

APDC

WEBINAR

O FUTURO COM 5G NA
INDÚSTRIA

15 OCTOBER, BOSCH OVAR





O futuro
com

5G



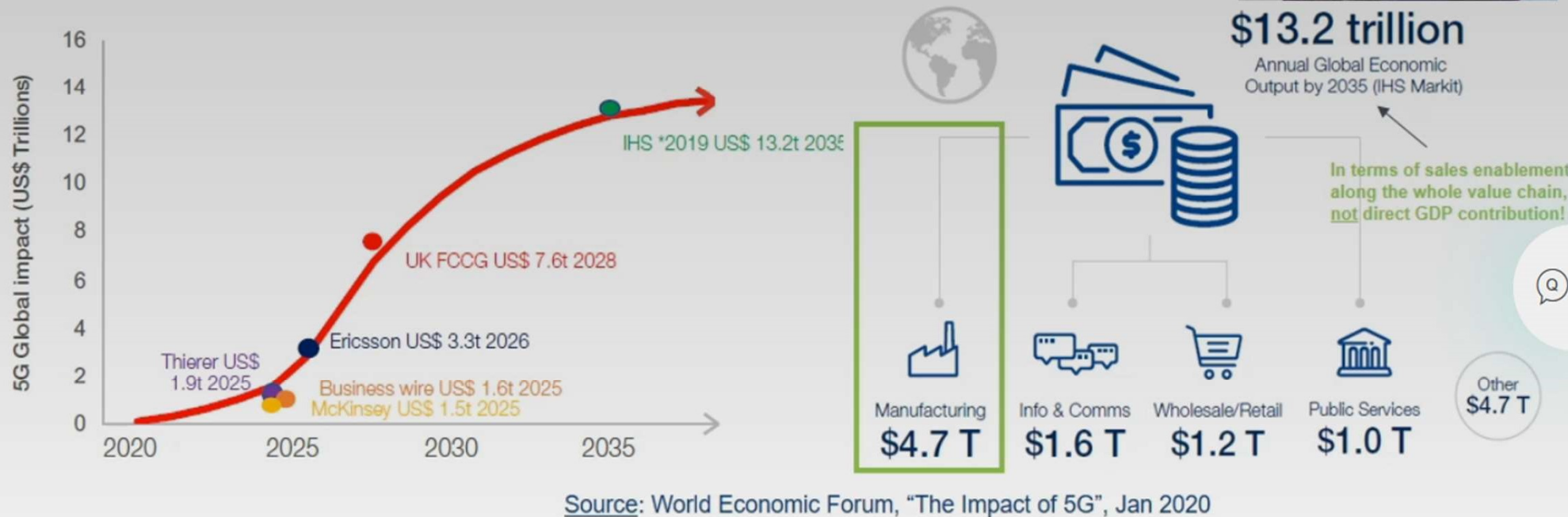
na Indústria

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Economic Impact of 5G

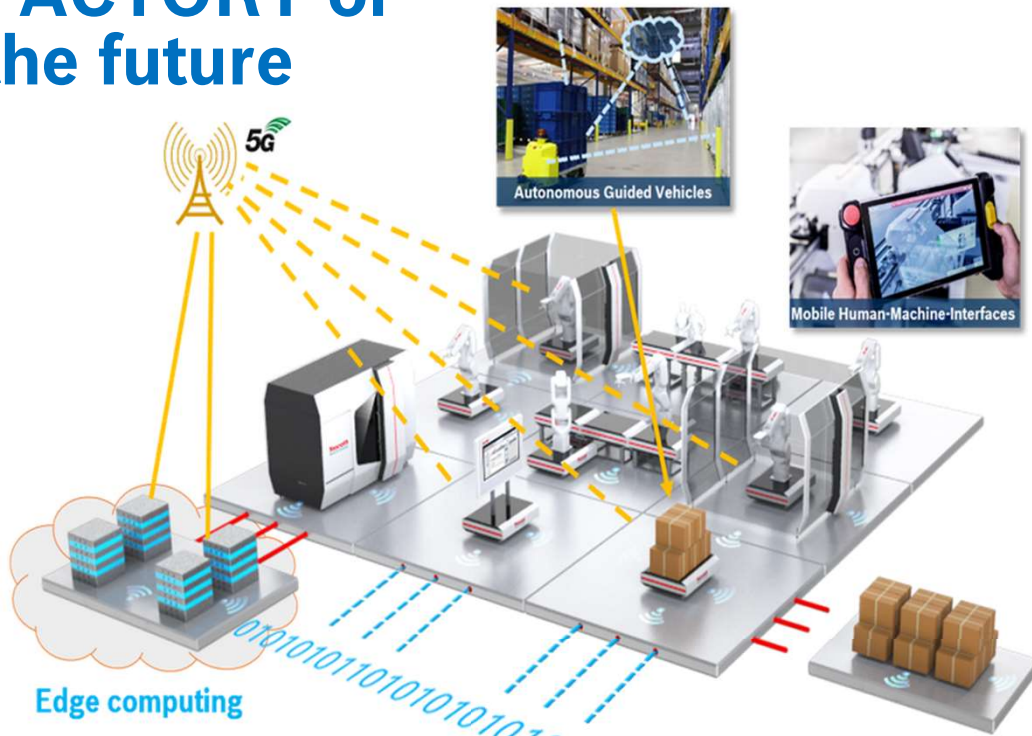


Value to unlocked by 5G in manufacturing: > 600 bn USD (KPMG, 2019)

Market for 5G cellular connections in manufacturing to reach 10.8 bn USD by 2030 (ABI Research, 2020)

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FACTORY of the future



5G benefits along 3 lines:

+ Real time

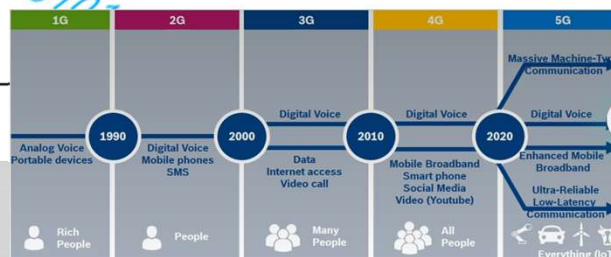
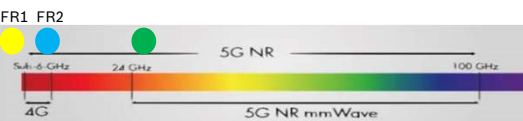
++ Faster connectivity

+++ Massive connectivity

+ > > 5G for industry

5G - FACTS AND FIGURES

	CONNECTION DENSITY: 1.000 – 1 million devices/km ²		LATENCY: 1 – 10 ms
	AVAILABILITY: > 99.99%		POSITION ACCURACY: < 1m-10m
	DATA RATE (Peak): 20Gb/s		DATA RATE (Peak): 10Gb/s

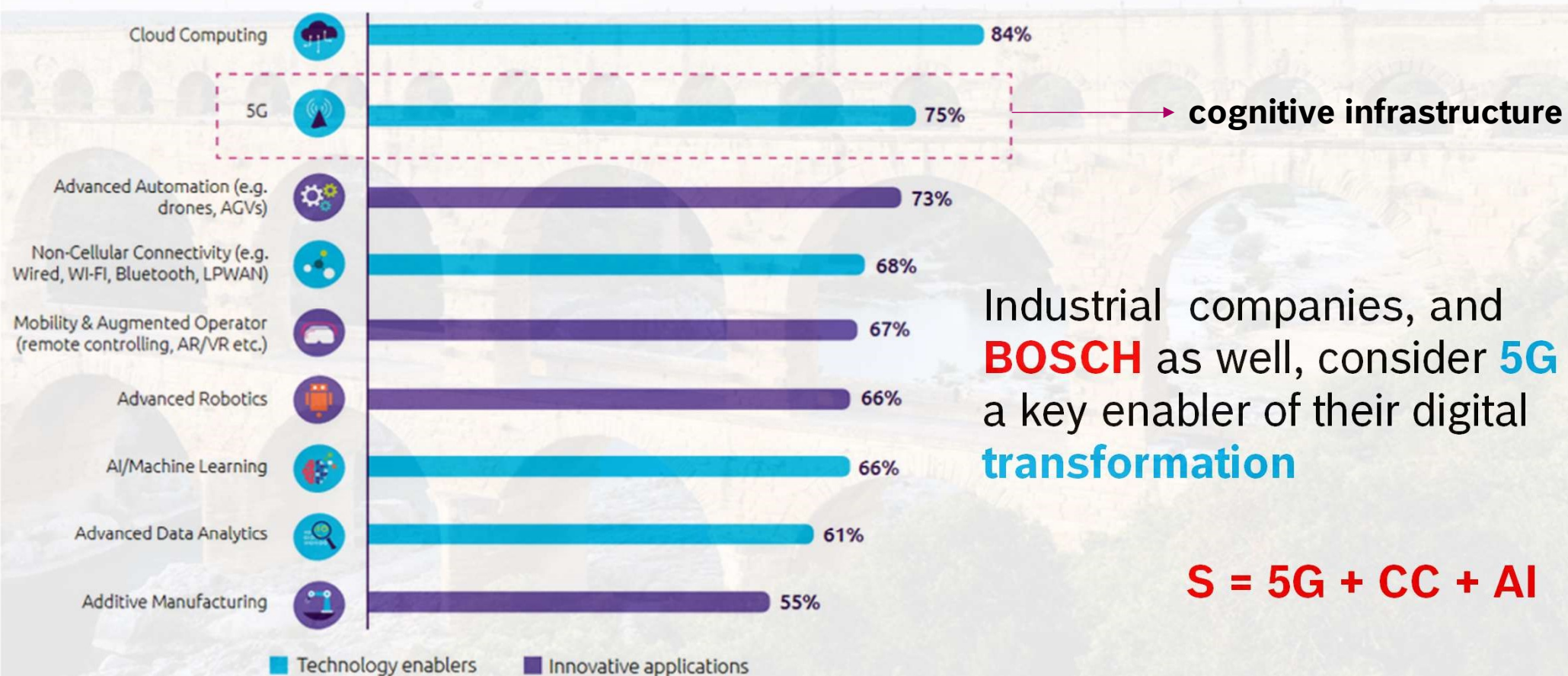


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cognitive infrastructure

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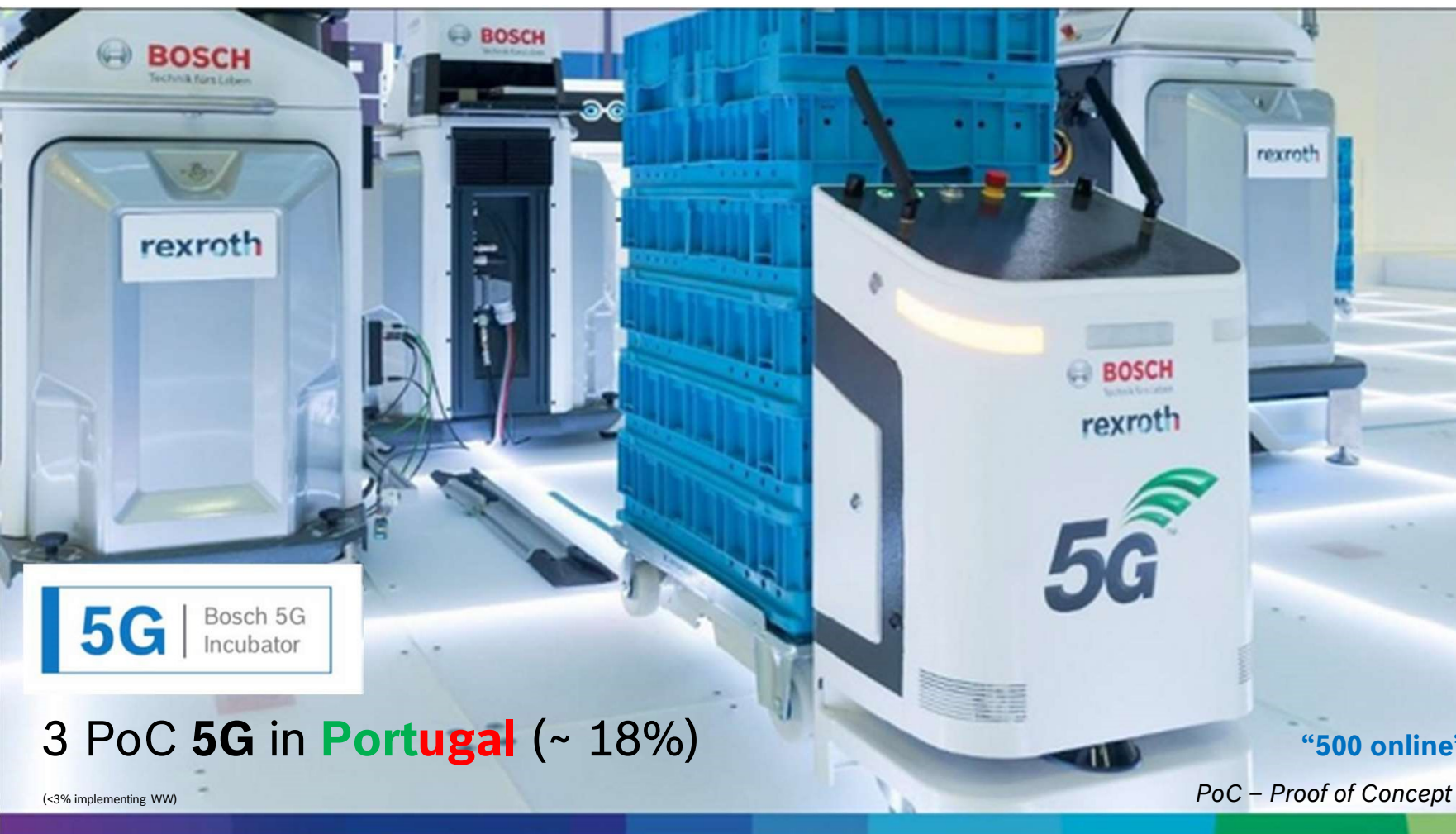


Industrial companies, and **BOSCH** as well, consider **5G** a key enabler of their digital **transformation**

$$S = 5G + CC + AI$$

Source: Capgemini Research Institute, Industrial companies' survey on 5G, March–April 2019, N=806 industrial companies.

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5G | Bosch 5G Incubator

3 PoC **5G** in **Portugal** (~ 18%)

(<3% implementing WW)

“500 online”

PoC – Proof of Concept

- 01_PoC_5G_Feuerbach
- 02_PoC_5G_Blaichach
- 03_PoC_5G_Reutlingen
- 04_PoC_5G_Worcester
- 05_PoC_5G_Ansbach
- 06_PoC_5G_Dresden
- 07_PoC_5G_Suzhou
- 08_PoC_5G_Amata_City
- 09_PoC_5G_Giengen
- 10_PoC_5G_Xian
- 11_PoC_5G_Hatvan
- 12_PoC_5G_Aveiro
- **13_PoC_5G_Ovar**
- 14_PoC_5G_Castellet
- 15_PoC_5G_Changsha
- 16_PoC_5G_Braga
- 17_PoC_5G_Suzhou
- 18_PoC_5G_Wujin

PoC

Sensitive Industry
Video (4K/8K)
anality

Remote Operations
Training
Maintenance
AR/VR

Predictive Preventive Maintenance

LEAN and clever Layout and Testing

AI enabled in remote control and motion (AGVs, Robots)

2020

2024

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Overview of Industrial Wireless Applications

Create from template

Title	Title	Technology	Description
D) Connected AGV	Connected AGV + Indoor SLAM	5G	Interconnect AGVs via 5G and enable real-time, remote control and distributed SLAM (simultaneous location and mapping).
C) SmartCam	SmartCam at the Edge	5G	Cameras are deployed throughout the factory with central image processing in the edge cloud.
B) Edge PLC	Edge PLC, Edge Controller (On-premise cloud controller)	5G	The controller is removed from the shop floor and runs as a virtualized function (virtual machine or container) in a data center inside the factory, e.g. an edge cloud.
A) HMI Tablet	Wireless HMI Control Panel	5G	Wireless panel for controlling machines including safety applications. Used to replace wired control interfaces mounted onto each machine.



PoC

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5G Implementation on the shop floor – Bosch Ovar

PoC

Understanding the 5G technology

What:

- Active / flexible layout
- Investment reduction

How: Using wireless (5G) test bays running at least 70 testing cameras simultaneously, with 4k video streams and 0,1 degrees movement, and allocate the test routines on a backend server

Why: Create flexibility , reduce costs and boost simultaneous engineering:

