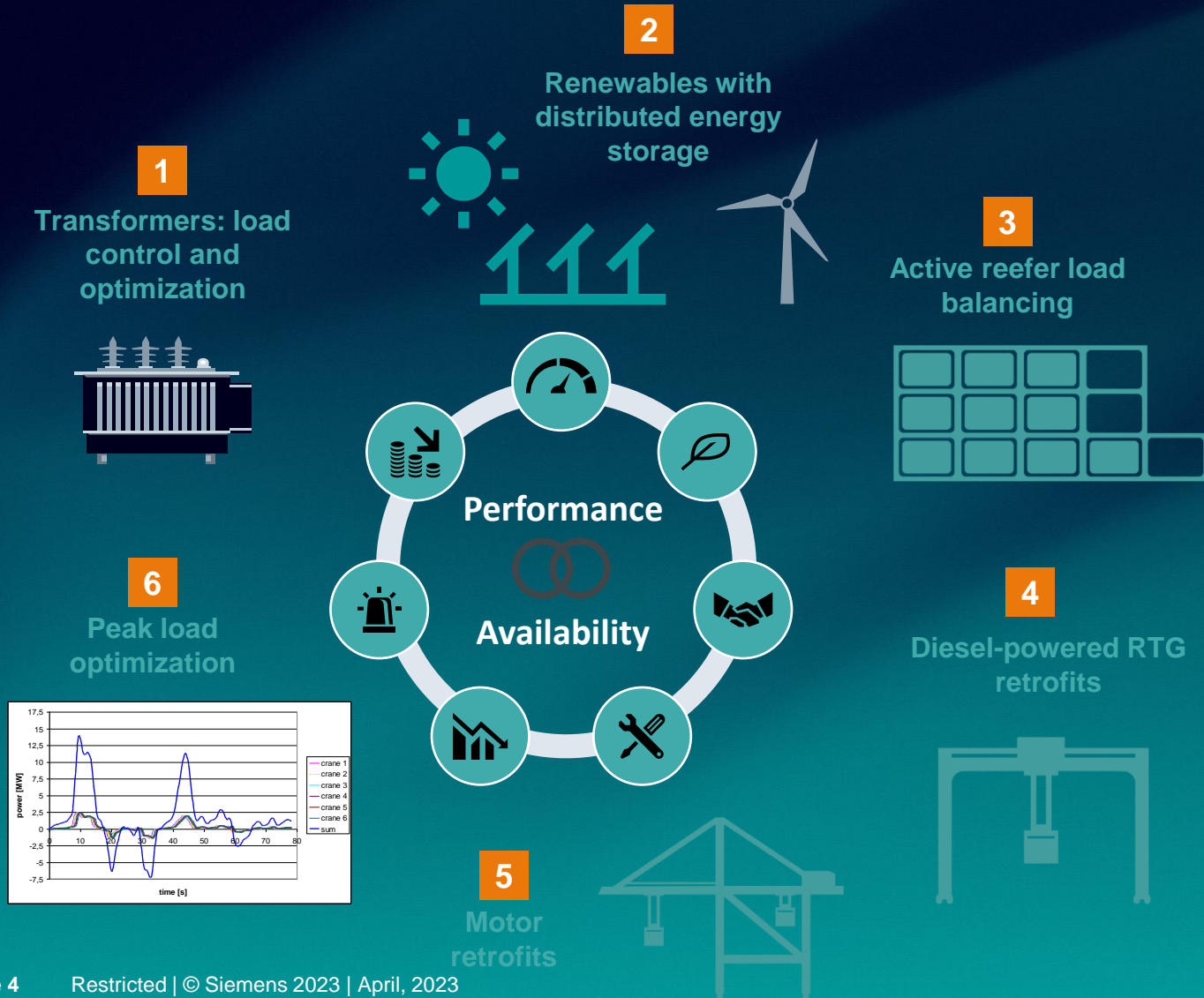
### Smart Infrastructure supporting the complete Logistic Process



### Electrical distribution network (Power backbone)

# Energy efficiency in Terminals is reality

## Proven holistic approach with Analytics



### Multimodal energy system...

- Integrated feedback loops
- Benefit of local generation, energy and operational efficiency (e.g. Reduce consumption → PV → storage, manage reefer area)
- Overall monitoring / analysis of energy consumption and carbon footprint
- Continuous improvement over time
- Based on Energy Efficiency Analytics

### Addressing the following benefits...

- **Reduced energy consumption** (electricity and Diesel)
- **Lower cost and CO<sub>2</sub> emissions**
- **Increased synergies** of different terminal areas with energy coupling
- Enhanced **visibility** showing progress and enabling **continuous improvement**
- Electrical grid **resilience**
- **Tariffs and Legislation**

# Eficiencia Energética, Descarbonización y Digitalización

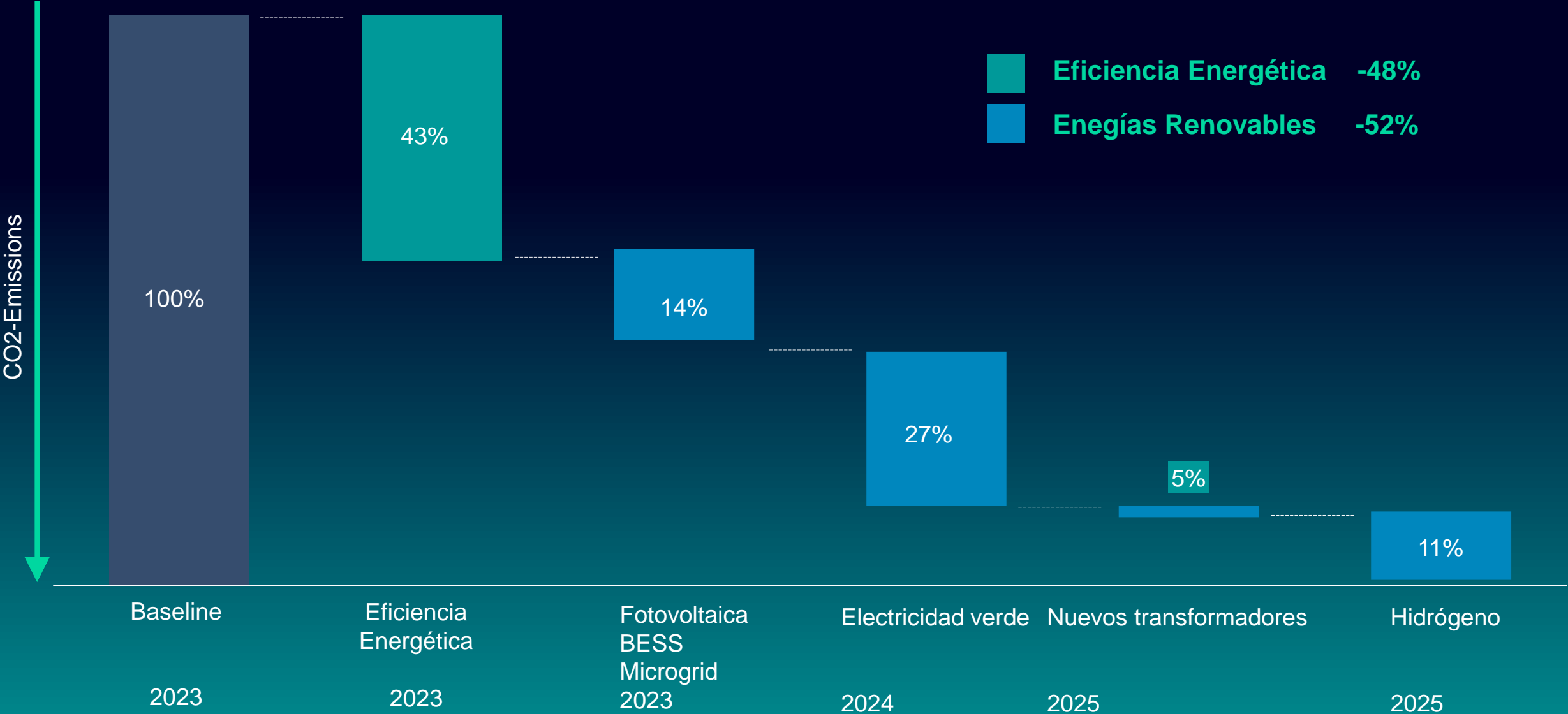
## Hoja de Ruta



Mejora de las infraestructuras y digitalización; estructuras y opciones financieras innovadoras

Alineación con el Riesgo Organizacional y los compromisos con el mercado

# Ejemplo de Hoja de Ruta de Descarbonización



# blue GIS<sup>®</sup> free SF6



# Brazil Microgrid Project Bulk Terminal

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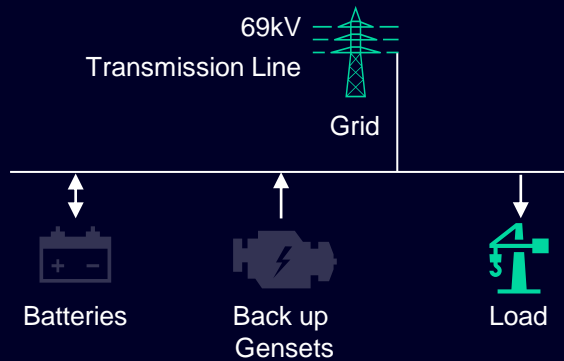
- 40 million tons of iron ore are transhipped at the Island Terminal in Brazil
- Siemens has provided a solution using a storage system for
  - Peak shaving
  - Reducing contracted demand by 50% at peak hours
  - Consequently reduced need for “thermal dispatch” from the National Grid Operator
- 2,400 tons CO<sub>2</sub> saved/year



# Smart Infrastructure Reference

## Brazil Microgrid Project – Bulk Terminal

### Solution



### Project Highlights

- Very close collaboration with customer and Storage Service Provider, from the concept onwards, ensured the best optimized solution
- Siemens expertise using software to size the complete solution including Switchgear, Management and Control systems
- Fully integrated solution ensuring highest possible customer benefit
- Significant positive environmental effect

### Siemens Solution scope

#### Management/Control System

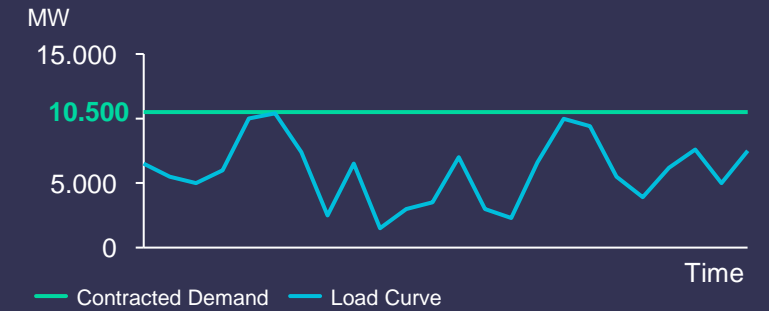
- Sizing study
- Microgrid Controller
- Redundant Automation
- Power Meters
- IEDs, Protection Relays

#### Switchgear related Systems

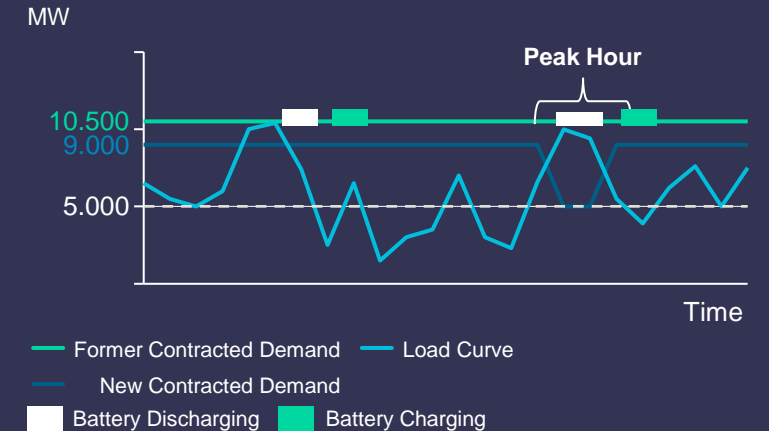
- Engineering and installation services
- E-House with MV/LV/Auxiliaries/Control
- Transformers

### Customer's Power Load

#### Before



#### After



# Clean Energy Transition and Grid Resilience for Madeira Island - Portugal

## Microgrid References

### Features

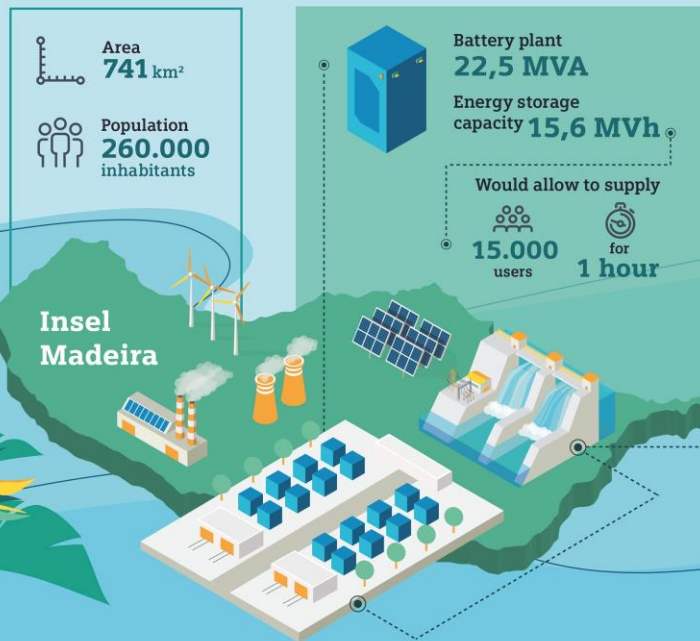
- Accelerate decarbonization
- Increase of renewables share
- Peak shaving

### Benefits

- The project will enable EEM to optimize its renewable energy integration, significantly contributing to increasing the share of renewable power to around 50 percent in its energy mix. As a result, the island can reduce its fuel consumption over the next two to three years, while gaining greater energy independence without affecting energy quality or grid stability.

## Battery energy storage plant in Madeira

SIEMENS



Up to **50%** of renewable energy in the next 2 to 3 years

Reduction of fuel consumption and CO<sub>2</sub> emissions

Plant integrated in a microgrid concept



# Alimerka, líder de la distribución alimentaria en Asturias



Siemens, compañía global líder en tecnología digital, ha firmado un acuerdo con Alimerka, empresa de distribución alimenticia líder en Asturias y con presencia en otras regiones como León, Zamora, Valladolid y Burgos, para ayudar a la compañía a transformar su flota de camiones en vehículos eléctricos que respeten el medioambiente, eliminen las emisiones y tengan un consumo más eficiente y sostenible.

El acuerdo consiste en la instalación de 19 cargadores eléctricos tipo Sicharge UC200, con una potencia de carga de 150kW, que se distribuirán entre los centros logísticos del gigante asturiano en Llanera (18) y Bobes (1), en el polígono industrial de Siero.

<https://press.siemens.com/es/es/notadeprensa/siemens-suministra-19-cargadores-electricos-alimerka-lider-de-la-distribucion>



# Eficiencia Energética, Descarbonización y Digitalización en Smart Ports y Terminales

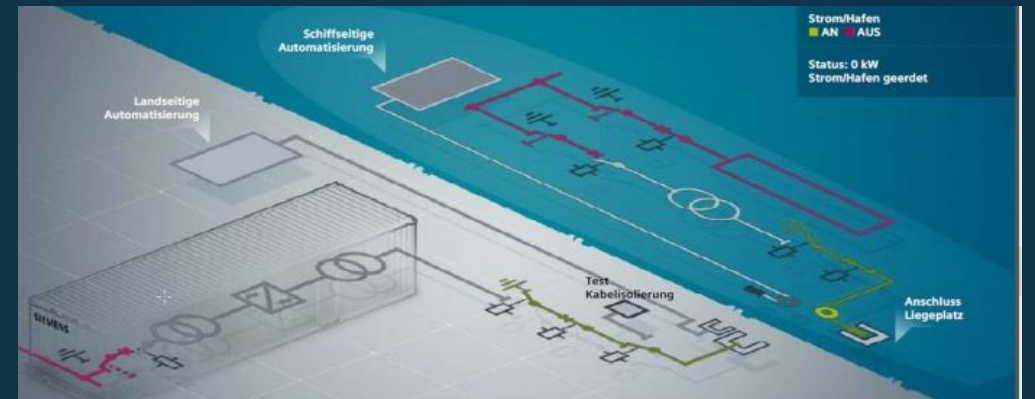


SEEHAFEN KIEL GmbH & Co. KG (PORT OF KIEL) has commissioned Siemens AG to build two additional shore power plants at Ostuferhafen. The construction project with a total cost of approximately €17 million comprises a 50/60 Hz shore power plant for cruise ships and ferries and a 50 Hz shore power plant for cargo ships. After completion of the project at the end of 2023, the seaport of Kiel will be able to supply green power to up to six ships simultaneously at all of its major passenger, cargo, and ferry terminals.



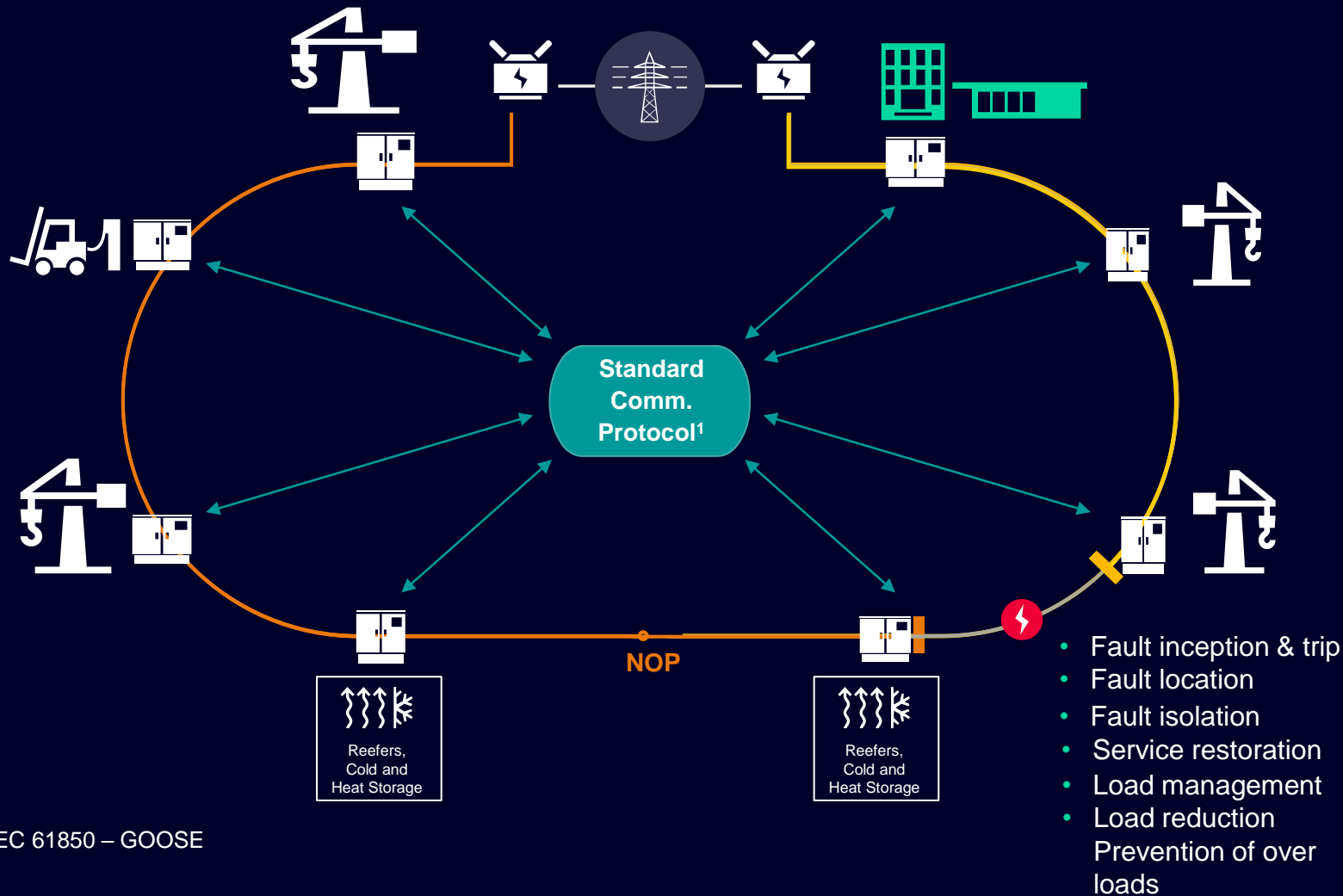
## SIHARBOR:

- 16 MVA and can supply cruise ships and ferries
- Frequency of 50 or 60 Hz and a voltage of 6.6 kV or 11 kV.



# Self-healing Grids for resilient Terminal Power Supply

## Autonomous outage management ensuring service restoration



<sup>1</sup> IEC 61850 – GOOSE



Time zero (before fault)  
Less than 300 ms

[Reference Link: Proven by Stedin in Rotterdam / Netherlands](#)

The intelligent automation solution from SIEMENS to secure Terminals Power Operation and Service !

[www.siemens.com/self-optimizing-grid](http://www.siemens.com/self-optimizing-grid)

# Contact

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