ETSI
The Standards People

# The ETSI Approach to Research, Innovation, and Technology Trends

**Source:** David Boswarthick:

ETSI Director NET (New Technologies)

November 2022

# ETSI – Bringing people together…

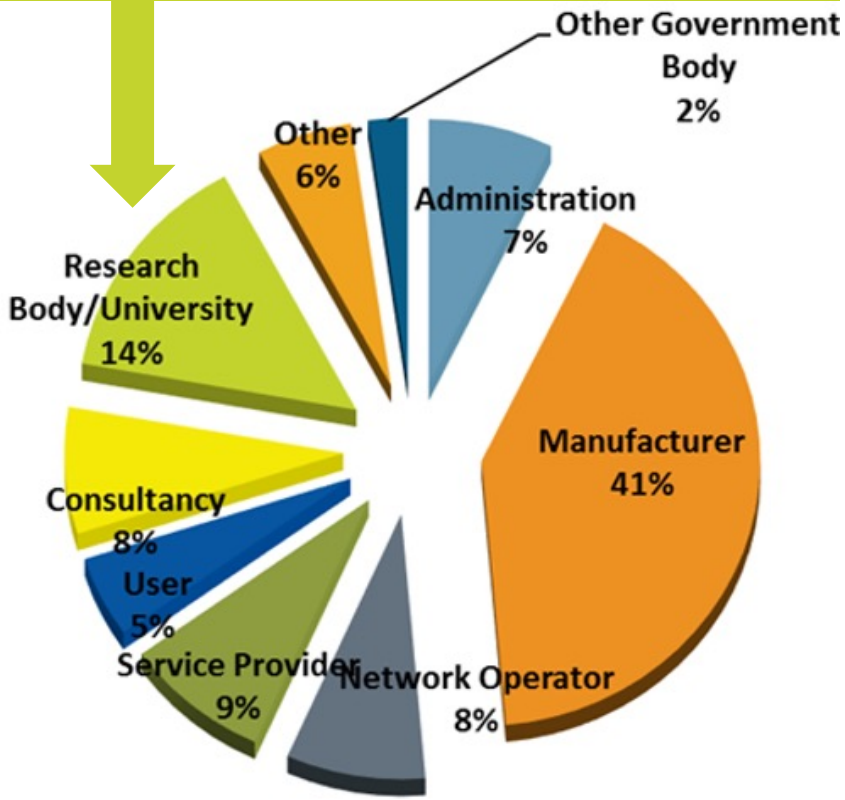
- Independent, non-profit standards organization
- Officially recognized by the European Union to support EU regulation
- 30+ year track record of technical excellence in the ICT sector
- Founding Partner of both 3GPP and oneM2M

- Over 900 members from 63 countries over 5 continents
- Diverse community: private companies, research and academia, governments, public bodies, societal stakeholders

- Over 51 000 standards published to date, 2 400 annually
- All standards are ***free of charge*** and may be downloaded from here https://www.etsi.org/standards

- Over 130 technical groups holding more than 4 000 (e)-meetings per year
- More than 50 (e)-conferences and interop events per year

Public / Private Research organizations and Universities make up for over 14% of our ETSI membership and are present both in Europe and globally



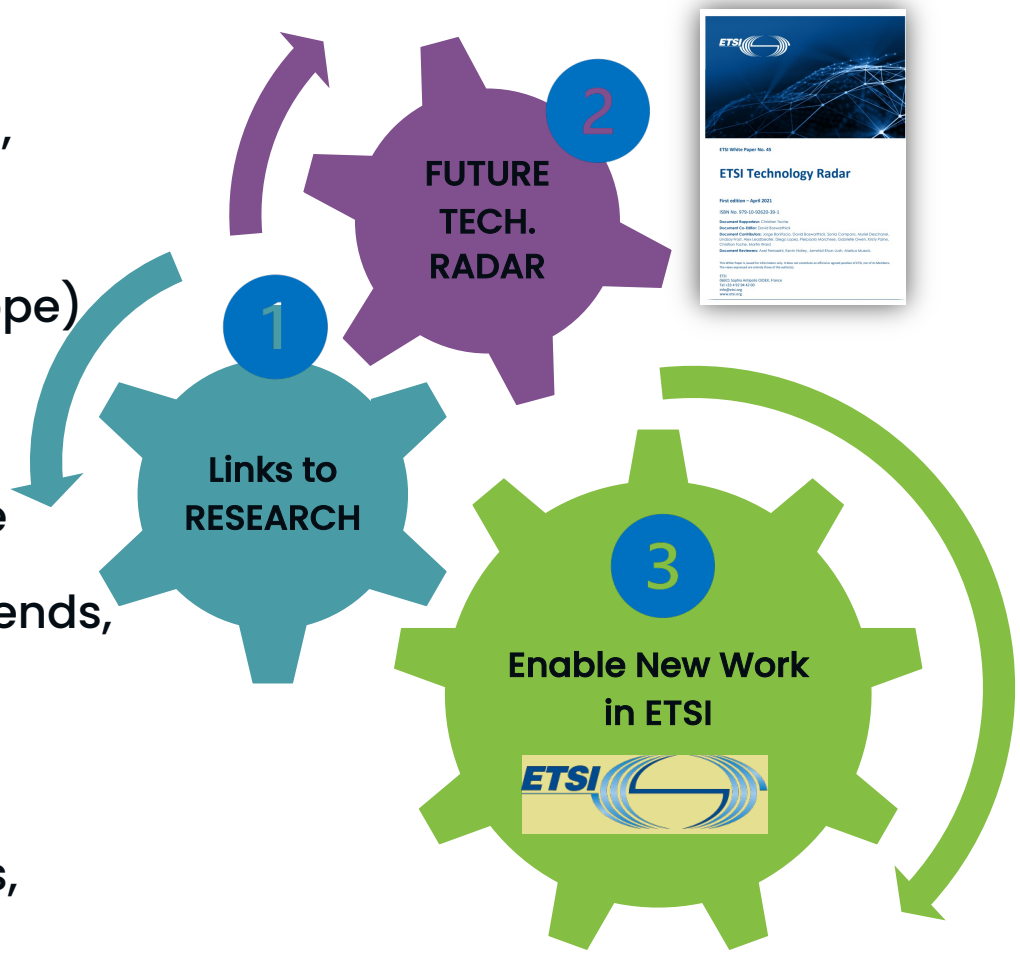

Source: Oct 2022 edition of the ETSI Enjoy! magazine https://www.etsi.org/newsroom/magazine

https://www.etsi.org/

# Research and Innovation in ETSI

- ETSI encourages a constant flow of research and innovation output into our standards work.

1. **ETSI Board_RISE group:** Strong links between Researchers, Innovators & Standards Makers,
   - Working with EU platforms (such as Horizon Europe, SNS JU, 6G-IA, NetworldEurope)
   - Working with national / EU / global projects (such as HEXA-X / Next G Alliance /one6G / IOWN)
   - Outreach to universities and research labs worldwide
2. **ETSI Board_TREND group:** Examines Future Technology Trends,
   - Produces the ETSI Technology Radar (ETR)
3. **ETSI NET (New Tech) Team:** responsible for,
   - Building the tools and enablers for R&I into Standards,
   - Tracking Future Technology Evolutions & outreach,
   - Creation of new technical groups, areas of work in ETSI



# Board TREND – Technology Radar Overview

- ETSI Technology Radar (ETR) tracks the major technology trends that are just on/over the horizon (approx. 0 –> 7 years).
- ETR was first published in April 2021 and originally contained 10 wide Tech-Trends

Initial 10 TRENDs [2021]

**Mobile Network Evolution** — Clause 3.2.1
- 5G NR
- 5G for Verticals
- B5G to 6G
- mmW to THz
- Holographic Radio
- dmMIMO

**Artificial Intelligence** — Clause 3.2.2
- AI Lifecycle
- Machine Learning
- Securing AI*
- Ethics in AI

**Autonomous Networks** — Clause 3.2.3
- Zero Touch
- Self Organizing
- Self Healing
- Self synthesizing Networks

**Cybersecurity** — Clause 3.2.4
- Security
- Trust
- Privacy
- AI Secure*

**Distributed Ledgers** — Clause 3.2.5
- Blockchain
- PDLs
- DAGs
- NFTs

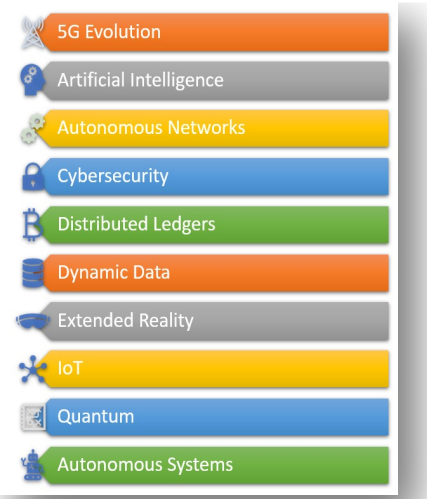
**Dynamic Data** — Clause 3.2.6
- Big Data
- Data Analytics
- Dynamic Data
- Semantic Interop**

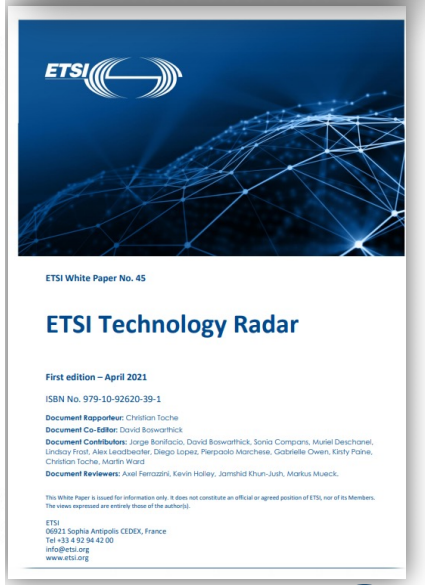
**Extended Reality** — Clause 3.2.7
- Augmented Reality
- Virtual Reality
- Mixed Reality
- Towards the Metaverse

**IoT** — Clause 3.2.8
- Ontologies**
- M2M –> IoT –> IoE
- Industrial IoT
- Sensors / wearables
- Internet of Senses
- Internet of Skills

**Quantum** — Clause 3.2.9
- Quantum Safe
- Quantum Key
- QIT (Quantum Info. Tech)
- Quantum Internet
- Quantum Metrology (Clock and sense)

**Autonomous Systems** — Clause 3.2.10
- Cloud Robotics
- Intelligent Transport Systems
- Unmanned Systems
- Robots / Cobots
- Drones / HAPS



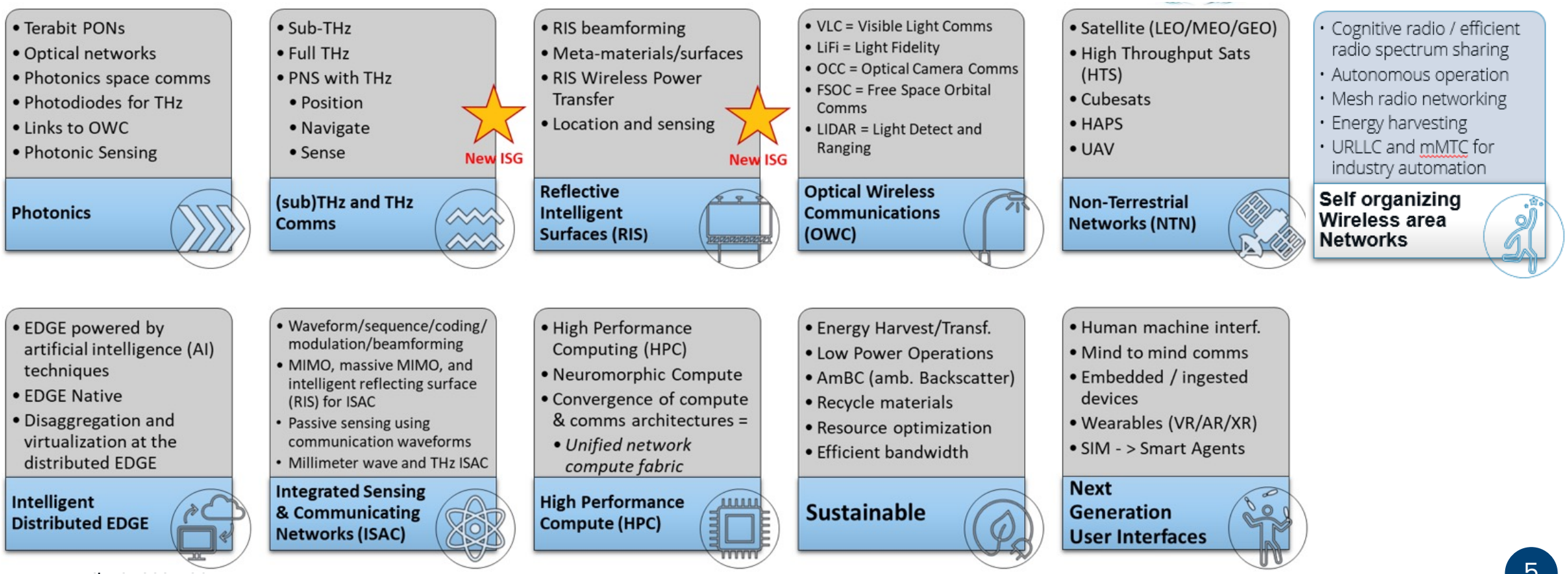



ETSI Technology: Radar https://www.etsi.org/images/files/ETSIWhitePapers/etsi_wp45_ETSI_technology_radar.pdf

# Board TREND – Technology Radar Update

- ETSI Technology Radar (ETR) is in the process of being updated by BOARD_TREND
- Revision of the ETR planned with WP publication April 2023, will include 11 additional Trends
- NOTE: Final selection of New TRENDs for 2023 edition will depend on active contributions

Additional 10 TRENDs [2023]



# Topics emerging from early 6G research

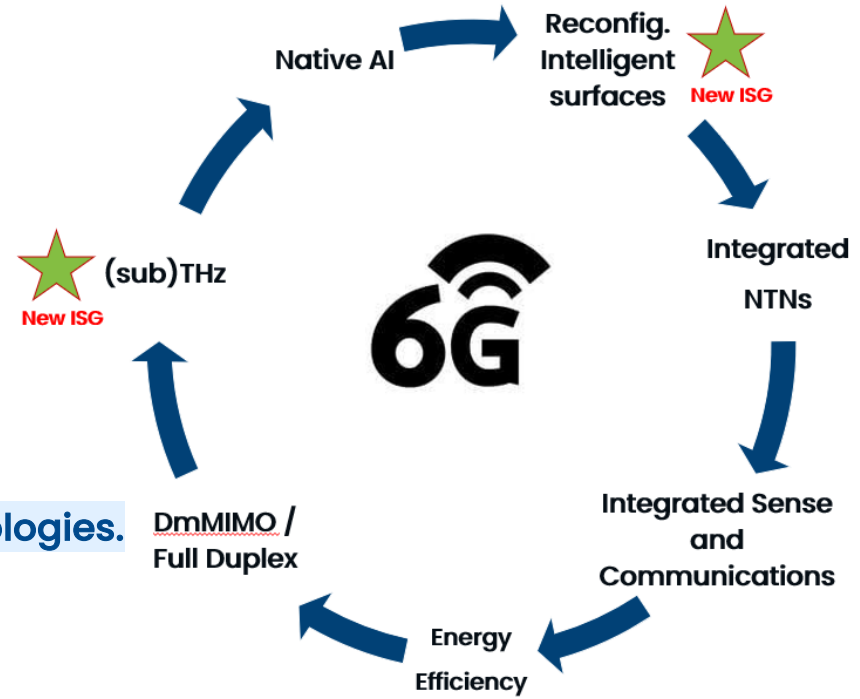
Current assumption is the first **6G** services *may* be deployed as of 2030… but of course expectations can and often do change due to global / market pressure.

**6G** is currently ONLY at the Vision & Research phase.

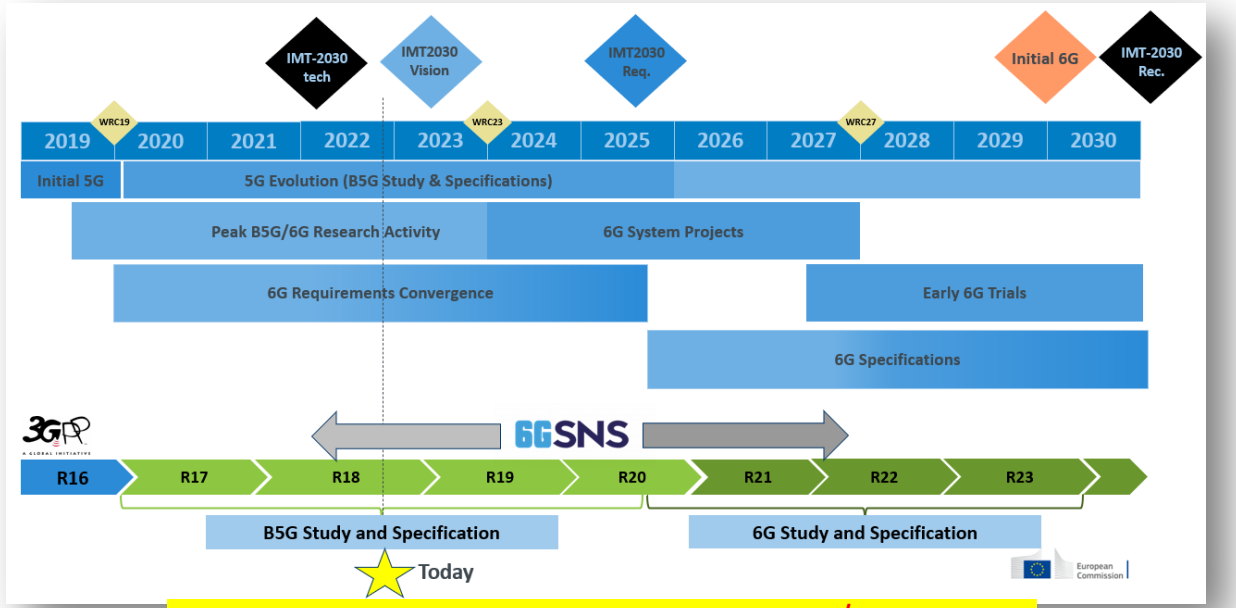
The sharing of ROADMAPs & 6G VISIONs is essential to avoid fragmentation

Initial study items for **6G** are not expected to be seen in 3GPP until > 2026/2027.

**5G** evolutions and **6G** developments will run as *parallel tracks* for many years.




**In ETSI we speak only of "RESEARCH and pre-standards work" for candidate 6G technologies.**




NOTE: These are "indicative and estimated" dates / releases only

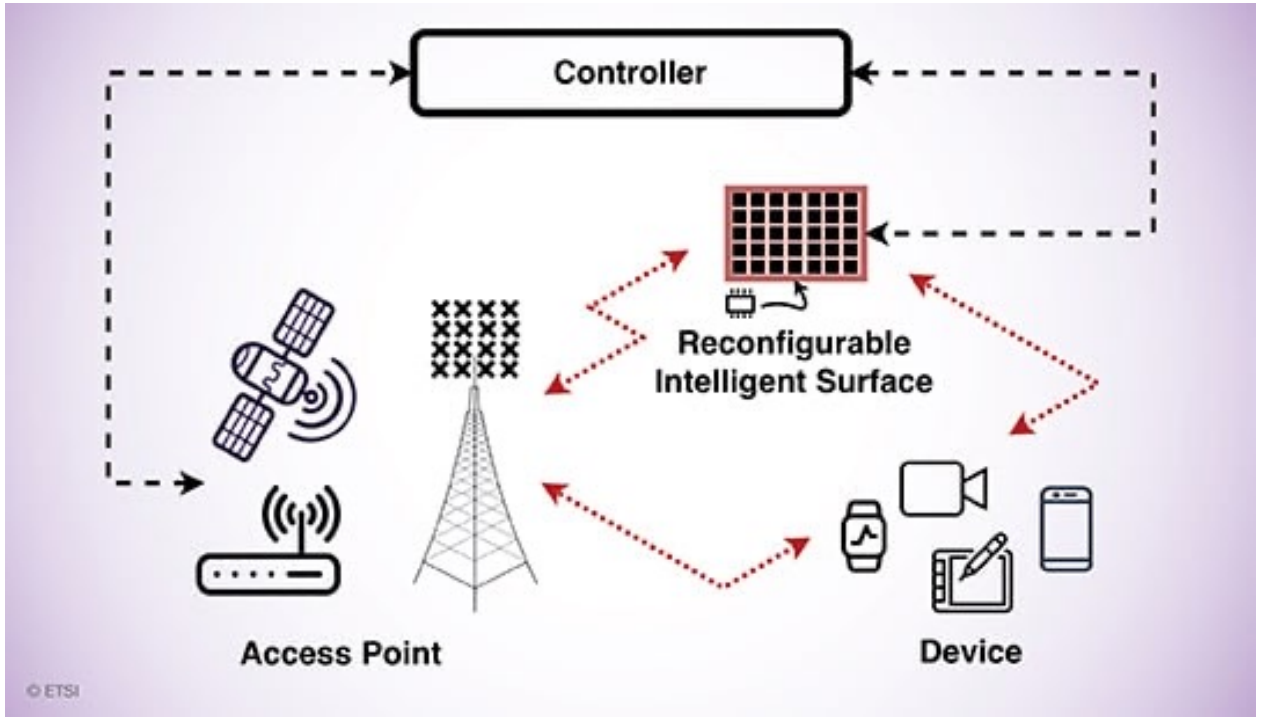
NOTE: These are simply *common* elements Extracted from *multiple* 6G vision papers.

**"ETSI seeks to promote the one global standard for 6G, and work proactively with all of our partners to avoid any risk of standards fragmentation"**

# Recent pre-standards Group, Industry Specification Group - ISG RIS (Sept. 2021)

**ETSI ISG RIS:** *

**Mission:** Provide an opportunity for ETSI members to collect their pre-standards research efforts on RIS technology across various EU/UK collaborative projects, extended with relevant global initiatives, towards paving the way for future standardization of the RIS technology.




Currently 35 members and 2 participants

3 x deliverables currently being drafted

* RIS = Reconfigurable Intelligent Surfaces

More information on https://www.etsi.org/committee/RIS

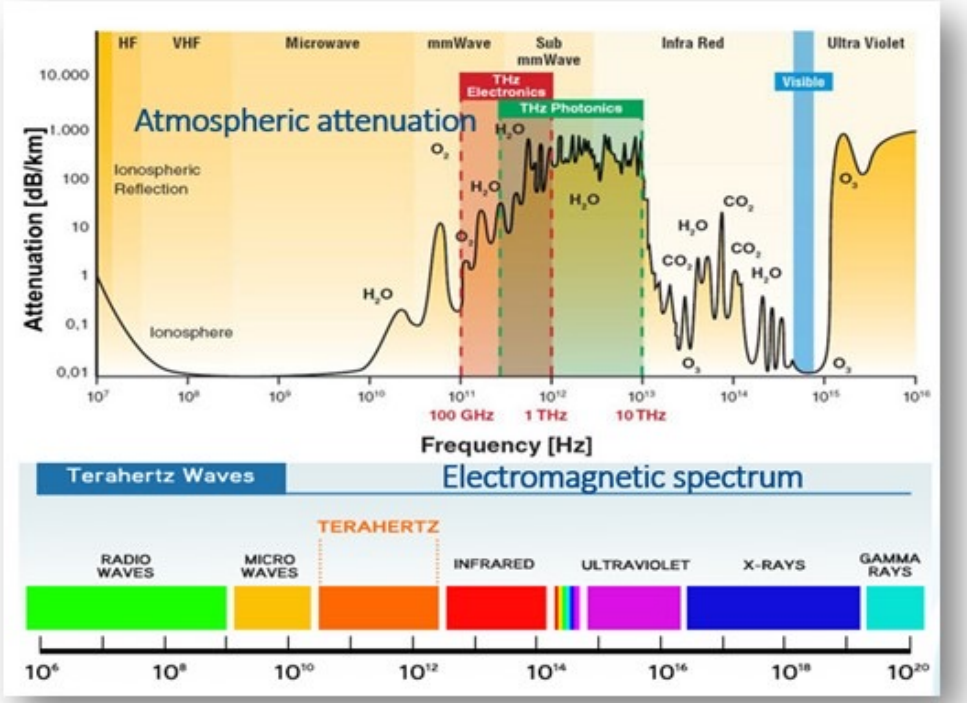
# New pre-standards Group, Industry Specification Group - ISG THz (Sept. 2022)

**ETSI ISG THz:**

**Mission:** Establish technical foundation for THz communications (0.1 - 10 THz) development and pre-standardization.

A place for ETSI members *(and non-members)* to progress their pre-standardization activities resulting from EU/National research efforts in the domain of THz technologies. The ISG will expand the community to include various industry players and international initiatives as week as investigating what is needed for THz standardization.

Prepare systematic output on channel models, system parameters, and evaluation assumptions, for subsequent evaluation of THz communications systems by 3GPP.




Approved at Board#139, 25 Founding Members *(record level of support)*

Kick of meeting planned 8th Dec 2022.

More information on https://www.etsi.org/committee/THz

# NEW ISGs/TBs in ETSI – what could be next?

ETSI is always considering potential new areas of work.

The topics identified in the ETSI Technology Radar (ETR) are a starting point but not only.

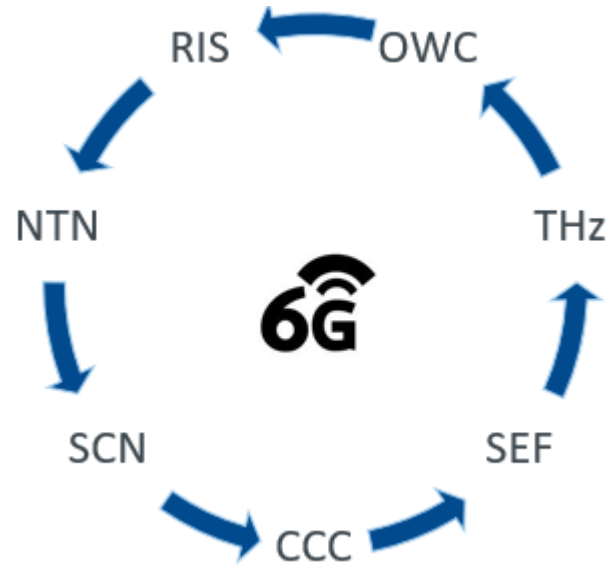
ETSI is 100% member-driven and is interested in suggestions and contributions from our Member organizations (present & future) about potential new areas of work for 2023 and beyond.

Today, there is no consensus of what the 6G technologies will include, but they will be a mix of,

- *Evolutionary* technology developments, building on 5G
- and *Revolutionary* technology leaps, requiring a new Generation

An early *estimate* of key technology areas for 6G *could* include:-

- Expanding from mmW to sub/full-THz Comms (**THz**)
- Reconfigurable Intelligent Surfaces (**RIS**)
- Integrated sensing and communications (**SCN**)
- **A greater focus on Trust / Privacy & Security as well as Sustainability.**
- and many others yet to be considered / imagined

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