

European innovation from a bird's-eye view



HOW STANDARDS IGNITE INNOVATION AND ACCELERATE EUROPE'S COMPETITIVENESS

- Standards rarely attract attention in everyday debate. Yet they remain among Europe's most practical instruments for turning policy ambition into a functioning, competitive, and globally connected market.

Dear reader,

The report “European innovation from a bird’s-eye view” attempts to step back from the institutional details of our system and instead look at European standardisation from a broader economic and innovative perspective. The starting point of the report is a simple observation: most successful innovations consist of only a limited share of genuinely new elements, while the majority builds on an existing foundation of technologies, interfaces, safety practices, and operational rules.

At NEK we refer to this as the 90/10 metaphor - innovators compete on the 10%, but they scale through the 90%. In the European context, a large part of this foundational 90% is maintained through the standardisation system.

Seen from this perspective, European standardisation can be understood as part of the technical infrastructure of the Single Market.

By providing common technical references and interoperability frameworks across a market of roughly 450 million consumers, standards reduce friction, support regulatory compliance, and allow companies to scale innovations across Europe before entering global markets.

The analysis has benefited from input received from a range of external stakeholders during the consultation process. The authors would like to express their sincere appreciation to all contributors for their insights, expertise, and engagement throughout the process. Their input has been instrumental in ensuring both analytical depth and relevance. Any remaining errors or omissions remain the responsibility of the authors.

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Andreas Antoniadis,

Secretary/Director, Nicosia Chamber of Commerce and Industry (NCCI)

Pambos Kammias,

Director of Standardisation Cyprus Organisation for Standardisation (CYS)

PhD Artemis Kontou,

Senior Research Associate

KIOS Research and Innovation Centre of Excellence University of Cyprus

Dr. Karl Grün, Prof. Dipl.-Ing.

Deputy Managing Director, Austrian Standards

Håkon Rem,

Vice President Sales and Marketing NEMKO, Chair of the Board NEK, 2026.

Dr Scott Steedman,

Director-General, Standards of the British Standards Institution (BSI)

PhD Anna Tanskanen,

Managing Director,

National Electrotechnical Standardization Organization representing Finland (SESKO)

Oslo, 24 June 2026

Leif T. Aanensen, managing director of NEK

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The symbols and illustrations used in this document have been developed by and for NEK for use in various publications.



Context/background/analytical reflections



About/more information

Note 1:

This report does not aim to cover innovation in its full scope. Instead, it focuses on the often-underexplored interface between innovation, standardisation, and market deployment - that is, the phase where ideas must integrate with existing systems, regulations, and infrastructures in order to scale.

Note 2:

Unless otherwise stated, "Europe" in this report refers to the EU/EEA standardisation ecosystem (CEN/CENELEC/ETSI and national member bodies), and the market effects are discussed in Single Market terms.



NEK RESEARCH AND ANALYSIS

We work across disciplines to understand and assess developments at the intersection of technology, infrastructure, markets, and regulation. Our work takes a system-oriented perspective, examining how different technologies interact and how they are deployed, governed, and scaled in practice.

- Our analyses aim to identify key drivers, dependencies, and trade-offs shaping future development pathways, with particular attention to interoperability, safety, and long-term sustainability.
- The goal is to provide robust, evidence-based insights that support informed decision-making for businesses, policymakers, and society at large.



Photo: Thomas Brun, NTB.

Tor Kristian Hjort-Sørensen is part of the research and analysis function at NEK, and has contributed to this report.

He focuses on how technology, standardisation, and regulation shape innovation and market development, with a particular interest in system-level perspectives and interoperability.

For questions, feedback, or collaboration opportunities, please contact: tor.kristian.sorensen@nek.no.

INTRODUCTION

This is a story of how a lean institutional backbone and a vast industry effort keep the Single Market efficient - and connect Europe to global rulemaking markets.

Europe's most important infrastructure is often the least visible. Beyond roads, power grids, and fibre networks sits another layer: shared technical rules that make products, services, and systems work smoothly across borders.

Standards provide the common technical language that enables scale, fair competition, and trust - whether we are talking about construction products, electrical safety, medical devices, cybersecurity, industrial data exchange, or the interfaces that connect digital services.

Why this matters for innovation and trade:

Standards are not only technical documents; they are part of the trust infrastructure that governs the smooth working of the market. They reduce hidden technical barriers, make conformity pathways more predictable, and enable interoperable solutions to scale.

This lowers transaction costs for cross-border trade and increases the speed at which new technologies can move from prototype to deployment - so firms can compete on performance and differentiation rather than on incompatible interfaces (vendor lock-in) or fragmented national requirements.

From a bird's-eye view, European standardisation is both modest and remarkable.

The European-level organisations are small in headcount, yet the overall system is large in reach and output because it builds on national member bodies and a substantial mobilisation of experts from industry, authorities, academia, and civil society.

The result is a model that reduces technical barriers to trade, supports innovation uptake, and provides a practical bridge between public policy goals and implementable technical detail.

The figures in this document are estimates presented as ranges. They are intended to convey orders of magnitude and relative proportions, rather than precise totals.



Photo: Thomas Brun, NTB.

Leif T. Aanensen

Managing Director and National Secretary of the Norwegian Electrotechnical Committee (NEK).

CENELEC, Board Member.

- Standards rarely attract attention in everyday debate. Yet they remain among Europe's most practical instruments for turning policy ambition into a functioning, competitive, and globally connected market.



THE 90/10 METAPHOR

A diverse set of innovation frameworks¹, describe innovation as a broad spectrum ranging from incremental to radical, and spanning products, services, processes, organisational and business model innovation.

Innovation narratives often focus on the visible 10%: the new feature, the novel business model, the “wow” element that differentiates a product or service. But in practice, successful innovation is rarely “mostly new”. It is more often mostly compatible.

This is the intuition behind the 90/10 metaphor: disruptive offerings typically succeed not because they reinvent everything, but because they place a limited set of novel elements on top of a large foundation of technologies, requirements, interfaces, and practices that already work.



III: The 90/10 metaphor. NEK, 2026.

SCOPE AND LIMITS OF THE 90/10 METAPHOR

In this report, “90/10” is used as a rule-of-thumb metaphor, not a precise measurement.

The 90/10 framing is not intended as a universal law of innovation, nor as a quantitative allocation of value creation. It is primarily a heuristic for understanding deployment, scaling and market integration, rather than early-stage discovery or deep-tech research.

In case of radical or science-driven innovation, a much larger share of value may originate from genuinely new technologies or breakthroughs. At the same time, even such innovations typically rely on existing technical, regulatory, and infrastructural foundations when moving from laboratory to market. Importantly, the “10%” of novelty can generate a disproportionately high share of economic value, despite resting on a much larger base of existing compatibility and trust mechanism.

The point is simple: most successful innovation depends on a large foundation of existing technical compatibility, trust mechanisms, and operational practices, while only a smaller share is truly novel and differentiating. In the Single Market context, standardisation is one of the main ways this foundation is made reusable across borders and sectors.

¹ For example: ISO 56000:2025 - Innovation management - Fundamentals and vocabulary.



In a European context, this metaphor travels well from product development to value creation in the Single Market. Europe's economy scales because millions of actors can coordinate - across borders, sectors, and supply chains - without renegotiating basic technical assumptions each time.

Standardisation is a key part of that coordination layer. It is the largely invisible infrastructure that makes the "90%" available to innovators, industry, and public authorities as reusable technical building blocks.

THE 90% FOUNDATION: WHAT EUROPE STANDARDISES FOR

From a bird's-eye view, the Single Market is a promise of free movement. Yet legal principles alone do not make markets function. Day to day trade and deployment depend on predictable technical and operational compatibility: test methods, safety levels, documentation, interfaces, definitions, and reliable ways to demonstrate conformity. This is where standards do their heavy lifting.

That 90% typically includes:

- Interoperability and compatibility: ensuring that products and systems can function across suppliers and borders, and fit into existing infrastructure (physical and digital).
- Safety and trust: shared methods for risk management, testing, quality assurance, and safety performance that reduce uncertainty for customers, investors, and regulators.
- Compliance pathways: predictable documentation and conformity practices (including third party testing and certification where relevant) that make market access feasible at scale.
- Cost and speed advantages: fewer bespoke interpretations, less "translation" between national approaches, and reduced duplication of requirements - lowering transaction costs and accelerating deployment.
- Industrialisation and diffusion: standardised frameworks that make it easier to move from prototype to production, and from local launch to Europe wide roll out.

None of this is the exciting part of innovation storytelling. But it is the part that determines whether the exciting part becomes a product in the market - or remains a demo.



Photo: SESKO, 2026.

"Standards constitute a stable and reliable knowledge base within the innovation chain, facilitating the transfer of research and development outcomes to the market.

They serve as a key enabler of commercialization and business growth, and form an essential component of the innovation ecosystem."

- PhD Anna Tanskanen, Managing Director, SESKO, 2026.

THE 10% THAT CREATES DIFFERENTIATION - AND WHY IT NEEDS THE 90%

The “10%” is still real and essential: new functionality, new technology, new user experience, and experimentation that creates differentiation and value.

The point of the 90/10 metaphor is *not* to downplay novelty, but to discipline it. If innovators over focus on the attractive 10% and under invest in the foundational 90%, they risk failure for reasons that are not about the idea itself: incompatibility, inability to demonstrate conformity, missing safety evidence, poor scalability, or friction in procurement and deployment.

A practical illustration is the smartphone: perceived as transformative, yet dependent on established charging infrastructure, radio and network standards, Wi-Fi protocols, electromagnetic compatibility constraints, safety expectations, and a mature ecosystem for manufacturing and quality assurance. The disruptive experience was enabled by extensive technical continuity.

Examples use cases:



The smartphone (IEC)

Perceived as transformative, yet dependent on established charging infrastructure, radio and network standards, Wi-Fi protocols, electromagnetic compatibility constraints, safety expectations, and a mature ecosystem for manufacturing and quality assurance. The disruptive experience was enabled by extensive technical continuity.



Electric vehicle charging infrastructure (IEC)

Common standards for plugs, communication protocols, safety and testing enable vehicles, chargers, grid operators and payment systems to interoperate across borders. Innovation happens in charging speed, services and user experience—but scaling depends on shared technical baselines.



Medical devices (IEC)

Innovation in diagnostics or treatment must integrate with established standards for safety, testing, documentation and regulatory compliance. Standards do not define innovation outcomes, but they determine whether new devices can be trusted, approved and procured at scale.



5G and digital infrastructure (ETSI)

While new generations of mobile technology represent major technological advances, their global deployment depends on extensive standardisation efforts that ensure interoperability, security and backward compatibility.

III: Examples uses cases. NEK, 2026.

The same pattern repeats across electrification, digitalisation, connected devices, industrial data exchange, energy systems, and cybersecurity:
the more networked and cross border a solution is, the more it relies on shared technical rules.

In that sense, *standardisation is not a substitute for innovation*. It is a mechanism for making innovation shareable, scalable, and trustworthy.



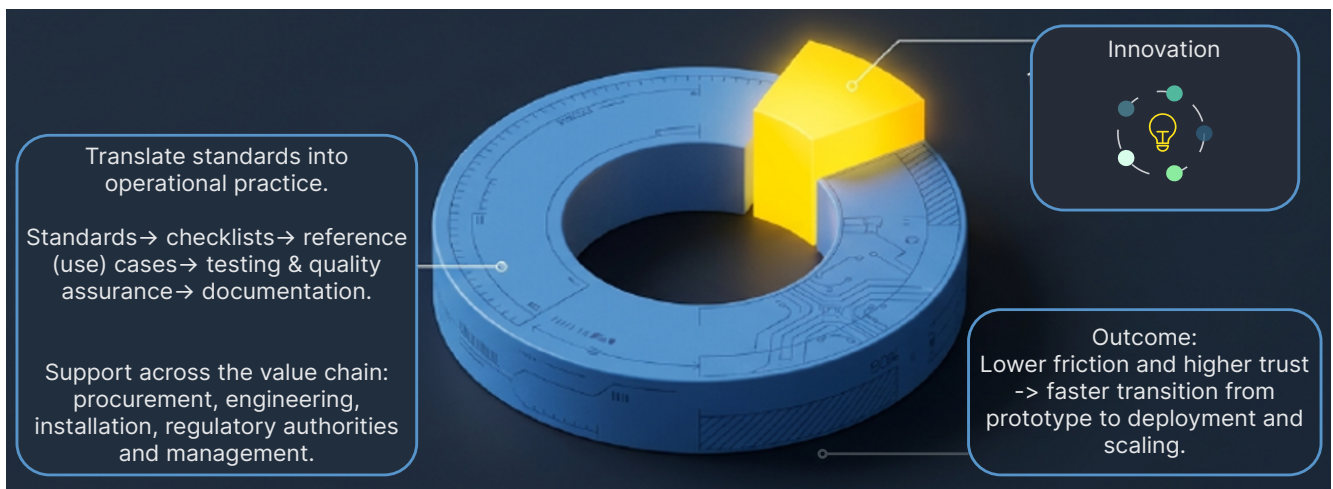
From metaphor to machinery.

If the “90%” is the foundation that makes scaling possible, the next question is practical: *who keeps that foundation stable, trusted, and up to date?*

In Europe, this is done through a layered standardisation system - European organisations coordinating with national member bodies and large expert communities. Crucially, most of the workload is not writing entirely new standards, but maintaining, revising, and confirming existing ones so that compatibility, safety, and conformity pathways remain usable as technology evolves.

In the 90/10 framing, maintenance is not administrative overhead; it is the continuous work that keeps the Single Market’s technical operating system running.

NEK has developed a conceptual framework, using the 90/10 metaphor, to illustrate how standardisation and innovation interact. The framework represents a pedagogical approach for understanding how a shared standards-based foundation may enable innovation and differentiation.



Ill: Conceptual framework 90/10. NEK, 2026.

Key takeaways (90/10):

Innovators win with the 10% - but they scale with the 90%.
Standards are where much of that 90% is codified, maintained, and made reusable.
Most of the system’s work is maintenance, because keeping the foundation current is what makes continual innovation possible.

- The automotive sector illustrates the regulatory power of standards in shaping innovation.

(Abduhl-Rahman & Ozusaglam, 2025)

QUALITY INFRASTRUCTURE - FUNCTIONS

From a business perspective, standards should not primarily be understood as constraints, but as structured, trustworthy information for business. Within a national quality infrastructure (NQI), standards bodies provide authoritative information on technical compatibility, safety expectations, interoperability and good practice - enabling firms to make informed investment and design decisions aligned with regulatory intent.

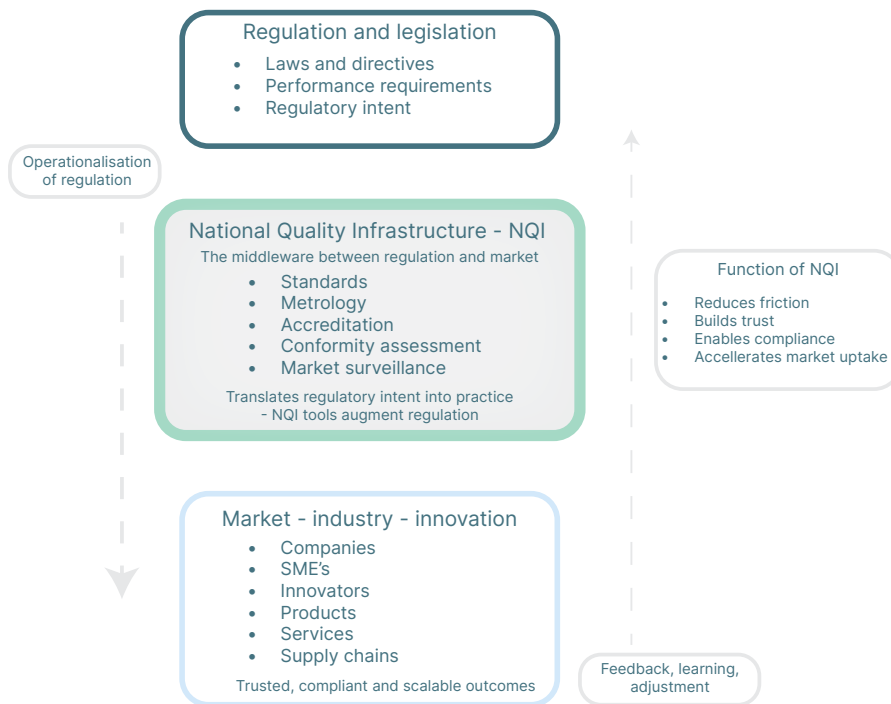


Illustration adapted from Steedman (BSI), modified by NEK (2026).

THE MIDDLEWARE¹ BETWEEN REGULATION AND INNOVATION

While innovation policy often focuses on funding, incentives and technological capability, the effectiveness of innovation in practice depends on how coherently regulatory intent is translated into market-level behaviour.

NQI can be understood as the middleware that operationalises regulation, aligning legal requirements with business processes through standards, measurement, conformity assessment and oversight.

When designed coherently, this middleware reduces friction, accelerates market uptake and lowers compliance costs. When fragmented or inconsistent, it introduces uncertainty, duplication and barriers to innovation.

NQI tools do not replace regulation, but make regulation more effective, predictable and innovation-friendly.



Illustration adapted from Steedman (BSI), modified by NEK (2026).

¹ By 'middleware' we mean the institutional layer that translates policy objectives into operational market rules.

"Standardisation & Innovation (R&D) are mutually reinforcing pillars; they act like twins".

"Innovation process, to achieve repeat implementation, need to write STANDARDS to help creativity, commercialization, enable interoperability, quality, safety, and more. Equally, standards are used as valuable reference information, for R&D to INNOVATE.

The European Union made it mandatory; all research proposals at the technical and vocational spectrum, to include standardization aims, to be assessed for funding approval".



Photo: CYS, 2026.

- Pambos Kammass, Director of Standardisation Cyprus Organisation for Standardisation (CYS), 2026.

ECONOMIC LEVER

A counterintuitive feature of this (standardisation)system is that its main value often comes from maintenance - the continuous updating of what already exists - rather than from producing novelty for its own sake.

At system level, the economics resemble the 90/10 logic: modest institutional overhead enables very large value creation. Europe's standardisation architecture is lean at the hub level, extensive through its national members, and powered by expert participation across industry, authorities, academia, and civil society. The "production cost" of standards is largely borne by those who use them, through sustained expert time and internal coordination.

Two features matter for understanding value creation:

1. Layering and reach

European standardisation coordinates through European organisations and national member bodies, connecting to the global layer (ISO/IEC/ITU). This creates a route from European needs to global standards, supports international recognition, and reduces technical friction in trade.

2. Maintenance as the dominant workload

In mature portfolios, maintenance, revision, confirmation, amendments, and systematic review account for a very large share of activity (often in the 85–90% range). In the 90/10 metaphor, this is the continuous work of keeping the foundation stable, current, and aligned with evolving technology. It is not "bureaucratic inertia"; it is what prevents the technical operating system of the Single Market from becoming obsolete.

This helps explain a paradox: standardisation can look incremental while enabling transformational change. The system's value lies less in producing novelty for its own sake and more in reducing friction across markets measured in trillions - by keeping compatibility, trust, and conformity pathways continuously usable.



WHY IT MATTERS FOR TRADE

European standardisation is not an island. It is tightly connected to global standardisation through **ISO** (International Organization for Standardization), **IEC** (International Electrotechnical Commission), and **ITU** (International Telecommunication Union).

This matters strategically for at least three reasons:

1. **A direct route from European needs to global standards**

Through aligned processes and active participation, European stakeholders can shape international standards so that global solutions reflect European market realities, safety expectations, and industrial strengths

2. **International recognition supports market access and trade agreements**

International standards are widely recognised and used as reference points around the world. A European system that is well connected to ISO/IEC/ITU can make it easier for EEA countries - and especially the EU - to rely on internationally accepted technical baselines when negotiating or implementing trade arrangements. This helps reduce “hidden” technical barriers that can otherwise persist even after tariffs fall.

3. **Alignment with WTO Agreement on Technical Barriers to Trade (TBT)**

The emphasis on standards is also strongly reflected in the WTO’s principles for limiting unnecessary obstacles to trade. The underlying logic is practical: where internationally recognised standards exist (or can be developed), they provide a common reference that lowers friction between regulatory systems and reduces the scope for country specific technical requirements to become de facto trade barriers.

In other words, Europe’s standardisation architecture is not only a Single Market instrument - it is also a mechanism for positioning Europe effectively in global rulemaking and for supporting smoother technical pathways in international commerce

- Standards and regulations are among the most important types of trade-related measures used around the world.

(Alan Wm. Wolff. Deputy Director-General of the WTO. World Trade Organization, 2021)



A POLICY BRIDGE

Europe has long used a strategic regulatory approach in technical domains: legislation sets essential, high-level requirements (safety, health, environmental protection, and other public interests), while standards provide detailed technical means to meet them. This division of labour is central to European value creation because it combines stability and agility:

- Law can remain principle-based and durable
- Standards can updated more frequently as technologies, risks, and operational lessons evolve.
- A single set of technical references can support many markets, lowering per unit costs and strengthening competitiveness.
- Common test methods and documentation expectations improve predictability for conformity assessment and market surveillance.

In 90/10 terms, this model helps keep the “90%” continuously usable for innovators: not only as technical building blocks, but as **credible routes to compliance and trust**.

WHY THIS MATTERS NOW

The growing electrification and digitalisation of society increases the premium on interoperability, cybersecurity, safety, resilience, and cross sector integration.

As systems converge - energy with ICT, products with services, physical with digital - interfaces and shared rules become more valuable, not less.

At the same time, standardisation is also *a form of global rulemaking*.

Europe’s connectivity to international standardisation matters for competitiveness and trade because it helps align European market realities with global technical baselines, consistent with the broader logic of avoiding unnecessary technical barriers.



III: Standardisation - a form of global rulemaking. NEK, 2026.



Draghi, 2024.

The Draghi Report (2024) highlights that European competitiveness increasingly depends on advanced technical standards.

- *The automotive sector in the EU would greatly benefit from advanced standards in the areas of:*

Charging protocol (charging points, plugs and ports, and communication...)

Recycling (battery and vehicle recyclability, recycled material rates...)

New technologies (cybersecurity systems, autonomous vehicles...)

(Draghi, 2024, p. 154).

The Draghi Report further stresses the importance of standards for recycling, reparability, cybersecurity and data exchange.



This section shifts from the 90/10 logic to the system's scale: who uses standards, how the architecture is organised, and what it costs relative to the value it enables.

THE USE OF EUROPEAN STANDARDS

Standards enable different regulatory models, ranging from voluntary self-regulation to prescriptive regulation. In particular, approaches such as earned recognition and co-regulation illustrate how standards and accredited conformity assessment can reduce regulatory burden while maintaining high levels of trust and compliance.

This ties innovation directly to regulatory design – rather than just technology, as illustrated below.

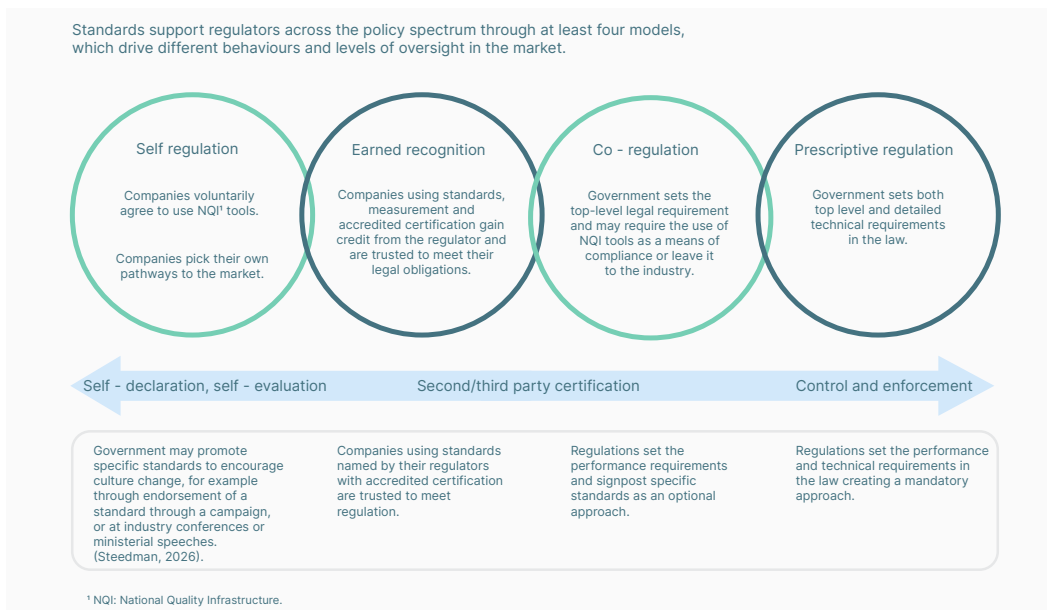


Illustration adapted from Steedman (BSI), modified by NEK (2026).



Photo: BSI, 2026.

“Standards are used for just three reasons: they are mandatory under the law, they are required as a condition of doing business, for example in a supply chain or for market access, or they are used purely voluntarily, because the company believes they are best practice that will help drive performance and competitive advantage”.

- Dr. Scott Steedman, BSI group, 2026.

Standards are used both **directly** (engineers, manufacturers, labs, installers) and **indirectly** (through procurement, contracts, regulation, and the trust embedded in conformity assessment).

According to DG GROW, the European Commission's department for internal market and industrial policy, European standards play a critical role in ensuring a seamless and resilient Single Market.

The most authoritative evidence comes from DG GROW's Single Market Economics Papers (2021), which show how standards function as economic infrastructure by reducing technical barriers and supporting innovation across EU industries.

The study covers the economic and societal effects of standards with a specific focus on 10 selected sectors (European Commission, 2021).



DG GROW

Is the European Commission's Directorate General for Internal Market, Industry, Entrepreneurship and SMEs. It is the department responsible for maintaining a seamless and resilient Single Market, supporting European industry, strengthening competitiveness, and ensuring the free movement of goods and services across the EU.

DG GROW also develops policies that help EU businesses innovate and grow, including through digitalisation, decarbonisation, and improved access to markets for SMEs.

Source: European Commission, 2021.

The EU pursues an active standardisation policy that uses standards as a tool for smarter regulation and to strengthen the competitiveness of European industry.

EU's standardisation strategy outlines the Commission's approach to standards within the Single Market and globally:



- Standards will play a critical role in enabling our industries to face the current challenges.
(European Commission, 2026).

There is - to our knowledge - no robust, official statistic that directly reports "the number of users of CEN/CENELEC/ETSI standards" in the EEA.

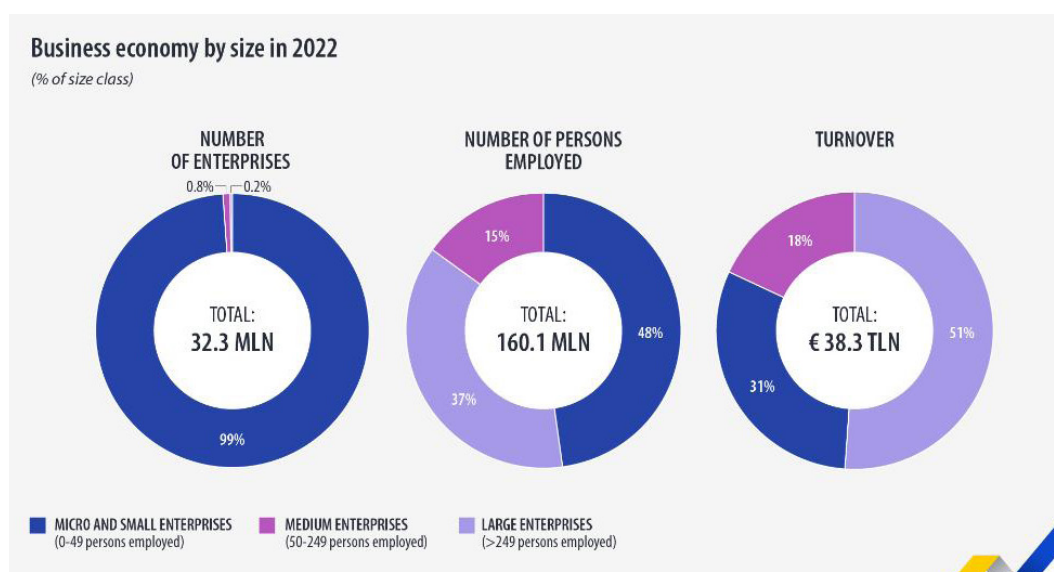
User can mean anything from buying/reading a standard, to designing or manufacturing to it, testing against it, requiring it in contracts, certifying or supervising/enforcing. Any figure therefore must be derived indirectly and stated with clear caveats.

A defensible EEA estimate: "at least tens of millions".



The most defensible proxy is to start from the scale of the EEA/EU market economy and treat “standards users” as those who directly or indirectly rely on standards in their professional activities (procurement, design, production, QA, testing, compliance, telecom/IT, construction, energy, etc.).

- Eurostat’s Structural Business Statistics report that the EU “business economy”¹ comprised 32.3 million enterprises in 2022 and 160 million persons employed in those enterprises, with €38.3 trillion net turnover. This provides an order-of-magnitude baseline for how many workers operate in environments where standards are commonly embedded in contracts, conformity assessment, product requirements, and interoperability practices. (Eurostat, 2024).



euostat III: Eurostat, 2021.

- The EEA adds the EFTA countries (Norway, Iceland, Liechtenstein). For a cautious, communication-friendly estimate, it is reasonable to treat the EEA as broadly the same order of magnitude as the EU for this purpose (i.e., not materially changing the “tens of millions” conclusion).

From that baseline, a conservative interval is that roughly 20-50% of those 160 million workers are “standards users” in the broad, professional sense above - yielding ~32-80 million in the EU, and therefore ~30-80 million people as a rounded EEA order-of-magnitude.

If we instead define enterprises (rather than individuals) as users, the relevant baseline is the 32.3 million enterprises in the EU business economy² - of which a substantial share will be affected by standards at least indirectly (contract clauses, procurement specifications, compliance expectations).

Rationale:

Standards intensity is very high in manufacturing, construction, energy, transport/logistics, regulated products, and ICT/telecom - while it is lower in parts of purely local or less regulated services. That mix makes an interval far more credible than a single point estimate.

¹ Market-oriented activities, excluding parts of the public sector and some other areas.
² Eurostat, 2024.



THE EU RELIES ON HARMONISED STANDARDS

The scale of EU legislation that frames the use of European standards is substantial. A practical search of EUR Lex, using filters commonly applied by legal practitioners, indicates that as of 2026 there are approximately 4,400 regulations and 800 directives currently in force.

These figures reflect the actual volume of binding EU legislation, rather than abstract estimates, and account for ongoing updates, consolidated versions and the dynamic nature of the legal corpus.

A significant share of these legal acts is directly linked to the functioning of the internal market. Directives, which are primarily used to harmonise national rules, are especially closely associated with internal market objectives.

A cautious estimate suggests that around 60-75 % of directives is related to market harmonisation. For regulations, which serve a wider range of policy purposes, the corresponding share is lower but still substantial, estimated at around 30-50 %.

Taken together, this implies that roughly 1,800 to 2,800 EU legal acts - around half of the acquis currently in force - support the functioning of the internal market in one form or another.

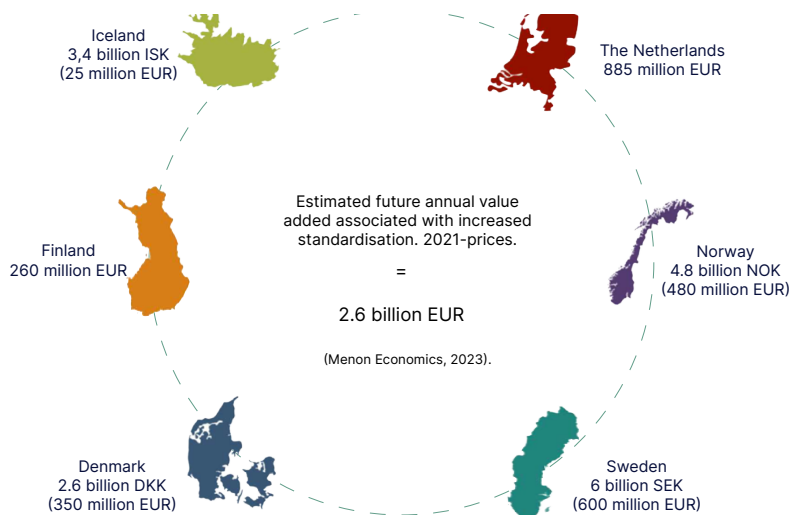
This density of legislation helps explain why European standards play such a central operational role. Faced with thousands of binding legal acts, EU institutions increasingly rely on harmonised standards as a practical means of translating legal requirements into implementable technical solutions.

Standards do not replace legislation but enable it to function, providing a common technical reference that supports legal certainty, market access and consistent application across Member States.

NOTE:

The figures above are based on advanced searches in European Union - EUR Lex using the filters "Directive" and "Regulation", "In force: yes", and "Collection: Legislation".

Variations reflect continuous updates, consolidated versions and the inclusion or exclusion of implementing and delegated acts.



Menon Economics (2023) has estimated future annual value added associated with increased standardisation in the Nordics and Netherlands = 2.6 billion EUR.

THE ARCHITECTURE

European standardisation is commonly associated with three organisations:

CEN

European Committee for Standardisation: broad standards across sectors (excl. electrotechnical and telecommunications).



Supports standardization activities in relation to a wide range of fields and sectors including: air and space, chemicals, construction, consumer products, defence and security, energy, the environment, food and feed, health and safety, healthcare, ICT, machinery, materials, pressure equipment, services, smart living, transport and packaging.

CENELEC

European Committee for Electrotechnical Standardisation: electrotechnical standards.



Supports standardization activities in relation to a wide range of fields and sectors including:

Electromagnetic compatibility, Accumulators, primary cells and primary batteries, Insulated wire and cable, Electrical equipment and apparatus, Electronic, electromechanical and electrotechnical supplies, Electric motors and transformers, Lighting equipment and electric lamps, Low Voltage electrical installations material, Electric vehicles railways, smart grid, smart metering, solar (photovoltaic) electricity systems, etc.

ETSI

European Telecommunications Standards Institute: telecommunications, ICT, and digital infrastructure.



Produces globally-applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and internet technologies. The organization supports standardization across sectors such as mobile communications (GSM, 3G-5G), IoT, M2M, intelligent transport systems, cybersecurity, electronic signatures, public safety, and cloud interoperability. ETSI's work ensures interoperability, supports EU policy and legislation, and facilitates the development, testing and validation of ICT standards globally.

These are membership-based organisations. They do not “own” standardisation in isolation; rather, they coordinate work conducted through national standards bodies and their committee structures.

In EEA countries - and effectively across a wider European footprint - the national bodies are the primary entry point for experts and stakeholders.

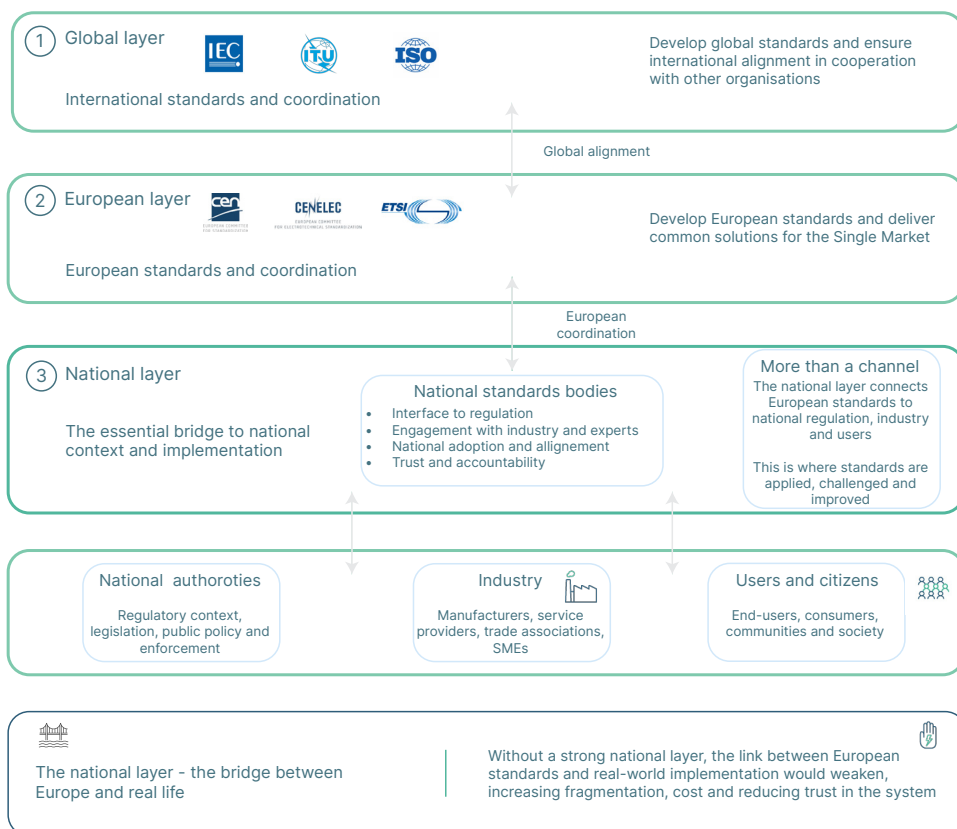
European work is typically mirrored nationally through “mirror committees” that coordinate positions and bring domestic stakeholders into the process.



Two features define the operating logic.

1: A LAYERED SYSTEM

1. **Global layer (ISO/IEC/ITU):** provides the global infrastructure to develop and maintain international standards - governance, process discipline, coordination, and publication.
2. **European layer (CEN/CENELEC/ETSI):** coordinates European standardisation and develops and maintains European standards.
3. **National layer:** organisations in each CEN/CENELEC member countries that run the committee machinery (mirror committees, public enquiries, national adoption, maintenance) and mobilises experts.



III: A layered system, NEK, 2026.

Beyond its operational functions, the national layer plays a distinct and irreplaceable role in the European standardisation system. It serves as the primary interface between European standards and national contexts - including regulators, industry, and users.

National bodies do not merely implement European standards; they ensure alignment with national legislation, administrative practices, and sector-specific needs. This is particularly critical in areas where regulation remains partly national.

As such, the national layer is a key part of the system's trust infrastructure - bridging European coordination and local accountability. It ensures that standards are not only developed, but understood, applied, and trusted in practice.

Without a strong national layer, the link between European standards and real-world implementation would weaken, increasing fragmentation and reducing trust.



Two features define the operating logic.

2: *MOST EFFORT IS MAINTENANCE*

A practical observation is that most standardisation work is not about creating new deliverables, but about maintaining and updating the existing body of standards - through revision, confirmation, and systematic review.

This should not be seen as a limitation. On the contrary, it is this continuous maintenance that keeps the Single Market's technical foundation robust, up to date, and fit for evolving technologies.

Reflection:



Can we credibly split users between CEN vs CENELEC vs ETSI?

Not in a robust way with publicly available, consistent data. Many organisations will “use” standards from all three (e.g., a product manufacturer may rely on CENELEC for safety/EMC, CEN for mechanical/sector standards, and ETSI for radio/IoT/telecom aspects).

ETSI standards (especially mobile/telecom) are also “used” by the entire population via networks and devices, but that is a different definition (end users of services vs professional users of standard documents).

Useful sources to cite (for scale and system logic)

- Eurostat (Structural Business Statistics / European Business Statistics) for the baseline scale: enterprises, employment, and turnover in the EU “business economy”.
- For the system mechanism (why one European Standard matters widely), you can cite CEN-CENELEC’s description that an EN is adopted nationally by members (supporting the argument that European standardisation has broad reach even if “user counts” are not directly measured).



KEY FIGURES - INDICATIVE ESTIMATES

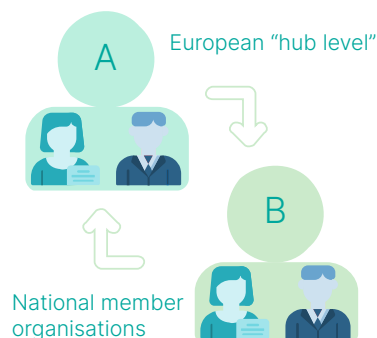
STAFFING IN THE ORGANISATIONS

To understand scale it is helpful to separate:

- (a) staffing at the European hub level from
- (b) staffing across national member organisations.

These ranges are **indicative** and depend on definitions (e.g., whether adjacent commercial services at national bodies are included).

They are intended to convey order of magnitude.



III: Staffing in organisations - magnitude. NEK, 2026.

EUROPEAN ORGANISATIONS (CEN, CENELEC, ETSI)

A reasonable combined staffing estimate across the three European-level organisations is:

- **European level (CEN, CENELEC, ETSI combined): Approximately 250 - 350 staff.**

This small hub layer exists to coordinate, govern, and publish - not to supply the bulk of technical labour.

NATIONAL MEMBER ORGANISATIONS (ACROSS EUROPE)

National standards bodies vary widely in size and scope. Depending on what is included (pure standardisation vs. broader adjacent activities), an indicative combined staffing estimate across European national standards bodies is:

- **National level (combined): Approximately 9,000 - 13,000 staff.**

COMBINED ORGANISATIONAL STAFFING IN EUROPE

Putting the two levels together yields (European + national):

- **Total organisational staffing: Approximately 9,250 - 13,350 staff.**

Even at the high end, this remains lean relative to the breadth of industrial sectors and value chains that depend on standards.



III: Staffing in organisations - approx. NEK, 2026.

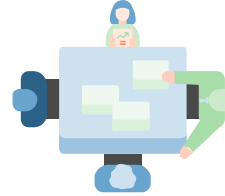


KEY FIGURES - WHO PAYS FOR THE WORK

THE EXPERT COMMUNITY

Where organisational staffing is moderate, expert participation is large.

Standards are drafted, debated, tested, and refined by people who understand technologies, markets, safety regimes, and regulatory constraints.



A practical estimate¹ for annual active experts involved in committee work connected to the CEN/CENELEC/ETSI ecosystem is:

- **Approximately 200,000 - 250,000 active experts per year** (estimate).

Over multiple years, the unique pool is larger as people rotate in and out:

- **Approximately 300,000 - 450,000 unique individuals over several years** (estimate).

The crucial economic point is not simply how many experts participate, but **where the cost sits**.

While the standardisation organisations provide the framework and the process, the majority of the “production cost” of standards is borne by industry and other stakeholders - primarily through:

- **expert time** spent in committees and working groups (national and European)
- **time spent** reading drafts, preparing positions, writing comments, and resolving issues
- **internal coordination** and governance inside companies (often larger than the visible meeting time)
- **travel and meeting** costs (smaller than before, but not zero).

In effect, standardisation is an industry supported system for producing shared technical public goods. The organisations operate the platform; the market supplies most of the labour.

- The majority of the "production cost" of standards is borne by industry and other stakeholders.

¹ This estimate includes not only experts directly participating at the European level, but also those contributing through national mirror committees, where input, comments, and voting form an integral part of the European standardisation process.



KEY FIGURES - INDICATIVE ESTIMATES

THE COST OF EUROPEAN STANDARDISATION

For a high-level view, the most useful split is:

1. Operating costs:

the cost of running the standardisation organisations and their processes (European and national levels).

2. Participation costs:

the value of time and resources spent by experts - predominantly industry - participating in development and maintenance.

These are **estimates**, and the precise totals depend on definitions (for example, whether one includes certain adjacent services provided by national bodies). The purpose here is to illustrate scale and proportions.

OPERATING COSTS	PARTICIPATION COSTS
The cost of running the standardisation organisations and their processes (European and national levels).	The value of time and resources spent by experts - predominantly industry - participating in development and maintenance.
Approximately €1.2 - €2.0 billion per year.	Approximately €4 - €7 billion per year.
This covers governance, secretariats, process management, digital platforms, publication, meeting support, quality assurance, and related overhead.	This range reflects the highly skewed distribution of effort:
The financing of operating costs varies by country, but in many cases relies heavily on standards sales.	many participants contribute limited hours, while a smaller core group (chairs, convenors, editors, technical leads, and heavily engaged companies) contributes substantial time, including significant internal work beyond formal committee participation.

III: The cost of European standardisation - estimates. NEK, 2026.

Putting the two components together yields an indicative annual cost for standard development and maintenance in Europe of:

- **Approximately €5.2 - €9.0 billion per year** (estimate).

Set against the economic scale of the Single Market - annual cross border and domestic turnover in goods and services measured in **trillions of euros** - this is **economically marginal**. Even without pinning down a single turnover number, the ratio is the key insight: the annual cost of running and feeding the standardisation system is **a tiny fraction of the value created and exchanged in the Single Market**, where standards act as critical “lubricant” enabling interoperability, safety, compliance confidence, and efficient competition.

In other words, Europe spends billions to reduce friction across markets worth many thousands of billions. Even at the high end, this is comfortably below 0.1% of Single Market turnover in goods and services - yet it helps reduce friction across the entire economy. The leverage is the point.



LEGISLATION THAT REFERENCES STANDARDS

For decades, the European Commission has used a structured model in technical regulation: legislation sets **essential requirements** (high level outcomes for safety, health, environmental protection, or other public interests), while standards provide detailed technical means for meeting those requirements.

This approach is strategically effective for the Single Market for several reasons:

1. Harmonisation without over prescription

Law stays stable at the principle level, while standards can be updated more frequently to reflect new technologies and operational lessons.

2. Technical quality through expert process

Standardisation committees aggregate practical expertise from manufacturers, users, labs, and authorities, typically producing more implementable technical detail than legislation alone.

3. Agility

When technology, risk, or market practice changes, standards can evolve without requiring the full political and legislative cycle.

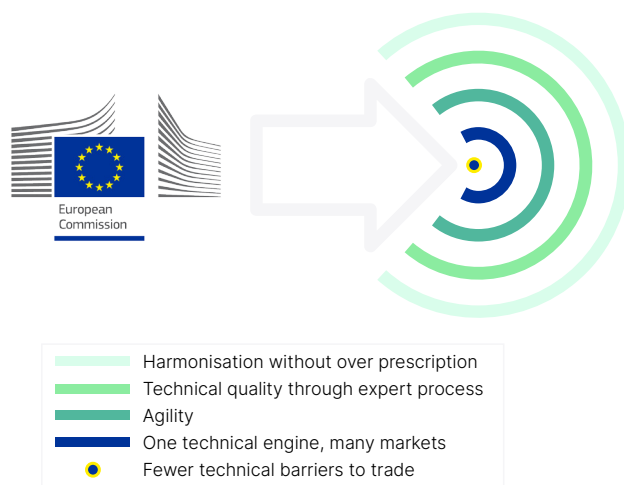
4. One technical engine, many markets

Common standards help firms design for a larger unified market rather than many fragmented ones—strengthening competitiveness and lowering per unit costs.

5. Fewer technical barriers to trade

Common test methods, documentation expectations, and performance criteria make cross border market access more predictable and less costly.

In practical terms, referencing standards helps create a shared operational “map” for the market. Standards become tools for conformity assessment and technical documentation, for consistent interpretation of requirements, and for more efficient market surveillance and enforcement.



III: Fewer technical barriers to trade. NEK, 2026.



AN ASSET HIDING IN PLAIN SIGHT

Standardisation is not innovation in itself. It does not define new value propositions, create user demand, or substitute for experimentation.

Its role is different: standardisation reduces uncertainty, aligns expectations, and lowers the cost of coordination, making it possible for innovations - incremental or radical - to be adopted and scaled across markets.

European standardisation is structured collaboration at scale. It is not a substitute for innovation; rather, it is one of the mechanisms that allows innovation to become shareable, scalable, and trustworthy across markets.

Seen through the lens of the 90/10 metaphor introduced earlier in this report, the role of standards becomes clearer. In many successful innovations, only a limited share is genuinely new and differentiating, while the majority must build on existing technologies, interfaces, safety expectations, and operational practices. Innovators compete on the 10%, but they scale through the 90%.

Standards are one of the main ways in which this foundational 90% is codified, maintained, and made reusable across sectors and borders.

This dynamic is particularly important in the context of the European Single Market. For much of Europe's industry, the Single Market functions as the natural home market: a unified economic area of around 450 million consumers and one of the largest integrated markets in the world.

From a bird's eye perspective, it represents an economic space with a GDP comparable to that of the United States and China. It is within this market that many European companies first scale their products, technologies, and services before expanding globally.

Standards play a crucial role in making such scaling possible.

By providing shared technical references, interoperability frameworks, test methods, and predictable conformity pathways, standards reduce friction across national borders and industrial ecosystems. They allow firms to focus their resources on differentiation and innovation rather than repeatedly solving compatibility challenges.

At the same time, standards form an important bridge between innovation, regulation, and market access. For companies operating in the Single Market, the use of European standards often provides a practical route to demonstrating conformity with European legislation while ensuring interoperability across suppliers, technologies, and infrastructures.

Because European standardisation is closely connected to international systems such as ISO, IEC, and ITU, these same standards frequently align with the technical frameworks shaping global markets.

From a bird's eye view, another striking feature is the leverage of the European model.

The institutional backbone is lean: the European organisations themselves are small, and the broader system relies on national bodies and a large expert community drawn primarily from industry.



A significant share of standardisation activity is devoted to maintaining and updating the existing body of standards, ensuring that the technical foundations of the Single Market remain stable, current, and responsive to technological development.

The economic logic follows the same pattern. The institutional cost of developing and maintaining European standards is relatively modest, while the economic activity that relies on shared, interoperable technical frameworks operates at a vastly larger scale.

In this sense, standardisation represents a high leverage investment: modest institutional costs help reduce friction across an entire continental economy.

Standards rarely attract attention in everyday debate. Yet they remain among Europe's most practical instruments for turning technological capability, industrial cooperation, and regulatory ambition into a functioning, competitive, and globally connected economy.

As Europe's industries innovate and scale within their home market, the shared technical foundations provided by standards quietly enable both market integration and international competitiveness.



Photo: Leif T. Aanensen, 2026.

"Innovation sparks progress, but standards make it scalable. Standardisation ensures that new technologies are interoperable, trusted, and deployed in ways that protect the safety and security of our citizens".

- Håkon Rem, Vice President Sales and Marketing NEMKO, Chair of the Board NEK, 2026.

KEY MESSAGES:

- Standardisation does not replace innovation; it provides the shared technical foundations that allow new ideas to become interoperable, trusted, and deployable across markets.
- A unified standards system reduces friction between countries and sectors, enabling European companies to scale first within their natural home market before expanding globally.
- By offering common references, conformity pathways, and interoperability frameworks, standards translate regulatory ambitions and technological capabilities into practical market entry.
- Despite modest institutional costs and a high share of maintenance work, the European standardisation system delivers outsized economic value by supporting trillions in market activity.
- Often overlooked in public debate, standards remain one of Europe's most effective instruments for turning industrial cooperation and technological progress into a functioning and competitive economy.

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All logos included in this document were obtained from the official websites of the respective organisations.

EUROPEAN INNOVATION FROM A BIRD'S - EYE VIEW



*Innovation rarely succeeds because everything is new
- it succeeds because the new can scale.*

This report offers a bird's-eye view of Europe's most overlooked competitive asset: a lean, layered standardisation system that quietly underpins the Single Market and enables innovation to move from prototype to deployment.

For policymakers, industry leaders and innovators, this report reveals how standards transform technological ambition into market reality - and why Europe's competitiveness increasingly depends on them.

KEY MESSAGES:

Standardisation does not replace innovation; it provides the shared technical foundations that allow new ideas to become interoperable, trusted, and deployable across markets.

A unified standards system reduces friction between countries and sectors, enabling European companies to scale first within their natural home market before expanding globally.

By offering common references, conformity pathways, and interoperability frameworks, standards translate regulatory ambitions and technological capabilities into practical market entry.

Despite modest institutional costs and a high share of maintenance work, the European standardisation system delivers outsized economic value by supporting trillions in market activity.

Standards remain one of Europe's most effective instruments for turning industrial cooperation and technological progress into a functioning and competitive economy.