



# Why Private 5G Networks Matter to Vertical Industries

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## 5G – From B2C to B2B



5G



Images: Bosch

Only local connectivity needed, but with special requirements and constraints

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## Why 5G is more than just another ,G‘

	1G – 4G	5G
<b>Main focus</b>	Phones / people	IoT verticals
<b>Main KPIs<sup>1</sup></b>	Voice quality, data rate	URLLC <sup>2</sup> , mMTC <sup>3</sup> , eMBB <sup>4</sup>
<b>Coverage need</b>	Nation-wide	Often only local
<b>What matters most</b>	Coverage	Dependability
<b>Business</b>	B2C	B2B
<b>Outage criticality</b>	Annoying	Business-critical
<b>Key success factor</b>	Marketing	Vertical know-how

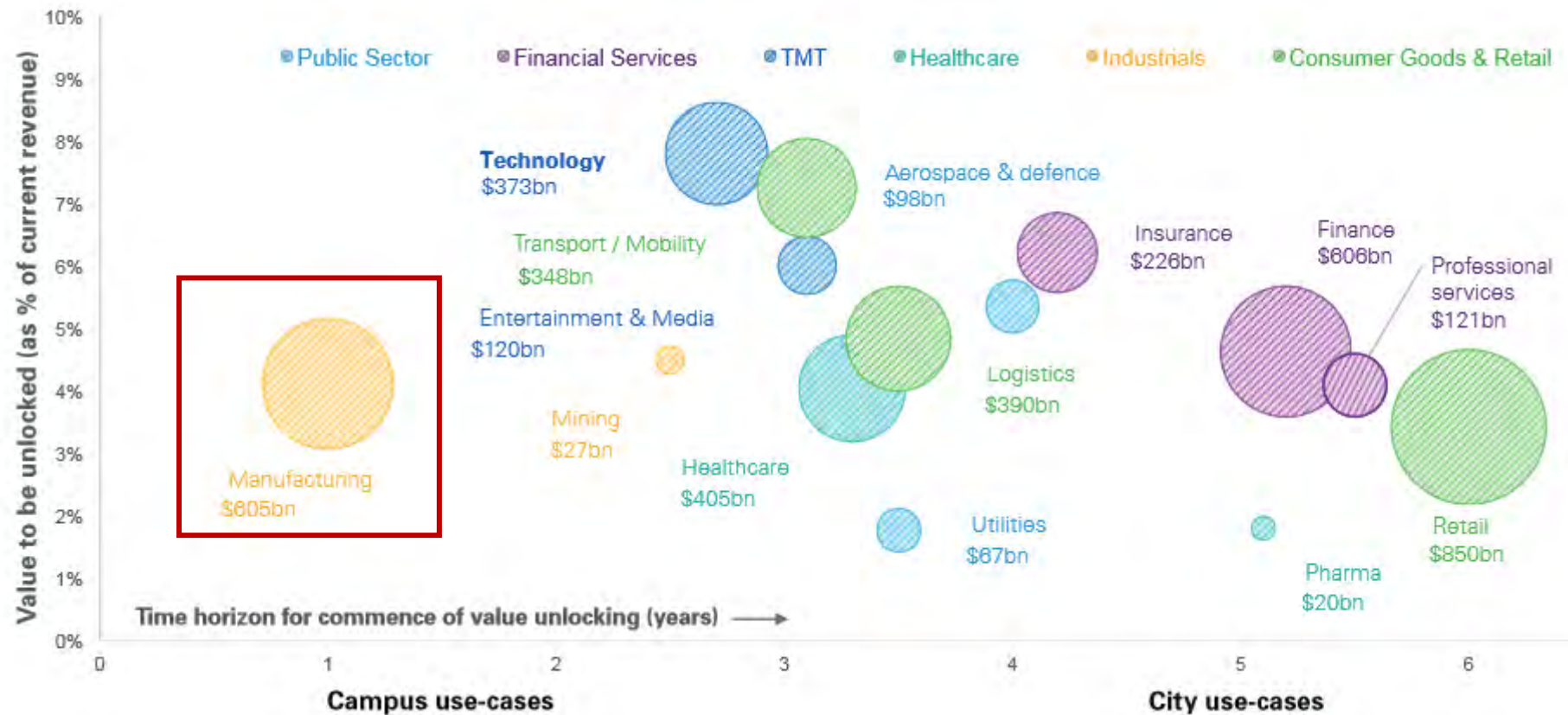
## 5G as a revolution rather than an evolution



**We should fundamentally question the entire current ecosystem and value chain**

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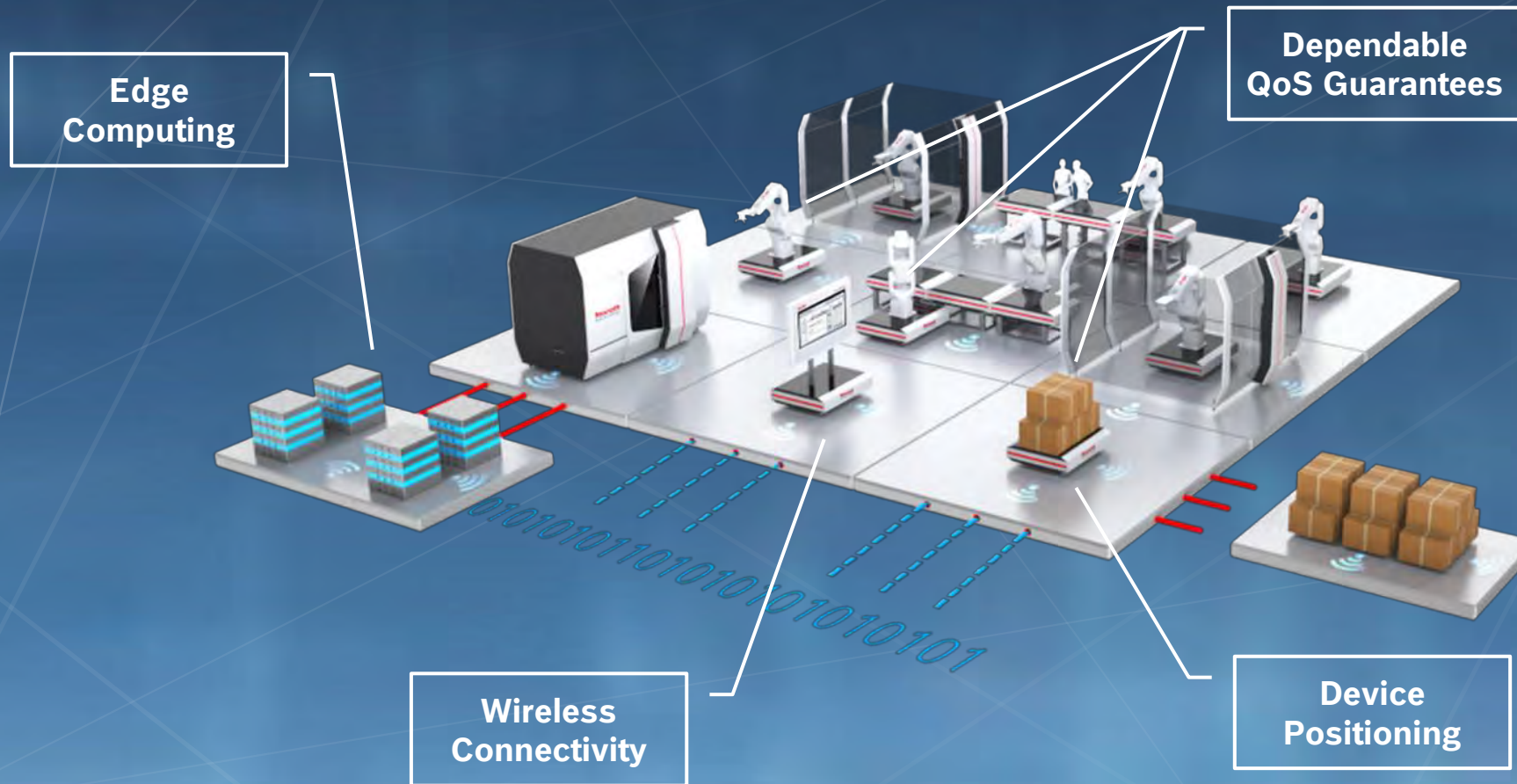
## Value to be unlocked by 5G in different vertical domains



Source: KPMG, "Unlocking the benefits of 5G for enterprise customers", 2019



# Example: 5G as the **Central Nervous System** of the Factory of the Future



# Why Private 5G Networks Matter to Vertical Industries

## Selected Industrial 5G Use Cases



**Mobile & Portable Assets**



**Moving & Rotating Parts**



**Human-Machine Interaction**



**Wireless Sensors**



**Positioning & Tracking**



**Modular Production**



**Retrofit Solutions**



**5G** =  
**one-size-fits-all solution  
+ future-proof  
innovation platform**

# Why Private 5G Networks Matter to Vertical Industries

## Major Concerns of Vertical Industries

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### Security

Keep full control of data, equipment and personnel

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### Performance

Optimally configure network as needed

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### Business

No lock-in + healthy competition w/ optimized solutions

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### Independence

Freedom to act where, when and how needed

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### Accountability

Root-cause analysis and liability in case of failures

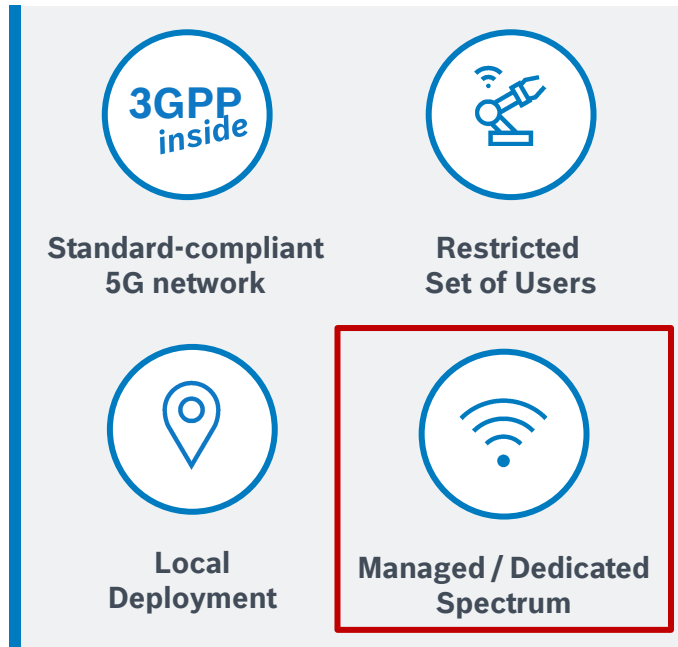
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# Why Private 5G Networks Matter to Vertical Industries

## Private / Non-Public / Campus Networks



**Private 5G networks trigger a lot of innovation & strengthen competition**



# Why Private 5G Networks Matter to Vertical Industries

## Different Flavors of Private Networks



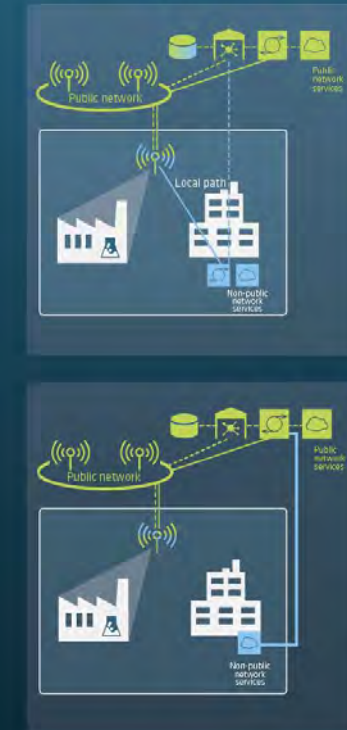
Example 1: Standalone Non-Public Network



Example 2: Shared Radio Access Network



Further Options



**Vertical users suddenly have a choice – regulatory changes drive major changes in the ecosystem**

# Why Private 5G Networks Matter to Vertical Industries

## Local 5G Spectrum Licenses in Germany



**3.7 – 3.8 GHz**

**Fee [€] = 1000 + B [MHz] \* t [years] \* 5 \* (6a<sub>1</sub> [km<sup>2</sup>] + a<sub>2</sub> [km<sup>2</sup>])**  
→ a<sub>1</sub>: populated areas, a<sub>2</sub>: rural areas

**24.25 – 27.5 GHz**

**Fee [€] = 1000 + B [MHz] \* t [years] \* 0.63 \* (6a<sub>1</sub> [km<sup>2</sup>] + a<sub>2</sub> [km<sup>2</sup>])**  
→ a<sub>1</sub>: populated areas, a<sub>2</sub>: rural areas

### Lessons Learned

Reasonable costs

Unbureaucratic  
application procedure

Quick processing of  
the license application

No deep expert  
knowledge required



**Very good framework  
from BNetzA and brave  
step into the right  
direction 😊**

### Bosch starts 5G campus network

November 27, 2020 // By Nick Flaherty

0 Comments



Bosch is putting its first 5G campus network into operation at its Industry 4.0 lead plant in Stuttgart-Feuerbach.



## Bosch 5G Campus Network in Stuttgart, Germany



### A central 5G testbed for Bosch:

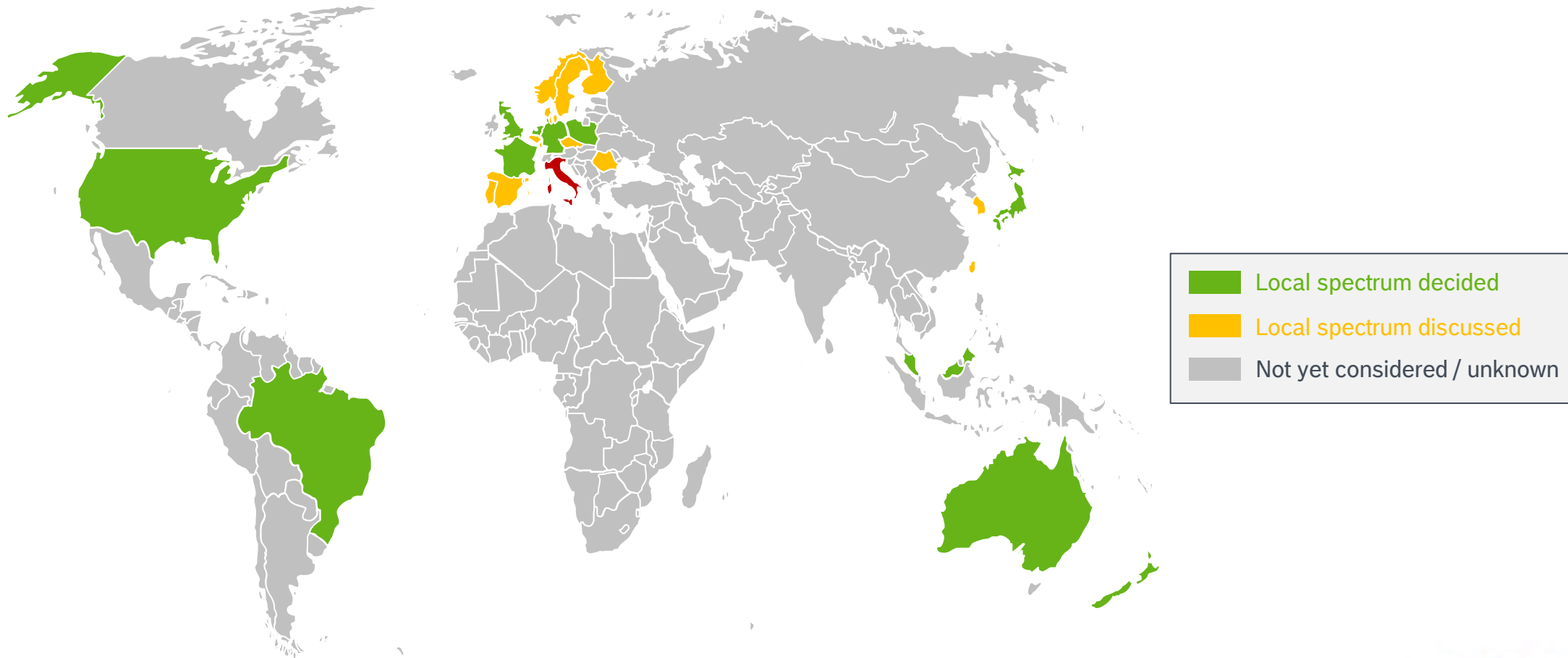
- Extensive performance evaluation and validation in real-world environment
- Basis for proof-of-concept / prototype development and testing
- Validation of concepts and approaches for secure integration of 5G into existing IT infrastructure





# Why Private 5G Networks Matter to Vertical Industries

## Global Regulatory Situation



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## Key Aspects for a Successful Private Spectrum Strategy

- ▶ **Sufficient bandwidth**, supporting multiple & diverse use cases at the same time
- ▶ Private spectrum should be in one of the **standard frequency bands**
- ▶ **Globally harmonized** / similar bands for local spectrum allocations
- ▶ **mmWave** spectrum (e.g. 26 / 28 GHz) alone is **not sufficient**

### Local spectrum generally will trigger a lot of innovation & competition

- ▶ Emergence of **new micro-operators**, focussing on certain vertical applications
- ▶ Emergence of **new infrastructure vendors**, offering optimized equipment for vertical / enterprise applications
- ▶ Existing mobile network operators in markets with local spectrum adjust their **business models** to better serve enterprise customers
- ▶ Private spectrum will have **leverage effects** by strengthening vertical industries in global competition



„We have come to stay 😊!“



**BOSCH**

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