

the next technology business driver



Mobile Market trends



Mobile industry set to reach major milestones to 2025



4G will become the leading mobile network technology in 2019



Internet of Things, 25 billion connection by 2025



Innovation, fast-evolving ecosystem of the digital edge



Artificial intelligence as next frontier

Global Market overview

Unique mobile subscribers



2017
5.0bn



2025
5.9bn



YoY 2017 -2025



Mobile Internet users



2017
3.3bn



2025
5.0bn



YoY 2017 -2025

SIM connections



2017
7.8bn



2025
9.0bn



YoY 2017 -2025

*GSMA

Global Market overview

Smartphones % of connections

2017
57%

2025
77%



Internet of Things



2025
25.1bn



Mobile Operator revenues

2017
1.05tn\$

2025
1.10tn\$



Mobile industry contribution to GDP

2017
3.6tn\$



2022
4.6tn\$

Employment jobs

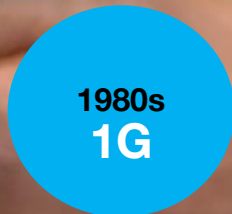
2017
29m



*GSMA

Mobile technology timelines

The next revolution is here



mobile voice



mobile coverage
voice plans



smartphone adoption
data usage
segmented data plans



unlimited voice / SMS
the smartphone is king
same network for all
multi SIM
multi screen
family offers
convergent bundles
Wi-Fi for intensive use



Connectivity
Internet of Things

Business Models
Agility

Technology
Programmability

5G vision & mission



“5G is an end-to-end ecosystem to enable a fully mobile and connected society. It empowers value creation towards customers and partners through existing and emerging use cases, delivered with consistent experience, and enabled by sustainable business models.” *



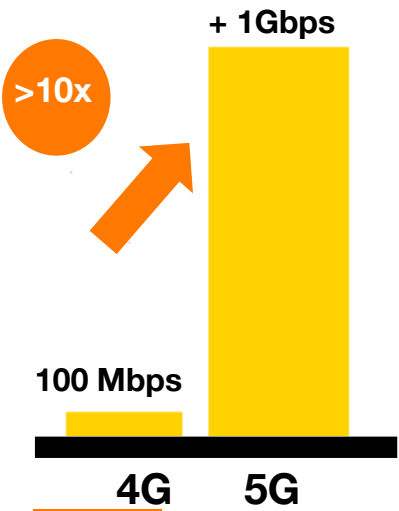
5G is intended to deliver solutions, architectures and techs for the next coming decades with huge potential to revive existing verticals and create new markets such as Smart Cities, e-Health, Intelligent Transport, Education, Agriculture, Media and Entertainment.



5G promises: faster, higher

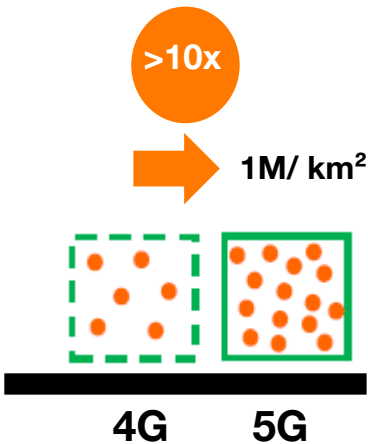
Faster data rate

5G wireless speeds compared with fiber



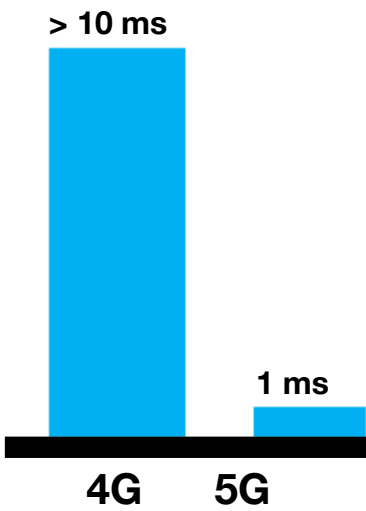
Higher device density

IOT enabler



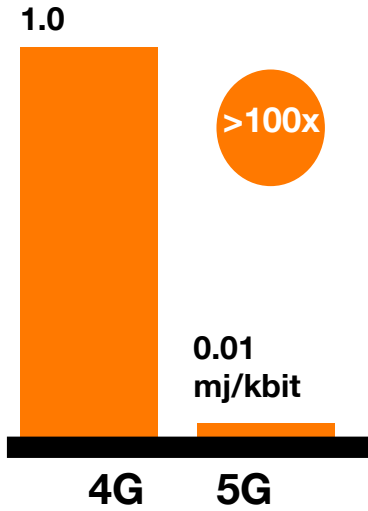
Reduced latency

Real-time application



Lower Energy

Network Efficiency
Network slicing



5G new services panel

High Reliability

**Broadband Access
in Dense Areas**

service availability in
densely-populated areas



**Higher User
Mobility**

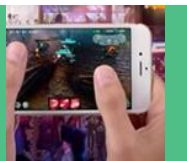
services at speeds
greater than 500km/h



High Capacity

**Broadband Access
Everywhere**

50+ Mbps everywhere
at ultra-low cost



**Ultra-reliable
Communications**

robots control
e-Health



High Speed

**Lifeline
Communications**

natural disasters



**Massive
Internet of Things**

low-cost / long-range
/ low-power



Low Latency

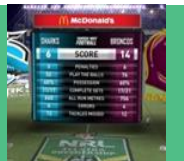
**Extreme Real-Time
Communications**

autonomous driving &
AI

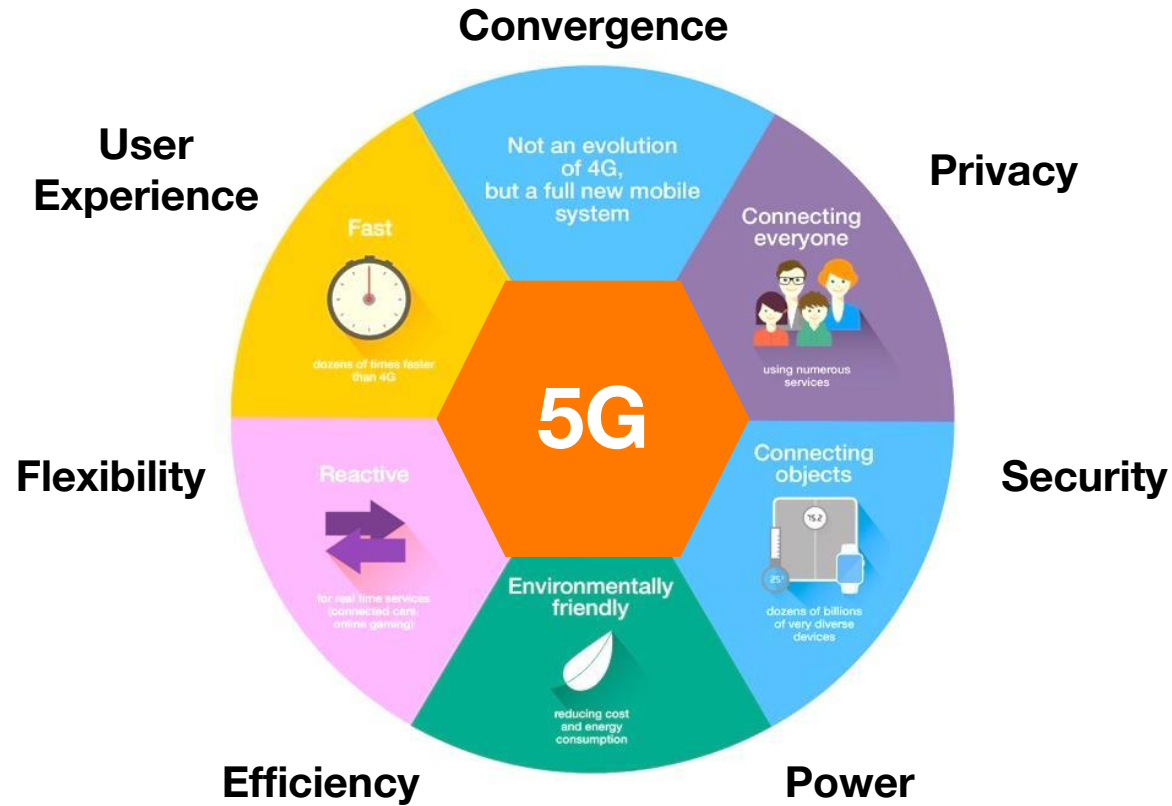


**Broadcast-like
Services**

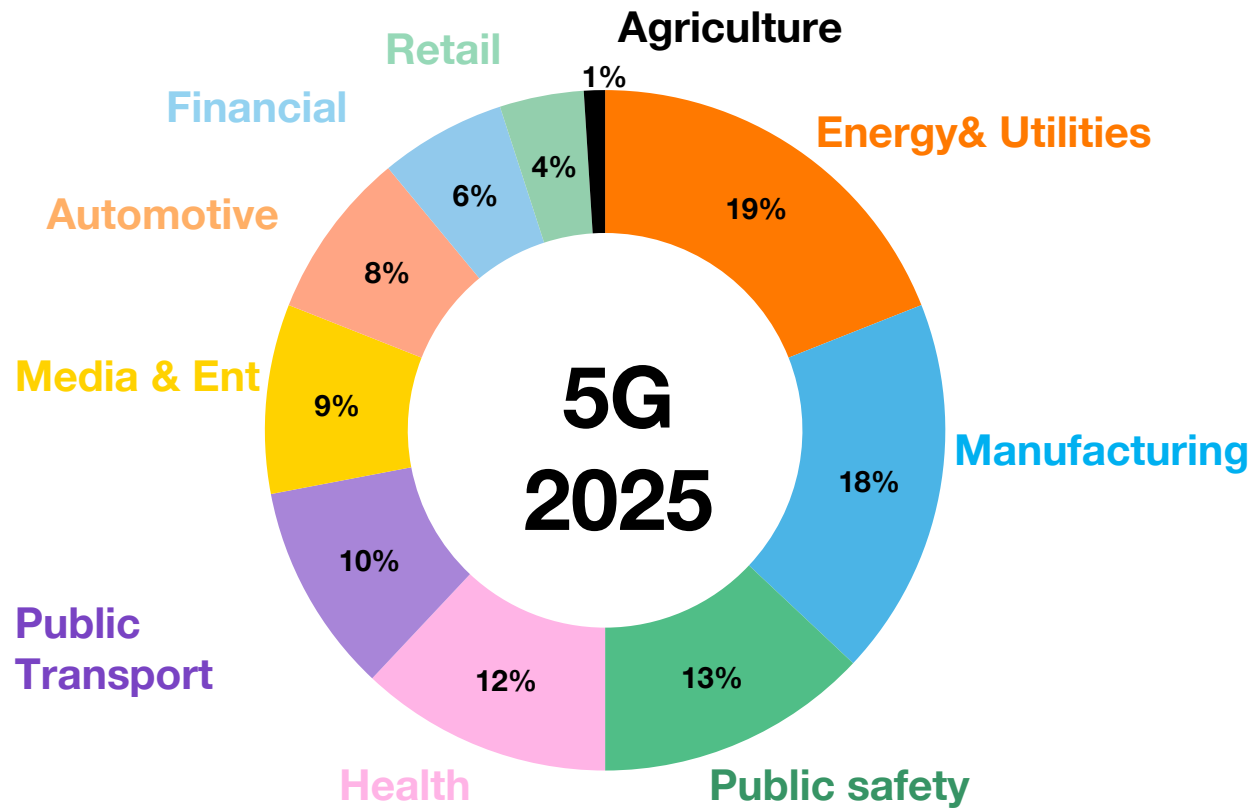
8K & mobile TV
AR / VR



5G key features



5G B2B opportunities



5G technical principles

Radio

Network

Operation

Cloud Apps

1

eMBB

(High to Very High
Broadband Mobile
Access)

2

FWA

(Fixed Wireless
Access)

3

Specialized Services

URLLC

(Ultra Reliable, Low
Latency
Communications)

Massive IoT

(Low Power, Long
Range / M2M
Communications)

Standards

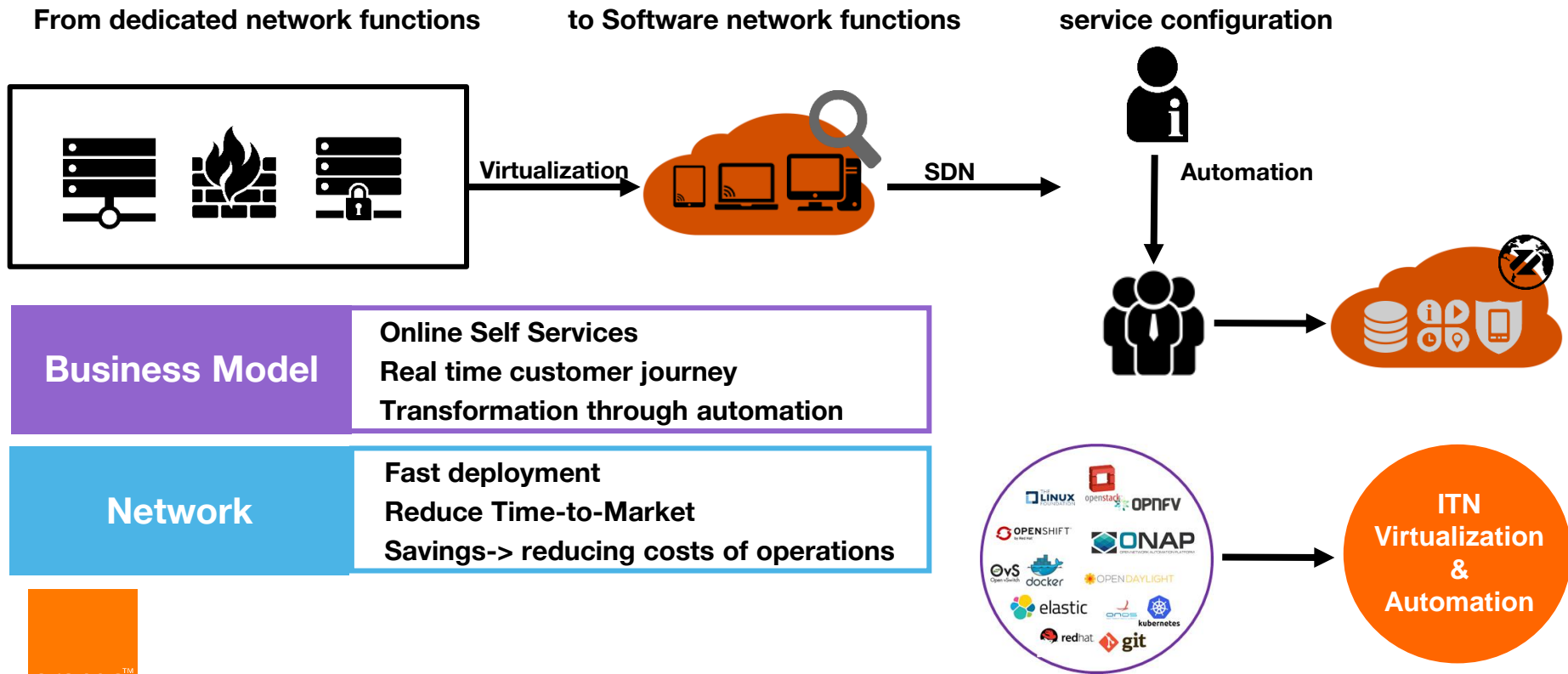
Devices

Spectrum



Efficiency: Power, Latency, Resiliency, Secured ICT, Costs

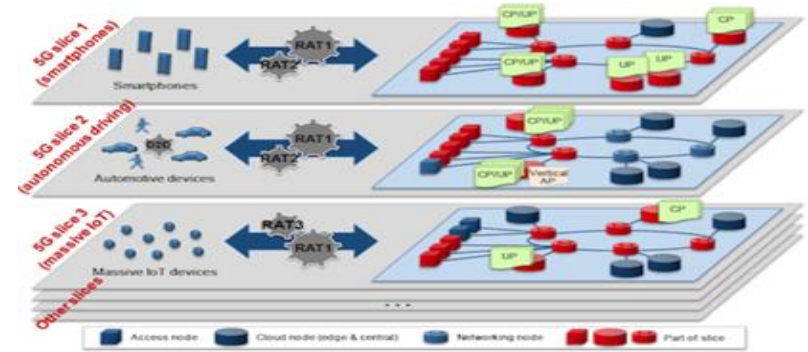
Future network transformation



5G network slicing

Economic context for deploying

- One big network for all services types
- Separate dedicated core networks per service type
- Network slice per service type (Service n slice)



*NGMN

Slicing motivation

Less
Opex

Increase
revenue

Benefits
Services

5G security threats & mitigation

Devices

Malware
DDoS Attacks
Firmware Hacks
Device Tampering
MitM attacks

Radio network

MEC Vulnerability
Rogue nodes
Jamming
MitM attacks

Core Network

Malicious Apps
CP & UP Sniffing
API vulnerabilities
Slice&Virtualization
DDoS attacks

External

API vulnerabilities
App vulnerabilities
IoT Apps

Identity

Authentication

Confidentiality

Integrity

Availability

Privacy

orange™

Infrastructure

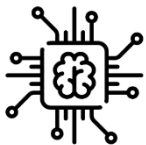
Users

Network

Application

5G Intelligent Connectivity

Fusion of 5G, AI and IoT



**Smart Platforms
with AI**



IoT – Everything Connected

**5G
Network**



Smarter and productive

Applicability

Entertainment - Gaming

Autonomous Transportation

Enhanced Public Services

Industry

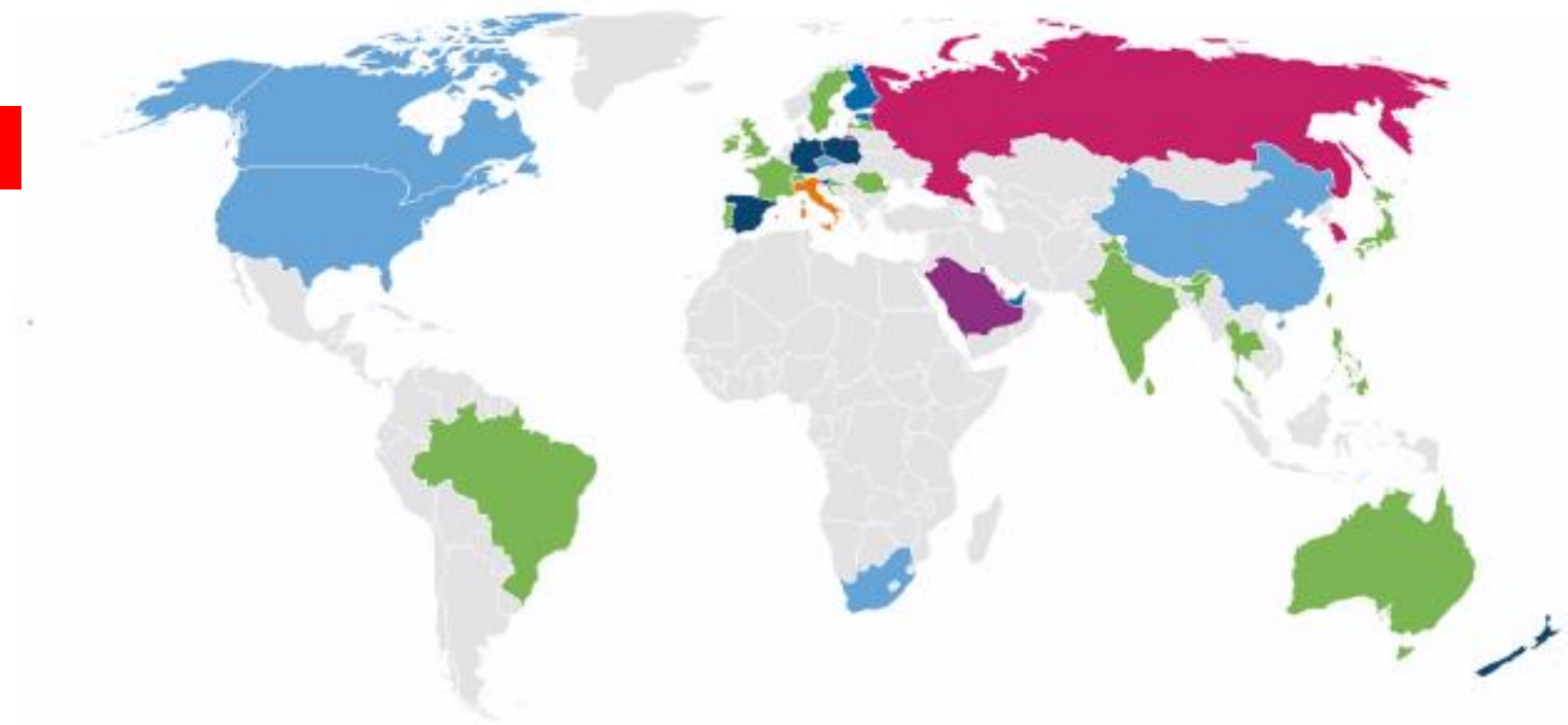
Sustainability

Connectivity

5G worldwide deployments plans

2025

14%
of connections



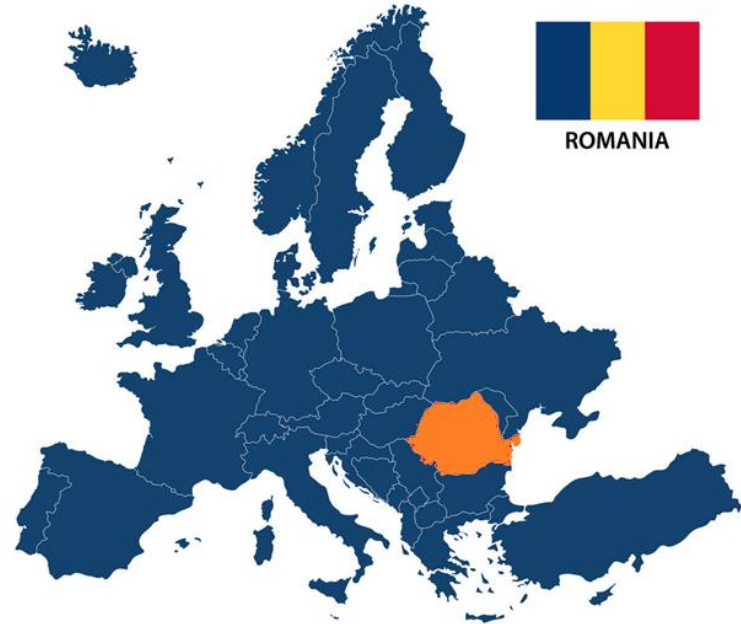
Expected 2020
Expected 2019

Expected 2021
Event services

*<https://uk5g.org> GSA Report August 2018

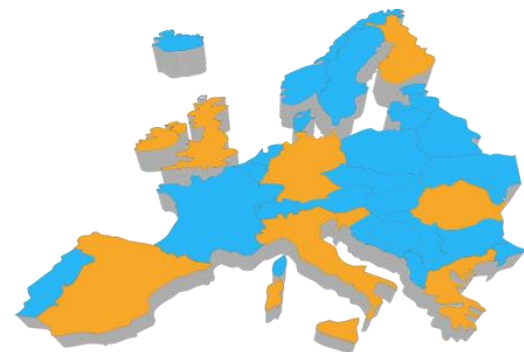
ORANGE 5G R&D Activities

5G-PPP Activities



MATILDA

A holistic, innovative framework for the design, development and orchestration of 5G-ready applications and network services over sliced programmable infrastructure



The vision of MATILDA is to design and implement a holistic 5G end-to-end services operational framework tackling the lifecycle of design, development and orchestration of 5G-ready applications and 5G network services over programmable infrastructure, following a unified programmability model and a set of control abstractions.

H2020 grant no. 761898, 18 partners from 11 countries, 6.6 mEuro budget (383kE ORO), 30 months

<http://www.matilda-5g.eu>



Orange FAB Romania

to make
technology available to everyone and
innovation enables us to do this

Program tracks

Smart Territories

Future of life

Networks of the Future

Security



Community outreach efforts



15 one-to-one sessions
with 70 startups in
Bucharest, Cluj, Iasi and Piatra
Neamt



Breakfast events with
startups and managers
from Orange



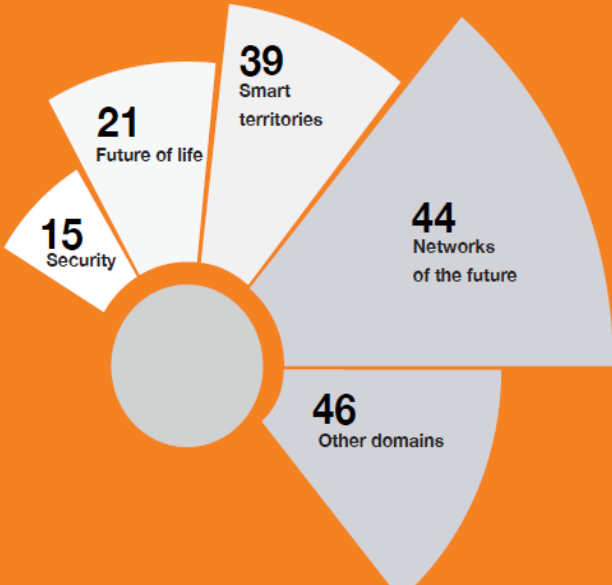
Demo Nights with a
total of 30 startups
pitching



visibility and support in
approximately **300**
community meetings
all over the country

Over the past year, we have
evaluated and discussed with
156 startups in various
domains. Here is distribution
following the tracks of the Orange
Fab program.

Out of these we have further
selected the 10 best startups that
we are currently working with.



5G key messages



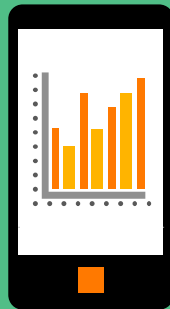
5G

major challenge for future

smart and ultra connected

new business opportunities

development of smartphones and apps



2025

anticipation

Internet users

mobile data traffic

connected things

5G Innovation

features, progressively rolled out

performance

technology valorization

Thank you

