

TechUK SPF gathering sept '23

EUWENA

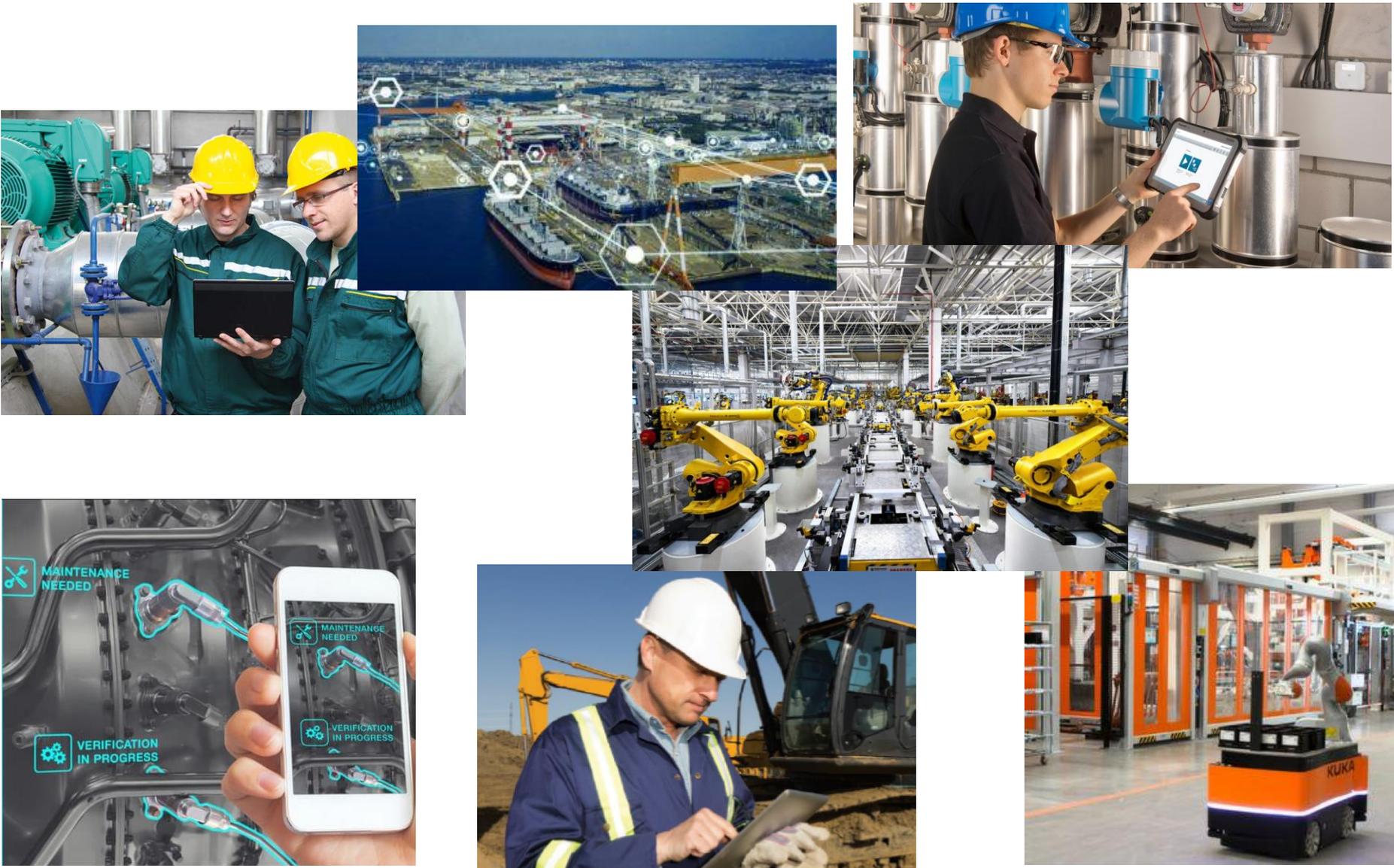
European Users of **W**ireless **E**nterprise **N**etworks **A**ssociation

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Intro EUWENA

- Founded in 2021 by 8 experts from the sector
- Formally launched in Paris, November '21
- **EUWENA** triggered by scatteredness of the enterprise 5G market and fragmentation of spectrum
- Main activities around
 - Spectrum (EU & local consultations!)
 - Eco System (supplier members)
 - Alliances (ao SPF, CW, 5G-ACIA, TCCA, EUTC, OnGo, WBA, MFA !)
 - Verticals Mainports !

Private wireless networks for industry 4.0 & process optimisation

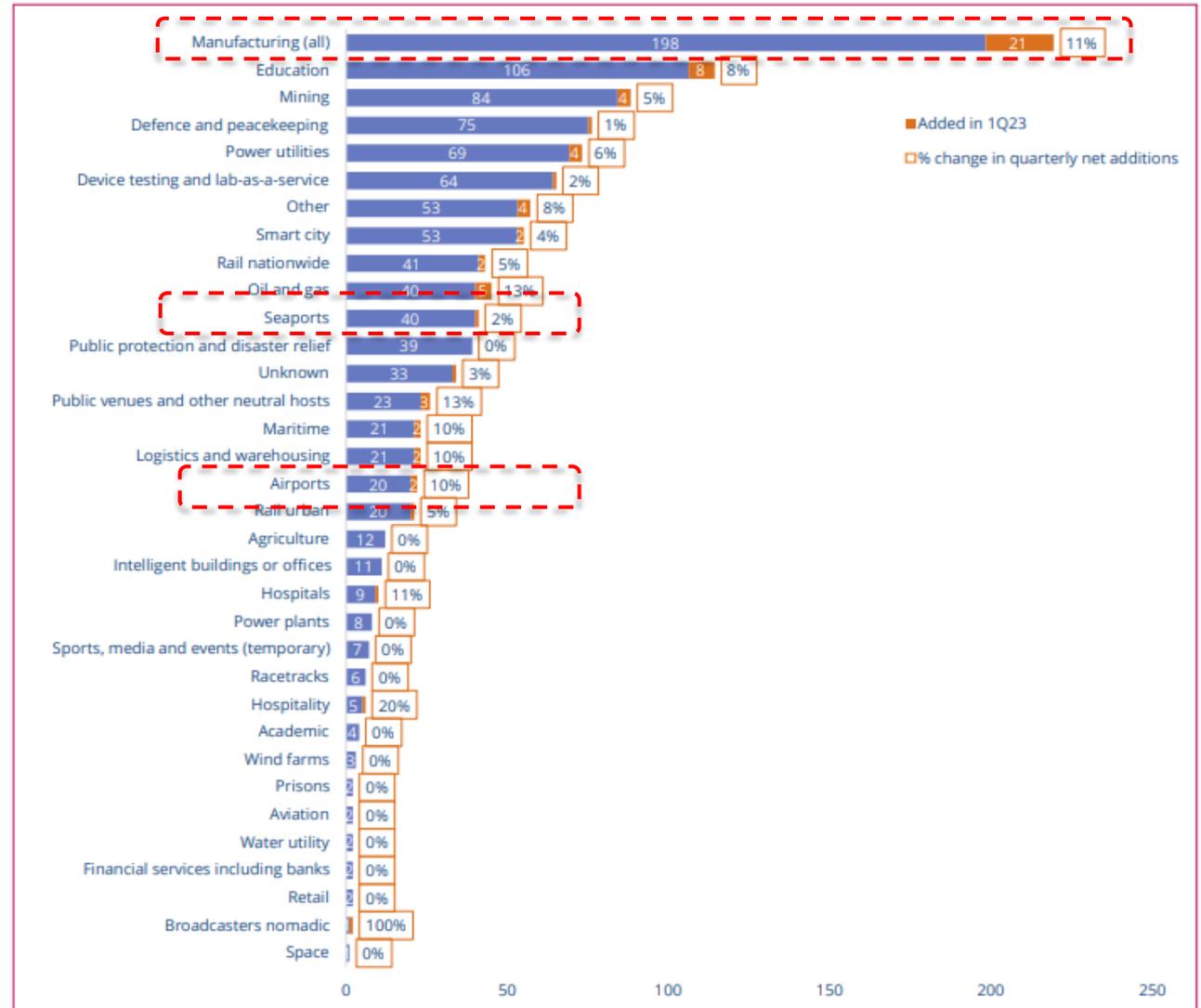


KM, sept'23

SPF on 3.8-4.2 requirements

GSA tracks private wireless networks deployed 1148 per may'23

Figure 4. Number of identified customers deploying private mobile networks in trials and commercially, by sector (base: 1,148 organisations deploying private wireless networks with revenue greater than €100,000)

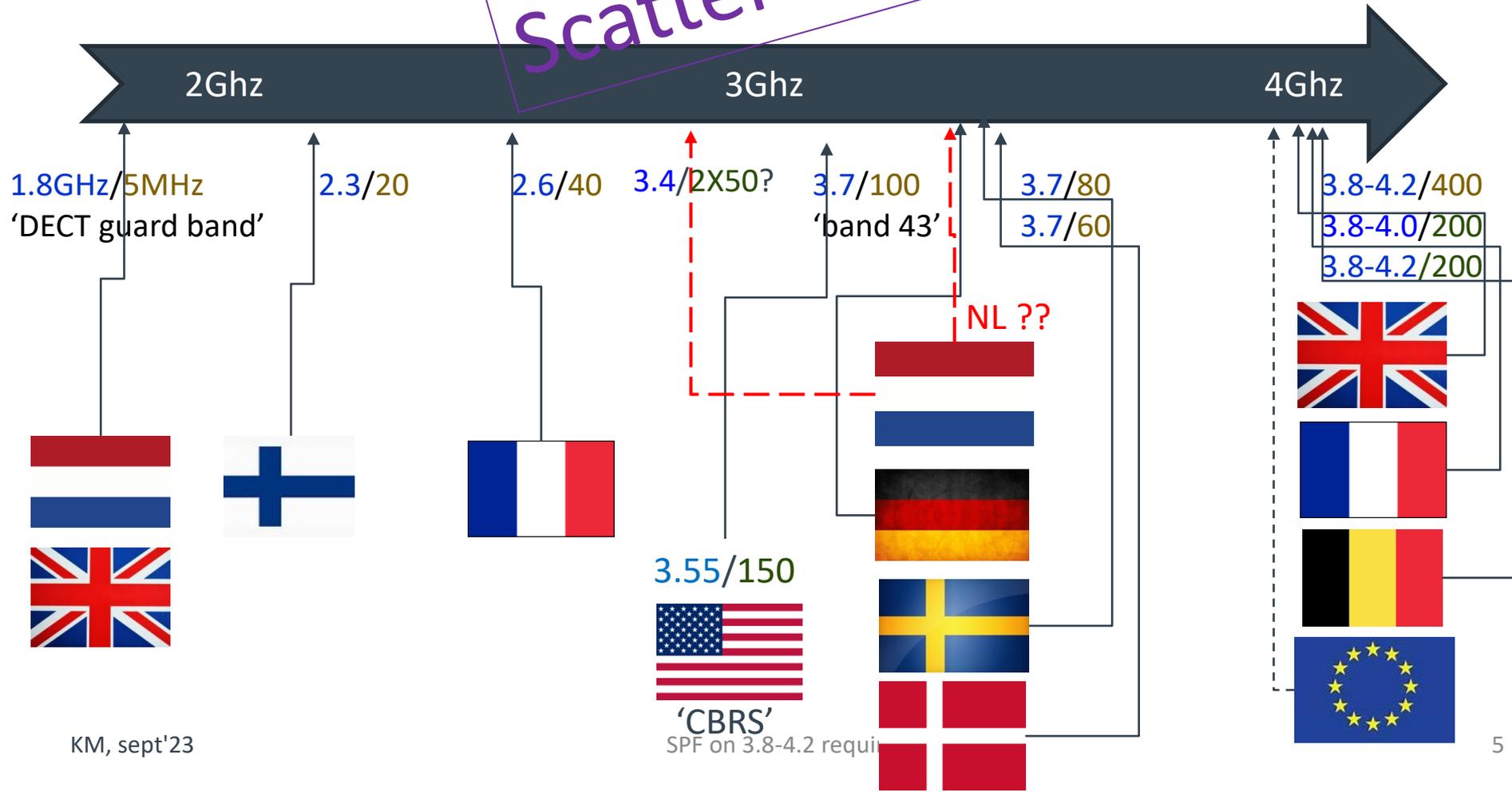


Key requirement : spectrum

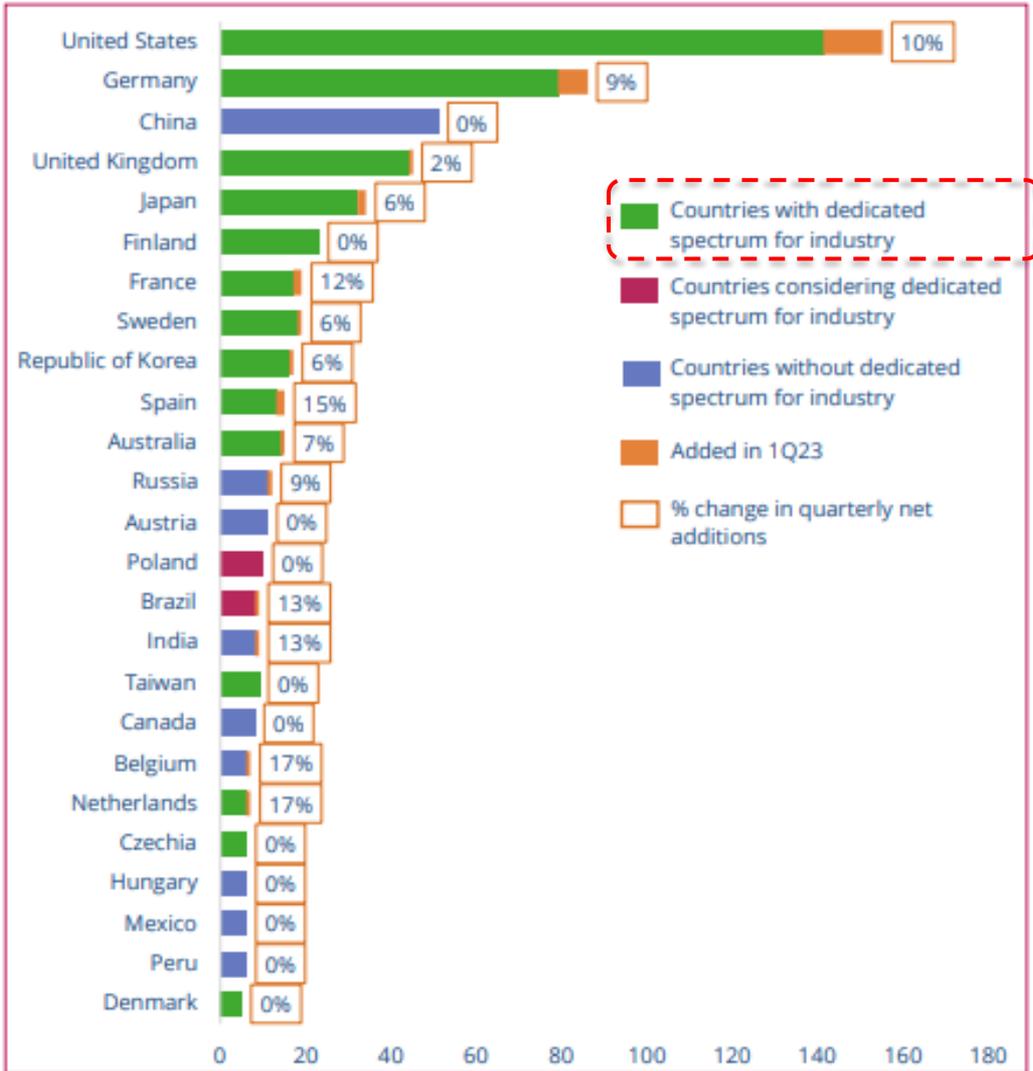
Spectrum allocations private wireless:

(band in Ghz/bandwidth in Mhz)

Scattered and inconsistent



Private spectrum availability inherently leads to deployment



Spectrum availability entices deployment and automation

Typical vertical: Mainports

Mainports NW Europe with private wireless roll out

- airports
- seaports
- Mainports NL



Kemi, Oulu, Helsinki, Kokkola

Glasgow

Hamburg

Lufthansa @ Hamburg

Belfast

North Sea

Schiphol*

UNITED KINGDOM NETHERLANDS

ECT
RWG

Felixstowe

Heathrow

Bristol

Southampton

Zeebrugge

Antwerpen

Zaventem

Le Havre

HaRoPa

AdP

FraPort

* Schiphol private wireless Tetra replacement by MNO + trial private 5G



Aeroports de Paris / operator 'HubOne'

- 1st LTE pilots already in 2014 !
- At present 2 networks;
 - 2 cores: 1 Air France, 1 HubOne
 - Yet on 1 shared RAN...!
- QoS implemented
- 40Mhz 2.6 TDD spectrum
- Current private network at Paris airport:



HUB ONE PRIVATE 4G/5G NETWORK – FEW FIGURES

50 km²

Outdoor coverage

21

Macro cellular sites

95

Small Cells for
turnaround operations

1.8M m²

Indoor coverage with
DAS and small cells

120 000

Workers on 3 airport
platforms

1 500

Enterprises working
in 3 airports



27/03/2023



- For **all operational processes**
- Now expanding their services to other transport/logistics markets in France

Operational processes at an airport; aircraft turnaround = 100+ process. All private 5G candidates !

DEFENCE AND SPACE

Turnaround Complexity

PASSENGER SERVICES

- Departure
- Arrival
- Inter-modal Transportation by Rail, Road or Sea

RAMP SERVICES

- Baggage Handling
- Marshalling
- Parking
- Ancillary Items
- Ramp to Flight Deck Communication
- Loading and Unloading
- Safety Measures
- Moving of Aircraft
- Cleaning Exterior/Interior
- Water/Toilet Service
- Cabin Equipment
- Storage of Cabin Material
- Catering Ramp Handling
- De-Icing/Anti-Icing Services

SECURITY

- Passenger and Baggage
- Screening and Reconciliation
- Cargo and Post Office Mail
- Catering
- Ramp
- Additional Security Services

MANAGING FUNCTIONS

- Representation
- Administrative Functions
- Supervision and/or Coordination
- Station Management)



AIRCRAFT MAINTENANCE

- Routine Services
- Replenishing of Oils and Fluids
- Non-routine Services
- Material Handling
- Parking and Hangar Space

CARGO & MAIL WAREHOUSE SERVICES

- Cargo and Mail Handling
- General
- Customs Control
- Documentation Handling
- Physical Handling Outbound/Inbound
- Transfer/Transit Cargo
- Post Office Mail

SUPPORT SERVICES

- Accommodation
- Automation/Computer Systems
- Unit Load Device (ULD) Control
- Fuel Farm (Depot)
- Ramp Fueling/Defuelling Operations
- Surface Transport
- Catering Services
- Liaison and Administration

LOAD CONTROL, COMMUNICATIONS AND FLIGHT OPERATIONS

- Load Control
- Communications
- Flight Operations
- Crew Administration

AIRBUS

Showcase Netherlands: Well known example private LTE in port Rotterdam: ECT container terminal (largest in EU)



400+ (!) cranes, AGV's and straddle carriers steered over private LTE



Druid core, Airspan radio's
Extremely critical KPI's:

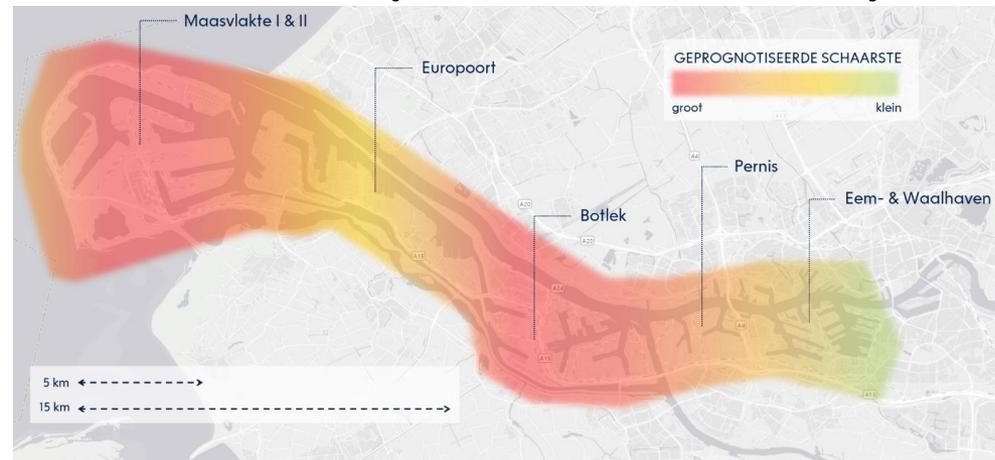
- 365 X 24 availability
- Latency and many 9's

Port of Rotterdam concentration of prospect users => emerging user requirements

- 5 container terminals; 2 already with private LTE + 1 WiFi:
+ Container Exchange Route with AGV's over 5G
=> spectrum runs out



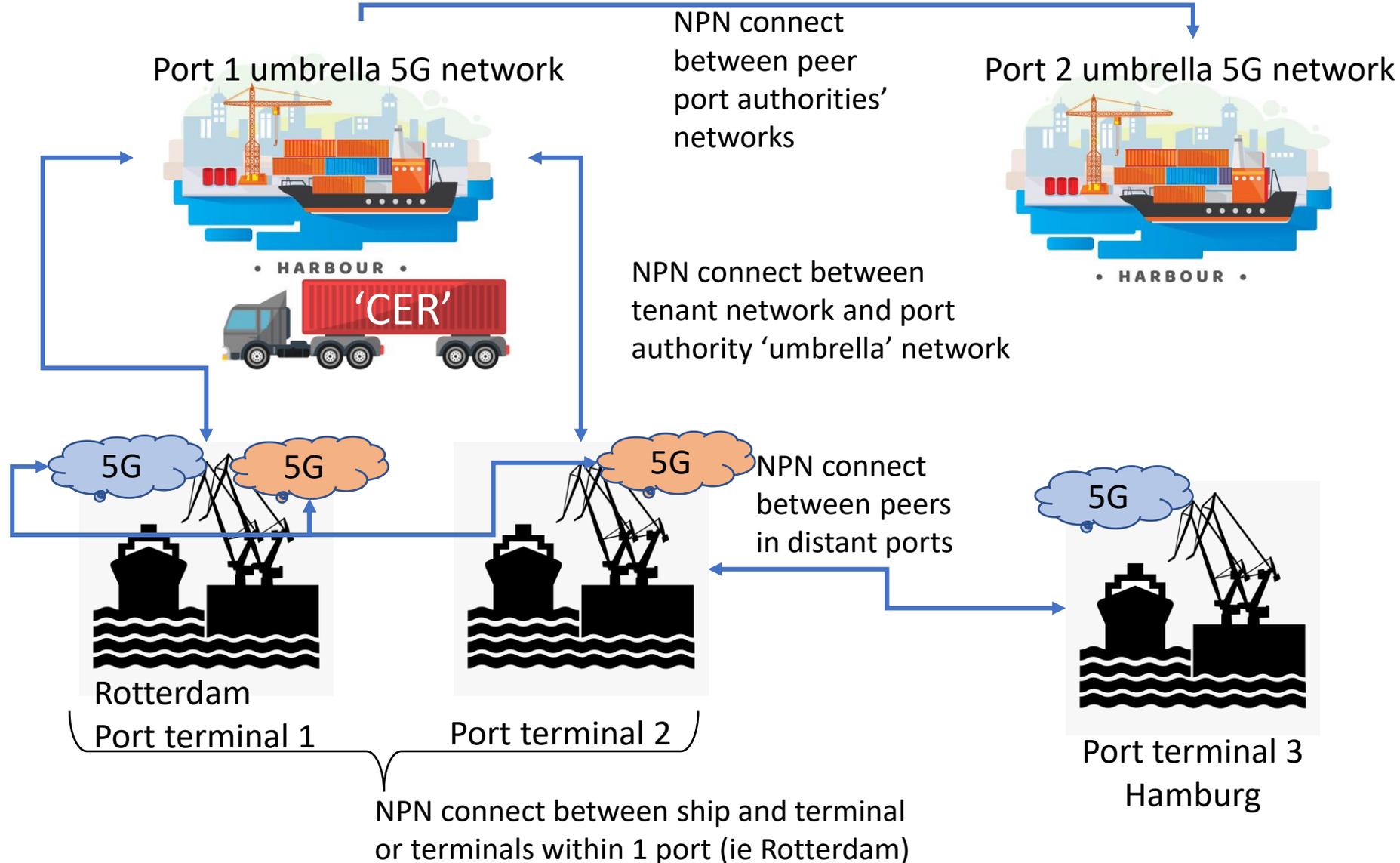
- 3000 port occupants !=> Potential spectrum scarcity :
=> inevitable role to play for port owner ...



More scarcity of spectrum in process industries:
28 of them densely packed

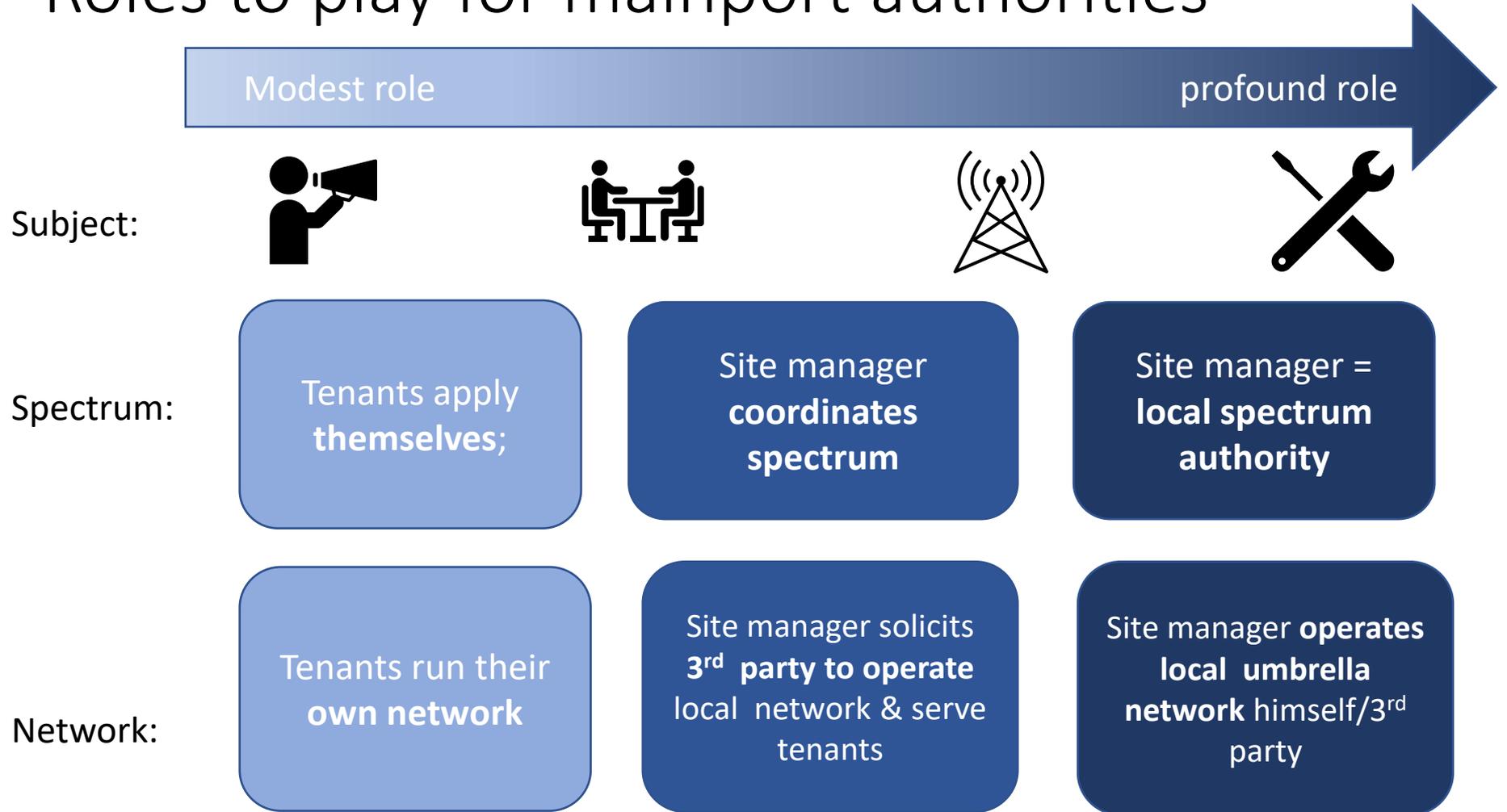


NPN interconnects between individual terminals with private 5G and overall port networks



Many adjacent networks =>

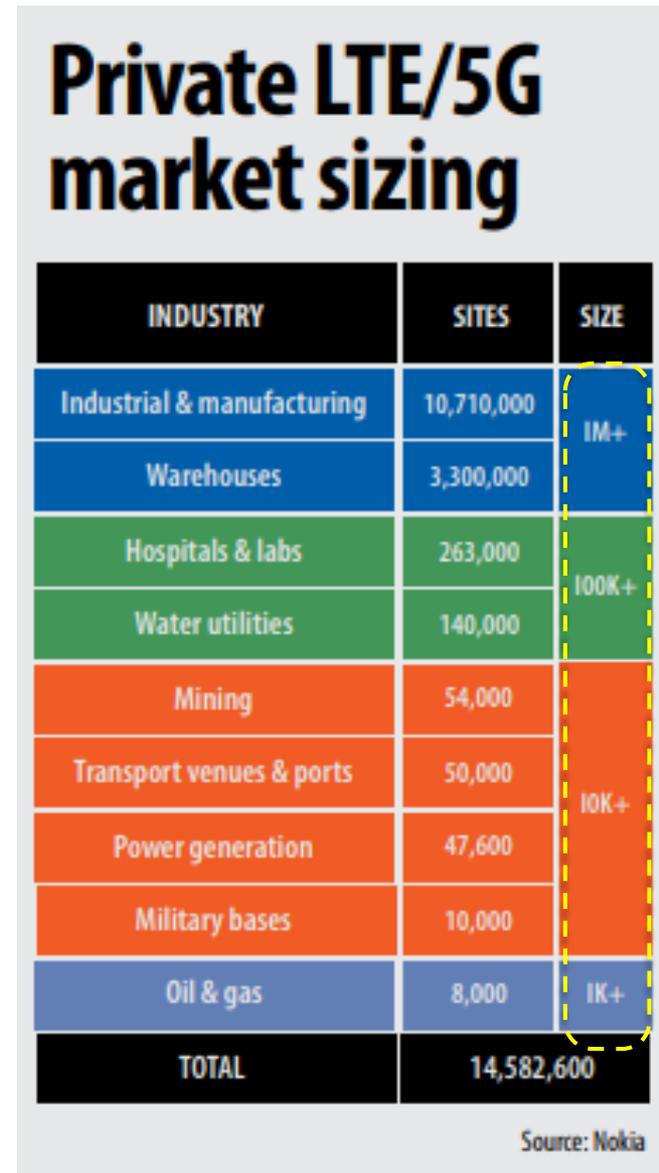
Roles to play for mainport authorities



Market size projections by tier 1 vendor

All sectors and verticals

- Of the 3 major wireless vendor, Nokia is most prone to private wireless
- Nokia predicts the following addressable market globally for the next few years: =>



Acceleration of enterprise private wireless applications

- Embryonic market, acceleration still in progress
 - Some 1000's of systems | Growth figures in 10's %/yr
 - **Industry automation enabler**
 - Manufacture, mainports, utilities
- Very diverse applications and verticals;
 - **Tailored KPI's and SLA's**
 - Adjacent & interconnected networks, **role landlords**
- Affordable, easy to acquire, **harmonised spectrum** !!
- Users **aggregation** through EUWENA, SPF and others

