5G enabling climate actions in industries

— Rossella Cardone
— Head of Sustainability & Corporate Responsibility
— Ericsson, Market Area Europe and LATAM

Ericsson and 5G

By numbers
180+ countries
227.2 b. SEK in Sales
99,417 employees
54,000 patents

Power commercial 5G live networks across 5 continents

139
Commercial 5G agreements

81
Publicly announced 5G contracts

86
Live 5G networks

https://www.ericsson.com/en/5g/contracts

Ericsson is leading the way in the ICT industry

CO_2 neutral

for company operations
by 2030

1.5C Supply Chain Leaders

Driving climate action throughout global supply chains

10X

more efficient 5G portfolio than 4G by 2022

Sources: Ericsson Sustainability & Corporate Responsibility Report 2019

Reducing the impact of digital networks

$25 billion

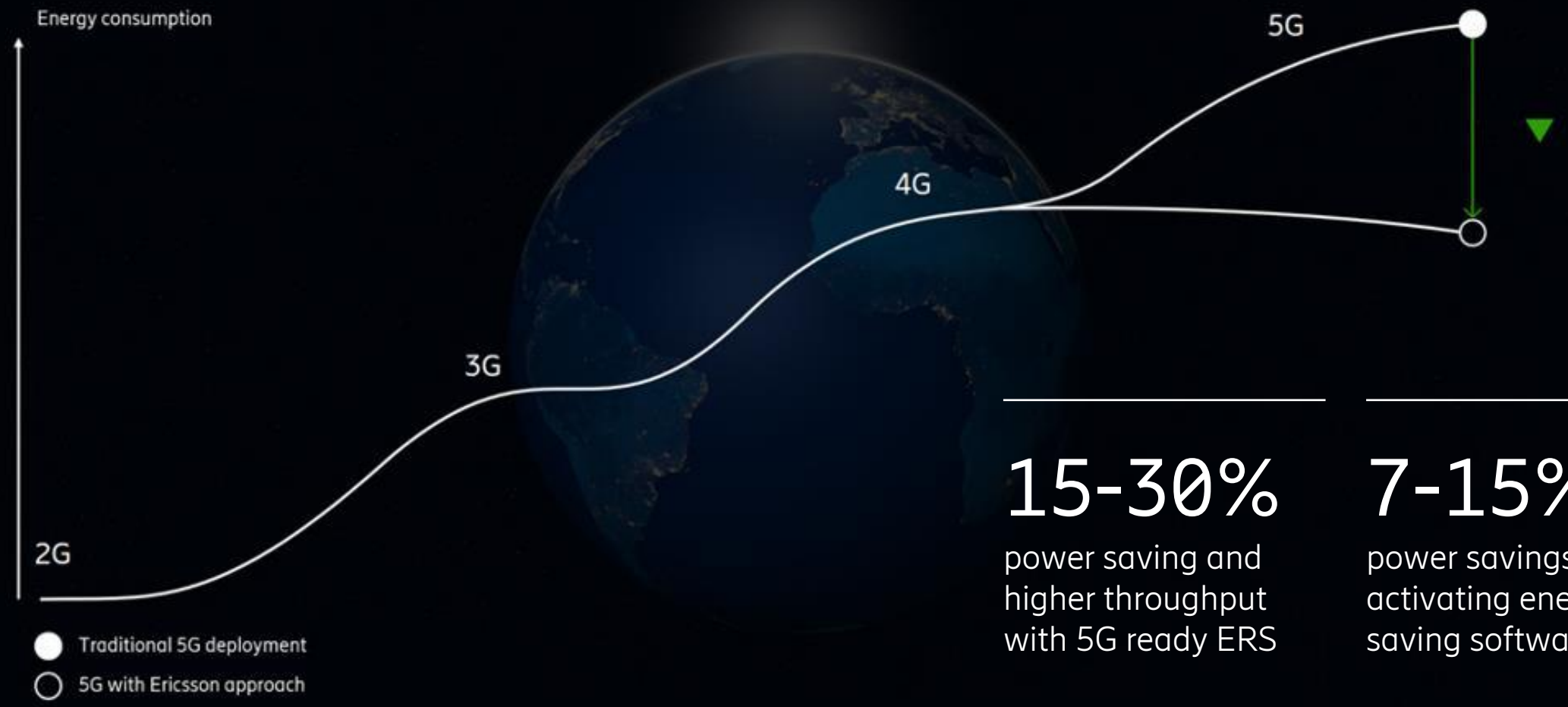
annual energy costs of running mobile networks globally

5X

increase in global mobile data traffic by 2025

Source: Ericsson Mobility and Breaking the Energy Curve reports

Reducing the impact of digital networks
Breaking the energy curve

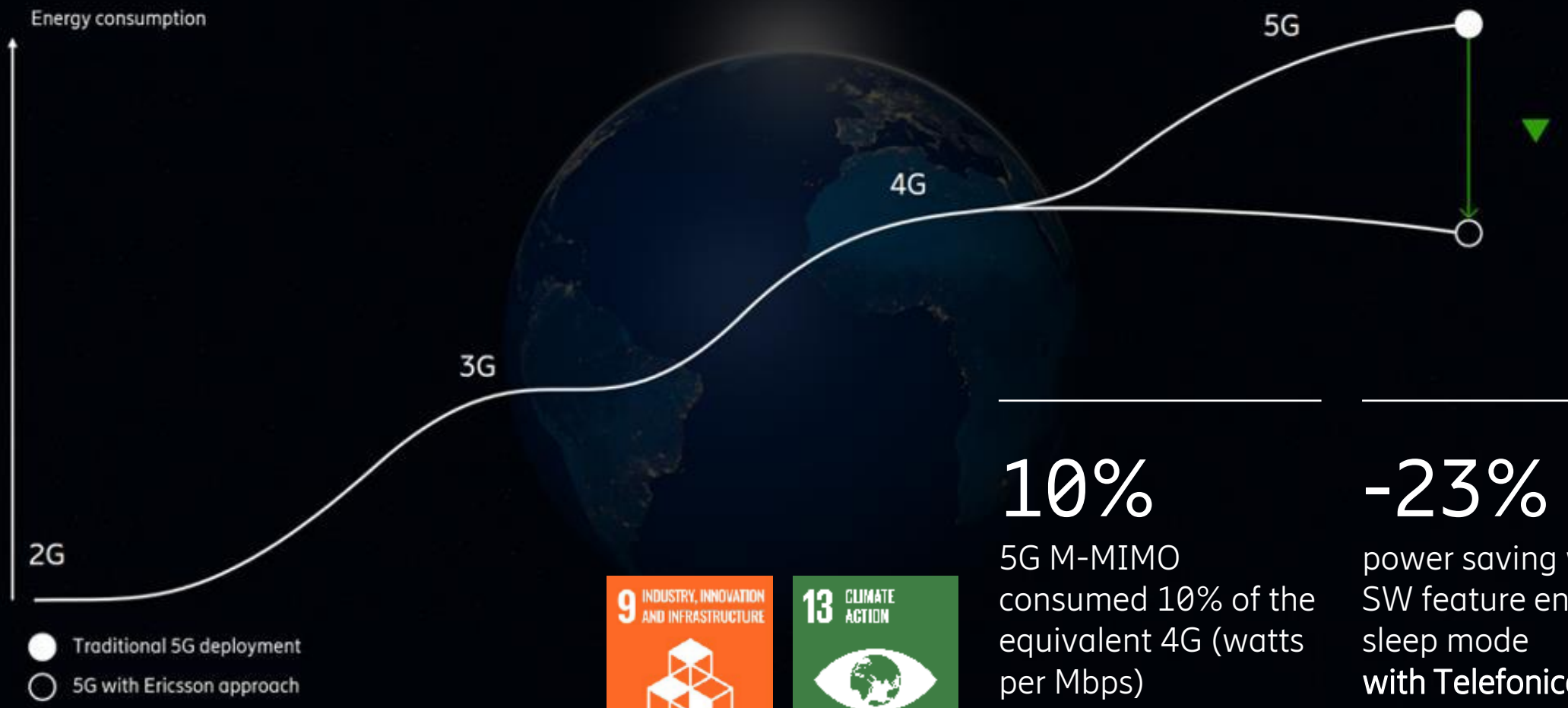


15-30%
power saving and higher throughput with 5G ready ERS

7-15%
power savings by activating energy saving software

Source: Ericsson mobility and Breaking the Energy Curve reports

Reducing the impact of digital networks
Breaking the energy curve



Source: Ericsson mobility and Breaking the Energy Curve reports

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

13 CLIMATE ACTION

10%

5G M-MIMO consumed 10% of the equivalent 4G (watts per Mbps)
with Telefonica

-23%

power saving with SW feature enabling sleep mode
with Telefonica

How can connectivity enable the industrial sector transition to a low carbon future?

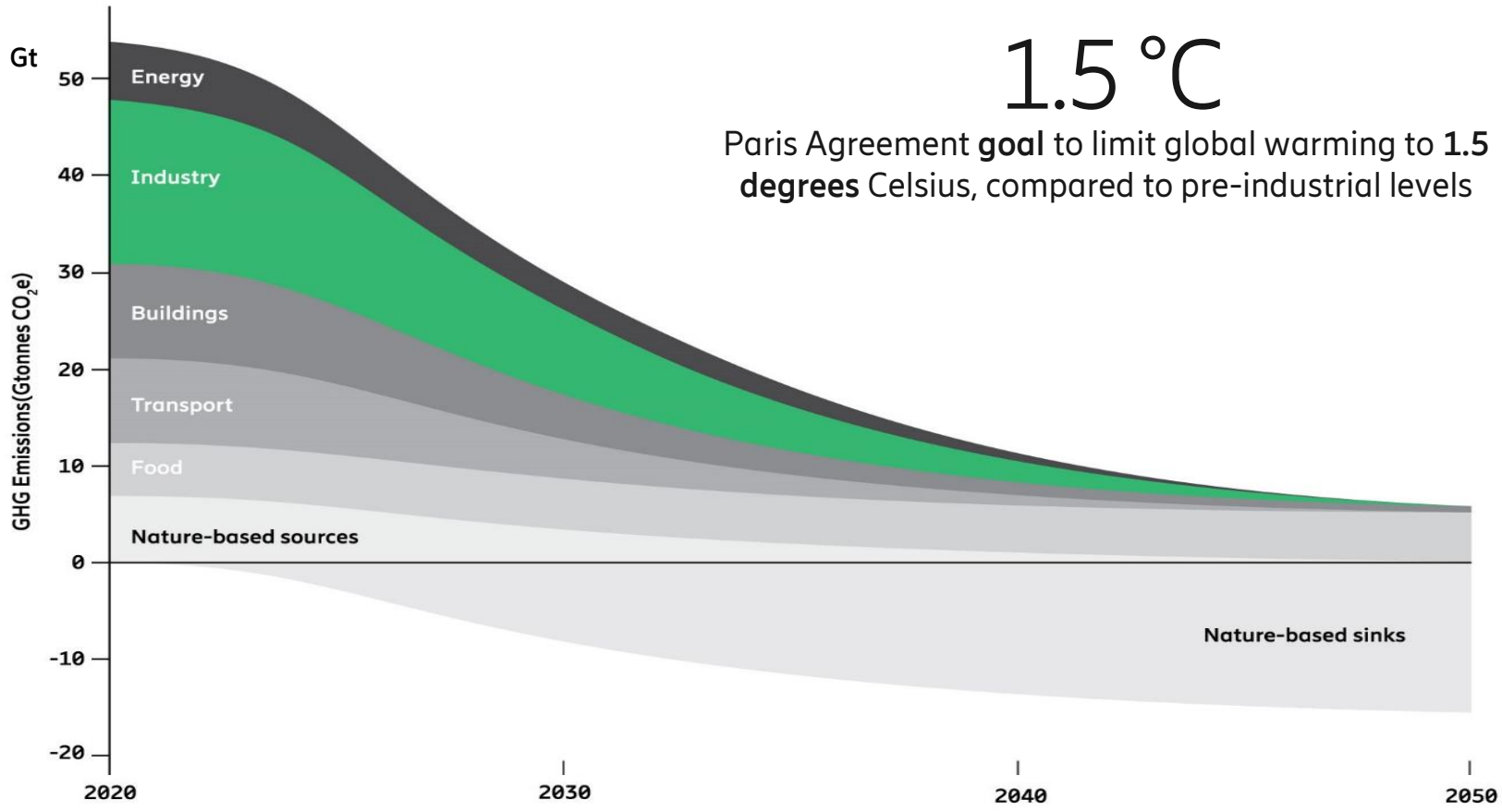
Digital connectivity drives climate action & sustainable development

1.4%

The carbon footprint of the ICT sector corresponds to 1.4% of global emissions.

15%

The ICT sector has the potential to enable greenhouse-gas emission reductions of 15% in other sectors by 2030.



1.5 °C

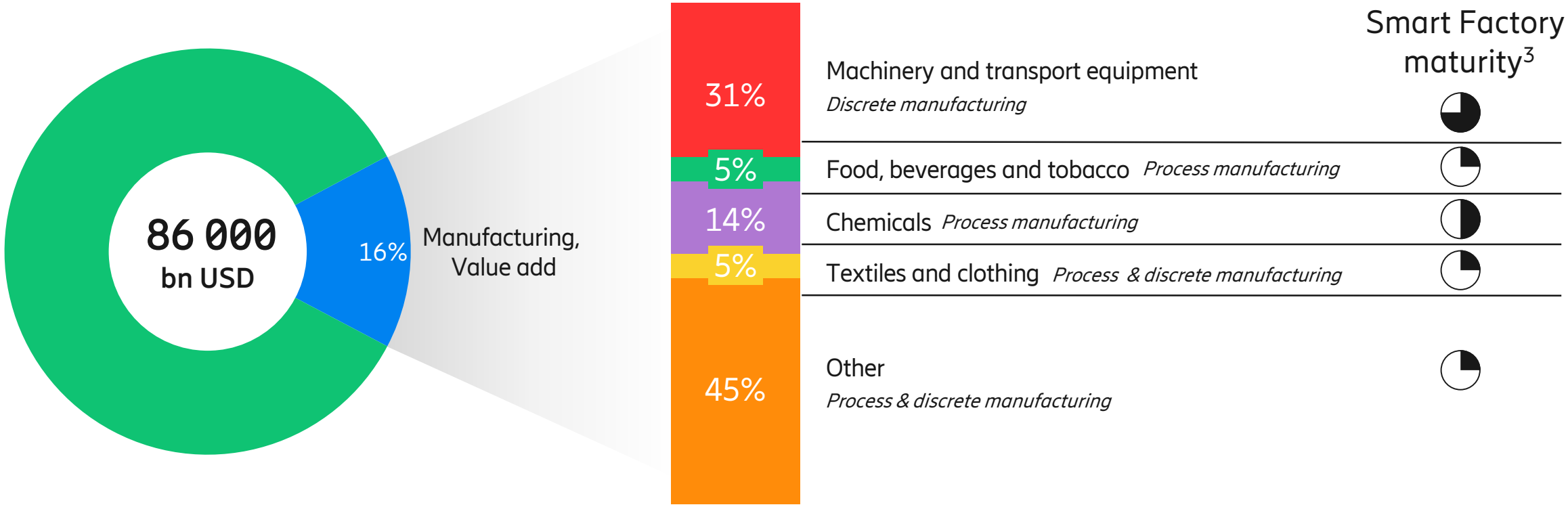
Paris Agreement **goal** to limit global warming to **1.5 degrees** Celsius, compared to pre-industrial levels

EXPONENTIAL ROADMAP

Source: Exponential Roadmap

5G to address climate actions in Manufacturing Ports

The manufacturing industry has a large potential to become smarter



Global GDP, 2018[1]

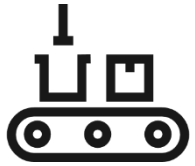
Manufacturing value add, per segment[2]

Source: World bank, Grand View research, Arthur D. Little

1) World Bank, Global GDP 2018, 2) World Bank, Structure of manufacturing 2016, 3) Smart Factory maturity assessed based on Smart Factory market size per segment related to contribution to GDP.

Examples of challenges that can be addressed by connecting your factory with 5G

Growth & Innovation

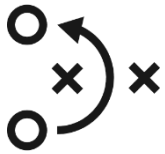


Future product mix require simple production line customization

Managing risk

Increasing demands on infrastructure security, data integrity and safety for workers

Operational excellence



Workflow interruptions, maintenance inefficiencies and carbon footprint improvements

Managing complexity

Aggregating and analyzing data flows from multiple complex systems

Digitalization is critical for decarbonization of the industrial sector

32%
of global emissions

20%
reduction with real-time monitoring and control

Reference: Exponential Climate Action Roadmap, World Economic Forum

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

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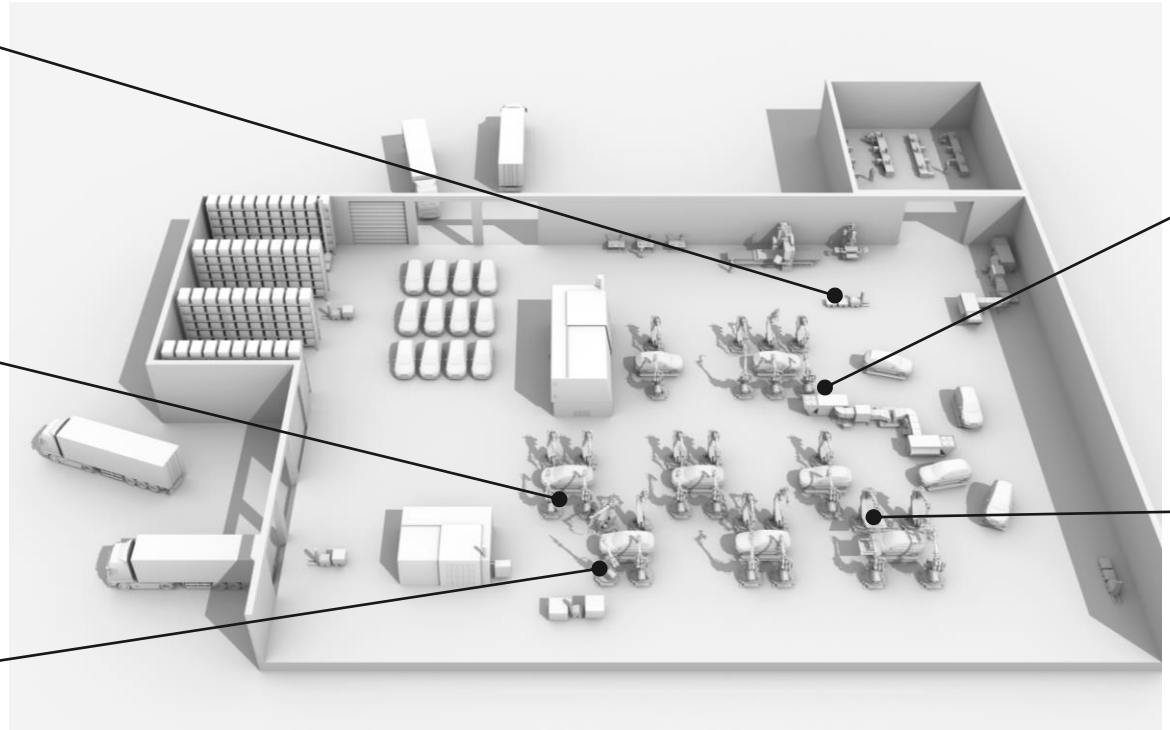
17 PARTNERSHIPS FOR THE GOALS

The five selected use cases for the Smart Factory
Real time monitoring of processes and energy use

Autonomous mobile robots (AMR) for real time production chain automation

Collaborative robots for efficient operations

AR for efficient quality inspections



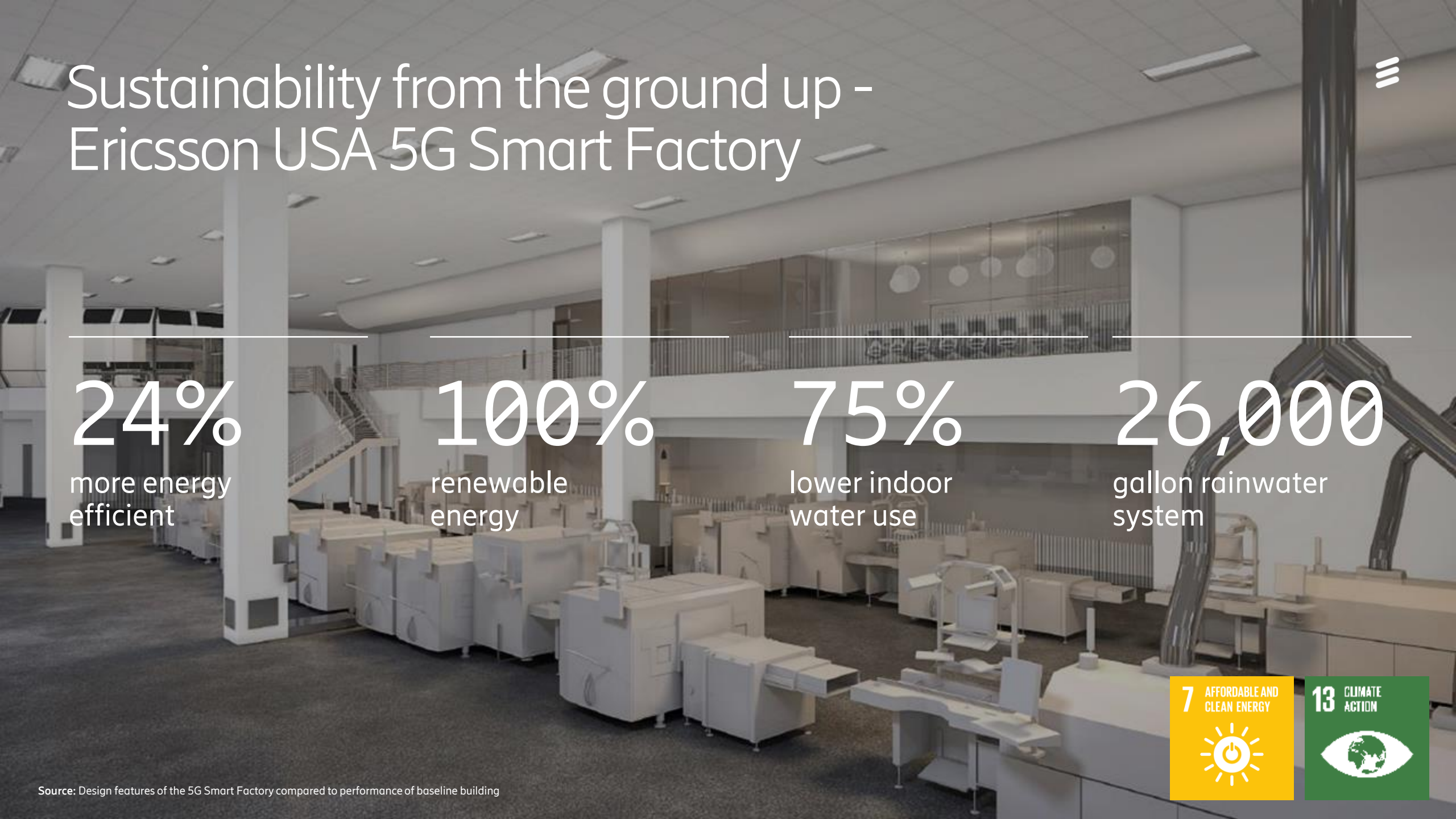
USE CASES FOR DISCRETE MANUFACTURING

Asset condition monitoring for decreased downtime

Digital twin for optimized operations

Source: Ericsson, Arthur D. Little

Sustainability from the ground up - Ericsson USA 5G Smart Factory



24%
more energy efficient

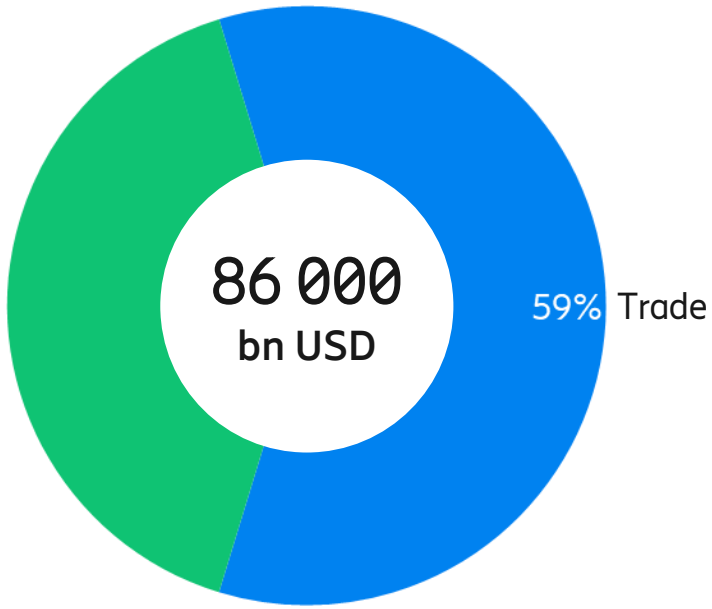
100%
renewable energy

75%
lower indoor water use

26,000
gallon rainwater system

Source: Design features of the 5G Smart Factory compared to performance of baseline building

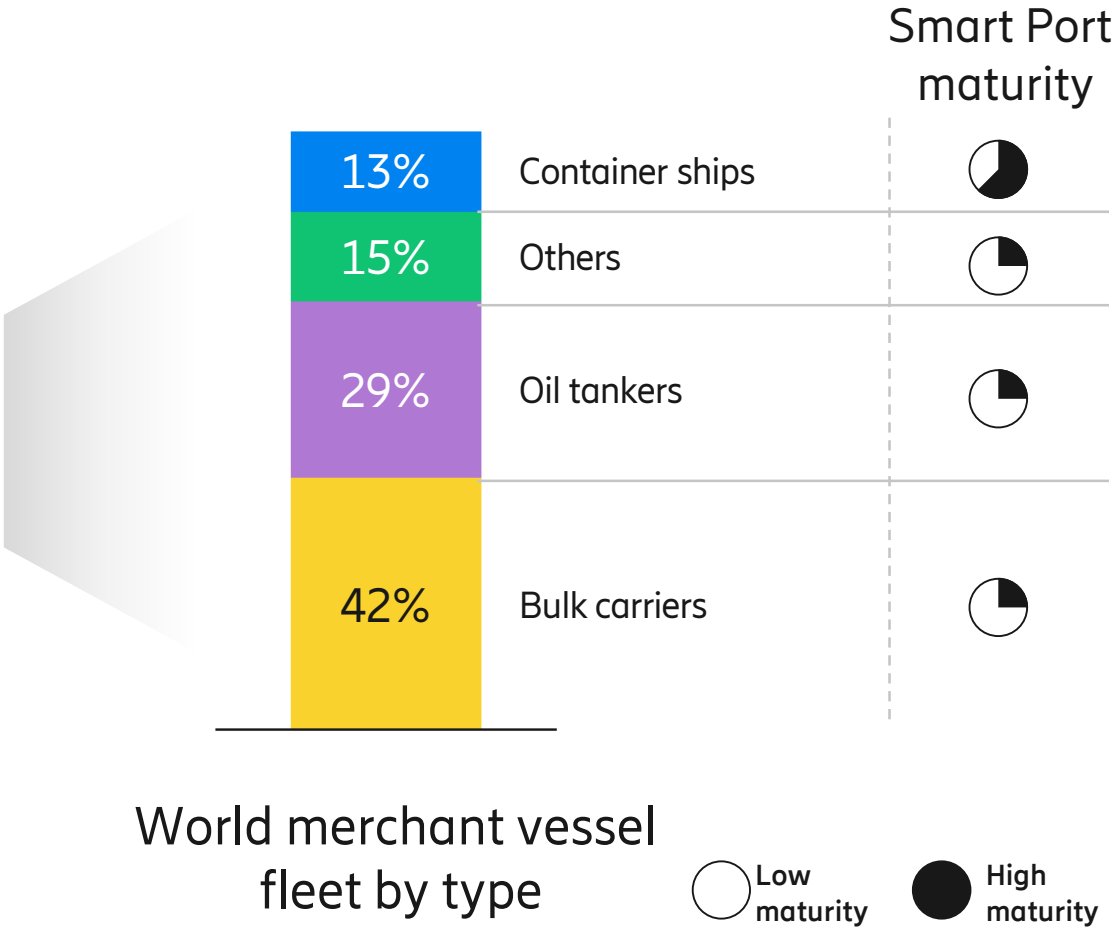
With 90% of world trade going through ports, smarter operations could have huge impact



Global GDP, 2018

90%

of world trade carried by sea



World merchant vessel fleet by type

Low maturity

High maturity

Source: World bank; International Chamber of Statistics; Arthur D. Little; Ericsson

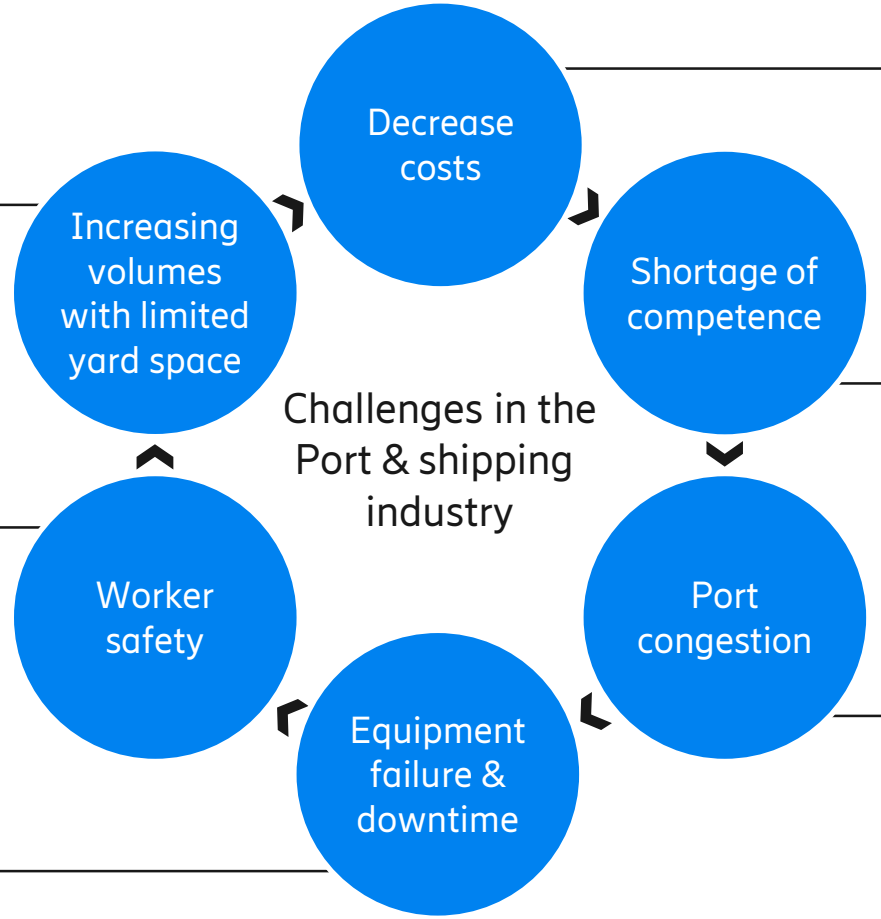
Notes: A Smart Port uses Automation and innovative technologies, e.g. AI, IoT and Big Data, with ultimate goal of full automation. The maturity is assessed based on degree of automation and deployment of smart solutions, by Arthur D. Little through industry expert discussions

Today's port operators face many challenges, which Smart Port technology can help to solve

52% of terminal operators see improving **yard operations as a key issue**

42% of marine causalities 2018 took place in port areas, implying a **risk for workers**

22% believe **asset monitoring** can help overcome business and economic challenges in the port



67% of terminal operators see cost reduction as a concern, which is required given **increasing competition**

75% of port operators with experience of automation state shortage of people with **necessary skills** as an issue

Vessel & truck congestion slow down business and port operations, resulting in issues along entire value chain

Source: Navis; COREALIS; EMSA; McKinsey; Arthur D. Little; Ericsson

5G networks in smart ports

5G CAPABILITIES:

- Low and predictable latencies (<1 ms), 200 Mbps uplink speed
- Flexible scaling of network capacity (5G supports up to 1 Million device per Km2)
- Security, reliability of device interoperability and mobility capabilities

5G ENABLES:

Economic benefits

Efficiency and productivity (e.g. reduce transit time and terminal time of goods and vessels) for **Industrial Automation IoT**

Environmental benefits

Reduced carbon emissions through greater logistic efficiency

Social benefits

Safeguard personnel conditions. Technologically skilled workforce

The five selected use cases could be the Smart Port starting point

Remote operations

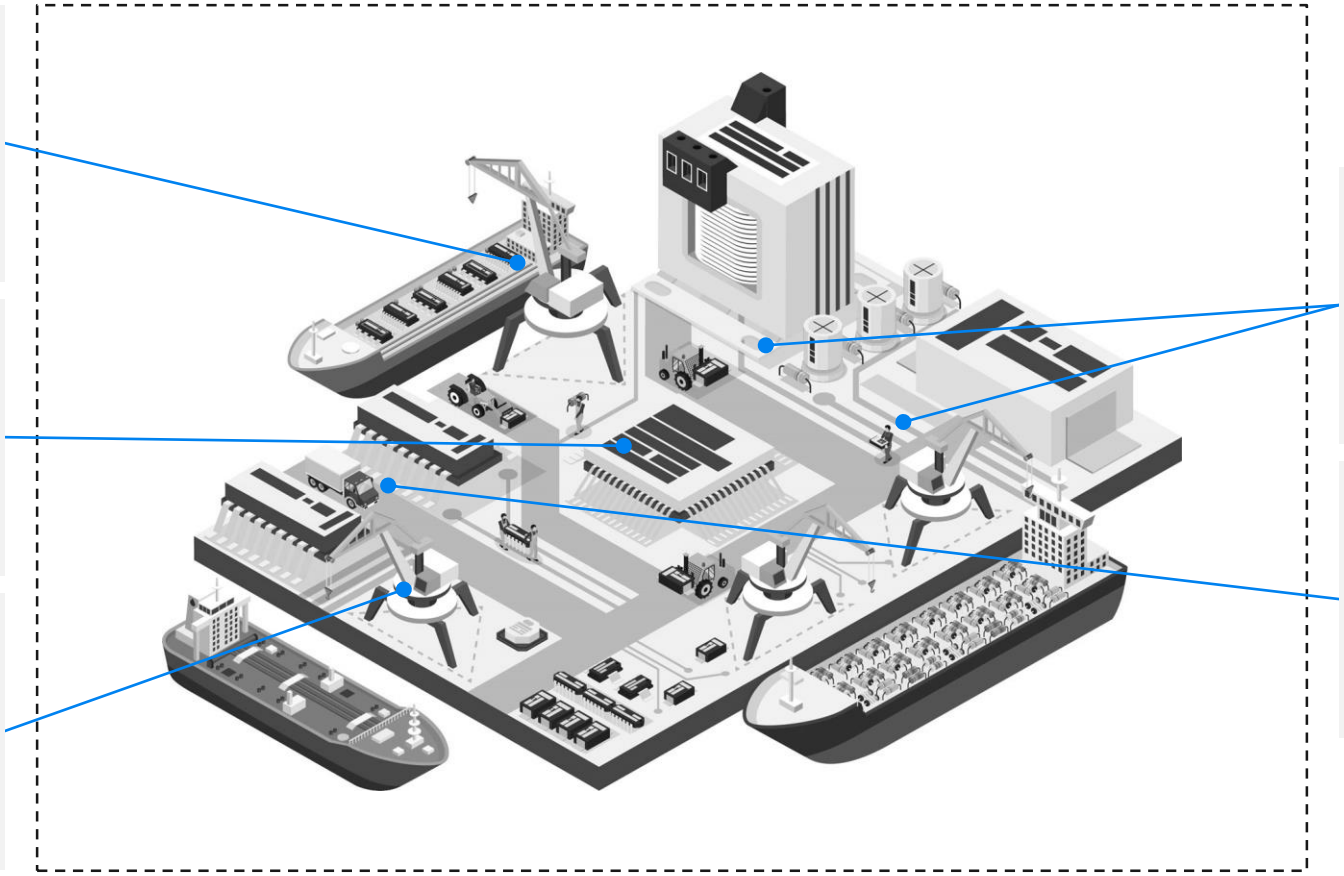
Remote control of Ship-to-shore cranes

Autonomous robotics

Automated RTG cranes

Hazard and maintenance sensing

Condition monitoring



Smart Surveillance

Drones for surveillance & deliveries

Connected vehicles

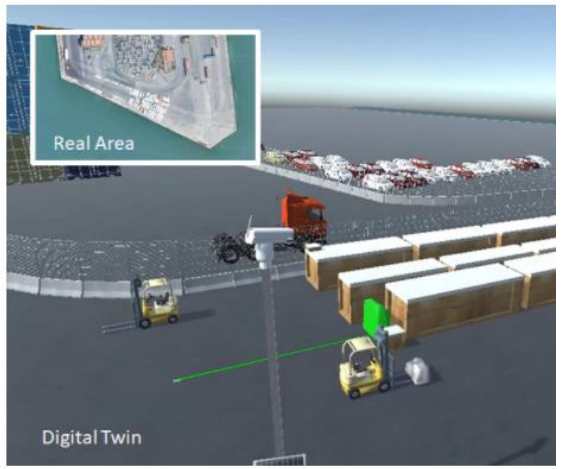
Cellular connected AGVs

Source: Arthur D. Little; Ericsson

5G Port of the Future, Italy

in partnership with TIM, Authority Port of Livorno and CNIT

5G networks, VR/AR Digital Twin and AI-operation system to optimize efficiency, productivity and environmental impacts



€2.5M saving

Optimizing vessel berthing can lead to a 20 percent average cost reduction per year, which is approx. EUR 2.5 million

25% productivity

Gantry and quay cranes controlled remotely through 5G telecommunication, increasing productivity by 20-25 percent

8.2% CO2

An 8.2 percent reduction in associated CO2 per container operation terminal

Industrial Energy Efficiency Award

«For the introduction of energy efficient solutions in production processes addressing ecologically challenges and characterized by economic advantages as competitive factor»

INDUSTRIAL ENERGY EFFICIENCY AWARD

HANNOVER MESSE

Read more in the report:
5G Port of the Future report

Conclusion

Digital sector can address at least 15% of total GhG in other industries by 2030

5G networks can accelerate climate action solutions

Public and private sector to work toward accelerating 5G and digital technologies for the future of our planet

https://www.ericsson.com/en/about-us/sustainability-and-corporate-responsibility/environment/climate-action