



*Enabling global identity
Protecting digital trust*



LEI Update

LEI Digital Strategy
Introducing the verifiable LEI (vLEI)

Securities Market Practice Group (SMPG)
October 5, 2022
GLEIF

Agenda

1. Overview of the Global LEI System
2. Policy Updates to the Global LEI System
3. LEI and Digital Identity – the vLEI
4. Features of the vLEI
5. vLEI first implementation in a real application – signing the GLEIF Annual Report





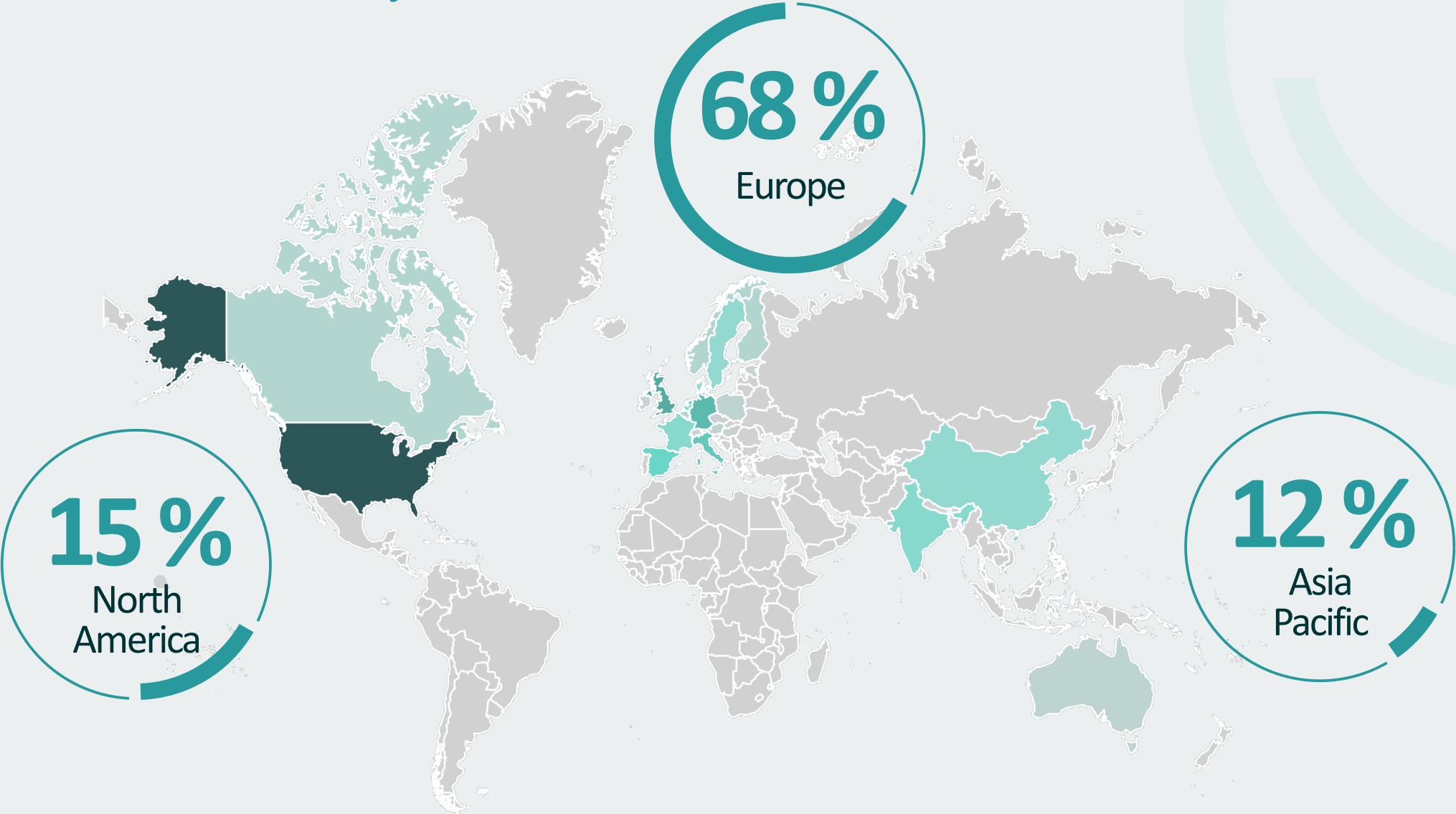
Overview of the Global LEI System

Who is Global Legal Entity Identifier Foundation (GLEIF)

- GLEIF is a not-for-profit Swiss foundation, founded by the Financial Stability Board (FSB).
- GLEIF is overseen by the Regulatory Oversight Committee (LEI ROC) with
 - **71 regulators** and
 - **19 observers**
 - from **50 countries**
- GLEIF Board has **18 independent directors**.
- **39 Partners** for LEI issuing (**LOUs**) and growing
- **> 2,075,867 issued LEIs** to date



Distribution of the LEIs across jurisdictions





Policy Updates to the Global LEI System

Updated Common Data File (CDF) formats

March 2022

- The CDF formats define how LEI issuing organizations report LEIs and reference data. GLEIF implemented updates to these formats in 2022 to align with the following new ROC policies:
 - [Legal Entity Events \(formerly referred to as ‘Corporate Actions’\) and Data History Policy](#)

Specifies events that alter the entity data, the relationship data of a legal entity, or result in the retirement and/or registration of LEIs.
 - [Policy on Fund Relationships and Guidelines for the registration of Investment Funds](#)

Introduces three new distinct relationship types that can be collected for funds.
 - [LEI Eligibility for General Government Entities Guidance Document](#)

Allows certain legal entities to be classified as Government Entities or International Organizations.



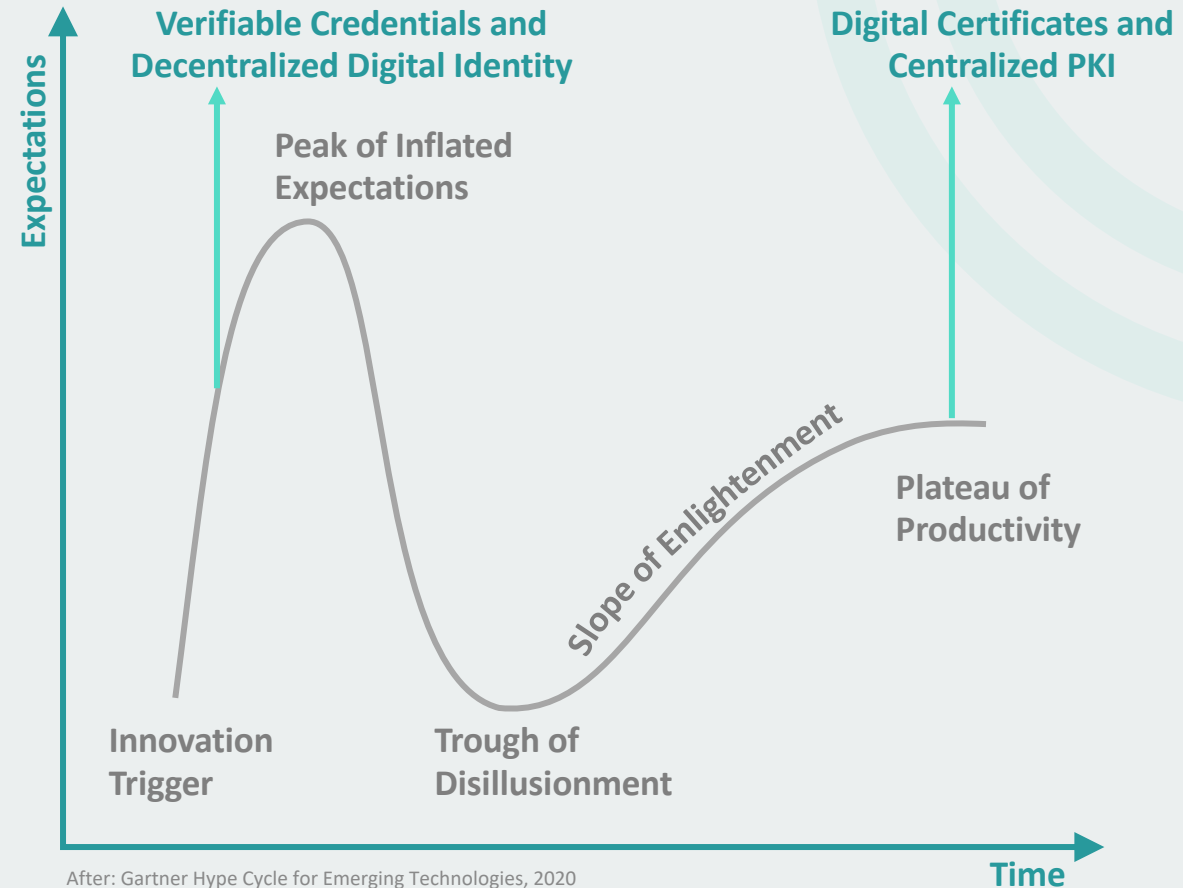
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LEI and Digital Identity – the vLEI

LEI Digital Strategy

Digital Certificates as well as Self-Sovereign-Identity Networks

- The LEI has a critical role to play in today's digital world through its ability to provide organizations with unique, permanent identification globally. This especially is important in the context of **identifying legal entities involved in digital transactions.**
- LEI delivers value to both the more mature product – Digital Certificates – and the more recent innovation of **Verifiable Credentials.**



LEIs in a digital world

Making LEIs verifiable

- LEIs provide **Identification**.

However, when presenting an LEI, it is not clear if ...

- the LEI is valid
- the presenter is the LEI owner or an affiliate
- the presenter has the right to use it

- As a result ...

- the recipient of the LEI must still check and verify
- background checks are often done manually at a high cost

- vLEIs provide **Authentication**.

- Each vLEI requires an underlying LEI

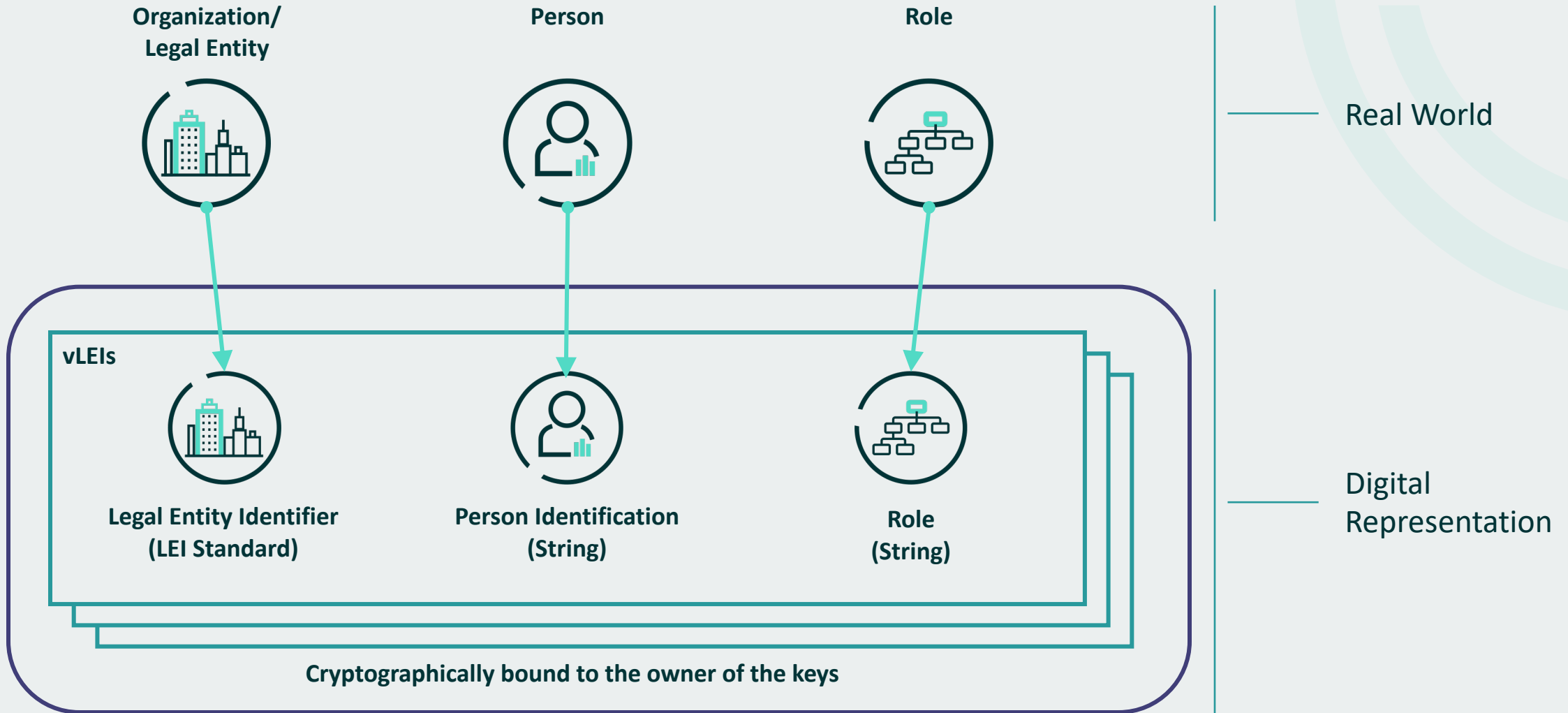
Combining Identification and Authentication give us the use case for the vLEI:

Decentralized identification and verification for organizations as well as the persons who represent their organizations either in official or functional roles

The vLEI solves the common problem of lack of trust and the costs involved for creating trust.

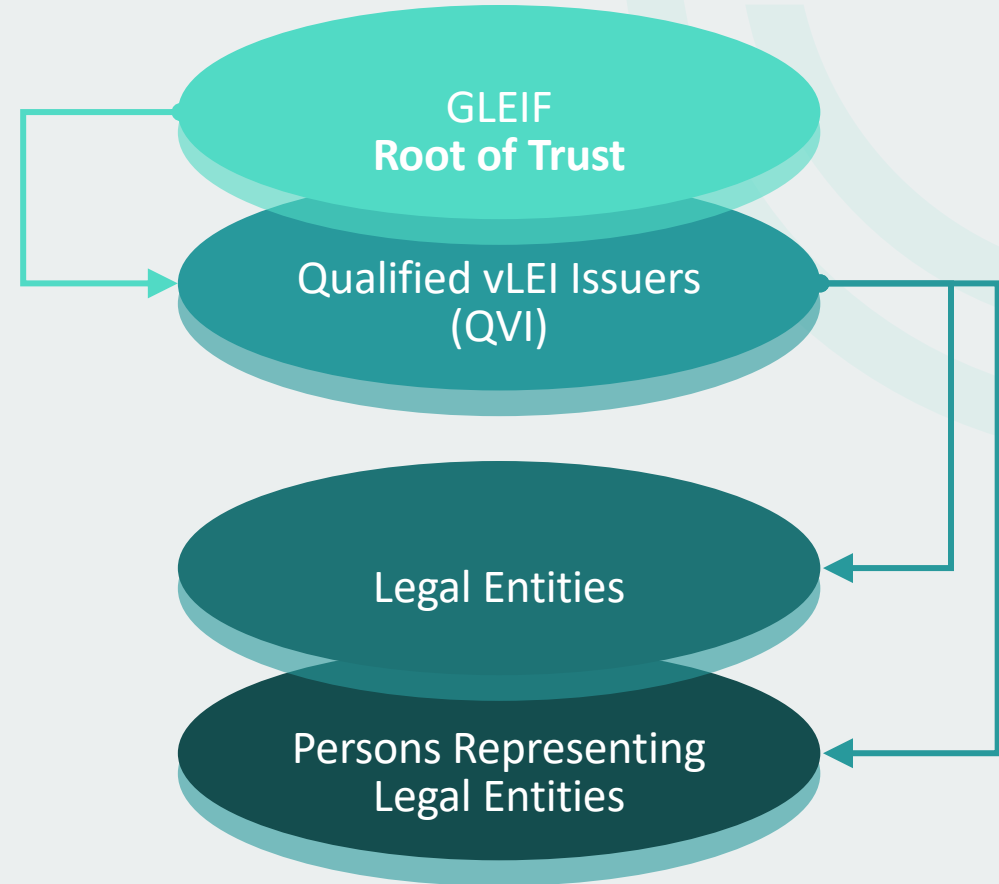
Embedding the LEI in digital tools

Representing Organizations, Persons and Roles



The LEI as a Verifiable Credential – the vLEI Trust Chain

- GLEIF is the **Root of Trust** Root **AID** (Autonomic Identifier) to establish the Root of Trust.
 - Delegated **AIDs** to issue Credentials
- GLEIF will establish a trusted network of Qualified **vLEI** Issuers (**QVIs**).
- **QVIs** are qualified to issue Entity and Role Credentials.
 - to Legal Entities
 - to Persons who represent Legal Entities either in official or functional roles



The vLEI Ecosystem Chain of Trust and vLEI Credentials

GLEIF

Issues Qualified vLEI Issuer vLEI

Qualified vLEI Issuer

Issues Legal Entity vLEI

Issues Legal Entity Official Organizational Role vLEI

Legal Entity

Issues Legal Entity Engagement Context Role vLEI

Elements:
Legal Entity LEI
(GLEIF will have one too!)

Elements:
Qualified vLEI Issuer LEI

Elements:
Legal Entity LEI, Person's name,
Official Organizational Role

Elements:
Legal Entity LEI, Person's name,
Engagement Context Role

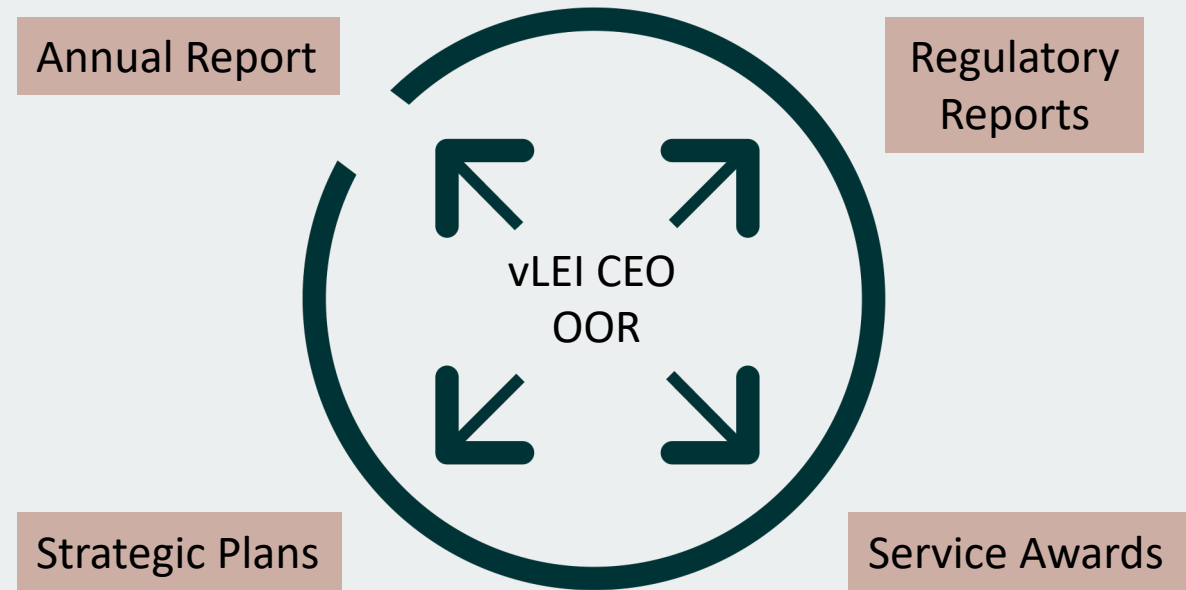
Legend

Entity Credentials
Role Credentials

Broader application of the vLEI Role Credentials

Official Organizational Role vLEI Credentials

- vLEI Role Credentials issued by Legal Entities to Persons whose **Official Organizational Roles** (ISO 5009 standard) that can be verified both by the Legal Entity as well as against one or more public sources.
- Example:
 - vLEI Role Credential for a CEO
 - Can be used to:
 - carry out official duties and powers conferred legally or required by regulation, e.g., annual reports, regulatory reports
 - carry out internal policies, duties or tasks, e.g., approve strategic plans, sign employee service awards



Broader application of the vLEI Role Credentials

Engagement Context Role vLEI Credentials

- vLEI Role Credential issued by Legal Entities to Persons **in the context of the engagement** of those Persons with the Legal Entities which can be verified by the Legal Entity.
- Example:
 - vLEI Role Credentials issued by a Legal Entity to its authorized suppliers
 - Requirements for use defined by the Legal Entity
 - Could require authorized suppliers to submit invoices signed with their vLEI Role Credentials to eliminate presentation of fraudulent invoices

Procurement
Manager



Authorized
Supplier

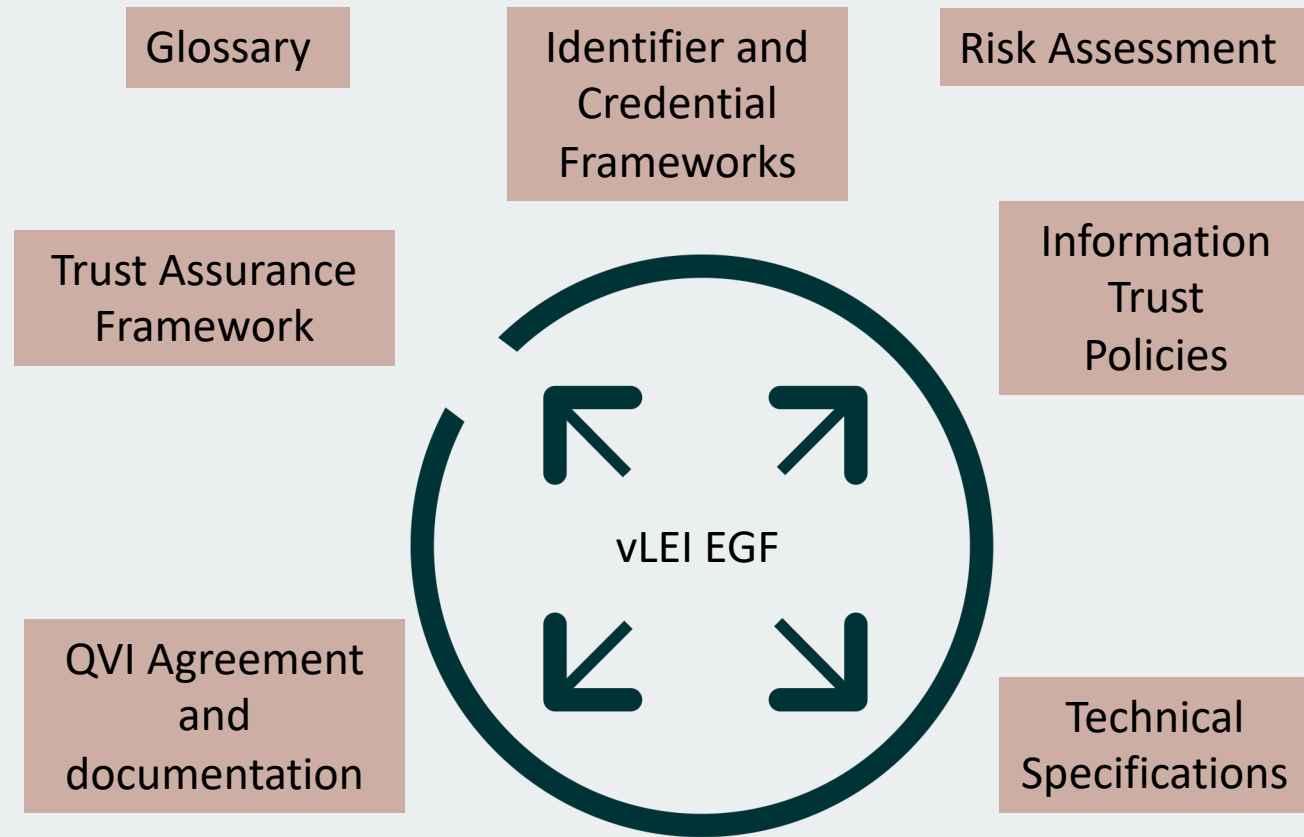


Features of the vLEI

Governance of the vLEI ecosystem and infrastructure

vLEI Ecosystem Governance Framework

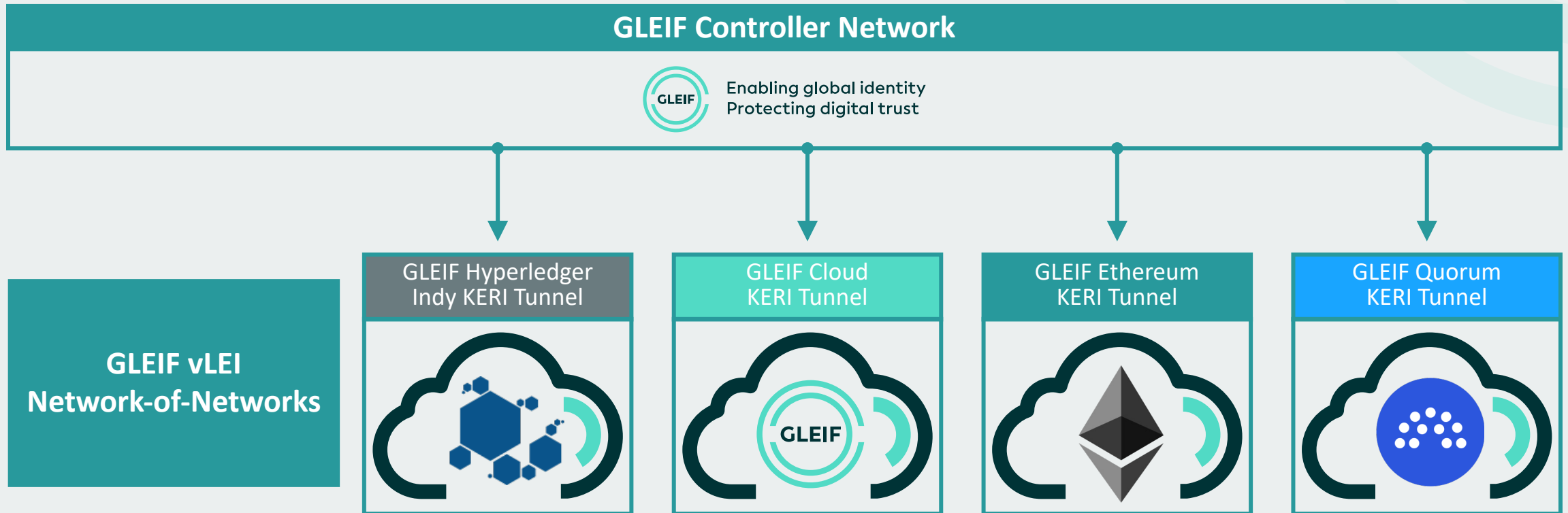
- The vLEI Ecosystem Governance Framework defines the vLEI operational model and describes how vLEI issuing stakeholders will qualify for and perform their roles in the Global LEI System.
- The vLEI EGF been created in full accordance with standards and recommendations Trust over IP Foundation using the ToIP EGF metamodel.
- The ToIP Foundation is hosted by the non-profit Linux Foundation.
- GLEIF is the Governing Body.



vLEIs are interoperable and portable

vLEI network-of-networks

- Development of the capabilities needed for issuance, verification and revocation of vLEIs do not need to operate on blockchain or distributed ledger technology.
- This would allow GLEIF to **connect to any blockchain or distributed ledger technology SSI network or cloud infrastructure** without the need for custom implementation, cost and overhead of operation.



GLEIF's vLEI approach

Agnostic to any network and interoperable

- GLEIF has implemented KERI (Key Event Receipt Infrastructure) and related technical capabilities to support fully decentralized portable secure key management operations on self-certifying identifiers.
- KERI is **Quantum Safe**. It is resistant to attacks by both classical and quantum computers.
- The KERI specification was developed within a ToIP working group and currently is a draft specification of the Internet Engineering Task Force (IETF).



<http://github.com/WebOfTrust/keri>

vLEI credentials are chained

Authentic Chained Data Containers (ACDCs)

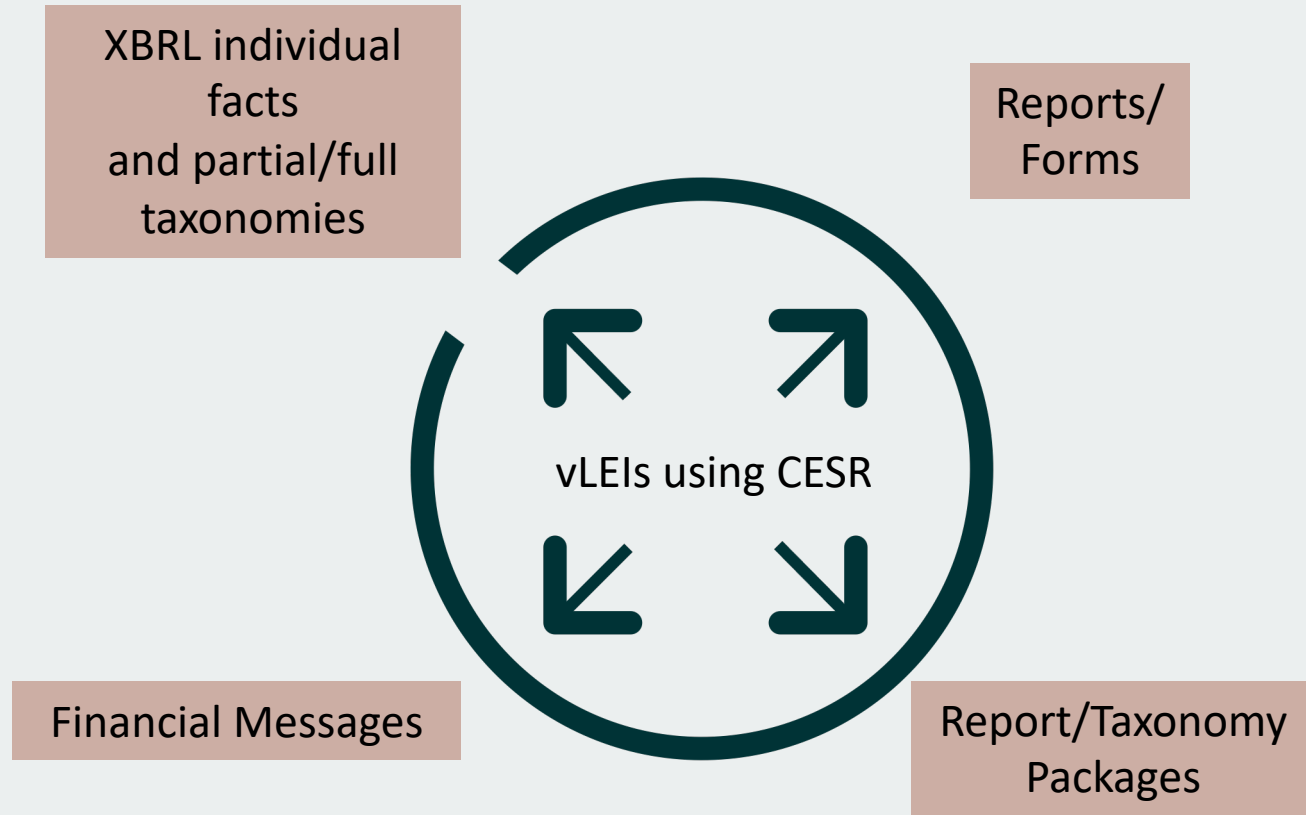
- Qualified vLEI Issuer vLEIs are chained to the GLEIF External AID.
- Legal Entity vLEIs are chained to their Qualified vLEI Issuer's vLEI.
- vLEI Role Credentials are chained to both the Qualified vLEI Issuer's vLEI as well as the Legal Entity's vLEI.
- The ACDC specification was developed within a ToIP working group and currently is a draft specification of the Internet Engineering Task Force (IETF).

**Connects vLEI Credentials for
issuance, verification and
revocation**

vLEI credentials can be used to digitally sign many things in many ways

Composable Event Streaming Representation (CESR)

- Specific content, for example, specific sections/parts of a report, can be signed by one or more officers and employees/managers of a Legal Entity using their OOR and ECR vLEIs.
- The entire content of the same report, for example, also can be signed in its entirety by one or more officers and employees/managers of a Legal Entity using their OOR and ECR vLEI Credentials.
- The CESR Specification and Proof Format were developed within a ToIP working group and currently are drafts of the Internet Engineering Task Force (IETF).





vLEI first implementation in a real application

<https://www.gleif.org/en/about/governance/annual-report>
(browser based, no plugin required)

vLEI first implementation in a real application

GLEIF Annual Report signed using vLEIs

- Signed with vLEI Role Credentials using CESR
 - vLEI Role Credentials (OOR and ECR) issued
 - Report signed in whole and in part with vLEIs using CESR
 - Status of the vLEI Credentials and the validity of the signatures on the submission are verified



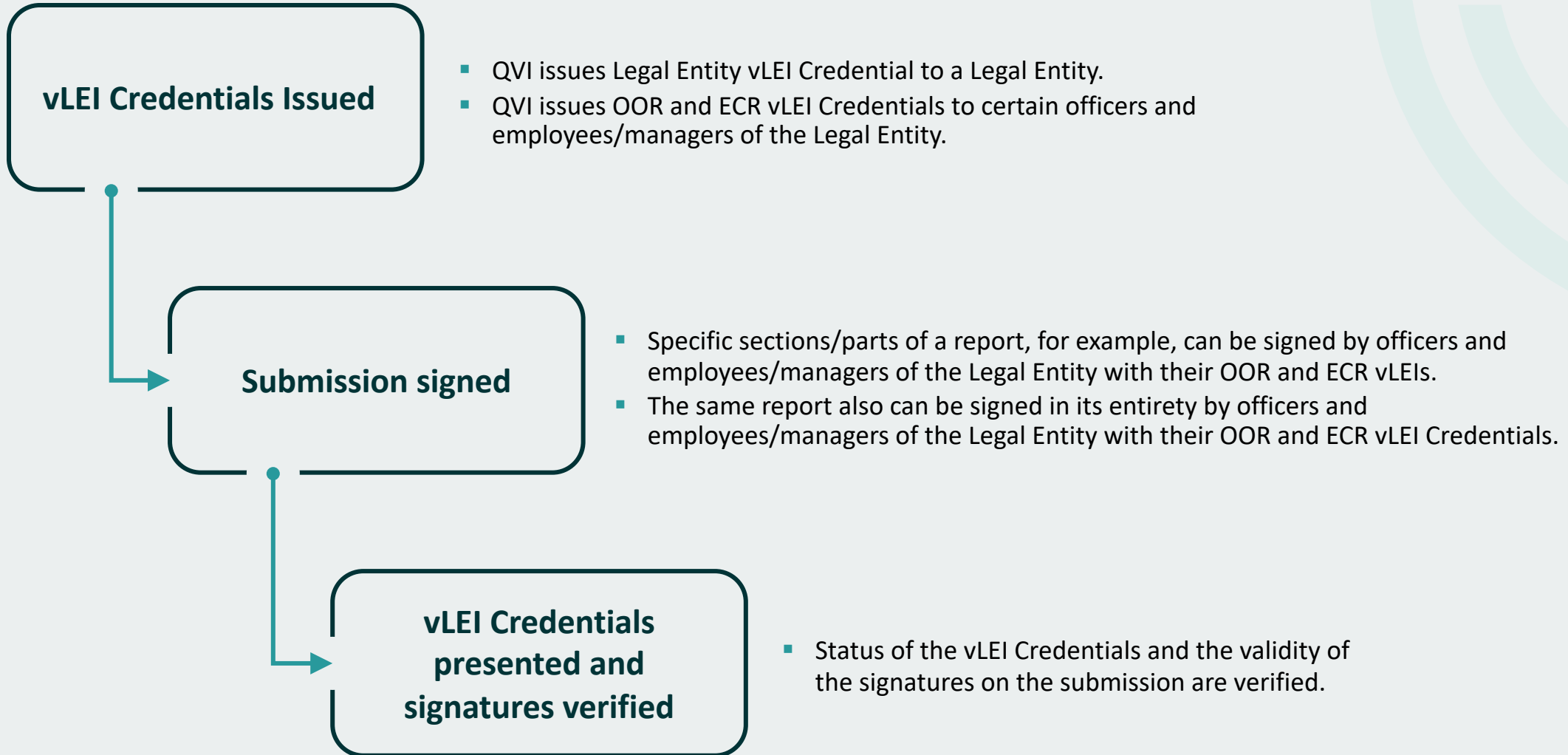
The screenshot displays the GLEIF Annual Report 2021 with a digital signature verification interface. The main content area shows a network graphic and the GLEIF logo. The right sidebar lists the following signatures:

Signature Status	Name	Official Role	LEI
Signed in Full	Stephan Wolf	Chief Executive Officer	506700GE1G29325QX363
Signed in Full	Steven Joachim	Board Chair	506700GE1G29325QX363
Signed in Full	Sven Schumacher	General Counsel	506700GE1G29325QX363
Partially Signed	Ines Gensinger	Head of Communications	506700GE1G29325QX363
Partially Signed	Annette Booth	Chief Financial Officer	506700GE1G29325QX363
Partially Signed	Jan Marxfeld	Auditor	506700GE1G29325QX363
Partially Signed	Armin Imoberdorf	Auditor	506700GE1G29325QX363



Use case: Private sector reporting to the public sector

Process Overview



vLEI first implementation in a real application

GLEIF Annual Report signed using vLEIs

- **Creation of the vLEI led to other standards work**
 - Development of the ISO 5009 Official Organizational Roles (OOR) standard
 - Proposal to add a Part 3 to the ISO 17442 LEI standard to specify the use of the LEI code in ACDC credentials currently under ballot in ISO
 - Formation of a working group to develop standard best practices for signing inline XBRL taxonomies, reports and documents with vLEIs



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