5G – enabling Europe's digital and green transformation

5G Forum, 6-7 May 2020

Peter Stuckmann
Head of Unit, Future Connectivity Systems
DG CONNECT
European Commission

6 Commission priorities for 2020-24 – Political Guidelines for the von der Leyen Commission
(16 July 2019)

1. *A European Green Deal*
2. *An economy that works for people*

3. *A Europe fit for the digital age*

4. *Protecting our European way of life*
5. *A stronger Europe in the world*
6. *A new push for European democracy*

A Europe fit for the digital age

5G Joint standards for our 5G networks

Technological sovereignty in some critical technology areas

Jointly define standards for blockchain, HPC, quantum, algorithms

Initiative for a coordinated EU approach on the human & ethical implications of AI

A new Digital Services Act will upgrade liability and safety rules for digital platforms

A Joint Cyber Unit to speed up information sharing and better protect ourselves

Full digitalisation of the Commission

Update the Digital Education Action Plan

European Education Area by 2025

European Green Deal

5G opportunities

FACTORIES OF THE FUTURE
1. Time-critical process control
2. Non time-critical factory automation
3. Remote control
4. Intra/Inter-enterprise communication
5. Connected goods

ENERGY
1. Grid access
2. Grid backhaul
3. Grid backbone

e-HEALTH
1. Assets and interventions management in Hospitals
2. Robotics
3. Remote monitoring
4. Smarter medication

AUTOMOTIVE
1. Automated driving
2. Share My View
3. Bird's Eye View
4. Digitalisation of Transport and Logistics
5. Information Society on the road

MEDIA & ENTERTAINMENT
1. Ultra High Fidelity Media
2. On-site Live Even Experience
3. User/Machine Generated Content
4. Immersive and Integrated Media
5. Cooperation Media Production
6. Collaborative Gaming

5G and COVID-19

- *Increasingly critical nature of digital services*
  - Technology sovereignty is at the heart of 5G and later 6G
  - Gaining even further significance in light of COVID-19
  - Europe's capacity to set evolving 5G and later 6G standards
  - Role of equipment suppliers of strategic importance

- *Addressing COVID-19*
  - Communication networks critical especially in times of crisis
  - 5G/6G for remote health/ care as well as rapid health crisis response
  - Economic recovery through major infrastructure investment programmes
    - Ideal instrument for rapid economic recovery
    - Major opportunities for SMEs as part of new 5G-based digital ecosystems
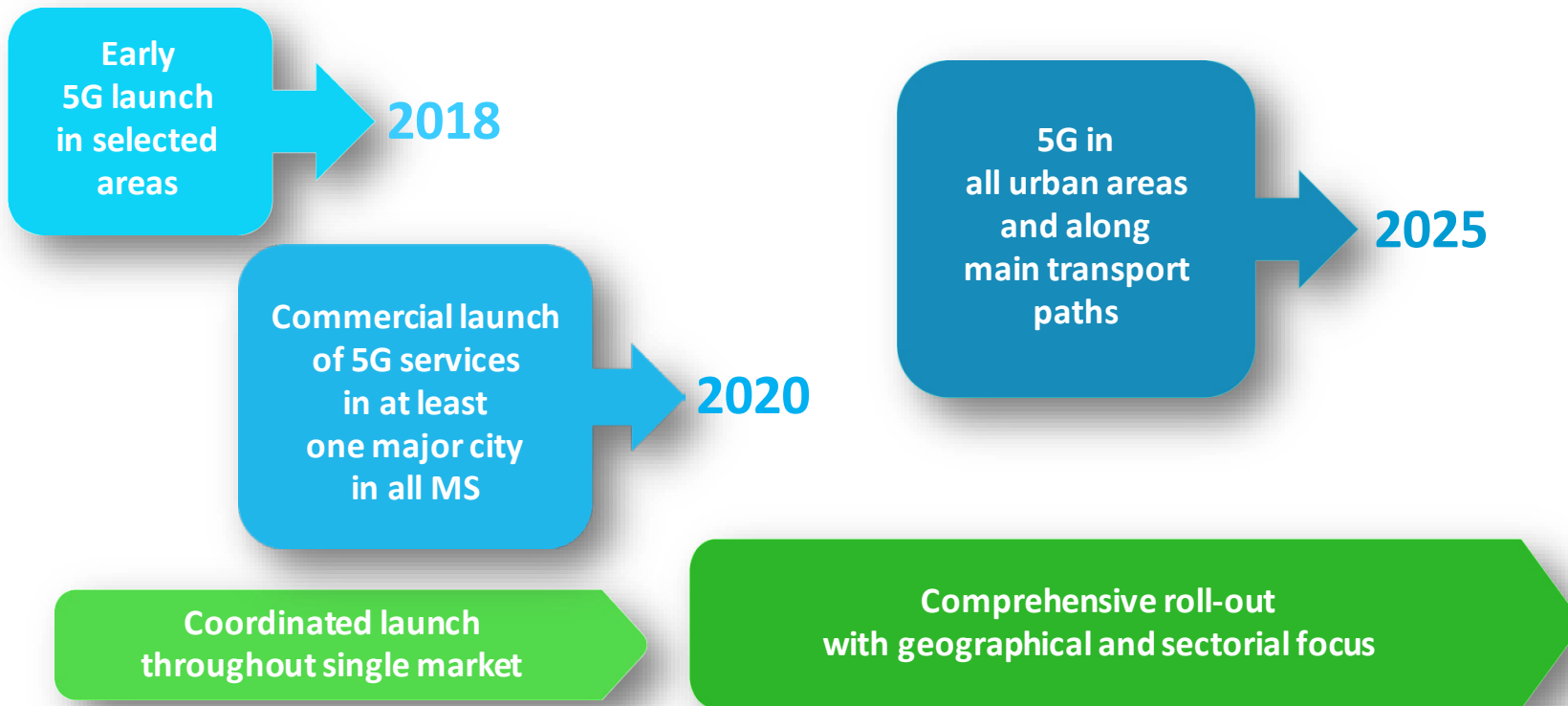
5G PPP Phase 3
€ 300 million for trials

5G R&I for "Long Term Evolution"

User needs, partnerships
with vertical industries

**Phase 3 b) Large-scale trials
with focus on verticals**

**5G Connected Cars in EU
cross-border corridors**
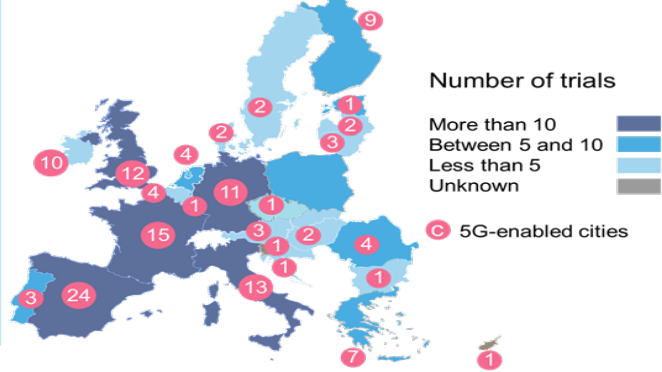
**Phase 3 a) Verification
Demo/Trial Platform**

**Phase I
Core Technologies**

**Phase 2 - Demos
Proof of Concept
Core Techs/ Components**

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

European 5G Observatory

5G trials | 5G cities

181 5G trials in the 28 Member States

138 Future 5G-enabled cities

Number of trials
- More than 10
- Between 5 and 10
- Less than 5
- Unknown

C 5G-enabled cities

5G corridors

11 5G Cross-Border corridors

5G Cross-Border corridors

FI-NO
DK-SE-FI-NO
LT-LV-EE
BE-NL
PL-LT
DE-CZ
FR-LUX-DE
DE-AT-IT
EL-BG-RS
ES-PT

5G pioneer spectrum

16.2% 5G spectrum assigned throughout the EU*

Assigned and usable in 2020 — Assigned but not-usable in 2020 — Not assigned

	Assigned and usable in 2020	Assigned but not-usable in 2020	Not assigned
700 MHz	16.7%	3.6%	79.7%
3.4-3.8 GHz	28.5%		71.5%
26 GHz	3.6%		96.4%
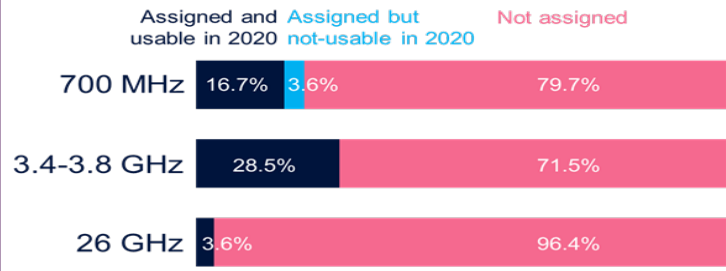
* 16.2% represents the total amount of spectrum assigned in all Member States. The figure is expected to increase following the recently updated EU telecom rules.

5G roadmaps and national plans

11 Member States have published national 5G roadmaps

- Finland
- Sweden
- Estonia
- United Kingdom
- Denmark
- Netherlands
- Germany
- Luxembourg
- Austria
- France
- Spain

European Commission

5G SCOREBOARD: INTERNATIONAL

European 5G Observatory

COMMERCIAL LAUNCHES

June 2018
Elisa (Network only)

October 2018
Verizon (FWA)

December 2018
AT&T (network only)
Early 2019 AT&T
(end-user devices)

**April 2019**
Verizon (mobile services)

May 2019
Sprint (mobile services)
June 2019
T-Mobile (pre-launch)

2018

2019

December 2018
(business users)

April 2019
(end-users)

May 2019
EE

May 2019
T-Mobile Austria

June 2019
Vodafone

June 2019
Vodafone, Digi

July 2019
Vodafone

August 2019
Vodafone

Autumn 2019
Commercial launch

August 2020
Olympic Games 2020

2019

2020

June 2019
TIM, Vodafone

July 2019
Vodafone

August 2019
Three (FWA)

September 2019
T-Mobile

October 2019
Orange

End 2020 5G launches by end of 2020 in all
Member States (5G Action Plan)

5G SPECTRUM

Low bands: spectrum assigned and not yet
assigned (among identified spectrum)

■ Assigned ■ Not assigned
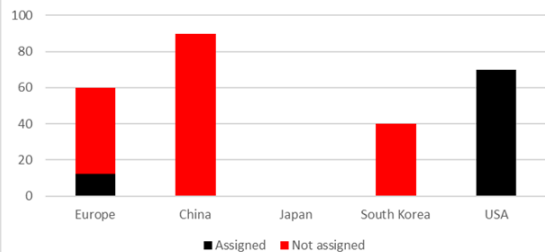
Mid bands: spectrum assigned and not yet
assigned (among identified spectrum)
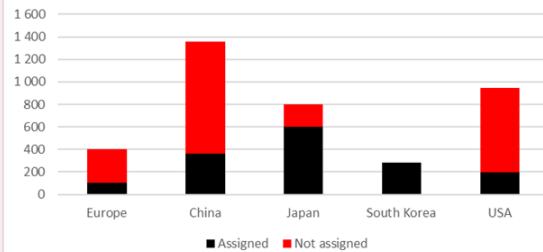
■ Assigned ■ Not assigned

High bands: spectrum assigned and not yet
assigned (among identified spectrum)

■ Assigned ■ Not assigned

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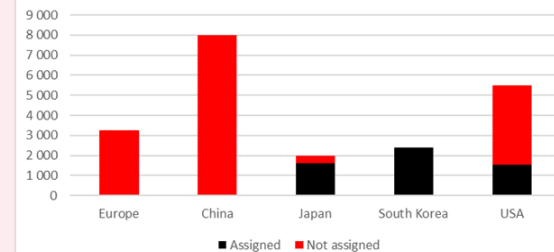
5G Corridors

- Vision: **Pan-EU 5G corridors** for Connected and Automated Mobility

- **Private investment** with public funding of cross-border and "challenge" areas

- Large-scale **testing** using Horizon 2020 (€80M)

- Large-scale **deployment** using CEF Digital (up to €3B)

- **Blending** or coordination with InvestEU and national programmes

5G Cross-border Corridors for Connected and Automated Mobility

Commission proposal

Horizon Europe 2021-2027

Support the creation and diffusion of high-quality knowledge	Strengthen the impact of R&I in supporting EU policies	Foster all forms of innovation and strengthen market deployment

Optimise the Programme's delivery for impact in a strengthened ERA

Pillar 1
Open Science

- European Research Council
- Marie Skłodowska-Curie Actions
- Infrastructures

Pillar 2
Global Challenges and Industrial Competitiveness

Clusters
- Health
- Inclusive and Secure Society
- **Digital, Industry, and Space**
- Climate, Energy and Mobility
- Food and natural resources

Joint Research Centre

Pillar 3
Open Innovation

- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation and Technology

Strengthening the European Research Area

Sharing excellence	Reforming and Enhancing the European R&I system

European Commission

Beyond 5G – Towards 6G

- *Create a human-centric Internet reflecting European values*

- *Towards connected intelligent critical infrastructures*

- *Develop lead markets, e.g. 5G deployment at cross-border corridors for Connected and Automated Mobility*

- *Address Sustainable Development Goals*

- *Leverage connectivity towards new value chains, e.g. in the area of cloud, IoT as well as components and devices*

CEF DIGITAL 2021-2027 - €3 billion

Alignment with Gigabit Society Strategy objectives: supporting MS in addressing the overall funding gap (€155 bn) with strategic projects

Complementarity with Digital Europe Programme, structural funds & InvestEU

- **Cross-border 5G automotive corridors (but also railways, inland waterways)**
- **Gigabit connected hospitals, schools, business parks, public Wi-Fi & coverage of surrounding areas (5G communities)**
- **Key international/ cross-border connectivity**

5G Strategic Deployment Agenda for CAM

- *Elaborated with the participation of stakeholders, the SDA aims at maximising CEF2 Digital intervention by:*
  - Defining deployment priorities and roadmaps
  - Identifying appropriate cooperation models and investment strategies
  - Advising on most suitable regulatory incentives

Input for CEF pillar of the Smart Networks and Services partnership

HORIZON EUROPE

Remaining and new challenges:
- ➤ **Higher capacity – Zero Latency Internet**
- ➤ **Spectrum challenges (TeraHertz, flexible use)**
- ➤ **Advanced Radio processing**
- ➤ **Close user data control - IoT– Privacy/security**
- ➤ **Energy consumption**

Opportunities and needs:
- ➤ **Smart devices, (edge) Networks, Data Processing,**
- ➤ **Value Chain perspective**
- ➤ **Better involvement of Member States and national initiatives**

DEP & CEF

Targeted actions towards deployment and capacity building:

- ➤ **5G corridor deployment for CAM**

- ➤ **Connectivity of socio economic drivers**

- ➤ **Smart cities**

- ➤ **AI/Cybersecurity /blockchain deployment in networks**

DEP: Digital Europe Programme; CEF: Connecting Europe Facility

networks, content and technology

Considering an institutionalized partnership

*- Ensure a EU **strategic approach** towards programme definition and implementation with strong ownership of industry and Member States in view of Europe's strategic autonomy in this key technology area*

*- Coordination of EU, and private funding from industry, with **MS/national support** in particular as regards large-scale experimentation and deployment*

*- **Synergies** with programmes and facilities for large-scale experimentation and **infrastructure deployment** at EU and MS-level*

*- Support European **consensus among stakeholders and Member States** towards global standards, spectrum roadmaps and other strategic issues*

Governance structure
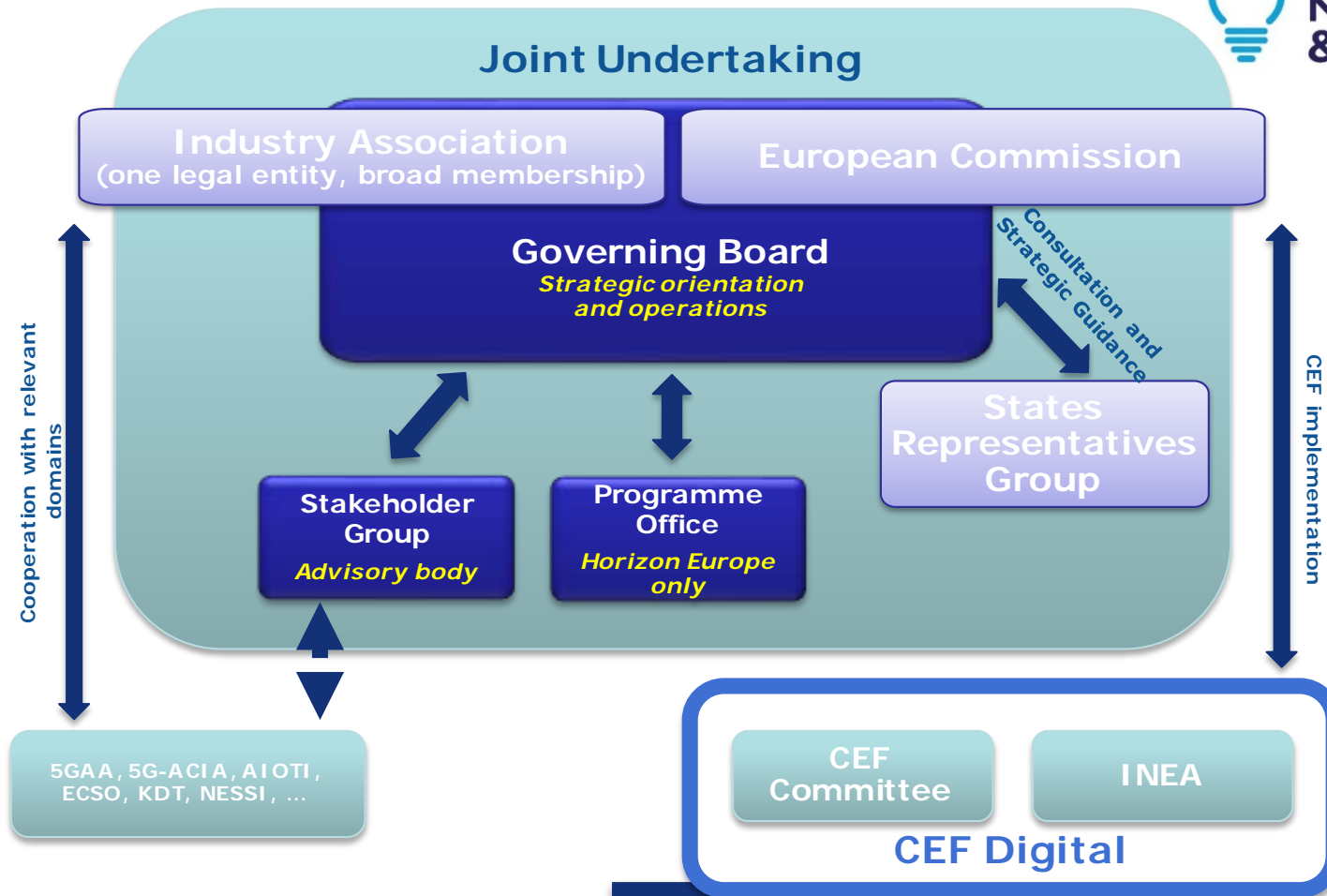
5G Cyber Security Challenges

Source: Ericsson
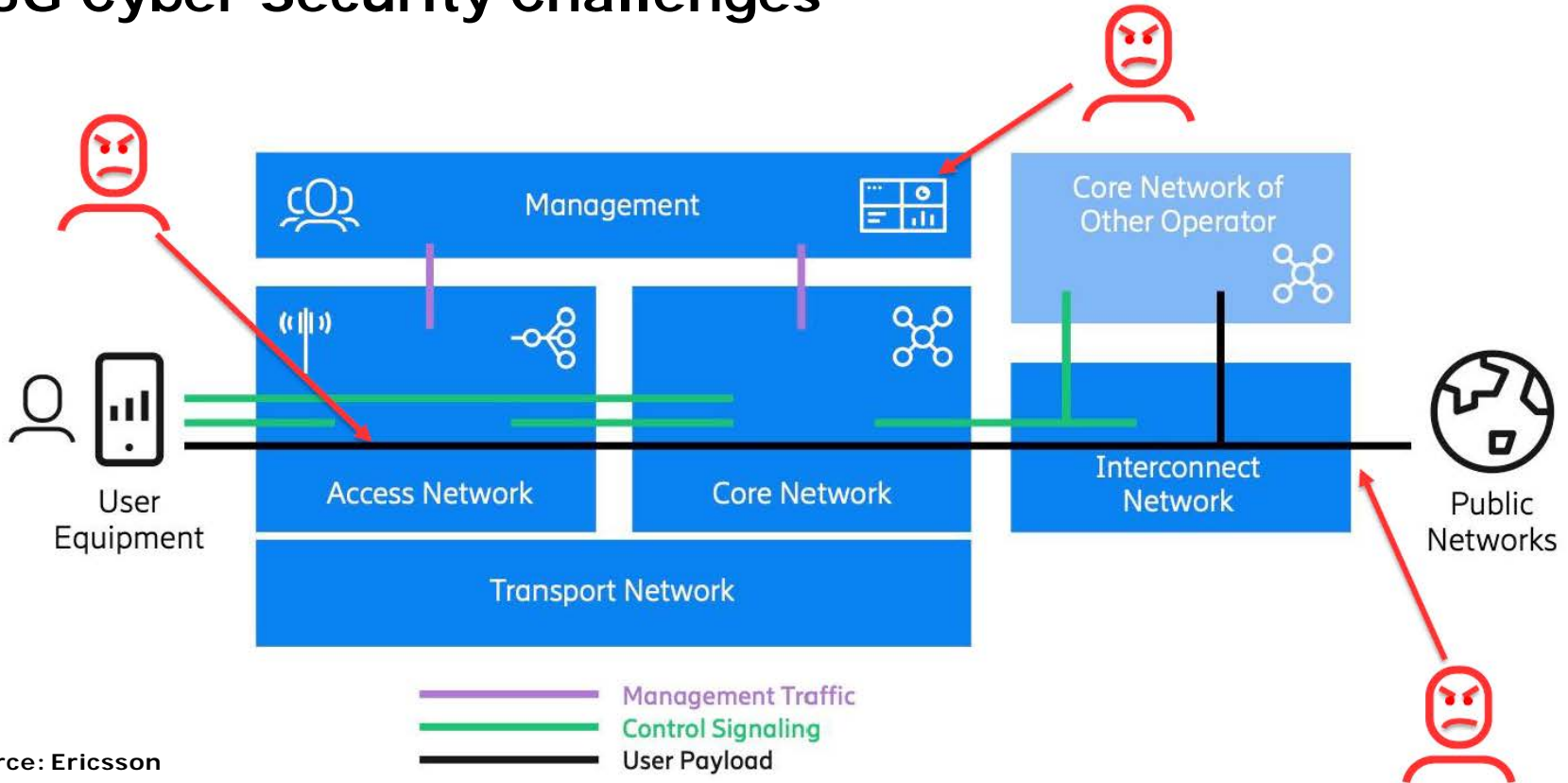
Cybersecurity of 5G networks – main milestones

12 March 2019 Report by the European Parliament.

22 March 2019 Conclusions by the European Council.

26 March 2019 Commission Recommendation on the cybersecurity of 5G networks

July 2019 Member States national risk assessments

9 October 2019 EU coordinated risk assessment of 5G networks security.

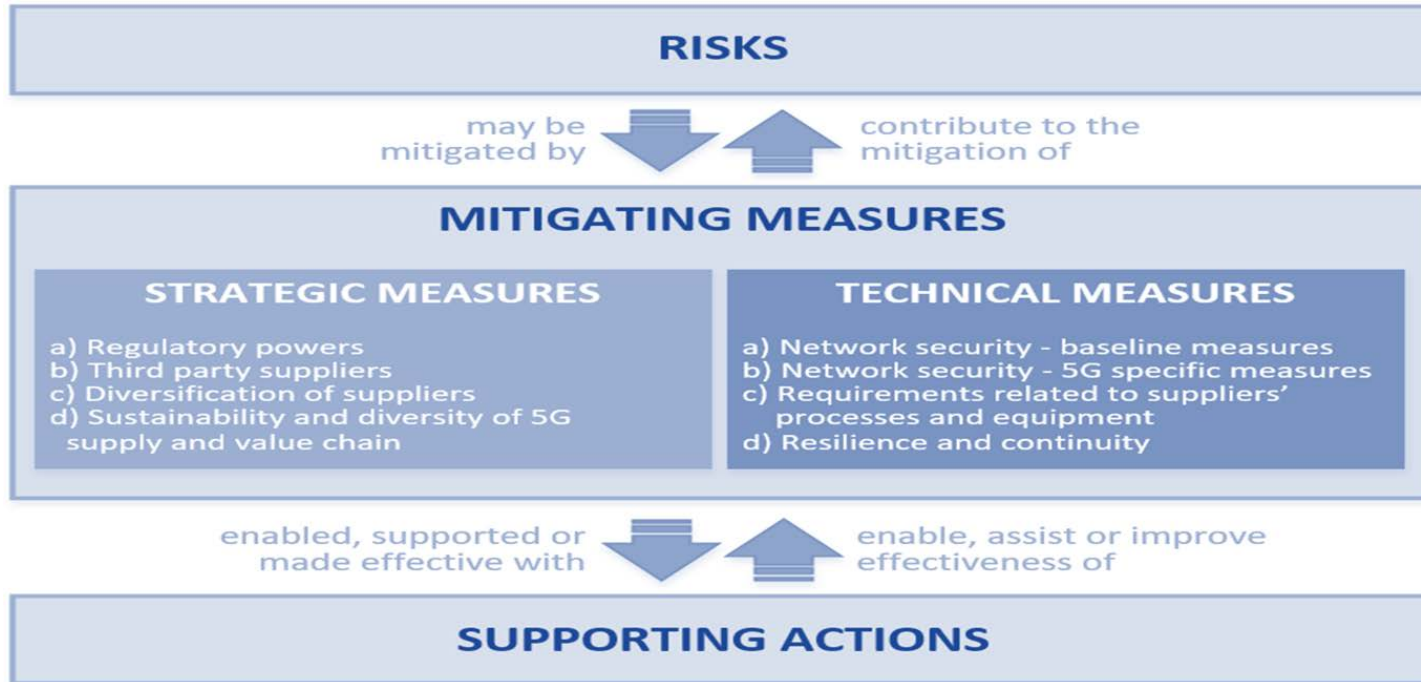**21 November 2019** ENISA report on threats relating to 5G networks.

29 January 2020 EU toolbox of mitigation measures and Commission Communication on the implementation of the EU toolbox.

EU coordinated risk assessment – Oct. 2019

- ✓ **Increase of the overall attack surface and potential entry points** for attackers

- ✓ Certain pieces of equipment will become more **sensitive**

- ✓ Increased exposure to risks related to **reliance on suppliers**

- ✓ Importance of the **risk profile of individual suppliers**

- ✓ Increased risks from major **dependencies on suppliers**

- ✓ **Availability** and **integrity** of networks will become major concerns.

- ✓ **State and state-backed actors** are the most serious and most likely to target 5G networks

EU toolbox for 5G networks – Jan. 2020

Identifies 8 strategic and 11 technical measures to mitigate the risks, and 10 corresponding supporting actions to reinforce their effectiveness.

RISKS

may be mitigated by   contribute to the mitigation of

MITIGATING MEASURES

STRATEGIC MEASURES

a) Regulatory powers
b) Third party suppliers
c) Diversification of suppliers
d) Sustainability and diversity of 5G supply and value chain

TECHNICAL MEASURES

a) Network security - baseline measures
b) Network security - 5G specific measures
c) Requirements related to suppliers' processes and equipment
d) Resilience and continuity

enabled, supported or made effective with   enable, assist or improve effectiveness of

SUPPORTING ACTIONS

Next steps – *Implementing the toolbox*

- **Endorsement of toolbox conclusions** (key measures to be implemented by all MS and by Commission)

- **By 30 April 2020,** to take concrete and measurable steps to implement the set of key measures recommended in the EU toolbox conclusions; reporting by Member States expected in the next few weeks.

- **By 30 June 2020,** to prepare a report by the NIS Cooperation Group on the state of implementation in each Member States of these key measures, based on the regular reporting and monitoring, with the support of the Commission and ENISA;

- **October 2020:** Review of the March 2019 Recommendation

Thank you!

5G Cybersecurity info under: https://ec.europa.eu/commission/presscorner/detail/de/ip_20_123

https://ec.europa.eu/digital-single-market/en/towards-5g