

November, 2021

TIM Group

The road to 6G standardization - an operator view

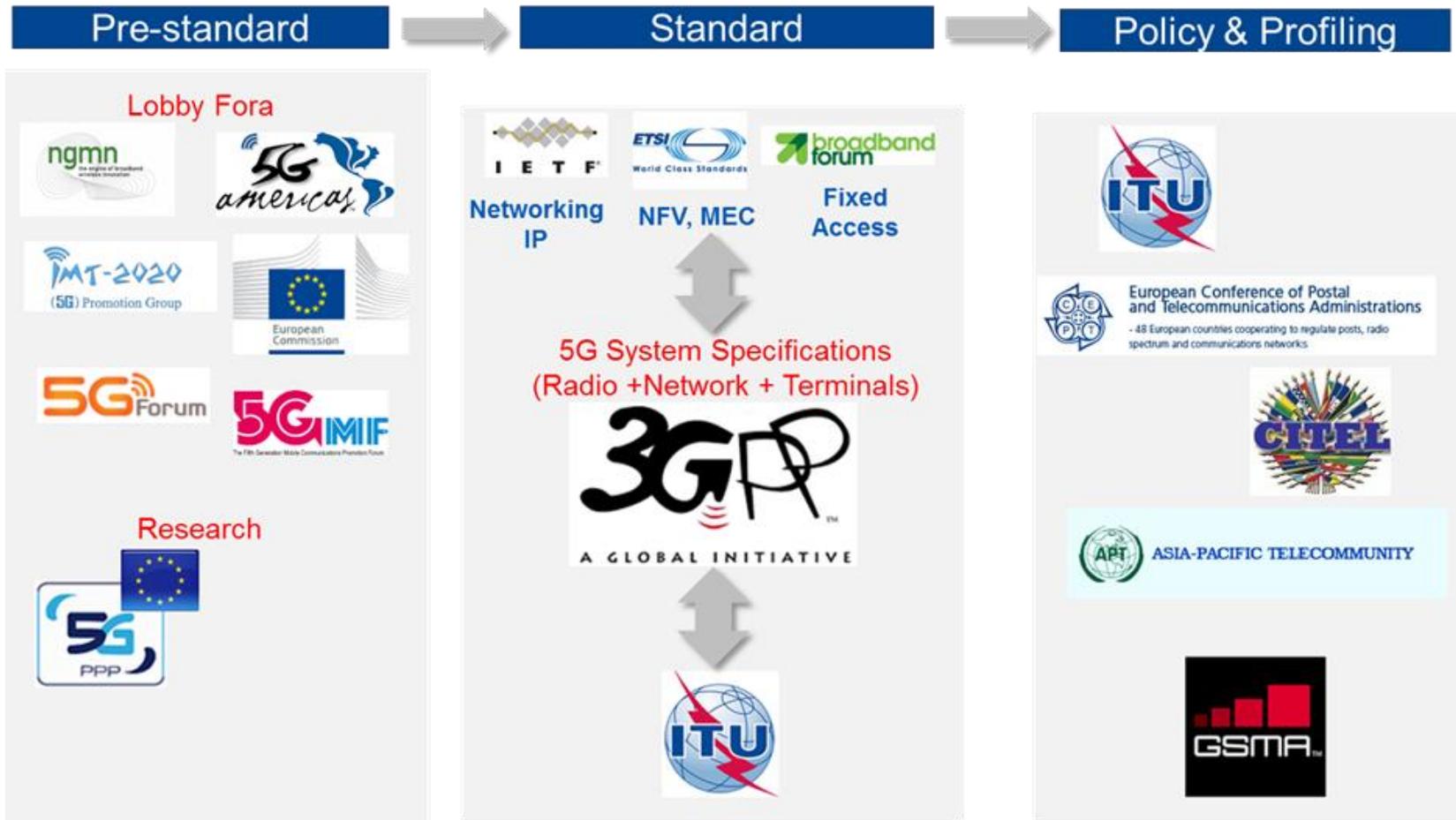
Visions for Future Communications Summit



Giovanni Romano

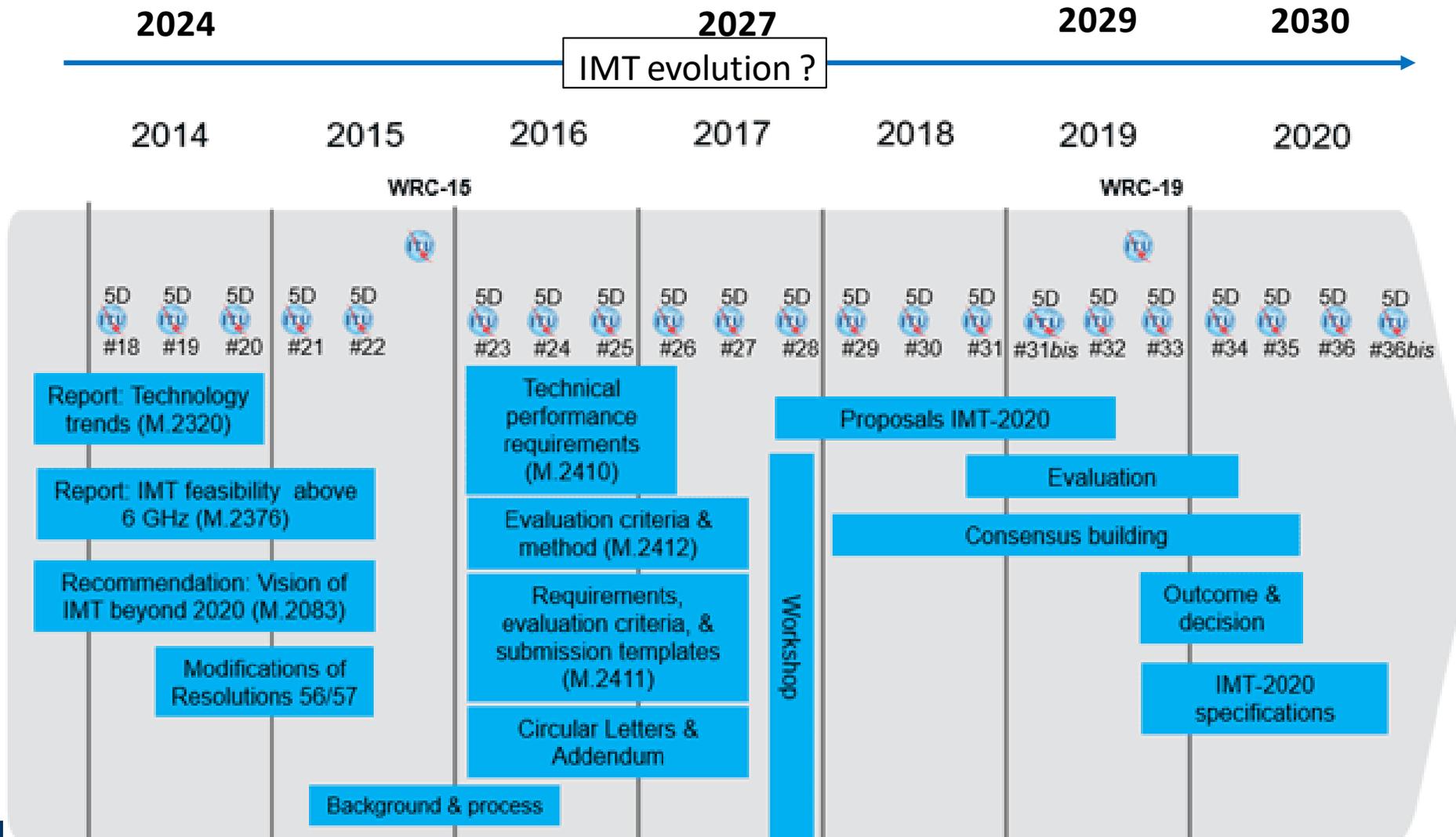
Learning from 5G experience

New "players"
The Verticals



The 5G standardization ecosystem

Will 6G follow the 5G road? Can we drop a parallel line to get 6G timeplan?



ITU-R already started the work on Future Technology Trends in 2021, plan to complete it in 2022!

A sharp acceleration?

Detailed Timeline and Process for IMT-2020 in ITU-R

<https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/imt-2020/Pages/default.aspx>

Will 6G follow the 5G road? Can we drop a parallel line to get 6G timeplan?

3GPP "5G"
Requirements
Rel 14 (10/2016)

3GPP "5G" Study
Rel 14 (03/2017)

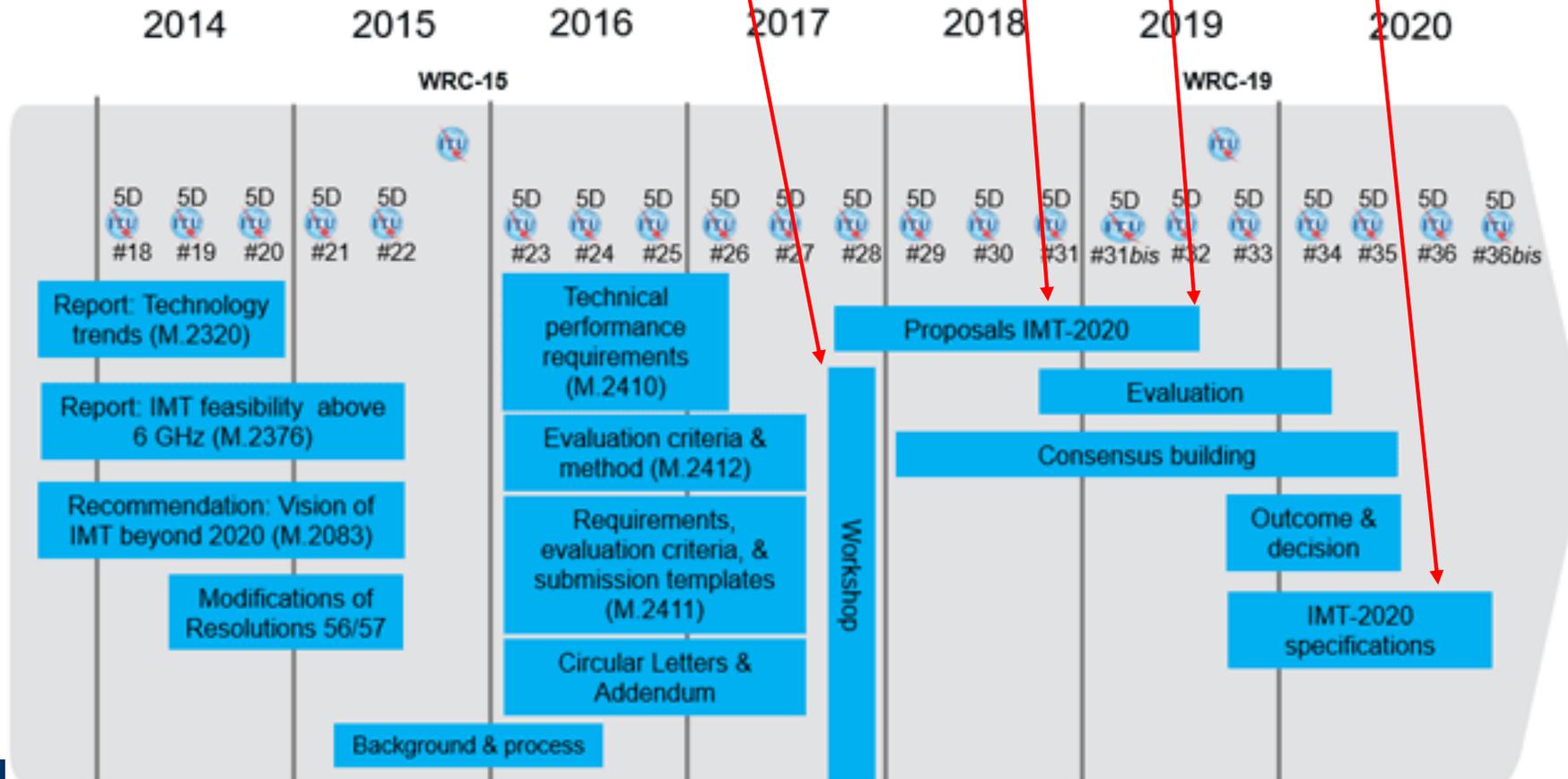
3GPP "5G"
Rel 15 (06/2018)

3GPP "5G"
Rel 16 (06/2020)

3GPP 5G Roadmap



A GLOBAL INITIATIVE



If the 6G roadmap is "the same" as in 5G:

- 06/2030 submission (3GPP Rel 22 ???)
- 06/2028 Basic 6G (3GPP Rel 21 ???)
- 2024-2026 6G Requirements and Study

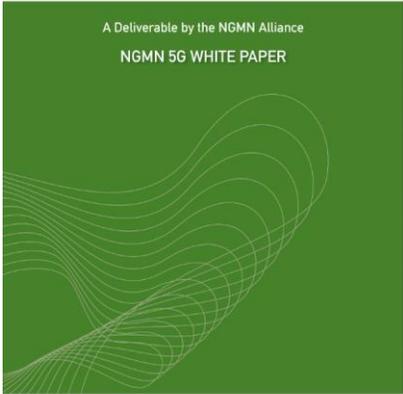
Detailed Timeline and Process for IMT-2020 in ITU-R

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The NGMN approach: 6G Drivers and Vision (April 2021)



https://www.ngmn.org/wp-content/uploads/NGMN-6G-Drivers-and-Vision-V1.0_final.pdf



A Deliverable by the NGMN Alliance
NGMN 5G WHITE PAPER

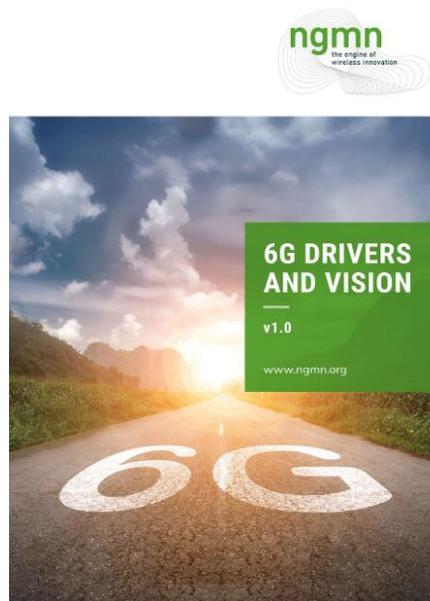
next generation mobile networks

The NGMN 5G White Paper
Feb 2015

https://www.ngmn.org/wp-content/uploads/NGMN_5G_White_Paper_V1_0.pdf

The paper addresses the **drivers** that provide the direction to 6G, and a **roadmap and vision** towards delivery

6G Drivers and Vision



Contents

1	Background and Introduction
2	Motivation and Drivers for 6G.....
2.1	Societal Goals.....
2.2	Market Expectations
2.3	Operational Necessities
3	A Journey Towards 6G.....
3.1	Developmental Considerations.....
3.2	Vision of 6G
	List of Abbreviations
	References

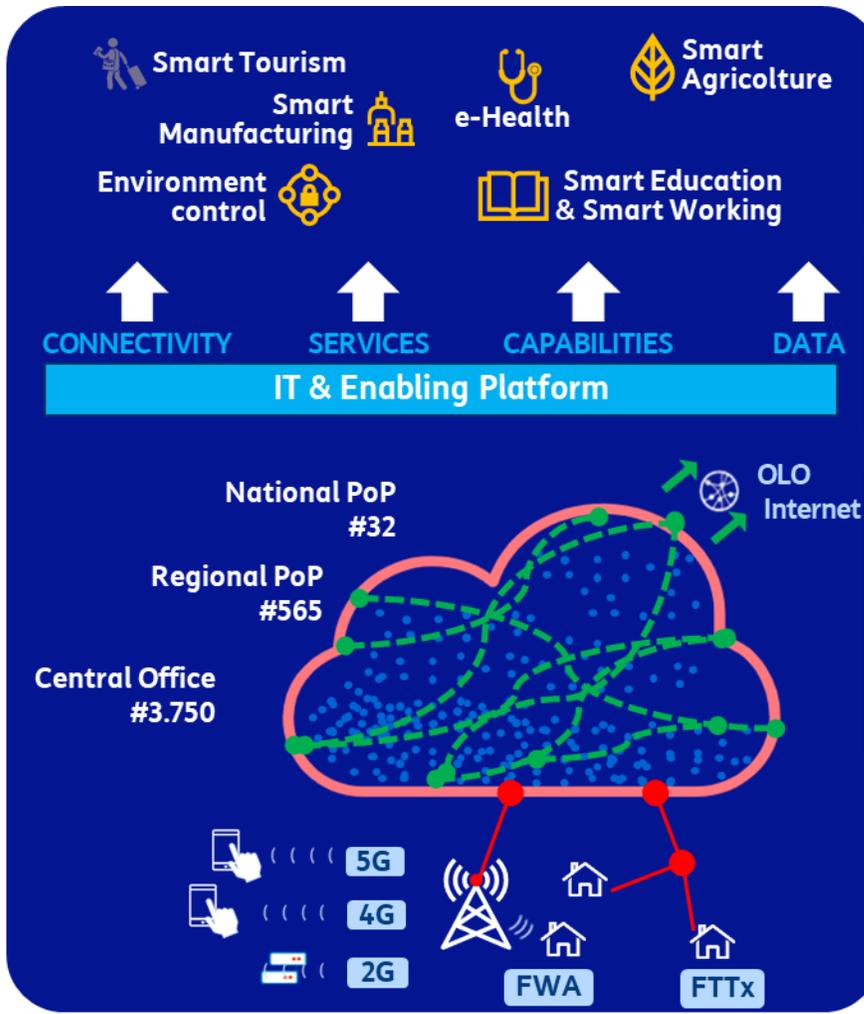
-  Introduction, 5G capabilities and longevity
-  Societal goals, outcome driven, and improved operational performance.
-  Agile and incremental, building upon 5G; global standards and open trade; holistic end-2-end view required; research themes that are user-driven

Requirements

- Consider societal goal
- E2E operating requirements, holistic E2E approach
- Need for Increased Scope for the SDOs
- Need for New Standards Evolution Paradigm
- Need for Unity and Integrity of Global Standards
- Need for Differentiated Technology Evolution

6G Drivers and Vision Project Report - NGMN Forum March 25th, 2021 (David Lister
Vodafone Group)

Network as a Platform and new Digital services



New Digital Services

For **Enterprise, Industry, Government, Consumers**: hyper-connectivity, automation, multi-channel experience and services with widespread intelligence

New generation IT & Enabling Platform

Enable and expose **capabilities** for **Digital Ecosystem**, supporting **partnerships** with **major players** in multiple business sectors

Pervasive and Cloudified Network

Fully **cloud native and automated** core network, with telco data center connected by a “**high-capacity IP highway**”, deployed down to the Edge to support new digital services

Access Network Evolution

High **Capacity, Open, Trust-worthy** and **Disaggregated** Technologies, Low **Latency**

5G Advanced and beyond – Key pillars



- Enlarge the ecosystem
- Address shortcomings of previous 3GPP Releases



- Network automation
- Define procedures and interfaces to measure, report/expose in a standard format
- Improve performance and efficiency



- Sustainable solutions
- Energy efficiency



- Future proof solutions

The rush to 6G – avoid tripping!!!

Questions

- Is 6G a mobile cellular system?
- Which frequency bands should be targeted?
- Is 6G a revolution?
- Which drivers?

And a few considerations

- Frequency bands below 52 GHz (and especially below 10 GHz) are key to provide geographic coverage
- The life cycle of a device in the industry is much longer than the average 3GPP Release / Generation
- Avoid overengineering
- 6G should address market needs and work with 4G and 5G to overcome limitations
- Exploit AI/ML to improve air interface and network management



- Sustainable solutions
- Energy efficiency

Takeaways

L'Italia si accende con il 5G

La trasformazione digitale inizia da TIM

- 5G is the enabler for a digital revolution
- 6G standardization should not focus on “technology first”
- Based on future proof and sustainable solutions
- Beyond 5G must support and enhance existing networks
 - Avoid tripping when looking far ahead !

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