ILNAS Breakfast "Technical Standardization: addressing Cloud Computing challenges and supporting related ICT development"

Introduction

14th June 2022

Jean-Philippe HUMBERT - Deputy Director, ILNAS

- **ILNAS**
    - o Public administration under the authority of the Minister of the Economy
    - o Created by the amended Law of July 4, 2014
    - o Total staff: 57 (June 2022)
    - o ISO 9001:2015 certification (Budget and administration department, OLN, Digital Trust department, Market surveillance department, BLM, OEC)

- **National Standards Body**
    - o Composed of 6 persons
    - o Close collaboration with the E.I.G. ANEC-N

- **Creation**: October 4, 2010

- **Status**: Economic Interest Group (EIG)

- **Objectives:** Promotion, awareness raising and training, applied research in the field of standardization and metrology in order to support companies' competitiveness in Luxembourg

- **Human resources**: 11 persons, including 5 employees in the standardization department (June 2022)

- **Partners** :

➔ Support for the implementation of the Luxembourg standardization strategy

Technical standardization
"Inclusive tool for performance and excellence to serve the economy"

STRATÉGIE
NORMATIVE
LUXEMBOURGEOISE
2020-2030

NORMALISATION TECHNIQUE
« Outil inclusif de performance et
d'excellence au service de l'économie »

ILNAS

→ Strategy signed by the Minister of the Economy of Luxembourg

PERFORMANCE

❑ **Pillar 1 – Use of relevant technical standards**

❑ **Pillar 2 – Involvement in the standardization process**

EXCELLENCE

❑ **Pillar 3 – Active participation of the NSB in the European and international standardization organizations**

❑ **Pillar 4 – Development of research and education about standardization**

Technical standardization
"Inclusive tool for performance and excellence to serve the economy"

3 growth sectors identified

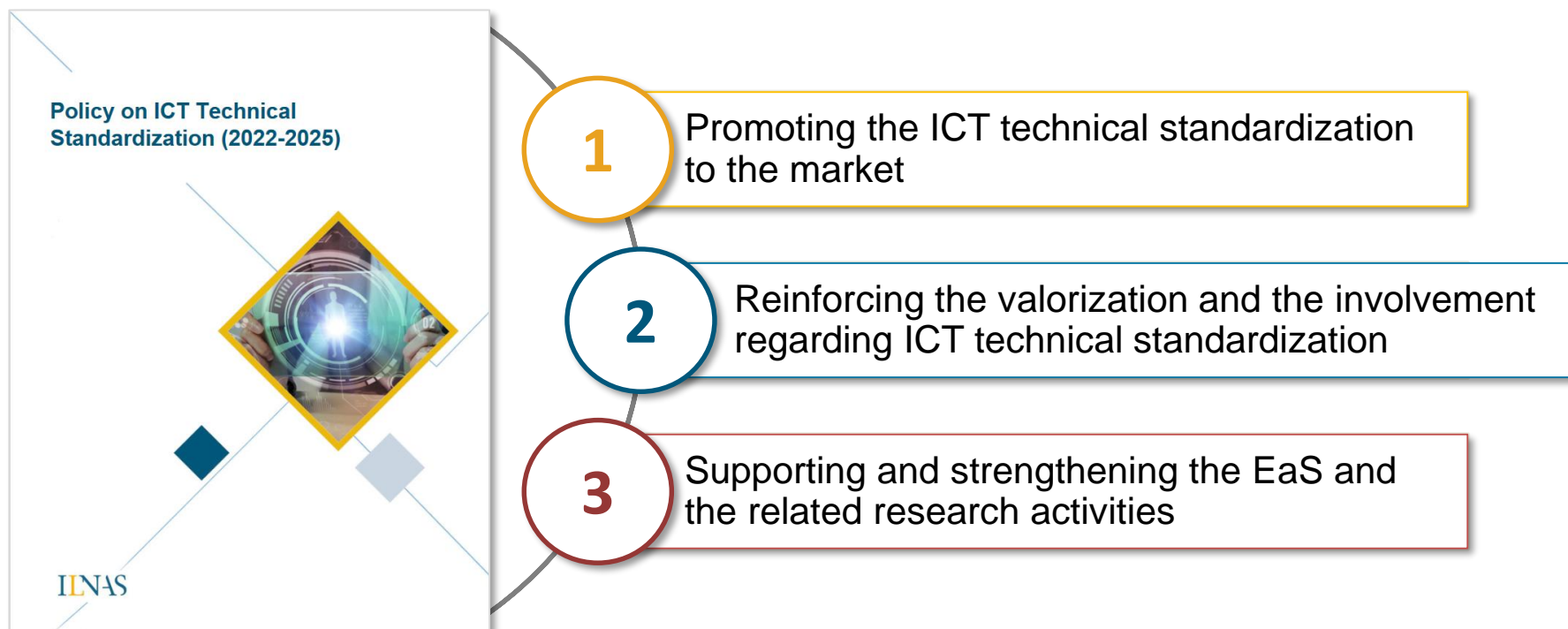**CONSTRUCTION**

INFORMATION AND COMMUNICATION TECHNOLOGIES

AEROSPACE

Identification of trans-sectoral standardization interactions

- ➢ **Computer Aided Design (CAD)**
- ➢ **Building Information Modelling (BIM)**
- ➢ **3D printing**
- ➢ **…**

- ➢ **Space data processing**
- ➢ **Space traffic management**
- ➢ **Smart Mobility**
- ➢ **…**

5

"Foster and strengthen the national ICT sector involvement in standardization work"

→ **Three lead projects**

Policy on ICT Technical Standardization (2022-2025)

ILNAS

1 Promoting the ICT technical standardization to the market

2 Reinforcing the valorization and the involvement regarding ICT technical standardization

3 Supporting and strengthening the EaS and the related research activities

2021-2022 - Standards Analysis

- **Content**

 o Standardization context of the related sectors

  o Presentation of European (CEN,CLC, ETSI) and international (ISO, IEC) technical committees active in the related sectors (distributed among subsectors relevant for the national economy)

  o Offer guidance to national stakeholders for a potential future involvement in the standardization development process

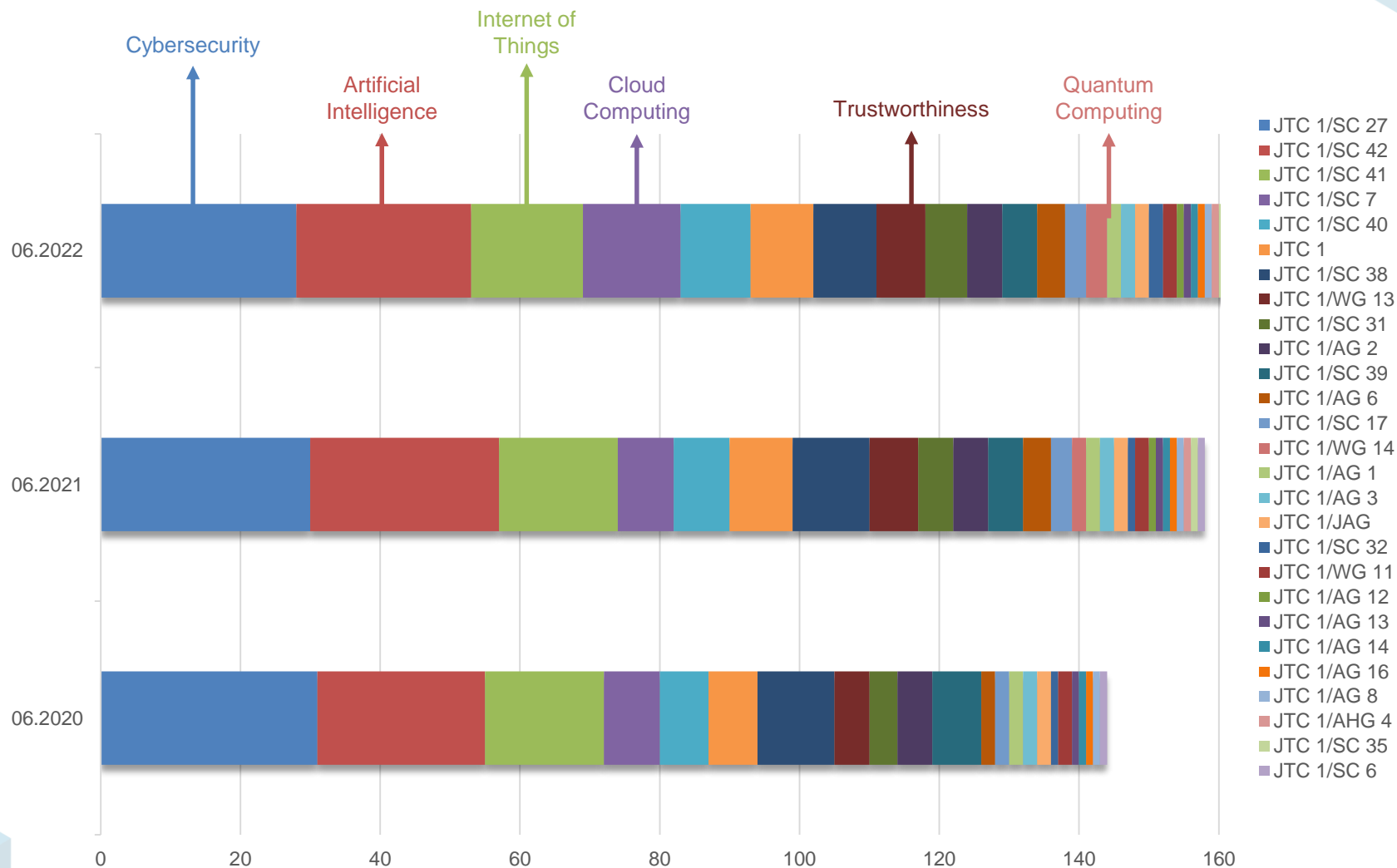- **Updated annually (twice a year for the ICT Standards Analysis)**
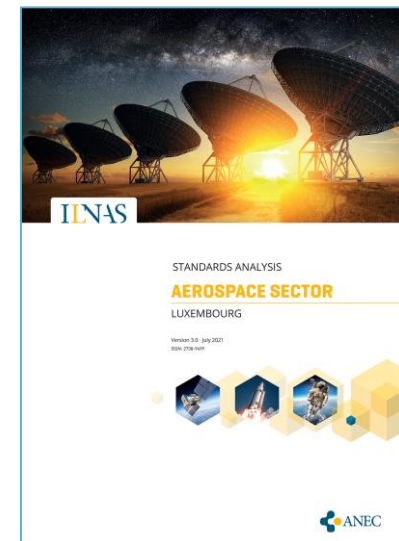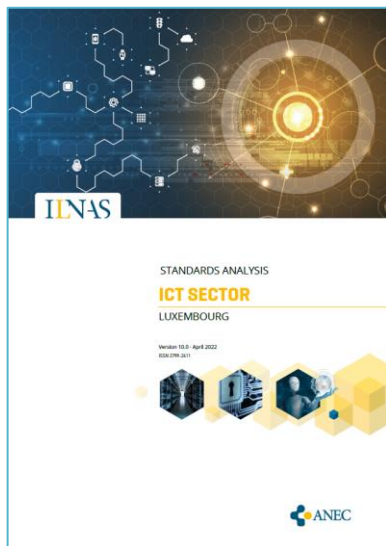
7
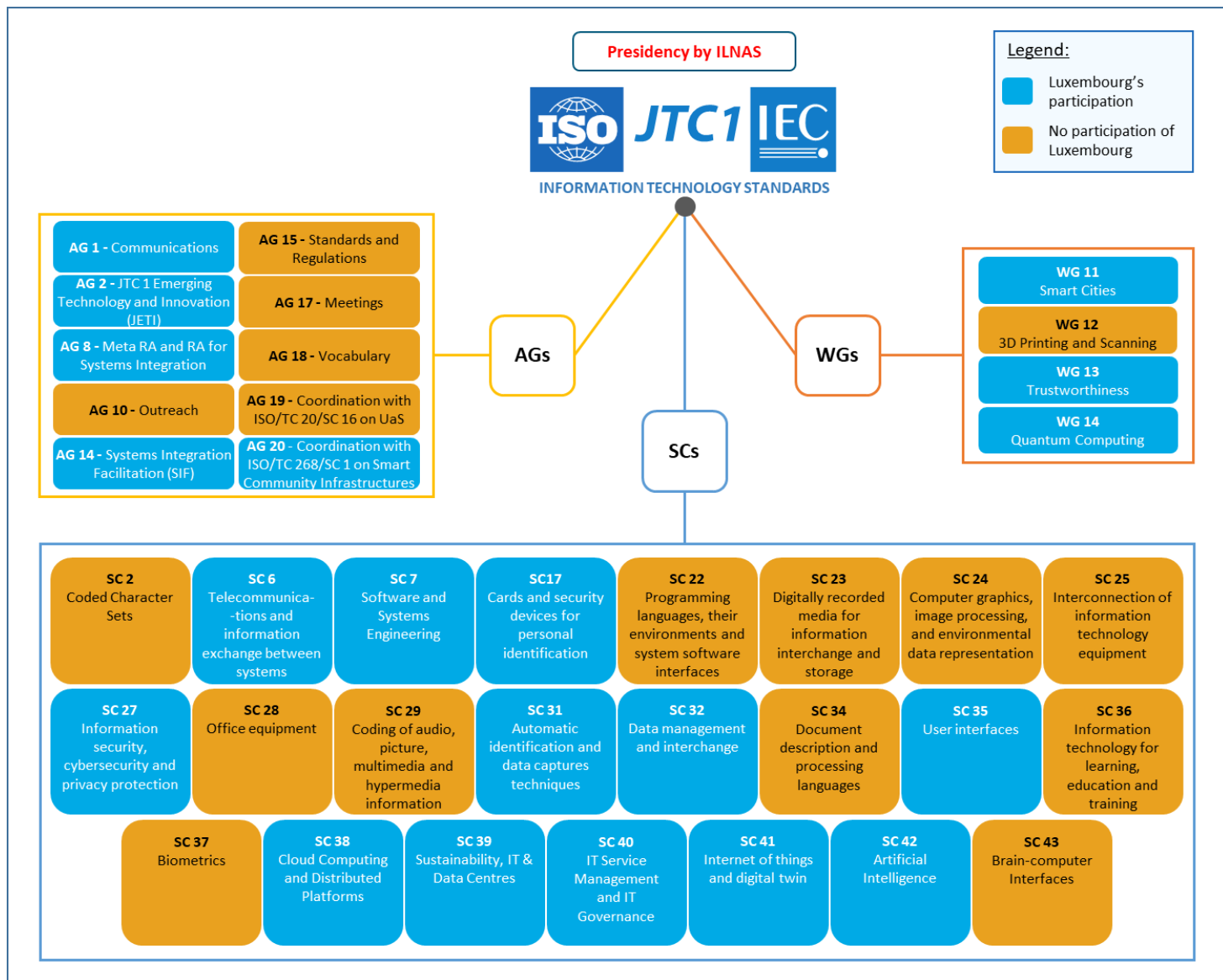
ISO/IEC JTC 1

ISO/IEC JTC 1

→ 73 national delegates registered in ISO/IEC JTC 1

- **15 ETSI members** in Luxembourg
  - Rank 15 of the countries with the most members worldwide
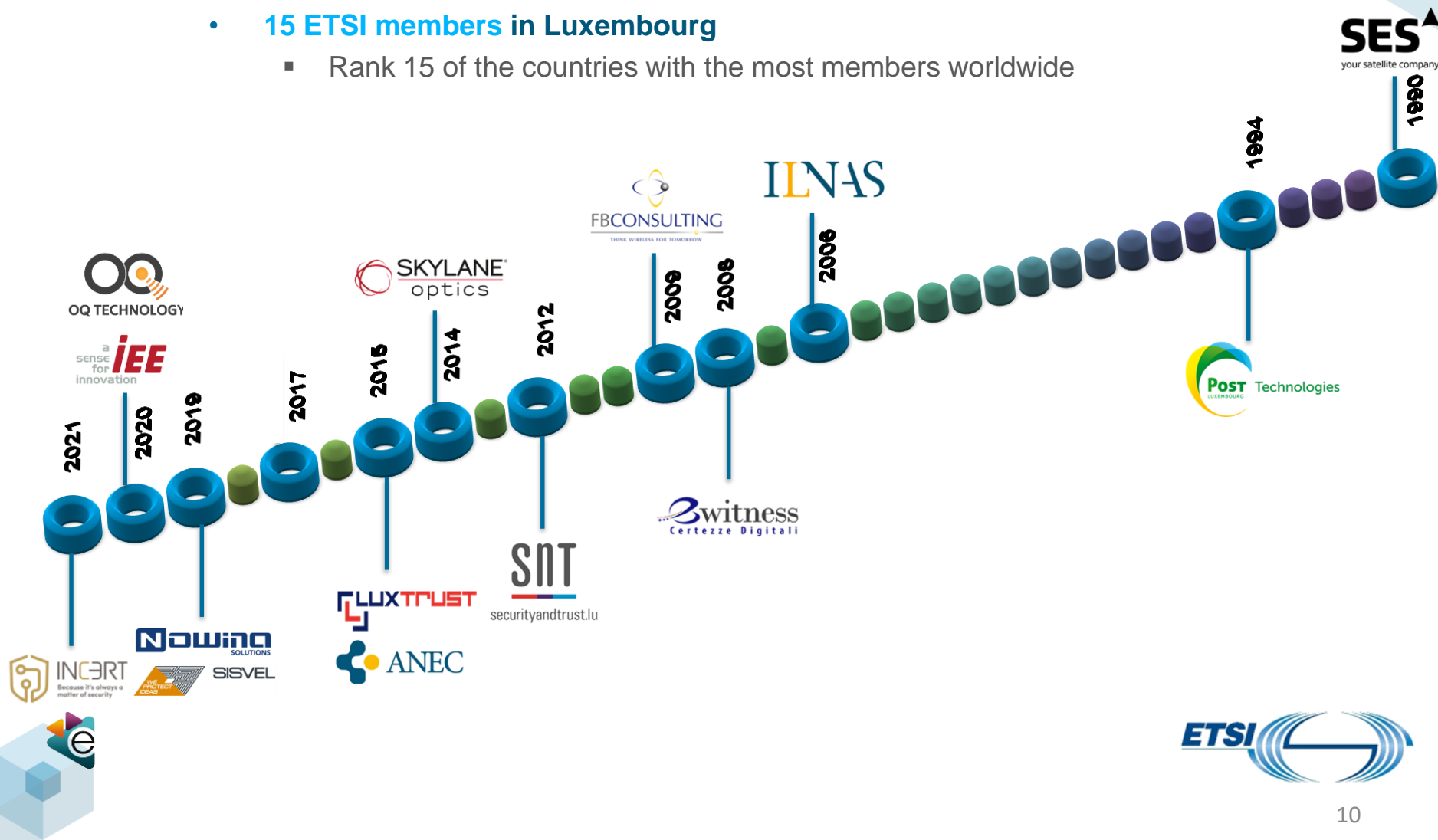
Research program "Technical Standardisation for Trusted Use in the Field of Smart ICT" (2017-2020) in collaboration with the University of Luxembourg

The University of Luxembourg and ILNAS are strengthening their collaboration in the field of Smart ICT and standardization. A ceremony was held on May 17, 2017 at the Ministry of Economy to formally conclude the partnership.

In the rear row, from left to right: Jean-Philippe Humbert, Pascal Bouvry, Paul Heuschling, Yves Elsen, Björn Ottersten; In the front row, from left to right: Ludwig Neyses, Francine Closener, Jean-Marie Reiff

The Smart-ICT Team — SnT

Nader Samir
- PhD Candidate
- Since 1.10.2017
- Industrial experience in UAVs

Prof. Pascal Bouvry
- Principal Investigator
- Project coordination
- PhD supervision

Saharnaz Dilmaghani
- PhD Candidate
- Since 01.03.2018
- Standardization experience

Chao Liu
- PhD Candidate
- Since 15.10.2017
- Cloud Computing

Matthias Brust
- Postdoc
- Project support

10/2018 - White Paper "DATA PROTECTION AND PRIVACY IN SMART ICT - SCIENTIFIC RESEARCH AND TECHNICAL STANDARDIZATION"

IS Day 2019 - Information Security Awards Security Project of the Year: SnT – ILNAS

10/2019 - Technical Reports "SMART ICT: GAP ANALYSIS BETWEEN SCIENTIFIC RESEARCH AND TECHNICAL STANDARDIZATION"

Journal Papers	4
Conference papers	21
Short Papers	4
White Paper	1
Technical Report	1
Awards	2
News Coverage	5
Talks to wider audience	15

Recent updates

- **Dr. Saharnaz Dilmaghani**
  - Winner of the 'Young Researcher' category of the CEN and CENELEC Standards+Innovation Awards (October 2021)
  - PhD thesis defended in Q1 2022 ("*On Trustworthy AI and Localized Complex Network Analytics*")

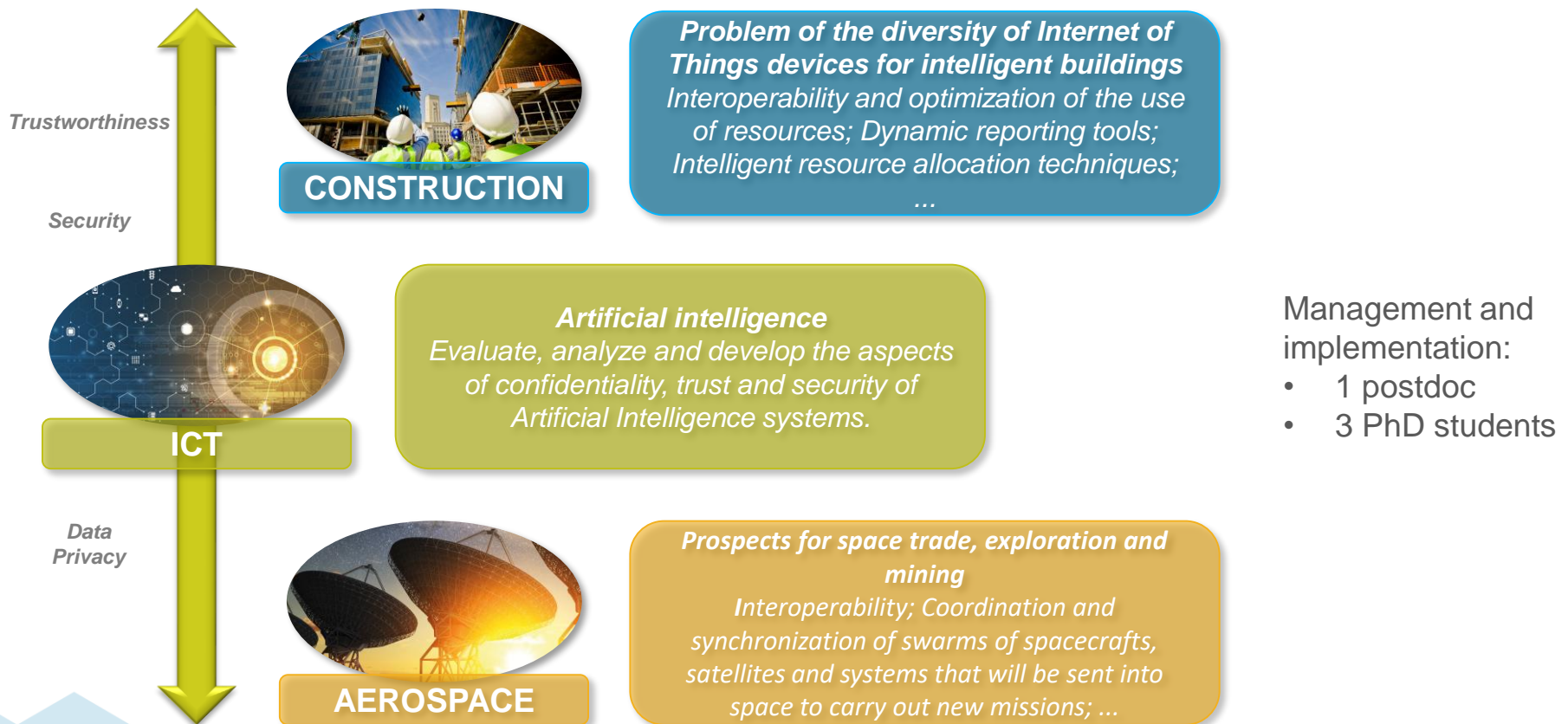- **Dr. Nader Samir Labib**
  - PhD thesis defended in Q4 2021 ("*A Distributed Unmanned Aerial Vehicles Traffic - Management System*")

Standards+Innovation Awards 2021

Saharnaz DILMAGHANI
Winner of Young Researcher category

Follow the conversation
#standardsplusinnovation

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

Research program "Technical Standardisation for Trustworthy ICT, Aerospace, and Construction" (2021-2024) in collaboration with the University of Luxembourg

Trustworthiness

Security

Data Privacy

CONSTRUCTION

Problem of the diversity of Internet of Things devices for intelligent buildings
Interoperability and optimization of the use of resources; Dynamic reporting tools; Intelligent resource allocation techniques; ...

ICT

Artificial intelligence
Evaluate, analyze and develop the aspects of confidentiality, trust and security of Artificial Intelligence systems.

AEROSPACE

Prospects for space trade, exploration and mining
Interoperability; Coordination and synchronization of swarms of spacecrafts, satellites and systems that will be sent into space to carry out new missions; ...

Management and implementation:
- 1 postdoc
- 3 PhD students

2010-2022 - ILNAS Research activities

DIGITAL TRUST

ARTIFICIAL INTELLIGENCE

BLOCKCHAIN

INTERNET OF THINGS

BIG DATA

2 *National Technical Standardization Reports* published

8 *White Papers* published

Technology review

Economic overview

Challenges

Technical Standardization

…

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2022 - Report "Technical Standardization - Addressing Cloud Computing Challenges and Supporting Related ICT Development"

Master MTECH

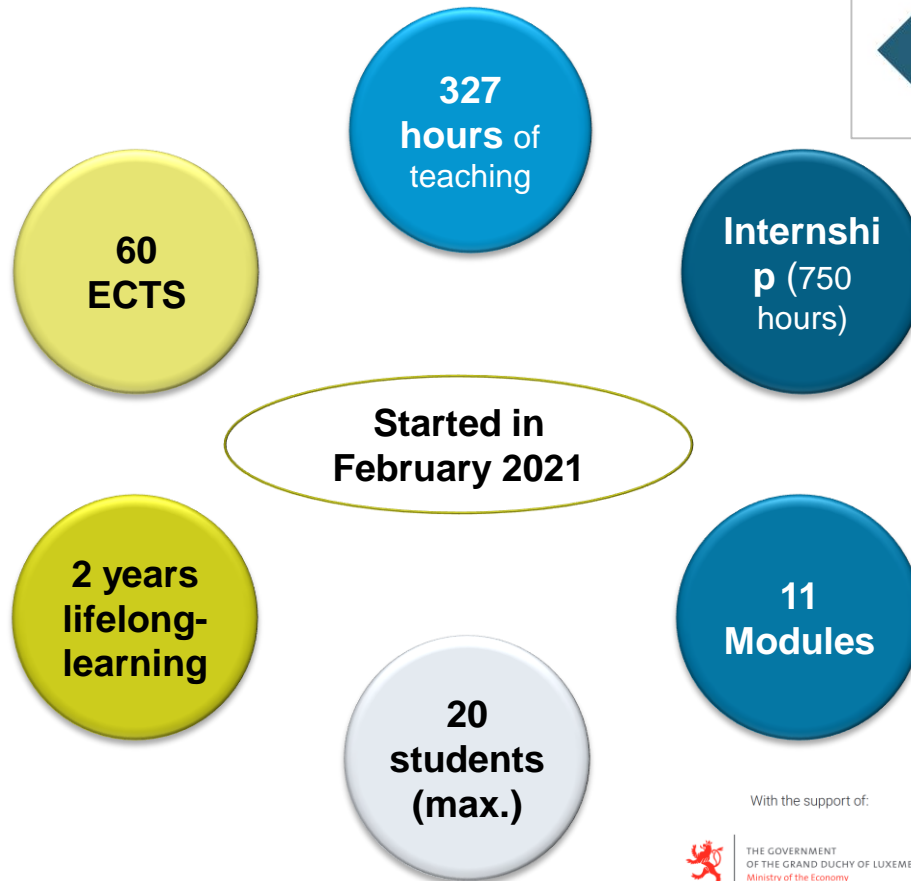**Master MTECH – ILNAS in collaboration with the University of Luxembourg and the Chamber of Employees**

STANDARDISATION	ECTS
Smart Secure ICT and Innovation	1
Technical Standardisation	3
TOTAL	4

SMART ICT	ECTS
Smart ICT Technologies I	5
Smart ICT Technologies II	5
TOTAL	10

DIGITAL TRUST FOR SMART ICT	ECTS
Security for Smart ICT I	2
Security for Smart ICT II	3
Trust Architectures for Smart ICT	4
TOTAL	9

TECHNOPRENEURSHIP	ECTS
Management of Business and Technical Innovation	3
Digital Intelligence	2
Legal Aspects	2
TOTAL	7

MASTER THESIS	ECTS
Master Thesis	30
TOTAL	30

327 hours of teaching

60 ECTS

Internship (750 hours)

Started in February 2021

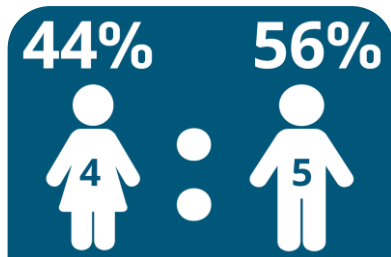**2 years lifelong-learning**

20 students (max.)

11 Modules

With the support of:

THE GOVERNMENT
OF THE GRAND DUCHY OF LUXEMBOURG
Ministry of the Economy

Supporting and strengthening the EaS and the related research activities

Master MTECH – Profile of the students enrolled in the Master MTECH

WOMEN : MEN

44%   56%

4 : 5

AGE

28 → 45

Average: 38

NATIONALITIES

6

ECONOMIC SECTORS

34%

33%

11%

22%

- Banking
- IT & Telecom
- Public sector
- Self-employed

ILNAS

June 2022

September 2022

January 2023

February 2023

End of third semester

Internship + Master Thesis

Master Thesis defense

Start of the registration for the 2nd promotion

Start of the 2nd promotion

→ Portail qualité:
www.portail-qualite.lu

→ ILNAS e-shop:
https://ilnas.services-publics.lu/

→ Newsletters: https://portail-qualite.public.lu/fr/support/newsletter.html
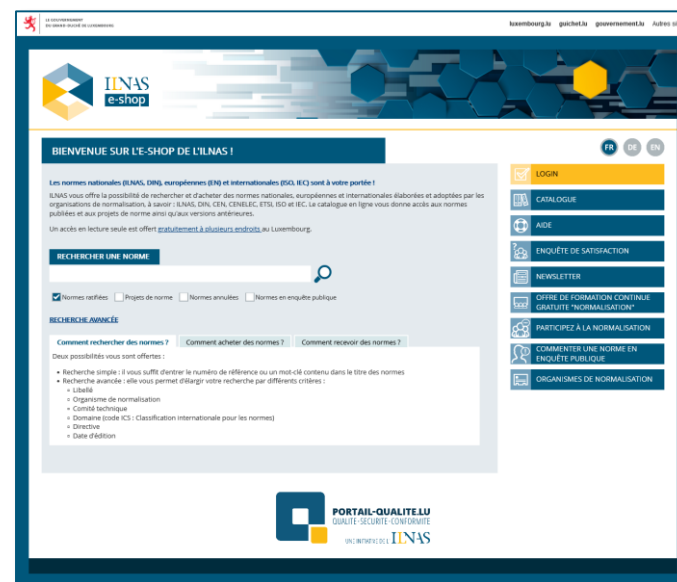
→ Social Networks:

ILNAS Breakfast "Technical Standardization: addressing Cloud Computing challenges and supporting related ICT development"

Presentation of the *organisme luxembourgeois de normalisation (OLN)*

14th June 2022

Nicolas DOMENJOUD - Responsible ICT & Technical Standardization, ILNAS

- **Coordinate and supervise the creation of national standards**
  - o **Construction sector**
   - ▪ Creation of a national standards office (in collaboration with CRTI-B)
    - ▪ National standard about the living surface (published - ILNAS 101:2016)
    - ▪ National annexes of the Eurocodes (published in 2011 and revised in 2019)
    - ▪ National annexes on concrete (ongoing work)
    - ▪ National standard on building acoustics (published – ILNAS 103-1:2022)
    - ▪ National standard related to the technical controls of buildings (published – ILNAS 105-1:2021)

  - o **Information and Communication Technologies (ICT) sector**
    - ▪ National standard on e-archiving (ongoing work)
    - ▪ National standard on information security in the context of the accreditation of laboratories (published - ILNAS 107:2020)

  - o **Other domains**
    - ▪ National annex concerning the Winter Diesel (published - EN 590:2013+A1:2017/AN-LU:2019)
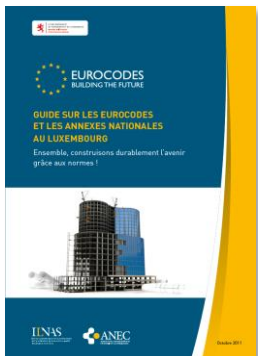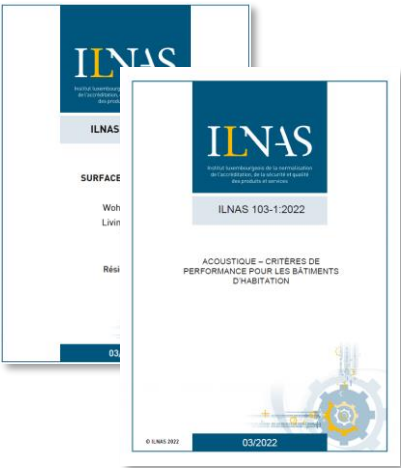
- 85 national standards (ILNAS)

- +81.000* European standards (CEN, CENELEC and ETSI)

- +74.000* International standards (ISO and IEC)

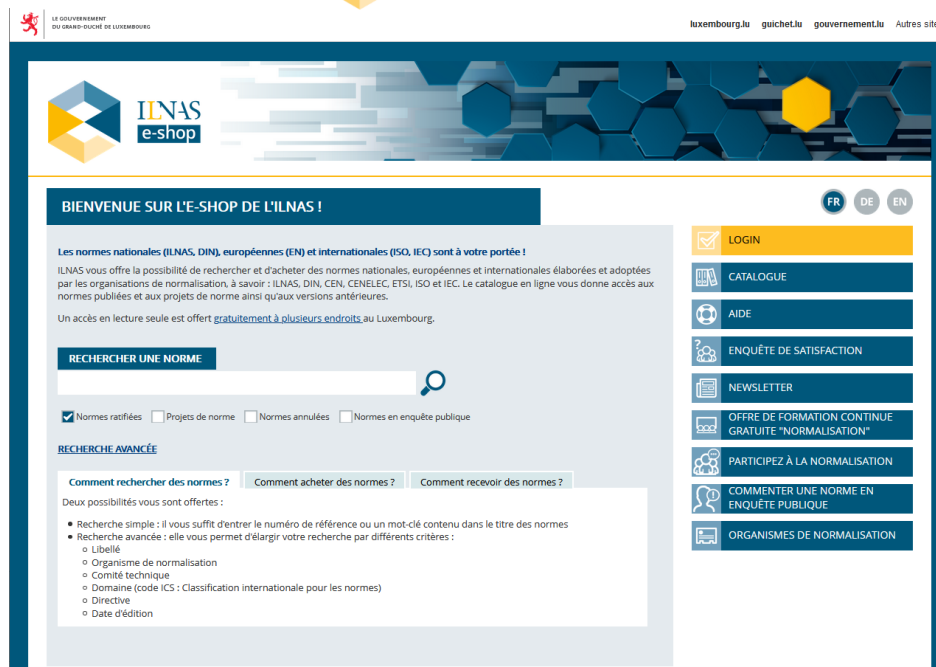- +49.000* German standards (DIN)

→ More than **200.000 normative documents available**

(*) = active and inactive

- Electronic format

- Languages : French, German & English

- Attractive prices

- Free access to draft standards in public enquiry (ILNAS, CEN, CENELEC, ETSI and IEC)

- Free consultation of European (CEN,CENELEC & ETSI), international (ISO & IEC) and national (ILNAS) standards

- Locations:

  1. **Esch-sur-Alzette & Sanem**
     - ILNAS premises in Esch-Belval (<u>on appointment</u>)
     - Luxembourg Learning Centre in Esch-Belval
     - LIST premises in Belvaux

  2. **Luxembourg city**
     - University of Luxembourg - Kirchberg
     - Securitymade.lu (SMILE) (<u>on appointment</u>)
     - Chambre des Métiers - Kirchberg
     - Lycée des Arts et Métiers - Limpertsberg

  3. **Echternach**
     - Town administration of Echternach

  4. **Redange-sur-Attert**
     - Atert Lycée Redange

- **Participation in standardization activities**
  - o Management of the participation of national experts who represent Luxembourg in the European and international technical committees
    - ▪ Open to everybody
    - ▪ Free of charge

- **National register of delegates**
  - o 284 experts registered (May 2022)
  - o 1032 registrations in technical committees
  - o Link: https://gd.lu/cCN7qg

Registre national des délégués en normalisation - Mai 2022

Nombre d'inscriptions aux comités techniques :

ILNAS/OLN	68
CEN	230
CENELEC	12
CEN/CLC	35
CEN/CLC/ETSI	2
ECISS	0
ISO/IEC	380
ISO	293
IEC	12
Total	1032

Nombre de personnes inscrites : 284

ILNAS

1, av du Swing - L-4367 Belvaux - Tél. : (+352) 24 77 43 40 - Fax : (+352) 24 79 43 40 - Email : normalisation@ilnas.etat.lu - www.portail-qualite.lu

jeudi 5 mai 2022   Approuvé par Jérôme HOEROLD   Page 1 sur 105

→ More information available on: https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html

ILNAS representation in ICT technical standardization

- **Representing Luxembourg in the "EU Multi Stakeholder platform on ICT Standardisation"**
  - o Publish the "Rolling Plan on ICT Standardisation" each year - "*a unique bridge between EU policies and standardisation activities in the field of ICT*"

- **Representing Luxembourg in the INT and EU standardization organizations**
  - o Member of CEN, CENELEC, ISO and IEC
  - o NSO and Administration in ETSI (Head of National delegation in ETSI GA)
  - o ADMIN in ITU-T (representing Luxembourg in standardization activities of ITU)

- **Following closely ICT-related standardization activities in all the SDOs**
  - o 94 national delegates registered in technical committees (CEN/CLC, ISO/IEC JTC 1, etc.)
  - o Presidency of the National Mirror Committee ISO/IEC JTC 1

- **Development of National Standardization Commission (NSC) to strengthening the national standardization communities in specific ICT subsectors**
  - o NSC 01 – Cybersecurity created in 2021
  - o Development of new NSC planned in 2022 (e.g.: Artificial Intelligence)

- **Foster and promote voluntary, consensus-based standards**
  - Website (portail-qualite.lu) regularly updated
  - Monthly Newsletter (https://gd.lu/4lTr96)
  - Events (e.g.: World Standards Day)
  - Brochures & White Papers
  - Social Media (LinkedIn, YouTube)

- **Organize education and training courses about standardization**
  - Training catalogue (updated annually)

- **Partnerships with University of Luxembourg**
  - Research program (2017-2020) on "Digital Trust for Smart ICT"
  - Master MTECH "Technopreneurship: mastering smart ICT, standardisation and digital trust for enabling next generation of ICT solutions"
  - Research program (2021-2024) "Technical Standardisation for Trustworthy ICT, Aerospace, and Construction (2021-2024)"

ILNAS Breakfast "Technical Standardization: addressing Cloud Computing challenges and supporting related ICT development"
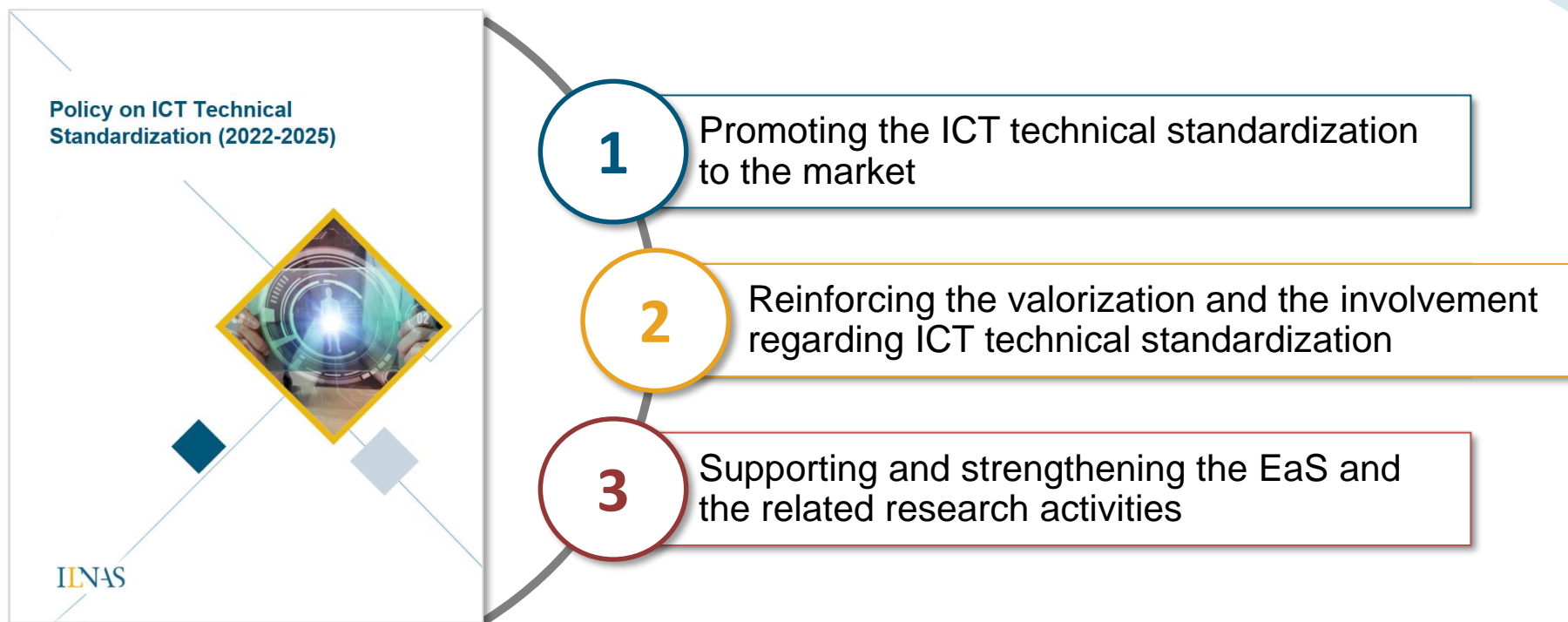
Presentation of the report "Technical Standardization: addressing Cloud Computing challenges and supporting ICT development"

14th June 2022

Rim DOUKHA – Project Officer, ANEC GIE

Policy on ICT Technical Standardization (2022-2025)

ILNAS

1 Promoting the ICT technical standardization to the market

2 Reinforcing the valorization and the involvement regarding ICT technical standardization

3 Supporting and strengthening the EaS and the related research activities

An outcome of "Project 3" in support of "Project 1" and "Project 2"

"Developing ICT research activities"

- Baseline resource about technical standardization in the field of Cloud Computing and related ICT technologies
- Practical information
- Freely available online

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Main information
The importance of technical standardization in addressing Cloud Computing and related ICT challenges

Purpose
To help you identify :
- Relevant technical committees related to Cloud Computing and interlinked ICT technologies
- Relevant standards and projects addressing Cloud Computing challenges

What aims?
- Sources of technical standards that might impact you
- Understand the importance of technical standardization in Cloud Computing
- Identify standards development connected to your business to which participating could be of interest

Part 1

Introduction to Cloud Computing
- Cloud Computing overview
- Cloud Computing challenges

Part 2

Introduction to standardization in the field of Cloud Computing
- The importance of technical standardization in the Cloud
- Overview of technical committees related to Cloud Computing
- List of standards addressing Cloud Computing challenges

Part 3

Cloud Computing supporting ICT developments: technical standardization as an enabler for the expansion of interlinked ICT technologies
- How can Cloud support AI, IoT and software engineering?
- Related standardization developments

Part 4

Standardization opportunities in Luxembourg
- How to access ICT standards
- Why and how to get involved in standards development

Part 1

Introduction to Cloud Computing
- Cloud computing overview
- Cloud computing challenges

ILNAS

ANEC

Part 2

Introduction to standardization in the field of Cloud
- The importance of technical standardization in the Cloud
- Overview of technical committees related to Cloud Computing
- List of standards addressing Cloud Computing challenges

Standardization organizations

	General Standardization	Electrotechnical Standardization	Telecommunications Standardization
International level	ISO	IEC	ETSI / ITU
European level	cen	CENELEC	
National level	ILNAS	ILNAS	ILNAS

ISO/IEC JTC 1/SC 38 "Cloud Computing and distributed platforms"

ISO/IEC JTC 1/SC 27 "Information security, cybersecurity and privacy protection"

ITU-T/SG 13 "Future networks and emerging network technologies"

ITU-T/SG 17 "Security"

Standards and projects addressing Cloud Computing challenges (extract)

Transparency of Service Delivery and Billing

ISO/IEC TR 23613:2020, Cloud service metering elements and billing modes
ISO/IEC 19086-1:2016, Service level agreement (SLA) framework — Part 1: Overview and concepts
ISO/IEC 19086-2:2018, Service level agreement (SLA) framework — Part 2: Metric model
ISO/IEC 19086-3:2017, Service level agreement (SLA) framework — Part 3: Core conformance requirements

Interoperability and portability

ISO/IEC 19944:2020, Data and its flow across devices and Cloud services
ISO/IEC 19941:2017, Interoperability and portability
ISO/IEC 5140 *(Under development),* Concepts for multi-Cloud and other interoperation of multiple cloud services

Part 3

Cloud computing supporting ICT developments: technical standardization as an enabler for the expansion of the interlinked ICT technologies
- How can Cloud support AI, IoT and software engineering?
- Related standardization developments

➢ Considered interlinked ICT technologies and standardization committees:
- ○ AI
- ○ IoT
- ○ Software engineering

➢ Also, how can Cloud Computing support AI, IoT and software engineering?

➢ Example of standards that support AI, IoT, software engineering developments and take into consideration Cloud Computing

How can Cloud Computing support AI?

(extract)

Drive faster innovation

Instead of building a model from scratch that could take many months to build and train, Cloud providers offer pre-trained models that can be used to solve similar problems or can be used as a starting point for other problems.

Unlimited resources

The Cloud provides access to large data stores and computing resources (CPU, GPU, TPU...) that help store, process and analyze in real-time a huge amount of data needed for AI/ML applications.

Configured platforms

Training AI models requires a complex configuration and installation of many dependencies. Cloud Computing solves these challenges by providing on-demand AI frameworks to build and train AI applications without any prior management.

Technical committees

ISO/IEC JTC 1/SC 42 "Artificial intelligence"

ISO/IEC JTC 1/SC 41 "Internet of Things and Digital Twin"

ISO/IEC JTC 1/SC 7 "Software and systems engineering"

(extract)

AI

ISO/IEC TR 24030:2021, Information technology - Artificial intelligence (AI) - Use cases

ISO/IEC 23053 *(Under development),* Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML)

IoT

ISO/IEC TR 30164:2020, Internet of things (IoT) - Edge computing

ISO/IEC 30161-1:2020, Internet of Things (IoT) - Requirements of IoT data exchange platform for various IoT services

SE

ISO/IEC TS 25052-1 *(Under development)*, Systems and software Quality Requirements and Evaluation (SQuaRE): cloud services - Part 1: Quality model

ISO/IEC TR 24586-series *(Under development),* Software and systems engineering — Agile and DevOps principles and practices

Part 4

Standardization opportunities in Luxembourg
- How to access ICT standards?
- Why and how to get involved in standards' development

Consulting and purchasing standards

- Reading stations
- e-Shop

Who can participate?

Open to all socio-economic actors in Luxembourg

Costs of participation?

Registration is free-of-charge

How to register?

Registration is done using the ILNAS/OLN/F001a form (Initial registration) or the ILNAS/OLN/F001b form (Additional registration).

- **Possibility to contribute to Cloud Computing and related standards**

    o Contribute to the work of ISO/IEC JTC 1/SC 38

    o Register in the national mirror committee

    o Free participation

    o Registration form ILNAS/OLN/F001a : **https://gd.lu/3vtZJC**

    ➢ Many other standards and standardization committees in Europe (CEN, CENELEC, ETSI) and in the world (ISO, IEC)

Why get involved in standards development?

- Collaborate to defend common interests
- Learn about your competitors and their positions in meetings
- Promote your organization and your skills at national, European and international levels
- Access drafts standards and influence their content based on your know-how
- Propose new standards projects
- Increase your knowledge regarding the state of the art in standardization of your core business
- Anticipate the evolution of your activity sector's good practices
- Integrate strategic network of national, European or international experts

Main takeaways of the Cloud Computing report

- **Know the importance of technical standardization in Cloud Computing and related ICT domains**
    o Know some existing standards
    o Know who is developing standards that might impact you
    o Follow their work, their evolution
    o Join them as delegate to
        ▪ Shape new standards that are in project form
        ▪ Rework published standards that are under revision
        ▪ Propose new standards and lead projects
- **Know what services ILNAS and ANEC GIE can offer to support you**
    o Coach you as a delegate
    o Serve as an interface to submit comments

DON'T HESITATE TO:

- **DIVE INTO THE DOCUMENT!**
- **CONTACT THE ANEC GIE ICT PROJECT OFFICERS!**

Thank you for your attention!

ACCRÉDITATION

CONFIANCE NUMÉRIQUE

SURVEILLANCE DU MARCHÉ

MÉTROLOGIE

NORMALISATION

- Satisfaction survey of the breakfast
- Declaration of interest

ILNAS **ANEC**

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