Picture courtesy of Gas Connect Austria

Joint ENTSOG, EASEE-Gas, GIE

4th Data Exchange Workshop

29th October 2024

ENTSOG offices, Brussels

Hybrid

1. Welcome

Hendrik Pollex
Director, System Operations
ENTSOG

2. Info & Agenda

Host for the wksp - Douglas Walker Hill
Interoperability & Data Exchange Advisor
ENTSOG

Questions

Meeting chat
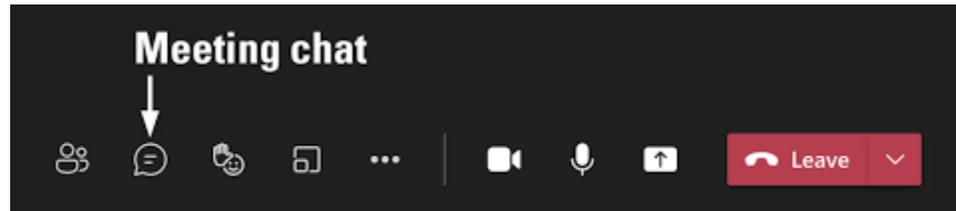
- *Online please ask your questions via the **Teams chat***

- *Physical attendance please ask questions at the end of the presentation*

Data Exchange Session Agenda

DAY 1. 29 October 2024 Data Exchange Topics	Presenter & Affiliation
Lunch 11:30-12:30	
Introduction and welcome	Hendrik Pollex, ENTSOG
Agenda	Douglas Walker Hill, ENTSOG
REMIT, Update	David Defour, GIE
EASEE-gas: 6.1 edig@s adoption challenges and opportunities	Oliver Schirok (VNG), edig@s WG Chair
EASEE-gas: EASEE-Connect Introduction	Dirk Serruys (Fluxys) EASEE-gas TSWG Chair
EASEE-gas: EASEE-Connect Demo	Jean-Francois van Snick (Fluxys), EASEE-gas TSWG
BREAK 13:45 - 14:05	
AS4: eDelivery rationale for AS4 updates	Bogdan Dumitriu, EC eDelivery (DIGIT)
AS4: ENTSOG profile and certificate update	Pim vd Eijk, Sonnenglanz Consultancy
AS4: ENTSOG AS4 implementation. A software provider perspective	Arun Anand, Zak CData Arc
BREAK 15:05 - 15:25	
ENTSOG CNOTS: CNOT edigas and its value-add to the general gas sector from a service provider perspective .	GMSL, David Hopkins
ENTSOG CNOTS: Data exchange validation tool for edig@s 6.1	Douglas Walker Hill, ENTSOG
ENTSOG CNOTS: Future development for data exchange in the gas sector	Panel session: Oliver Schirok (VNG) Dirk Serruys (Fluxys)
Q&A, wrap up and Goodbye |ENTSOG	Douglas Walker Hill, ENTSOG

3. REMIT Updates

David Defour
CTO
GIE

REMIT & Transparency Platforms
Data processing

GIE REGISTERED REPORTING MECHANISM | REMIT

Separate Production
+ Acceptance/Test environment

SSO

STORAGE

62

LSO

LNG

26

TSO

TRANSMISSION

19

RRM IIP

IIP

| **4984** users |
| **22** countries |
| **141** operators |

WEBGUI **69**
Online Forms
XML Upload

SFTP **14**

AS2 **28**

AS4 **18** **+10**

~~SOAP~~

XML 🔒

XML 🔒

XML 🔒

REMIT Reports
GIE Receipts
ACER Receipts

2 processing types

UMM & unavailability :
asynchroneous (immediate)

FacilityReports (AGSI/ALSI) per gasDay
scheduled, **publication time 19:30 daily**
second processing run at 23:00

ISO8601 time format, UTC only

GIE REGISTERED REPORTING MECHANISM | REMIT

850+ files/day

cdata arc

DATA CENTER | SENTIA > accenture | DATA CENTER

3 XML schemas
6 reporting types
- sFAR - lFAR
- sUNR - lUNR
- sPAR - UMM

REMIT Reports
ACER Receipts

XML 🔒 VPN **SFTP**

ACER
European Union Agency for the Cooperation of Energy Regulators

ARIS
ACER REMIT Information System

📶 **RSS**feed

IIP REMIT UMM
Inside Information Platform

TRANSPARENCY PLATFORMS

AGSI
Aggregated Gas Storage Inventory

ALSI
Aggregated LNG Storage Inventory

📶 REST API

250000 datacalls/day

2000+ API users

RSSfeed

ATOM | RSS | JSON | CSV | PDF | XLSX

REMIT & Transparency Platforms
Communication standards status

RRM IIP — **4984** users

22 countries

IIP — **141** operators

⇄ **Data exchange mechanisms**
By infrastructure type

	SFTP	AS2	AS4	WEBGUI
SSO	13	22	15	30
LSO	1	6	3	23
TSO	-	-	-	19
	14	**28**	**18**	**69**

TSO : WEBGUI only access (online forms & XML upload) for IIP back-up contingency procedure with ENTSOG IIP

AS4 transition:
+10 in progress
(3 LSO – 7 SSO)

Switch to AS4 will impact more operators because of <u>proxy reporting</u> (reporting on behalf of other SSO/LSO)

REMIT & Transparency Platforms
Communication standards status

Data exchange mechanisms
By country (SSO/LSO only)

NOTE : PROXY reporting to be taken into account
All TSO connections are type WEBGUI for GIE IIP reporting

	SFTP	AS2	AS4	AS4 setup	WEBGUI
Austria		3	1	1	1
Belgium		1		1	1
Bulgaria			1		
Croatia	1		1		
Czech Rep.		1	3	1	
Denmark			1		
Finland					2
France		4		1	2
Germany	4	10	2	1	17
Greece		1		2	1
Hungary	2				
Italy	1		2	2	4

	SFTP	AS2	AS4	AS4 setup	WEBGUI
Latvia			1		
Lithuania					1
Netherlands		4	2		1
Poland	1		1		
Portugal	2				
Romania	1				2
Slovakia		2		1	
Spain	1				6
Sweden			1		
UK	1	2	1		2
Ukraine			1		1
TOTAL	**14**	**28**	**18**	**10**	41*

* + Each account has WEBGUI access as back-up channel

Rapid deployment & new reporting
different IT environments / new players

 GIE REGISTERED REPORTING MECHANISM **REMIT**

ALSI
DATA COVERAGE
100% EU27 / No UK Data

(*) data pending

+8 FSRU
+2 landbased

start 19.09.2022	EemsEnergyTerminal	NL	**EemsEnergyterminal**	(FSRU Eemshaven LNG)
(*) start 06.10.2022	HAMINA LNG	FI	**Hamina LNG terminal**	(landbased – small scale)
start 13.01.2023	DET DEUTSCHE ENERGY TERMINAL	DE	**Wilhelmshaven LNG terminal**	(FSRU Hoegh Esperanza)
start 23.03.2023	DET DEUTSCHE ENERGY TERMINAL	FI	**Inkoo LNG Terminal**	(FSRU Exemplar)
start 21.04.2023	GASGRID	DE	**Brunsbüttel LNG terminal**	(FSRU Hoegh Gannet)
(*) start 03.07.2023	Musel E-Hub	ES	**El Musel LNG Terminal**	(landbased – large scale)
start 12.07.2023	fsruItalia snam	IT	**Piombino LNG terminal**	(FSRU Golar Tundra)
start 18.10.2023	te	FR	**Le Havre LNG Terminal**	(FSRU Cape Ann)

Transition Lubmin > Mukran since 09/04/2024

Start commercial operations since 01/10/2024

	Deutsche ReGas	DE	**Ostsee LNG Terminal / Mukran**	(FSRU Neptune)
	gastrade	GR	**Alexandroupolis LNG terminal**	(FSRU Alexandroupolis)

+4 FSRU
expected

ETA end 2024	DET DEUTSCHE ENERGY TERMINAL	DE	**Stade LNG Terminal**	(FSRU Energos Force)
FSRU 2 - end 2024	DET DEUTSCHE ENERGY TERMINAL	DE	**Wilhelmshaven LNG Term. #2**	(FSRU Excelerate Excelsior)
FSRU 2 - end 2024	Deutsche ReGas	DE	**Ostsee LNG Terminal** #2	(FSRU Energos Power)
ETA end 2024	fsruItalia snam	IT	**Ravenna LNG terminal**	(FSRU BW Singapore)

AGSI
DATA COVERAGE
100% EU27 / No UK Data

since 31.04.2024	SEFE	DE	Astora becomes **SEFE Storage**
since 03.05.2024	EWE	DE	**EWE** adds UGS Nüttermoor H-5 (conversion L-gas to H-gas)
since 01.10.2024	storengy	DE	**Storengy Deutschland** decommissioned UGS Fronhofen

Challenges
Technical setup & maintenance

AS4/AS2 automation

- AS2 / AS4 : indicated as cost inhibitive for small operators (non-standard hosting, IT setup)
- AS2 / AS4 : not always well known (to small or new operators – learning curve / accredited suppliers)

Recommendation: Publish list of standard-compliant / reputable / accredited solution providers per country

Technical setup

- **IP whitelisting issues**, following implementation of CloudFlare environment
- **Certificate issues** (test/production diff., encryption algorythm selection, secure methods of transfer)
- **Filenaming convention issues** (hashing during transfer, adherance to prescribed formatting)
- **SFTP setup issues** : access to counterparty systems (pull & push from SFTP server setup)
- **Documentation and regulatory guidance** : complexity growing
- **Reporting types** : multiple connections to reporting mechanisms to cover all REMIT reporting types
- **Quick start** : initial reporting phase always starts via WEBGUI tools, CDATA Arc enables quick automation
- **Proxy reporting** : new operators contracting an existing / experienced operator to report on their behalf

Security

- Attacks :
  - Brute-force botnet attack at GIE (failed)
  - Cyberattack at accounts (successful) and ACER (blocked)

- Mitigation :
  - VPN access to ARIS (ACER REMIT Information System)
  - CloudFlare & additional resources deployed on GIE systems

THANK YOU
For your attention

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4. EDIG@S. 6.1 in use

Oliver Schirok
Data Exchange Manager & Chair MWDWG
(aka) edig@s WG
VNG Handel & Vertrieb

About EASEE-gas

EASEE-gas promotes and develops solutions for the simplification and streamlining of the trading and physical transfer of gas.

FOUNDED IN 2002

80+ EUROPEAN MEMBERS

Represents the entire gas value chain

Transmission System Operators

Distribution System Operators

Storage System Operators

LNG System Operators

Traders & Shippers

Suppliers

Prosumers

End-users

Producers

EASEE-gas
Streamlining the gas business

Membership by category

- Producers
- Transmission System Operators
- Distribution System Operators
- Storage System Operators
- LNG System Operators
- Traders & Shippers
- Suppliers
- End-users
- Prosumers
- Service Provider

67 FULL MEMBERS

15 SERVICE PROVIDER MEMBERS

Pie chart values: 36, 20, 16, 12, 12, 8, 5, 4, 3

Edig@s working group | Who are we?

MWDWG in numbers (2023)

8
Hybrid workgroup meetings conducted

12
Task force meetings held

40
Maintenance requests handled

32
Different companies represented

Edig@s 6.1 Adoption

1. Which are the focus processes areas of Edig@s 6.1 adoption?
2. Why do you implement Edig@s 6.1?
3. What tools exist to make the implementation easier?
4. What challenges did we face during the implementations?
5. Where do you see the future adoption in which process areas for 6.1?
6. Are there any tools missing that could be useful for implementation?

Edig@s 6.1 Adoption

1. Which are the focus processes areas of Edig@s 6.1 adoption?

Phase 1
a) Nomination and Matching (NOMINT, NOMRES, DELORD, DELRES)
b) Balancing and Settlement (MARSIT, METRED)
c) OTC Gas Trading (REQEST, REQRES)
d) General (ACKNOW)

Phase 2
a) Capacity Allocation (AUCBID, AUCRES, OFFCAP)
b) System Operation (INVENT, LIMITS, FLOWRQ)

Edig@s 6.1 Adoption

2. Why do you implement Edig@s 6.1?

   a) Increased visibility (with counterparty nomination) on matching for BRP's
   b) Harmonised solution for market and account position, cash-out prices and imbalances
   c) Improved customer satisfaction
   d) Make it easier for BRP's to enter new markets
   e) LNG and Storage messages covered
   f) Edig@s version 6.1 support and maintenance guaranteed
   g) Network Code & BRS compliance assurance

Edig@s 6.1 Adoption

3. What tools exist to make the implementation easier?

   a) Decision tables in the message implementation guidelines
   b) Message examples
   c) Validation tool (planned for 2025)
   d) Best practice document
   e) Comparison document between version 5.1 and 6.1
   f) For members, an implementation task force is established for help and support

Edig@s 6.1 Adoption

4. What challenges did we face during the implementations?

 a) Having few counterparties for testing - being the first movers
 b) Analyse possible back-end changes
 c) Storage messages missing in 6.0 but added back in version 6.1
 d) Message implementation guidelines still improving

5. Where do you see the future adoption in which process areas for 6.1?

   a) All areas to add support for Hydrogen, CO_2, future gases and the processes belonging to them (where most of them will follow the current standards)
   b) More market information support
   c) Gas product support (e.g. locational spread, over-nomination)
   d) European Gas Package adoptions

Edig@s 6.1 Adoption

6. Are there any tools missing that could be useful for implementation?

   a) Adaption of XSD version 1.1 (now 1.0) to make the check of incoming messages stricter and less validations have to be done in the backend systems.
   b) Edig@s XML validation tool, verification against the official standard
   c) Schematron validation rules for enhanced compliance

edig@s® EASEE-gas

Thank you for your attention!

in

Stay updated:
EASEE-gas

5. EASEE-gas Connect Introduction and background

Dirk Serruys (Fluxys)
Chair TSWG EASEE-gas

Introduction to easee-connect

Dirk Serruys (Fluxys Belgium)

Chair EASEE-gas Technology Standards Working Group (TSWG)

There will be some history …

But we will look at the future

There will be some techtalk …

But I promise you, no artificial intelligence

EASEE-gas

The plan for this presentation

Landscape **+** Communication standards **+** Communication profiles **+** Communication profile management **=** Case for easee-connect

EASEE-gas

Landscape

Communication at the highest level
An example

Order

Shipper

Order confirmation

System Operator

EASEE-gas
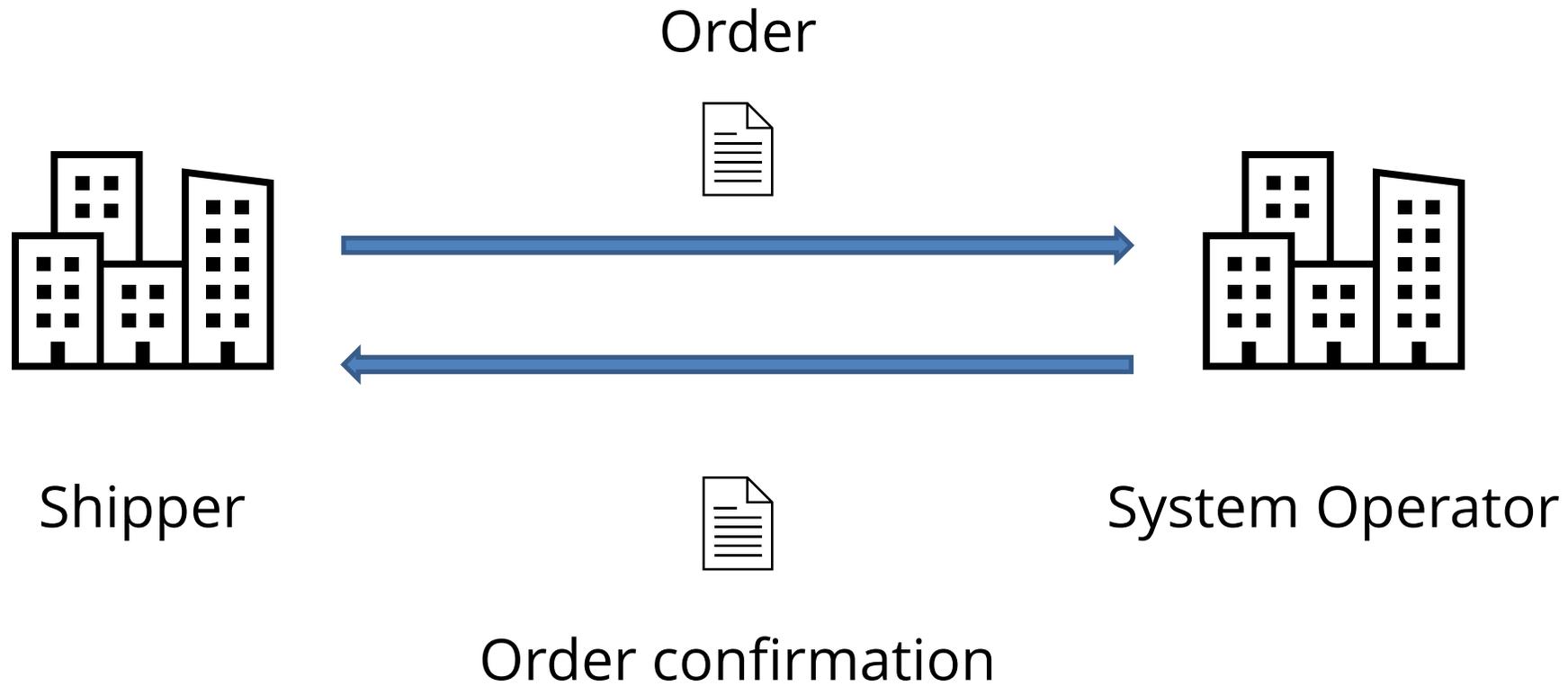
It doesn't seem like rocket science, and it isn't, but there are a few constraints which we need to be aware of

∞ We need large volumes of these exchanges with many business parties and in a timely fashion

We want to be sure that companies are who they claim to be

We want guarantees about the delivery of information, that it reaches the intended destination/addressee.

We don't want the information disclosed to parties for which the information wasn't intended

EASEE-gas

A typical system setup to be able to exchange documents

Company A

Company B

In-house System

Communication Sytem

Network

Communication Sytem

In-house System

Focus area for easee-connect
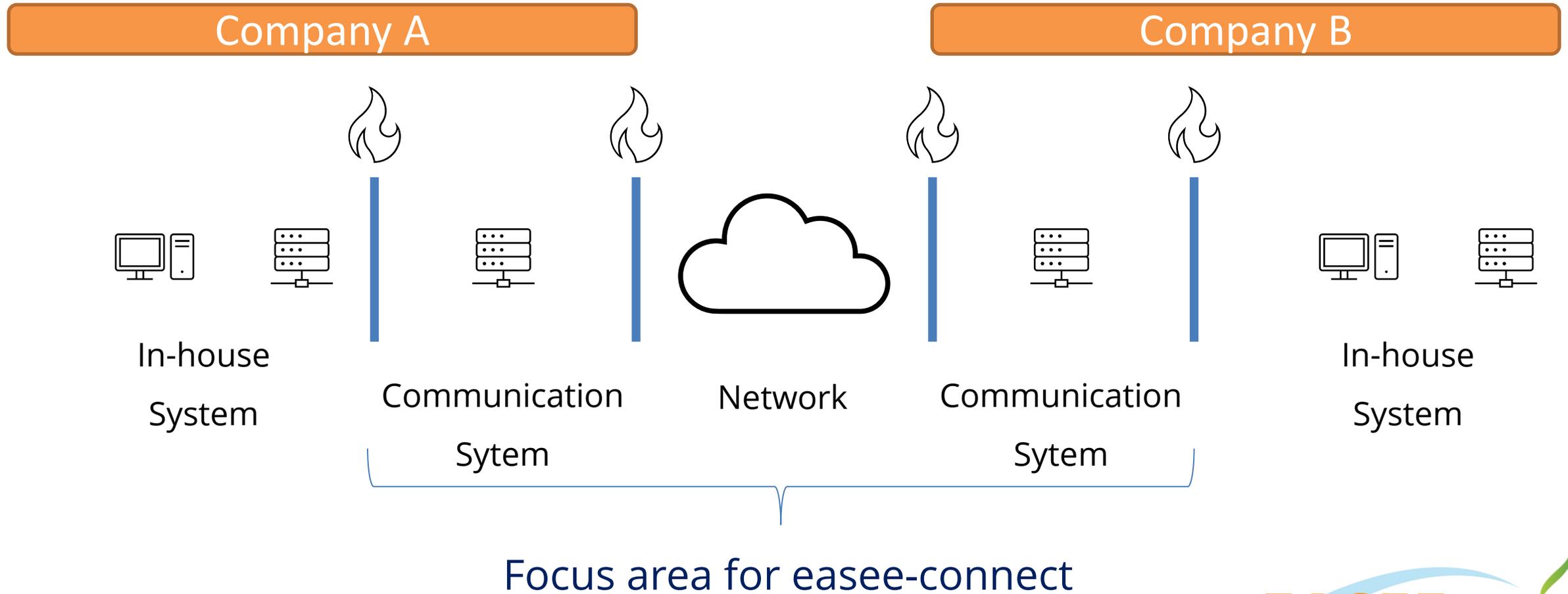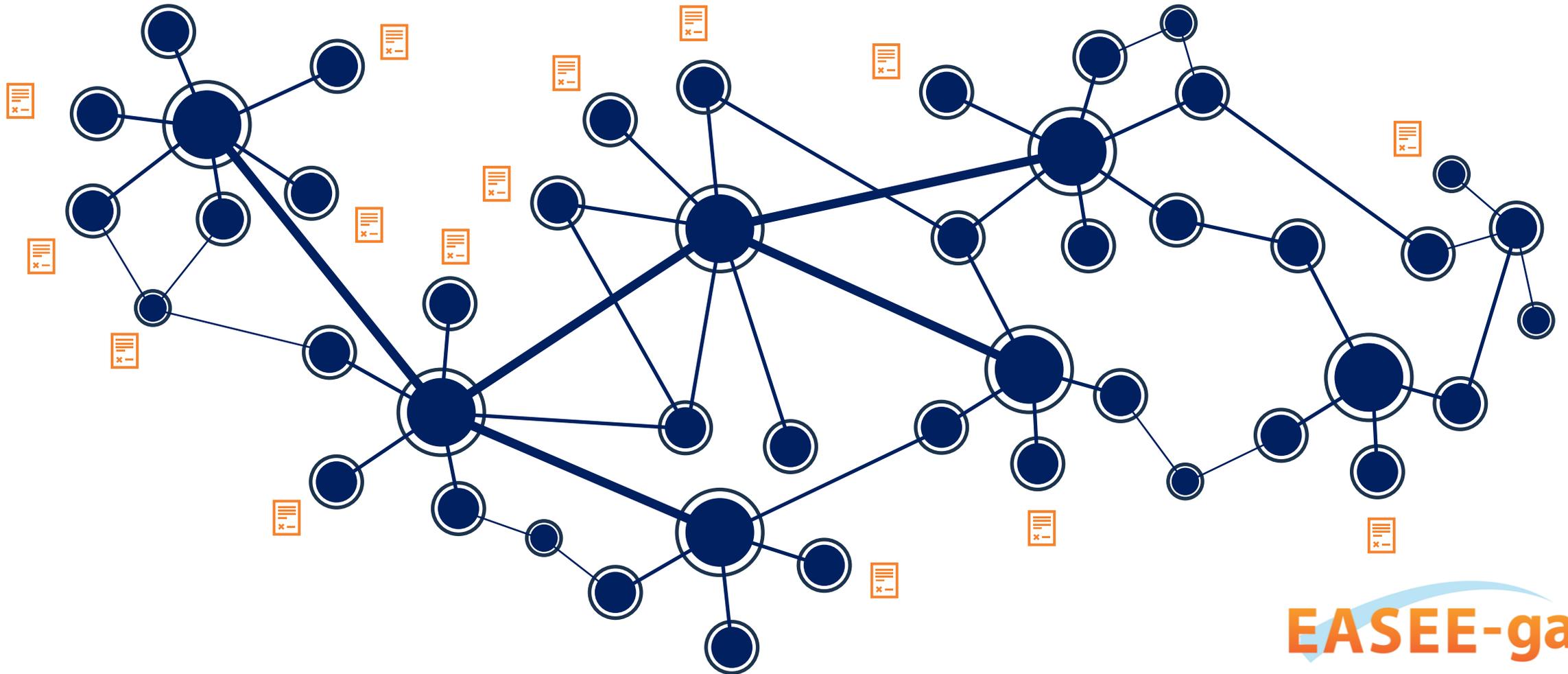
EASEE-gas

Standards

ENTSOG / EASEE-gas
This chapter starts in 2015

Data network

"The big bad internet"
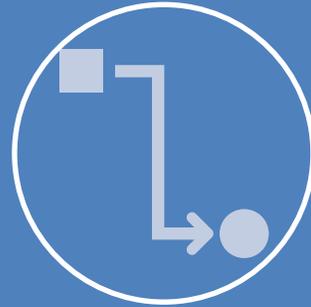
Protocol

AS4 (OASIS)
ENTSOG profile

Format

EASEE-gas
Edig@s

ENTSOG/EASEE-gas – Network code + Common network operations tools

EASEE-gas

What were the drivers for these choices?

Everywhere available

The data network – The internet

Fast onboarding

Security risks

Established standard

The data format – Edig@s

Fit for purpose

Good support

Good support for the functional and security requirements

The protocol – AS4

(In the mean time the protocol of choice in broader european communities)

EASEE-gas

Signatures, receipts and encryption and all digital please

A company is uniquely and digitally identifiable by its EIC code.

e.g. 21X-BE-A-A0A0A-Y identifies FLUXYS

This identity will be certified by a Certificate Authority and the proof of the certification is a digital certificate.

These certificates play a key role in digital signing and encryption!!

EASEE-gas

The flow of information – Down the rabbit hole …

Inhouse format

Inhouse format

Transformation towards a...

Present to receiver

Edig@s format

Sign to prove identity of the s...

Encrypt to prevent eavesdropping

Check sender's identity

Edig@s format

Send back a signed receipt as proof of delivery

Add delivery information

decrypt

Send to addressee

Transport
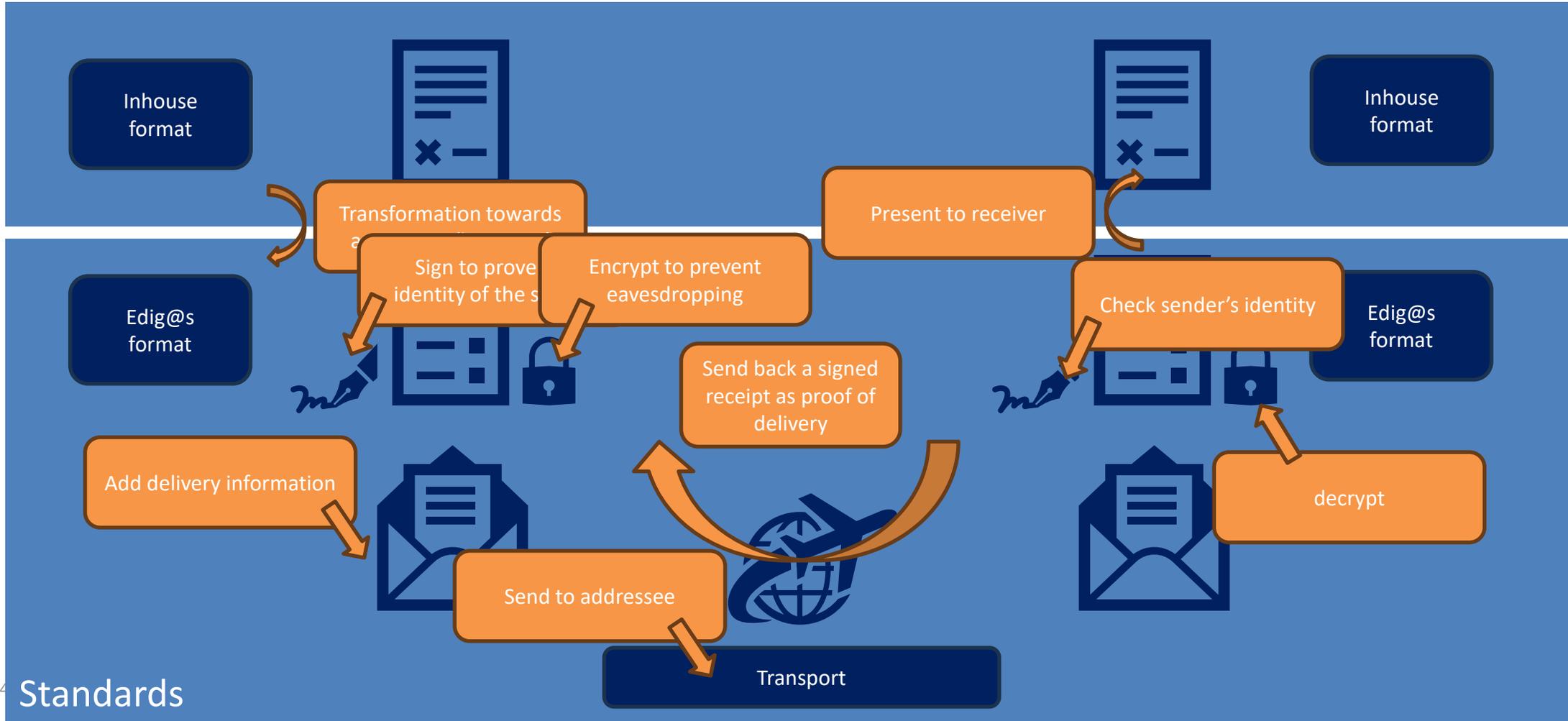
Standards

What would this context be without standards?

Protocol: FTP
Format: KISS

Protocol: JSON-RPC
Format: CSV

Protocol: AS2
Format: JSON

Protocol: AS4bis
Format: ???

Protocol AS4
Format edig@s
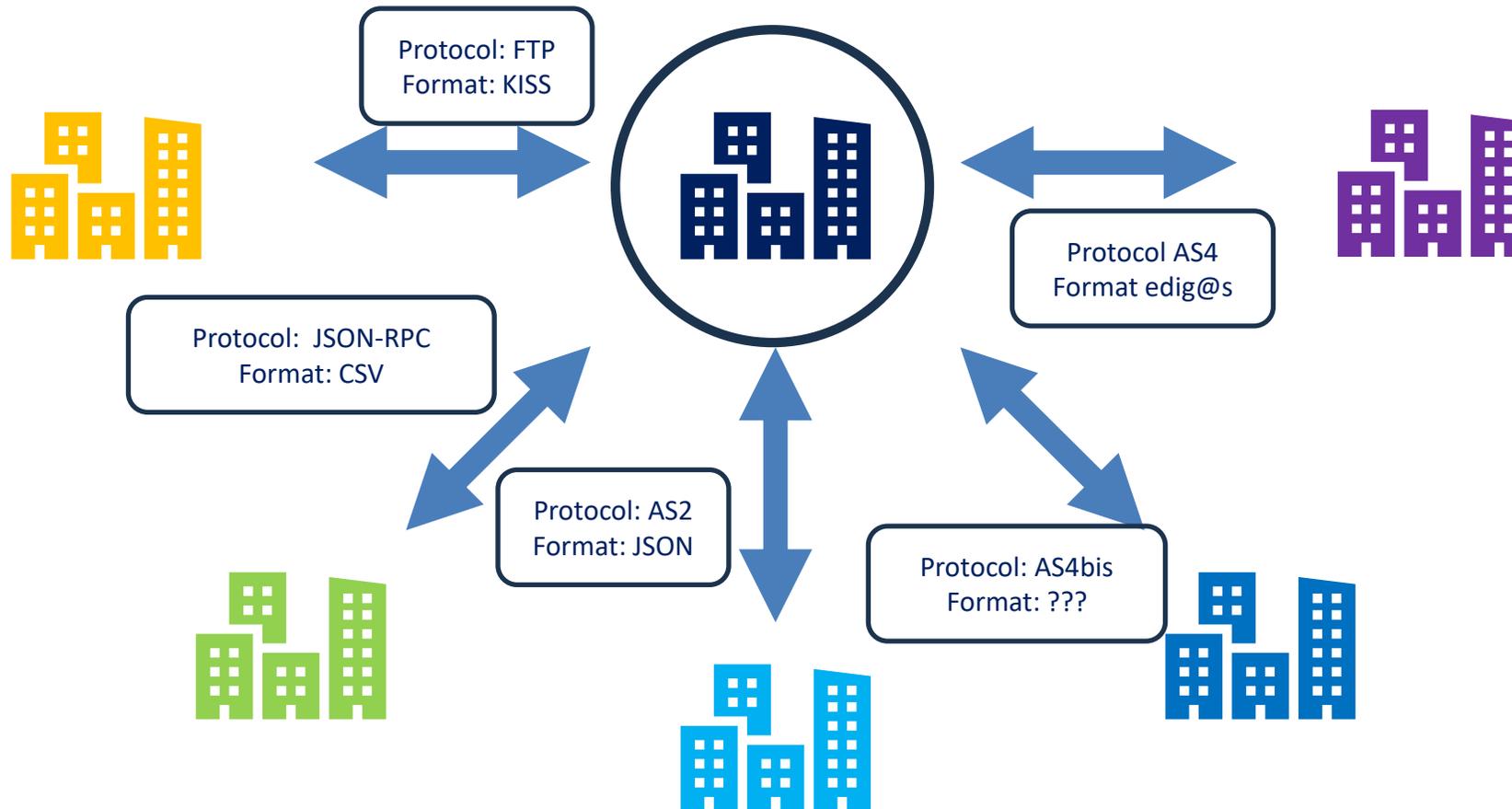
From a single company's view

You would have to support multiple protocols and multiple formats

Each with it's own lifecycle, specificities and issues

Difficult but lucrative landscape for software vendors and integrators

And at high cost

Imagine the impact for the whole community!!

EASEE-gas

What would the 'cost' be of not having standards?

Onboarding of new communication parties would be tedious and require renegotiating technical details over and over again.
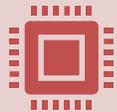
The cost of maintaining communication systems would be a multiple of the cost today and for certain aspects linear with the number of message formats and protocols to manage.

The number of operational problems would be a multiple of those today.

EASEE-gas

Profiles

As a result we need to manage sets of configuration parameters

Network settings
      Internet endpoints
      Secure channel settings

Protocol settings
      Cryptographic settings

Identities
      EIC codes
      Sender & receiver certificates

Document format
      Supported message types

Profile

EASEE-gas
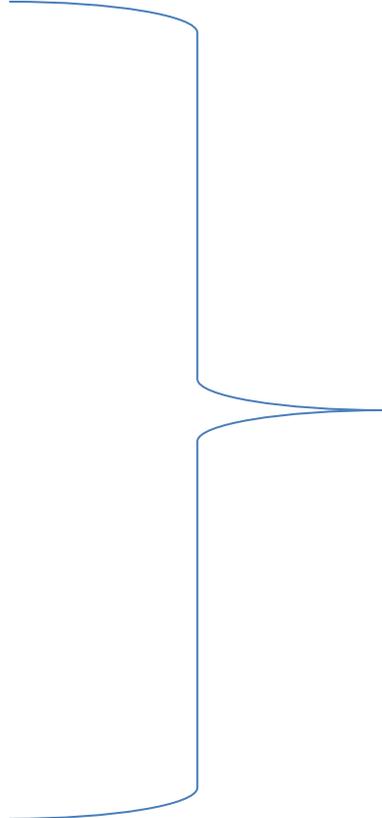
And many of them

All particpants need to keep record of the parameter sets, to be able to communicate

For each partner you want to communicate with

And sometimes per portfolio of communication partners

EASEE-gas

But there are issues

Today these parameter sets, or profiles, are exchanged bilaterally and not necessarily with respect of the right security context.

Manually exchanging these settings can lead to errors because they are copied and/or re-interpreted

This all leads to inefficiencies in setting up or maintaining communication

EASEE-gas

The case for easee-connect

The aim

One single, central library of parameter sets!

If everybody updates his own parameters, everybody else will access the most accurate data

Instant access to contact information

Ready for automation of parameter & certificate management (side topic)

But only, if everybody joins, the value increases with the number of participants

EASEE-gas

To MoC or not to MoC …

The TSWG debates the future and feasibility of the MoC projects we organize each 3 years for following reasons:

If the number of participants grows, the more tricky it will become to organize MoC projects

The lifecycle of certificates could be shortened as cyber risk countermeasure

The number of certificates could increase

And why?

To give your messaging teams a tool which will make them more efficient by

provided accurate information

eliminating manual handling errors when exchanging profiles

eliminating security risks

more rapidly onboard new partners

And in the meantime save some money …

EASEE-gas

Nec plus ultra

We could even take profile management to the next level!!

Fully automated exchange of profile information

We exchange profile information by means of our messaging systems

The specification is there (ref. [Agreement update](#))

EASEE-gas

The only thing left to do is register

https://easeeconnect.eu/

EASEE-gas

6. EASEE-connect demo

Jean-Francois van Snick (Fluxys)
GSConnect Analyst
EASEE-gas TSWG

What is Easee-Connect?

Easee-Connect is an online platform for operators and stakeholders in the gas industry.

It allows the secure storage and exchange of AS2 and AS4 connection parameters.

Facilitates communication and electronic data exchange between business partners in the gas industry.

Easee-Connect Features

Why Use Easee-Connect?

- Simplifies the management of electronic exchanges in the gas industry.
- Ensures compliance with security and communication standards (AS2/AS4).
- Reduces the risk of errors during connection parameter configuration.
- Improves communication between operators, minimizing service interruptions.
- Facilitator in the Certificate Renewal Processes

Platform Evolution

New features in development, including integration of additional communication protocols.

Ongoing improvements in platform security and efficiency.

Increased interoperability with other data management systems in the gas industry.

Open-minded system to your suggestions for future evolutions.

7. Coffee break 13:45 - 14:05

8. AS4: eDelivery rationale for AS4 updates (Dial in)

Bogdan Dumitriu

EC eDelivery

Directorate-General for Informatics (DIGIT)

AS4: EC eDelivery rationale for AS4 updates

Bogdan Dumitriu
EC DG DIGIT

29 October 2024
ENTSOG Workshop on Data Exchange and Cybersecurity

Digital Europe Building Blocks

A **Building Block** is an open and reusable digital solution.

What?

It can take the shape of **frameworks, standards, software products or software as a service (SaaS)**, or any combination thereof.

How?

It promotes the adoption of the same **open standards and technical specifications** by the **different sectors** of the Union for the most basic & common functionalities of their projects or platforms.

Why?

Building Blocks enable interoperability across borders and sectors.

eDelivery
Exchange online data and documents reliably and securely.

eInvoicing
Promote the implementation of the European standard for electronic invoicing across borders.
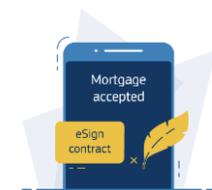
eSignature
Create and verify electronic signatures between businesses and EU citizens.

eID
Allow citizens to prove who they are across borders, making it easier to access online services in another EU Member State.

Buy

Buy a compliant, interoperable solution from the market.

Reuse

Reuse sample software available through Digital Europe.

Build

Build an EU-compliant solution from scratch based on Building Block standards.

eDelivery-powered digital ecosystems

entsog

European Health Data Space (HealthData@EU)

Union Database for Biofuels (UDB)

Peppol
The future is open

ICS2

Interconnection of Insolvency Registers (IRI)

Business Registers Interconnection System (BRIS)

ENERGY
European Product Registry for Energy Labelling (EPREL)

DECIDE Decision

European Maritime Single Window environment (EMSWe)

European Database on Medical Devices (EUDAMED)

Beneficial Ownership Registers Interconnection System (BORIS)

EU Common Entry Gate for Tobacco Reporting (EU-CEG)

ECHA
EUROPEAN CHEMICALS AGENCY
Poison Centres Notification System (PCN)

eEvidence Digital Exchange System

EUCARIS

eFTI Regulation

Council Information Exchange Platform (CIxP)

CESOP

Once only
Technical System

e CODEX | making justice faster.eu

European Crew Database (ECDB)

European Commission

eDelivery Service offering

SOFTWARE
Sample software maintained by the EC (with documentation)
Access Point (AP)
Service Metadata Publisher (SMP)
Service Metadata Locator (SML)

OPERATIONS SERVICES		
Managed services	Testing services	Supporting services
Public Key Infrastructure (PKI)	Connectivity testing	Training & Deployment
Service Metadata Locator (SML)	Conformance testing	Service Desk

STAKEHOLDER MANAGEMENT SERVICES	
Onboarding services (for stakeholders)	Community management services
Self-assessment tool	Developers Community
Onboarding of new stakeholders	Market guide
Cost estimation tool	

TECHNICAL SPECIFICATIONS					
Access point specifications	SMP specifications	SML specifications	Security control guidance	Trust models guidance	Guidance on digital certificates

STANDARDS OF SOs
Standards monitoring

Service offering Description (SoD)

Service Level Arrangements (SLA)

eLearning, videos, success stories

Digital Europe platform

Digital Europe

2014
Created and piloted by Member States

Powered by the **European Commission**

2024
Available to anyone

Connecting Europe Facility (2014-2020)

Digital Europe Programme (2021-2027)

And more...

AS4 security update: rationale and approach

Cryptography and Internet security continues to evolve

- In December 2020, ENISA publication "Good Practices in Cryptography" classified "RSA-PKCS# 1 v1.5" as "Legacy X" (with the meaning "Attack exists or security considered not sufficient. Mechanism should be replaced in fielded products as a matter of urgency")

- The current profile must be updated to stay secure

- New algorithms and key types based on elliptic curve cryptography are commonplace and their use is expected for new applications and protocols
  - IETF RFC 9231 allows their use in XML Security, WS-Security and AS4
  - CA/Browser Forum's baseline requirements for S/MIME

- By aligning with state-of-the-art security we provide continuity and investment protection

eDelivery AS4 2.0 message layer security

Message signing

- Mandatory support (Common Profile) for Ed25519 (elliptic curve signature algorithm using EdDSA and Curve25519)

Message encryption

- Mandatory support for key agreement for encryption using X25519 (elliptic curve Diffie-Hellman key exchange using Curve25519). AES-128 continues to be used for encryption.

eDelivery AS4 2.0 message layer security

Message encryption

- ECDH allows two parties to jointly agree on a shared secret using an insecure channel.

- ECDH-ES mode involves a stable shared recipient public key

- Optional ECDH-full ephemeral mode in combination with new ebCore Certificate Update (enhancement)

eDelivery AS4 2.0 message layer security

Alternative cryptography

- Optional support (enhancement) for ECDSA (for cryptographic agility and/or interoperability with some MS scheme)

- Implementations MUST support at least the **secp256r1**, **secp384r1**, **secp521r1**, **BrainpoolP256r1** curves but MAY also support other ECC curves.

eDelivery AS4 2.0 transport layer security

- Support for TLS 1.3
- Modern curves

eDelivery AS4 2.0 profile roadmap

Interoperability Event session #3

Interoperability Event sessions #1 & #2

Roll-out in products

2nd public consultation

Interoperability Forum meeting

Adoption

March/April
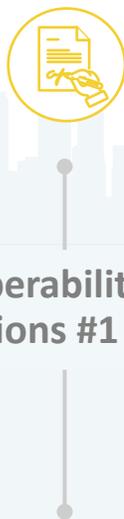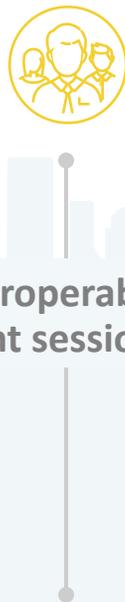
11 & 25 June

1 October

24 October

4 December

Latest draft: eDelivery AS4 - 2.0 (draft 03)

Interoperability Events

What was it? Online sessions (11 June, 25 June, 1 October) to test connectivity between proof-of-concept implementations of eDelivery AS4 2.0 draft specifications.

Testing approach Tests were done in pairs, with EdDSA and/or ECDSA, depending on the participants' capabilities. Each pair followed the test plan twice, with roles (sender/receiver) reversed.

Results

- Three products managed to pass all tests

- Two further products passed some tests

- Feedback addressed in "draft 03"

- Specifications can be implemented

Implementation support

eDelivery Building Block support

- Code contributions to Apache libraries used for XML Security & WS-Security

- EC sample software (Domibus) will implement support in release 6.0 (early 2026)

- eDelivery Conformance Testing Service will allow testing of conformant solutions as of 2026

Strenghtening EdDSA support

- In June 2024, EC submitted change request to ETSI to request inclusion of EdDSA in ETSI TS 119 312 (standard on Cryptographic Suites in electronic signatures)

Learn more about eDelivery

Stay in touch!

eDelivery User Community

The eDelivery User Community space enables stakeholders to share experiences and best practices on the exchange of electronic data and documents between public administrations, businesses and citizens. Pan-European projects (re)using eDelivery have their own sub-communities within this space.

Register for personalised eDelivery news here 🌐 https://europa.eu/!8rtpfj

More about eDelivery

🐦 @edeliveryBB

▶ PeerTube https://europa.eu/!hwcjvy

▶ YouTube eDelivery events (DEP) - YouTube

Newsletter

Events

Interoperability Forum

Webinars
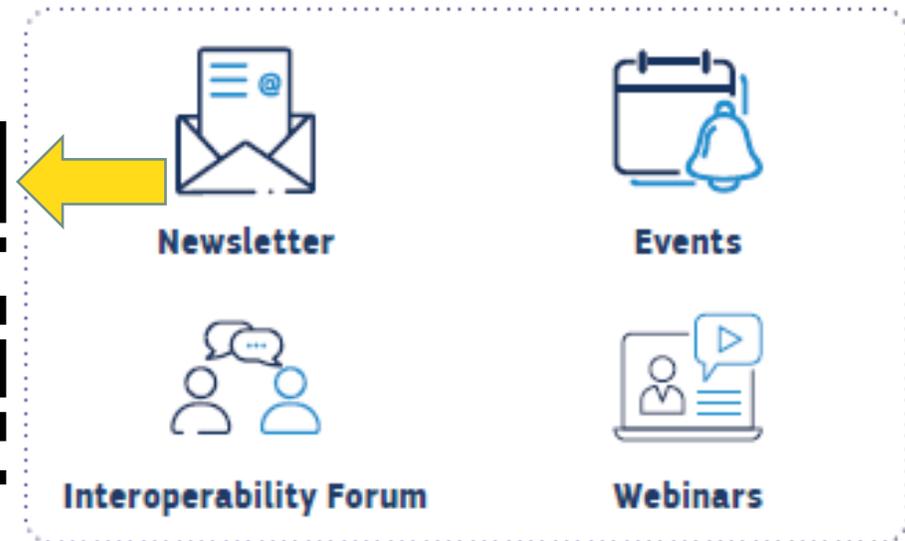
Have a question?
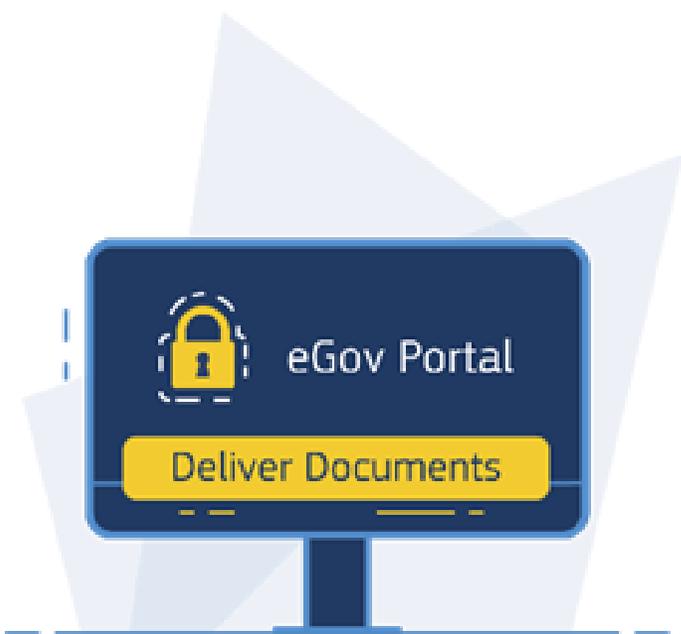
eDelivery

Exchange data and documents online reliably and securely

eGov Portal

Deliver Documents

Bogdan Dumitriu

To continue the conversation, contact our team via email

Emails:

EC-digital-building-blocks@ec.europa.eu

EC-eDelivery-support@ec.europa.eu

Thank you

& stay in touch

eDelivery features

Standardised protocol

The eDelivery public interface is based on OASIS/ISO ebMS3/AS4, further refined by the eDelivery AS4 profile. Cross-domain and cross-project interoperability is facilitated by using the same standardized protocol.

Scalability

eDelivery solutions can continue to be used even when the number of participants/messages in the network grows.

Mature solution

eDelivery is already used in production in tens of projects across Europe with varying sizes and needs.

Interoperability

Interconnecting systems based on open standards already used in countless other projects provides further interoperability opportunities after initial creation.

Payload and business agnostic

eDelivery is payload- and business-agnostic. Once created, the network can be reused to support arbitrary new workflows and datasets.

Vendor-neutral

eDelivery specifications are not proprietary or controlled by one vendor alone. eDelivery is available in multiple products and solutions from different vendors to choose from.

Security, accountability and reliability

The eDelivery AS4 profile has built-in secure exchange of data (encrypted) in a reliable way (one-time message delivery with retries). AS4 acknowledgement receipts provide accountability and non-repudiation of receipt.

Asynchronous messaging

The eDelivery AS4 profile is asynchronous. Synchronous communication can be emulated through various techniques.

Cost-efficient

Reusing an existing and proven building block that benefits from public investment of millions of euro and ongoing funding is more cost-efficient than developing a custom solution.

9. ENTSOG's new AS4 profile & improved security features

Pim van der Eijk
Sonnenglanz Consultancy

AS4: ENTSOG profile and certificate update

Network code on interoperability and data exchange rules

Network code on interoperability and data exchange rules regulation (EU) 2015/703) article 21(2) mandates **AS4**, **Edig@s XML** and the **Internet** as solutions for document-based data exchange

Article 21

Common data exchange solutions

1. Depending on the data exchange requirements under Article 20(2), one or more of the following types of data exchange may be implemented and used:

(a) **document-based data exchange**: the data is wrapped into a file and automatically exchanged between the respective IT systems;

(b) **integrated data exchange**: the data is exchanged between two applications directly on the respective IT systems;

(c) **interactive data exchange**: the data is exchanged interactively through a web application via a browser.

2. The common data exchange solutions shall comprise the protocol, the data format and the network. The following common data exchange solutions shall be used for each of the types of data exchange listed in paragraph 1:

(a) For the document-based data exchange:

  (i) protocol: AS4;

  (ii) data format: Edig@s-XML, or an equivalent data format ensuring identical degree of interoperability. Entsog shall publish such an equivalent data format.

(b) For the integrated data exchange:

  (i) protocol: HTTP/S-SOAP;

  (ii) data format: Edig@s-XML, or an equivalent data format ensuring identical degree of interoperability. Entsog shall publish such an equivalent data format.

(c) For the interactive data exchange, the protocol shall be HTTP/S.

For all data exchange types set out in points (a) to (c), the network shall be internet.

Results of an interoperability PoC supported the choice for AS4

The gas sector used a variety of other existing protocols that were no longer state of the art

– Adoption of AS4 was an opportunity to adopt a common European standard

– However, AS4 was relatively new

AS4 was successfully shown to be interoperable in a proof-of-concept:

- seven companies (ENAGAS, ENI, GASSCO, GCA, Gaz System, SNAM, Westnetz)

- five countries (AT, DE, ES, IT, NO, PL)

- five solution providers (ADES, Axway, Seeburger, Software AG, Tibco)

entsog
european network
of transmission system operators
for gas

ENTSOG AS4 PoC Final Report
2014-08-01

ENTSOG AS4 Proof-of-Concept
Final Report

Final version – 2014-08-01

ENTSOG AS4 background

- AS4 is a configurable protocol, so it requires a "usage profile" that more precisely documents the specific configuration to be used

- Consensus was to use an existing set of implementation guidelines for AS2 from EASEE-gas as starting point for functional requirements

- "ENTSOG AS4" is an AS4 usage profile for TSOs that uses the AS4 feature set to implement the functional requirements

- The ITC KG in ENTSOG maintains the profile

- EASEE-gas current CBP for Message Transmission Protocol for Document Exchange references ENTSOG AS4

CBP 2017-001/01   1   EASEE-gas

EASEE-gas

European Association for the Streamlining of Energy Exchange - gas

Common Business Practice

Number:	2017-001/01
Subject:	Message Transmission Protocol for Document Exchange
Approved:	10-07-2017

Summary

This Common Business Practice promotes the use of AS4 for the transmission of EDIG@S-XML documents.

EASEE-gas association loi 1901
12 Tour Opus, La Défense 9, 77, Esplanade du General de Gaulle, La Défense, 92914 Paris, France
https://easee-gas.eu/

ENTSOG AS4 Usage Profile

- Current version is 3.6

- Available from the ENTSOG site

INT0488-161115 AS4 Usage Profile_Rev_3.6
2018-03-27

ENTSOG AS4 Profile

1

Version 3.6 – 2018-03-27

2

ENTSOG AS4 functionality (1)

- One-way "Push" messaging

- Reliable messaging
  - Retries, receipt acknowledgements, duplicate detection
  - Allows automated recovery from (temporary) system or network unavailability

- Secure messaging
  - Transport and message level
  - Messages and receipts are signed using certificates (integrity, non-repudiation)
  - Payloads are encrypted at transport level and message level (confidentiality)
  - State-of-the-art algorithms following ENISA guidelines

ENTSOG AS4 functionality (2)

- Networking
  - Requirement to use the public Internet for exchange

- Compression
  - Reduces the size of messages

- Domain profiling:
  - Edig@s XML payloads
  - Guidelines for the content of AS4 headers: service, action, roles, part properties

- New feature for certificate exchange using ebCore Agreement Update was added in 2016

ENTSOG AS4 and eDelivery AS4

- EC eDelivery has its origins in EU pilot projects in the same period as ENTSOG's early work

- ENTSOG's proof-of-concept confirmed the readiness of AS4 for eDelivery

- Generic feature set of eDelivery is the same as ENTSOG

- A shared "Common Profile" among many different communities creates economies of scale

- ENTSOG benefits from EC services such as conformance testing

eDelivery (current version)

Four Corner Topology

SBDH

Dynamic Receiver

Dynamic Sender

Pull

Split / Join

ENTSOG

Gas domain profiling

ebCore Cert Update

Common Profile
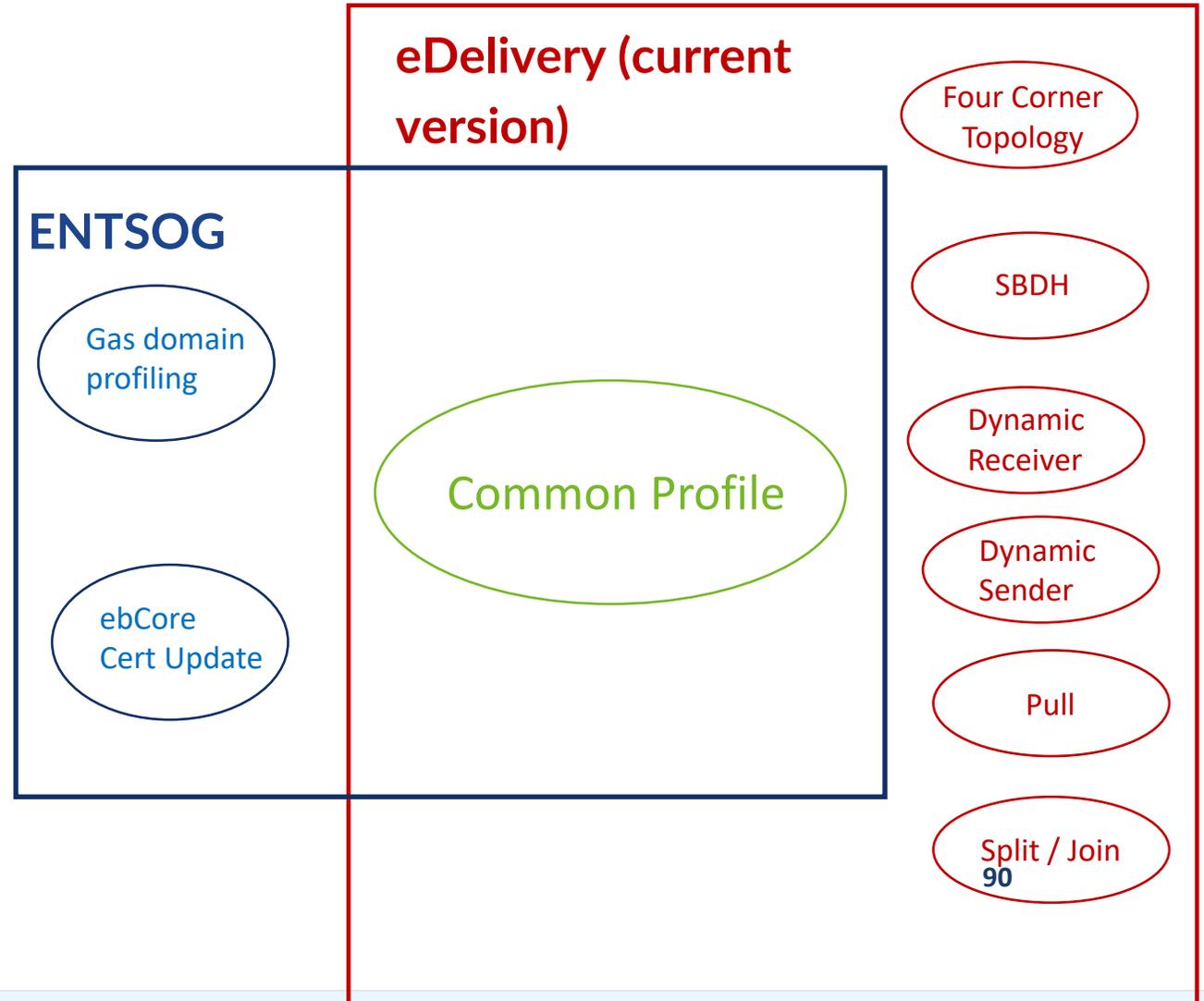
OASIS ebCore Agreement Update (1)

ebCore Agreement Update is an OASIS specification for interoperable message-based updating of messaging configurations.

ENTSOG was one of the first user communities requesting it:

– More flexible alternative process for managing certificates

Certificate update

– Signing, encryption, key exchange certificate updates

– Sharing short-lived, partner-specific key exchange public keys
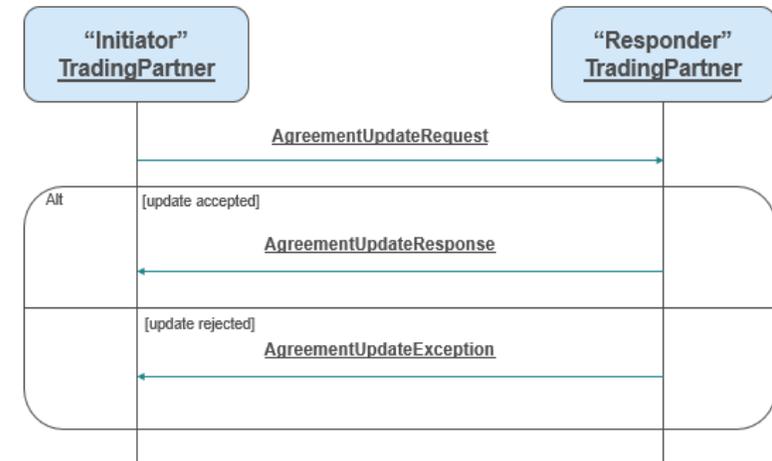
OASIS ebCore Agreement Update (2)

Agreement Update is an extensible protocol, it can be used to update parameters other than certificates such as:

- Endpoint URLs, profile versions, algorithms, network security updates

Benefits

- Automation for direct trust / mutual exchange networks

- Zero dependency on central services

- Supports frequent key updates (approximates ephemeral ECDH)
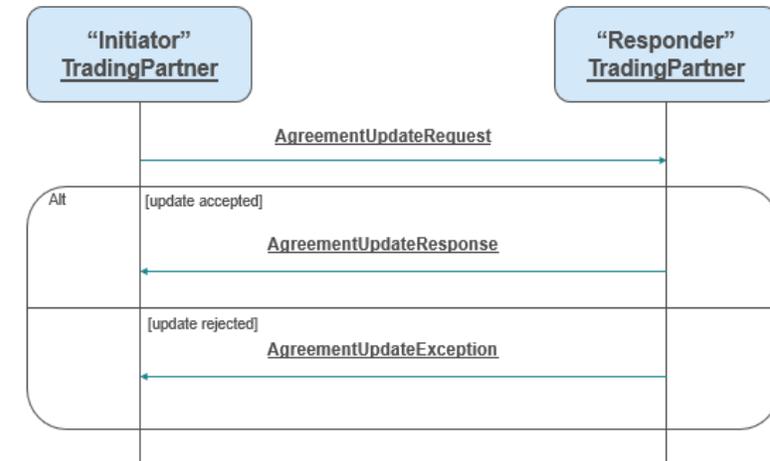
ENTSOG AS4 today

- ENTSOG AS4 is in stable production use

  - Initially, choices in the profile were technically challenging for solution providers

  - However, going for "state-of-the-art" cryptography enabled 10+ years of stable production use

  - No changes since version 3.6, March 2018

  - All documentation publicly available from the ENTSOG site

  - Several Member States also use ENTSOG AS4 at national level

  - Certificate Update still not widely implemented

Future of AS4 for gases

- Prepare for a "next decade" of stable production use of ENTSOG AS4

  - Updated profile using leading edge security for continued secure use

  - Also similar to the AS4 profile developed by BDEW for German energy sector

  - Technical details on algorithms in EC eDelivery presentation

- Protect investments made by TSOs and market parties

  - Continued support for the "document-based data exchange" model

  - Impact is to be addressed by AS4 software and configurations;

  - Impact on the backend interfaces (enterprise integration) can be zero

  - Migration can be incremental, per partner

Future of AS4 for gases

– Continued alignment with EC eDelivery

   – Draft ENTSOG AS4 4.0 core and eDelivery AS4 2.0 Common Profile are the same

   – ebCore Agreement Update will be a new optional feature in eDelivery

– As in 2014, another interoperability PoC was done to validate the draft profile

   – Five products, three of which completed all tests among each other

   – Tests included scenarios using Edig@s XML and AS4 headers set according to the ENTSOG profile

– Next steps

   – Final approval by eDelivery (expected December 2024) and ENTSOG (expected Q1 2025)

   – ENTSOG ITC KG will work on roadmaps, implementation strategy and documentation

   – More vendor testing in 2025, promotions, outreach, alignment with EASEE-gas

Future of AS4 for gases

- AS4 is already used at national level in several Member States

- In other domains, AS4 has proven its suitability for "low latency" exchanges
  - Business processes in gas sector that today use other protocols could benefit from the superior security and versatility of ENTSOG AS4

- Gas transmission is expanding beyond natural gas
  - If/when Edig@s supports other gases, the profile could be reused as-is
  - Non-Edig@s processes could be supported using different values for *Service* and *Service/@type* header values
  - Party identification systems other than EIC could be supported using a different *PartyId/@type* header value
  - AS4 supports arbitrary payload formats, it is not limited to XML

Closing

Further information

– https://www.entsog.eu/interoperability-and-data-exchange-nc

– https://www.entsog.eu/contact-us

10. ENTSOG AS4 a software provider perspective

Arun Anand
CDATA

ENTSOG and CData Arc

How Arc enables TSOs to upgrade to the new AS4 profile

Agenda

- Why Upgrade to the new AS4 Profile?
- CData Arc and the European Energy Market
- How Arc enables a seamless upgrade experience
- Q&A

Why Upgrade to the Latest AS4 Profile?

- **Security:** The new AS4 profile implements state-of-the-art cryptography to ensure your regulatory transmissions are made securely.
  - X25519 Encryption Certificate
- **Business continuity:** TSOs can ensure continuity between the older AS4 specification and the new by upgrading through Arc. Upgrading the profile has no impact on existing transmissions.

CData Arc and the European Energy Market

- CData Arc powers regulatory reporting for the most number of EU energy operators, including Gasunie, EnergyOne and GIE
- Arc's ease of setup ensures that IT teams don't have to negotiate protocols – you can simply point and click to ensure regulatory compliance
- Current upgrading customers can communicate with trading partners/counterparties simultaneously using the old profile as well as the new AS4 profile.

How Arc Enables a Seamless Upgrade Experience

- Arc provides a 2-step upgrade process to the new AS4 certificate
  - Select "ENTSOG_V4" as the **Profile** on the connector
  - Upload a fresh certificate to the Arc console
- No impact on existing connectors using the old AS4 profile

Arc Upgrade Process

Q&A

11. Coffee break 15:05 - 15:25

12. ENTSOG CNOTS: edigas from a service provider perspective (dial in)

GMSL, David Hopkins

The value of Edigas with new gases

A Service Provider's perspective

Based on the Edigas implementation rather
than any implemented "new gas" process

GMSL – a service provider

gmsl

Who are we:

UK based service provider to energy markets for almost 30 years.

Provide message routing services for over 100 gas and power shipper customers, to over 170 market operators, TSOs, SSOs and other counterparties throughout Europe.

Supported Edigas formats and B2B protocols throughout development, via Easee-Gas membership and advice to the working groups.

Provide a "Value-Added-Network" for B2B connections across power and gas with the goal of reducing costs for B2B connections for both customers and 3rd parties.

Edigas: Use in the gas and "future" gases markets

Energy companies need EDI...

...but the TSOs and the markets were independent, each with their own different data models and different data exchange protocols.

To perform EDI, the two "exchangers" must agree both data format AND how to exchange it.

EDI and Edigas
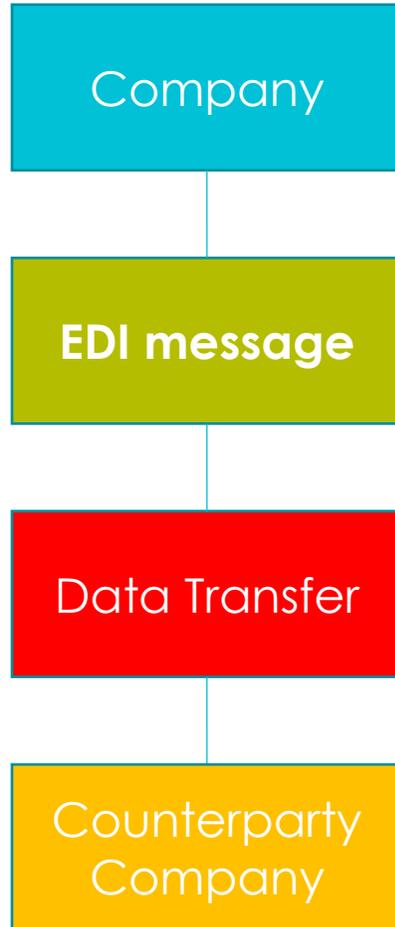
Company

Companies need to perform EDI: exchange electronic documents ("messages") with other companies.

EDI message

Must agree on a data format or "message content" to be exchanged

Data Transfer

Then agree how to exchange the data (B2B), i.e. the "envelope and postman". Timely, securely, legal proof of exchange.

Counterparty Company

EDI and Edigas

Company

Edigas message

Data Transfer

Counterparty Company
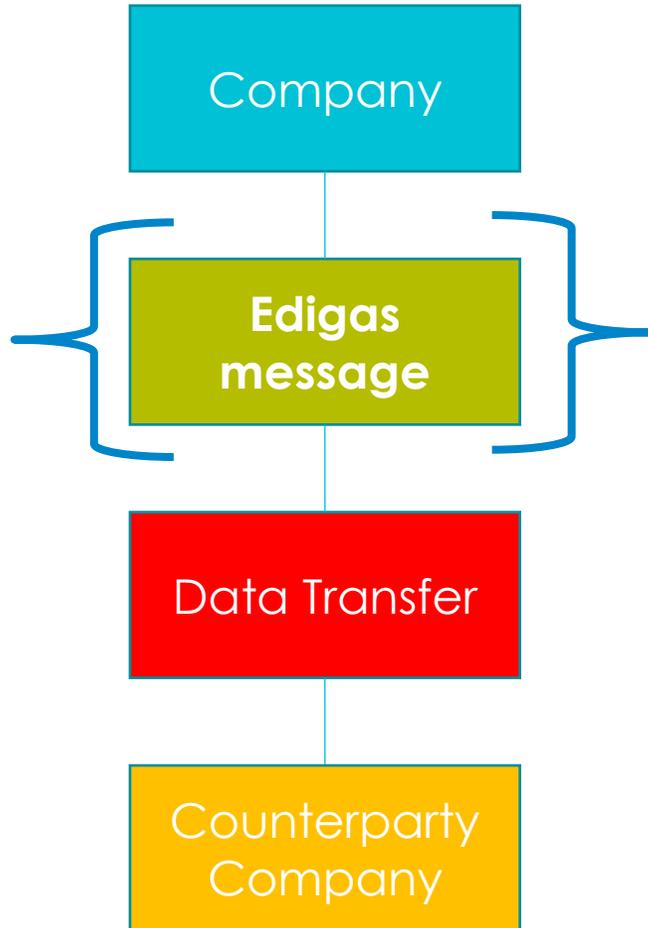
Edigas message formats.

The goal?

…**Harmonisation** of the data format used by the various roles in the markets, to improve interoperability for all parties in the industry.

By attempting to capture ALL use cases within the "message formats", allowing companies to communicate their roles and intentions in a standardised way to all market partners.

Would Edigas work for H2?

For gases where the important data is the "energy value", Edigas can be largely interchangeable, with only limited changes needed.

In other words, Edigas is largely "agnostic" of the gas type. For example, commonality for hydrogen:

Energy values for accounts, over a period, will remain the most fundamental detail:

- Companies still trade and flow volumes of the gases.
- Calorific values could be important where hydrogen is mixed.
- Balances and settlement would still be managed for both the physical and economic aspects.

Pipe capacity will still be needed.

Gas is still produced and "consumed".

System rules and restrictions can and will be applied by TSOs, MAOs, SSOs.

Edigas: The Good?

Almost all market partners now use Edigas message formats of one version or another.

Market parties are much more likely to be able to communicate, on some terms at least, even if companies then need to implement additional rules in their backend processes.

...BUT

It's very difficult to capture all use cases: across each system/market models and processes, which are also changing all the time, so schemas don't fit existing models in all situations.

So, parties create their own interpretations, not checking what other users do, modifying schemas to fit their architecture (which is obviously harder to change).

It can be difficult to find arbitrators where disagreements are found, especially for smaller companies to argue against interpretations of system operators.

AS4

Company

Edigas message

Data Transfer

Counterparty Company
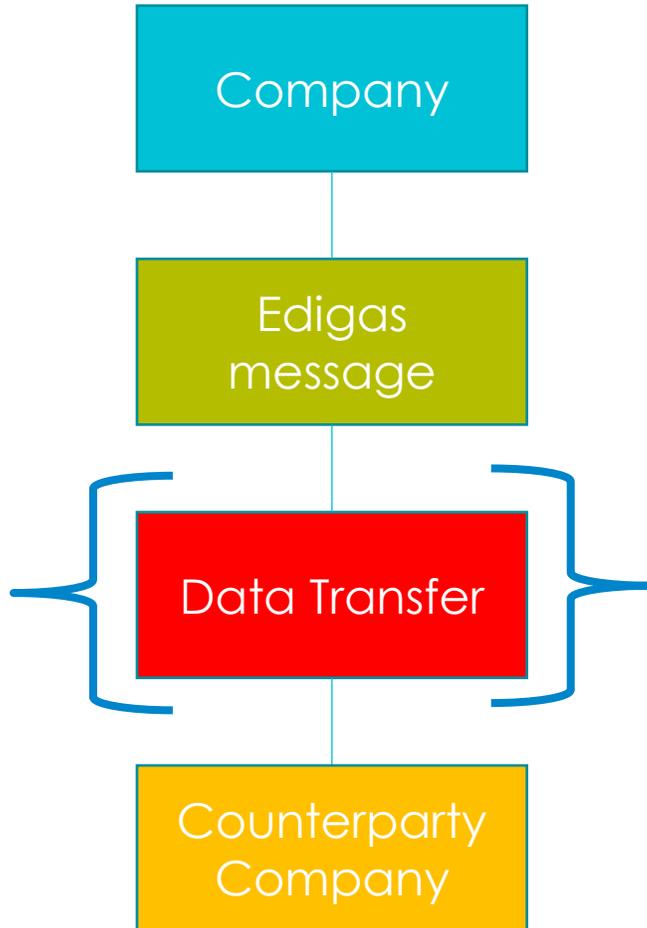
As with the data format, the potential method of transfer could be just as unconventional across the markets.

ENTSOG produced the "AS4 Profile", which is now widely adopted across Edigas-using markets.

This is intended to solve the interoperability problem at the B2B / "Data Transfer" level of the EDI process.

AS4 - considerations

Implementation still results in a **web** of slightly different connections needing support.

- AS4 is technical, with various business components leaking into the B2B behaviour, resulting in slightly different configurations needed between counterparties.
- B2B is left as a final detail on top of legacy solutions; Some connections end up bespoke to support one party or the other's backend problems.
- Support is technical and so discussions on interoperability between counterparties can be difficult.
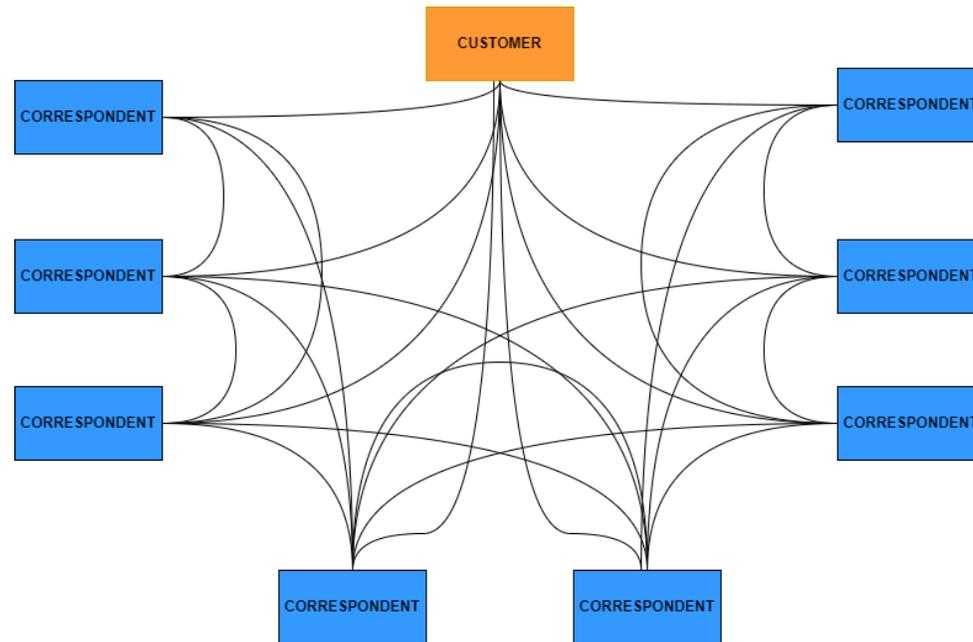
EDI Connections; All 1:1

Would Edigas work for other "new" gases?

A Service Provider's opinion based on Edigas use:

This is very much from a theoretical standpoint, with limited experience of the new gases in the real world.

Non-calorific gases would require some re-working of Edigas messages, as factors other than an energy value will likely be the fundamental detail of much of the data.

However, re-working would be likely be small, and only needs to affect data types rather than underlying formats; Key factors and processes would remain the same:

It's still gas:

- It has volume and is flowed in pipes/containers over a period.
- It is produced, stored or "consumed".

It will be traded/exchanged, nominated/matched and require balancing / settlement processes to be enforced by the system operators.

So yes, Edigas could work for new gases:

There is no point re-inventing the wheel. All you need is some adjustment:

Energy (e.g. H2) + Gas Flows + Trading and System Operator Rules = Edigas

- Nomination and Matching messages
- Gas Trading / OTC messages
- Capacity Allocation messages
- Balancing and Settlement / Meter Reading messages

Non-Energy + Gas Flows + Trading and System Operator Rules = STILL EDIGAS process

- Ultimately, the business-to-business processes and inter-business relationships remain
- Reworking of some data types
- Addition of new data types and maybe some new messages

However, as with Edigas and AS4, we should consider:

Avoiding a starting situation where all System Operators are doing different things:

- Implementation and capture of use cases will be more easily harmonised if everyone starts from the same place.

- There will always be parties using part of the specification to meet their own need, but this will be reduced if everyone starts from a similar point.

Remember that Edigas is a canonical data format; It's translated by the backend of many different companies. Loose definitions, unexpected or new use cases leads to discrepancies in understanding between parties.

However, as with Edigas and AS4, we should consider:

B2B data transfer should be simplified to meet the needs of existing parties in the market, whilst remaining simple enough for new entrants; AS4 is perhaps not the solution for larger numbers of smaller companies due to its technical nature and reliance on certificates.

A Testing / Audit body that tests the System Operators implementation/use cases to ensure compliance to the agreed standards and process.

This would be a significant improvement for the new gases in terms of the quality of harmonisation achieved.

Ultimately, the goal for all is reducing the cost of support and minimising changes over time.

13. ENTSOG CNOTS: Data exchange validation tool for edig@s 6.1

Douglas Walker Hill
Interoperability & Data Exchange Advisor
ENTSOG

The need for an edigas 6.1 xml validation tool

Joint venture between EASEE-gas and ENTSOG collaboration

– TSOs requested a tool to help xml instance checking against edig@s 6.1

– Increase the level of conformance to edig@s 6.1 xsds and guideline rules

– Make standardised schematron validation rules available to users

– Encourage and facilitate uptake of 6.1 in the gas sector (inc new gases)

High level benefits of an edigas validation tool

Help market participants validate their edig@s 6.1

- <u>Encourage</u> market participants to check their implementations against THE standard and also to give tools to help migration to 6.1

- <u>Flag up</u> where there are inconsistencies with a given implementation

- <u>Reduce</u> mistakes in interpretation of the usage of fields (reduce misuse)

- <u>Facilitate</u> upfront counterparty message testing (check before sending test file)

Value proposition of the edig@s 6.1 xml validation portal

- **Target audience…**

  - *Gas market participants using, or intending to implement, edigas 6.1*

- **Opportunity…**

  - *Facilitate compliance to edigas 6.1 specs*

  - *Speed-up edigas implementations by self/counterparty testing*

  - *Provide a standardised set of schematron validation (business and context) rules for the market*

- **'As is' solution**…

  - *SPs, TSOs, LSOs and SSOs test bilaterally with human intervention*

  - *Guides are only provided in a static pdf format*

  - *Guides and testing environment are totally separate and require reconciliation when testing ongoing*

  - *No standard business schematron rules' checks are available, companies rely on varying internal validation*

- **Unique offer**…

  - *Online portal combines the library of edigas messages, guidelines, associated schematron (for download) in a central validation test portal for ease of use and facilitate edigas adoption. **A standard set of schematron tests against edig@s 6.1***

High-level features of the XML validation portal

1. News

- Communication with the portal's user community over a news page. Inform users about corrections, updates, new versions and other topics.

2. Downloads

- SPOC. Publish and make available for download specifications, xsd files, XLST, schematron, guides, stylesheets..

3. Admin

- Configure the portal as an administrator.
- Add documentation to portal.
- Manage users.

4. Validation

- Supports user community to implement edigas and guideline rules identically and achieve real interoperability.

Text here

Simple user interface

1.

Select the guideline and upload message

2.

Creates a report validated against a schematron file and shows the error with an error message.

Back-office stats available to admin to show which rules are broken most.

3. Click link to error position in message

Text here

Next steps

- – Test an instance of the tool with TSOs and EASEE-gas members

- – Agreement with a Service provider

- – Should be made freely available online Q1 2025

- – Gradually add edigas messages & schematron to the portal in 2025

- – Review the progress and usage of the tool 2025

Questions?

Thank you for your attention

Douglas Walker Hill

Douglas.Hill@ENTSOG.EU

14. ENTSOG CNOTS: Future development for data exchange in the gas sector

Panellists:
Oliver Schirok, VNG
Dirk Serruys, Fluxys

Panel questions

1. Do you think the current batch of DE CNOTs are sufficient and suitable for the foreseeable future, here we can think of edigas xml and ENTSOG AS4, or even the BRSs?

2. Do you feel as though there are any other important edi DE tools or standards that we are missing or need to develop further to improve current DE between counterparties?

3. Do you see any reuse of the current batch of ENTSOG CNOTS for new gases/products such as H_2, CO_2, heat etc?

15. Round-up, Questions & Answers

Douglas Walker Hill
Interoperability & Data Exchange
ENTSOG

Tomorrow's session:
Cybersecurity 09:00-14:00

DAY 2. 30 October 2024 Cybersecurity Topics	Presenter & Affiliation
Introduction and welcome	Andrea Chittaro, Snam (Chair of the ENTSOG GIE Task force on Cybersecurity)
Agenda	Douglas Walker Hill, ENTSOG
Threats: Cybersecurity landscape threat assessment	Eleni Philippou, ENISA
Legislation: NIS 2.0 updates	Konstantinos Moulinos, ENISA
Threats: Evolution of Cybersecurity attacks - A TSO perspective	Lucrezia Tunesi, Snam
ICS frontiers: Purdue Model for large grids, a point of view and future challenges	Fabrizio Zucca, Snam
BREAK	
International CS: Physical asset security and the connection to cybersecurity | EDA	Brig Gen. Ioannis Chatzialexandris, EDA
International CS: ENTSOG ReCo Security of Supply for the gas sector	Anton Kolisnyk, ENTSOG
International CS: The European Cybersecurity Scheme on Common Criteria (EUCC)	Philippe Blot, ENISA
International CS: ENTSOG GIE Joint cybersecurity task force update	Douglas Walker Hill (ENTSOG), Andrea Chittaro (Snam)
International CS: Cyber Europe Findings |ENISA	Dr Alexandros Zacharis, ENISA
LUNCH	
Awareness: Introduction to the ENISA awareness package | ENISA	Dr Alexandros Zacharis, ENISA
Awareness: Desktop exercises with ENISA | ENISA	Dr Alexandros Zacharis, ENISA
QA, Thank you and goodbye	Douglas Walker Hill, ENTSOG

Thank you for your attention
Tomorrow's cybersecurity session starts at 09:00 hrs

Douglas Walker Hill,

Interoperability & Data Exchange Adviser

douglas.hill@entsog.eu

ENTSOG - European Network of Transmission System Operators for Gas

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