



Role of Standards in Accelerating Innovation Example: Beyond 5G to 6G

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[NOTE: all figures and information correct as of that date]

About ETSI - Bringing people together...

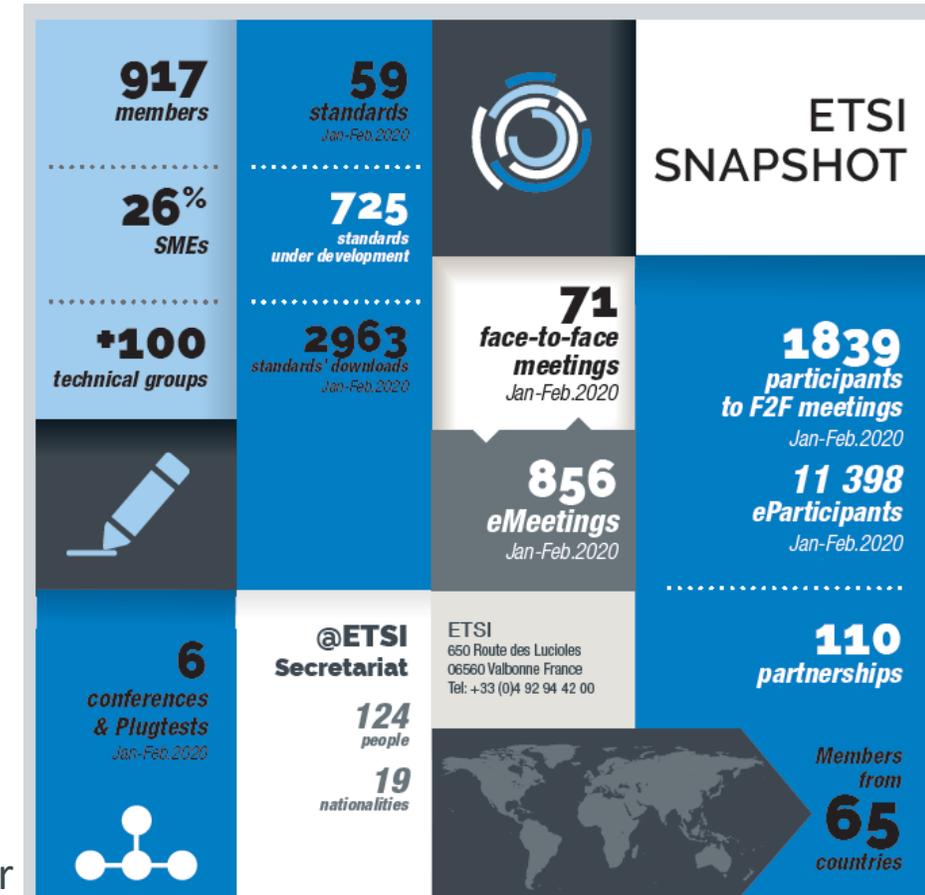


- ✔ Independent, non-profit standards organization
- ✔ Officially recognized by the European Union to support EU regulation
- ✔ **30** year track record of technical excellence in the ICT sector
- ✔ Founding Partner Member of both **3GPP** and **oneM2M**

- ✔ Over **910** members from **65** countries over **5** continents
- ✔ Diverse community: private companies, research and academia, governments, public bodies, societal stakeholders

- ✔ Over **48 000** standards published to date, **2 600** annually
- ✔ **17.5 million** downloads annually – All standards are free of charge

- ✔ Over **90** technical groups holding more than **4 000 (e)** meetings per year
- ✔ More than **50** conferences and interop events per year



Taken from April edition of the ETSI Enjoy! magazine
<https://www.etsi.org/newsroom/magazine>

About ETSI - At the heart of digital...



To design tomorrow's digital world

- ✓ 5G
- ✓ IoT / M2M
- ✓ Cybersecurity
- ✓ Network Virtualization
- ✓ Multi-access Edge Computing
- ✓ Automated Network Management
- ✓ Artificial Intelligence
- ✓ Blockchain (Distributed Ledgers)
- ✓ Quantum (Compute & Key)
- ✓ AR/VR/XR
- ✓ ... and many others

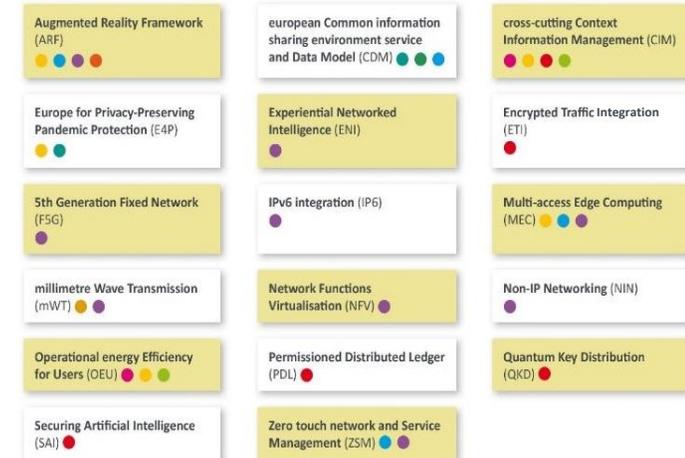
Committees, Projects & other groups



ETSI Partnership Projects



Industry Specification Groups



Open Source Group



The ETSI ISG – An Early Standards Incubator for Research

ISGs (industry Specification Groups) are the perfect tool for developing ‘early’ standardization work resulting from research projects.

This tool has been used for many successful standards efforts on technologies such as **mWT, NFV, Edge, Artificial Intelligence, AR/VR/XR, Quantum Safe, Quantum Key.**

An ISG may be established on the initiative of any group of, at least four (4), ETSI members (or applicant members) making a request to the ETSI Director-General and meeting the essential criteria for new ISGs in ETSI.

The streamlined ISG process can enable a group to be set up quickly (min. 4 weeks) and deliverables may be published in only a matter of months making it the ideal mechanism for early stage standardization.

ETSI ISGs are open to both ETSI members and non-members.



ETSI ISG Building Blocks for 5G

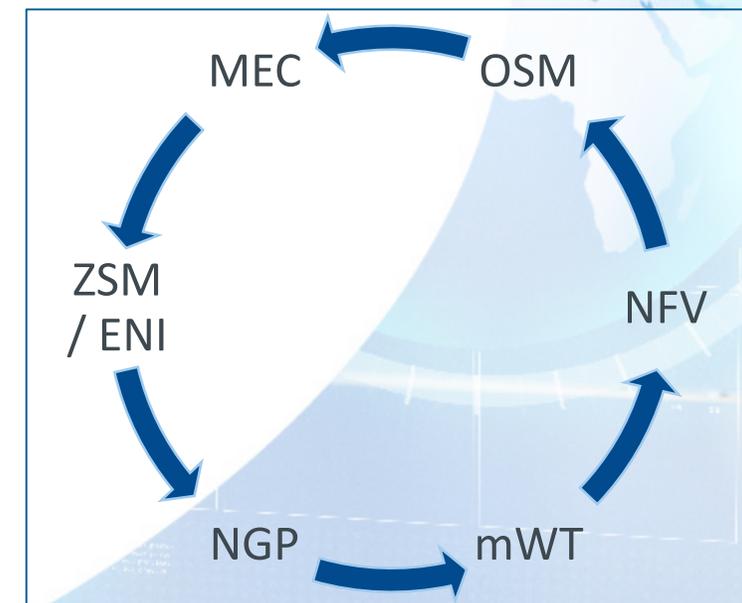
All ICT systems are a collection of distinct technologies linked together to provide the requisite solutions and services.

5G is a good example as it assembles several technologies including (but not limited to):

- (Radio) / mWT / Massive MIMO / Beam forming ...
- (Network) Slicing / Edge computing / Cloudification / Zero Touch ...
- (Transport/Optical) PONs / ARNs / ...
- .. to name but a few

Several of the technologies listed above have been examined in ETSI ISGs before being proposed to 3GPP, via member contribution, including (but not limited to):

- ISG NFV / OSM
- ISG mWT
- ISG MEC
- ISGs ZSM / ENI / SAI / NGP



Building Blocks for BY5G

Operators are now actively deploying 5G across the globe.

It is important to use caution and avoid diluting the impact of 5G (through big 6G announcements).

At the same time there is a large amount of innovative technology research all over the globe that may eventually be incorporated into BY5G / 6G. Study items for 6G are not expected to be seen in 3GPP until beyond 2023, with possibly the first 6G services only appearing after 2030, but of course expectations can/do change.

The related research is in the early stages, and the corresponding European Funding programmes are just beginning (Horizon Europe 2020 – 2027).

However it is 'never too early' to consider the impact research could have on standards.

On the contrary the requisite standards can often be considered 'too late' and opportunities missed.

There is no real clear understanding of what **6G technologies may include**, but a "guesstimate" could be:-

- Something involving beyond mmW -> THz Communications
- Smart Surfaces / large intelligent surfaces
- More Artificial Intelligence, SON -> SSN (Self Sustaining Networks)
- Energy harvesting / transfer
- Nanophononics (glass to radio) ... and much more, yet unknown.



Relationship between Standards and Research

Why Standardization?

Global ICT markets are shaped by standards.

When ICT research is destined result in new products, new services, or even new markets, then research should be fed into standardization activities to encourage market uptake.

When Standardization?

Engaging in Standards groups at the appropriate stages of research is essential.

The early identification of potential research topics for standardization and the appropriate standards bodies is important to ensure that the requisite standards are available to the industry when they are needed.

All research projects should include a standards landscape / gap-analysis resulting in a standards roadmap and engagement plan.

How to Accelerate Innovation through Standards

Standardization and research are highly interlinked.

Different standards can play different roles at different stages of the research and innovation process.

For innovative research, a lighter form of standardization is required as opposed to more formal standards required to design a 5G system for example.

Such pre-standards are often done in ETSI Industry Standardization Groups (ISGs) before moving to more formal standards groups.

It is a good method to build community and prove the concepts from innovative research whilst moving to market. Solid standards help to build market confidence.

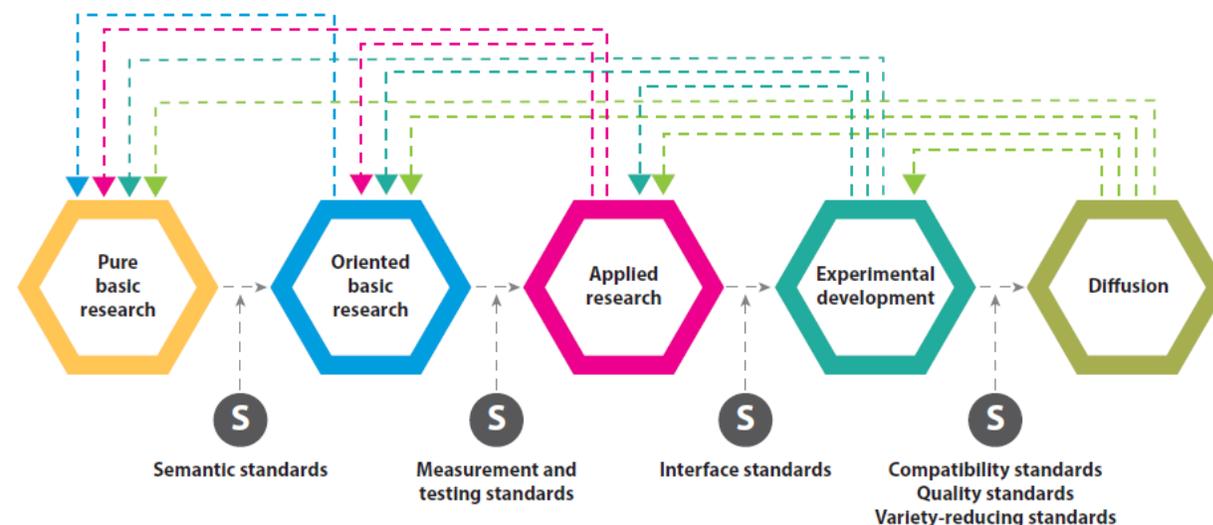


Figure 5.9: Various roles of different types of standards in the innovation process (Blind and Gauch 2009)

Cooperation, Communication, Coordination

Bridging the gap between Research and Standardization requires:

Cooperation between research projects and standardization bodies

Education by standardization bodies about their processes and current work programmes

Outreach by standardization bodies on the value of standardization and the possibilities available to research communities

Coordination between research bodies and standardization bodies fostering an Open approach

ETSI Helpdesk for Researchers

- **Dedicated research Webpages**



www.etsi.org/research

- **Dedicated contact email**

- **Guides / Leaflets / Videos**

- **Support to EU Projects**

- **Advice on EU Research**

- **Setting up new Standards Groups**

- **Advice on Standards Activities**

- **... and more**



<https://www.linkedin.com/showcase/etsi-standardization-research-innovation-education>



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