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Normalisation : un support pour la politique européenne en matière d'Intelligence Artificielle

M. Nicolas Domenjoud, ILNAS

Mme Natalia Vinogradova-Cassagnes, ANEC GIE

Témoignage : Dr. Emilia Tantar, Black Swan LUX

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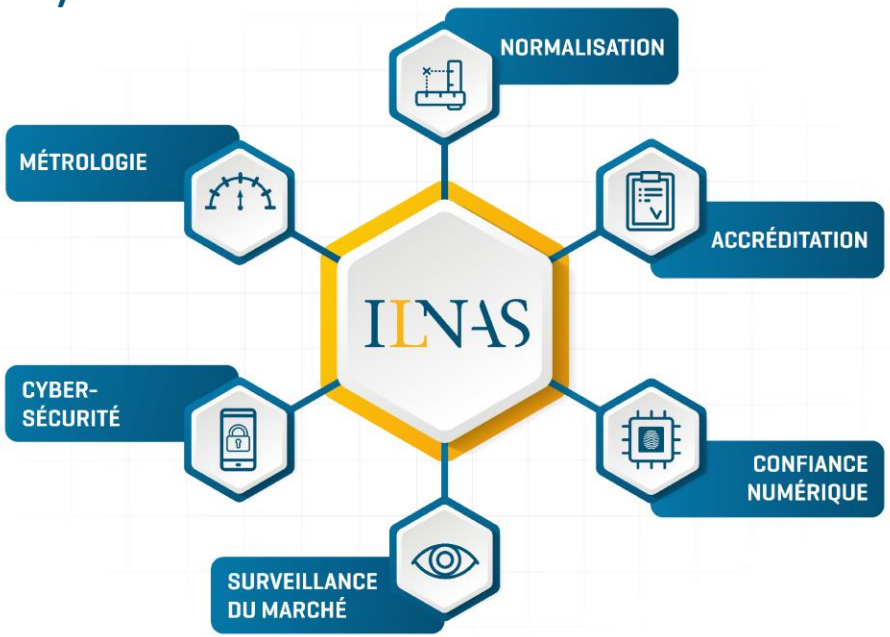
Introduction
Les normes en support de la politique européenne

M. Nicolas Domenjoud, ILNAS

Présentation de l'ILNAS

- **ILNAS**
  - Statut : Administration publique sous tutelle de M. le Ministre de l'Économie
  - Création : Loi du 20 mai 2008 relative à la création de l'ILNAS
  - Législation en vigueur : Loi modifiée du 4 juillet 2014 portant réorganisation de l'ILNAS
  - Ressources humaines : 53 collaborateurs (avril 2022)
  - Certification ISO 9001:2015

- **Organisme luxembourgeois de normalisation (OLN)**
  - Composé de 6 collaborateurs
  - Collaboration étroite avec le département normalisation de l'ANEC GIE
  - Objectifs principaux :
    - Création d'une culture normative
    - Création de normes nationales
    - Mise à disposition des normes
    - Participer à la création de normes européennes et internationales
    - Représentation du Luxembourg au niveau européen et international



Agence pour la normalisation et l'économie de la connaissance (ANEC GIE)

- **Création** : 4 octobre 2010

- **Statut** : Groupement d'intérêt économique (GIE)

- **Missions** : Promotion, sensibilisation et formation, recherche appliquée dans le domaine de la normalisation et de la métrologie afin de soutenir la compétitivité des entreprises au Luxembourg

- **Effectif total** : 13 collaborateurs (6 dans le département normalisation, 5 dans le département métrologie et 2 dans le département budget et administration)

- **Membres** :

LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Économie

ILNAS

CHAMBRE DES METIERS Luxembourg

CHAMBRE DE COMMERCE LUXEMBOURG

➔ Supporte l'ILNAS dans l'exécution de la Stratégie normative luxembourgeoise

Stratégie normative luxembourgeoise 2020-2030

Normalisation technique
« Outil inclusive de performance et d'excellence au service de l'économie »

→ Stratégie signee par M. le minister de l'Economie

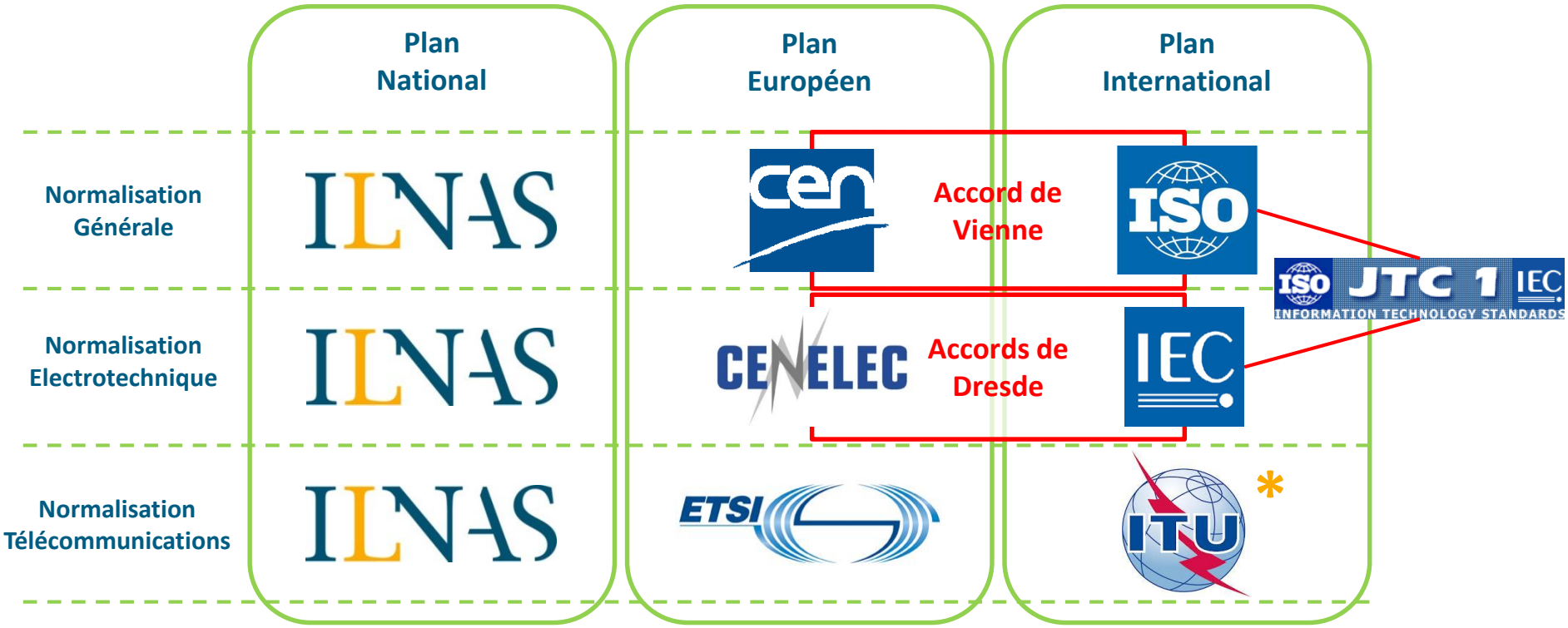
PERFORMANCE

- ❑ **Pilier 1 - Valoriser et promouvoir l'utilisation des normes techniques pertinentes**
- ❑ **Pilier 2 - Favoriser et accompagner l'implication au sein du processus de normalisation technique**

EXCELLENCE

- ❑ **Pilier 3 - Assurer la participation active de l'Organisme luxembourgeois de normalisation au sein des organisations européennes et internationales de normalisation**
- ❑ **Pilier 4 - Organiser et participer au développement des axes de recherche et d'éducation normatifs**

Organisations de normalisation



* ITU-T

Le rôle de la normalisation dans le cadre légal communautaire

Accroître la compétitivité des entreprises européennes

Améliorer la convergence générale des normes internationales pour éliminer les obstacles techniques au commerce

Faciliter l'accès à de nouveaux marchés

Normes et Législation – Quelles différences

NORMES

1. Volontaires
2. Consensuelles
3. Développées par des organisations indépendantes
4. Révisées tous les 5 ans
5. Fournissent des spécifications et des méthodes de test (interopérabilité, sécurité, qualité, etc.)

LEGISLATION

1. Obligatoire
2. Imposée par la loi
3. Etablie par les autorités publiques
4. Révisée sur décision du législateur
5. Etablit des exigences pour protéger les intérêts publics

Les références aux normes dans la législation EU

- **Des références directes : obligation pour le produit d'être en conformité avec la norme dans certains usages spécifiques**
  - Exceptionnel
  - Résiduel
  - Nécessite de réviser la législation à chaque fois que la norme est révisée

- **NOUVELLE APPROCHE : Références indirectes**
  - Textes légaux font référence à des normes publiées
  - Les références sont publiées séparément au Journal Officiel de l'UE

- **Facilite la libre circulation des produits et des services dans le Marché Unique en garantissant un niveau élevé de protection pour les consommateurs**

Base légale de la normalisation européenne

- **Règlement UE n°1025/2012**

  - Définit l'utilisation des normes européennes pour les produits et les services en support de la législation et de la politique européenne

  - Etablit les obligations des organismes européens (CEN, CENELEC et ETSI) et nationaux de normalisation (ex. : ILNAS)
    - Transparence du processus de normalisation
    - Participation des parties prenantes dans les activités européennes et nationales de normalisation

Programme de travail

- **Programme de travail (UE / ONN) publiquement disponible**

- **Programme de travail annuel de la Commission Européenne**

  - Définit les normes et autres documents normatifs que la CE entend requérir des organisations européennes de normalisation

  - La Commission Européenne ne peut effectuer des requêtes de normalisation que dans les domaines listés dans son programme de travail annuel pour produire des normes harmonisées

    - 2022* – Exemple : *Safe and trustworthy artificial intelligence systems*

** The 2022 annual EU work programme for European standardization (02/2022) - https://ec.europa.eu/docsroom/documents/48601*

Les requêtes de normalisation

- **Requêtes de normalisation = mandat de normalisation**

- **Emises par la Commission Européenne en support de la politique et de la législation européenne**
  - Requête préliminaire développée par la CE en consultation avec l'ensemble des parties prenantes intéressées
  - Requête préliminaire soumise au vote d'un comité sur les normes mis en place par le règlement 1025/2012
  - Si le vote est positif la CE adopte la requête en tant que décision d'application
  - Les organisations européennes de normalisation peuvent accepter ou refuser la requête
    - Refus rares grâce à la consultation préalable des parties prenantes

Normes harmonisées

- **Normes européenne développée par un organisme de normalisation européen reconnu (CEN, CENELEC et ETSI)**

- **Développées sur base d'une requête de normalisation de la Commission Européenne**

- **Peuvent être utilisées par les fabricants, les autres opérateurs économiques et les organismes d'évaluation de la conformité pour démontrer que leur produit, service ou processus est conforme à la législation européenne pertinente**
  - Présomption de conformité
  - D'autres spécifications peuvent être utilisées à condition que ces dernières soient appropriées pour établir la conformité avec les exigences légales

- **Enregistrées au Journal Officiel de l'Union Européenne**

- **Transposées en tant que normes nationales par les Etats Membres**

Résumé du processus

Directive / Règlement

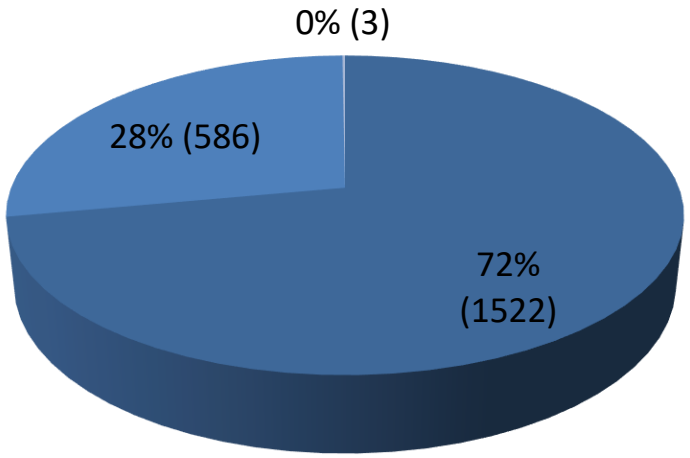
Mandat de normalisation

Norme harmonisée

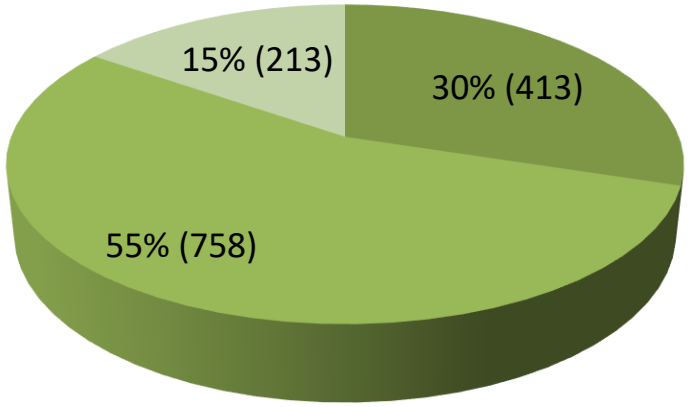
Publication au Journal Officiel

Transposition par les organismes de normalisation nationaux des Etats Membres

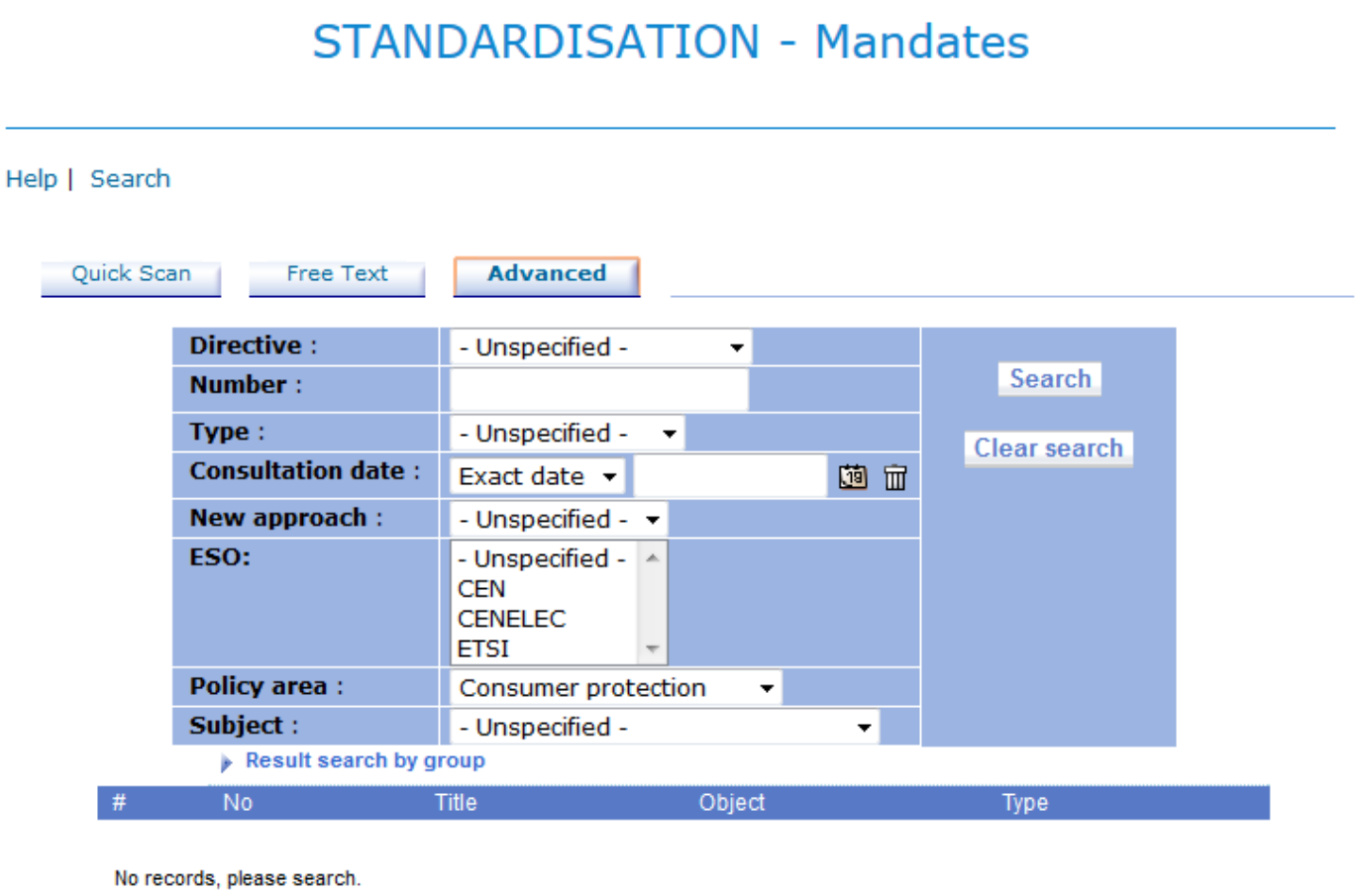
Normes harmonisées du CEN



Normes harmonisées du CENELEC



Identifier les mandats de normalisation



https://ec.europa.eu/growth/tools-databases/mandates/index.cfm?fuseaction=refSearch.main

Identifier les normes harmonisées

Accessibility

- Websites and mobile applications of public sector bodies EN

Chemicals

- Chemical substances (REACH) EN
- Explosives for civil uses EN
- Pyrotechnic articles EN

Conformity assessment and management systems

- New Legislative Framework (NLF) and Eco-Management and Audit Scheme (EMAS) EN

Construction

- Construction products (CPD/CPR) EN

Consumers and workers protection

- Cosmetics products EN
- General product safety EN
- Personal protective equipment (PPE) EN
- Toys safety EN

https://ec.europa.eu/growth/single-market/european-standards/harmonised-standards_en

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Les normes en support de la politique européenne en matière d'Intelligence Artificielle

Mme Natalia Vinogradova-Cassagnes, ANEC GIE

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Role of Harmonized Standards

CHAPTER 5

STANDARDS, CONFORMITY ASSESSMENT, CERTIFICATES, REGISTRATION

Article 40
Harmonised standards

High-risk AI systems which are in conformity with harmonised standards or parts thereof the references of which have been published in the Official Journal of the European Union shall be presumed to be in conformity with the requirements set out in Chapter 2 of this Title, to the extent those standards cover those requirements.

Article 41
Common specifications

Where harmonised standards referred to in Article 40 do not exist or where the Commission considers that the relevant harmonised standards are insufficient or that there is a need to address specific safety or fundamental right concerns, the Commission may, by means of implementing acts, adopt common specifications in respect of the requirements set out in Chapter 2 of this Title. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 74(2).

Article 43
Conformity assessment

For high-risk AI systems listed in point 1 of Annex III, where, in demonstrating the compliance of a high-risk AI system with the requirements set out in Chapter 2 of this Title, the provider has applied harmonised standards referred to in Article 40, or, where applicable, common specifications referred to in Article 41, the provider shall follow one of the following procedures:

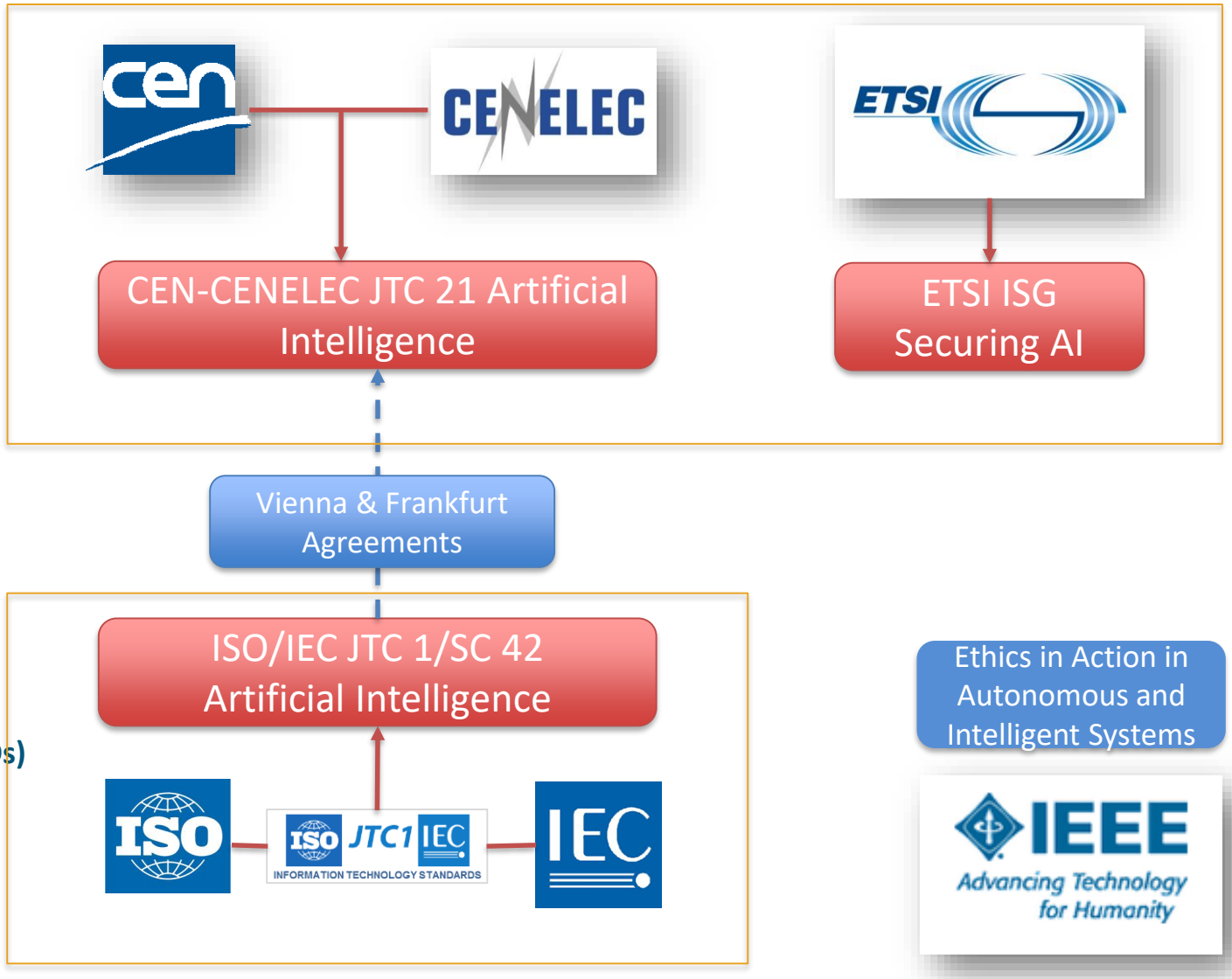
(a) the conformity assessment procedure based on internal control referred to in Annex VI;

(b) the conformity assessment procedure based on assessment of the quality management system and assessment of the technical documentation, with the involvement of a notified body, referred to in Annex VII.

Normalisation : un support pour la politique européenne en matière d'Intelligence Artificielle

Standards Development Organizations for Harmonized Standards

European Standards Development Organizations (SDOs)



International Standards Development Organizations (SDOs)

Ethics in Action in Autonomous and Intelligent Systems

IEEE Advancing Technology for Humanity

Article 9

Risk management system

A risk management system shall be established, implemented, documented and maintained in relation to high-risk AI systems.

Continuous iterative process throughout the entire lifecycle: identification, evaluation and mitigation

Testing: consistent performance, suitability, against defined metrics

Specific considerations if likely to be accessed by or have an impact on children

Continuous iterative process throughout the entire lifecycle: identification, evaluation and mitigation

ISO/IEC 23894 AI Risk Management

ISO/IEC 42005 AI system impact assessment

ISO/IEC 4213 Assessment of machine learning classification performance

AI Risk Catalogue

Testing: consistent performance, suitability, against defined metrics

ISO/IEC 29119-11 Testing for AI systems

ISO/IEC 17847 Verification and validation analysis of AI systems

Specific considerations if likely to be accessed by or have an impact on children

IEEE P2089:2021
Standard for Age Appropriate Digital Services Framework - Based on the 5 Rights Principles for Children

Article 10
Data and data governance

High-risk AI systems which make use of techniques involving the training of models with data shall be developed on the basis of training, validation and testing data sets that meet the quality criteria referred to in paragraphs 2 to 5.

Management and governance of training, validation and testing data sets

Data quality: relevant, representative, free of errors, complete

Bias monitoring, privacy protection

Management and governance of training, validation and testing data sets

ISO/IEC 8183 Artificial intelligence — Data life cycle framework

ISO/IEC 5259-3 Data quality for analytics and machine learning (ML) — Part 3: Data quality management requirements and guidelines

ISO/IEC 5259-5 Data quality for analytics and machine learning (ML) — Part 5: Data quality governance

Data quality: relevant, representative, free of errors, complete

ISO/IEC 5259-2 Data quality for analytics and machine learning (ML) — Part 2: Data quality measures

ISO/IEC 5259-4 Data quality for analytics and machine learning (ML) — Part 4: Data quality process framework

Bias monitoring, privacy protection

ISO/IEC TR 24027:2021 Bias in AI systems and AI aided decision making

ETSI GR SAI 008
Privacy aspects of AI/ML systems

Article 11
Technical documentation

The technical documentation of a high-risk AI system shall be drawn up before that system is placed on the market or put into service and shall be kept up-to date.

Article 12
Record-keeping

High-risk AI systems shall be designed and developed with capabilities enabling the automatic recording of events ('logs') while the high-risk AI systems is operating. Those logging capabilities shall conform to recognised standards or common specifications.

The logging capabilities shall ensure a level of traceability of the AI system's functioning throughout its lifecycle that is appropriate to the intended purpose of the system.

Article 11
Technical documentation

The technical documentation of a high-risk AI system shall be drawn up before that system is placed on the market or put into service and shall be kept up-to date.

No standards

Article 12
Record-keeping

High-risk AI systems shall be designed and developed with capabilities enabling the automatic recording of events ('logs') while the high-risk AI systems is operating. Those logging capabilities shall conform to recognised standards or common specifications.

The logging capabilities shall ensure a level of traceability of the AI system's functioning throughout its lifecycle that is appropriate to the intended purpose of the system.

Article 13

Transparency and provision of information to users

High-risk AI systems shall be designed and developed in such a way to ensure that their operation is sufficiently transparent to enable users to interpret the system's output and use it appropriately. An appropriate type and degree of transparency shall be ensured, with a view to achieving compliance with the relevant obligations of the user and of the provider set out in Chapter 3 of this Title.

Intended purpose	Levels of accuracy/robustness/cybersecurity	Circumstances leading to risks to health and safety
Input data spécifications	Human oversight measures	Expected lifetime and necessary maintenance

Intended purpose

Levels of accuracy/robustness/cybersecurity

Circumstances leading to risks to health and safety

Used datasets

Human oversight measures

Expected lifetime and necessary maintenance

ISO/IEC 12792
Transparency taxonomy of AI systems

ISO/IEC 5469
Functional safety and AI systems

Article 14
Human oversight

High-risk AI systems shall be designed and developed in such a way, including with appropriate human-machine interface tools, that they can be effectively overseen by natural persons during the period in which the AI system is in use.

Either built into the system or to be implemented by user

Human individuals to whom it is assigned shall be able to understand the limitations and act accordingly

Either built into the system or to be implemented by user

ISO/IEC TS 8200
Controllability of automated artificial intelligence systems

Human individuals to whom it is assigned shall be able to understand the limitations and act accordingly

Human oversight for AI systems

Article 15

Accuracy, robustness and cybersecurity

High-risk AI systems shall be designed and developed in such a way that they achieve, in the light of their intended purpose, an appropriate level of accuracy, robustness and cybersecurity, and perform consistently in those respects throughout their lifecycle.

Declared levels of accuracy

Resilience as regards errors, faults, or inconsistencies

Resilience as regards unauthorized third parties manipulations exploiting vulnerabilities

Robustness through back-up or fail-safe plans

Avoid bias in continuously learning systems

Declared levels of accuracy

ISO/IEC 4213
Assessment of machine learning classification performance

Resilience as regards errors, faults, or inconsistencies

ISO/IEC TR 24029-1:2021
Assessment of the robustness of neural networks — Part 1: Overview

ISO/IEC 24029-2
Assessment of the robustness of neural networks — Part 2: Methodology for the use of formal methods

ISO/IEC 5469
Functional safety and AI systems

Resilience as regards unauthorized third parties manipulations exploiting vulnerabilities

ETSI GR SAI 001 V1.1.1 (2022-01)
AI Threat Ontology

ETSI GR SAI 005 V1.1.1 (2021-03)
Mitigation Strategy Report

ETSI GR SAI 002 V1.1.1 (2021-08)
Data Supply Chain Security

ETSI GR SAI 006 V1.1.1 (2022-03)
The role of hardware in security of AI

ETSI GR SAI 003
Secuirty testing of AI

Avoid bias in continuously learning systems

ISO/IEC 12791
Treatment of unwanted bias in classification and regression machine learning tasks

Article 43

Conformity assessment

For high-risk AI systems listed in point 1 of Annex III, where, in demonstrating the compliance of a high-risk AI system with the requirements set out in Chapter 2 of this Title, the provider has applied harmonised standards referred to in Article 40, or, where applicable, common specifications referred to in Article 41, the provider shall follow one of the following procedures:

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ISO/IEC 42001

Artificial intelligence — Management system

ISO/IEC 42001

Artificial intelligence — Management system

Context of the organization	Leadership	Planning	Support
Operation	Performance evaluation	Improvement	Controls

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AI Conformity assessment and certification

Dr. Emilia Tantar, Black Swan LUX
Convenor CEN/CLC JTC 21 AI WG2 “Operational aspects
President of National Mirror Committee AI

Ready4AI, 16 May 2022
Chamber of Commerce

STATEMENT OF PURPOSE

Black Swan LUX

The purpose of the herein document is to offer a high-level view on aspects within AI standardisation, business implications [compiling a number of normative documents and articles on AI], with a main focus on societal and business-related implications. The presentation is intended for dissemination within the limits of the Ready4AI 2022 event, organised by Luxembourg Chamber of Commerce only. Where applicable, [public domain] external materials are credited and links are provided to allow referring to the respective originating works.

AI Standardization for an SME – our path

Our strategy:

Select 3-4 relevant standardisation initiatives and actively engage.

- CEN and CENELEC JTC 21:

Convenor of *Ad-hoc on AI conformity assessment*

Convenor of WG 2 "Operational aspects" including Conformity assessment

- EU Observatory of ICT Standards

- IEC SEG 10
- ISO/IEC JTC1/SC 42

- ***National level***

- European standards from *CEN CENELEC* Focus Group on AI and JTC 21

- International standards from *ISO*/IEC and IEC SEG 10

I. CEN and CENELEC JTC 21

A. WG 2 “Operational aspects”

The group is the first working group of the CEN and CENELEC JTC21 Artificial Intelligence treating with standardization requests

It joins WG1 Strategic Advisory Group

Structure:

- **Dr. Emilia Tantar (convenor, Luxembourg)**
- **Dr. Ansgar Koene (co-convenor, UK – informal role)**

The group treats all operational aspects related with the standardization request expected to come from the EC as to support the Artificial Intelligence Act

Our first work item is NWIP “TR AI Conformity Assessment” internally approved by the participating NMCs

Besides this, the group is intended to operationalize the adoption of international standards coming from ISO/IEC JTC 1/SC 42 Artificial Intelligence, including terms and definitions

Scope of AI Conformity assessment working group

Scope: **delivery of a technical report on AI Conformity Assessment, relevant for Europe and** *all the CEN/CENELEC national members** **and support further harmonised standards requests**

Timeline foreseen for initial scope -Technical report on AI Conformity assessment: 18 months

Timeline foreseen for follow up standardization work: to be aligned with the EU AI legislative proposal.

*CENELEC's National Members are the National Committees (NCs) of the 27 European Union countries, United Kingdom, the Republic of Northern Macedonia, Serbia and Turkey, plus three countries of the European Free Trade Association (Iceland, Norway and Switzerland). There is one member per country.

Further AI conformity assessment considerations

Identification of purpose and scope of the scheme

Object of conformity assessment:

- Product
- Service
- Process
- System
- **Person**
- Management system
- Body

Conformity assessment can be conducted by:

1st party: a manufacturer or supplier, the person or organization that provides the object

2nd party: a user or purchaser

3rd party: an independent body, a person or body that is independent of the person or body that provides the object.

Schemes should be developed in accordance with ISO/IEC 17067:2013, Conformity assessment -Fundamentals of product certification and guidelines for product certification schemes.

Conformity assessment schemes can be setup as voluntary (“self-regulation”)

Accreditation applies only to 3rd party Conformity Assessment Bodies (CABs)

Proposal for a TR on AI conformity assessment

Scope:

This document sets out a review of the current methods and practices (including tools, assets, and conditions of acceptability) for conformity assessment in respect to, among others, products, services, processes, management systems, organizations, or persons, as relevant for the development and use of AI systems. It includes an industry horizontal (vertical agnostic) perspective as well as an industry vertical perspective.

This document focuses only on the process of assessment and gap analysis of conformity. It defines the **objects of conformity related to AI systems** and all other related aspects of the process of conformity assessment. The document also reviews to what extent AI poses specific challenges with respect to assessment of, for example, software engineering, data quality and engineering processes.

This document takes into account requirements and orientations from policy frameworks such as the EU AI strategy and those from CEN and CENELEC member countries.

This document is intended for technologists, standards bodies, regulators and interested parties.

Proposal for a TR on AI conformity assessment: draft ToC

Existing Conformity Assessment toolboxes and methodology

Horizontal approach

Characteristics identified as important for conformity assessment

1. Conformity assessment components/assets
2. Competencies of notification bodies

Risk assessment/management components:

Vertical approach

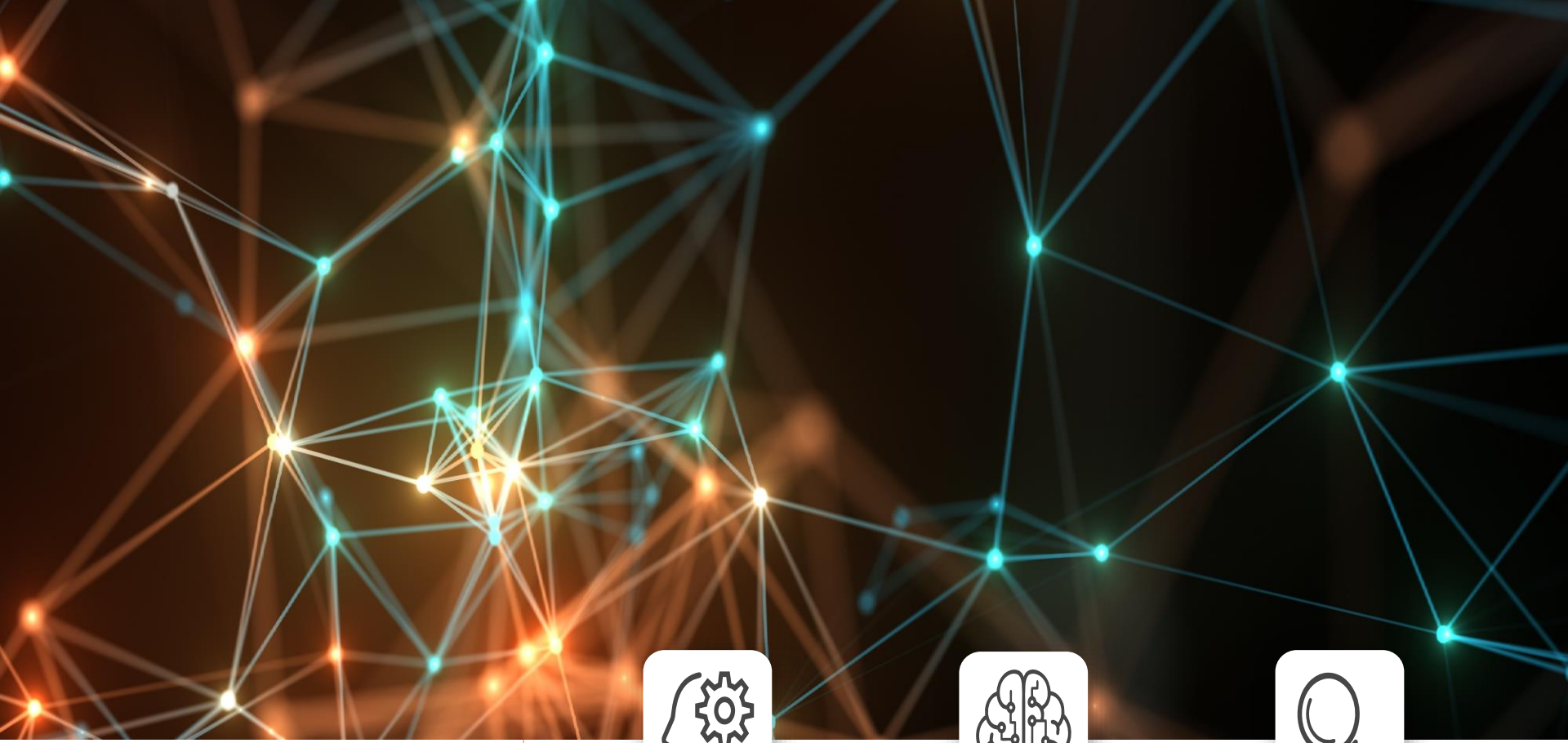
Following use cases provided by industry verticals

Asses existing sectorial regulation

Instruments of conformity assessment

Existing labels

Existing Conformity Assessment procedures from other areas (e.g. cybersecurity) and what is needed to adapt them as to reuse them for AI



Take aways

#Bewisestandardize

Standards to support regulation

Find your own path, no unique solution

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Participer à la normalisation technique

Participation à la normalisation - Devenir délégué national en normalisation

- **Participation aux activités de normalisation**
  - Gestion de la participation des experts nationaux qui représentent le Luxembourg au sein des comités techniques de normalisation européens et internationaux
    - Ouvert à tout acteur socio-économique du Luxembourg qui dispose d'une certaine expertise
    - Participation gratuite au Luxembourg

- **Registre national des délégués en normalisation**
  - 284 experts enregistrés (mai 2022)
  - 1032 enregistrements dans les comités techniques
  - Lien : 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

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→ Plus d'informations disponibles sur : https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html

Participer à la normalisation dans le domaine de l'IA

European Standards Development Organizations

CEN-CENELEC JTC 21 Artificial Intelligence

International Standards Development Organizations

ISO/IEC JTC 1/SC 42 Artificial Intelligence

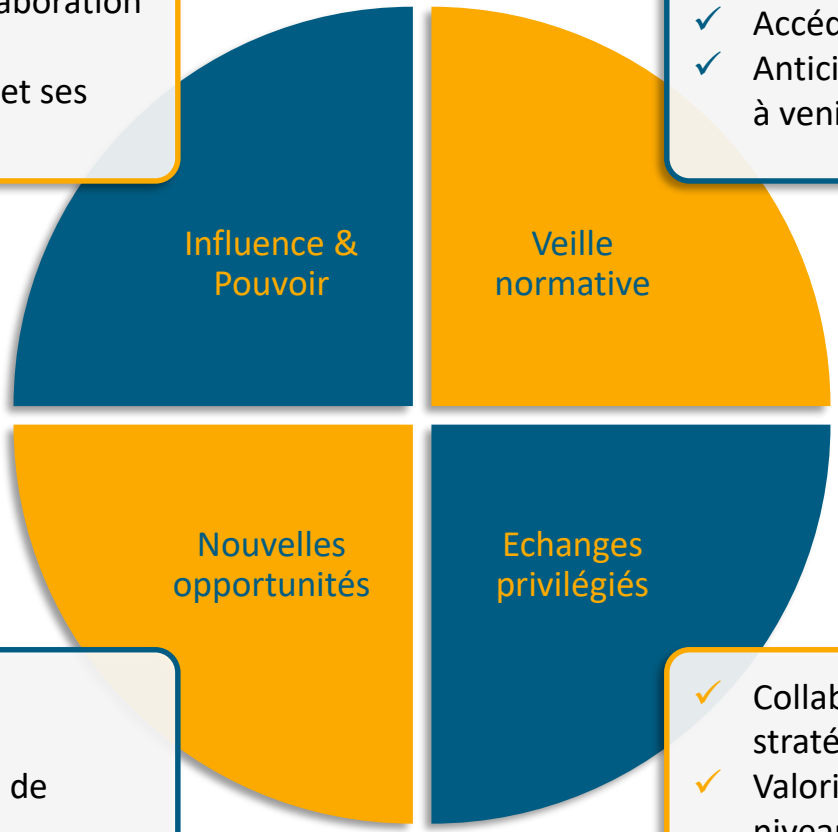
National Standardization Commission "Artificial Intelligence"

(mise en place planifiée d'ici fin juin 2022)

Les avantages de la participation à la normalisation

- ✓ Donner son avis dans l'élaboration des normes
- ✓ Valoriser son savoir faire et ses bonnes pratiques

- ✓ Accéder aux documents normatifs
- ✓ Anticiper et prévoir les évolutions à venir

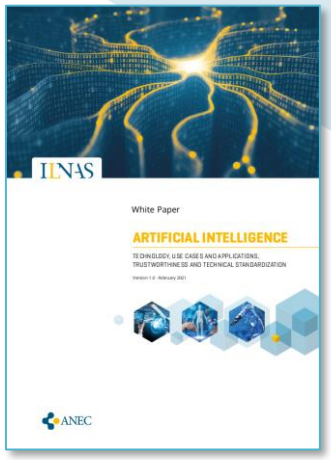


- ✓ Identifier des pistes de développement
- ✓ Se positionner en termes de compétitivité

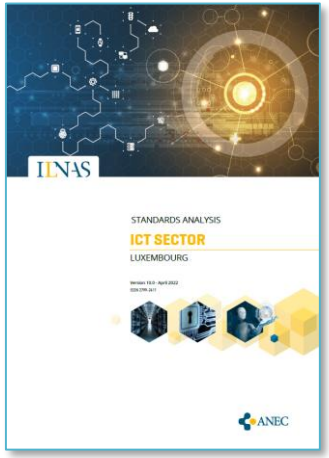
- ✓ Collaborer avec des partenaires stratégiques
- ✓ Valoriser son organisation au niveau national et international

Produits et services

- **Afin d'exploiter au mieux les avantages liées à la normalisation, l'ILNAS offre, en collaboration avec le GIE ANEC-N, les produits et services suivants aux acteurs socio-économiques nationaux :**



  - Diffusion de l'information normative
  - Formation continue en normalisation
  - Master MTECH "*Technopreneurship: mastering smart ICT, standardisation and digital trust for enabling next generation of ICT solutions*" (en collaboration avec l'Université du Luxembourg et la CSL)
  - Veille normative ciblée
  - Analyse normative sectorielle (Secteurs « porteurs »)



Informations complémentaires

→ **Portail qualité :**
www.portail-qualite.lu

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

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

→ **Réseaux sociaux :**

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