

Policies for 5G Promotion in Europe

3rd 5G Global Event



24-25 May 2017, Tokyo

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5G in the Digital Single Market (DSM)

The 5G Action plan

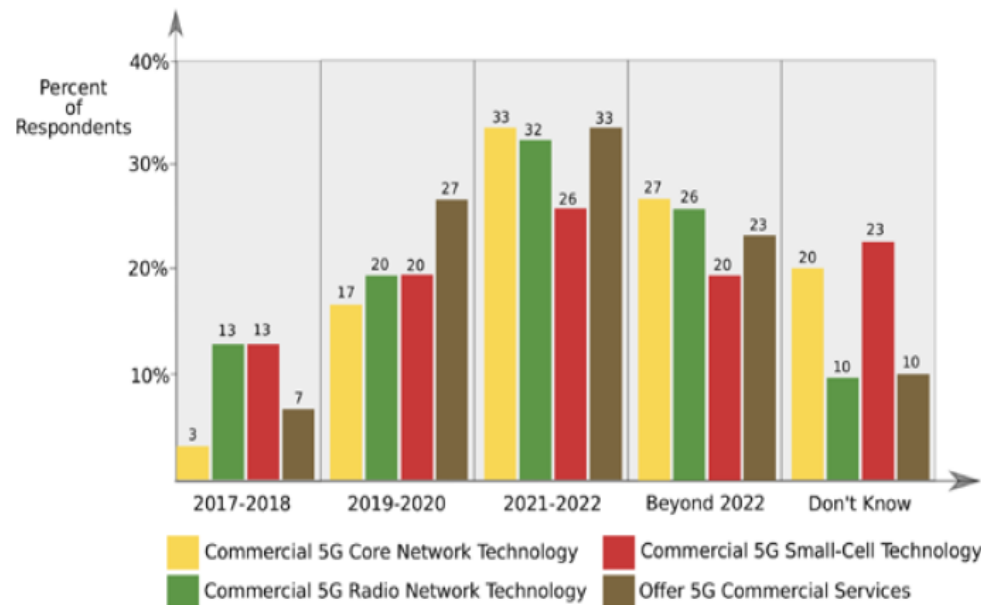
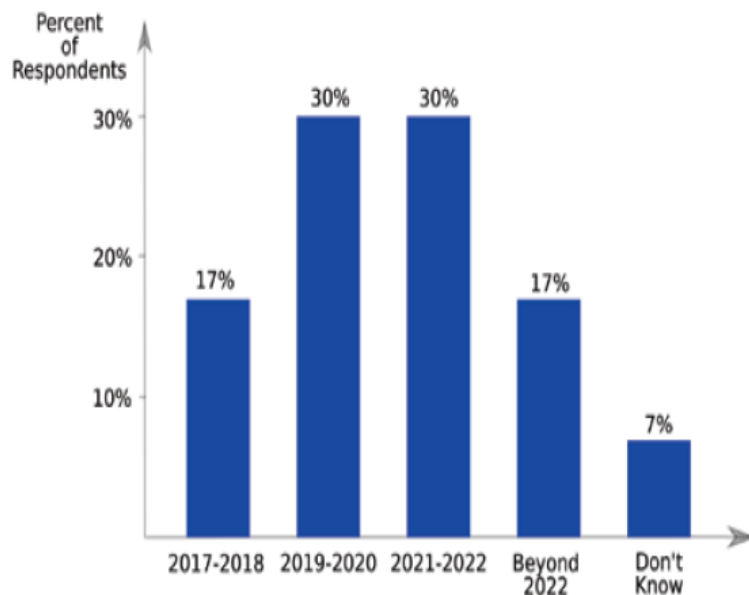
- Commission Communication: to support European industrial leadership;
- Part of the September 2016 "Connectivity Package"
- Preparing Framework Conditions at EU level for 5G deployment
- Demand Side

The 5G Public Private Partnership (5G PPP)

- 700 M€ initiative under R&I H2020 programme
- Technologies, systems, applications,
- spectrum, standards;
- International cooperation
- Supply Side

Towards Deployment

When do you expect to make 5G investments as part of your CAPEX budget? When do you expect your company will deploy?



"Single Market" approach to EU 5G Introduction

Early 5G
launch in
selected
areas

2018

Commercial
launch of 5G
services in at
least one
major city in
all MS

2020

5G in all
urban areas
and
Along main
transport
paths

2025

Coordinated/quasi-
simultaneous launch
throughout single market

Aggressive roll-out with
geographical and sectorial
focus

Moving along with EU 5G "Pioneer Bands", based on RSPG Opinion

700 MHz (harmonised; ongoing assignment)

- ✓ COM Decision (April'16): WBB & national options
- ✓ UHF Decision (EP and Council, April'17)
 - ✓ Transition schedule by mid-2020 (+2 years)

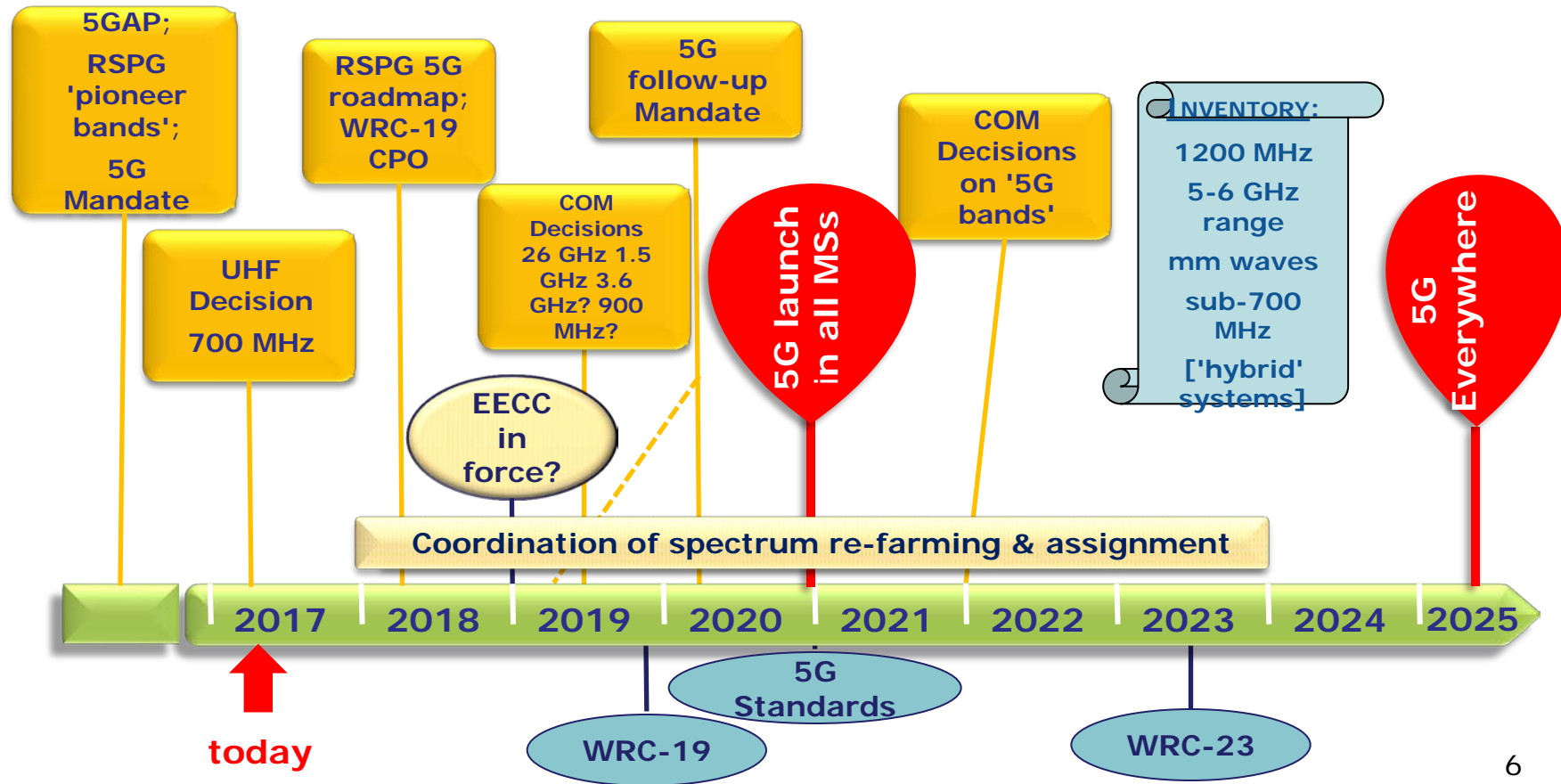
3.6 GHz (harmonised, available, partly used)

- ✓ Review of COM Decision by 2019 (ongoing)
- ✓ Re-farming/defragmentation for larger bandwidths (ongoing)

26 GHz (in preparation)

- ✓ Harmonised technical/sharing conditions (ongoing)
- ✓ COM Decision before WRC-19
- ✓ Services & authorisation models (RSPG opinion, 5G-PPP input)

Roadmap



Standards Roadmap (3G PP)

RAN
#74

RAN
#75

RAN
#78

RAN #80
(Rel-15 completion)

2016	2017				2018			
Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

5G study

5G NR Work Item

5G NR NSA
Completion

5G NR SA
Completion

Further work item

NSA = Non StandAlone = EPC core ("Option 3") & LTE anchor
SA = StandAlone

Stage 3 completion
for Non-Standalone 5G-NR

Stage 3 completion
for Standalone 5G-NR

NSA Option 3 family ASN.1

Rel-15 ASN.1 for SA & NSA



European Trials Roadmap

Trials roadmap announced in the 5G Action Plan

- ✓ To help technology and business model validation
- ✓ To prepare for early deployments
- ✓ To foster partnership with verticals and creation of an ecosystem

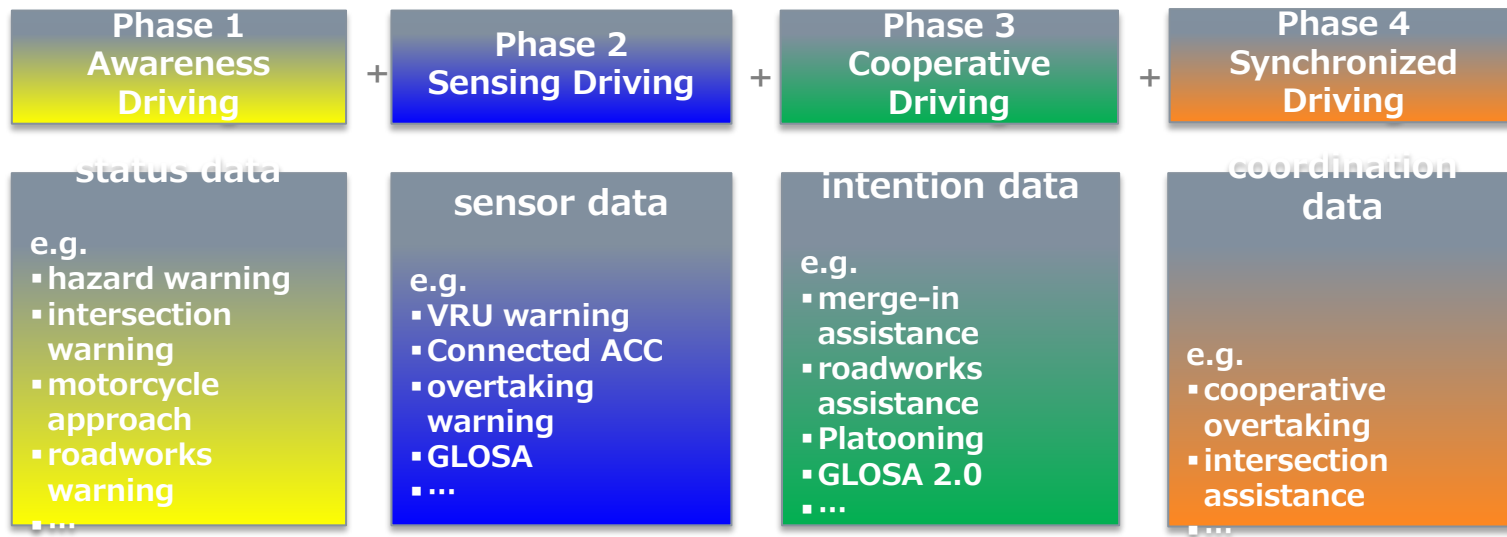
Roadmap announced at MWC '17 in Barcelona

- ✓ Support from key players for 5G in Europe
- ✓ Attraction of verticals and cities

Further announcement on the trial roadmap later today

- ✓ Session 3 "Collaboration on 5G trial plans"

Developing 5G Lead market, from V2V to V2X



Source: automation roadmap of the Car2Car consortium

Established R&I example: cooperation with Japan

Call 1

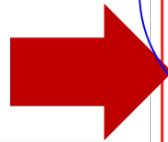
- 5G as an important framing topic following signature of the Joint Declaration
- Leveraging Japanese and EU excellence in wireless technologies
- Moving towards joint demonstrations



Call 2

Call 3

5G



  <p>Optical Communications STRAUSS</p> <p>Wireless Communications M@WEBA</p> <p>Cybersecurity NECOMA</p>	  <p>Internet of Things Cloud</p> <p>Federated testbeds FELIX</p> <p>Green & content centric networks Green ICN</p>
  <p>Optical Communications SAFARI</p> <p>Big Data iKaas</p>	  <p>Federated testbeds FESTIVAL</p> <p>Photonic Infrastructure RAPID 5G</p>
  <p>5G(Network) 5G! PAGODA</p> <p>5G(RAT) MiEdge</p>	  <p>Big data / Cloud / IoT BigCloud</p> <p>CPaaS.io</p> <p>Experimental Testbeds ICN2020</p>

International cooperation, moving forward

	R&D, 2018-20 Workprogramme	Policy
JAPAN	<ul style="list-style-type: none"> - Applications and trials with 5G networks 3M€ - Beyond 5G, applicability of spectrum >275 GHz 3M€ 	<ul style="list-style-type: none"> - Spectrum, interoperability in different bands
REPUBLIC OF KOREA	<ul style="list-style-type: none"> - Application trials at mmwave bands 2 M€ - Interworking across multiple radios 2 M€ 	<ul style="list-style-type: none"> - Standard, validation of specs
PEOPLE'S REPUBLIC OF CHINA	<ul style="list-style-type: none"> - Trials at 3,5 GHz and in the V2X context 6M€ 	<ul style="list-style-type: none"> - Spectrum co-operation - Standards, preparing 5G phase 2 through trial results
USA	<ul style="list-style-type: none"> - Coordination of EU-NSF projects relevant to the Advanced Wireless Platform programme: 2M€ 	
BRAZIL	<ul style="list-style-type: none"> - mMTC/URLLC Trials 	<ul style="list-style-type: none"> - Spectrum co-operation - Standards trialling
TAIWAN	<ul style="list-style-type: none"> - End to End Testbeds for specific applications: 4 M€ 	



Towards 5G PPP Phase 3 (WP18-20)

5G R&I for "Long Term Evolution"

Early 5G
introduction
Lower frequency
bands

Later 5G
introduction
Higher frequency
bands

User needs, partnerships with
vertical industries

Phase 3 b) Integrated Verification Trial
- radio+network+applications -

Kick off at EUCNC
Conference 12-15 June,
Oulu, Fin

**5G Connected Cars in EU
corridors**

**Phase 3 a) Verification
Demo/Trial Platform**
- Integration radio+ network

Phase I Core Technologies

**Phase 2 - Demos
PoC- Core Techs
Components**

Work in Progress

Y2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022

Thank you for your attention