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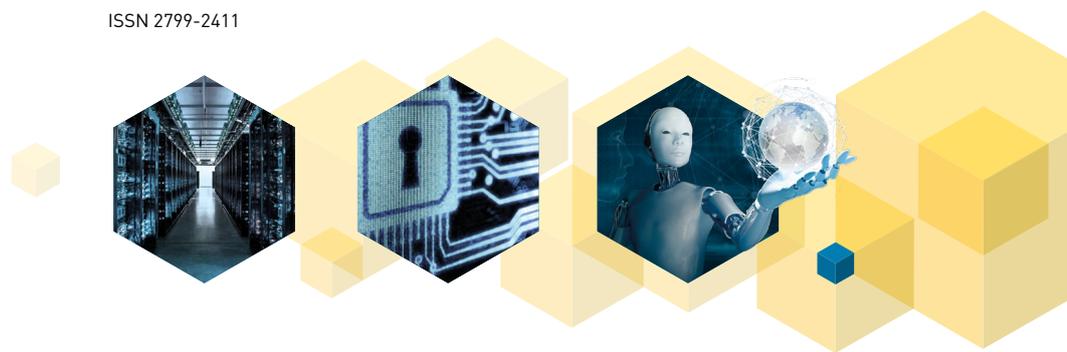
STANDARDS ANALYSIS

ICT SECTOR

LUXEMBOURG

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Institut Luxembourgeois de la
Normalisation, de l'Accréditation, de la
Sécurité et qualité des produits et services

 **ANEC**

Agence pour la Normalisation et
l'Economie de la Connaissance

FOREWORD

Technical standardization and standards play an important role in the support of economic development. Nowadays, almost every sector relies on standards to function day-to-day and provide services in an efficient manner. They can provide, for example, good practices for services and product development, governance, quality assessment, safety, trustworthiness, etc. Even if the application of standards remains voluntary, it yields a real advantage in creating added value to a product, service, or process. Standards are therefore considered a major source of benefits, and this is particularly true for Information and Communication Technology (ICT), which supports all other economic developments.

Indeed, the ICT sector has gained more and more importance in society as a whole in the few last decades, as evidenced for instance by the computerization of equipment in general, the advent of global connectivity, and more recently the emergence of smart paradigms such as the Internet of Things and Artificial Intelligence. We are probably only at the beginning of this transformation, wherein ICT domains fully converge. In this context, technical standardization plays a key role, for example to connect all ICT components, to make them interoperable and prevent vendor lock-in, to support the integration of multiple data sources or to provide the security and safety of the next digital world.

The Grand Duchy of Luxembourg has clearly understood the importance of the digital economy and has engaged since several years in an ambitious innovation strategy for the ICT sector, considering that the development of a trusted and sustainable economy will notably rely on a data-driven approach. The “*Institut Luxembourgeois de la Normalisation, de l’Accréditation, de la Sécurité et qualité des produits et services*” (ILNAS) fully supports this development through the “Luxembourg Standardization Strategy 2020-2030”¹, signed by the Minister of the Economy, which identifies the ICT sector as key to fostering growth, along with the construction and aerospace sectors. In this context, ILNAS has developed the “Luxembourg’s policy on ICT technical standardization 2020-2025”², which aims to promote and strengthen the use of technical standards by the national market, to reinforce the positioning of Luxembourg in the global ICT standardization landscape, particularly through a stronger involvement of national stakeholders in the relevant standardization technical committees, and to pursue the development of research and education programs. In order to carry out this policy, ILNAS benefits notably from the support of the Economic Interest Group “*Agence pour la Normalisation et l’Économie de la Connaissance*” (ANEC G.I.E. - Standardization Department).

In this frame, ILNAS is well involved in standardization education, as educational programs have been developed through a fruitful collaboration with the University of Luxembourg, the latest being the Master MTECH “Technopreneurship: mastering smart ICT, standardisation and digital trust for enabling next generation of ICT solutions”³, launched in February 2021. This diploma allows national stakeholders to gain familiarity with Smart Secure ICT technologies, notably from the standardization and

Technopreneurship points of view, in order to seize future business opportunities offered in this innovative area.

In parallel, ILNAS also has ongoing research activities, in particular in ICT. On the one hand, ILNAS and the Interdisciplinary Centre for Security, Reliability and Trust (SnT) of the University of Luxembourg recently completed a research program “Technical Standardisation for Trusted Use in the Field of Smart ICT” (2017-2020)⁴, involving three PhD students, respectively working on Cloud Computing, Internet of Things and Big Data/Artificial Intelligence. This program largely considered the technical standardization and Digital Trust aspects of these technologies and has resulted in several publications in the Smart Secure ICT area⁵. Following this success, a new research program with SnT, involving three new PhD students, will soon begin, this time covering not just ICT, but construction and aerospace sectors as well. Entitled “Technical Standardisation for Trustworthy ICT, Aerospace, and Construction (2021-2024)”, it will explore Digital Trust aspects of the three sectors, with ICT in particular playing a horizontal role in the other two.

On the other hand, ILNAS has published a series of White Papers and reports in order to inform the market about technical standardization developments in certain ICT sub-topics⁶. The most recent are the 2021 White Paper “Artificial Intelligence: Technology, Use cases and Applications, Trustworthiness and Technical Standardization”⁷ and the 2021 “National Technical Standardization Report - Blockchain and Distributed Ledgers”⁸.

As a part of the overall effort to reinforce the positioning of Luxembourg in the ICT standardization landscape, other initiatives are undertaken at ILNAS level in order to facilitate the participation of national stakeholders in specific ICT standardization areas. The first of these is the creation of a National Standardization Commission “Cybersecurity”, providing a single access point to multiple international and European technical committees active in this area. ILNAS aims at developing Commissions dealing with other ICT topics in order to continuously improve the experience of its national standardization delegates.

Within this global framework, this Standards Analysis “ICT Sector - Luxembourg” is intended to serve as a practical tool to discover the latest standardization developments in the overall landscape of ICT related technologies, from more seasoned topics such as software engineering and programming languages to more recent ones such as the Internet of Things, Cloud Computing, or Artificial Intelligence. Therefore, the present document will allow national stakeholders to identify relevant standardization technical committees, with the ultimate objective to offer them guidance for a potential future involvement in the standards development process and allow them to discover the services provided by ILNAS at the national level regarding technical standardization.

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¹ <https://portail-qualite.public.lu/dam-assets/publications/normalisation/2020/strategie-normative-luxembourgeoise-2020-2030.pdf>

² <https://portail-qualite.public.lu/dam-assets/publications/normalisation/2020/policy-on-ict-technical-standardization-2020-2025.pdf>

³ <https://mtech.uni.lu/>

⁴ <https://smartict.gforge.uni.lu/>

⁵ <https://portail-qualite.public.lu/fr/normes-normalisation/education-recherche/normalisation-recherche.html#prog-2017-2020>

⁶ <https://portail-qualite.public.lu/fr/normes-normalisation/education-recherche/white-papers-rapports-techniques.html>

⁷ <https://portail-qualite.public.lu/fr/publications/normes-normalisation/etudes/ilnas-white-paper-artificial-intelligence-and-technical-standardization.html>

⁸ <https://portail-qualite.public.lu/fr/publications/normes-normalisation/etudes/ilnas-national-technical-standardization-report-blockchain-dlt-june-2021.html>

TABLE OF CONTENTS

| | | |
|------|---|----|
| 1 | INTRODUCTION | 9 |
| 2 | TECHNICAL STANDARDIZATION AND STANDARDS | 11 |
| 2.1 | Standardization Objectives and Principles..... | 11 |
| 2.2 | Standardization Landscape | 12 |
| 2.3 | National Actors..... | 15 |
| 3 | LANDSCAPE OF THE ICT SECTOR | 17 |
| 3.1 | Economic Overview | 17 |
| 3.2 | ICT in Luxembourg..... | 18 |
| 3.3 | Definition of ICT Subsectors | 20 |
| 4 | ICT SECTOR STANDARDS WATCH | 23 |
| 4.1 | Cloud Computing | 23 |
| 4.2 | Internet of Things | 24 |
| 4.3 | Artificial Intelligence and (Big) Data | 27 |
| 4.4 | Software and Programming Languages | 32 |
| 4.5 | Blockchain..... | 34 |
| 4.6 | Digital Trust..... | 36 |
| 4.7 | Telecommunications and Networking | 43 |
| 4.8 | Governance of IT | 47 |
| 4.9 | Education and Digital Skills..... | 48 |
| 4.10 | E-Health | 50 |
| 4.11 | Fintech..... | 53 |
| 4.12 | Data Centers and Green ICT | 56 |
| 4.13 | Intelligent Transport Systems..... | 58 |
| 4.14 | Smart Cities..... | 60 |
| 4.15 | Smart Energy and Grid | 63 |
| 4.16 | Smart Manufacturing..... | 65 |
| 4.17 | Technical committees falling outside of the classification..... | 69 |
| 4.18 | ETSI Industry Specification Groups and CEN/CLC Workshops | 72 |
| 5 | OPPORTUNITIES FOR THE NATIONAL MARKET | 75 |
| 5.1 | Information about Standardization | 75 |
| 5.2 | Training in Standardization | 79 |
| 5.3 | Involvement in Standardization | 80 |
| 6 | CONCLUSIONS..... | 83 |

1 INTRODUCTION

The Information and Communication Technology (ICT) sector is a keystone of the global economy. Indeed, nowadays it provides pervasive support to all other sectors of activity. As systems become more and more digitized and intricate, the growth of the ICT sector is now driven by the ability of its multiple components to interoperate (“to talk to each other”). Standards can allow this interoperability between different products from different manufacturers, while offering solutions to ensure an adequate level of trustworthiness in their operation.

Luxembourg’s economy benefits from a vibrant ICT ecosystem. It was composed of 2,935 companies in 2020 (7.7% of the total number of companies) and represented 4.58% of the total employment of the first quarter of 2021⁹. ILNAS supports the economic development of the sector from the technical standardization perspective, through the implementation of the “Luxembourg Standardization Strategy 2020-2030” and the execution of the “Luxembourg’s policy on ICT technical standardization 2020-2025”. The institute undertakes multiple activities in order to develop a network of experts, support the transfer of knowledge and education about ICT standardization to national stakeholders, and strengthen their participation in related technical committees¹⁰.

In this frame, this Standards Analysis “ICT Sector - Luxembourg” aims to serve as a practical tool dedicated to national organizations, allowing them to identify technical standardization activities supporting their business. For this purpose, this analysis concentrates on the main activities of recognized Standards Development Organizations (SDOs) within the ICT landscape. It provides a panoramic view of the technical committees working in the domain, so that national stakeholders, whether providers or users of ICT, can easily identify standards and committees relevant to their core business and needs.

This Standards Analysis is organized as follows:

- Chapter 2 outlines the objectives of technical standardization and introduces its landscape at the international, European and national levels;
- Chapter 3 introduces the ICT landscape. It provides an economic overview of the sector, highlights some figures and initiatives at the national level and finally proposes a description of the categorization of the ICT sector used in this Standards Analysis (ICT subsectors) in order to present the standardization technical committees identified;
- Chapter 4 constitutes the heart of the Standards Analysis. It provides an overview of the ICT standardization technical committees, spread out according to the categories from Chapter 3. Each technical committee is presented using a table (ID-card), which details the most relevant information about its activities and allows national stakeholders to rapidly determine their relevance in regards to their business;
- Chapter 5 presents opportunities related to standardization for national stakeholders. It also introduces the way ILNAS supports the national economy through technical standardization;
- Chapter 6 provides a summary of this Standards Analysis and reiterates the commitment of ILNAS to assist national entities with their involvement in technical standardization.

⁹ Source: STATEC

¹⁰ Note: In this report, the term “standardization technical committee” is generic and covers “technical committees”, “subcommittees”, “working groups”, etc.

2 TECHNICAL STANDARDIZATION AND STANDARDS

Standardization corresponds to the definition of voluntary technical or quality specifications with which current or future products, production processes or services may comply. Standardization is organized by and for all relevant interested parties based on national representation (CEN, CENELEC, ISO and IEC) and direct participation (ETSI and ITU-T), and is founded on the principles recognized by the World Trade Organization (WTO)¹¹ in the field of standardization (see Section 2.1).

Technical standards provide an effective economic tool for achieving various objectives, such as mutual understanding, reduction of costs, elimination of waste, improvement of efficiency, achievement of compatibility between products and components or access to knowledge about technologies¹². The application of the fundamental principles stated by the WTO throughout the development of technical standards also guarantees the legitimacy of these documents.

In addition, technical standards play an important role for innovation. As pointed out by the European Commission (EC) in its communication on ICT Standardisation Priorities for the Digital Single Market¹³: *“They guarantee that technologies work smoothly and reliably together, provide economies of scale, foster research and innovation and keep markets open”*. It is all the more relevant in the current context, in which the world tends to become digitized and everything becomes connected. Technical standardization is thus a keystone to ensure interoperability of complex ICT systems, thereby minimizing the barriers that may still exist to build the future of the digital world.

2.1 Standardization Objectives and Principles

As stated in the Regulation (EU) N°1025/2012¹⁴ on European standardization, and according to the WTO, standardization is based on founding principles, which are observed by the formal standards bodies for the development of international standards:

Transparency

All essential information regarding current work programs, as well as on proposals for standards, guides and recommendations under consideration and on the results should be made easily accessible to all interested parties.

Openness

Membership of an international standards body should be open on a non-discriminatory basis to relevant bodies.

Impartiality and Consensus

All relevant bodies should be provided with meaningful opportunities to contribute to the elaboration of an international standard so that the standard development process will not give privilege to, or favor the interests of, a particular supplier, country or region. Consensus procedures should be established that seek to take into account the views of all parties concerned and to reconcile any conflicting arguments.

¹¹ WTO, “Second triennial review of the operation and implementation of the agreement on technical barriers to trade – Annex,” 2000 - <http://docsonline.wto.org/imrd/directdoc.asp?DDFDocuments/t/G/TBT/9.doc>

¹² CEN-CENELEC, “Standards and your business,” 2013 - https://www.cencenelec.eu/media/CEN-CENELEC/Get%20Involved/Documents/standards_and_your_business.pdf

¹³ European Commission, “ICT Standardisation Priorities for the Digital Single Market, COM(2016) 176,” 2016 - <https://ec.europa.eu/newsroom/dae/redirection/document/15265>

¹⁴ Regulation (EU) N° 1025/2012 of the Parliament and of the Council - <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:316:0012:0033:EN:PDF>

Effectiveness and Relevance

International standards need to be relevant and to effectively respond to regulatory and market needs, as well as scientific and technological developments in various countries. They should not distort the global market, have adverse effects on fair competition, or stifle innovation and technological development. In addition, they should not give preference to the characteristics or requirements of specific countries or regions when different needs or interests exist in other countries or regions. Whenever possible, international standards should be performance based rather than based on design or descriptive characteristics.

Coherence

In order to avoid the development of conflicting international standards, it is important that international standards bodies avoid duplication of, or overlap with, the work of other international standards bodies. In this respect, cooperation and coordination with other relevant international bodies is essential.

Development dimension

Constraints on developing countries, in particular, to effectively participate in standards development, should be taken into consideration in the standards development process. Tangible ways of facilitating developing countries participation in international standards development should be sought.

Standardization is an efficient economic tool offering the possibility to pursue various objectives, such as:

- Management of diversity;
- Convenience of use;
- Performance, quality and reliability;
- Health and safety;
- Compatibility;
- Interchangeability;
- Security;
- Trustworthiness;
- Environmental protection;
- Product protection;
- Mutual understanding;
- Economic performance;
- Trade;
- Etc.

2.2 Standardization Landscape

In Europe, the three recognized European Standardization Organizations (ESO), as stated in Regulation (EU) No 1025/2012¹⁵, are:

- European Committee for Standardization (CEN);
- European Committee for Electrotechnical Standardization (CENELEC);
- European Telecommunications Standards Institute (ETSI).

At the international level, the three recognized standardization organizations are:

- International Organization for Standardization (ISO);
- International Electrotechnical Commission (IEC);
- International Telecommunication Union's Telecommunication Standardization Sector (ITU-T).

¹⁵ Regulation (EU) N°1025/2012 of the Parliament and of the Council - <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:316:0012:0033:EN:PDF>

This standardization frame allows cooperation between standardization organizations at the same level, or at different levels but on the same topics:

- CENELEC and IEC are specialized in electrotechnical standards;
- ETSI and ITU-T are focused on telecommunications standards;
- CEN and ISO are in charge of the standards in other sectors.

At the national level, one or several national standards bodies protect the interests of the country within each of the European and international standardization organizations (e.g.: in Germany, on the one hand DIN is the member of ISO and CEN, and on the other hand DKE is member of IEC, CENELEC and ETSI). In Luxembourg, ILNAS – the only official national standards body – is a member of the European and international standardization organizations CEN, CENELEC, ETSI, ISO, IEC and ITU-T.

| | General Standardization | Electrotechnical Standardization | Telecommunications Standardization |
|---|--|--|---|
|  International level |  |  |   |
|  European level |  |  |  |
|  National level |  |  |  |

Figure 1: Interactions between the Standardization Organizations

Several bridges exist between the national, European and international standardization organizations in order to facilitate the collaboration and coordination of standardization work in the different fields.

Indeed, in order to ensure transparency in the work, prevent standards duplication, and avoid conflicting requirements, agreements have been established between international and European standardization organizations.

In 1991, ISO and CEN signed the Vienna Agreement¹⁶, which is based on the following guiding principles:

- Primacy of international standards and adoption of ISO Standards at the European level (EN ISO);
- Work at the European level (CEN), if there is no interest at the international level (ISO);
- When a given project undergoes parallel development, procedures are in place ensuring standardization documents of common interest are approved by both organizations (ISO and CEN).

Similarly, CENELEC and IEC signed the Dresden Agreement in 1996 with the aim of developing intensive consultations in the electrotechnical field. This agreement was superseded by the Frankfurt Agreement¹⁷ in 2016 with the aim to simplify the parallel voting processes, and increase the traceability

¹⁶ Agreement on technical co-operation between ISO and CEN (Vienna Agreement) - https://boss.cen.eu/media/CEN/ref/vienna_agreement.pdf

¹⁷ IEC-CENELEC Agreement on Common planning of new work and parallel voting (Frankfurt Agreement) https://www.iec.ch/about/globalreach/partners/pdf/IEC-CENELEC_Frankfurt_Agreement%7B2016%7D.pdf

of international standards adopted in Europe thanks to a new referencing system. It is intended to achieve the following guiding principles:

- Development of all new standardization projects by IEC (as much as possible);
- Work at the European level (CENELEC), if there is no interest at the international level (IEC);
- When a given project undergoes parallel development, ballots for relevant standardization documents are organized simultaneously by both organizations (IEC and CENELEC).

Under both agreements, 33% of all European standards ratified by CEN, as well as 74% of those ratified by CENELEC, are respectively identical to ISO or IEC standards¹⁸. In that respect, the European and international organizations do not duplicate work.

Similarly, ITU-T and ETSI have agreed on a Memorandum of Understanding (MoU) in 2000, lastly renewed in 2016¹⁹, that paves the way for European regional standards, developed by ETSI, to be recognized internationally.

Agreements also exist between the standards organizations to facilitate their cooperation. For example, ISO and IEC have the possibility to sign conventions to create a Joint Technical Committee (JTC) or a Joint Project Committee (JPC) when an area of work overlaps the two organizations (e.g.: ISO/IEC JTC 1 for Information Technology). Similarly, CEN and CENELEC have the possibility to create a JTC in areas covering the expertise of both organizations, such as in the ICT domain (e.g.: CEN/CLC/JTC 13 for Cybersecurity and Data Protection).

ISO, IEC and ITU have also established the World Standards Cooperation (WSC) in 2001, a high-level collaboration system intending to strengthen and advance the voluntary consensus-based international standards system and to resolve issues related to the technical cooperation between the three organizations²⁰. Similarly, a cooperation agreement²¹ has been established between CEN, CENELEC and ETSI in order to facilitate cooperation and collaboration between the three ESOs, and to share their expertise of standards-making, particularly in the light of new technologies, mandated work and areas of common interest.

ISO and IEC Standardization Committees

ISO is the world's dominant developer and publisher of International Standards in terms of scope. It has over 23,500 standards published and more than 4,400 standards under development²². ISO is in charge of developing International Standards for all industry sectors.

IEC prepares and publishes International Standards for all electrical, electronic and related technologies – collectively known as “electrotechnology”.

To prevent an overlap in standardization work related to information technology, ISO and IEC formed a Joint Technical Committee in 1987 known as ISO/IEC JTC 1 *Information technology*. It has taken a leading role in ICT standardization in the last few years with the creation of working groups and technical subcommittees directly responsible for the development of ICT International Standards.

CEN and CENELEC Standardization Committees

CEN and CENELEC are two official European Standards Organizations (ESOs) closely collaborating through a common CEN-CENELEC Management Centre since 2010. They are notably in charge of developing ICT standards at the European level. Even if most of the ICT-related topics are being tackled at the international level by ISO/IEC JTC 1, complying with the “Vienna Agreement” set up between

¹⁸ CEN CENELEC in figures – 2020 Q2 - https://www.cencenelec.eu/stats/CEN_CENELEC_in_figures_quarter.htm

¹⁹ Renewed memorandum of understanding between ETSI and ITU - <https://www.itu.int/en/ITU-T/extcoop/Documents/mou/MoU-ETSI-ITU-201605.pdf>

²⁰ <http://www.worldstandardscooperation.org/>

²¹ CEN/CENELEC Internal Regulations - Part 2:2020 - Annex C - https://boss.cen.eu/media/CEN/ref/ir2_e.pdf

²² <https://www.iso.org/iso-in-figures.html>

CEN and ISO, as detailed above, CEN and CENELEC have technical committees and additional other groups active in different areas of the ICT sector directly under their supervision.

The standardization activities of CEN and CENELEC are detailed in an annual common Work Program, which was published in January 2021 for the year 2021²³. They are active in several ICT-related areas covering both digital society and smart technologies: e-Signatures, Intelligent Transport Systems, Smart Grids, Smart Metering, Internet of Things, Smart Homes, Smart Cities, Advanced Manufacturing, Artificial Intelligence, Blockchain and Distributed Ledger Technologies, Cybersecurity and Data Protection, etc.

ETSI - European Telecommunications Standards Institute

ETSI is a leading standardization organization for ICT standards fulfilling European and global market needs. The European Union officially recognizes ETSI as an ESO. ETSI is active in ten ICT “sectors”, regrouping a number of technical committees and covering a wide range of technologies, namely: Home and Office, Better living with ICT, Content Delivery, Networks, Wireless Systems, Transportation, Connecting Things, Interoperability, Public Safety and Security²⁴. The standardization activities of ETSI are detailed in an annual Work Program, whose last edition is covering the period 2021/2022²⁵.

ITU-T - International Telecommunication Union - Telecommunication Standardization Sector

The International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) is an “intergovernmental public-private partnership organization” which brings together experts from around the world to develop international standards known as ITU-T Recommendations, which cover defining elements in the global infrastructure of ICT. It is currently composed of 11 Study Groups working on different aspects of ICT²⁶.

2.3 National Actors

2.3.1 ILNAS - The National Standards Body

ILNAS (*Institut luxembourgeois de la normalisation, de l'accréditation, de la sécurité et qualité des produits et services*) is a public administration under the authority of the Minister of the Economy of the Grand Duchy of Luxembourg. Founded in 2008, ILNAS represents a network of competencies relating to quality, safety and conformity of products and services (see Figure 2), and its mission is to support national competitiveness.

One of ILNAS' missions is to promote technical standardization. As such, it is the Grand Duchy's National Standards Body. ILNAS organizes its standardization work according to the 2020-2030 national standardization strategy²⁷, and associated ICT²⁸, Construction²⁹, and Aerospace³⁰ national technical standardization policies.

²³ <https://www.cenelec.eu/media/CEN-CENELEC/Publications/workprogramme2021.pdf>

²⁴ <https://www.etsi.org/technologies>

²⁵ <https://www.etsi.org/e-brochure/Work-Programme/2021-2022/mobile/index.html>

²⁶ <https://www.itu.int/en/ITU-T/studygroups/2017-2020/Pages/default.aspx>

²⁷ <https://portail-qualite.public.lu/fr/publications/normes-normalisation/avis-officiels/strategie-normative-luxembourgeoise-2020-2030.html>

²⁸ <https://portail-qualite.public.lu/fr/publications/normes-normalisation/avis-officiels/politique-luxembourgeoise-pour-la-normalisation-technique-des-tic-2020-2025.html>

²⁹ <https://portail-qualite.public.lu/fr/publications/normes-normalisation/avis-officiels/politique-luxembourgeoise-pour-la-normalisation-technique-du-secteur-de-la-construction-2020-2025.html>

³⁰ <https://portail-qualite.public.lu/fr/publications/normes-normalisation/avis-officiels/politique-luxembourgeoise-pour-la-normalisation-technique-du-secteur-de-l-aerospatial-2021-2025.html>

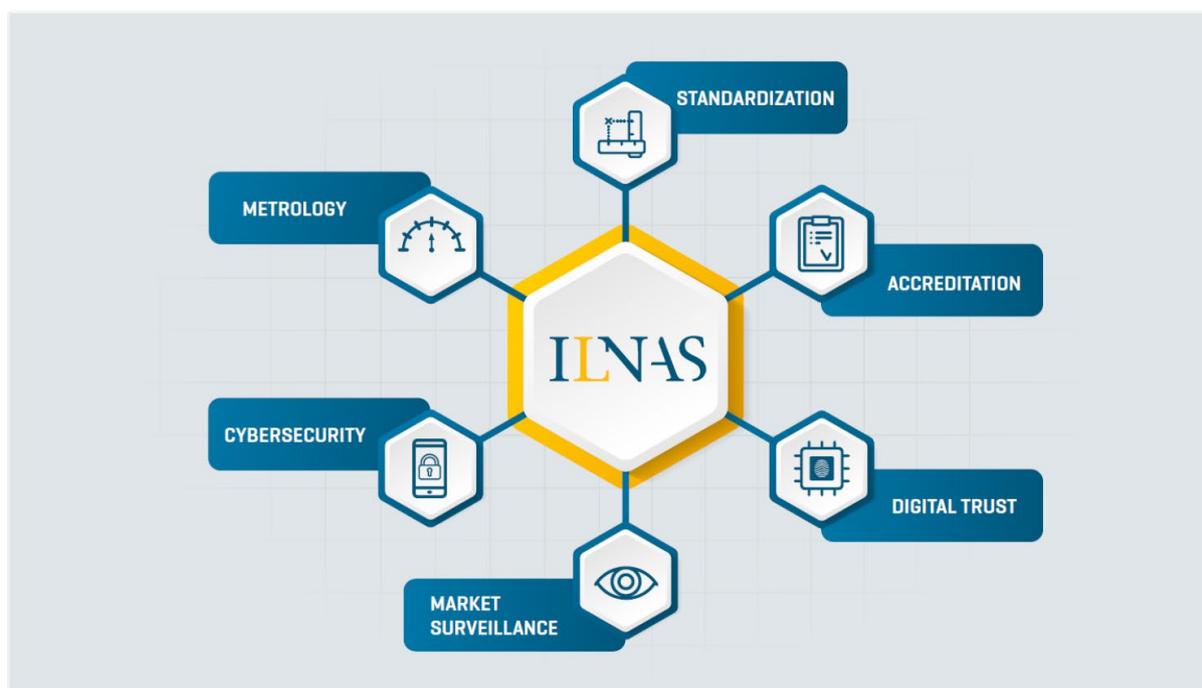


Figure 2: The departments of ILNAS

Overall, the objectives are to raise awareness on the use of technical standards, promote active participation in the development and publication of standards drafts, enhance Luxembourg's international visibility in standardization, and develop strong links between standardization, scientific research and education.

2.3.2 ANEC G.I.E.

ANEC G.I.E. (*Agence pour la normalisation et l'économie de la connaissance*) is an economic interest group whose partners are the Ministry of the Economy, the *Chambre des métiers* and the *Chambre de commerce*. One of its main roles is to support ILNAS in its standardization missions. In particular, it implements the 2020-2025 national standardization policy for ICT. In practice, this entails pursuing the following activities:

- Regularly informing the national market of the latest technical standardization developments;
- Actively promoting the use of standards and the benefits of participating in the standards development process;
- Animating trainings on technical standardization in relation to technologies of interest;
- Participating in national mirror committees for certain international technical committees;
- Supporting ILNAS in the production of national deliverables, such as white papers, national technical standardization reports, topic-specific standards analyses, etc.;
- Supporting ILNAS in its efforts to strengthen the ties between technical standardization, scientific research, education, and innovation, namely through research programs between ILNAS and the University of Luxembourg³¹, and participation in the MTECH Master's degree (Technopreneurship: mastering smart ICT, standardisation and digital trust for enabling next generation of ICT solutions³²).

³¹ <https://portail-qualite.public.lu/fr/normes-normalisation/education-recherche/normalisation-recherche.html>

³² <https://portail-qualite.public.lu/fr/normes-normalisation/education-recherche/education-normalisation.html>

3 LANDSCAPE OF THE ICT SECTOR

Information and Communication Technology (ICT) has progressively gained importance in recent decades, becoming a foundation for all sectors of the economy. The fast-growing connectivity, storage, software and hardware capabilities have strongly affected society in all its aspects. The way of doing business as well as daily lives of citizens now strongly rely on ICT. This trend shows no sign of slowing and the sector still offers great promises, opportunities and challenges.

This Chapter offers a panorama of the ICT sector, encompassing an economic overview, a review of the national ICT ecosystem in Luxembourg as well as a presentation of the categorization of the ICT sector used in this Standards Analysis. It includes a brief description of each ICT “subsector” defined in this frame.

3.1 Economic Overview

The ICT sector is now more than ever an important part of the global economy. Investments in ICT continue to increase. Indeed, according to IDC³³, worldwide spending in ICT is expected to pass the \$5 trillion mark in 2021, with spending in new technologies (such as Internet of Things (IoT), Augmented Reality (AR) / Virtual Reality (VR), robotics or blockchain) passing the \$1 trillion mark that year as well. Despite the COVID-19 pandemic, ICT spending has continued to grow overall, and it is forecast to be over \$5.8 trillion in 2023 (with over \$1.3 trillion going into new technologies). Another study by Gartner³⁴ estimates that spending in ICT will grow by 8.6% in 2021, and a further 5% in 2022.

Companies are also largely turning towards cybersecurity solutions to ensure a high level of Digital Trust in their technologies and services. Nowadays, one of the major challenges is indeed to prevent or mitigate increasingly frequent cyber-attacks, whose costs deal major damage to the economy, as evidenced by the expectation from Cybersecurity Ventures to see global cybercrime costs reach over \$10 trillion by 2025³⁵. Gartner security study predicts that information security and risk management spending will exceed itself \$150 billion in 2021, an increase of 12.4% from 2020³⁶.

Overall, research and development are also quite ICT intensive. For instance, the 2020 EU Industrial R&D Investment Scoreboard shows that ICT producers and ICT services accounted together for just under 40% of all R&D spending in 2019³⁷.

At the European level, the ICT sector has been directly responsible for 5.16% of the GVA³⁸ (Gross Value Added), with a market value of €734 billion in 2018³⁹, but it contributes far more to overall productivity growth. This is not only due to the high levels of dynamism and innovation inherent to the sector, but also due to the enabler role this sector plays, in changing how other sectors do business. At the same time, the social impact of ICT has become significant. This is supported by European statistics of 2019, with 89% (Luxembourg: 95%) of households having a broadband connection⁴⁰, 85%

³³ <https://www.idc.com/promo/global-ict-spending/forecast>

³⁴ <https://www.gartner.com/en/newsroom/press-releases/2021-07-14-gartner-forecasts-worldwide-it-spending-to-grow-9-percent-2021>

³⁵ <https://cybersecurityventures.com/hackerpocalypse-cybercrime-report-2016/>

³⁶ <https://www.gartner.com/en/newsroom/press-releases/2021-05-17-gartner-forecasts-worldwide-security-and-risk-managem>

³⁷ <https://iri.jrc.ec.europa.eu/scoreboard/2020-eu-industrial-rd-investment-scoreboard>

³⁸ Gross value added is the value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector (source: OECD)

³⁹ Source: Eurostat - National accounts aggregates by industry (up to NACE A*64) - code: nama_10_a64

⁴⁰ Source: Eurostat - Households with broadband access - code: TIN00073

(Luxembourg: 93%) of individuals using the Internet on a regular basis⁴¹ of which 75% (Luxembourg: 86%) used a mobile device to connect to the Internet away from home or work⁴².

The European Commission also views the ICT sector as key to the overall development of Europe, as evidenced by its commitment to ICT research and innovation through the Horizon Europe research funding program, which was launched in 2021, and will run until 2027. The 2021-2022 work program for the Digital, Industry and Space cluster (within Pillar II “Global challenges and European Industrial Competitiveness”) is allocated in total just over €3.5 billion (out of a total of €95 billion for the whole of the program).

3.2 ICT in Luxembourg

ICT is considered a key economic sector in the Grand Duchy of Luxembourg. Within the Coalition Agreement of the Government⁴³, the follow-up of ICT development constitutes an important aspect since they represent great opportunities for the economy. At the same time, it is important to mitigate threats related to their overall adoption. The Government works to make the country one of the leaders of the ICT sector and has adopted strategies in order to accelerate developments in different areas, such as 5G, Artificial Intelligence or High Performance Computing (HPC), while taking into account cybersecurity related challenges. In this context, the “National Cybersecurity Strategy IV”⁴⁴, covering the 2021-2025 period, provides the way forward in order to ensure maximum security for all stakeholders.

This program ensures continuity in the ICT sector’s growth in the country. Indeed, since the last decade, multiple actions have been initiated to foster the positioning of Luxembourg in the ICT landscape. One was the creation of the Ministry for Digitalisation in 2018, which is, for example, responsible for:

- The implementation of the “Digital Lëtzebuerg” action plan and the monitoring of the ICT sector (competence shared with the Minister of the Economy and the Minister for Communications and Media);
- The promotion of the ICT sector (competence shared with the Minister of the Economy);
- The development and implementation of an Internet of Things plan;
- The development of a national strategy in the field of Artificial Intelligence (in consultation with the Minister for Communications and Media and the Minister of the Economy);
- The development of a plan towards overall electronic governance.

Through the national policy pursued in recent years, Luxembourg aims to accompany the transition to a digital economy and society. Indeed, several initiatives have been launched to consolidate and expand the country’s ICT capabilities. For example:

- The launch of “Digital Lëtzebuerg”⁴⁵ in 2014, which is a multidisciplinary government initiative working with public, private and academic players to harness digitalization for positive transformation;
- The “Digital4Education” initiative⁴⁶, unveiled in 2015 by the Minister of Education, Childhood & Youth, which aims at developing digital skills & know-how fit for the 21st century;
- The strategic study on the “Third Industrial Revolution”⁴⁷, presented in November 2016, which proposes concrete actions and tools, including a range of strategic measures and projects, to

⁴¹ Source: Eurostat - Individuals regularly using the internet - code: TIN00091

⁴² Source: Eurostat - Individuals using mobile devices to access the internet on the move - code: TIN00083

⁴³ <https://gouvernement.lu/dam-assets/documents/actualites/2018/12-decembre/Accord-de-coalition-2018-2023.pdf>

⁴⁴ <https://hcpn.gouvernement.lu/fr/publications/strategie-nationale-cybersecurite-4/strategie-nationale-cybersecurite-4.html>

⁴⁵ <https://gouvernement.lu/en/dossiers/2014/digital-letzebuerg.html>

⁴⁶ <https://men.public.lu/dam-assets/catalogue-publications/dossiers-de-presse/2014-2015/digital-4-education.pdf>

⁴⁷ <http://www.troisiemerevolutionindustrielle.lu/etude-strategique/>

prepare the country, its society and its economy to begin the process of the “Third Industrial Revolution”;

- The “National Cybersecurity Strategy IV”⁴⁸, covering the 2021-2025 period, which intends to foster digital development, while ensuring maximum security for all stakeholders. This strategy is articulated around building trust in the digital world, strengthening the resilience and security of digital infrastructures, and building a secure and resilient digital economy;
- The “5G strategy for Luxembourg”⁴⁹, published in November 2018, which sets the objective of the country to develop the infrastructure supporting 5G deployment;
- The document “Artificial Intelligence: a Strategic Vision for Luxembourg”⁵⁰, published in May 2019, which defines three main ambitions for the country: to be among the most advanced digital societies in the world, especially in the European Union (EU); to become a data-driven and sustainable economy; to support human-centric Artificial Intelligence (AI) development;
- The “Data-Driven Innovation Strategy for the Development of a Trusted and Sustainable Economy in Luxembourg”⁵¹, published in May 2019. It provides an approach to accelerate the digitalization-enabled transformation of Luxembourg’s industry across key strategic sectors, boosting productivity across the entire Luxembourg economy;
- The “Strategy for Electronic Governance 2021-2025”⁵², adopted and published in early 2021. The ultimate goal is to lead to a public administration that is as digital and efficient as possible, providing seamless e-government services to citizens. It outlines six key principles in this regard: Once Only (that is, the systematic reuse of citizen data across administrations, under the assumption consent is given to do so), Digital by Default, inclusion and accessibility, openness and transparency, reliability and security, and interoperability and standardization.

All these developments have allowed Luxembourg to establish a competitive ICT sector. The country ranked 10th out of the 28 EU Member States in the “European Commission Digital Economy and Society Index” (DESI) 2020⁵³. The country is particularly strong in terms of connectivity (ranked 3rd), human capital (ranked 8th) and use of the Internet (ranked 12th). Luxembourg is also well placed in the cybersecurity landscape, ranking 13th in the Global Cybersecurity Index 2020⁵⁴, which is a composite index published by the ITU to measure the commitment of countries to cybersecurity in order to raise cybersecurity awareness. The ICT sector was composed of 2 935 companies in 2020 (7.7% of the total number of companies) and represented 4.58% of the total employment of the first quarter of 2021⁵⁵.

⁴⁸ <https://hcpn.gouvernement.lu/fr/publications/strategie-nationale-cybersecurite-4/strategie-nationale-cybersecurite-4.html>

⁴⁹ <https://digital-luxembourg.public.lu/stories/luxembourgs-5g-strategy>

⁵⁰ <https://digital-luxembourg.public.lu/stories/luxembourgs-strategic-vision-ai>

⁵¹ <https://gouvernement.lu/dam-assets/fr/publications/rapport-etude-analyse/minist-economie/The-Data-driven-Innovation-Strategy.pdf>

⁵² <https://ctie.gouvernement.lu/dam-assets/documents/Strategie-gouvernance-electronique-2021-2025-vfin.pdf>

⁵³ <https://ec.europa.eu/digital-single-market/en/scoreboard/luxembourg>

⁵⁴ https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-GCI.01-2021-PDF-E.pdf

⁵⁵ Source: STATEC

3.3 Definition of ICT Subsectors

This section defines the subsectors of ICT used to classify the technical standardization committees that have been identified. Sixteen subsectors are listed, in connection with European and national standardization policy objectives for the ICT sector as well as main potential areas of interest of the national stakeholders.

| SUBSECTOR | DESCRIPTION |
|--|---|
| <p>Cloud Computing</p> | <p>Cloud Computing is an IT paradigm that enables ubiquitous access to shared pools of services and system resources, which can be rapidly provisioned with minimal management effort over the Internet. The current advancement of Cloud Computing is closely related to virtualization. The ability for customers to pay on demand and for the service to scale quickly when required is largely a result of cloud providers being able to regroup resources that could be divided into multiple users.</p> <p>Cloud Computing has enabled considerable new potential and changed the way business processes are addressed. It also permits new kinds of technologies to emerge. For example, it can provide the power necessary to store and process large volumes of data (Big Data analytics), as well as the connectivity and management infrastructure for the Internet of Things.</p> |
| <p>Internet of Things</p> | <p>The Internet of Things (IoT) refers to an emerging paradigm consisting of a continuum of uniquely addressable things communicating with each other to form worldwide dynamic networks. It could be also represented as a network of uniquely identifiable connected devices such as objects, devices, sensors, and everyday items with computing services, which describes a world where anything can be connected and can interact in an intelligent fashion.</p> <p>Many services can be envisioned as a result of many objects playing an active role thanks to their connection to the Internet: real-time traffic updates, building automation and controls, automatic energy management, intelligent shopping applications, vehicle auto-diagnosis, assistance for elderly or disabled people to help them living independently, etc. The IoT is highly interrelated to other ICT areas like Sensor Networks, Machine-to-Machine (M2M) communications, or Automatic identification and data capture techniques (e.g.: RFID).</p> |
| <p>Artificial Intelligence and (Big) Data</p> | <p>Artificial Intelligence (AI) refers to the ability of a computer or a computer-enabled robotic system to process information and produce outcomes in a manner similar to the thought process of humans in learning, decision-making, and solving problems. AI could be understood as a set of techniques aimed at approximating some aspects of human or animal cognition using machines.</p> <p>Big Data can be defined as technologies and techniques that a company can employ to analyze large-scale, complex data for various applications intended to augment performance in various dimensions. It is defined in ISO/IEC 20546:2019 <i>Information technology -- Big data -- Overview and vocabulary</i> as "Data set(s) with characteristics (e.g. volume, velocity, variety, variability, veracity, etc.) that for a particular problem domain at a given point in time cannot be efficiently processed using current/existing/established/traditional technologies and techniques in order to extract value".</p> |
| <p>Software and Programming Languages</p> | <p>A program is a set of instructions that help a machine or computer to function automatically and software is a set of programs combined to execute a specific task. Users can choose specific programming languages and software; they are now ubiquitous and extremely important elements in almost any technology-based systems. This subsector covers guidelines of commonly accepted processes and supporting tools for the engineering of software products or systems.</p> |
| <p>Blockchain</p> | <p>A blockchain is a distributed and shared digital ledger that records all transactions that take place in a nearly-immutable, trust-spreading way. The ledger is decentralized in the sense that the database is replicated across many participants/nodes in the network, who collaborate via a consensus mechanism to create, make evolve and to keep track of records. Blockchains, and more generally distributed ledger technologies, are being considered nowadays to provide decentralized trust in many different fields, such as digital currencies, supply chains, and others.</p> |

| SUBSECTOR | DESCRIPTION |
|-----------------------------------|--|
| Digital Trust | Trust is essential in ICT and it is transversal to the sector in almost any aspect of hardware and software, ranging from consumer devices and equipment to service providers and data centers. Digital Trust in ICT has to deal not only with purely technical problems but also with social aspects and constraints that have to be addressed in a technical manner. Subtopics that are covered in this subsector include information security and cybersecurity, electronic signatures, and electronic archiving, among others. |
| Telecommunications and Networking | Telecommunications refers to the theory and techniques of the transmission of signals by electromagnetic or electronic means. The telecommunications and networking subsector covers any transmission, emission or reception of signs, signals, writing, images, and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems. In the context of the growing need of high-speed connectivity, lower latency, cheaper cost, and network optimization across businesses, this sector demands the use of new concepts, for example, a new generation of mobile communications. |
| Governance of IT | <p>Corporate governance involves a set of relationships between a company's management, its board, its shareholders, and other stakeholders. Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined.</p> <p>The governance of IT is thus a component or a subset of organization governance, which is one key element in improving economic efficiency and growth as well as enhancing investors' confidence. Governance of IT can be defined as the system by which the current and future use of IT is directed and controlled.</p> |
| Education and Digital Skills | This subsector includes accepted methods and guidelines in the field of information technologies for learning, education, and training to support individuals, groups, or organizations, and to enable interoperability and reusability of resources and tools as well as to define a common language for professional digital and ICT competences, skills and knowledge applied across domains. |
| E-Health | E-Health refers to the combined use of electronic communication and information technology in the health sector to enable better health and healthcare. It comprises technologies and guidelines in the field of health informatics, to facilitate capture, interchange, and use of health-related data, information, and knowledge, to support and enable all aspects of an overall healthcare system. |
| Fintech | Fintech, or Financial Technologies, are essentially ICT techniques as applied to the world of finance. It is currently a topic at the top of the agenda in Luxembourg since Fintech are foreseen to rethink the traditional financial sector by exploiting the potential of new technologies. |
| Data Centers and Green ICT | <p>Data centers are structures, or groups of structures, dedicated to the centralized accommodation, interconnection, and operation of information technology and network telecommunications equipment providing data storage, processing and transport services together with all the facilities and infrastructures for power distribution and environmental control, and the necessary levels of resilience and security required to provide the desired service availability⁵⁶.</p> <p>Green ICT focuses on the ability to reduce the environmental impact of IT (hardware and software) throughout its life cycle, for instance addressing waste associated with the use of hardware and software and energy consumption. It also involves the development and use of information systems that reduce the environmental impact (e.g. energy savings) of products and services that require IT.</p> |

⁵⁶ Source: ISO/IEC 30134-1:2016, Information Technology -- Data Centres -- Key performance indicators -- Part 1: Overview and general requirements (developed by ISO/IEC JTC 1/SC 39)

| SUBSECTOR | DESCRIPTION |
|---|--|
| <p>Intelligent Transport Systems</p> | <p>Intelligent Transport Systems (ITS) are transport systems in which advanced information, communication, sensor, and control technologies, including the Internet, are applied to increase safety, sustainability, efficiency, and comfort⁵⁷. This subsector can significantly contribute to cleaner, safer, and more efficient transport systems. The most significant benefits from ITS are: minimizing the impact of traffic on the environment, improving energy efficiency and decreasing dependency on fossil fuels; reducing congestion and optimizing the use of existing infrastructure; encouraging the use of environment-friendly transport modes; improving traffic safety and security; increasing convenience of transport⁵⁸.</p> |
| <p>Smart Cities</p> | <p>A smart city refers to a community infrastructure with enhanced technological performance that is designed, operated, and maintained to contribute to sustainable development and resilience of the community⁵⁹. It has many dimensions and encompasses many economic sectors and technologies. Different dimensions are proposed for a smart city (e.g.: smart economy, smart mobility, smart environment, smart people, smart living, smart governance, etc.). In this frame, we can consider a smart city as a system of systems, meaning it is a complex construction that requires the development of many other technologies (e.g.: Internet of Things, Big Data, Intelligent Transport Systems, etc.).</p> |
| <p>Smart Energy</p> | <p>The Smart Energy subsector primarily focuses on the use of ICT to automatize and optimize the production and distribution of energy, allowing on one hand to better connect the demand and supply between consumers and producers and on the other hand to improve the stability and availability of energy. The primary objective of this subsector is to save energy. It covers in particular the design and operation of smart meters and smart grids.</p> |
| <p>Smart Manufacturing</p> | <p>The main idea behind Smart Manufacturing is to create smart systems using modernization trends in the manufacturing environment. Smart Manufacturing corresponds to the use of smart ICT systems to transform the manufacturing environment, intending to maximize energy efficiency and productivity. Touching upon many technologies, it is an umbrella subsector which includes additive manufacturing (3D printing), robotics and automation systems in the industrial context.</p> |

⁵⁷ International Standard ISO 17465-1:2014, Intelligent transport systems -- Cooperative ITS -- Part 1: Terms and definitions (developed by ISO/TC 204)

⁵⁸ CEN/TC 278 Website (<http://www.itsstandards.eu/>)

⁵⁹ Definition available in ISO/TS 37151:2015, Smart community infrastructures -- Principles and requirements for performance metrics

4 ICT SECTOR STANDARDS WATCH

The objective of this Standards Analysis “ICT Sector Luxembourg” is to facilitate the involvement the national stakeholders in the technical standardization process. To achieve this goal, this chapter regroups, according to the classification proposed above, the different relevant ICT technical standardization committees. The focus is mainly on ISO, IEC, CEN, CENELEC, and ETSI.

4.1 Cloud Computing

| ISO/IEC JTC 1/SC 38 CLOUD COMPUTING AND DISTRIBUTED PLATFORMS | |  | |
|--|---|---|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2009 | Secretariat | ANSI (United States) |
| Chairperson | Mr. Steve Holbrook | Committee Manager | Mr. Bill Ash |
| Scope | Standardization in the areas of Cloud Computing and Distributed Platforms including: <ul style="list-style-type: none"> - Foundational concepts and technologies; - Operational issues; - Interactions among Cloud Computing systems and with other distributed systems. SC 38 serves as the focus, proponent, and systems integration entity on Cloud Computing, Distributed Platforms, and the application of these technologies. SC 38 provides guidance to JTC 1, IEC, ISO and other entities developing standards in these areas. | | |
| Structure | AG 1 Communications committee AG 2 JTC 1/SC 38 Officers group AG 5 Long-term strategy CAG Chair’s Advisory group CG 1 Liaison coordination group for JTC 1/SC 27 CG 2 Liaison coordination group for JTC 1/SC 41 CG 3 Liaison coordination group for JTC 1/SC 42 CG 4 Liaison coordination group for JTC 1/SC 7 CG 5 Liaison coordination group for JTC 1/WG 13 WG 3 Cloud Computing Fundamentals (CCF) WG 5 Data in cloud computing and related technologies | | |
| Webpage | https://www.iso.org/committee/601355.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 22 | Projects | 7 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 28 participating members (including Luxembourg) | | |
| O-Members | 21 observing members | | |
| Luxembourg’s involvement | 13 national delegates | | |

4.2 Internet of Things

| ISO/IEC JTC 1/SC 41 INTERNET OF THINGS AND DIGITAL TWIN | |  | |
|--|--|---|--------------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2017 | Secretariat | KATS (Republic of Korea) |
| Chairperson | Dr. François Coallier | Committee Manager | Ms. Jooran Lee |
| Scope | Standardization in the area of Internet of Things and Digital Twin, including their related technologies: <ul style="list-style-type: none"> - Serve as the focus and proponent for JTC 1's standardization programme on the Internet of Things and Digital Twin, including their related technologies. - Provide guidance to JTC 1, IEC, ISO and other entities developing Internet of Things and Digital Twin related applications. | | |
| Structure | AG 6 JTC 1/SC 41 Advisory Group AG 20 Sectorial Liaison Group (SLG 1) on Industrial sector AG 21 Sectorial Liaison Group (SLG 2) on Utilities AG 22 Liaison Coordination Group (LCG) on IoT Trustworthiness AG 25 Use cases AG 27 Digital Twin Strategy AG 28 JTC 1/SC 42 Liaison Group AG 29 Liaison Coordination Group on Communication and Networking WG 3 IoT Foundational Standards WG 4 IoT Interoperability WG 5 IoT Applications WG 6 Digital Twin WG 7 Maritime, underwater IoT and Digital Twin applications Joint working groups under the responsibility of another committee: JWG 24 IIoT applications in power systems management Managed by TC 57 JWG 17 System interface between industrial facilities and the smart grid Managed by TC 65 JWG 3 IEC Smart Energy Roadmap Managed by SyC Smart Energy | | |
| Webpage | https://www.iec.ch/dyn/www/f?p=103:7:400026989087213:::FSP_ORG_ID,FSP_LANG_ID:20486,25 | | |
| STANDARDIZATION WORK | | | |
| Published standards | 34 | Projects | 20 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 30 participating members (including Luxembourg) | | |
| O-Members | 10 observing members | | |
| Luxembourg's involvement | 16 national delegates | | |

| ISO/IEC JTC 1/SC 31 AUTOMATIC IDENTIFICATION AND DATA CAPTURE TECHNIQUES | | | |
|---|--|-------------------|------------------|
|  | | | |
| GENERAL INFORMATION | | | |
| Creation date | 1996 | Secretariat | ANSI (USA) |
| Chairperson | Mr. Henri Barthel | Committee Manager | Mr. Eddy Merrill |
| Scope | Standardization of data formats, data syntax, data structures, data encoding, and technologies for the process of automatic identification and data capture and of associated devices utilized in inter-industry applications and international business interchanges and for mobile applications. | | |
| Structure | WG 1 Data carrier WG 2 Data and structure WG 4 Radio communications WG 8 Application of AIDC standards | | |
| Webpage | https://www.iso.org/committee/45332.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 128 | Projects | 27 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 24 participating members (including Luxembourg) | | |
| O-Members | 26 observing members | | |
| Luxembourg's involvement | 5 national delegates | | |

| ETSI/TC SMARTBAN SMART BODY AREA NETWORK | | | |
|---|--|----------|---|
|  | | | |
| GENERAL INFORMATION | | | |
| Creation date | N/A | | |
| Chairperson | Mr. John Farserotu | | |
| Scope | <p>The activities of TC SmartBAN include the:</p> <ul style="list-style-type: none"> - standardisation activities in all relevant areas to and preparation of ETSI deliverables for the wireless Body Area Network for personal welfare; - close liaison with ETSI TC ERM, TC M2M, 3GPP and other relevant ETSI TBs; - co-ordination of Health ICT related requirements in order to produce a consistent set of ETSI deliverables and to undertake measures to efficiently continue and stimulate further Health ICT related work within ETSI; - provision of mechanisms for the effective liaison between ETSI TBs and with relevant external organisations such as SDOs, professionals from the areas of BAN applications, end-user representatives, local, national and regional Government Authorities, the European Commission, EU projects and Emergency Authorities/Organisations; - organisation of regular meetings/workshops with appropriate wireless Body Area Network for personal welfare stakeholders; - establishment of external relationships (and joint working groups) where and when ever needed, including co-operation with CONTINUA Alliance, Bluetooth SIG, CEN, CENELEC, ISO, HL7, IHE etc. Formal relationships will be established using the normal processes via the ETSI Secretariat (Partnerships). | | |
| Structure | - | | |
| Webpage | https://www.etsi.org/committee/1413-smartban | | |
| STANDARDIZATION WORK | | | |
| Published standards | 10 | Projects | 7 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 20 members organizations | | |
| Luxembourg's involvement | 1 national ETSI Member | | |

| ETSI/TC Smart M2M SMART MACHINE-TO-MACHINE COMMUNICATIONS | |  | |
|--|--|---|----|
| GENERAL INFORMATION | | | |
| Creation date | 2014 | | |
| Chairperson | Mr. Scarrone Enrico | | |
| Scope | <p>The activities of TC Smart M2M will include the following:</p> <ul style="list-style-type: none"> - Be a centre of expertise in the area of M2M and Internet of Things (IoT) to support M2M services and applications; - Maintain ETSI M2M published specifications; - Produce specifications as needed for regulatory purposes; - Transpose the output of oneM2M to TC M2M. <p>TC Smart M2M will aim at referring to existing work done elsewhere, or encouraging existing groups to fulfil Smart M2M requirements. The TC will undertake necessary work that is not being provided for elsewhere.</p> | | |
| Structure | - | | |
| Webpage | https://www.etsi.org/committee/1414-smartm2m | | |
| STANDARDIZATION WORK | | | |
| Published standards | 96 | Projects | 29 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 101 members organizations | | |
| Luxembourg's involvement | 2 national ETSI Members | | |

| CEN/TC 225 AIDC TECHNOLOGIES | |  | |
|--|---|---|-------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1989 | Secretariat | TSE (Turkey) |
| Chairperson | / | Secretary | Ms Aysegül Ibrism |
| Scope | Standardization of data carriers for automatic identification and data capture, of the data element architecture therefore, of the necessary test specifications and of technical features for the harmonization of cross-sector applications. Establishment of an appropriate system of registration authorities, and of means to ensure the necessary maintenance of standards. | | |
| Structure | WG 4 Automatic ID applications | | |
| Webpage | https://standards.cen.eu/dyn/www/f?p=204:7:0::::FSP_ORG_ID:6206&cs=1E1227AECC001196A7556B8DBCDF0A1C | | |
| STANDARDIZATION WORK | | | |
| Published standards | 29 | Projects | 0 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 34 members of CEN/CENELEC | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

4.3 Artificial Intelligence and (Big) Data

| ISO/IEC JTC 1/SC 42 ARTIFICIAL INTELLIGENCE | |  | |
|--|---|---|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2017 | Secretariat | ANSI (United States) |
| Chairperson | Mr. Wael William Diab | Committee Manager | Ms. Heather Benko |
| Scope | Standardization in the area of Artificial Intelligence <ul style="list-style-type: none"> - Serve as the focus and proponent for JTC 1's standardization program on Artificial Intelligence; - Provide guidance to JTC 1, IEC, and ISO committees developing Artificial Intelligence applications. | | |
| Structure | AG 2 AI Systems Engineering AHG 1 Dissemination and outreach AHG 2 Liaison with SC 38 AHG 4 Liaison with SC 27 AHG 5 AI standardization landscape and roadmap JWG 1 Joint Working Group ISO/IEC JTC1/SC 42 - ISO/IEC JTC1/SC 40: Governance implications of AI WG 1 Foundational standards WG 2 Data WG 3 Trustworthiness WG 4 Use cases and applications WG 5 Computational approaches and computational characteristics of AI systems | | |
| Webpage | https://www.iso.org/committee/6794475.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 8 | Projects | 22 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 33 participating members (including Luxembourg) | | |
| O-Members | 17 observing members | | |
| Luxembourg's involvement | 29 national delegates | | |

| CEN/CLC/JTC 21 ARTIFICIAL INTELLIGENCE | |  | |
|---|---|---|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2021 | Secretariat | DS (Denmark) |
| Chairperson | Mr. Sebastian Hallensleben | Secretary | Mr. Kim Skov Hilding |
| Scope | The JTC shall produce standardization deliverables in the field of Artificial Intelligence (AI) and related use of data, as well as provide guidance to other technical committees concerned with Artificial Intelligence. The JTC shall also consider the adoption of relevant international standards and standards from other organisations, like ISO/IEC JTC 1 and its subcommittees, such as SC 42 Artificial intelligence. The JTC shall produce standardization deliverables to address European market and societal needs and to underpin EU legislation, policies, principles, and values. | | |
| Structure | WG 1 Strategic Advisory Group (SAG) AHG 1 Augmented Goal Specification AHG 2 AI Conformity Assessment AHG 3 Green and Sustainable AI AHG 4 Speech Recognition AHG 5 Data Governance & Quality for AI | | |

| | | | |
|---|---|----------|---|
| Webpage | https://standards.cencenelec.eu/dyn/www/f?p=205:7:0::::FSP_ORG_ID:2916257&cs=11D701467243B7C63DEF4702C86E0138A | | |
| STANDARDIZATION WORK | | | |
| Published standards | 0 | Projects | 0 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 34 members of CEN/CENELEC | | |
| Luxembourg's involvement | 5 national delegates | | |

| | | | |
|--|---|-------------------|---|
| ISO/IEC JTC 1/SC 32 DATA MANAGEMENT AND INTERCHANGE | | |  |
| GENERAL INFORMATION | | | |
| Creation date | 1997 | Secretariat | ANSI (United States) |
| Chairperson | Mr. Karl Schendel | Committee Manager | Mr. Bill Ash |
| Scope | <p>Standards for data management within and among local and distributed information systems environments. SC32 provides enabling technologies to promote harmonization of data management facilities across sector-specific areas. Specifically, SC32 standards include:</p> <ul style="list-style-type: none"> - Reference models and frameworks for the coordination of existing and emerging standards; - Definition of data domains, data types and data structures, and their associated semantics; - Languages, services and protocols for persistent storage, concurrent access, concurrent update and interchange of data; - Methods, languages, services, and protocols to structure, organize, and register metadata and other information resources associated with sharing and interoperability, including electronic commerce. | | |
| Structure | <p>WG 1 eBusiness WG 2 MetaData WG 3 Database language WG 6 Data usage</p> | | |
| Webpage | https://www.iso.org/committee/45342.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 95 | Projects | 46 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 18 participating members | | |
| O-Members | 24 observing members (including Luxembourg) | | |
| Luxembourg's involvement | 1 national delegate | | |

| | | | |
|--|---|-------------------|---|
| ISO/IEC JTC 1/SC 34 DOCUMENT DESCRIPTION AND PROCESSING LANGUAGES | | |  |
| GENERAL INFORMATION | | | |
| Creation date | 1998 | Secretariat | JISC(Japan) |
| Chairperson | Mr. Francis Cave | Committee Manager | Ms. Toshiko Kimura |
| Scope | <p>Standardization in the field of document structures, languages and related facilities for the description and processing of compound and hypermedia documents, including:</p> <ul style="list-style-type: none"> - languages for describing document logical structures and their support facilities - languages for describing document-like objects in web environments facilities - document processing architecture and formatting for logical documents facilities - languages for describing interactive documents facilities - multilingual font information interchange and related services facilities - final-form document architecture and page information interchange facilities | | |

| | - hypermedia document structuring language and application resources facilities - API's for document processing |
|--|---|
| Structure | JWG 7 Joint JTC 1/SC 34 – TC 46/SC 4 – IEC/TC 100/TA 10 WG: EPUB WG 4 Office Open XML WG 6 OpenDocument Format WG 9 Document semantics support |
| Webpage | https://www.iso.org/committee/45374.html |
| STANDARDIZATION WORK | |
| Published standards | 79 |
| Projects | 1 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | |
| P-Members | 17 participating members |
| O-Members | 34 observing members |
| Luxembourg's involvement | NO (no registered delegate) |

ISO/IEC JTC 1/SC 24 COMPUTER GRAPHICS, IMAGE PROCESSING AND ENVIRONMENTAL DATA REPRESENTATION



| GENERAL INFORMATION | | | |
|--|--|-------------------|----------------------|
| Creation date | 1987 | Secretariat | BSI (United Kingdom) |
| Chairperson | Prof. Myeong Won Lee | Committee Manager | Ms. Jean Stride |
| Scope | <p>The current area of work for JTC 1/SC 24 consists of: Standardization of interfaces for information technology based applications relating to:</p> <ul style="list-style-type: none"> - computer graphics and virtual reality, - image processing, - environmental data representation, - support for Mixed and Augmented Reality (MAR), and - interaction with, and visual presentation of, information. <p>Included are the following related areas: Modeling and simulation, related reference models; virtual reality with accompanying augmented reality/augmented virtuality aspects, related reference models; application program interfaces; functional specifications; representation models; interchange formats, encodings and their specifications, including metafiles; device interfaces; testing methods; registration procedures; presentation and support for creation of multimedia, hypermedia, and mixed reality documents.</p> <p>Excluded: Character and image coding; coding of multimedia, hypermedia, and mixed reality document interchange formats; JTC 1 work in user system interfaces and document presentation; ISO TC 207 work on ISO 14000 environment management, ISO/TC 211 work on geographic information and geomatics; and software environments as described by JTC 1/SC 22.</p> | | |
| Structure | <p>CAG Chair's Advisory Group WG 6 Computer Graphics and Virtual Reality WG 7 Image processing and interchange WG 8 Environmental representation WG 9 Augmented reality continuum concepts and reference model WG 10 Representation and visualization of information for systems integration WG 11 Health, safety, security and usability of Augmented & Virtual Reality (AR/VR)</p> <p>Joint working groups under the responsibility of another committee: JWG 16 Joint ISO/TC 184/SC 4 - ISO/IEC JTC 1/SC 24 - ISO/TC 171/SC 2 WG: Formats for visualization and other derived forms of product data</p> | | |
| Webpage | https://www.iso.org/committee/45252.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 85 | Projects | 10 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 12 participating members | | |
| O-Members | 24 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

| ISO/IEC JTC 1/SC 29 CODING OF AUDIO, PICTURE, MULTIMEDIA AND HYPERMEDIA INFORMATION | |  | |
|--|--|---|------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1991 | Secretariat | JISC(Japan) |
| Chairperson | Dr. Gary J. Sullivan | Committee Manager | Ms. Mayumi Koike |
| Scope | Standardization in the field of <ul style="list-style-type: none"> - Efficient coding of digital representations of images, audio and moving pictures, including <ul style="list-style-type: none"> o Conventional (natural, computer-generated and immersive) images, moving pictures and audio o Invisible light and other sensory (such as medical and satellite) images o Static and dynamic graphic objects - Efficient coding of other digital information, including <ul style="list-style-type: none"> o Multimedia, environment and user related metadata o Sensor and actuator information related to audiovisual information o Other digital data in agreement with the relevant committee, such as genomics - Digital information support, including <ul style="list-style-type: none"> o Synchronization, presentation, storage and transport of single or combinations of media o Media security and privacy management o Quality of Experience evaluation and system performance metrics | | |
| Structure | AG 1 Advisory Group on Management AG 2 MPEG Technical coordination AG 3 MPEG Liaison and communication AG 4 JPEG and MPEG Collaboration AG 5 MPEG Visual quality assessment WG 1 Coding of still pictures WG 2 MPEG Technical requirements WG 3 MPEG Systems WG 4 MPEG Video coding WG 5 MPEG Joint Video Coding Team(s) with ITU-T SG 16 WG 6 MPEG Audio coding WG 7 MPEG 3D Graphics coding WG 8 MPEG Genomic coding | | |
| Webpage | https://www.iso.org/committee/45316.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 590 | Projects | 105 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 29 participating members | | |
| O-Members | 16 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

| ISO/IEC JTC 1/SC 23 DIGITALLY RECORDED MEDIA FOR INFORMATION INTERCHANGE AND STORAGE | | | |
|---|---|-------------------|--------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1987 | Secretariat | JISC(Japan) |
| Chairperson | Mr. Shoji Taniguchi | Committee Manager | Ms. Toshiko Kimura |
| Scope | Standardization in the field of removable digital storage media utilizing optical, holographic and magnetic recording technologies, and flash memory technologies for digital information interchange, including; <ul style="list-style-type: none"> - algorithms for the lossless compression of data - volume and file structure - methods for determining the life expectancy of digital storage media - methods for error monitoring of digital storage media | | |
| Structure | - | | |
| Webpage | https://www.iso.org/committee/45240.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 132 | Projects | 2 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 6 participating members | | |
| O-Members | 22 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

| ISO/IEC JTC 1/SC 2 CODED CHARACTER SETS | | | |
|---|---|-------------------|--------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1987 | Secretariat | JISC (Japan) |
| Chairperson | Mr. Dr. Shuichi Tashiro | Committee Manager | Ms. Ayuko Nagasawa |
| Scope | Standardization of graphic character sets and their characteristics, including string ordering, associated control functions, their coded representation for information interchange and code extension techniques. Excluded: audio and picture coding. | | |
| Structure | WG 2 Universal coded character set | | |
| Webpage | https://www.iso.org/committee/45050.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 49 | Projects | 2 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 24 participating members | | |
| O-Members | 25 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

4.4 Software and Programming Languages

| ISO/IEC JTC 1/SC 7 SOFTWARE AND SYSTEMS ENGINEERING | |  | |
|--|---|---|----------------|
| GENERAL INFORMATION | | | |
| Creation date | 1987 | Secretariat | BIS (India) |
| Chairperson | Dr. Sundeep Oberoi | Committee Manager | Ms. Reena Garg |
| Scope | Standardization of processes, supporting tools and supporting technologies for the engineering of software products and systems. Note: The processes, tools and technologies are within the scope of JTC1 terms of references and exclude specific tools and technologies that have been assigned by JTC1 to other of its SC's. | | |
| Structure | AG 1 Chair's Advisory Group AG 2 Business planning group AG 3 Communications and outreach AG 4 Standards management AG 5 Architecture and future watch AHG 3 System resiliency AHG 4 Machine Readable Standards (MRS) AHG 6 Digital engineering WG 2 System software documentation WG 4 Tools and environment WG 6 Software Product and System Quality WG 7 Life cycle management WG 10 Process assessment WG 19 Techniques for Specifying IT Systems WG 20 Software and systems bodies of knowledge and professionalization WG 21 Information technology asset management WG 22 Vocabulary validation WG 24 Systems and software standards for Very Small Entities WG 26 Software testing WG 29 Agile and DevOps WG 42 Architecture Joint working groups under the responsibility of another committee: JWG 28 Joint ISO/TC 159/SC 4 - ISO/IEC JTC 1/SC 7 WG: Common industry formats for usability related information | | |
| Webpage | https://www.iso.org/committee/45086.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 200 | Projects | 34 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 36 participating members (including Luxembourg) | | |
| O-Members | 23 observing members | | |
| Luxembourg's involvement | 10 national delegates | | |

| ISO/IEC JTC 1/SC 22 PROGRAMMING LANGUAGES, THEIR ENVIRONMENTS AND SYSTEM SOFTWARE INTERFACES | | |  |
|--|---|-------------------|---|
| GENERAL INFORMATION | | | |
| Creation date | 1987 | Secretariat | ANSI (United States) |
| Chairperson | Mr. David Keaton | Committee Manager | Mr. Bill Ash |
| Scope | JTC1/SC 22 is the international standardization subcommittee for programming languages, their environments and system software interfaces. SC 22 is oftentimes called the “portability subcommittee”. | | |
| Structure | WG 4 COBOL WG 5 Fortran WG 9 Ada WG 14 C WG 17 Prolog WG 21 C++ WG 23 Programming Language Vulnerabilities WG 24 Linux Standard Base (LSB) | | |
| Webpage | https://www.iso.org/committee/45202.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 107 | Projects | 32 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 24 participating members | | |
| O-Members | 21 observing members | | |
| Luxembourg’s involvement | NO (no registered delegate) | | |

4.5 Blockchain

| ISO/TC 307 BLOCKCHAIN AND DISTRIBUTED LEDGER TECHNOLOGIES | |  | |
|--|--|---|------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2016 | Secretariat | SA (Australia) |
| Chairperson | Mr. Craig Dunn | Committee Manager | Ms. Emily Dawson |
| Scope | Standardization of blockchain technologies and distributed ledger technologies. | | |
| Structure | AG 1 SBP Review Advisory Group AG 2 Liaison Advisory Group AHG 2 Guidance for Auditing DLT Systems CAG 1 Convenors coordination group SG 7 Interoperability of blockchain and distributed ledger technology systems WG 1 Foundations WG 2 Security, privacy and identity WG 3 Smart contracts and their application JWG 4 Joint ISO/TC 307 - ISO/IEC JTC 1/SC 27 WG: Security, privacy and identity for Blockchain and DLT WG 5 Governance WG 6 Use cases <u>Joint working groups under the responsibility of another committee:</u> ISO/TC 46/SC 11/JWG 1 Joint ISO/TC 46/SC 11 - ISO/TC 307 WG: Blockchain | | |
| Webpage | https://www.iso.org/committee/6266604.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 4 | Projects | 11 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 43 participating members (including Luxembourg) | | |
| O-Members | 18 observing members | | |
| Luxembourg's involvement | 17 national delegates | | |

| CEN/CLC/JTC 19 BLOCKCHAIN AND DISTRIBUTED LEDGER TECHNOLOGIES | |  | |
|--|---|---|--------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2019 | Secretariat | UNI (Italy) |
| Chairperson | Mr. Andrea Caccia | Secretary | Ms. Carla Sirocchi |
| Scope | To prepare, develop and/or adopt standards for Blockchain and Distributed Ledger technologies covering the following aspects: - Organizational frameworks and methodologies, including IT management systems; - Processes and products evaluation schemes; - Blockchain and distributed ledger guidelines. The JTC will focus on European requirements, especially in the legislative and policy context, and will proceed with the identification and possible adoption of standards or other relevant documentation already available or under development in other SDOs or regulatory bodies, which could support the EU Digital Single Market and/or EC Directives/Regulations. Special attention will be paid to ISO/TC 307 standards. If required these standards will be augmented by CEN TRs and TSs. | | |
| Structure | CEN/CLC/JTC 21/WG 1 | Decentralised identity management | |

| | | | |
|---|---|----------|---|
| Webpage | https://standards.cencenelec.eu/dyn/www/f?p=205:29:0::::FSP_ORG_ID,FSP_LANG_ID:2702172,25&cs=16E2ADC46E2536C73D74C407A6FE4B3FD#1 | | |
| STANDARDIZATION WORK | | | |
| Published standards | 0 | Projects | 0 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 34 members of CEN/CENELEC | | |
| Luxembourg's involvement | 2 national delegates | | |

4.6 Digital Trust

| ISO/IEC JTC 1/SC 27 INFORMATION SECURITY, CYBERSECURITY AND PRIVACY PROTECTION | |  | |
|---|---|---|-------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1989 | Secretariat | DIN (Germany) |
| Chairperson | Mr. Dr. Andreas Wolf | Committee Manager | Mr. Sobhi Mahmoud |
| Scope | <p>The development of standards for the protection of information and ICT. This includes generic methods, techniques and guidelines to address both security and privacy aspects, such as:</p> <ul style="list-style-type: none"> - Security requirements capture methodology; - Management of information and ICT security; in particular, information security management systems, security processes, and security controls and services; - Cryptographic and other security mechanisms, including but not limited to mechanisms for protecting the accountability, availability, integrity and confidentiality of information; - Security management support documentation including terminology, guidelines as well as procedures for the registration of security components; - Security aspects of identity management, biometrics and privacy; - Conformance assessment, accreditation and auditing requirements in the area of information security management systems; - Security evaluation criteria and methodology. <p>SC 27 engages in active liaison and collaboration with appropriate bodies to ensure the proper development and application of SC 27 standards and technical reports in relevant areas.</p> | | |
| Structure | <p>AG 1 Management Advisory Group AG 2 Trustworthiness AG 3 Concepts and Terminology AG 4 Data security AG 5 Strategy AG 6 Operations AG 7 Communication and outreach (AG-CO) CAG Chair's Advisory Group WG 1 Information security management systems WG 2 Cryptography and security mechanisms WG 3 Security evaluation, testing and specification WG 4 Security controls and services WG 5 Identity management and privacy technologies</p> <p>Joint working groups under the responsibility of another committee: ISO/TC 307/JWG 4 Joint ISO/TC 307 - ISO/IEC JTC 1/SC 27 WG: Security, privacy and identity for Blockchain and DLT</p> | | |
| Webpage | https://www.iso.org/committee/45306.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 212 | Projects | 78 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 48 participating members (including Luxembourg) | | |
| O-Members | 38 observing members | | |
| Luxembourg's involvement | 30 national delegates | | |
| | <p><u>Note:</u> National participation in ISO/IEC JTC 1/SC 27 is done via ILNAS' National Standardization Commission "Cybersecurity", which centralizes and coordinates Luxembourg experts' work in ISO/IEC JTC 1/SC 27, ISO/IEC JTC 1/WG 13, CEN/CLC/JTC 13, and ISO/PC 317.</p> | | |

| ISO/IEC JTC 1/WG 13 TRUSTWORTHINESS | |  | |
|--|---|---|------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2019 | Secretariat | DIN (Germany) |
| Convenor | Mr. Johann Amsenga | Secretary | Mr. Jan Branzell |
| Scope | <p>Terms of reference:</p> <ul style="list-style-type: none"> - Complete, improve and maintain the inventory including the heat map as a JTC 1 standing document reflecting the landscape of trustworthiness in JTC 1, other ISO and IEC Committees, and other SDOs. - Complete terminology and description of characteristics and determine what type of document should be created. - Develop horizontal deliverables such as frameworks, taxonomy and ontology for ICT trustworthiness for guiding trustworthiness efforts throughout JTC 1 and upon which other deliverables can be developed (beginning with ISO/IEC TS 24462, Ontology for ICT Trustworthiness Assessment). <p>Excluded are domain specific trustworthiness deliverables, such as those within the scope of JTC 1 SCs.</p> | | |
| STANDARDIZATION WORK | | | |
| Published standards | 0 | Projects | 3 |
| NATIONAL INVOLVEMENT | | | |
| Luxembourg's involvement | <p>6 national delegates</p> <p><u>Note:</u> National participation in ISO/IEC JTC 1/WG 13 is done via ILNAS' National Standardization Commission "Cybersecurity", which centralizes and coordinates Luxembourg experts' work in ISO/IEC JTC 1/SC 27, ISO/IEC JTC 1/WG 13, CEN/CLC/JTC 13, and ISO/PC 317.</p> | | |

| CEN/CLC/JTC 13 CYBERSECURITY AND DATA PROTECTION | |  | |
|---|---|---|--------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2017 | Secretariat | DIN (Germany) |
| Chairperson | Mr. Walter Fumy | Secretary | Mr. Martin Uhlherr |
| Scope | <p>Development of standards for cybersecurity and data protection covering all aspects of the evolving information society including but not limited to:</p> <ul style="list-style-type: none"> - Management systems, frameworks, methodologies; - Data protection and privacy; - Services and products evaluation standards suitable for security assessment for large companies and small and medium enterprises (SMEs); - Competence requirements for cybersecurity and data protection; - Security requirements, services, techniques and guidelines for ICT systems, services, networks and devices, including smart objects and distributed computing devices. <p>Included in the scope is the identification and possible adoption of documents already published or under development by ISO/IEC JTC 1 and other SDOs and international bodies such as ISO, IEC, ITU-T, and industrial fora. Where not being developed by other SDOs, the development of cybersecurity and data protection CEN/CENELEC publications for safeguarding information such as organizational frameworks, management systems, techniques, guidelines, and products and services, including those in support of the EU Digital Single Market.</p> | | |
| Structure | <p>WG 1 Chairman advisory group</p> <p>WG 2 Management systems and controls sets</p> <p>WG 3 Security evaluation and assessment</p> <p>WG 4 Cybersecurity services</p> <p>WG 5 Data Protection, Privacy and Identity Management</p> <p>WG 6 Product security</p> | | |

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|---|--|----------|----|
| Webpage | https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP_ORG_ID:2307986&cs=1E7D8757573B5975ED287A29293A34D6B | | |
| STANDARDIZATION WORK | | | |
| Published standards | 23 | Projects | 16 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 34 members of CEN/CENELEC | | |
| | 5 national delegates | | |
| Luxembourg's involvement | <p><u>Note:</u> National participation in CEN/CLC/JTC 13 is done via ILNAS' National Standardization Commission "Cybersecurity", which centralizes and coordinates Luxembourg experts' work in ISO/IEC JTC 1/SC 27, ISO/IEC JTC 1/WG 13, CEN/CLC/JTC 13, and ISO/PC 317.</p> | | |

| | | | |
|--|--|-------------------|---|
| ISO/PC 317 CONSUMER PROTECTION: PRIVACY BY DESIGN FOR CONSUMER GOODS AND SERVICES | | |  |
| GENERAL INFORMATION | | | |
| Creation date | 2018 | Secretariat | BSI (United Kingdom) |
| Chairperson | Mr. Jan Schallaboeck | Committee Manager | Ms. Jean Stride |
| Scope | Standardization in the field of consumer protection: privacy by design for consumer goods and services. | | |
| Structure | TG 1 Communication group WG 1 Privacy by design | | |
| Webpage | https://www.iso.org/committee/6935430.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 0 | Projects | 1 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 16 participating members | | |
| O-Members | 25 observing members (including Luxembourg) | | |
| | 1 national delegates | | |
| Luxembourg's involvement | <p><u>Note:</u> National participation in ISO/PC 317 is done via ILNAS' National Standardization Commission "Cybersecurity", which centralizes and coordinates Luxembourg experts' work in ISO/IEC JTC 1/SC 27, ISO/IEC JTC 1/WG 13, CEN/CLC/JTC 13, and ISO/PC 317.</p> | | |

| | | | |
|---|--|-------------------|---|
| ISO/IEC JTC 1/SC 17 CARDS AND SECURITY DEVICES FOR PERSONAL IDENTIFICATION | | |  |
| GENERAL INFORMATION | | | |
| Creation date | 1987 | Secretariat | BSI (United Kingdom) |
| Chairperson | Mr. Dr. Peter Waggett | Committee Manager | Ms. Jean Stride |
| Scope | <p>The current area of work for JTC 1/SC 17 consists of:</p> <ul style="list-style-type: none"> - Identification and related documents, - Cards, - Security devices and tokens <p>and interface associated with their use in inter-industry applications and international interchange.</p> | | |
| Structure | <p>AG 1 Registration Management Group (RMG) CAG 1 Chairman advisory group WG 1 Physical characteristics and test methods for ID-cards WG 3 Traveller identification WG 4 Generic interfaces and protocols for security devices WG 8 Integrated circuit cards without contacts</p> | | |

| | | | |
|---|---|----------|----|
| | WG 10 Motor vehicle driver licence and related documents WG 11 Application of biometrics to cards and personal identification WG 12 Drone license and drone identity module | | |
| Webpage | https://www.iso.org/committee/45144.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 113 | Projects | 23 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 32 participating members (including Luxembourg) | | |
| O-Members | 23 observing members | | |
| Luxembourg's involvement | 3 national delegates | | |

| | | | |
|---|--|---|----|
| ETSI/TC CYBER CYBER SECURITY | |  | |
| GENERAL INFORMATION | | | |
| Creation date | 2014 | | |
| Chairperson | Mr. Alex Leadbeater | | |
| Scope | <p>The activities of ETSI TC CYBER include the following broad areas:</p> <ul style="list-style-type: none"> - Cyber Security - Security of infrastructures, devices, services and protocols - Security advice, guidance and operational security requirements to users, manufacturers and network and infrastructure operators - Security tools and techniques - Provision of security mechanisms to protect privacy - Creation of security specifications and alignment with work done in other TCs. | | |
| Structure | WG QSC Quantum-Safe Cryptography | | |
| Webpage | https://www.etsi.org/committee/1393-cyber | | |
| STANDARDIZATION WORK | | | |
| Published standards | 65 | Projects | 24 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 248 members organizations | | |
| Luxembourg's involvement | 5 national ETSI Members | | |

| | | | |
|--|--|---|--|
| ETSI/TC ESI ELECTRONIC SIGNATURES AND INFRASTRUCTURES | |  | |
| GENERAL INFORMATION | | | |
| Creation date | N/A | | |
| Chairperson | Mr. Riccardo Genghini | | |
| Scope | <p>TC ESI is responsible for standardization within ETSI supporting current and upcoming technology for Electronic Signatures and related services (e.g. registered electronic delivery, electronic seals) as well as trust service infrastructures supporting such services. This is aimed at supporting regulatory requirements such as the eIDAS Regulation as well as general commercial requirements.</p> <p>TC ESI is the lead body within ETSI in relation to electronic signatures, related services and trust service Infrastructures, to protect electronic transactions and ensure trust and confidence with business partners, including the preparation of reports and other necessary activities, by:</p> <ul style="list-style-type: none"> - Developing generic standards, guides and reports - Liaising with other ETSI bodies - Liaising with bodies external to ETSI - Establishing a continuing work plan. | | |
| Structure | - | | |
| Webpage | https://www.etsi.org/committee/1399-esi | | |

| STANDARDIZATION WORK | | | |
|--|--------------------------|----------|----|
| Published standards | 212 | Projects | 30 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 85 members organizations | | |
| Luxembourg's involvement | 3 national ETSI Member | | |

ISO/TC 46/SC 11 ARCHIVES/RECORDS MANAGEMENT



| GENERAL INFORMATION | | | |
|---------------------|--|-------------------|----------------|
| Creation date | 1998 | Secretariat | SA (Australia) |
| Chairperson | Ms. Judith Ellis | Committee Manager | Mr. Saim Riaz |
| Description | Standardization of principles for the creation and management of documents, records and archives as evidence of transactions and covering all media including digital multimedia and paper. | | |
| Structure | AG 1 Strategic decisions AHG 2 Disposition AHG 6 White paper JWG 1 Joint ISO/TC 46/SC 11 - ISO/TC 307 WG: Blockchain WG 1 Metadata WG 8 Management systems for records WG 17 Records in the cloud WG 18 ISO 13008:2012 Revision WG 19 Risk assessment for records processes and systems WG 20 Records management capability assessment model WG 21 Disposition WG 22 Records management in structured data environments | | |
| Webpage | https://www.iso.org/committee/48856.html | | |

| STANDARDIZATION WORK | | | |
|--|---|----------|---|
| Published standards | 19 | Projects | 6 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 34 participating members (including Luxembourg) | | |
| O-Members | 14 observing members | | |
| Luxembourg's involvement | 8 national delegates | | |

CEN/TC 224 PERSONAL IDENTIFICATION AND RELATED PERSONAL DEVICES WITH SECURE ELEMENT, SYSTEMS, OPERATIONS AND PRIVACY IN A MULTI SECTORIAL ENVIRONMENT



| GENERAL INFORMATION | | | |
|---------------------|--|-------------|-------------------|
| Creation date | 1989 | Secretariat | AFNOR (France) |
| Chairperson | Mr. Olivier Senot | Secretary | Mrs. Fanny Lannoy |
| Scope | The development of standards for strengthening the interoperability and security of personal identification and its related personal devices, systems, operations and privacy in a multi sectorial environment. It covers: <ul style="list-style-type: none"> - Operations such as applications and services like electronic identification, electronic signature, payment and charging, access and border control; - Personal devices with secure elements independently of their form factor, such as cards, mobile devices, and their related interfaces; | | |

| | | | |
|---|--|--|---|
| | <ul style="list-style-type: none"> - Security services including authentication, confidentiality, integrity, biometrics, protection of personal and sensitive data; - System components such as accepting devices, servers, cryptographic modules. <p>CEN/TC 224 multi-sectorial environment involves sectors such as Government/Citizen, Transport, Banking, e-Health, as well as Consumers and providers from the supply side such as card manufacturers, security technology, conformity assessment body, software manufacturers.</p> | | |
| Structure | WG 11 | Transport applications | |
| | WG 17 | Protection Profiles in the context of SSCD | |
| | WG 18 | Biometrics | |
| | WG 19 | Breeder Documents | |
| Webpage | http://standards.cen.eu/dyn/www/f?p=204:7:0::::FSP_LANG_ID,FSP_ORG_ID:25,6205&cs=1A98C573151AB3D7A22712120D94364C1#1 | | |
| STANDARDIZATION WORK | | | |
| Published standards | 63 | Projects | 5 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 34 members of CEN/CENELEC | | |
| Luxembourg's involvement | 2 national delegates | | |

CEN/TC 468 MANAGEMENT AND PRESERVATION OF DIGITAL CONTENT



| | | | |
|---|---|-------------|------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2020 | Secretariat | AFNOR (France) |
| Chairperson | Ms. Séverine Denys | Secretary | Ms. Fanny Lannoy |
| Scope | <p>Standardization of processes in the field of long-term digital preservation of content, covering all functional, operative and technical aspects. This includes: the quality control and the maintenance of integrity; the implementation, inspection and quality procedures for the preservation of digital contents; the maintenance of the quality and the integrity of the content over its life cycle of the information exchange between systems; procedures and processes supporting legal admissibility and/or integrity and security; retrieval and accessibility of content within the GDPR framework. Excluded is: standardization of electronic signature (CEN/TC 224 and ETSI TC ESI); Sectoral applications already covered by existing technical bodies: preservation of digital cinema movie (CEN/TC 457), long term archiving and retrieval of digital technical product data (ASD-STAN/D 7/WG 1 aerospace LOTAR) cybersecurity and data protection (CEN-CLC/JTC 13).</p> | | |
| Structure | - | | |
| Webpage | https://standards.cencenelec.eu/dyn/www/f?p=205:7:0::::FSP_ORG_ID:2878378&cs=16FD02B1BC3FC316038CE4FFC2E0C3888 | | |
| STANDARDIZATION WORK | | | |
| Published standards | 0 | Projects | 0 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 34 members of CEN/CENELEC | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

| ETSI/TC SCP SMART CARD PLATFORM | |  | |
|--|--|---|----|
| GENERAL INFORMATION | | | |
| Creation date | N/A | | |
| Chairperson | Mr. Vedder Klaus | | |
| Scope | <p>The main responsibilities of TC SCP are: development and maintenance of specifications for Secure Elements in a multi-application capable environment, the integration into such an environment, as well as the secure provisioning of services making use of such Secure Elements.</p> <p>The specifications under the responsibility of TC SCP shall be generic and application-agnostic, and the work of TC SCP shall cover at least the following:</p> <ul style="list-style-type: none"> - development and maintenance of application independent specifications for the Secure Element/Terminal Equipment interface of telecommunication systems; - development and maintenance of application independent Secure Element specifications for general telecommunication purposes; - development and maintenance of application independent Secure Element specifications for Machine-to-Machine/IoT communication purposes; - development and maintenance of Secure Element specifications employing advanced security methods for telecommunications applications such as financial transactions over Telecommunication Networks; - development and maintenance of interface, procedures and protocol specifications between the Secure Element and entities (remote or local) used in the management of that Secure Element. This includes interfaces, procedures and protocol specifications used between such entities for the secure provisioning and operation of services making use of that Secure Element; - maintenance of mobile commerce specifications of the former EP M-COMM. | | |
| Structure | WG REQ | Requirements Working Group | |
| | WG TEC | Technical Working Group | |
| | WG TEST | Working Group "TEST" | |
| Webpage | https://www.etsi.org/committee/1411-scp | | |
| STANDARDIZATION WORK | | | |
| Published standards | 86 | Projects | 10 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 84 members organizations | | |
| Luxembourg's involvement | NO national ETSI Members | | |

4.7 Telecommunications and Networking

| ISO/IEC JTC 1/SC 6 TELECOMMUNICATIONS AND INFORMATION EXCHANGE BETWEEN SYSTEMS | |  | |
|---|---|---|-----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1988 | Secretariat | KATS (Korea Republic) |
| Chairperson | Dr. Hyun Kook Kahng | Committee Manager | Mr. Jungyup OH |
| Scope | Standardization in the field of telecommunications dealing with the exchange of information between open systems, including system functions, procedures, parameters as well as the conditions for their use. This standardization encompasses protocols and services of lower layers including physical, data link, network, and transport as well as those of upper layers including but not limited to Directory and ASN.1: MFAN, NFC, PLC, Future Networks and OID. | | |
| Structure | AG 1 Wearable devices AG 2 Concepts and terminology AHG 1 Networking for blockchain (AHG-NB) AHG 2 Trustworthiness Working group WG 1 Physical and data link layers WG 7 Network, transport and future network WG 10 Directory, ASN.1 and Registration | | |
| Webpage | https://www.iso.org/committee/45072.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 367 | Projects | 46 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 19 participating members | | |
| O-Members | 34 observing members (including Luxembourg) | | |
| Luxembourg's involvement | 1 national delegate | | |

| ISO/IEC JTC 1/SC 25 INTERCONNECTION OF INFORMATION TECHNOLOGY EQUIPMENT | |  | |
|--|--|---|-----------------|
| GENERAL INFORMATION | | | |
| Creation date | 1990 | Secretariat | DIN (Germany) |
| Chairperson | Mr. Rainer Schmidt | Committee Manager | Mr. Marco Peter |
| Scope | Standardization of microprocessor systems, interfaces, protocols, architectures and associated interconnecting media for information technology equipment and networks to support embedded and distributed computing environments, storage systems and other input/output components. Standards for home and building electronic systems in residential and commercial environments to support interworking devices (IoT-related) and applications such as energy management, environmental control, lighting, and security. Cabling system standards for information and communication technology (ICT), in all types of residential, commercial and industrial environments for the design, planning and installation, test procedures, automated infrastructure management systems and remote powering. (NOTE: JTC 1/SC 25 standards reference IEC standards for cables, waveguides and connectors.) | | |
| Structure | WG 1 Home electronic system WG 3 Customer Premises Cabling WG 4 Interconnection of Computer Systems and Attached Equipment WG 5 Taxonomy and Terminology for Intelligent Homes JWG 10 Industrial Cabling Managed by SC 65C | | |

| | | | |
|---|---|----------|----|
| Webpage | https://www.iec.ch/dyn/www/f?p=103:7:0:::FSP_ORG_ID:3399 | | |
| STANDARDIZATION WORK | | | |
| Published standards | 229 | Projects | 21 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 28 participating members | | |
| O-Members | 17 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

ETSI/SC EMTEL EMERGENCY TELECOMMUNICATIONS



| | |
|----------------------------|--|
| GENERAL INFORMATION | |
| Creation date | 2005 |
| Chairperson | Mrs. Cristina Lumbreras |
| Scope | <p>The main objectives of TC EMTEL are:</p> <ul style="list-style-type: none"> - to capture and consolidate the requirements from the relevant stakeholders; - to consider the appropriate scenarios including emergency communications: <ul style="list-style-type: none"> o of individuals with authorities/organisations, o between authorities/organisations, o from authorities/organisations to the individuals, o amongst individuals, - to identify gaps where existing standards do not fulfil the requirements and provide specifications and standards to fill these gaps, without duplication of work in other ETSI committees and partnership projects, or request other ETSI TBs to provide specifications to fill these gaps; - to develop and maintain the Standards and other deliverables to support the development and implementation of emergency communications standardization within ETSI; - to provide requirements on issues of network security, network integrity, network behaviour in emergency situations, and emergency telecommunications needs in networks; - to coordinate work on emergency communications in ETSI with relevant external groups. |
| Structure | - |
| Webpage | https://www.etsi.org/committee/1397-emtel |

| | | | |
|---|-------------------------------|----------|----|
| STANDARDIZATION WORK | | | |
| Published standards | 38 | Projects | 11 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 42 members organizations | | |
| Luxembourg's involvement | 1 national ETSI Member | | |

ETSI/TC MSG MOBILE STANDARDS GROUP



| | |
|----------------------------|--|
| GENERAL INFORMATION | |
| Creation date | N/A |
| Chairperson | Mr. Dominique Everaere |
| Scope | <p>The main responsibilities of ETSI TC MSG are:</p> <ul style="list-style-type: none"> - Perform work regarding areas of activity as requested by mandates from the European Commission and all other tasks attributed to ETSI in support of European regulation of related systems, - Identify European Regulatory requirements on Cellular systems to be developed by 3GPP, |

| | |
|---|--|
| | <ul style="list-style-type: none"> - Develop Harmonised Standards covering essential requirements under article 3.2 of the Radio Equipment Directive 2014/53/EU and related ETSI deliverables for GSM, IMT systems and technologies evolving therefrom. Close liaison should be maintained with 3GPP, 3GPP2, IEEE and WiMAX Forum as well as related ETSI bodies which might be affected by the deliverables made by MSG, - Address issues relating to the transposition of 3GPP Technical Specifications and Technical Reports into ETSI Deliverables (noting that the transposition is performed by the ETSI Secretariat and is normally done without direct involvement of ETSI MSG), - Provide maintenance of the ETSI deliverables under its responsibility after publication and throughout their useful lifetime, - Avoid duplication of work in particular with 3GPP on the tasks described above, - Subcontract work as needed, e.g. to/by 3GPP. |
| Structure | MSG EVAL MSG Evaluation Group MSG TFES TC MSG / TC ERM Task Force for the production of Harmonised Standards under the RED for the IMT family |
| Webpage | https://www.etsi.org/committee/1404-msg |
| STANDARDIZATION WORK | |
| Published standards | 95 |
| Projects | 9 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | |
| Members | 63 members organizations |
| Luxembourg's involvement | NO national ETSI Members |

ETSI/TC NTECH NETWORK TECHNOLOGIES



GENERAL INFORMATION

| | |
|---|---|
| Creation date | N/A |
| Chairperson | Mr. Bruno Chatras |
| Scope | <p>The activities of TC NTECH include the following:</p> <ul style="list-style-type: none"> - Protocol specification and/or profiling, including - but not limited to - session control signalling, policy-based QoS/resource control signalling and AAA signalling for conversational and content delivery services. - Numbering, naming, addressing and routing. - Service and Network interconnection and interworking, including content delivery networks. - Migration to and Interworking with future networks, including – but not limited to - Information Centric Networking, Real-Time Communications over the Web. - Enablers for enterprise communications: Business trunking, network-hosted enterprise services (including Network as a Service). - Enablers and associated APIs to access network resources (e.g. network-based authentication, location information, content caching, etc.). - Enablers for law enforcement and regulatory requirements (e.g. emergency communications routing, lawful interception, data retention). - Maintenance of NGN, IN, ISDN, B-ISDN and SS7 specifications. - Network security. - End-to-end security. - Maintenance of Cloud Computing deliverables. |
| Structure | - |
| Webpage | https://www.etsi.org/committee/1406-ntech |
| STANDARDIZATION WORK | |
| Published standards | 19 |
| Projects | 1 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | |
| Members | 26 members organizations |
| Luxembourg's involvement | NO national ETSI Members |

| ETSI/TC INT CORE NETWORK AND INTEROPERABILITY TESTING | |  | |
|--|---|---|----|
| GENERAL INFORMATION | | | |
| Creation date | N/A | | |
| Chairperson | Mr. Giulio Maggiore | | |
| Scope | <ul style="list-style-type: none"> - Develop Core Network test specifications (interoperability, conformance, performance, security), based on, but not limited to, 3GPP specifications (including Virtual, Layered and Autonomic Networks). - Initiate and supervise interoperability events (such as Plugtests) related to Core Networks as well as other events (workshops and seminars). - Coordinate interoperability efforts with other organisations GSMA, IETF, OMA. - Endorse test specifications from/to other SDOs e.g. ITU-T. | | |
| Structure | INT AFI Autonomic Management and Control Intelligence for Self-Managed Fixed & Mobile Integrated Networks | | |
| Webpage | https://www.etsi.org/committee/1401-int | | |
| STANDARDIZATION WORK | | | |
| Published standards | 221 | Projects | 31 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 23 members organizations | | |
| Luxembourg's involvement | NO national ETSI Members | | |

| ETSI/TC ATTM ACCESS, TERMINALS, TRANSMISSION, AND MULTIPLEXING | |  | |
|---|--|--|----|
| GENERAL INFORMATION | | | |
| Creation date | N/A | | |
| Chairperson | Mr. Dominique Roche | | |
| Scope | The scope of Technical Committee (TC) ATTM addresses operational aspects of Access, Terminals, Transmission and Multiplexing including all aspects within the ETSI scope covering cabling, installations, implementation of network services, signal transmission, multiplexing and other forms of signal treatment up to digitalization in private and public domain, excluding those aspects that relate to Hybrid Fibre-Coaxial cable networks. | | |
| Structure | WG AT2 Infrastructure, Physical Networks, and Communication Systems WG SDMC Sustainable Digital Multiservice Communities WG TG IC CG Task Group on Installation and Cabling WG TM 4 Fixed Radio Systems WG TM 6 Wireless Access Network Systems | | |
| Webpage | https://www.etsi.org/committee/1390-attm | | |
| STANDARDIZATION WORK | | | |
| Published standards | 132 | Projects | 13 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 47 members organizations | | |
| Luxembourg's involvement | NO national ETSI Members | | |

4.8 Governance of IT

| ISO/IEC JTC 1/SC 40 IT SERVICE MANAGEMENT AND IT GOVERNANCE | |  | |
|--|---|---|-----------------|
| GENERAL INFORMATION | | | |
| Creation date | 2013 | Secretariat | SA (Australia) |
| Chairperson | Ms. Jan Begg | Committee Manager | Ms. Suba Ananth |
| Scope | <p>Standardization of IT Service Management and IT Governance. Develop standards, tools, frameworks, best practices and related documents for IT Service Management and IT Governance, including areas of IT activity such as audit, digital forensics, governance, risk management, outsourcing, service operations and service maintenance, but excluding subject matter covered under the scope and existing work programs of JTC 1/SC 27 and JTC 1/SC 38. The work will initially cover:</p> <ul style="list-style-type: none"> - Governance of IT, including the development of the ISO/IEC 38500 series standards and related documents. - Operational aspects of Governance of IT, including ISO/IEC 30121 Information Technology — Governance of digital forensic risk framework, and interfaces with the management of IT as well as the role of governance in the area of business innovation. - All aspects relating to IT service management, including the development of the ISO/IEC 20000 series standards and related documents. - All aspects relating to IT-Enabled Services — Business Process Outsourcing, including the development of the ISO/IEC 30105 series standards and related documents. | | |
| Structure | CAG 1 Chairman Advisory Group WG 1 Governance of Information Technology WG 2 Service management – Information technology WG 3 IT-enabled services / Business process outsourcing | | |
| Webpage | https://www.iso.org/committee/5013818.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 24 | Projects | 13 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 33 participating members (including Luxembourg) | | |
| O-Members | 24 observing members | | |
| Luxembourg's involvement | 8 national delegates | | |

4.9 Education and Digital Skills

| ISO/IEC JTC 1/SC 36 INFORMATION TECHNOLOGY FOR LEARNING, EDUCATION, AND TRAINING | |  | |
|---|---|---|-------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1999 | Secretariat | JISC (Japan) |
| Chairperson | Mr. Erlend Øverby | Committee Manager | Ms. Sunyoung Youn |
| Scope | <p>Standardization in the field of information technologies for learning, education, and training to support individuals, groups, or organizations, and to enable interoperability and reusability of resources and tool.</p> <p>Excluded from this scope are:</p> <ul style="list-style-type: none"> - Standards or technical reports that define educational standards (competencies), cultural conventions, learning objectives, or specific learning content. - Work done by other ISO or IEC TCs, SCs, or WGs with respect to their component, specialty, or domain. Instead, when appropriate, normative or informative references to other standards shall be included. Examples include documents on special topics such as multimedia, web content, cultural adaptation, and security. | | |
| Structure | AG 1 Business planning and communications AG 2 Emerging Technologies (AGET) AHG 5 Blockchain in Education TCG Terminology Coordination Group WG 3 Learner information WG 4 Management and delivery WG 7 ITLET - Culture, language and individual needs WG 8 Learning Analytics Interoperability | | |
| Webpage | https://www.iso.org/committee/45392.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 55 | Projects | 9 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 20 participating members | | |
| O-Members | 27 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

| CEN/TC 428 ICT PROFESSIONALISM AND DIGITAL COMPETENCES | |  | |
|---|---|---|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2007 | Secretariat | UNI (Italy) |
| Chairperson | Ms Mary Cleary | Secretary | Mrs Veronica Salsano |
| Scope | <p>CEN TC 428 is responsible for all aspects of standardization related to maturing the ICT Profession in all sectors, public and private. This includes, at a minimum, activity related to four major building blocks of ICT Professionalism:</p> <ul style="list-style-type: none"> - Competences (standardization of a common language of digital and ICT Professional competences, skills and knowledge applied in all domains), - Education and certification, - Code of Ethics and - Body of Knowledge (BoK). <p>The main areas of standardization where CEN TC 428 will develop its activity are as follows:</p> <ul style="list-style-type: none"> - Definition, maintenance and evolution of digital Professional competences in all sectors, always looking at current business adoption and new emerging technologies and trends as they become relevant to the ICT profession as a whole (e.g. security, fintech, cloud, blockchain) | | |

| | | |
|---|--|-------------------|
| | <ul style="list-style-type: none"> - Interaction with different frameworks - Curricula guidance - ICT Professional Role Profiles - Guidance for assessing the published standards - Body of Knowledge (BoK) for ICT - Development of an education and certification model related to e-CF, - Developing a sustainable code of ethics in the ever-changing ICT world. <p>All conceptual developments shall be consistent and interrelated.</p> | |
| Structure | WG 1 eAccessibility | |
| Webpage | https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:1218399&cs=16D21D7497970A5A38FB4CCE737358BFE | |
| STANDARDIZATION WORK | | |
| Published standards | 4 | Projects 6 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | |
| Members | 34 members of CEN/CENELEC | |
| Luxembourg's involvement | NO (no registered delegate) | |

4.10 E-Health

| ISO/TC 215 HEALTH INFORMATICS | |  | |
|--|--|---|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1998 | Secretariat | ANSI (United States) |
| Chairperson | Mr. Michael Glickman | Committee Manager | Ms. Rachel Hawthorne |
| Scope | Standardization in the field of health informatics, to facilitate capture, interchange and use of health-related data, information, and knowledge to support and enable all aspects of the health system. | | |
| Structure | SC 1 Genomics Informatics AHG 4 Standards and Conformance CAG 1 Executive council, harmonization and operations CAG 2 Advisory group JWG 7 Joint ISO/TC 215 - IEC/SC 62A WG: Safe, effective and secure health software and health IT systems, including those incorporating medical devices TF 1 Task Force on Quantities and Units to be used in e-health TF 3 Outreach & Communications TF 5 AI technologies in health informatics WG 1 Architecture, Frameworks and Models WG 2 Systems and Device Interoperability WG 3 Semantic content WG 4 Security, Safety and Privacy WG 6 Pharmacy and medicines business WG 10 Traditional Medicine WG 11 Personalized digital health Joint working groups under the responsibility of another committee: ISO/TC 249/JWG 1 Joint ISO/TC 249 - ISO/TC 215 WG: Traditional Chinese Medicine (Informatics) | | |
| Webpage | https://www.iso.org/committee/54960.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 211 | Projects | 60 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 31 participating members | | |
| O-Members | 34 observing members (including Luxembourg) | | |
| Luxembourg's involvement | 4 national delegates | | |

| CEN/TC 251 HEALTH INFORMATICS | |  | |
|----------------------------------|---|---|---------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1990 | Secretariat | NEN (Netherlands) |
| Chairperson | Mr. Robert Stegwee | Secretary | Ms. Shirin Golyardi |
| Scope | Standardization in the field of Health Information and Communications Technology (ICT) to achieve compatibility and interoperability between independent systems and to enable modularity. This includes requirements on health information structure to support clinical and administrative procedures, technical methods to support interoperable systems as well as requirements regarding safety, security and quality. | | |

| | |
|---|---|
| Structure | WG 1 Enterprise and Information WG 2 Technology and Applications |
| Webpage | https://standards.cenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:6232&cs=179BCDF5F3C53AF099558615A53207584 |
| STANDARDIZATION WORK | |
| Published standards | 108 |
| Projects | 19 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | |
| Members | 34 members of CEN/CENELEC |
| Luxembourg's involvement | NO (no registered delegate) |

ETSI/EP eHealth ETSI PROJECT (EP) eHEALTH



| | | | |
|---|---|-----------------|---|
| GENERAL INFORMATION | | | |
| Creation date | 2007 | | |
| Chairperson | Mr. Suno Wood | | |
| Scope | <p>EP eHEALTH shall have primary responsibility:</p> <ul style="list-style-type: none"> - to collect and define the Health ICT related requirements from relevant stakeholders and to input the requirements to the concerned ETSI Technical Bodies; - to identify gaps, where existing ETSI standards do not fulfil the Health ICT requirements, and suggest further standardization activities to fill those gaps; - to develop Health ICT related deliverables in all areas not covered by existing system specific and horizontal Technical Bodies or other SDO; - to ensure the co-ordination of Health ICT related activities with the relevant ETSI Technical Bodies in order to avoid duplication of effort and deliverables; - to ensure that activities within EP eHEALTH are co-ordinated with other European and International Standards making bodies to avoid duplication of effort and deliverables; - to co-ordinate ETSI positions on Health ICT related issues and represent ETSI externally. | | |
| Structure | - | | |
| Webpage | https://www.etsi.org/committee/1396-ehealth | | |
| STANDARDIZATION WORK | | | |
| Published standards | 4 | Projects | 5 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 46 members organizations | | |
| Luxembourg's involvement | NO national ETSI Members | | |

CEN/CLC/JTC 16 ACTIVE IMPLANTABLE MEDICAL DEVICES



| | | | |
|----------------------------|---|--------------------|------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2017 | Secretariat | DKE (Germany) |
| Chairperson | Mr. Michael Neumann | Secretary | Mr. Klaus Neuder |
| Scope | To standardize all active implantable medical devices and their accessories | | |
| Structure | <p>WG 1 Chairman advisory group WG 2 Management systems and controls sets WG 3 Security evaluation and assessment WG 4 Cybersecurity services WG 5 Data Protection, Privacy and Identity Management WG 6 Product security</p> | | |

| | | | |
|---|---|----------|---|
| Webpage | https://standards.cencenelec.eu/dyn/www/f?p=205:7:0::::FSP_ORG_ID:2401823&cs=1064128213BC2CC6BE5082D7DBBB2D792 | | |
| STANDARDIZATION WORK | | | |
| Published standards | 0 | Projects | 6 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 34 members of CEN/CENELEC | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

4.11 Fintech

| ISO/TC 68 FINANCIAL SERVICES | |  | |
|---|--|---|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1972 | Secretariat | ANSI (United States) |
| Chairperson | Mr. Jim Northey | Committee Manager | Ms. Janet Busch |
| Scope | Standardization in the field of banking, securities and other financial services. | | |
| Structure | ISO/TC 68/AG 2 Standards Advisory Group ISO/TC 68/AG 3 Best practices ISO/TC 68/AG 4 Sustainable finance Advisory Group ISO/TC 68/AG 5 Digital currencies ISO/TC 68/CAG Strategic Leadership Group ISO/TC 68/SG 4 Communications ISO/TC 68/TAG 1 Fintech Technical Advisory Group ISO/TC 68/SC 2 Financial Services, security ISO/TC 68/SC 8 Reference data for financial services ISO/TC 68/SC 9 Information exchange for financial services | | |
| Webpage | https://www.iso.org/committee/49650.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 65 | Projects | 25 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 34 participating members (including Luxembourg) | | |
| O-Members | 49 observing members | | |
| Luxembourg's involvement | 1 national delegate | | |

| ISO/TC 68/SC 2 FINANCIAL SERVICES, SECURITY | |  | |
|--|---|---|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1981 | Secretariat | BSI (United Kingdom) |
| Chairperson | Mr. Kim Wagner | Committee Manager | Ms. Sarah Horsfield |
| Scope | The mission of ISO/TC 68/SC 2 is standardization of information security for the financial services industry. | | |
| Structure | WG 8 Public key infrastructure management for financial services WG 11 Encryption algorithms used in banking applications WG 13 Security in retail banking WG 16 Security aspects related to third party payment service providers (TPP's) WG 17 Security aspects of digital currencies WG 18 Customer identification and authentication technologies WG 19 Security aspects of code-scanning payment | | |
| Webpage | https://www.iso.org/committee/49670.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 17 | Projects | 13 |

| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | |
|--|-----------------------------|
| P-Members | 19 participating members |
| O-Members | 22 observing members |
| Luxembourg's involvement | NO (no registered delegate) |

ISO/TC 68/SC 8 REFERENCE DATA FOR FINANCIAL SERVICES



| GENERAL INFORMATION | | | |
|---------------------|---|---|-------------------|
| Creation date | 2017 | Secretariat | SNV (Switzerland) |
| Chairperson | Mr. Dominique Tanner | Committee Manager | Ms. Sandra Roth |
| Scope | Standardization in the field of reference data for financial services | | |
| Structure | AG 1 | Advisory Group on Classification of Financial Instruments | |
| | CAG | Chair Advisory Group | |
| | MA (Voting Members) | ISO 20275 Maintenance Agency | |
| | MA 1 (Voting Members) | ISO 4217 Maintenance Agency | |
| | MA 2 (Discussions) | ISO 4217 Maintenance Agency | |
| | MA 3 (Discussions) | ISO 20275 Maintenance Agency | |
| | MA 4 (Voting Members) | ISO 10962 Maintenance Agency | |
| | MA 5 (Discussions) | ISO 10962 Maintenance Agency | |
| | WG 1 | Classification of financial instruments | |
| | WG 2 | Specification for description of banking products or services | |
| WG 3 | Digital Token Identifier – DTI | | |
| WG 7 | Natural persons identifier | | |
| WG 8 | Unique Product Identifier (UPI) | | |
| WG 9 | Official organizational roles (OOR) | | |
| Webpage | https://www.iso.org/committee/6534796.html | | |

| STANDARDIZATION WORK | | | |
|--|---|----------|---|
| Published standards | 15 | Projects | 6 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 28 participating members (including Luxembourg) | | |
| O-Members | 9 observing members | | |
| Luxembourg's involvement | 3 national delegates | | |

ISO/TC 68/SC 9 INFORMATION EXCHANGE FOR FINANCIAL SERVICES



| GENERAL INFORMATION | | | |
|---------------------|---|------------------------------------|---------------------|
| Creation date | 2017 | Secretariat | AFNOR (France) |
| Chairperson | Mr. Patrice Hertzog | Committee Manager | Ms. Maëlle Gaonac'h |
| Scope | Standardization in the field of information exchange for financial services | | |
| Structure | ISO/TC 68/SC 9/AG 1 | ISO 20022 RA Oversight Group | |
| | ISO/TC 68/SC 9/SG 1 | Review of ISO 20022 SR comments | |
| | ISO/TC 68/SC 9/TG 1 | Cards standards | |
| | ISO/TC 68/SC 9/WG 1 | ISO 20022 Semantic Models | |
| | ISO/TC 68/SC 9/WG 3 | Revision of ISO 8583 and ISO 18245 | |
| Webpage | https://www.iso.org/committee/6534831.html | | |

| STANDARDIZATION WORK | | | |
|--|---|----------|---|
| Published standards | 31 | Projects | 8 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 23 participating members (including Luxembourg) | | |
| O-Members | 9 observing members | | |
| Luxembourg's involvement | 1 national delegate | | |

4.12 Data Centers and Green ICT

| ISO/IEC JTC 1/SC 39 SUSTAINABILITY, IT AND DATA CENTRES | |  | |
|--|---|---|--------------|
| GENERAL INFORMATION | | | |
| Creation date | 2012 | Secretariat | ANSI (USA) |
| Chairperson | Mr. Jay Taylor (until end 2021) | Committee Manager | Mr. Bill Ash |
| Scope | <p>Standardization of assessment methods, design practices, operation and management aspects to support resource efficiency, resilience and environmental sustainability for and by information, data centres and other facilities and infrastructure necessary for service provisioning.</p> <p>To avoid any duplication of work and to support innovation, SC 39 will engage in active liaison and collaboration with</p> <ul style="list-style-type: none"> - other JTC1 entities - ISO TC 207, ISO TC 242, ISO TC 257 - IEC TC 100, IEC TC 111, IEC PC 118, SMB SG 4, IEC/TC 57/WG 2 and IEC/TC 9 - ITU-T SG 5; and - Any other appropriate body including external organizations (e.g. consortia) | | |
| Structure | WG 1 Resource Efficient Data Centres WG 3 Sustainable facilities and infrastructures | | |
| Webpage | https://www.iso.org/committee/654019.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 22 | Projects | 11 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 23 participating members | | |
| O-Members | 13 observing members (including Luxembourg) | | |
| Luxembourg's involvement | 5 national delegates | | |

| ETSI/TC EE ENVIRONMENTAL ENGINEERING | |  | |
|---|---|---|----|
| GENERAL INFORMATION | | | |
| Creation date | 1997 | | |
| Chairperson | Mr. Beniamino Gorini | | |
| Scope | <p>The Technical Committee EE is responsible for defining the environmental and infrastructural aspects for all telecommunication equipment and its environment, including equipment installed in subscriber premises. Wherever possible this will be achieved by references to existing international standards.</p> <p>The field includes:</p> <ul style="list-style-type: none"> - Environmental Conditions (WG-EE1) - Power Supply, Bonding and related topics (WG-EE2) - Mechanical Structure and Physical design of equipment and structures - Environmental affairs (WG-EEPS) - Environmental matters associated with Mobile ICT devices (WG M-ICT) | | |
| Structure | WG EE 1 Environmental Condition WG EE2 Power supply WG EE M-ICT Environmental matters associated with Mobile ICT Devices WG EEPS Eco Environmental Product Standards Group | | |
| Webpage | https://portal.etsi.org/ee | | |
| STANDARDIZATION WORK | | | |
| Published standards | 197 | Projects | 25 |

| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | |
|--|--------------------------|
| Members | 50 members organizations |
| Luxembourg's involvement | NO national ETSI Members |

4.13 Intelligent Transport Systems

| ISO/TC 204 INTELLIGENT TRANSPORT SYSTEMS | |  | |
|--|---|---|-----------------|
| GENERAL INFORMATION | | | |
| Creation date | 1992 | Secretariat | ANSI (France) |
| Chairperson | Mr. Dick Schnacke | Committee Manager | Mr. Adrian Guan |
| Scope | <p>Standardization of information, communication and control systems in the field of urban and rural surface transportation, including intermodal and multimodal aspects thereof, traveller information, traffic management, public transport, commercial transport, emergency services and commercial services in the intelligent transport systems (ITS) field.</p> <p>Note: ISO/TC 204 is responsible for the overall system aspects and infrastructure aspects of intelligent transport systems (ITS), as well as the coordination of the overall ISO work programme in this field including the schedule for standards development, taking into account the work of existing international standardization bodies.</p> | | |
| Structure | <p>WG 7 Data modelling for integration of physical devices</p> <p>WG 9 Interfaces between manufacturing systems</p> <p>WG 10 Numerical control systems for machine tools - Technical requirements</p> <p>WG 11 Reference model for cyber - Physically controlled smart machine tool systems</p> | | |
| Webpage | https://www.iso.org/committee/54706.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 302 | Projects | 87 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 29 participating members | | |
| O-Members | 30 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

| ETSI/TC ITS INTELLIGENT TRANSPORT SYSTEMS | |  | |
|--|---|---|--|
| GENERAL INFORMATION | | | |
| Creation date | 2012 | | |
| Chairperson | Mr. Andersen Niels Peter Skov | | |
| Scope | <p>TC ITS shall have the following responsibility:</p> <ul style="list-style-type: none"> - Development and maintenance of Standards, Specifications and other deliverables to support the development and implementation of ITS Service provision across the network, for transport networks, vehicles and transport users, including interface aspects and multiple modes of transport and interoperability between systems, but not including ITS application standards, radio matters, and EMC. - Scope includes communication media, and associated physical layer, transport layer, network layer, security, lawful intercept and the provision of generic web services | | |
| Structure | - | | |
| Webpage | https://www.etsi.org/committee/1402-its | | |

| STANDARDIZATION WORK | | | |
|--|---------------------------|----------|----|
| Published standards | 142 | Projects | 56 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 138 members organizations | | |
| Luxembourg's involvement | 1 national ETSI Member | | |

CEN/TC 278 INTELLIGENT TRANSPORT SYSTEMS



| GENERAL INFORMATION | | | |
|--|--|-------------|--------------------|
| Creation date | 1992 | Secretariat | NEN (Netherlands) |
| Chairperson | Mr. Hans Nobbe | Secretary | Ms. Astrid de Haes |
| Scope | <p>Standardization in the field of intelligent transport systems, encompassing services and techniques to achieve road safety, environmental sustainability and traffic efficiency, and to improve the travel experience; applying information and communication technologies between vehicles/infrastructure/other road users.</p> <p>The following are included: aspects of cooperation (C-ITS); intermodality and multimodality; traffic management; mobility information; mobility integration; mobility as a service; systems and services for vulnerable road users; ITS services for automated vehicles; parking management; user fee collection; public transport management; eCall; after-theft vehicle recovery systems; kerbside and pavement management. Mobility accessibility for all users is an important aspect of ITS standardization.</p> | | |
| Structure | <ul style="list-style-type: none"> WG 1 Electronic fee collection and access control (EFC) WG 3 Public transport (PT) WG 4 Traffic and traveller information (TTI) WG 7 ITS spatial data WG 8 Road traffic data (RTD) WG 14 After theft systems for the recovery of stolen vehicles WG 15 eSafety WG 16 Cooperative ITS WG 17 Mobility integration | | |
| Webpage | https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:6259&cs=164A194F2D8EB9ACD98538F3DDE9CA11B | | |
| STANDARDIZATION WORK | | | |
| Published standards | 201 | Projects | 53 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 34 members of CEN/CENELEC | | |
| Luxembourg's involvement | 1 national delegate | | |

4.14 Smart Cities

| ISO/IEC JTC 1/WG 11 SMART CITIES | |  | |
|--|---|---|-------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2013 | Secretariat | SAC (China) |
| Convenor | Mr. Heng Qian | Secretary | Mr. Hongwei Zhang |
| Scope | <ul style="list-style-type: none"> - Serve as the focus of and proponent for JTC 1's Smart Cities standardization program. - Develop foundational standards for the use of ICT in Smart Cities - including the Smart City ICT Reference Framework and an Upper Level Ontology for Smart Cities - for guiding Smart Cities efforts throughout JTC 1 upon which other standards can be developed. - Develop a set of ICT related indicators for Smart Cities in collaboration with ISO/TC 268. - Develop additional Smart Cities' standards and other deliverables that build on these foundational standards. - Identify JTC 1 (and other organization) subgroups that are developing standards and related material that contribute to Smart Cities, and where appropriate, investigate ongoing and potential new work that contributes to Smart Cities. - Develop and maintain liaisons with all relevant JTC 1 subgroups. - Engage with the community outside of JTC 1 to grow the awareness of, and encourage engagement in, JTC 1 Smart Cities standardization efforts within JTC 1, forming liaisons as is needed. - Ensure a strong relationship with Smart Cities activities in ISO and IEC. | | |
| STANDARDIZATION WORK | | | |
| Published standards | 5 | Projects | 5 |
| NATIONAL INVOLVEMENT | | | |
| Luxembourg's involvement | 2 national delegates | | |
| ISO/TC 268 SUSTAINABLE CITIES AND COMMUNITIES | |  | |
| GENERAL INFORMATION | | | |
| Creation date | 2012 | Secretariat | AFNOR (France) |
| Chairperson | Mr. Bernard Gindroz | Committee Manager | Ms. Caroline Reis |
| Scope | <p>Standardization in the field of Sustainable Cities and Communities will include the development of requirements, frameworks, guidance and supporting techniques and tools related to the achievement of sustainable development considering smartness and resilience, to help all Cities and Communities and their interested parties in both rural and urban areas become more sustainable.</p> <p>Note: TC 268 will contribute to the UN Sustainable Development Goals through its standardization work.</p> | | |
| Structure | <p>SC 1 Smart community infrastructures</p> <p>SC 2 Sustainable cities and communities - Sustainable mobility and transportation</p> <p>CAG 1 Chairman Advisory Group</p> <p>TG 1 Awareness-raising, communication and promotion</p> <p>TG 2 Collection of cities good practices and needs</p> <p>TG 3 Supporting the strategic positioning of ISO/TC 268</p> <p>WG 1 Management System Standards</p> <p>WG 2 City indicators</p> <p>WG 4 Smart processes and operating models for sustainable communities</p> | | |

| | | | |
|---|---|----------|----|
| Webpage | https://www.iso.org/committee/656906.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 29 | Projects | 19 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 41 participating members | | |
| O-Members | 28 observing members (including Luxembourg) | | |
| Luxembourg's involvement | 1 national delegate | | |

| | | | |
|--|--|-------------------|---|
| ISO/TC 268/SC 1 SMART COMMUNITY INFRASTRUCTURES | | |  |
| GENERAL INFORMATION | | | |
| Creation date | 2012 | Secretariat | JISC (Japan) |
| Chairperson | Mr. Takahiro Kihara | Committee Manager | Ms. Ritsu Hamaoka |
| Scope | This is a sub-committee of TC 268. It primarily focuses in the field of smart community infrastructure of sustainable cities and communities standardization. | | |
| Structure | CAG 1 Chairman's Advisory Group TG 2 Smart Community Infrastructure - Pilot Testing WG 1 Infrastructure metrics WG 2 Integration and interaction framework for smart community infrastructures WG 3 Smart transportation WG 4 Data exchange and sharing for smart community infrastructure WG 5 Power plant WG 6 Disaster risk reduction WG 7 Utility tunnel | | |
| Webpage | https://www.iso.org/committee/656967.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 21 | Projects | 19 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 28 participating members | | |
| O-Members | 15 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

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|---|--|-------------------|---|
| ISO/TC 268/SC 2 SUSTAINABLE CITIES AND COMMUNITIES - SUSTAINABLE MOBILITY AND TRANSPORTATION | | |  |
| GENERAL INFORMATION | | | |
| Creation date | 2021 | Secretariat | JISC (Japan) |
| Chairperson | Vacant | Committee Manager | Mr. Koichi Matsuoka |
| Scope | The Sub-Committee will consider organizational issues, infrastructures and services in the mobility and transportation options for cities and communities, including those related to new technologies (i.e. electric, hydrogen, autonomous). The proposed series of International Standards will provide requirements, frameworks, guidance and supporting techniques and tools for cities and territories, as well as all mobility and transportation stakeholders to plan, develop, operate, maintain and manage sustainable mobility and transportation systems and services with a long-term vision. | | |

| | | | |
|---|---|----------|---|
| | Excluded: Road vehicles covered by ISO/TC 22, Intelligent transport systems covered by ISO/TC 204, Railway applications covered by ISO/TC 269 and Electrical equipment and systems for railways covered by IEC/TC 9. Note: To ensure the development of a consistent set of standards on Sustainable mobility, ISO/TC 268/SC 2 will liaise with relevant ISO and IEC committees. | | |
| Structure | - | | |
| Webpage | https://www.iso.org/committee/8742800.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 0 | Projects | 0 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 16 participating members | | |
| O-Members | 14 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

4.15 Smart Energy and Grid

| CEN/TC 294 COMMUNICATION SYSTEMS FOR METERS | | | |
|---|---|-------------|---------------------------|
|  | | | |
| GENERAL INFORMATION | | | |
| Creation date | N/A | Secretariat | DIN (Germany) |
| Chairperson | Mr. Dipl.-Ing. Achim Reissinger | Secretary | Mrs. Mareike Tscheuschner |
| Scope | Standardization of communications interfaces for metering and submetering systems for Water, Fuel Gases, Heat and similar energies and fluids where the protocols are applied to the meters, sensors and actuators and systems used to provide metering services. Security features like Confidentiality, Authenticity and Integrity are provided at the application and lower layers. Cooperation with CENELEC and ETSI, in relation to consistent protocol and use of spectrum, is an essential condition for achieving interoperability between entities in systems. Excluded from this scope are areas, which are under the responsibility of CLC/TC 205 and CEN/TC 247. | | |
| Structure | WG 2 Data exchange for meters on DLMS/COSEM systems WG 4 Data exchange for meters on M-Bus systems WG 5 Data exchange for meters on wireless M-Bus systems WG 6 Data exchange for meters on wireless mesh networking systems WG 7 Adaptation layer | | |
| Webpage | https://standards.cenelec.eu/dyn/www/f?p=205:29:0:::FSP_ORG_ID,FSP_LANG_ID:6275,25&cs=13F70DD49695CE3BE6A37ADB2604B6E99#1 | | |
| STANDARDIZATION WORK | | | |
| Published standards | 12 | Projects | 3 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 34 members of CEN/CENELEC | | |
| Luxembourg's involvement | NO (no registered delegate) | | |
| CEN/CLC/ETSI CG-SG COORDINATION GROUP ON SMART GRIDS | | | |
|  | | | |
| GENERAL INFORMATION | | | |
| Creation date | N/A | Secretariat | NEC (Netherlands) |
| Chairperson | N/A | Secretary | N/A |
| Scope | <p>The CG-SG advises on European standardization requirements relating to smart electrical grid and multi-commodity smart metering standardization, including interactions between commodity systems (e.g. electricity, gas, heat, water), and assesses ways to address them. This includes interactions with end-users, including consumers/prosumers.</p> <p>Its aim is to promote the deployment of open and interoperable data architectures, based on European and international standards. The scope also includes any standards needed to design, operate and maintain electrical grids securely and efficiently. In the specific area of metering, its scope includes electricity, water, gas and heat/cooling metering devices and systems, and associated architectures.</p> <p>Within its scope the Group will address the European requirements resulting from the Clean Energy Package, including secondary legislation, and any other relevant Commission initiatives.</p> <p>The CG-SG shall also receive inputs from and provide input to the European Commission's activities related to standardization in the field of smart grids and meters.</p> | | |

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|---|---|---------------------------------|---|
| | <p>With respect to international standardization activities on smart grids and meters, the Group shall monitor the progress of the relevant standardization activities in ISO, IEC and ITU, and promote coordination between the European activities and those at the international level and promote when needed the consideration of European requirements within international standardization.</p> <p>The Group shall not develop standardization deliverables (e.g. European Standards, Technical Specifications, Technical Reports), but may develop informative material intended for the public domain after approval by the CEN and CENELEC Technical Boards (BTs) and ETSI Board.</p> | | |
| Structure | WG AHG CEP | AHG Clean Energy Package | |
| | WG AHGI | AHG Interoperability | |
| | WG DISS | Dissemination | |
| | WG INTER | Interoperability | |
| | WG METHO | Methodology | |
| | WG RA | Reference Architecture | |
| | WG SG | Steering Group | |
| | WG SGIS | Smart Grid Information Security | |
| | WG SP | Sustainable Processes | |
| | WG STD | Set of Standards | |
| Webpage | https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:2252899&cs=163CBA1F1D1A26EC737AC8934C9951AFF | | |
| STANDARDIZATION WORK | | | |
| Published standards | 0 | Projects | 0 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | N/A | | |
| Luxembourg's involvement | N/A | | |

4.16 Smart Manufacturing

| ISO/TC 184 AUTOMATION SYSTEMS AND INTEGRATION | |  | |
|--|---|---|------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1983 | Secretariat | AFNOR (France) |
| Chairperson | Mr. Patrick Lamboley | Committee Manager | Ms. Mélissa Jean |
| Scope | <p>Standardization in the field of automation systems and their integration for design, sourcing, manufacturing, production and delivery, support, maintenance and disposal of products and their associated services. Areas of standardization include information systems, automation and control systems and integration technologies.</p> <p>Note: There will be active collaboration with the relevant technical committees responsible for areas such as machines, manufacturing resources and facilities, robotics, electrical and electronic equipment, PLC for general application, quality management, industrial safety, information technologies, multi-media capabilities, and multi-modal communication networks.</p> | | |
| Structure | <p>AG 2 Digital Twin AHG 1 Support for smart manufacturing reference model AHG 3 Liaison review CAG Chairman Advisory Group JWG 21 Joint ISO/TC 184 - IEC/TC 65/JWG 21 - Smart Manufacturing Reference Model(s) linked to ISO/TC 184 TF 2 Supermeeting organization WG 6 Asset intensive industry interoperability SC 1 Physical device control SC 4 Industrial data SC 5 Interoperability, integration, and architectures for enterprise systems and automation applications</p> | | |
| Webpage | https://www.iso.org/committee/54110.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 869 | Projects | 51 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 23 participating members | | |
| O-Members | 21 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

| ISO/TC 184/SC 4 INDUSTRIAL DATA | |  | |
|------------------------------------|---|---|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1984 | Secretariat | ANSI (United States) |
| Chairperson | Mr. Kenneth Swope | Committee Manager | Ms. Dana Tripp |
| Scope | <p>Standardization of the content, meaning, structure, representation and quality management of the information required to define an engineered product and its characteristics at any required level of detail at any part of its life-cycle from conception through disposal, together with the interfaces required to deliver and collect the information</p> | | |

| | | | |
|---|--|-----------------|----|
| | <p>necessary to support any business or technical process or service related to that engineered product during its life-cycle. Note: Life-cycle includes recursive recycling to a terminal state.</p> | | |
| Structure | <p>AG 0 Change management advisory group AG 2 Implementation Forum AG 3 Core terminology for industrial data AHG 2 Nuclear digital ecosystem specification AHG 3 UUID management for industrial data JWG 16 Joint ISO/TC 184/SC 4 - ISO/IEC JTC 1/SC 24 - ISO/TC 171/SC 2 WG: Formats for visualization and other derived forms of product data JWG 24 Joint ISO/TC 184/SC 4 - IEC SC3D WG: Use of IEC CDD for ISO data dictionaries and ontologies PPC Policy and planning committee QC Quality committee TF 1 ISO 10303 SMRL architecture innovation TF 2 SC 4 reference model for industrial data WG 3 Oil, Gas, Process and Power WG 11 Implementation methods and conformance methods WG 12 STEP product modelling and resources WG 13 Industrial Data Quality WG 15 Digital manufacturing WG 21 SMRL Validation Team WG 22 Reference data validation team WG 23 Vocabulary validation team</p> <p>Joint working groups under the responsibility of another committee: ISO/TC 59/SC 13/JWG 12 Joint ISO/TC 59/SC 13 - ISO/TC 184/SC 4 WG: Development of building data related standards</p> | | |
| Webpage | https://www.iso.org/committee/54158.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 779 | Projects | 35 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 19 participating members | | |
| O-Members | 13 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

ISO/TC 184/SC 5 INTEROPERABILITY, INTEGRATION, AND ARCHITECTURES FOR ENTERPRISE SYSTEMS AND AUTOMATION APPLICATIONS



| | | | |
|----------------------------|---|--------------------------|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1970 | Secretariat | ANSI (United States) |
| Chairperson | Ms. Charlotta Johnsson | Committee Manager | Mr. Walter Zoller |
| Scope | <p>Standardization in the field of automation systems and their integration for design, sourcing, manufacturing, production and delivery, support, maintenance and disposal of products and their associated services. Areas of standardization include information systems, automation and control systems and integration technologies.</p> <p>Note: There will be active collaboration with the relevant technical committees responsible for areas such as machines, manufacturing resources and facilities, robotics, electrical and electronic equipment, PLC for general application, quality management, industrial safety, information technologies, multi-media capabilities, and multi-modal communication networks.</p> | | |

| | | | |
|---|-----------------------------|--|--|
| Structure | AG 1 | SC5 Advisory Group | |
| | JWG 5 | Joint WG ISO/TC 184/SC 5 - IEC/SC 65E: Enterprise-control system integration | |
| | SG 7 | Interoperability of simulation models on different platforms | |
| | WG 1 | Modelling and architecture | |
| | WG 4 | Manufacturing software and its environment | |
| | WG 5 | Open systems application frameworks | |
| | WG 6 | Application service interface | |
| | WG 9 | Key performance indicators for manufacturing operations management | |
| | WG 10 | Evaluation of energy efficiency and other relevant factors of a manufacturing system with respect to its environmental influence | |
| | WG 12 | Convergence of informatization and industrialization | |
| | WG 13 | Equipment behaviour catalogue | |
| | WG 14 | Mass customization | |
| | WG 15 | Model-based standards authoring study group | |
| | Webpage | https://www.iso.org/committee/54192.html | |
| | STANDARDIZATION WORK | | |
| Published standards | 64 | Projects | |
| | | 4 | |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 16 participating members | | |
| O-Members | 14 observing members | | |
| Luxembourg's involvement | NO (no registered delegate) | | |

ISO/TC 299 ROBOTICS



| | | | |
|---|---|--|-----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2015 | Secretariat | SIS (Sweden) |
| Chairperson | Mr. Tomas Lagerberg | Committee Manager | Ms. Katarina Widström |
| Scope | Standardization in the field of robotics, excluding toys and military applications | | |
| Structure | ISO/TC 299/AG 1 | Communications group | |
| | ISO/TC 299/CAG | Chairman's Advisory Group | |
| | ISO/TC 299/JWG 5 | Joint ISO/TC 299 - IEC/SC 62A - IEC/SC 62D: Medical robot safety | |
| | ISO/TC 299/SG 1 | Study group on gaps and structure | |
| | ISO/TC 299/WG 1 | Vocabulary and characteristics | |
| | ISO/TC 299/WG 2 | Service robot safety | |
| | ISO/TC 299/WG 3 | Industrial safety | |
| | ISO/TC 299/WG 4 | Service robot performance | |
| | ISO/TC 299/WG 6 | Modularity for service robots | |
| ISO/TC 299/WG 7 | Management system for service robots | | |
| ISO/TC 299/WG 8 | Validation methods for collaborative applications | | |
| Webpage | https://www.iso.org/committee/5915511.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 26 | Projects | 11 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 28 participating members | | |
| O-Members | 12 observing members (including Luxembourg) | | |
| Luxembourg's involvement | 1 national delegate | | |

| CEN/TC 310 ADVANCED AUTOMATION TECHNOLOGIES AND THEIR APPLICATIONS | | | |
|---|---|-------------|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1993 | Secretariat | BSI (United Kingdom) |
| Chairperson | Mr. Steven Carter | Secretary | Ms. Sophie Erskine |
| Scope | Standardization in the field of automation systems and technologies and their application and integration to ensure the availability of the standards required by industry for design, sourcing, manufacturing and delivery, support, maintenance and disposal of products and their associated services. Areas of standardisation may include enterprise modelling and system architecture, information and its supporting systems, robotics for fixed and mobile robots in industrial and specific non-industrial environments, automation and control equipment and software, human and mechanical aspects, integration technologies and system operational aspects. These standards may utilise other standards and technologies beyond the scope of TC310, such as machines, equipment, information technologies, multi-media capabilities, and multi-modal communications networks. | | |
| Structure | WG 1 Systems architecture | | |
| Webpage | https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP_ORG_ID:6291&cs=1FB8DE3E2415169C5A629164496F80A52 | | |
| STANDARDIZATION WORK | | | |
| Published standards | 6 | Projects | 3 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| Members | 34 members of CEN/CENELEC | | |
| Luxembourg's involvement | No (no registered delegate) | | |

| ISO/IEC JTC 1/WG 12 3D PRINTING AND SCANNING | | | |
|---|---|-------------|-------------------|
| GENERAL INFORMATION | | | |
| Creation date | 2018 | Secretariat | SAC (China) |
| Convenor | Mr. Byoung Nam Lee | Secretary | Ms. Hongwei Zhang |
| Scope | <p>Working Group 12 on 3D Printing and scanning was established to:</p> <ul style="list-style-type: none"> - Serve as a focus of and proponent for the JTC 1 standardization program on 3D Printing and Scanning - Develop ICT related foundational standards for 3D Printing and Scanning upon which other standards can be developed - Develop other 3D Printing and Scanning standards that are built upon the foundational standards when relevant ISO and IEC committees that could address these standards do not exist or are unable to develop them - Identify gaps and opportunities in 3D Printing and Scanning standardization - Develop and maintain liaisons with all relevant ISO and IEC committees as well as with external organizations that have interests in 3D Printing and Scanning - Engage with 3D Printing and Scanning communities to raise awareness of JTC 1 standardization efforts and provide an open platform for discussion and further cooperation - Develop and maintain a list of existing 3D Printing and Scanning standards produced and standards development projects underway in ISO TCs, IEC TCs and JTC 1 | | |
| STANDARDIZATION WORK | | | |
| Published standards | 1 | Projects | 2 |
| NATIONAL INVOLVEMENT | | | |
| Luxembourg's involvement | No (no registered delegate) | | |

4.17 Technical committees falling outside of the classification

| ISO/IEC JTC 1 INFORMATION TECHNOLOGY | |  | |
|--|---|---|----------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1987 | Secretariat | ANSI (United States) |
| Chairperson | Mr. Phil Wennblom | Committee Manager | Mrs. Lisa Rajchel |
| Scope | Standardization in the field of information technology. | | |
| Structure | AG 1 Advisory Group on Communications AG 2 Advisory Group on JTC 1 Emerging Technology and Innovation (JETI) AG 6 Autonomous and Data Rich Vehicles AG 8 Meta Reference Architecture and Reference Architecture for Systems Integration AG 10 Outreach AG 13 VR/AR/MR based ICT Integration Systems AG 14 Systems Integration Facilitation (SIF) AG 15 Standards and Regulations AG 16 Brain-computer interface AG 17 Meeting guidelines - SD 19 AG 18 Vocabulary AHG 4 Collaboration across domains WG 11 Smart cities WG 12 3D Printing and scanning WG 13 Trustworthiness WG 14 Quantum Computing SC 2 Coded character sets SC 6 Telecommunications and information exchange between systems SC 7 Software and systems engineering SC 17 Cards and security devices for personal identification SC 22 Programming languages, their environments and system software interfaces SC 23 Digitally recorded media for information interchange and storage SC 24 Computer graphics, image processing and environmental data representation SC 25 Interconnection of information technology equipment SC 27 Information security, cybersecurity and privacy protection SC 28 Office equipment SC 29 Coding of audio, picture, multimedia and hypermedia information SC 31 Automatic identification and data capture techniques SC 32 Data management and interchange SC 34 Document description and processing languages SC 35 User interfaces SC 36 Information technology for learning, education and training SC 37 Biometrics SC 38 Cloud computing and distributed platforms SC 39 Sustainability, IT and data centres SC 40 IT service management and IT governance SC 41 Internet of things and digital twin SC 42 Artificial intelligence | | |
| Webpage | https://www.iso.org/committee/45020.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 3297 | Projects | 545 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 35 participating members (including Luxembourg) | | |
| O-Members | 65 observing members | | |
| Luxembourg's involvement | 8 national delegates | | |

| ISO/IEC JTC 1/SC 28 OFFICE EQUIPMENT | |  | |
|--|---|---|--------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1990 | Secretariat | JISC (Japan) |
| Chairperson | Mr. Takashi Ito | Committee Manager | Mr. Nobuaki Hamada |
| Scope | Standardization of basic characteristics, test methods and other related items of products such as 2D and 3D Printers/Scanners, Copiers, Projectors, Fax and Systems composed of their combinations, excluding such interfaces as user system interfaces, communication interfaces and protocols. | | |
| Structure | AG Advisory Group WG 2 Consumables WG 3 Productivity WG 4 Image quality assessment WG 5 Office Colour WG 6 Sustainability requirements | | |
| Webpage | https://www.iso.org/committee/45314.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 34 | Projects | 10 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 12 participating members | | |
| O-Members | 19 observing members | | |
| Luxembourg's involvement | No (no registered delegate) | | |

| ISO/IEC JTC 1/SC 35 USER INTERFACES | |  | |
|--|--|---|------------------|
| GENERAL INFORMATION | | | |
| Creation date | 1998 | Secretariat | AFNOR (France) |
| Chairperson | Dr. Khalid Choukri | Committee Manager | Ms. Mélissa Jean |
| Scope | Standardization in the field of user-system interfaces in information and communication technology (ICT) environments and support for these interfaces to serve all users, including people having accessibility or other specific needs, with a priority of meeting the JTC 1 requirements for cultural and linguistic adaptability. This includes: <ul style="list-style-type: none"> - user interface accessibility (requirements, needs, methods, techniques and enablers); - cultural and linguistic adaptability and accessibility (such as evaluation of cultural and linguistic adaptability of ICT products, harmonized human language equivalents, localization parameters, voice messaging menus); - user interface objects, actions and attributes; - methods and technologies for controlling and navigating within systems, devices and applications in visual, auditory, tactile and other sensorial modalities (such as by voice, vision, movement, gestures); - symbols, functionality and interactions of user interfaces (such as graphical, tactile and auditory icons, graphical symbols and other user interface elements); - visual, auditory, tactile and other sensorial input and output devices and methods in ICT environments (for devices such as keyboards, displays, mice); - user interfaces for mobile devices, hand - held devices and remote interactions. | | |
| Structure | AG 1 Study group on Accessibility within immersive environments AHG 2 Affective computing AHG 3 Accessibility of Internet of things user interfaces WG 1 Keyboards, methods and devices related to input and its feedback WG 2 Graphical user interface and interaction WG 4 User interfaces for mobile devices | | |

| | | | |
|---|---|----------|----|
| | WG 5 Cultural and linguistic adaptability | | |
| | WG 6 User interfaces accessibility | | |
| | WG 9 Natural user interfaces and interactions | | |
| | WG 10 Affective computing user interfaces | | |
| Webpage | https://www.iso.org/committee/45382.html | | |
| STANDARDIZATION WORK | | | |
| Published standards | 78 | Projects | 11 |
| INTERNATIONAL MEMBERS AND NATIONAL INVOLVEMENT | | | |
| P-Members | 19 participating members | | |
| O-Members | 18 observing members (including Luxembourg) | | |
| Luxembourg's involvement | 1 national delegate | | |

| | | | |
|--|--|---|---|
| ISO/IEC JTC 1/WG 14 QUANTUM COMPUTING | |  | |
| GENERAL INFORMATION | | | |
| Creation date | 2019 | Secretariat | - |
| Convenor | Ms. Hong Yang | Secretary | - |
| Scope | Terms of reference: <ul style="list-style-type: none"> - Serve as a focus of and proponent for JTC 1's standardization program on Quantum Computing. Identify gaps and opportunities in Quantum Computing standardization. - Develop and maintain a list of existing Quantum Computing standards produced and standards development projects underway in ISO/TCs, IEC/TCs and JTC 1. - Develop deliverables in the area of Quantum Computing. - As a systems integration entity, maintain relationships with other ISO and IEC/TCs and other organizations that are involved in Quantum Computing standardization. | | |
| STANDARDIZATION WORK | | | |
| Published standards | 0 | Projects | 1 |
| NATIONAL INVOLVEMENT | | | |
| Luxembourg's involvement | 4 national delegates | | |

4.18 ETSI Industry Specification Groups and CEN/CLC Workshops

4.18.1 ETSI Industry Specification Groups

An Industry Specification Group (ISG) is a quickly set-up type of ETSI structure that produces deliverables related to a very specific technology area. It is a structure that operates alongside ETSI technical committees, and within which both ETSI members and non-members can participate. The deliverables produced are either informative reports (known as Group Reports) or recommendations (known as Group Specifications).

As is the case for ETSI TCs, registration to an ISG is done directly by the entity interested, and not through ILNAS. Table 1 below lists the existing ISGs⁶⁰.

| ISG | TITLE | RELATED SUBSECTOR(S) |
|-----|--|---|
| ARF | Augmented Reality Framework | Artificial Intelligence and (Big) Data |
| CDM | European Common information sharing environment service and Data Model | Artificial Intelligence and (Big) Data |
| CIM | Cross cutting Context Information Management | Smart Cities |
| ENI | Experimental Networked Intelligence | Telecommunications and Networking |
| ETI | Encrypted Traffic integration | Digital Trust |
| F5G | 5 th Generation Fixed Network | Telecommunications and Networking |
| IPE | IPv6 Enhanced innovation | Telecommunications and Networking |
| MEC | Multi-access Edge Computing | Internet of Things |
| mWT | Millimeter Wave transmission | Telecommunications and Networking |
| NFV | Network Functions Virtualisation | Telecommunications and Networking |
| NIN | Non-IP Networking | Telecommunications and Networking |
| OEU | Operational energy Efficiency for Users | Data Centers and Green ICT |
| PDL | Permissioned Distributed Ledger | Blockchain |
| QKD | Quantum Key Distribution | Digital Trust |
| RIS | Reconfigurable Intelligent Surfaces | Telecommunications and Networking |
| SAI | Securing Artificial Intelligence | Artificial Intelligence and (Big) Data Digital Trust |
| ZSM | Zero Touch Network and Service Management | Telecommunications and Networking |

Table 1: ETSI's Industry Specification Groups (ISG)

⁶⁰ Details on the ISGs can be found at <https://www.etsi.org/committees>

4.18.2 CEN/CENELEC Workshops

CEN, CENELEC, or CEN/CENELEC Workshops (WS) are structures set up in order to quickly produce documents that are considered reference documents by those entities participating in the Workshop. These are typically set up for rapidly-evolving technologies or fields. The documents produced are known as CEN (or CENELEC) Workshop Agreements, or CWAs. While they are meant to be quickly-produced reference documents, a process exists to make them into European standards, if deemed suitable.

Participation in a Workshop is done directly, and notably is open also to non-Europeans. In particular, registration in a Workshop is not done through ILNAS.

Table 2 below lists those WS that exist, relevant to ICT.

| WS | TITLE | RELATED SUBSECTOR(S) |
|-------------------------|--|---|
| CEN/CLC/WS SEP2 | Industry Best Practices and an Industry Code of Conduct for Licensing of Standard Essential Patents in the field of 5G and Internet of Things | Internet of Things Telecommunications and Networking |
| CEN/CLC/WS INACHUS | Urban search and rescue (USaR) robotic platform technical and procedural interoperability | / |
| CEN/CLC/WS Monsoon | Predictive management of data intensive industrial processes | Artificial Intelligence and (Big) Data Smart Manufacturing |
| CEN/CLC/WS SEP-IoT | Workshop on Best Practices and a Code of Conduct for Licensing Industry Standard Essential Patents in 5G and the Internet of Things (IoT), including the Industrial Internet | Internet of Things Telecommunications and Networking |
| CEN/CLC/WS ZONeSEC | Interoperability of security systems for the surveillance of widezones | Digital Trust |
| CEN/CLC/WS WiseGRID | Reference model for distribution application for microgrids | Smart Energy and Grid |
| CEN/CLC/WS EFPFInterOp | European Connected Factory Platform for Agile Manufacturing Interoperability | Smart Manufacturing |
| CEN/CLC/WS ZDMterm | Zero Defects in Digital Manufacturing Terminology | Smart Manufacturing |
| CEN/WS Smart CE Marking | Smart CE marking for the construction industry | Smart Manufacturing |

Table 2: CEN and CEN/CLC Workshops (WS)

5 OPPORTUNITIES FOR THE NATIONAL MARKET

The purpose of this Standards Analysis “ICT Sector - Luxembourg” is to encourage the participation of national stakeholders in technical standardization, as doing so would directly contribute to supporting and stimulating the Luxembourg ICT market's competitiveness, visibility and performance. Many national organizations are involved in ICT technical standardization, offering them unique opportunities to participate in the process and help design the future global ICT landscape, in all topics ranging from Software Engineering to the new Smart ICT paradigms (e.g.: AI, Blockchain), and through Information Security and Digital Trust. This chapter provides an overview of ILNAS developments aiming at facilitating the involvement of stakeholders in the technical standardization process, for the benefit of the national economy.

The ICT sector is, at a national level, the most active standardization sector. Luxembourg is a “P-member”⁶¹ of ISO/IEC JTC 1 and represents national interests in its plenary meetings. 94 delegates⁶² from the country are currently involved in international and European technical standardization committees of the ICT sector. However, considering the size and richness of the ecosystem of organizations involved in ICT in Luxembourg, ILNAS believes that ICT standardization technical committees could still attract more national stakeholders and make them benefit from related opportunities. In this way, ILNAS, with the support of ANEC G.I.E., is following ICT-related technical committees in order to provide the most relevant information to the national ICT community. There are currently four ANEC G.I.E. standardization project officers dedicated to the ICT sector, each with a portfolio of topics to manage in this regard⁶³.

In short, ILNAS, with the support of ANEC G.I.E., undergoes different activities to inform national stakeholders and support their normative steps. The opportunities presented in this chapter are available at the national level, and should be considered by stakeholders as a series of proposals, inviting them to go further and to engage in activities to take advantage of standardization.

5.1 Information about Standardization

5.1.1 Awareness Sessions

Interested national stakeholders can contact ILNAS and ANEC G.I.E. in order to program a dedicated awareness session. This kind of meeting aims at providing basic knowledge about standardization as well as information that meets the standards-related interests of the requesting organization. A sample of relevant technical committees and standards projects under development is given to allow one to take advantage of standardization, for example by registering in the identified technical committees.

Aside from making direct contact, interested stakeholders can also fill out a declaration of interest in ICT standardization⁶⁴ that ILNAS and the ANEC G.I.E will act on.

⁶¹ P-members actively participate by voting on the standard at various stages of its development, while O-members can observe the standards that are being developed, offering comments and advice. (<https://www.iso.org/who-develops-standards.html>)

⁶² Some experts are participating in more than one technical committee.

⁶³ More information at: <https://portail-qualite.public.lu/content/dam/qualite/publications/normalisation/2021/Flyer-Standards-A5-web.pdf>

⁶⁴ <https://portail-qualite.public.lu/content/dam/qualite/fr/documentations/normes-normalisation/declarations-interet/declaration-interet-normalisation-tic/declaration-interet-standardization-it.pdf>

5.1.2 ICT Standards Watch

The objective of this Standards Analysis is to facilitate the identification of technical committees in the ICT domain that meet organizations' potential interests. In addition, ILNAS, with the support of ANEC G.I.E., proposes a focused standards watch to answer the needs of a national organizations⁶⁵. This service consists in the analysis of relevant standards (both published and under development) and technical committees related to a specific problematic of a requesting organization. A standards watch report is delivered at the end of the process as a result and some additional steps can be proposed by ILNAS and ANEC G.I.E., like the registration in technical committee(s) to allow the follow-up of the relevant standardization developments by the requesting organization. This service can also consist in the verification of standards catalogues.

5.1.3 General Dissemination of Normative Information

Publications

ILNAS, with the support of ANEC G.I.E., regularly publishes and disseminates reports and White Papers at the national level in order to provide valuable information on ICT standardization topics to the market. The latest documents made available through this means are:

- **National Technical Standardization Report - Blockchain and Distributed Ledgers (2021)**⁶⁶

This report provides national actors with an overview of the normative landscape of distributed registers and highlights the opportunities available to them to get involved in technical standardization. It is made up of four chapters:

- A presentation of the basic concepts of blockchains. This chapter provides an understanding of the different blockchain consensus mechanisms and how smart contracts work;
- An overview of existing platforms. This part describes various major blockchain platforms, specifying their specific characteristics as well as the uses for which they are intended;
- An overview of initiatives and applications. This chapter provides an overview of the main European initiatives and an overview of the Luxembourg blockchain ecosystem. It also presents use cases of this technology in different industries;
- A description of the current state of technical standardization. This last chapter provides an inventory of the main standardization work in the field of distributed registers. It also allows the national market to understand how to get involved in the drafting of these projects.

This publication aims to raise awareness among national stakeholders about blockchain technology and the many related standardization works, which will help guide future developments in this field.

⁶⁵ <https://portail-qualite.public.lu/fr/normes-normalisation/produits-et-services.html>

⁶⁶ <https://qd.lu/1DXV4Z>

- **White Paper - Artificial Intelligence and Technical Standardization (2021)**⁶⁷

The white paper describes key concepts to understand the technology and its challenges in an accessible way. Technical standardization is used as Ariadne's thread to present and address these challenges throughout the document. Artificial intelligence is introduced through four complementary facets:

- A presentation of the historical and current context. This chapter explains the growing enthusiasm around artificial intelligence and provides an overview of the related standards developments in Europe and around the world;
- A technical introduction specifying the fundamental concepts of artificial intelligence. This chapter provides a link between technical concepts and business use cases. It considers three main branches of artificial intelligence – searching, reasoning and machine learning – with a particular emphasis on machine learning. It also introduces the technical standards that help to understand these concepts and make the right technological choices;
- An analysis of the application domains of artificial intelligence. Different application domains of artificial intelligence are presented, and put in the context of the economic impact in Europe and worldwide, in terms of both investments and expected benefits. The chapter focuses on the healthcare sector, banking and finance, industry, the transportation and automotive sector, commerce, and the public sector. Domain-specific and general-purpose standards are introduced to refer the reader to relevant information that can aid in the adoption of artificial intelligence;
- An overview of artificial intelligence trustworthiness issues. The chapter describes the complex ecosystem of components that help build trust across all aspects of the implementation of artificial intelligence. Standards are presented as useful tools providing mitigation measures to address trust-related challenges.

Through this white paper, ILNAS offers an overview of the concepts and challenges related to the technology and connects these with the field's standards landscape, in the interest of the national economy.

News Items

ILNAS and ANEC G.I.E regularly publish, on the *Portail-Qualité*⁶⁸, news items related to recent developments in technical standardization, and encourage interested parties to take advantage of these developments.

Videos Promoting Standards and Standardization

The application and uptake of ICT standards is also a key opportunity that the market can take advantage of. In order to encourage this, videos dedicated to certain standards series are produced and made freely available on the ILNAS and ANEC G.I.E. YouTube⁶⁹ channel (along with other promotional videos).

⁶⁷ <https://qd.lu/42Wqnv>

⁶⁸ <https://portail-qualite.public.lu/fr/actualites.html>

⁶⁹ https://www.youtube.com/channel/UCiGeFq_P0HPdBcqohXjEpkA/featured

5.1.4 Purchase of standards

The ILNAS e-Shop⁷⁰ is a catalog of more than 195,000 normative documents. It offers the possibility to purchase national (ILNAS and DIN), European (CEN, CENELEC and ETSI) and international (ISO and IEC) standards in electronic format at competitive prices. This catalog is available in three languages: English, French and German.

5.1.5 Free Consultation of Standards

ILNAS offers the possibility to consult its entire standards' catalog free of charge through dedicated reading stations located in different places in Luxembourg⁷¹.

This service allows, for example, interested organizations or individuals to consult a standard before its purchase on the ILNAS e-Shop.

5.1.6 Standardization Research Results

Technical Standardisation for Trusted Use in the Field of Smart ICT (2017-2020)

ILNAS, with the support of ANEC G.I.E., has completed a joint research program with the University of Luxembourg (Interdisciplinary Centre for Security, Reliability and Trust – SnT). An agreement was signed in May 2017⁷², to reinforce the collaboration of the organizations in the domain of Smart Secure ICT for Business Innovation through Technical Standardization. The research program analyzed and extended standardization and Digital Trust knowledge in three Smart ICT domains, namely Cloud Computing, Internet of Things and Artificial Intelligence/Big Data. In this frame, three PhD students conducted research activities in these domains. The results of this research program served as a basis for the professional Master Program “Master in Technopreneurship: mastering smart ICT, standardisation and digital trust for enabling next generation of ICT solutions” that started in February 2021.

National stakeholders active in the Smart ICT landscape have the opportunity to benefit from the results of this research program, for example by participating in the courses offered in future iterations of the Master's degree (described in the next section). National stakeholders can also consult different publications related to this research program.

- **White Paper - Data Protection and Privacy in Smart ICT**⁷³

The White Paper “Data Protection and Privacy in Smart ICT - Scientific Research and Technical Standardization”, resulting from the collaboration between ILNAS and the University of Luxembourg, was published in October 2018. The objective of this document is to provide a holistic view of privacy and data protection in Smart ICT. To this aim, a review of the state of the art highlighting existing challenges and proposed solutions is presented from two different viewpoints: scientific developments and technical standardization.

⁷⁰ <https://ilnas.services-publics.lu/ecnor/home.action>

⁷¹ <https://portail-qualite.public.lu/fr/normes-normalisation/achat-consultation-normes.html>

⁷² <https://portail-qualite.public.lu/fr/actualites/normes-normalisation/2017/ul-ilnas-investissent-smart-ict.html>

⁷³ <https://portail-qualite.public.lu/dam-assets/publications/normalisation/2018/White-Paper-Data-Protection-Privacy-Smart-ICT-october-2018.pdf>

- **Technical Reports – “Gap Analysis Between Scientific Research and Technical Standardization”⁷⁴**

The White Paper “Data Protection and Privacy in Smart ICT” was extended in October 2019 with the publication of three Technical Reports delivering gap analyses between scientific research and technical standardization for the three Smart ICT domains studied in the context of the research program.

Technical Standardisation for Trustworthy ICT, Aerospace, and Construction (2021-2024)

The collaboration with the University of Luxembourg will continue, with the launch of a new research program entitled “Technical Standardisation for Trustworthy ICT, Aerospace, and Construction (2021-2024)”. Covering all three of the priority sectors identified in the National Standardization Strategy 2020-2030 (ICT, construction, and aerospace), this program will explore reliability, security and privacy aspects in all three sectors, with ICT playing a crucial transversal role. More particularly in ICT, the work initiated in the first research program will continue with investigations in AI, in order to better apprehend the Digital Trust of AI systems.

5.2 Training in Standardization

5.2.1 Training on Smart ICT Standardization

ILNAS, with the support of ANEC G.I.E., develops a training catalogue⁷⁵ annually, which is updated according to market expectations. In addition to general trainings about standards and standardization, technical trainings on Smart ICT standardization and related challenges are proposed:

- Internet of Things and technical standardization;
- Blockchain and technical standardization;
- Cloud Computing and technical standardization;
- Artificial Intelligence and technical standardization.

These trainings aim at meeting the expectations of national stakeholders in terms of normative knowledge in ICT. Based on courses proposed in the training catalogue, customized training sessions can also be organized. Any request will be evaluated and a dedicated training program will be proposed to serve specific professional development needs.

5.2.2 Professional “Master in Technopreneurship: mastering smart ICT, standardisation and digital trust for enabling next generation of ICT solutions”

ILNAS, supported by ANEC G.I.E., with the University of Luxembourg and the Chamber of Employees (CSL) have developed a Master entitled “Master in Technopreneurship: mastering smart ICT, standardisation and digital trust for enabling next generation of ICT solutions”⁷⁶. It is designed for experienced professionals who wish to develop their technological skills in the field of Smart Secure ICT and technopreneurship. It started its first iteration in February 2021.

⁷⁴ <https://portail-qualite.public.lu/dam-assets/publications/normalisation/2019/TR-Smart-ICT-Gap-Analysis-SR-TS-ILNAS-UL.pdf>

⁷⁵ <https://portail-qualite.public.lu/dam-assets/publications/normalisation/2021/Training-Catalogue-ILNAS-ANEC-2021-ersion.pdf>

⁷⁶ https://www.wfr.uni.lu/formations/fstm/master_in_technopreneurship

This program focuses on Smart Secure ICT and provides students with the Smart ICT concepts and tools at their disposal to develop their sense of technical innovation (or “technopreneurship”). Digital Trust is also a central component, and it is not only treated from the point of view of security, but also considering other aspects like reliability, accountability, privacy, transparency, integrity, legitimacy, etc. in order to allow the adoption of Smart ICT technologies and the development of innovative services, products, and businesses. The Master’s program tackles various aspects of Smart ICT and their applications, such as the development of Cloud Computing, Internet of Things, Artificial Intelligence or Blockchain and Distributed Ledger Technologies. International experts address these Smart ICT concepts, along with the concepts of information security and Digital Trust, which are essential now more than ever.

This program provides lectures from three points of view:

- Technical: providing the fundamentals of Smart ICT technologies and security techniques and the latest scientific developments;
- Technopreneurship: in order to highlight major opportunities for technical innovation;
- Technical standardization: plays a key role within the program, as an important source of knowledge and good practices, while defining the future ICT. Concretely, technical standardization remains a main keystone between Smart ICT technologies, the related Digital Trust needs, and the development of business innovation, as it points the way forward.

5.3 Involvement in Standardization

5.3.1 Becoming a National Delegate in Standardization

Benefits of Participation in ICT standardization technical committees

In Luxembourg, registration in technical committees from ISO, IEC, CEN or CENELEC is free of charge⁷⁷. Participating in ICT standardization technical committees offers a broad set of opportunities and benefits, such as:

- Giving your opinion during the standardization process (comments and positions of vote on the draft standards);
- Showcasing your know-how and good practices;
- Accessing draft standards;
- Anticipating future evolutions of ICT standardization;
- Collaborating with strategic partners and international experts;
- Enhancing the visibility of your organization at national and international level;
- Identifying development opportunities;
- Making your organization competitive in the market.

Participating in the Training for new delegates in standardization

ILNAS can organize trainings for newcomers in technical standardization⁷⁸, who have registered in a technical committee. They are encouraged to participate in order to better understand the roles and missions of delegates in standardization on one hand, and to become familiar with the tools and services at their disposal for this work on the other. ILNAS has also created an online video training for

⁷⁷ <https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation/experts-normalisation.html>

⁷⁸ <https://portail-qualite.public.lu/fr/formations/normes-normalisation/f03-delegue-normalisation.html>

new delegates, as well as other standardization training videos covering certain general aspects. All these videos are available online⁷⁹.

Support to National Delegates

As the national standards body, ILNAS, with the support of ANEC G.I.E., offers its support to national delegates of the different committees at the national level. These duties are of primary importance and well stated in the “Luxembourg’s Policy on ICT technical standardization 2020-2025”, which aims at developing the ICT technical standardization representation at the national level.

Particularly in the ICT sector, ILNAS, with the support of ANEC G.I.E., proposes a dedicated coaching service that is available for any registered national delegate, who requires assistance for the achievement of his standardization work.

Stronger Commitment as a National Delegate (Chairman, Head of Delegation, Editor of European or International Standards)

Registration as a national delegate offers possibilities to assume different levels of involvement, such as:

- Chairman of a national mirror committee: Each national mirror committee has to nominate a chairman who will be in charge of the organization of the national community of delegates registered in that particular committee. Indeed, the chairman has to vote on the draft standards on the basis of the consensual position agreed between the economic entities represented within the national mirror committee;
- Head of delegation: A national delegate can be nominated by the national mirror committee to represent its position during plenary meetings of the corresponding international or European technical committees;
- Editor or co-editor of standards documents: Each standards project is subject to a call for participation. In this frame, a national delegate can choose to actively participate in the project as an editor or co-editor. He will then take the responsibility to ensure the successful conduct of the project until its publication.

5.3.2 Comment Standards under Public Enquiry

ILNAS proposes, through its e-Shop, the opportunity to submit comments on the standards under public enquiry. Every interested national stakeholder can propose changes to a draft standard, regardless of whether this stakeholder is officially registered in the technical committee responsible for the development of that standard.

5.3.3 Propose New Standards Projects

National stakeholders can propose new standardization projects both at international and national levels through ILNAS. The national standards body offers its support to ensure the good implementation of the process and the project’s compliance with the related rules and legislation.

This opportunity can allow national stakeholders to take a leading role in the standardization of a specific domain and to benefit from the definition of future market rules.

⁷⁹ https://www.youtube.com/channel/UCiGeFq_P0HPdBcqohXjEpkA/featured

HIGHLIGHTS OF OPPORTUNITIES AT THE NATIONAL LEVEL

Luxembourg offers different opportunities to national stakeholders to enable them to take advantage of technical standardization, summarized as follows:

- To be informed about standardization:
 - o Benefit from dedicated awareness sessions;
 - o Identify the most relevant ICT technical standardization committees and standards projects using the standards watch service;
 - o Consult ILNAS publications on ICT standardization;
 - o Consult freely national, European and international standards;
 - o Benefit from the ICT standardization research results at the national level.

- To be trained in technical standardization:
 - o Participate in the trainings on Smart ICT standardization;
 - o Participate in the professional “Master in Technopreneurship: mastering smart ICT, standardisation and digital trust for enabling next generation of ICT solutions”.

- To be involved in standardization:
 - o Become national technical standardization delegate:
 - Participate in ICT technical committees;
 - Register in the training on New delegates in standardization;
 - Benefit from the support offered by the national standards body,
 - Take on additional responsibilities as a national delegate (chairman, head of delegation, editor of European or international standards project).
 - o Submit comments on draft standards under public enquiry;
 - o Propose new standards projects.

As long as the stakeholders of the sector wish to grab these opportunities, ILNAS, supported by ANEC G.I.E., can facilitate getting on board the overall process.

As the national standards body, ILNAS offers national stakeholders the possibility to follow specific standardization activities of technical committees, either at European or international level. It supports those who are interested to participate in standardization activities, namely by providing information and delivering trainings. Therefore, resources from ILNAS and ANEC G.I.E. are specifically dedicated to these aspects and are able to efficiently support and inform prospective national delegates⁸⁰.

To reinforce this support, dedicated resources are allocated as specific points of contact for delegates of the ICT sector.

⁸⁰ <https://portail-qualite.public.lu/content/dam/qualite/fr/documentations/normes-normalisation/declarations-interet/declaration-interet-normalisation-tic/declaration-interest-standardization-it.pdf>

6 CONCLUSIONS

The ICT sector is constantly evolving. From the continued improvement of traditional topics to the development of new and innovative digital products and services, ICT constitutes a major source of economic development and it directly participates in the resolution of current environmental and social concerns. Moreover, ICT plays a crucial role to support innovation and foster the development of all the other economic sectors where applications and services offer new opportunities. This is particularly true of Smart ICT technologies such as Cloud Computing, the Internet of Things, Artificial Intelligence, and Blockchain. At the same time, Digital Trust remains an essential issue to secure complex systems and provide confidence.

In this context, standards are essential not only to develop ICT, but also to support its interoperability with other sectors. Rapid technological advancements in ICT and their widespread adoption have resulted in a huge demand for careful study and development of relevant technical standards, notably to take into consideration Digital Trust related issues such as data privacy and protection. On the one hand, technical standardization plays an important role not only to give a first-hand insight into the latest developments, thus supporting innovation, but also to contribute to the harmonization of systems and procedures, opening access to external markets, ensuring constant progress, and building trust. On the other hand, standards contribute to promote and share good practices and techniques available through the market. They ensure the quality, security and performance of products, systems, and services. They also facilitate dialogue and exchange between various stakeholders. In this sense, standardization represents an important economic lever to improve business productivity.

ICT is one of the growth sectors identified in the National Standardization Strategy 2020-2030⁸¹, since it supports many innovative or smart developments. ICT is indeed one of the most competitive economic sectors in the Grand Duchy of Luxembourg, which has high-quality communication infrastructures, hosts several world-leading ICT companies as well as many start-ups⁸², and is composed of a market of many companies, associations, administrations, and experts. Luxembourg is also particularly active in creating a secure environment for developing a trusted data-driven economy.

ILNAS, with the support of ANEC G.I.E., constantly analyzes ICT technical standardization developments and actively supports national stakeholders who want to be involved in this area, according to “Luxembourg’s Policy on ICT technical standardization 2020-2025”⁸³. The main objectives of this policy are to foster and strengthen the national ICT sector’s involvement in standardization work. To achieve this, ILNAS is conducting three intertwined projects:

- a) Promoting ICT technical standardization to the market;
- b) Reinforcing the valorization and the involvement regarding ICT technical standardization;
- c) Supporting and strengthening education about standardization and related research activities.

In line with the first project, this Standards Analysis “ICT Sector - Luxembourg” constitutes a tool to foster the positioning of Luxembourg in the ICT standardization landscape. It highlights the opportunities offered to the national market to participate in the standardization.

Similarly, for the second project, ILNAS, aided by ANEC G.I.E., offers its support to different industries/organizations through standardization according to the nature of their business at the national level. ICT related technical committees already benefit from a good national representation with over

⁸¹ <https://portail-qualite.public.lu/dam-assets/publications/normalisation/2020/strategie-normative-luxembourgeoise-2020-2030.pdf>

⁸² <https://www.tradeandinvest.lu/business-sector/ict/>

⁸³ <https://portail-qualite.public.lu/dam-assets/publications/normalisation/2020/policy-on-ict-technical-standardization-2020-2025.pdf>

90 national delegates currently registered to participate in one or several of these normative domains⁸⁴. This figure demonstrates the interest of individuals and industries/organizations in technical standardization. ILNAS has also undertaken other initiatives in order to facilitate the participation of national stakeholders in specific ICT standardization areas. The first of these is the creation of a National Standardization Commission “Cybersecurity”, offering a single access point to multiple international and European technical committees active in this area. ILNAS intends to adopt the same approach for other ICT topics in which several technical committees are active in order to continuously improve the experience of its national standardization delegates, and facilitate their understanding of the overall standardization picture in their domain.

Finally, conforming to the third project, ILNAS, with the support of ANEC G.I.E., has undertaken concrete developments for strengthening education and research activities in the area of technical standardization. It includes the launch of a professional Master “Master in Technopreneurship: mastering smart ICT, standardisation and digital trust for enabling next generation of ICT solutions” in February 2021. ILNAS and the University of Luxembourg will also soon be implementing a new research program⁸⁵ whose objective is to analyze and to extend standardization and Digital Trust knowledge across the three main sectors that are ICT, construction, and aerospace, with ICT playing a transversal role to the three.

In parallel, ILNAS, with the support of ANEC G.I.E., has also published White Papers and National Technical Standardization Reports on Smart ICT technologies, such as the recent 2021 White Paper on Artificial Intelligence⁸⁶ and 2021 Technical report on Blockchain⁸⁷, aiming to create awareness and interest concerning relevant standardization developments within the national market.

The three projects of the “Luxembourg’s Policy on ICT technical standardization 2020-2025” will allow the national market to make rapid progress and reap the benefits of technical standardization effectively. A proper understanding of the stakes associated with ICT standardization is key to adopting the appropriate position across the standardization landscape and benefit from all the related opportunities. Driven by the motto of the National Standardization Strategy 2020-2030: “Technical standardization – An inclusive tool for performance and excellence to serve the economy”⁸⁸, ILNAS, with the support of ANEC G.I.E., stands ready to encourage and assist each initiative in this process.

⁸⁴ Please note that some experts are participating in more than one technical committee

⁸⁵ <https://portail-qualite.public.lu/fr/normes-normalisation/education-recherche.html>

⁸⁶ <https://gd.lu/42Wqnw>

⁸⁷ <https://gd.lu/1DXV4Z>

⁸⁸ <https://portail-qualite.public.lu/dam-assets/publications/normalisation/2020/strategie-normative-luxembourgeoise-2020-2030.pdf>





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