

5G challenges & perspectives

Orange view

Philippe **LUCAS**
EVP Customer Equipment & Partnerships
Orange

March 2020



Why 5G?



2x more
data consumed each year

How to meet our growing connectivity needs, for example with video uses that already account for 75% of global traffic?



8 billion
people to connect

How to ensure equal digital opportunities - both geographical and economic - that allow the greatest number of people to benefit from the opportunities offered by very high speed connectivity at an economic cost?



25 billion
objects to interconnect

How to steer the economic, industrial and technological revolution carried by the Internet of Things and artificial intelligence in a positive direction?



**What is 5G,
according to
Orange?**

An agile network, which will allow the emergence of new uses and a significant improvement in the customer experience

An optimised deployment

reuse of existing 3G/4G sites

A high performance connection

Extremely reduced response times for critical uses requiring reliability and responsiveness: games, industry, connected and autonomous vehicles, etc.

Throughputs multiplied by 10 compared to 4G

An optimal connection at home or out, and immersive experiences on the move



A more homogeneous experience

50 Mb/s minimum under coverage

Ability to adapt performance to each type of object and to each business process based on reliability, latency, and throughput requirements

No superfluous energy

Smart antennas that adapt electricity consumption to the actual use of the network. Improved standby levels between the mobile and the network

A woman with long brown hair, wearing a tan trench coat, is looking at her white smartphone. She is standing on a city street with other people and cars in the background. The scene is brightly lit, suggesting daytime.

5G:

how is it
used?



The development of 5G for Orange: 3 complementary axes

1. Improved high speed mobile broadband
2. High speed broadband at home with 5G
3. New applications to support the digital transformation of companies, and take advantage of real-time uses

Improved high speed mobile broadband

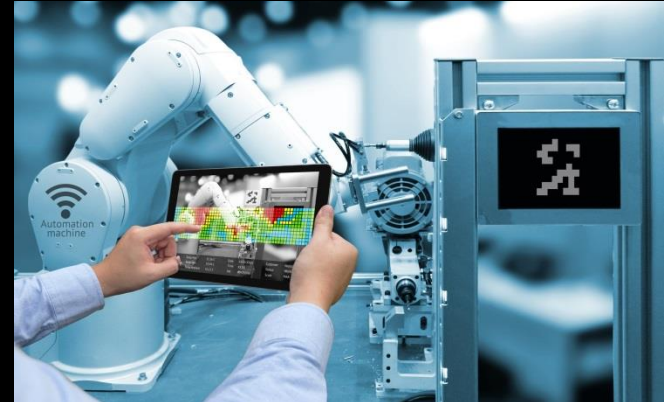


For the general public...

- TV and Ultra HD Video (4K/8 K) on the go
- 360° video combining virtual and augmented reality
- Live video sharing
- Online gaming
- Instant translation services

...and for businesses

- Wireless connection for corporate sites and digital campuses
- A more mobile work environment
- Business solutions in augmented reality (e.g. for maintenance)
- Immersive customer relationship solutions



High speed broadband at home with 5G

A complementary solution to fibre to deploy high speed broadband in some countries.



For the general public: collaborative work at home, online gaming that starts at home and can be continued on the go



For businesses and smart city players: mobile on-demand connection, wireless urban infrastructure connection


New applications to support the digital transformation of companies



New business and industry uses

- Industrial robotics
- Supply chain
- e-Health: home hospitalisation and patient follow-up, remote surgery
- Connected and autonomous vehicles
- Smart cities and territories
- Tourism: smart companions
- Media (information, entertainment)
- Bank/Insurance (customer relations)



A photograph of three people in a meeting. A woman with dark hair is in the center, looking slightly to her right with a thoughtful expression. To her right, a woman with blonde hair and large hoop earrings is looking down. To the left, a man's profile is partially visible. The background is a blurred office setting with a computer monitor.

5G,
how do we
prepare for it?

Orange is actively preparing for the arrival of 5G

Strong involvement in **research**

- In Europe, Orange is a founding member of the “5G” public-private partnership (PPP)
- In France, with the French National Research Agency (ANR).

Active contribution to its **standardisation** within 3GPP.

Technological and innovation partnerships since 2016 with a co-construction approach.

Collaboration with hundreds of partners and start-ups in order to **boost innovation**.

Co-innovation projects with businesses in Europe.

Tests with residential customers and businesses in Orange 5G cities.



Examples of experiments with our technological and innovation partners

Technical trials on our networks

- 5G end-to-end trials in France, in Lille and Douai with Ericsson, and in Marseille, with Nokia
- The 1st 100% 5G data call, based on 5G Stand Alone technology, in Valencia, in Spain

5G fixed access technology

Experiment with residential customers and businesses in Romania, with Samsung and Cisco

Uses for corporate sites

- Queue management
- Fire management on an industrial site
- Robotics and remote maintenance

Based on Orange / Nokia co-innovation platform

5G Lab at Orange Gardens

Tests of partners' products and services embedding features such as virtual, augmented or mix reality, or 4K/8K video, thanks to 5G connectivity



Advanced 4G and 5G for connected and autonomous cars

Experiment of use cases on UTAC-CERAM test tracks, in Linas-Montlhéry (France), with Ericsson

5G Challenge: the 3 winning start-up



IoT solutions to improve workers' safety on site



Mobile robots for urban and industrial logistics



A connected solution for maintenance and real-time assistance



- 2018 : a 360° video experience on the Montjuic cable-car
- 2019 : 5G smartphones' live on Orange Spain's 5G network

Joint innovation projects with businesses in order to test future uses of 5

In France, Orange is bringing together companies to test and develop future 5G uses through Orange Business Services, its entity dedicated to businesses.

Lacroix Group

Ambiant connectivity on an industrial site

Renault / Ericsson

Enriched communications between cars and their environment

Schneider Electric

Test and evaluate 5G opportunities in industrial production processes

SNCF / Nokia

Development of new in-station services

RATP

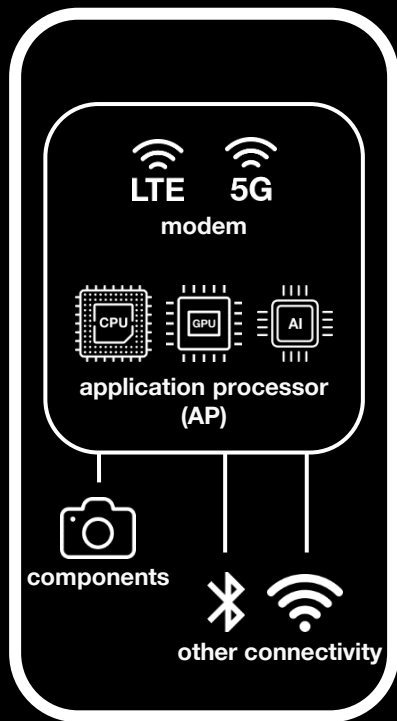
Experiment autonomous and connected public transport vehicles





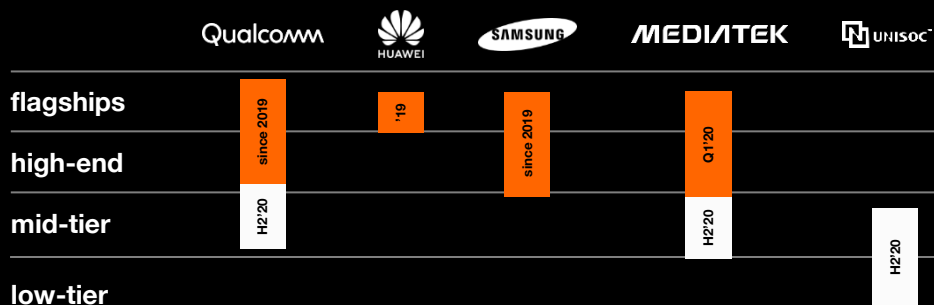
5G, when will
it arrive?

5G chipsets state of the art



The chipset is the brain of the device

- It manages the processing, display rendering, interaction with components (memory, geolocation, security, camera, SIM, NFC, Wi-Fi & Bluetooth...)
- The baseband part of the chipset acts as the modem for cellular networks (4G, 5G...)
- Chipset manufacturers can implement the chipsets as separate elements (AP + modem) though often criticized for potential poor energy management or as a fully integrated chipset (forged on the same material), reducing costs and improving energy consumption and heat dissipation



In 2020, 5G smartphone democratization is on the way while new products categories are emerging

5G smartphones at affordable price starting from Q3'2020



From 649€

From 399€

From 299€

SAMSUNG



HUAWEI



oppo honor

ZTE



ONEPLUS



motorola



The Home of Nokia Phones.

Fast growing penetration of 5G smartphones in Europe

2 M



28 M
(13,6% of the global sales)

2019

2020

Sales Volumes of 5G smartphone in Europe

New 5G products coming



Always connected PC



Smart glasses
Casques VR/AR

Our roadmap

2012

First research work

2018

End-to-end experiments

2nd version of the NR 5G standard (June 2018)

2019

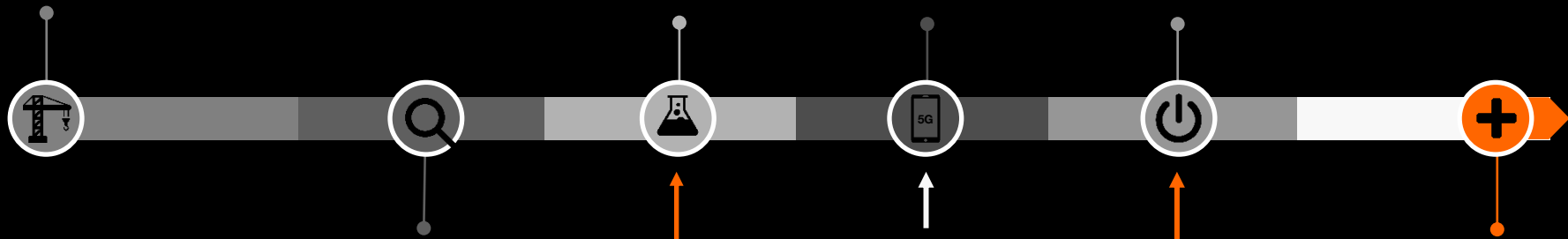
17 Orange 5G cities in Europe

Availability of the first terminals

2020

Progressive start of commercial service

Availability of frequencies
Increase of uses



2017

Demonstrators and proofs of concept

1st version of the NR 5G standard (NR = new radio) (Dec. 2017)



2022-2025

New uses as standardisation evolves and 100% 5G networks are deployed (5G Standalone networks)

Thank you

