5G & IoT business potentials

Ammar Sabbagh
Head of Technology & IOT
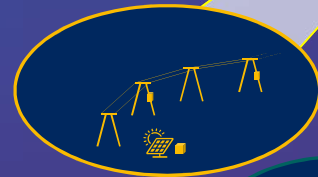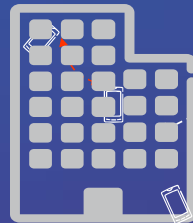
2019-08-27

WHY 5G IS CRITICAL THE DEVELOPMENT OF SMART CITIES

"Beam mobility"
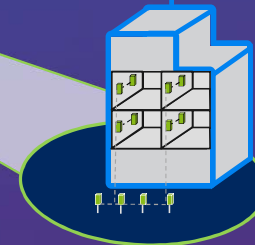Mobility between beams rather than nodes

Mobile Edge Computing & security

Ultra-dense Deployments 1 million devices

Fixed Wireless Broadband

Ultra-reliable Communication 1MS vs 50MS

V2V, V2X Communication

Network slicing

Capillary Networks
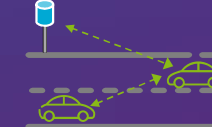
Cellular IoT evolution and segments

Commercial – Growth   Early pilots & standardization

Massive IoT	Broadband IoT	Critical IoT	Industrial Automation IoT

One network – multiple use cases and industries

Smart Metering	Fleet Management	VR/AR	Traffic Safety & Control	Collaborative robotics
Asset management	Drones/UAV	Automotive C-ITS	Smart Grid Automation	Advanced Automation & Control

Low cost devices, low energy Small data volumes Massive numbers NB-IoT/Cat-M1 (LTE and NR)	High throughput Low latency Large data volume LTE + NR	Ultra reliability Ultra low latency Very high availability NR	Industrial protocols Time sensitive networks Precise indoor positioning NR

5G Business Opportunity

Massive Machine
Type Communication

Critical Machine Type
Communication

Fixed Wireless
Access

5G Business Opportunity

Massive Machine Type Communication

Critical Machine Type Communication

$ 200-600 b
Industrial digitalization

Enhanced Mobile Broadband

$ 950-1,100 b
Capacity
cost per bit
performance

$ 50-100 b
Underserved
home & SME
markets

Fixed Wireless Access

5G Business Opportunity phases

5G Opportunities

Fixed Wireless

"Quad Play"
Opportunity

Mobile Broadband

New Consumer
Apps AR/VR

5G-Enabled Cloud

Intelligent Edge/MEC
Industrial Automation

Effective Manufacturing of Bladed Disks

Case: 5G monitored manufacturing of jet engine components

The challenge

Ensuring maximum quality and monitoring production to avoid costly and energy heavy rework and life-threatening faulty components

The technology

Real-time monitoring and control of bladed disks for jet engine turbines enabled through 5G

The results

— Annual savings of 360 MEuro
— 16 M metric tons savings[1] of CO_2

Partners:

ERICSSON

Fraunhofer
IPT

[1] assuming 2% more efficient jet engines resulting from higher-quality BLISKs

Connected mines

Case: Pilot for Industrial Mobile Communication in Mining, Sweden

The challenge
Use of cellular for increased productivity and improved safety in mining applications.

Technology used
5G, IoT, cloud processing, Automated Guided Vehicles (AGV)

Expected or delivered results
Increased productivity and Improved Safety
Industrial 5G requirements
Understand eco system, business models, etc.

Partners:

TeliaSonera · VINNOVA · VOLVO · SWEDISH ICT · SICS · ABB · NEW BOLIDEN · ERICSSON · LULEÅ TEKNISKA UNIVERSITET · WOLFIT · PiiA PROCESS INDUSTRIAL IT AND AUTOMATION

Port of the Future

Activity part of the H2020 COREALIS project

The challenge
Increase the port
capacity and safety with
a positive environmental
and societal footprint:
ports in the future era.

Technology used
4G/5G, IoT, Augmented
Reality

Expected or delivered results
Enable, through a 5G network planned to operate in
the port of Livorno area, augmented reality
applications for improving efficiency and safety in
goods handling in the port area.

Porti di Livorno, Piombino,
Capraia Isola, Portoferraio,
Rio Marina, Cavo

cnit

COREALIS
THE PORT OF THE FUTURE

Search & Rescue Public Safety

Case: WARA-Public Safety

The challenge
Coordinating the resources in a search & rescue scenario autonomously.

Technology used
Positioning, autonomous drones and boats, sensor fusion, command & control, reliable communication, distributed cloud

WARA-PS:
Public Safety / Search and Rescue

Partners:
Swedish universities in WASP, SAAB, Ericsson, Axis Communication.

Industry 4.0 collaborations

5G Enabled Manufacturing
— Gothenburg ER
— Manufacturing operations
— Connected machine, Dots, 5G Core, Cloud Services

Connected Production
— 5G lab and cloud
— P-Labs in Gaimersheim robots

Industrial Mobile
— Industrial 5G/ LTE
— Industrial IoT
— Precise Localization

5G Industry 4.o Lab
— Vasteras ER
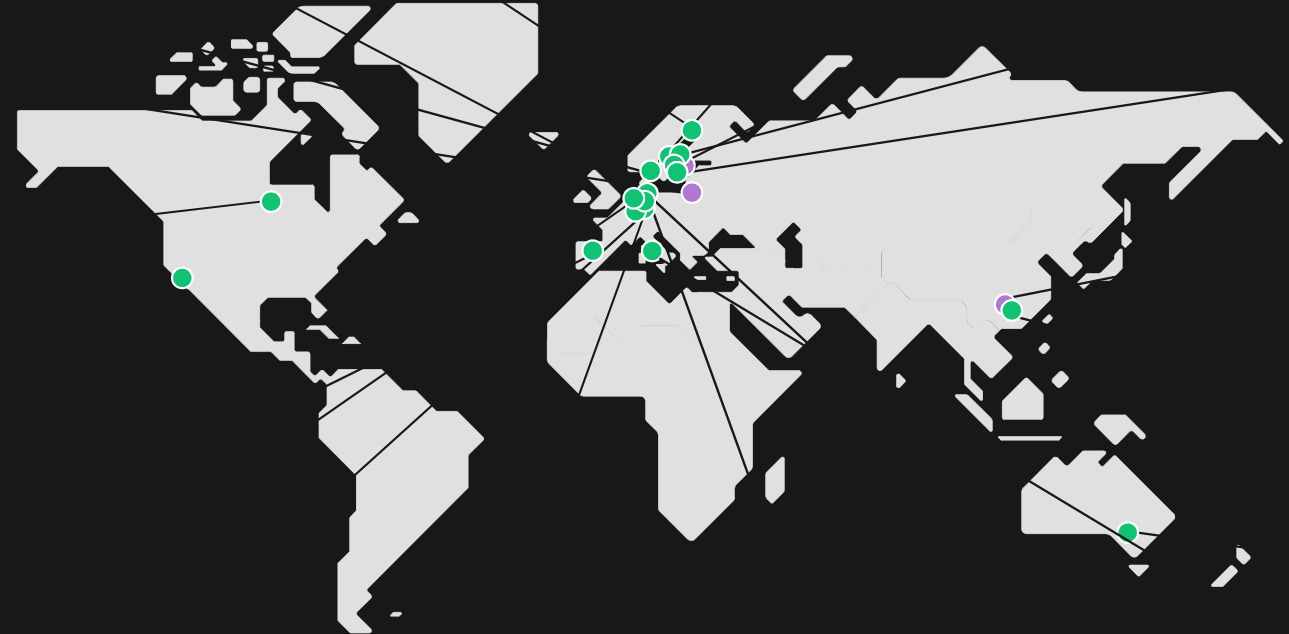— Robot remote control
— Haptic feedback

5G Factory
— Kista, Supply
— Test facility filter 5G
— Experience opportunity

Smart Production lab
— Industry Connect testing
— Ecosystem development

Ericsson Manufacturing
— Tallinn, Supply
— Radio manufacturing
— VR/ AR tests

Industry 4.0 tran
— ÅF partnership to address SME and SI for industry 4.0

Connected Mine
— Dedicated industrial network for mine

Ericsson Manufacturing
— Naijing, Supply
— Radio manufacturing
— Automation/ robotics

5GI2
— Santa Clara, USA
— 5G & Edge Computing

NB IoT and Predictive
— Nanjing
— China mobile
— Connected Screwdrivers

Industry 4.0 private NW
— Telefonica global address industries with private networks

Connected Mine
— Telstra Australia
— Enabling small scale network and capability

Fieldlab Campione
— Rijen
— Condition Based Maintainance

Industry 4.0 Lab
— Aachen
— EV Vehicles
— Radio, Core
— 10,000 visitors/year

Coordinated Industry Communication
— Aachen ER
— Low latency & high reliability

Campus Network
— DT, Ericsson & Osram
— Connect AGVs with dedicated networks

Automotive production
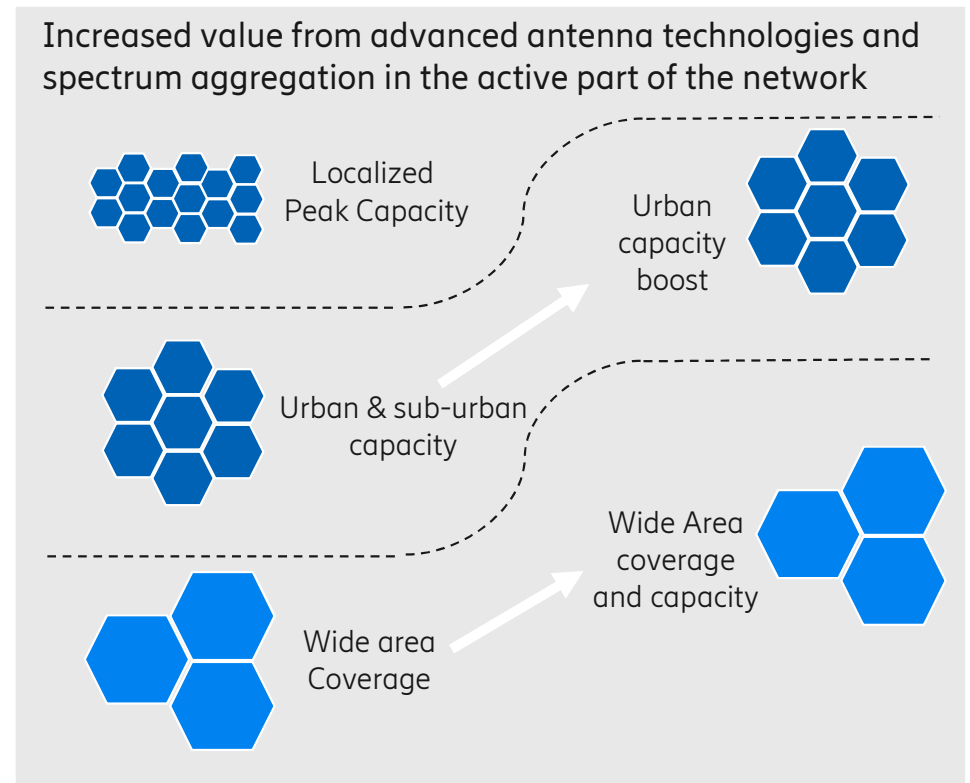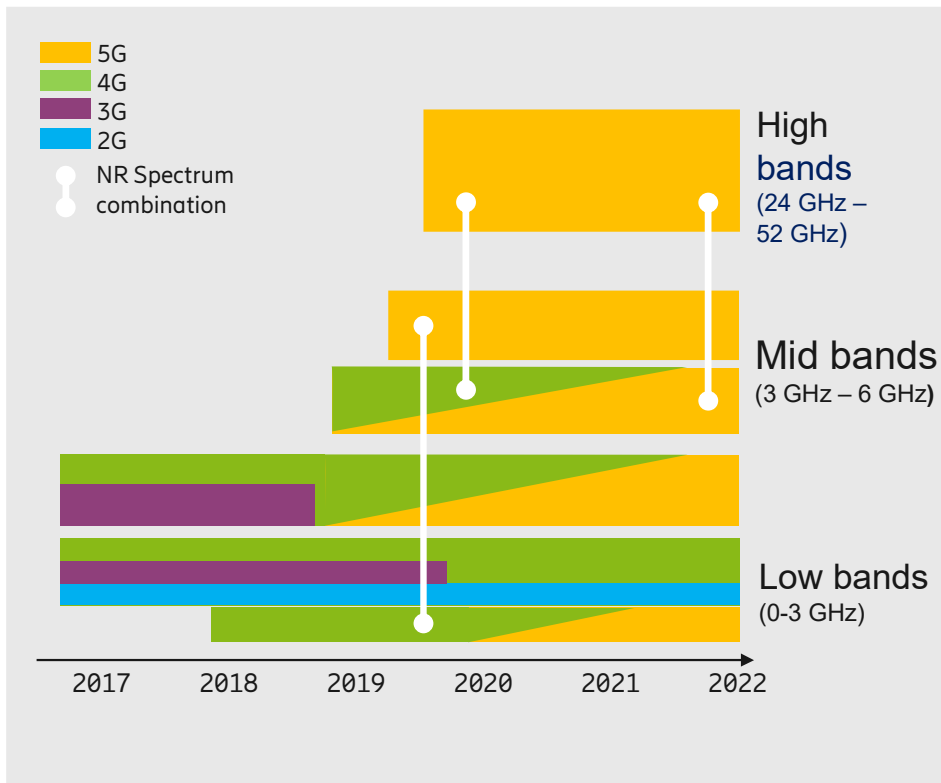— eGo factory Germany being connected with dedicated network

Smart Manufacturing
— Italy, ER
— 5G for Europe
— Lab testing

● Ericsson Proof of Concept activities   ● Ericsson Production Plants

Spectrum usage overview

Legend:
- 5G (yellow)
- 4G (green)
- 3G (purple)
- 2G (light blue)
- NR Spectrum combination

High bands (24 GHz – 52 GHz)
Mid bands (3 GHz – 6 GHz)
Low bands (0-3 GHz)

Years: 2017, 2018, 2019, 2020, 2021, 2022

Increased value from advanced antenna technologies and spectrum aggregation in the active part of the network

- Localized Peak Capacity
- Urban & sub-urban capacity → Urban capacity boost
- Wide area Coverage → Wide Area coverage and capacity

Technology neutral spectrum licenses support a rapid deployment of nationwide 5G services

For more information please see 5G Deployment Considerations

Views on the ITU WRC-19 Agenda Item 1.13 for IMT-2020 (5G)

Identification of spectrum for IMT under Agenda Item 1.13 is the most critical task of WRC-19 for the developments of 5G in the millimetre wave (mmW) bands 24.25 − 86.0 GHz

Ericsson strongly supports the identification of the frequency ranges
24.25 − 27.5 GHz, and
37.0 − 43.5 GHz
for IMT with the highest priority

Ericsson supports consideration of an identification for IMT in the ranges
66 − 71 GHz
45.5 − 50.2 GHz, and
50.4 − 52.6 GHz

Ericsson agrees with "no change" (**NOC**) for 31.8 − 33.4 GHz

https://www.ericsson.com/en/5g/what-is-5g