



Webinar Series

Standardisation in research and
technology for practitioners
Knut Blind, Fraunhofer ISI

- Background: EDU4Standards
- Pilot EARTO

EDU4Standards.eu - Empowering Standardisation through Education in Europe

OBJECTIVES

Obj.1: Develop and disseminate teaching material about standardisation

Obj.2: Increase the visibility via "Academic Standardisation Days" (ASDs)

Obj.3: Increase the number of HEI & universities offering teaching on standardisation

Obj.4: Increase number of teachers offering courses and students attending courses about standardisation

Obj.5: Set up a Students' Standardisation Association (SSA)

Community

- Standardisation Student Association created
- 100+ HEIs exposed to standard education
- 100+ teachers with standardisation knowledge
- 500 students educated in pilots
- 1,500+ engaged community members
- EURAS
- External Advisory Group (EAG)

Innovative Teaching Concept of Standardisation (ITCoS)

Web Platform

Student Standardisation Association & Academic Standardisation Days



Pilots

- a. B.Sc course
- b. M.Sc course
- c. In-company Training
- d. Extra-curricular Format

Pan-EU EARTO

- e. Seasonal university school
- f. Distance learning

EU & International Synergies

- > 10 Mutual cooperations with National, European, and Int'l organisations and initiatives
- Continuous engagement and exchanges on all ICT standards topics
- Interaction with Policy makers: (Including: EURAS, MSPs, Sherpa Groups of the High-level Standardisation Forum, STAIR, ISO, IEC, ITU & IEEE etc)
- Collaborations with HE Standards projects:



Outreach

- 4 Pilot Workshops
- 10 Webinars
- 5 Academic Standardisation Days
- 2 CEN Workshop Agreement Meetings
- 1 Final event
- 12 newsletters
- 3 Press Releases
- 10 Professional Videos
- Visibility at >15 3rd party events
- PPC Campaign
- Social media channels

Reports & other value-add output

- Whitepapers & Scientific Publications
- Online Teaching Content
- CEN Workshop Agreement
- Pilot evaluation reports
- Sustainability strategy
- Policy Recommendations
- EU Standardisation Roadmap
- All Results published via zenodo

SG 1
HEIs/universities

SG 2
Teachers & standards educators

SG 3
Students & Student Associations

SG 4
Standard Development Organisations

SG 5
Policy Makers

SG 6
Environmental and consumer organisations

SG 7
Research organisations & EU projects

SG 8
Industry & SMEs

SG 9
Citizens and citizen groups

Target groups:

- Beginners “Research & Development and Standardisation” course provides a concise yet in-depth understanding of standardisation as relevant from a Research and Technology (RTO) perspective.
- Intermediate experts “Effectively participating in standardisation bodies” course addresses skills to operate in standards bodies.
- Sophisticated experts “Strategic standardization for RTOs” high-level course, aimed at senior researchers, offers a tailored format for standardisation topics for management level also related to RTO’s business models (e.g. IPRs, SEPs, Open Source)

Webinar series Standardisation in research and technology for practitioners:

- Modul 1: Standardisation Landscape 6.11. 2025
- Modul 2: Types and Impacts of Standards 13.11. 2025
- Modul 3: Research and Standardisation 20.11. 2025
- Modul 4: IPRs and Standardisation 27.11. 2025
- Modul 5: Open Source and Standardisation with Mirko Böhm LF 4.12. 2025
- Modul 6: Geopolitics of Standardisation with Barbara Reiter Uni Graz 11.12. 2025



EDU4
Standards.eu

Module 4 IPRs and Standardisation



Funded by
the European Union

1. [Introduction](#)
2. [IPRs and its different forms](#)
3. [Ways in which IPRs can be relevant to standards and standardisation](#)
4. [Tension between patents and standards](#)
5. [IPR policies at SDOs](#)
6. [IPR, standards, and the legal system](#)
7. [Patent pools](#)
8. [Public interest and policy initiatives](#)

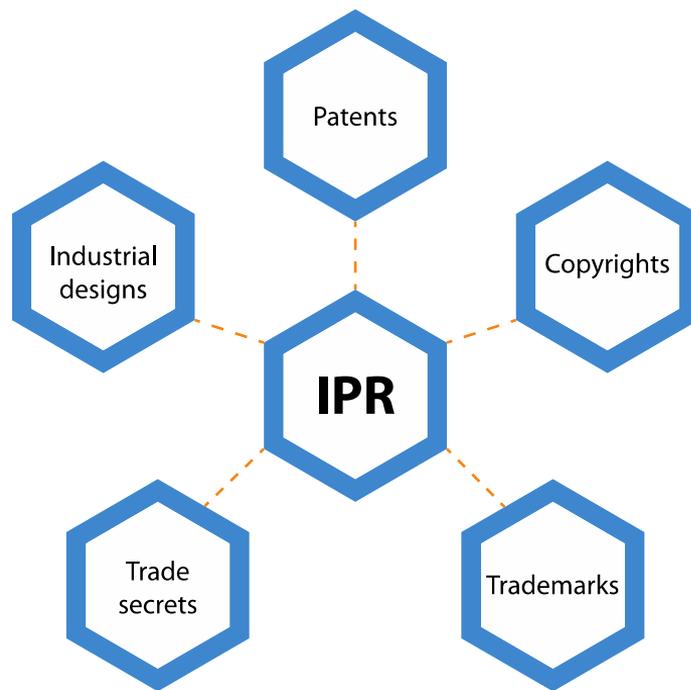
Accompanying textbook:

- Understanding ICT Standardization: Principles and Practice (Published 2021)
 - Includes supporting material, e.g. quizzes to prove knowledge
 - More detailed information about the topics
 - Available at: www.etsi.org/standardization_education
- CEN-CENELEC: Guide 39: The role of standards in support of Technology Transfer (Published 2022)
 - Information about various IPRs and their links to standards
 - Procedures and support offered by CEN-CENELEC
 - Available at: <https://www.cencenelec.eu/media/Guides/CEN-CLC/cenclcguid39.pdf>

- The learning objectives of this webinar are:
 - To know the **various forms of IPRs**
 - To understand the **tensions** between **patents** and **standards**
 - To know the different types of **IPR policies** of **SDOs**
 - To comprehend the possible role of **patent pools** in the context of **standards**
 - To understand the **policy relevance** of **IPRs in standardisation**

- Standardisation is driven by various sources (Blind et al. 2024), like
 - customer requirements
 - regulation and policy
 - research and innovation
- However, most research output and innovative ideas are subject to intellectual property rights (IPRs)
 - many participants in standardisation are indeed active in applying for various types of IPRs
- Some of these IPRs may limit the usage of these ideas in general (e.g. integration in devices) and particularly related to the implementation of standards
- For this reason, it is important to have a good understanding of the interplay between IPRs and standards

- IPRs exist in almost in all countries around the world
- Countries have established laws to protect intellectual property for several reasons:
 - acknowledgement the moral and economic rights of creators
 - promotion of research, creativity and innovation, and the dissemination and application of their results
 - allowing their trade
 - contributing to sustainable development
- As creations by humans can take several forms, there are different types of IPRs to protect them



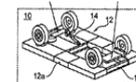
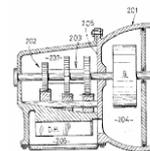
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Legal right

What for?

How?

Patents	New inventions	Application and examination
Utility models	New inventions	Application and registration
Copyright	Original creative or artistic forms	Exists automatically
Trademarks	Distinctive identification of products or services	Use and/or registration
Registered designs	External appearance	Registration
Trade secrets	Valuable information not known to the public	Reasonable efforts to keep secret



Trade marks

- NOKIA
- Product '208'
- Start-up tone

Copyright

- Software
- User manuals
- Ringtones
- Start-up tone
- Images



Patents and utility models

- Data-processing methods
- Operating system
- Operation of user interface

Designs

- Form of overall phone
- Arrangement and shape of buttons
- Position and shape of screen

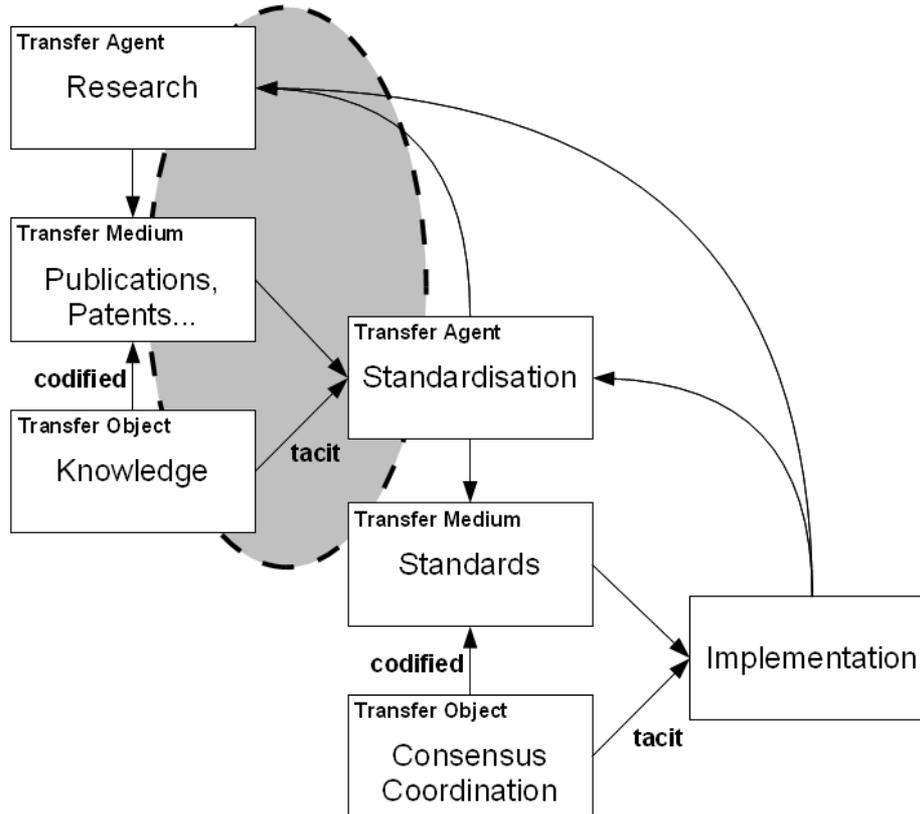
Trade secrets

- Some technical know-how kept 'in-house' and not published

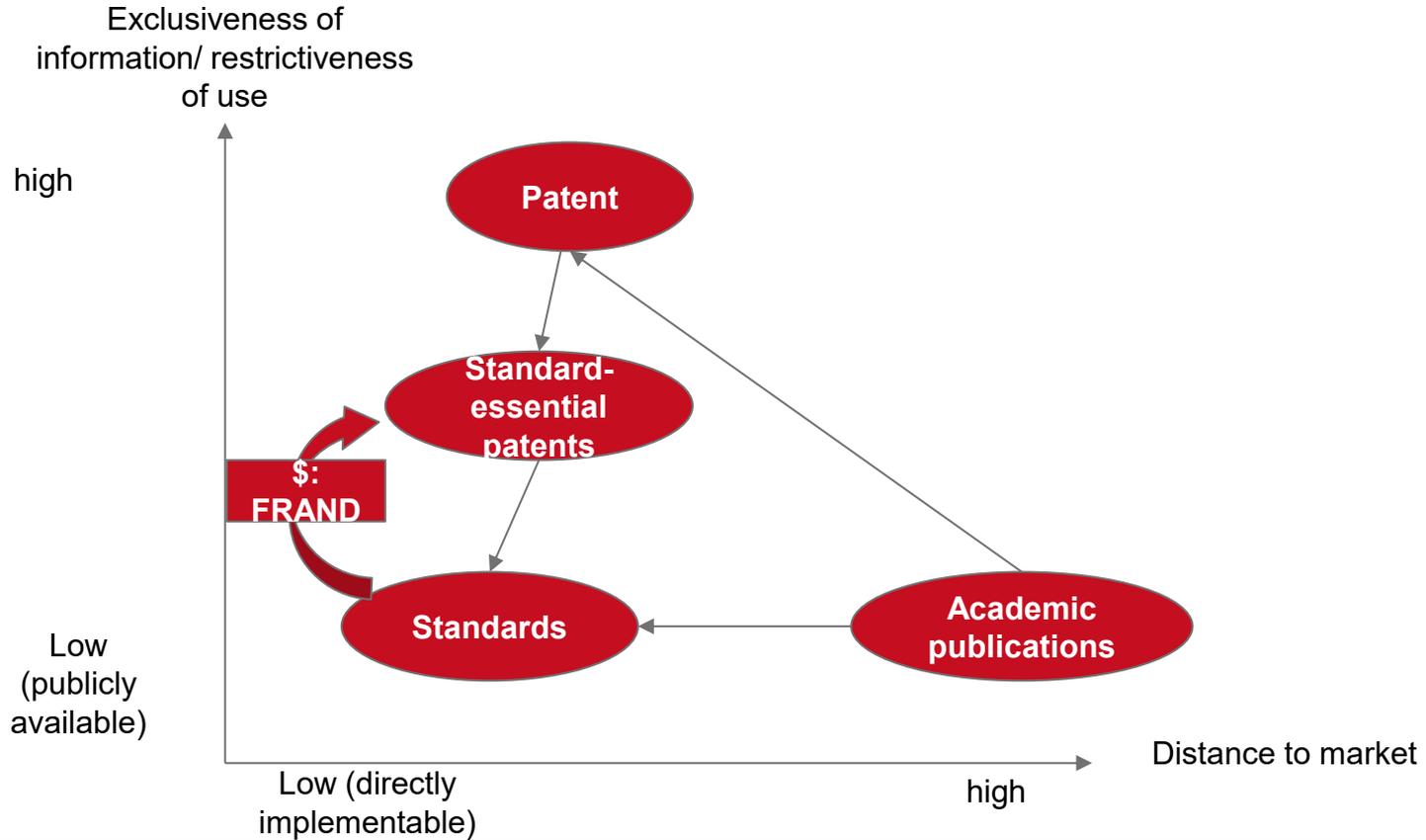
- What does it mean to own an IPR?
 - An IPR provides its owner with the right to exclude others from making use of the creation or innovation
 - It may do several things with this right:
 - Use the innovation for itself
 - Allow others to use the innovation, for instance for monetary compensation (by offering a license) or for free
 - The rights awarded by IPRs are temporary (e.g. patents last in general 20 years, and copyrights at least 50 years after the death of the author depending on the country)
- While an IPR allows the holder to exclude others, it does not automatically creates the right to use the innovation: it is well possible that using a patented invention in the context pf an innovative product also requires the use of inventions that were already patented by others
 - ✓ In such a case, a license from these others is needed

- IPRs can be relevant to standards in different ways:
 - Standards are text documents, and the question of copyright arises
 - Standards are often known by a name and associated with certain logos (or symbols or emblems, think of GSM, Wi-Fi, Bluetooth and CD)
 - sometimes, SDO copyright owner of the name
 - in rare case, e.g. the well-known “GSM” logo is owned by the GSM Association (GSMA) and the trademark
“Wi-Fi” is owned by the Wi-Fi Alliance
 - The implementation of a standard into a product or service may require the use of certain IPRs
 - patented inventions
 - proprietary software code

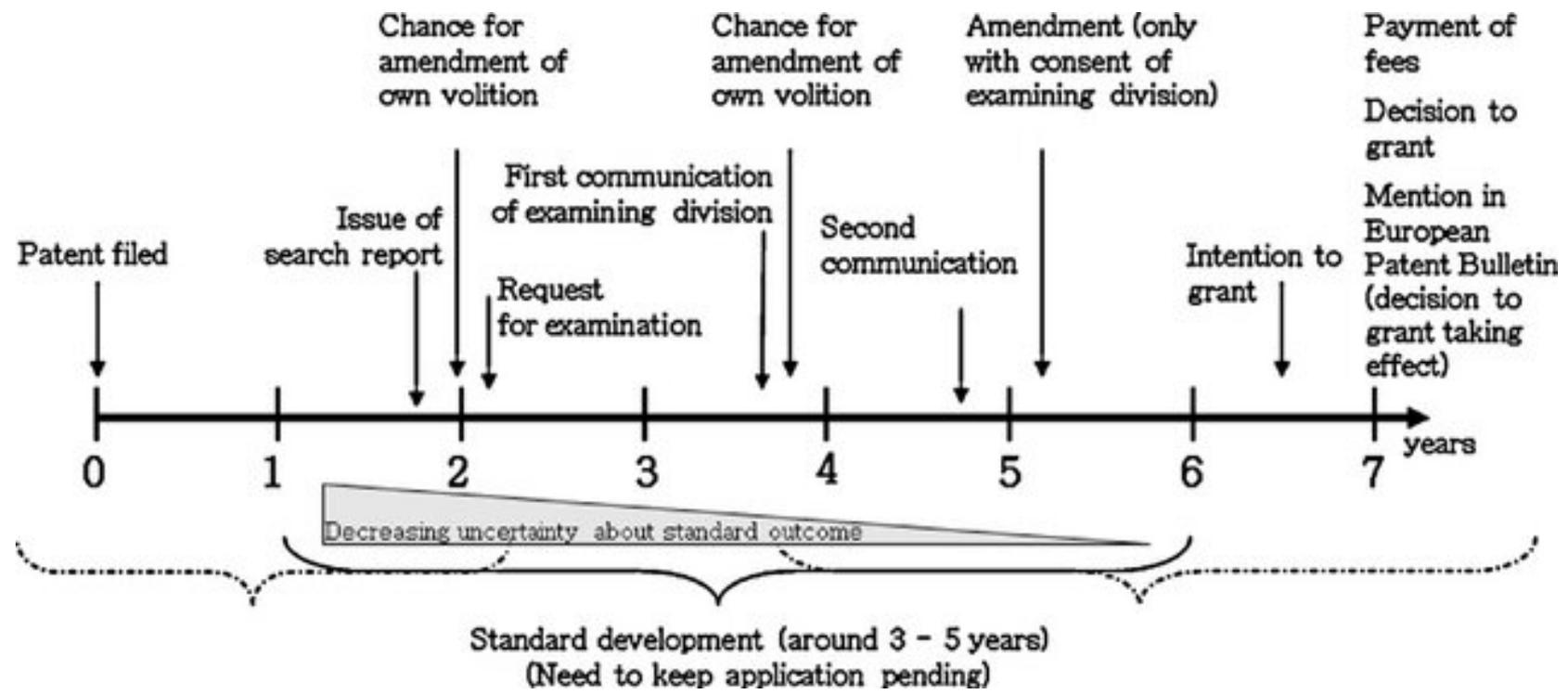
A Cascading Model



Source: Blind and Gauch 2009



Timeline with overlapping patenting and standardisation processes



Source: Berger, Blind and Thumm, 2012

Comparison between SR publications and SEPs

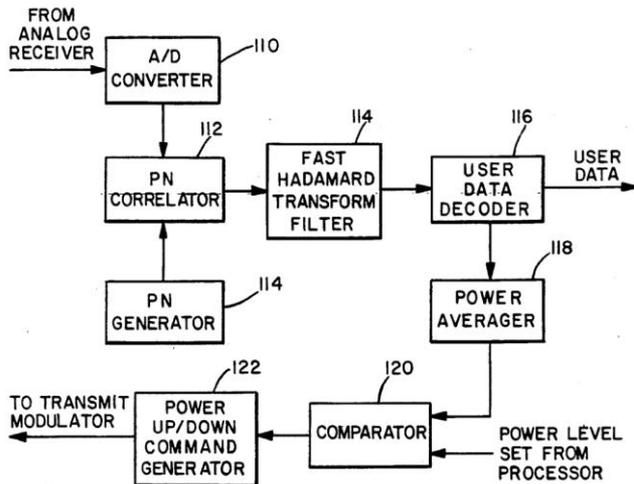
	Standard-Relevant Publications	Standard-Essential Patents
Process	No formalized process	Mainly formalized declarations (e.g. ETSI Homepage)
Input	Mostly published publications	Mostly applied but not granted patents
Timing	Inclusion up until publication of standards	Inclusion during the standardization process, but official declaration before and after the publication of the standards
Type of Research	Both basic and applied research	Applied research
Areas	All scientific and technological areas with a focus on health, safety, and environmental standards	Strong focus on ICT standards
Actors	Mainly research institutes and universities Companies and governmental agencies	Mainly companies and some research institutes
Demographics	Researchers later in their careers	Older than average inventor
Motives	Intrinsic interests, reputation, and influence on public policies	Commercial interests, incl. reputation, signaling, and freedom to operate
Barriers	Cost of participation and lack of recognition by the scientific community	Cost of participation
Impacts	Higher cited papers are referenced in standards Higher subsequent citations due to being referenced in standards No information about commercial impacts	Higher cited patents are declared to be essential to standards Higher subsequent citations due to the essentiality declaration Positive commercial impacts

Source: Neuhäusler and Blind 2026

- The patent and the standardisation system are both institutionalised to serve the public benefit
 - Due to their different rationales, there are tensions, which require thoughtful considerations and policy
 - Patents: Exclusive rights to incentivise research and innovation granted by a sovereign state to an inventor or their assignee for a limited period of time in exchange for the public disclosure of an invention; Intended to allow its owner excluding others from using the protected invention
 - Standards: Common platform or specification of a technology to connect, communicate and work on a common basis to encourage the spread and wide implementation of the standardised technology
- This tension specifically pronounced for so-called Standard Essential Patents (SEPs)
- Solution mandatory license (License cap under F/RAND)
 - Fair: no bundling (only essential patents); no free grant backs
 - Reasonable: cumulative license reasonable to technology price
 - And Non-Discriminatory: equal license for every licensee

- Basic concept of a SEP: without the use of the technology protected by that patent, it is impossible to develop a product that satisfies the standard
 - Consequently, without having obtained a permission, e.g. a license, or being the owner of that patent itself, to be able use the patented technology, an implementer cannot produce or sell a product that complies with the standard
 - Whereas in circumstances without the need to comply with a standard, a producer can choose not to implement a certain feature in a product if it cannot obtain the necessary licenses, or 'invent around' to create a similar feature using a technology different from the one that is patented, in the case of a SEP both approaches are, by definition, not possible, since implementing the standard requires the use of the SEP
 - This constellation creates a particularly strong position for the SEP owner
 - If many SEPs are linked to a standard, then each implementer must obtain licenses for each of these SEPs, if they are relevant for the development of the product in question.

Patent that may well be a SEP:



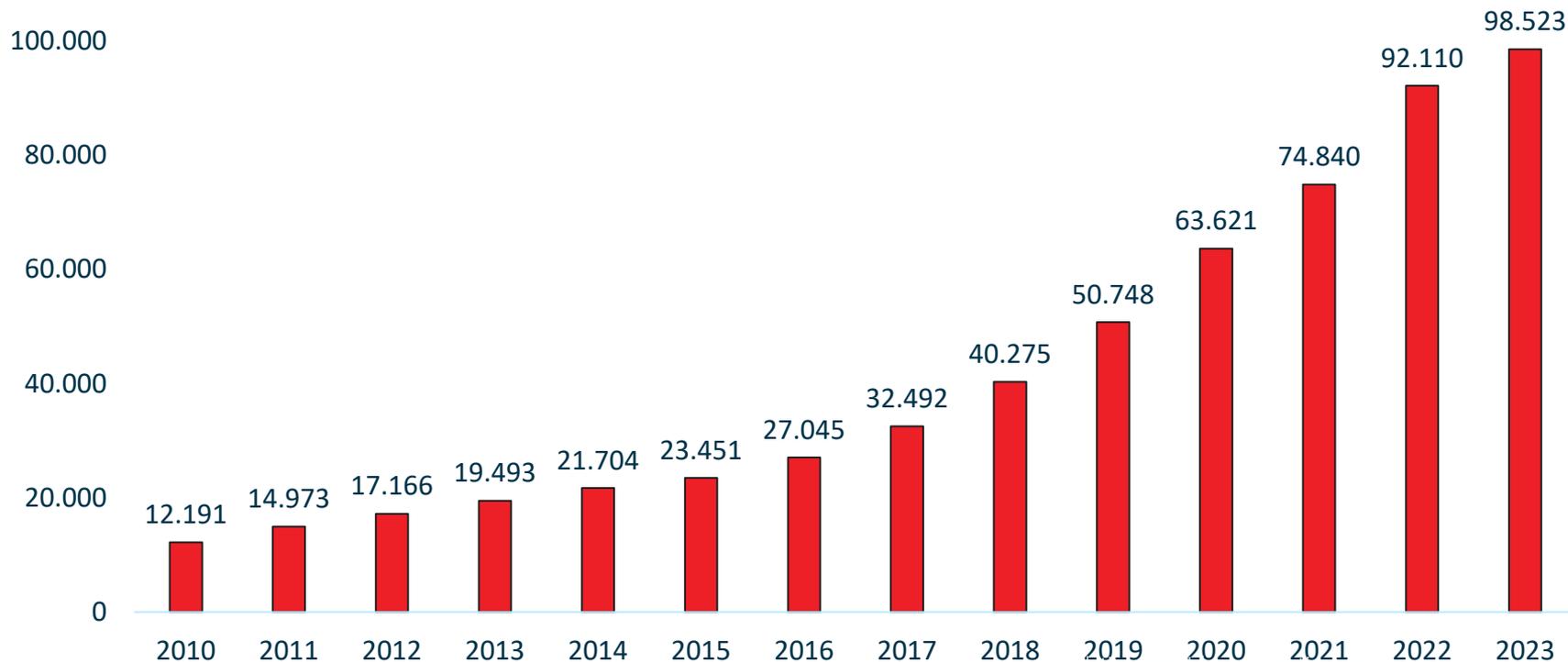
Patent that is not a SEP:



(but may nevertheless be valuable!)

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- Many SDO policies require participants to disclose information on patents that are potentially essential.
 - A study for the European Commission (Bekkers et al., 2019) showed that until 2019, parties declared around 260,000 patents as potentially essential for ETSI standards, which can be grouped into slightly over 25,000 patent families, grouping patents on the same invention but applied for in different countries. In 2024, the IPlytics database counts more 100,000 patent families declared to a large share of all SDOs, which are owned by very few companies.
 - Yet, a potential SEP is not a factual SEP
 - At the time of such a declaration, the precise content of the final standard is not yet known, and the technology in the declared patent may eventually not be included in the standard at all. Furthermore, by the time of such declaration, the ultimate scope of the patent may not be yet known either, because it might be modified in case of an application. Consequently, it only becomes known at the moment when that patent is actually granted, if granted at all.
- The European Commission started initiatives to increase transparency related to essentiality and licensing conditions of SEPs



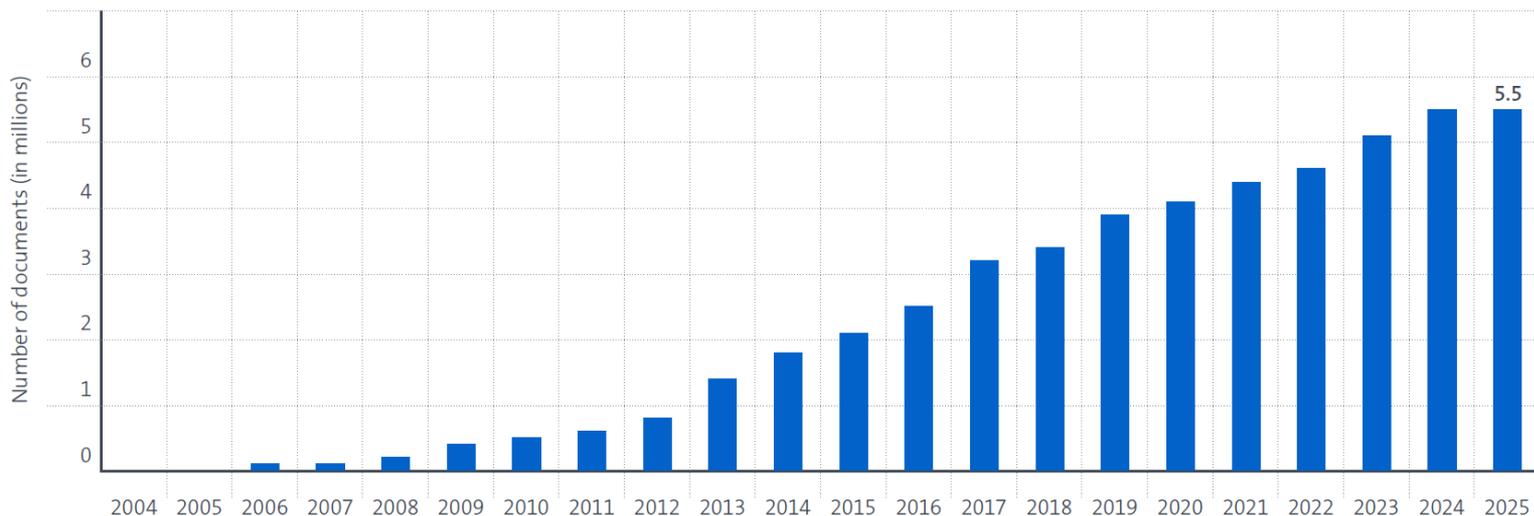
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- While patented technology can bring innovative and valuable solutions into a standard, its inclusion can also raise several challenges

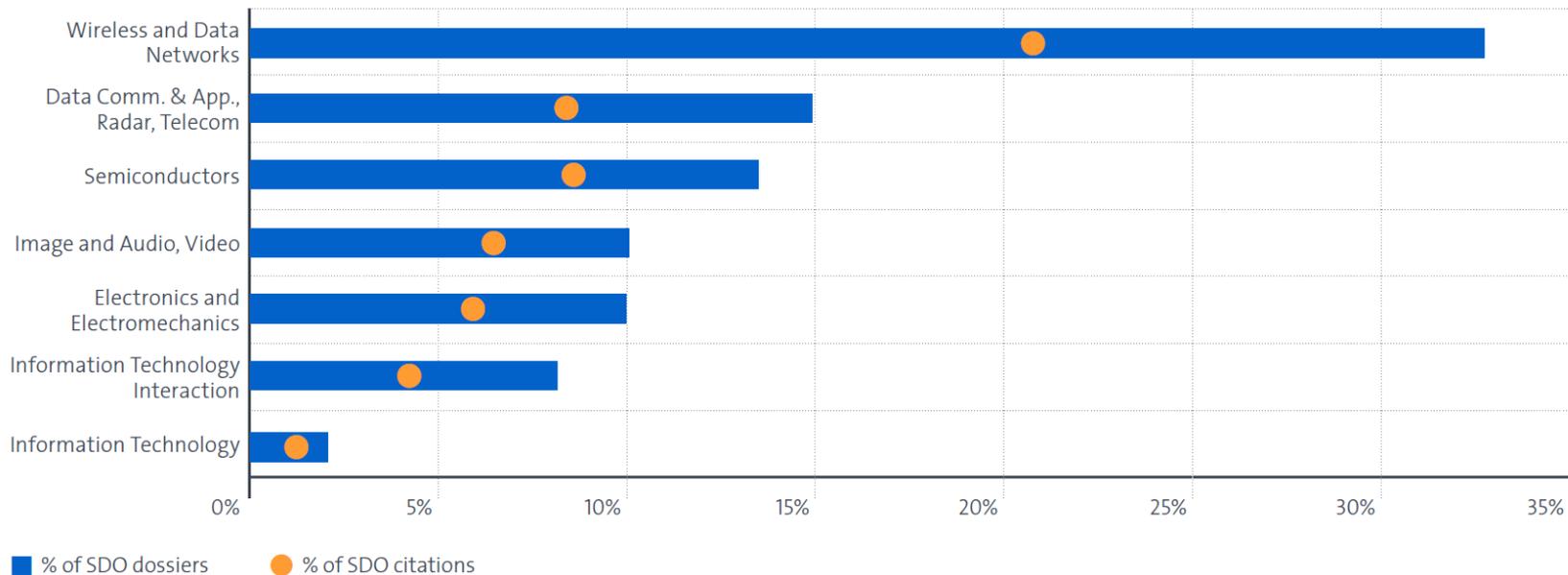
NON-AVAILABILITY OF LICENCES	SDOs and their participants, after having finalized and published a standard, find out that one or more owners of essential patents are not willing to license these
EX POST PATENT HOLD-UP	SEP owners, aware of the fact that implementers have no choice other than obtaining a license from them, use the resulting bargaining power to demand a significantly higher licensing fee than they could have obtained in a licensing negotiation where implementers were not yet 'locked into' the standard
ROYALTY STACKING	The total amount of royalties for a single product that implements that standard mounts up to such a level that the product is no longer commercially viable
UNDUE DISCRIMINATION	This refers to the situation where a SEP owner treats potential implementers and licensees differently

- The integration of SDO databases into the patent grant process has led to a steady rise in examiner citations of these documents. In technology areas with intense standardisation activity, over 30% of search reports involve SDO-related dossiers.
- Examiner citations of documents in the SDO databases establish a natural link between standards and patent applications eventually reducing the grant rates significantly.
- There is considerable overlap between the presence and number of citations of SDO documents and the likelihood of a patent being declared a standard-essential patent (SEP).

- Number of documents in the EPO SDO databases



- Percentage of SDO search reports and SDO citations by examiner unit



- Overlap between SDO-citing published applications and SEP declarations



- SDOs have already been long aware of the difficult relationship between patents and standards
 - For ANSI in the US, this goes back to the 1930s
 - Yet, it took until the 1980s and 1990s before discussion started at almost all large SDOs to adopt IPR policies
 - Each SDO had its own consultations and made its own choice in terms of the policy it adopted, matching its objectives, its specific technical context, and its culture
 - Sometimes SDOs adjusted their policies reacting to changes in technologies and the composition of their stakeholders

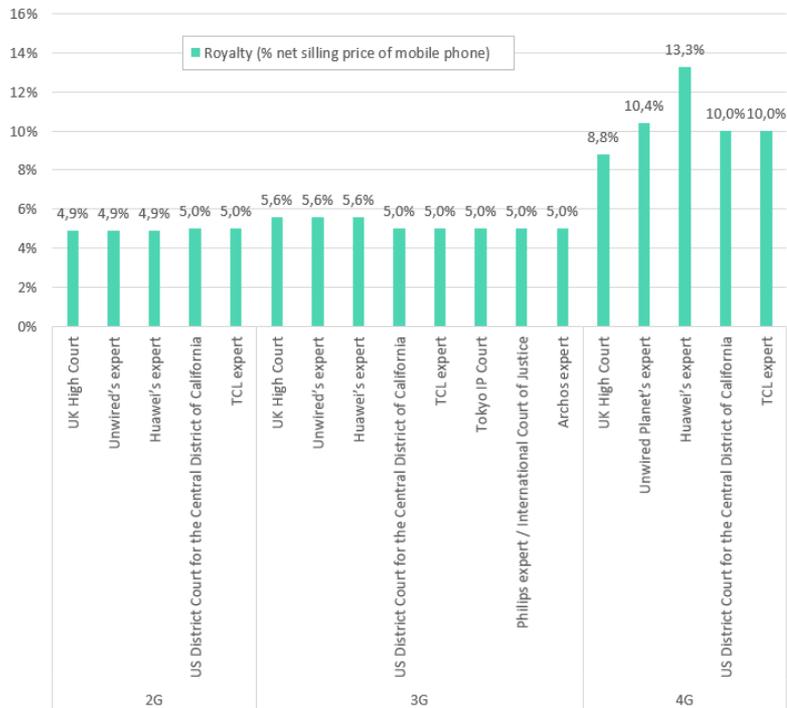
- SDO IPR policies can be broadly categorized into two main categories:

Policy type	Description	Examples
COMMITMENT-BASED POLICIES	(A) Members have the obligation to inform ('disclose', 'declare') the SDO when they believe they own patents that may be or may become essential to a standard. (B) Owner of disclosed patents are requested to commit to making licenses for these patents available specified conditions, if the patent indeed becomes essential	ISO, IEC, ITU, ETSI and IEEE
PARTICIPATION-BASED POLICIES	As is a condition of membership, all members of the SDO must be willing to license all their essential patents at specified conditions, if the patent indeed becomes essential. Opt-out possibilities may exist	W3C, HDMI Forum

- If a commitment related to SEP is missing, the SDO will seek to develop a standard not requiring the patent
- Examples of specified licensing conditions:
 - Fair, Reasonable and Non-Discriminatory (FRAND, sometimes referred to just as RAND)
 - "Royalty Free"

- How can one be sure that an SEP owner respects the commitments it made to an SDO in terms of licensing their SEPs, or respected other obligations related to standards and IPR, such as disclosure obligations?
- While SDOs seek to have licensing commitments in place for (potentially) SEP, they usually do not perceive themselves responsible to enforce such commitments
- Instead, if SEP owners and potential licensees themselves fail to successfully conclude licensing agreements, then national courts have the authority to resolve such disputes

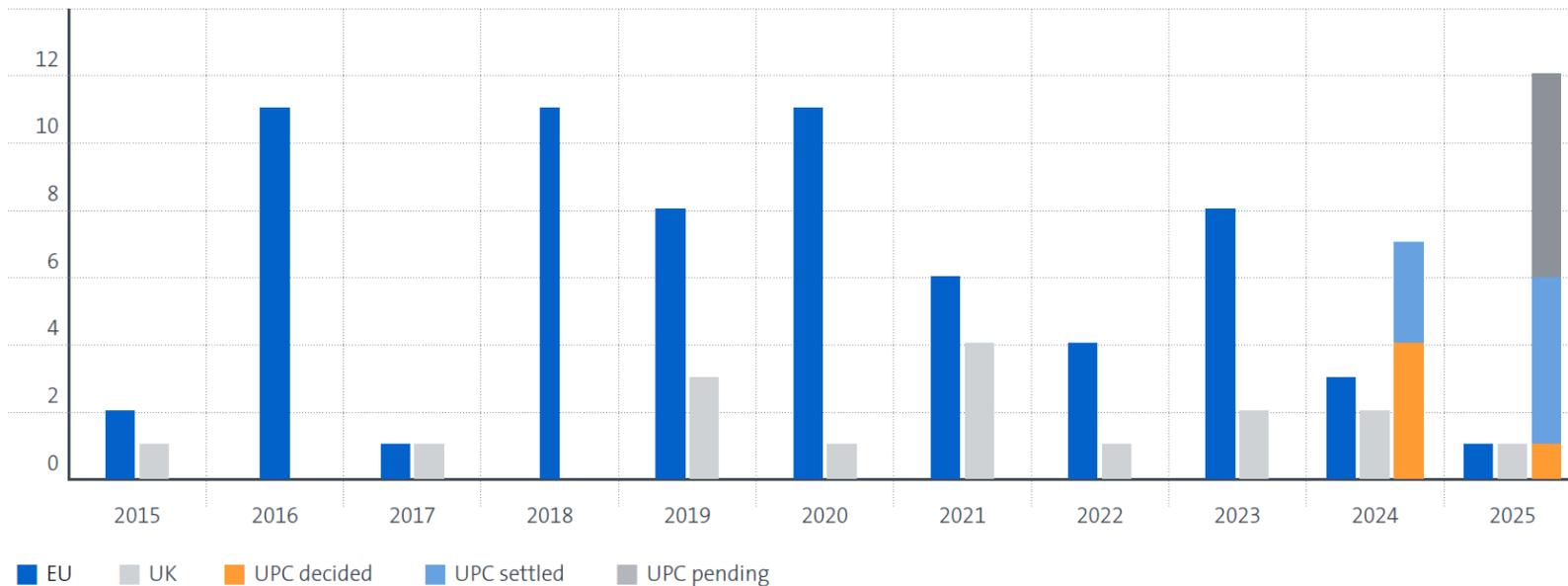
Figure 10: Level of royalties in court decisions on FRAND licensing of 2G, 3G and 4G SEPs for mobile phones. Fees as a percentage of the sales price of a mobile phone.



Source: Pohlmann, Blind & Heß (2020)

- When parties turn to the legal system (courts), three bodies of law are relevant:
 - Patent law
 - is relevant here because it is this body of law that allows a patent holder to prevent others from making, using, selling, or importing the patented invention without permission
 - Private law
 - is relevant because it governs contracts and other relationships between companies and other parties
 - Competition/antitrust law
 - is important because it places restrictions on the conduct of parties (or groups of parties) that have a dominant market position
- There have been quite some court cases on SEPs. Landmark cases include Microsoft vs. Motorola (2013), In re Innovatio (2013), TCL v Ericsson (2017), and Huawei/ZTE (2015), Apple vs Samsung and Nokia vs Daimler (2020)

- Explanations of the increasing number of legal conflicts on SEPs in the last decades
 - The number of SEPs has increased significantly over the years as well as the number of their different owners
 - SEPs are increasingly traded, including acquisitions by new owners that have strategies, in which patent assertion (i.e. accusing others of patent infringement) or litigation (i.e. patent court cases) plays a major role, e.g. more than 100 litigations per year
 - Standards are becoming more relevant for a wide variety of markets, which also brings together parties that have very different business cultures, expectations, etc.
 - The relevant markets often have very considerable commercial interest and are subject to strong dynamics

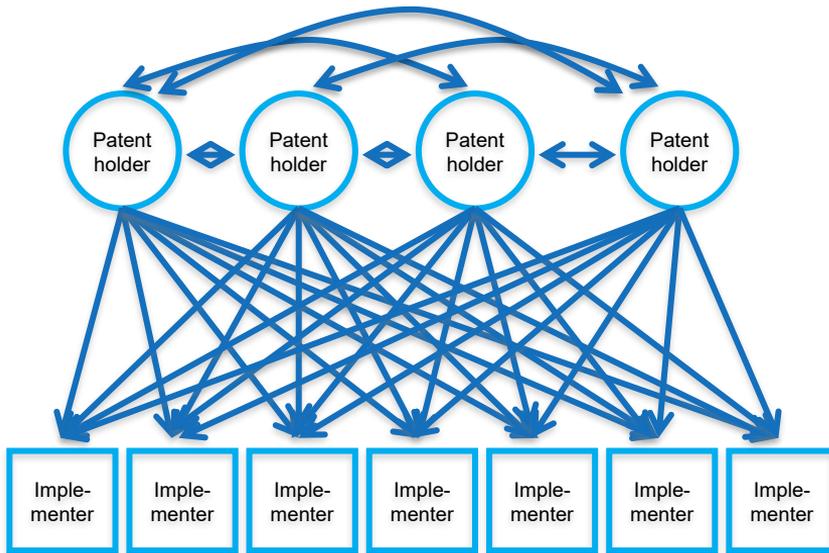


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- For many standards, there are many SEP owners as well as many implementers
- As a consequence, an large amount of bilateral licenses needs to be conducted
- Recognizing such inefficiencies, patent owners started to experiment in the 1980s with joint licensing programs for technical standards, now known as patent pools
 - While not easy to set up, a large, successful pool requires much fewer licensing agreements (see next slide) which reduces transaction costs
- In standards-based pools, the pooled patents are available to licensors participating in the pool, as well as to external licensees. The licensees are offered standard licensing terms, typically with a menu of “patent packages” relevant for specific product categories
- Many pools have a high degree of transparency, and the licensing fees, pooled patents, lists of licensors and list of signed-up licensees can be found on their websites

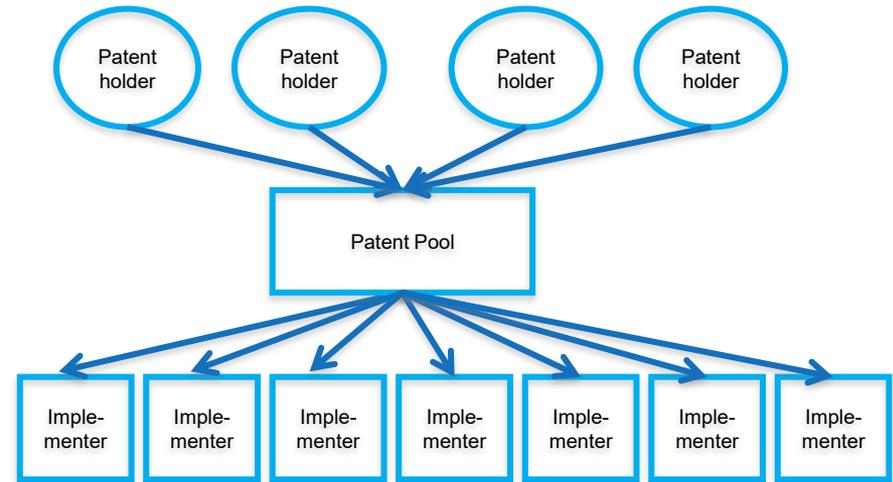
No pool

(34 licensing agreements needed)



Patent pool

(11 licensing agreements needed)



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- Pools bring along significant advantages for both implementers and patent owners:

Advantages for (prospective) licensees	Advantages for participating patent owners
<ul style="list-style-type: none"> • Provide a one-stop shop for access to patent licenses • Lower transaction costs and (usually) a discounted licensing fee compared to multiple individual licenses • Create a level playing field (fewer competitors that do not pay royalty fees) • Reduce uncertainty, increase transparency 	<ul style="list-style-type: none"> • Helps to promote the overall adoption and success of the technology • Lower transaction costs • May lead to higher profits because of more efficient licensing and royalty collection

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- Patent pools also attracted the attention of authorities; after all, a group of SEP owners can easily have a dominant position. Competition/antitrust stipulates that such a position may not be abused
- At the same time, pools have many pro-competitive elements and generally, competition/antitrust regulators looked favourably at pools
 - Their precise assessment depends on the exact design of the pool under investigation
 - One important condition is that pools only bring together complementary patents, not substitute patents
 - Another important condition is that an implementer must always be allowed to negotiate with an individual patent owner as well for a license, and not be forced to license only via the pool

- If pools have advantages for both patent owners and licensees, why has the pool model not overtaken bilateral licensing? Possible reasons include:
 - Pools are difficult and expensive to set up
 - There is usually a wide diversity of interests and views across (potential) pool participants, making it hard to find a set of agreements and rules that everybody is willing to endorse
 - Patent owners might be of the opinion that the freedom and flexibility they have when they do bilateral licensing outweighs the advantages of pools
- Whereas pools for mobile telecommunications (2G, 3G and 4G) have failed to materialize or had rather limited success, one might argue that this may change in the future
 - For the Internet of Things (IoT) and Industry 4.0, the implementer landscape is much more diverse, and transaction costs for bilateral licenses may be much higher
 - Avanci, is a new automobile pool that also announced IoT pools, and has many SEP owners involved

- A selection of current pools and their licensing administrators:

Licensing Administrator	Description and selection of pools	Based in / founded
	Pioneered the MPEG2 pool for video coding, served as an example for many others. Current pools include various modern audio and video coding protocols, but also wireless power, EV charging, and video ports (DisplayPort)	US, 1990s
	Has active pools in the field of audio and video coding, but also for 3G and 4G mobile telecommunications and other technologies. Owned by Dolby Laboratories	US, 2002
	Patent pool covering wireless communications (including Wi-Fi, 2G, 3G and 4G mobile telecommunications, audio and video coding, and (DVB) television broadcast	Italy, 1990s
	Focusing Blu-ray, the successor of the DVD	2011, Europe
	Initially focusing on licensing mobile telecommunications SEPs for connected cars and has announced activities aimed at the IoT	2016, US /Europe

- The relation between patents and standards has a clear public interest dimension
 - It may hinder the development or adoption of standards, create undue barriers for market entry, create ('unnecessary') friction, etc.
 - The exploitation of its relationship creates large incentives for investments into research and innovation
- All around the globe, policy makers and regulators have recognized have actively been involved in this policy area
 - Research and government-commissioned studies
 - Public consultations among stakeholders
 - Policy papers and draft regulations
 - Enforcement of competition law

○ Broad overview of main public interest topics over time:

Period	Main public interest topics
1990s	Market access (esp. possible exclusion of market parties by nonavailability of SEP licenses)
2000s	Concerns regarding possible abuse in terms of excessive licensing fees Concerns over increasing sales of SEPs where the buyers did not deem itself bound to FRAND commitments
2010s	Increasing interest related to competition policy
2020s	In the light of the broad use of standards by the Internet of Things, vertical industries, Industry 4.0, increasing interest in transparency on SEP ownership and factual essentiality, possible frictions in the market, licensing conditions, and the relation between (FRAND-based) standards and open source Discussion about role of SEPs for assuring or achieving technological sovereignty

○ In April 2023, planned elements

- Competence Center
- SEP register incl. essentiality checks
- SEP aggregate royalty determination process
- Out-of-court dispute resolution mechanism

○ In February 2025:

- European Commission Withdraws Proposals for Standard Essential Patents Regulation
- One interest group said in a statement, “The current patent system in Europe urgently needs modernisation to bolster the region’s competitiveness and innovation capacity. The lack of transparency and fairness in SEP licensing, combined with the absence of the application of proportionality to patent infringement cases, continues to impede innovation and ultimately diminishes the benefits of interoperability for European consumers.”

○ In November 2025

- The European Parliament is suing the EC because of the withdrawal



Brussels, 27.4.2023
COM(2023) 232 final
2023/0133 (COD)

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
on standard essential patents and amending Regulation (EU)2017/1001

- Different types of IPRs play a role in standardisation, but patents are most important
- If content is relevant for patent applications, this should be protection within a patent application before entering standardisation activities
- Standards are increasingly cited in patent applications and are considered as prior art by patent examiners
- SDOs have different IPR rules, in particular related to standard-essential patents and licensing rules, but FRAND is the most common approach
- Consider patent pools for commercializing your standard-essential patents
- Follow the policy debate and changes in the IPR regimes of SDOs and in regulations

❖ **THANK YOU FOR YOUR ATTENTION.**

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