



Picture courtesy of Gas Connect Austria

Joint ENTSOG, EASEE-Gas, GIE Workshop

Data exchange & Cyber security

FOR RELEASE – contains ACER slide placeholder

Microsoft Teams Online Meeting

1. Technical checks and instructions

2. Welcome & structure of the workshop



Hendrik Pollex
System Operations Director
ENTSOG

Data exchange session

	Topic and speaker	Timings
1	Tech checks registration	09:45 - 09:55
2	Welcome: Hendrik Pollex	09:55 – 10:00
3	ENTSOG's data exchange vision: Douglas Hill	10:00 – 10:15
4	Challenges harmonising exchange protocols: GIE's vision & developments. David Defour	10:15 – 10:45
5	Technology Standards Working Group EASEE-gas. Dirk Serruys	10:45-11:00
6	Update on EASEE-connect. Wim De Olde	11:00-11:15
7	GRT gaz an application of AS4. Marc Duhamel	11:30 – 11:45
8	Usage of Edig@s. Jarle Rønnevik	11:45-12:00
9	System operations with EDIG@S. Oliver Schirok	12:00-12:15
10	Q&A. Douglas Hill	12:15-12:20
	Lunch	12:20-12:45

Cyber security session

	Topic and speaker	Timings
11	Setting the scene: The Colonial pipeline attack. Hendrik Pollex	12:45-13:00
12	A potential Gas & Hydrogen Cyber security NC. Stefano Bracco NB Placeholder only, please contact ACER directly for the slides	13:00-13:30
13	Three real cases of cyber incidents in SNAM: Lucrezia Tunesi <ul style="list-style-type: none">• CEO Fraud• Potential Ransomware Infection• Supply Chain Attack	13:30-13:45
14	A review of the NIS 1.0 and NIS 2.0 Directive. Stefano Mele	13:45-14:00
15	Future cyber security and challenges. Andrea Chittaro	14:00-14:15
16	Q&A. Douglas Hill	14:15 14:20
17	Closing remarks. Hendrik Pollex	14:20-14:30

DATA EXCHANGE SESSION

3. ENTSOG's Data exchange vision & developments



Douglas Walker Hill
Interoperability & Data Exchange
ENTSOG

ENTSOG

What we have achieved 2021

- ENTSOG ITC KG AS4 work items
- Resolved FUNC issues ref certain BRSs
- Updated and improved BRS in line with new EDIG@S guides
- Reviewing ways to strengthen collaboration with partners



Vision of Data Exchange 2022

Organisational

- Plan – WKSPs, Best practice
- Organise – Relations, Policy response
- Control – Updates, Maintenance

Technical

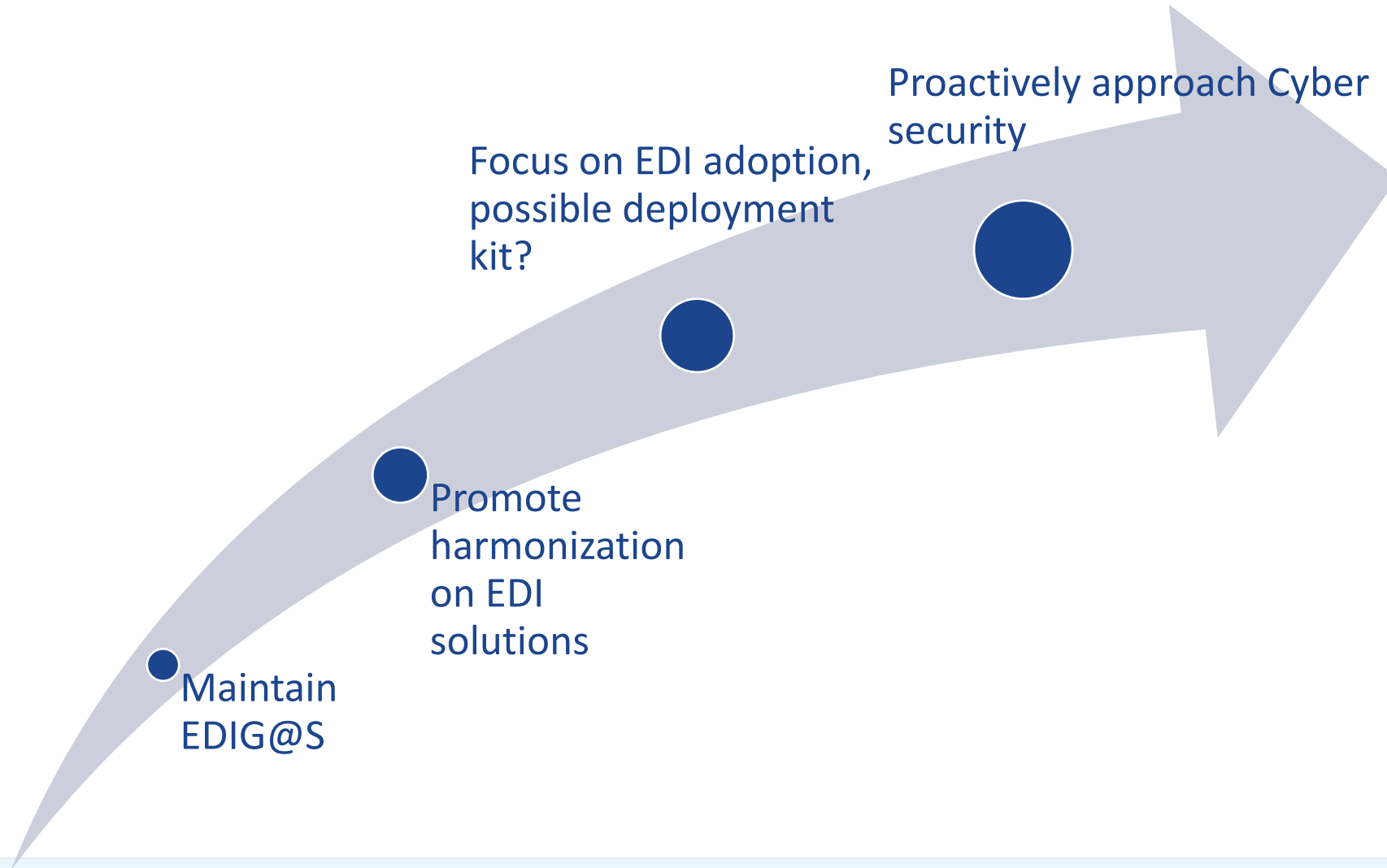
- Lead – Pilots, Research
- Advise – Comms, New tech

- **Organisational Support**
 - **Build out** external working relationships i.e. GIE, SNAM, EASEE-gas, EDIG@S WG, ACER, CEF/DEP, etc.
 - **Define** a formal release policy for the ENTSOG AS4 profile
 - **Collect** 'Best practices' in data exchange (Case studies, val prop)
 - **Support** internal INT WG, FUNC issue resolution, ENTSOG KGs
 - **Hold** workshops for Data Exchange and Cyber Security
 - **Follow-up** ongoing dialogues with stakeholders.

- **Technical Support**

- **Review** various P2P protocols and ‘Tech watch’.
- **Harmonise** future algorithms for data exchange within the gas market (AS4)
- **Explore** state of the art cryptography, Elliptic Curves
- **Deliver** proof of concept AS4 trials and pilots and EDI deployment kits
- **Investigate**
 - any new BRS & EDIG@S needs stemming from hydrogen
 - JSON adoption?
- **Support** 2022 for ACER CNOTs

Potential Data Exchange Topics in 2022



Open questions

1. Do you think there is more digitization work to be done?
2. Do you think that we have a critical mass of the gas SC doing EDI?
3. Is there scope for a new push to encourage implementation?
4. Is EDIG@S JSON an option for easier systems' implementation?

4. Challenges harmonising exchange protocols



David Defour
CEO
GIE



Gas
Infrastructure
Europe

Cyber security in the energy sector

Existing challenges & opportunities

17 November 2021

10:00-15:00 CET

Online meeting

Challenges in harmonisation exchange protocols



David Defour
GIE
Chief Technology Officer

WHAT

do we report

REMIT & Transparency Platforms

GIE REMIT reporting services



GIE as RRM (Registered Reporting Mechanism) **for REMIT**

for **REMIT Fundamental Data reporting** on storage and LNG to ACER

The REGULATION (EU) on Energy Market Integrity and Transparency (REMIT) (EU Comm. Impl. Reg. (EU) No 1348/2014 of 17 December 2014) requires that information related to capacity and use of facilities for storage of natural gas and use of LNG facilities, incl. planned or unplanned unavailability of facilities ('fundamental data') is to be reported to ACER, the Agency for the Cooperation of Energy Regulators (www.acer-remit.eu).

Data publication : alsi.gie.eu (LNG) - agsi.gie.eu (storage)

ACER list of accredited RRMs : <https://www.acer-remit.eu/portal/list-of-rrm>

GIE as IIP (Inside Information Platform) **for REMIT** (RIS : Regulated Information Service)

for **REMIT Inside Information reporting** on transmission, storage and LNG to ACER

According to REGULATION (EU) No 1227/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 October 2011 on wholesale energy market integrity and transparency (Official Journal of the European Union, L 326/1), market participants shall publicly disclose inside information which they possess w/ regard to the businesses or facilities that they or their parent undertaking own or control.

Data publication : iip.gie.eu (UMM : Urgent Market Messages)

ACER list of accredited IIPs : <https://www.acer-remit.eu/portal/list-inside-platforms>




REMIT & Transparency Platforms

GIE as Inside Information Platform (IIP)

ACER accredited **3 Central Transparency Platforms** with **pan-European data coverage** for Inside Information Disclosure (REMIT UMM reporting)



ACER
European Union Agency for the Cooperation
of Energy Regulators



ARIS
ACER REMIT Information System

European Register
of Market
Participants

List of
Organised
Market Places

List of
Standard
Contracts

List of RRTMs

List of Inside
Information
Platforms

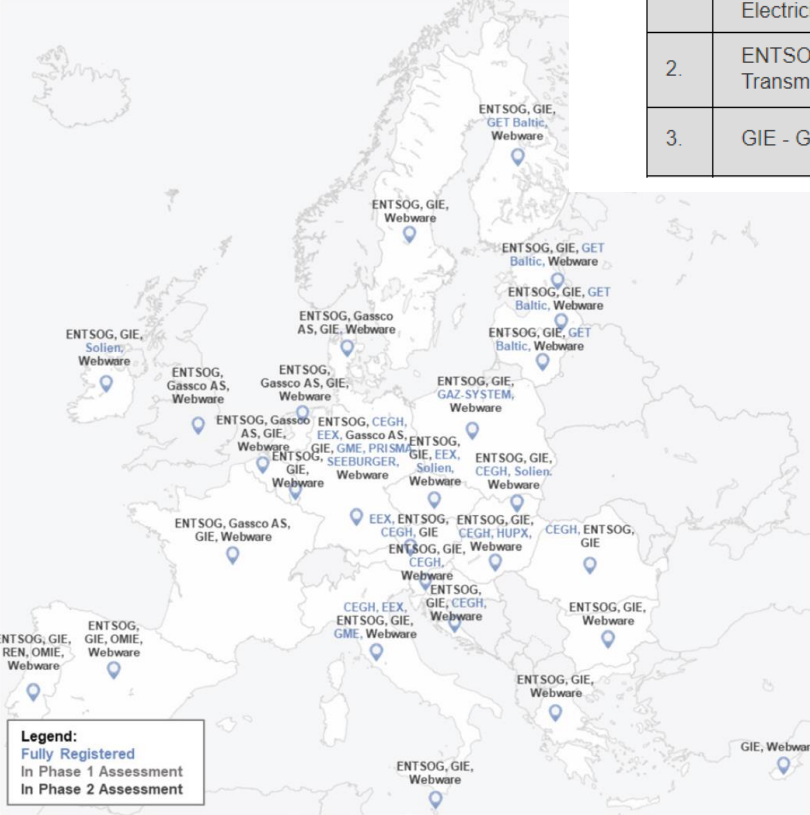
No.	Name of the platform	EL	NG
1.	ENTSOE - European Network of Transmission System Operators for Electricity	yes	no
2.	ENTSOE - European Network of Transmission System Operators for Gas	no	yes
3.	GIE - Gas Infrastructure Europe AISBL	no	yes

Electricity Market – coverage by IIPs



Source: ACER (2021).

Gas Market – coverage by IIPs



Source: ACER (2021).

ENTSO-E / Electricity
ENTSOE / Gas (TSO)
GIE / Gas (SSO-LSO-TSO)



<https://iip.gie.eu>

REMIT & Transparency Platforms

GIE as IIP for REMIT (RIS : Regulated Information Service)



TYPE	TOPIC	WHO
REMIT Fundamental Data reporting	Security of Supply	Mandatory for all EU SOs
REMIT Transaction Data reporting	Trading	Mandatory for SOs active on the wholesale energy market
REMIT Inside Information reporting	UMM	Mandatory for SOs active on the wholesale energy market

- **ACER regulatory requirement** to use IIP for UMM since 01/01/2021
- Mandatory to use by Market Participants (open to **LSO/SSO/TSO**)
- Official listing on ACER Portal since 22/12/2020
- Fully accredited since 29/09/2021 following ACER conformance & data quality assessment
- **Free of use** for GIE REMIT customers
- **UMM Map view** to be added
- Joint **MoU with ENTSOG IIP** for mutual contingency back-up reporting services



Data usage & Transparency

Industry tool



- **Transparency to the market**

Industry tool monitored by **traders, analysts and journalists** covering European gas market and is **repackaged** by large commodity data providers such as Bloomberg, Refinitiv, Reuters, etc

- **Information source on Security of Supply**

Data used by **EC GCG (EC Gas Coordination Group)** to monitor security of supply – proven worth during gas crises
Data source for **ACER**, for market monitoring

- **Extended and wider reporting base**

REMIT data reporting became in act as of 7 April 2016.

AGSI+ and ALSI further expand this historical dataset going back to 2011 (AGSI+) or 2012 (ALSI).

Additionally, the AGSI+ platform **also covers data reporting by non-EU countries not falling under REMIT obligations** such as Ukraine

GAS-GERD-GIE Quote		GAS-GERD-GIE	
GIE Germany		Ref.	Q1DEC15
Gas Storage EU		Daily	05:30
Area: DE	From	To	PCT
	%Full		
02DEC15 05:30	76.62	1.69	Storage 18674.66
01DEC15 05:30	76.31	-0.08	Withdr 38.38
30NOV15 05:30	77.66	-0.08	DTMTS 24374.52
CL: 01DEC15	78.31		DTMTI 326.58
			DTMTW 598.55
GAS-GERD-GIE More info click <EUGAS/STORAGE> (C):GIE			
DTMTS Declared Total Maximum Technical Storage in mcm			Status
DTMTI Declared Total Maximum Technical Injection/day in mcm			Estmtd
DTMTW Declared Total Maximum Technical Withdrawal/day in mcm			

Country	Storage	Injection	Withdrawal	DTMTS	DTMTI	DTMTW
Germany	18674.66	1.69	-0.08	24374.52	326.58	598.55
France	12345.67	0.12	-0.05	15678.90	123.45	456.78
Italy	9876.54	0.08	-0.03	12345.67	98.76	345.67
Spain	5432.10	0.05	-0.02	7654.32	54.32	210.98
UK	3210.98	0.03	-0.01	4567.89	32.10	109.87

Country	Storage	Injection	Withdrawal	DTMTS	DTMTI	DTMTW
Germany	18674.66	1.69	-0.08	24374.52	326.58	598.55
France	12345.67	0.12	-0.05	15678.90	123.45	456.78
Italy	9876.54	0.08	-0.03	12345.67	98.76	345.67
Spain	5432.10	0.05	-0.02	7654.32	54.32	210.98
UK	3210.98	0.03	-0.01	4567.89	32.10	109.87





Gas
Infrastructure
Europe

HOW

do we report



GIE

REGISTERED
REPORTING
MECHANISM

REMIT

AGSI+

Aggregated Gas Storage Inventory

ALSI

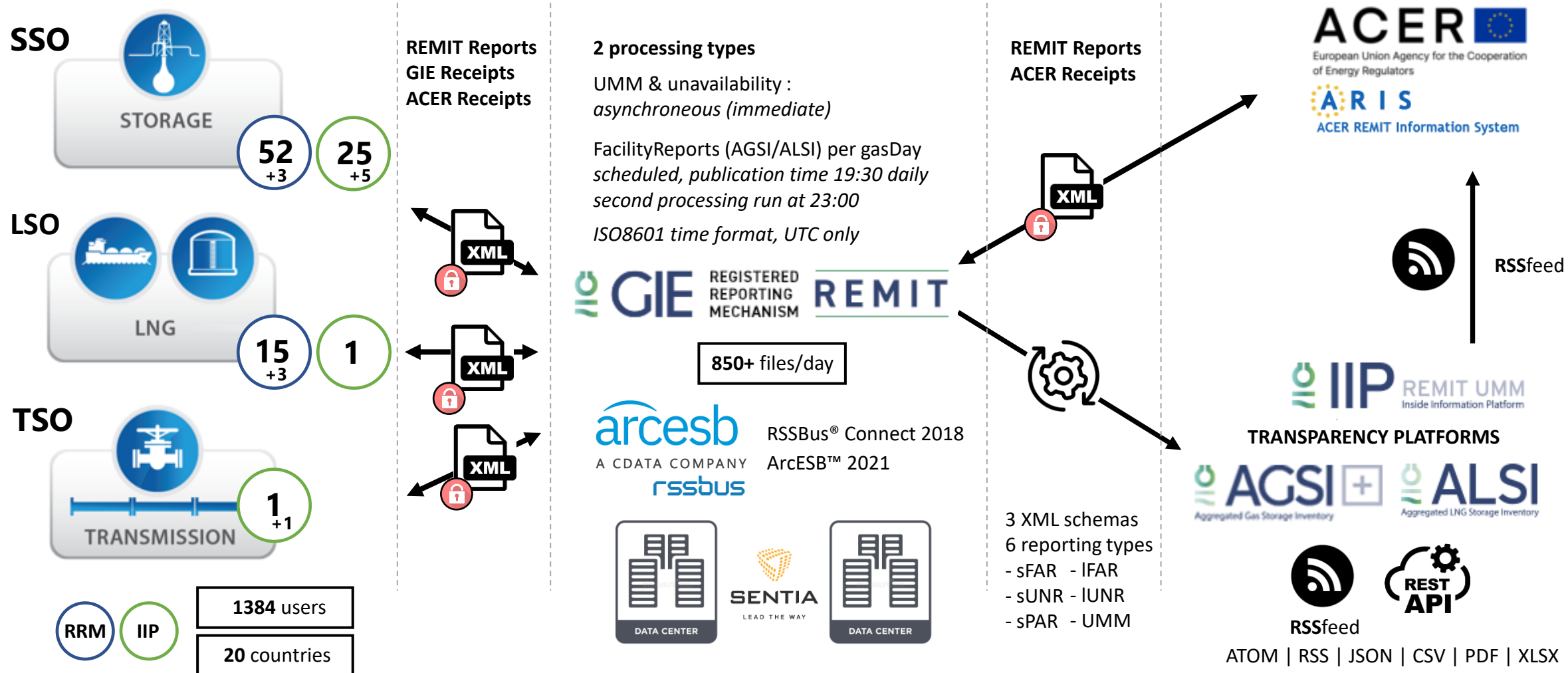
Aggregated LNG Storage Inventory

IIP

REMIT UMM
Inside Information Platform

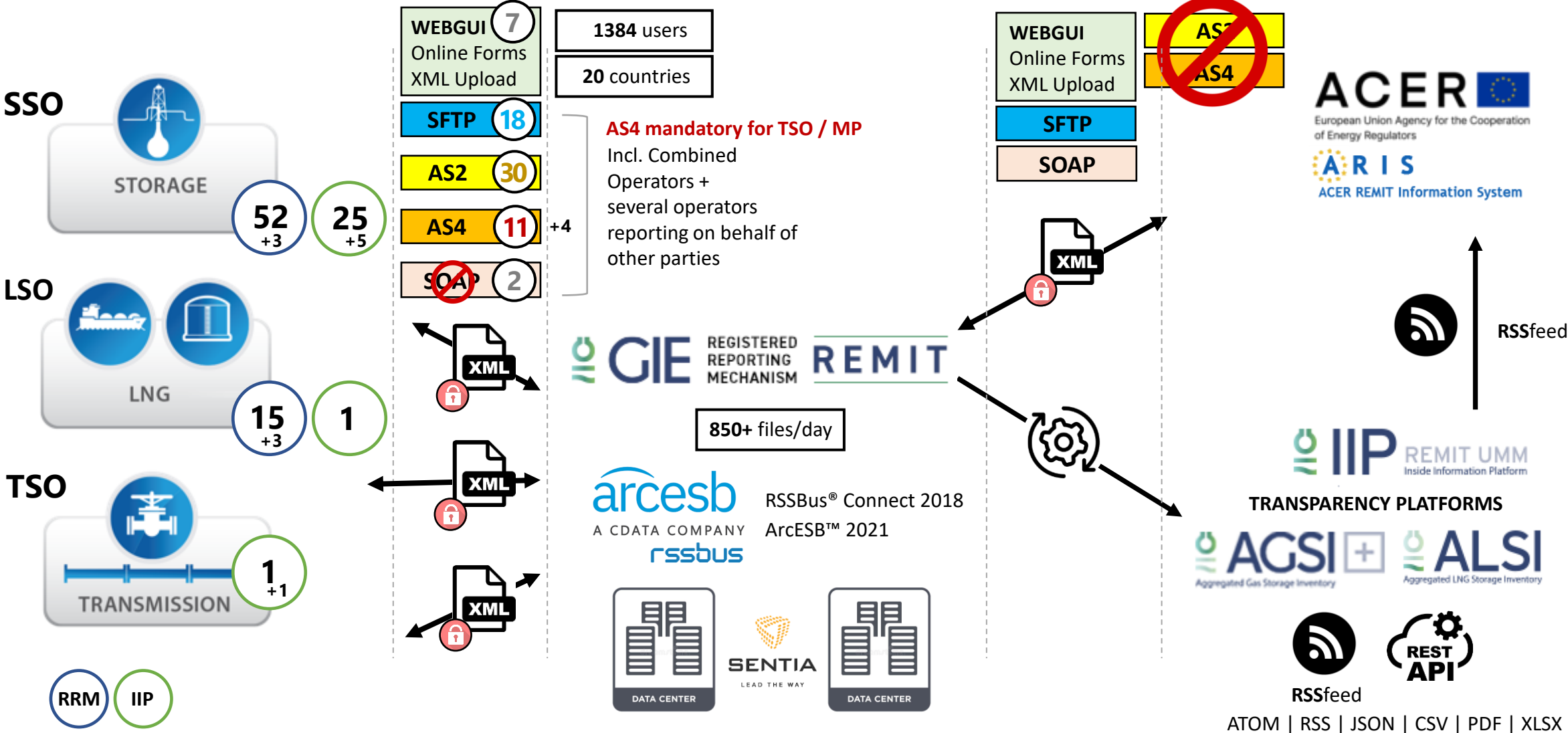
REMIT & Transparency Platforms

Data processing



REMIT & Transparency Platforms

Data exchange



REMIT & Transparency Platforms

Secure data exchange

REMIT legal requirements

ACER legal attestation RRM/IIP

- Secure transmission of data
- Timely transmission of data
(UMM : to be reported within the hour)
- Validation of input
(Error handling & Processing)
- Output format & content
- Governance
- Operational Reliability
- Disruption of services
- Security Breaches
- Contingency procedures
- Auditing procedure

Data Centre

2 data centres located in Belgium

ISO Certification, ZDLS cloud environment, strict SLA, mirroring

Separate UAT and PROD



850+ files/day



Data Connectors

WEBGUI
Online Forms
XML Upload

Dispatching / Control centre
back-up channel for all accounts

SFTP 18

SFTP pull from client, scheduled
standard : each 10 mins, varies depending
on load balancing requested by client)

AS2 30

AS2 most popular, industry standard

AS4 11

Increasing switch to AS4, most secure

~~SOAP~~ 2

Deprecated
Rijndael encryption required

REMIT & Transparency Platforms

Automated & secure data exchange

SFTP

SFTP 18

- SFTP pull from client
SFTP authentication mechanisms: Password, Public Key, or Multiple Factor

AS2 / AS4

AS2 30 AS4 11 +4

- Web service
 - **Most secure** data transmission method (end-to-end encryption)
 - **Widely supported within the industry**
 - Communication Agreement following with **ENTSOG specifications**
AS4 profile types supported at GIE : standard, ENTSOG or e-SENS
 - **Flexibility**: file types, size, upgrade path towards AS4
 - **AS2 MDN (Message Disposition Notification)** or
AS4 SOAP XML Digital Signatures : immediate confirmation of receipt
 - **AS4 mandatory to use for TSO** :

[EU Commission Implementing Regulation \(EU\) No 2015/703 of 30 April 2015 on the establishment of a network code on interoperability and data exchange rules](#) indicates in Chapter V (Data Exchange), Article 20-24 that the **AS4 protocol** is to be used and implemented for communication **by TSOs** (network users active on interconnection points or virtual trading points). This requirement became applicable on 1 May 2016 and implementation is being monitored by ENTSOG (for more information, see CNOTS / AS4 section at <http://www.entsog.eu/publications/as4>).



Gas
Infrastructure
Europe

CHALLENGES

& SOLUTIONS



GIE

REGISTERED
REPORTING
MECHANISM

REMIT

AGSI+
Aggregated Gas Storage Inventory

ALSI
Aggregated LNG Storage Inventory

IIP
REMIT UMM
Inside Information Platform

REMIT & Transparency Platforms

Automated & secure data exchange

Experiences from the „shop floor“

SFTP

SFTP 18

Challenges :

- Firewall issues*
- Remote path
- Read/write access
- Port settings
- User authentication (keyboard-Interactive)
- Retroactive updates

AS2 / AS4

AS2 30 AS4 11 +4

Challenges :

- AS2/AS4 profile compliance
- Encryption Certificate (X.509)
- Verification Certificate (X.509)
- SSL Server Certificate (X.509)
- AS2/AS4 transmission url
- EASEE-gas certificate renewals
- Profile settings

Common

Challenges :

Connection sheet standardisation

Firewall issues

IT environment types

on client side (BizTalk, custom development / undocumented, ArcESB/RSSbus, Seeburger, etc)

Certificates provision methods (email txt + SMS, download, upload)

REMIT & Transparency Platforms

Automated & secure data exchange

AS2

30

AS4

11

+4

Best and most secure protocols for synchronized time-critical reporting

Recommendation

Implementation and standardisation towards AS2/AS4 by reporting parties would **reduce IT cost** on both sides (GIE and Operator support and infrastructure, setup and licensing costs) and improve **security**

Especially as Operators have several REMIT reporting types to perform, towards multiple RRM's.

This is especially relevant to 'combined operators', which are both SSO, LSO and/or TSO.

This in return will be beneficial to the TP **data quality** and **timeliness** of reporting

Recommendation

Implementation of AS2/AS4 by ACER would provide **better response times** towards the reporting parties. ACER response times often run up to 30 minutes or longer. Additionally we would have better **security** and **proof of delivery** (currently we receive no transmission receipts)

Unfortunately, there are no plans on ACER side to make the switch. GIE did find support in this change with other RRM's and ACER indicated that if enough depend is received, this can be considered in the future.

Earlier, budget reasons on ACER side were indicated as the root cause, but since 01/01/2021 RRM's are subject to a mandatory REMIT Fee for reporting to the Agency

AS2/AS4 is also highly recommended for Inside Information reporting, as this data is highly sensitive as it can affect pricing on the wholesale market for energy



THANK YOU
For your attention

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1000 Brussels - BELGIUM

T +32 2 209 05 00
gie@gie.eu

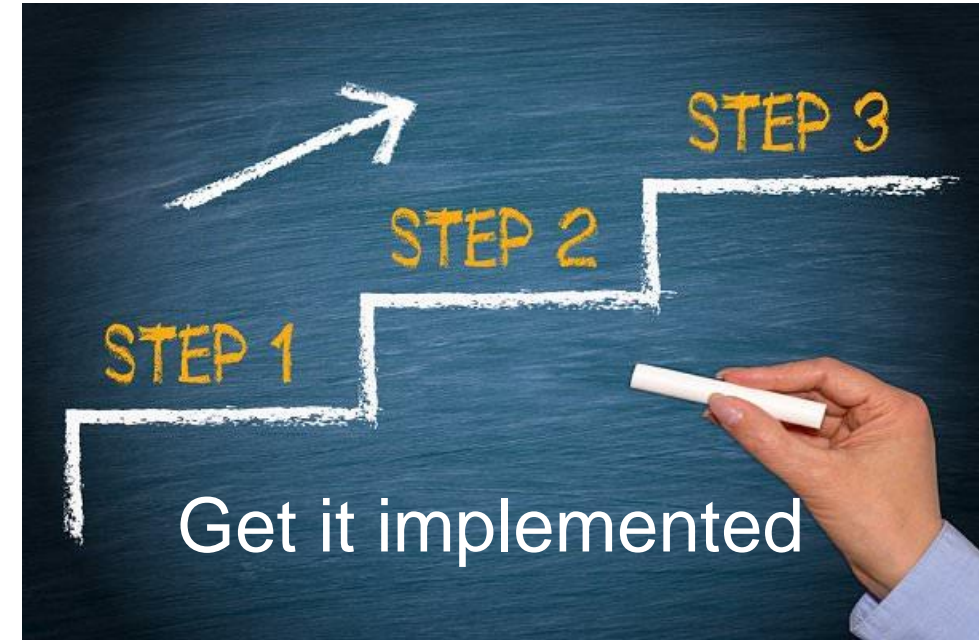
@GIEBrussels
www.gie.eu

5. Update Specification ENTSOG AS4 profile Ext



Dirk Serruys
Chair TSWG
EASEE-gas

Agreement Update & Certificate Exchange CBP AU&CE



Agreement Update & Certificate Exchange CBP AU&CE



- AS4 is now widely used in the gas sector for secure and efficient exchanges of messages
- Operations and security starts with the exchange of parameters for AS4 configuration
- Manual exchange of parameters is error-prone

Operational efficiency and accuracy are the fundamental benefits brought by the AU&CE CBP. Its implementation brings money savings and risk mitigation benefits.

Get it implemented | Step 1 – Support multiple sets of parameters

By means of the AgreementRef header field we can distinguish which set of parameters was used on a per message basis

This is the key for smooth transitions when parameter sets need to change

Will need support within your AS4 product



Get it implemented | Step 2 – Exchange parameter sets in band of AS4

Using a standardized document,
exchange new parameter sets using
your AS4 message handlers

This will minimize errors in
transmitting and transcoding
parameter values



Get it implemented | Step 3 – Full automation

Based upon the capabilities in step 1 and 2 you could decide to fully automate the handling of parameter sets within your AS4 product.

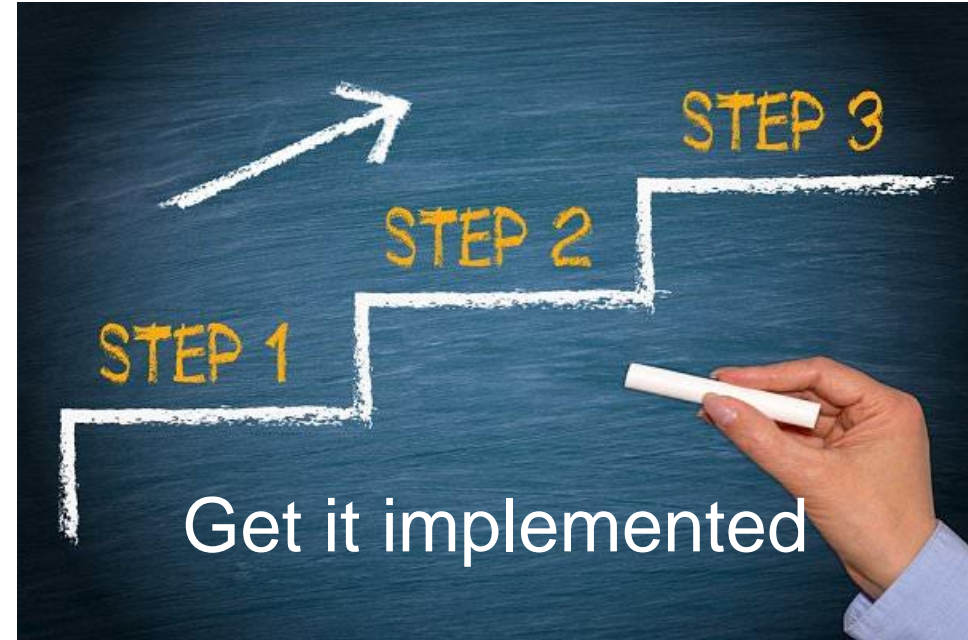


Thank you for your attention

easee-gas.eu | easee-gas@kellencompany.com



Agreement Update & Certificate Exchange CBP *AU&CE*



6. Update on EASEE-connect



Wim de Olde
Secretary TSWG
EASEE-gas



© Wim de Olde

EASEE-connect

Wim de Olde, secretary TSWG

- What is EASEE-connect?
- Function overview
(including updates, enhancements and security)
- Licensing
- Planning

The trusted platform for AS4/AS2 profiles



EASEE-connect is a digital platform developed by EASEE-gas whereby gas **market participants can create and manage** their AS4 and AS2 company **profiles and portfolio of business connections** in a simple and secure way.

- EASEE-connect replaces the e-mail and telephone conversations regarding technical connection parameters
- Up-to-date contact details of communication partners in one application
- By using EASEE-connect, companies have access to an automated profile management system that helps them to:
 - increase efficiency and quality of information
 - save time and money
 - avoid mistakes and mitigate security risks



EASEE-connect functionality



Members:



RELATION PARTY PROFILE CERTIFICATE COMPANY SWITCH PARTY MY ACCOUNT LOGOUT

- Company management (a company can have multiple parties)
- Party management
- Certificate upload and management
- Profile management (technical parameters)
- Relation management
- “My Account” management

Administrator (secretariat):



ADMINISTRATION MY ACCOUNT LOGOUT

- Management companies/parties (procedures in place)
- Management user access

Address book

EASEE-connect Gasunie Transport Service...



Edit Company

Name Gasunie IT department

Parent/Representin Company Name N.V. Nederlandse Gasunie

EASEE-connect BBL Company



Relation

Existing relations

Equinor & BBL Company Agreement
Gasunie Transport Services B.V. & BBL Company Agreement
BBL Company & TESTYURI 1 Party Name P1Request

DOWNLOAD ALL CONTACTS

Search for new relations

gas

Click to invite the party

Name	EIC code	Name	Phone Number	Email
GasOne	AAAAAAAAAAAAA	Business		
Gassco	21X-NO-A-A0A0A-2	Jeroen Zanting	0031012344578	jeroen@gasunie.nl
Gasunie Transport Services B.V.	21X-NL-A-A0A0A-Z	Production Support		
Thyssengas delegated by David Magryta	21X-DE-G-A0A0A-U	Nimbus-T (operation)	0031123432879	operation@gasunie.nl
		Technical		
		Wim de Olde	003112789234789	wim@gasunie.nl



INVITE



INVITE

Phone Number	Email	
031012344578	jeroen@gasunie.nl	REMOVE EDIT
031123432879	operation@gasunie.nl	REMOVE EDIT
03112789234789	wim@gasunie.nl	REMOVE EDIT

Profiles

Manage your technical profiles for communication and create relations

Profiles

Select profile

Profile

GTS acceptance all A06 documents (from: 2018-09-27, to: 2021-09-27)

X

GTS Nomination Production (from: 2018-09-27, to: 2021-09-09)

X

Production (from: 2021-10-01, to: 2023-12-09)

X

CREATE NEW PROFILE

Profile 'GTS Nomination Production'



SAVE

Profile Name

Inbound IP

Outbound IP

Inbound URL

Add document type

Search by Role

Service	Direct
---------	--------

Relation

DOWNLOAD ALL CONTACTS

Existing relations

Fluxys & Gasunie Transport Services B.V. Agreement

Equinor & Gasunie Transport Services B.V. Agreement

Gasunie Transport Services B.V. & Gassco P1Request

GMSL & Gasunie Transport Services B.V. Agreement

ENI & Gasunie Transport Services B.V. Agreement

ENGIE SA & Gasunie Transport Services B.V. Agreement

ECC & Gasunie Transport Services B.V. Agreement

Action

End date of profile tied to end date certificate

Validity

Start date

2018-09-27



End date


2021-09-27



Certificates



Certificates can be uploaded and managed

 Gasunie Transport Service...

RELATIONPARTYPROFILECERTIFICATECOMPANYSWITCH PARTYMY ACCOUNTLOGOUT

Certificates

Name	Created on	Valid until	Thumbprint
Gasunie Transport Services B.V.	2018-09-27	2021-09-27	4A0A6F6FA969D6174D78I
Gasunie Transport Services B.V.	2020-12-09	2023-12-09	FA4586409E7520A9502E


New Certificate

Certificate name

Certificate text

—BEGIN CERTIFICATE—

SAVE

 Gasunie Transport Service...

RELATIONPARTYPROFILECERTIFICATECOMPANYSWITCH PARTYMY ACCOUNTLOGOUT

Certificates

Name	Created on	Valid until	Thumbprint
Gasunie Transport Services B.V.	2018-09-27	2021-09-27	4A0A6F6FA969D6174D78DC49E09CC5D2B5E02899
Gasunie Transport Services B.V.	2020-12-09	2023-12-09	FA4586409E7520A9502EA288FEF746B91CE2F0A4

New Certificate

Certificate name

Certificate text

TZKf8A0U0UJGIMN+45THMOKM/ZU3TQRROIKE8UgrbW803AYZU5JMXLgrWRP/YIK
NUX3NZBfBH4yKiviDD+BnYQc
—END PRIVATE KEY—

SAVE

✖

You uploaded a wrong certificate type

OK

A new certificate can be received through the “Certificate Update” message.

Agreement between companies



- Agreement “by invitation”
- Technical settings can be downloaded (future: standard CPPA3 format for automatic import in local application)

```
{
  "parties": [
    {
      "eicCode": "21X-BE-A-A0A0A-Y",
      "signing_certificate": "@!^#&*",
      "encryption_certificate": "@!^#&*",
      "client_ipv4": "168.58.46.55",
      "clientOutboundIp": "168.58.46.60 & 168.58.46.61",
      "server_address": "b2b.fluxys.com:8383",
    },
    {
      "eicCode": "21X-NL-A-A0A0A-Z",
      "signing_certificate": "@!^#&*",
      "encryption_certificate": "@!^#&*",
      "client_ipv4": "168.20.46.55",
      "clientOutboundIp": "168.20.46.60 & 168.20.46.61",
      "server_address": "prp.gu-messaging.com",
      "documents": [],
      "agreementRef": "http://entsog.eu/communication/agreements/21X-BE-A-A0A0A-Y/21X-NL-A-A0A0A-Z/21"
    }
  ]
}
```

EASEE-connect Gasunie Transport Service...

RELATION PARTY PROFILE CERTIFICATE COMPANY SWITCH PARTY MY ACCOUNT LOGOUT

Agreement 'Production from 2021-10-1'

Name: Production from 2021-10-1

Agreement Ref: <http://entsog.eu/communication/agreements/21X-BE-A-A0A0A-Y/21X-NL-A-A0A0A-Z/21> [CHANGE VERSION](#)

Fluxys

Role: Undefined

Profiles: Fluxys Production

document types for profile

Gasunie Transport Services B.V.

Role: ZSO

Profiles: Production

document types for profile

Available Documents to use for this agreement

Service	Direction	Document Type Code	Action
A02	All receives from All	87G	+
A06	ZSO receives from ZSO	26G	+
A06	ZSO sends to ZSO	26G	+

[SAVE](#) [DOWNLOAD](#) [CANCEL](#)

This information can be used in de AgreementRef Update message. Possibility to insert a custom value.

Authentication

Two factor authentication (2FA) by email or Authenticator app

 [Back to EASEE-connect](#) Hello gasunie@quintor.nl Logc

Manage your account

Change your account settings

[Profile](#)

[Password](#)

[Two-factor authentication](#)

[Personal data](#)

Two-factor authentication (2FA)

To enable two-factor authentication you can setup an authenticator app or if you have confirmed you e-mail address you can receive a token per e-mail.

[Disable 2FA](#)

Authenticator app

[Add authenticator app](#)



Log in

Use a local account to log in.

Email

Password

☐ Remember me?

[Log in](#)

[Forgot your password?](#)


It is highly recommended to use a group email account of the company's operational team.

This reduces the administration burden at EASEE-gas and avoids risks because the company responsibility is to take care of access to this operational email account.

Two factor authentication code



EASEE-gas <noreply@easeegas.eu>

Aan  Olde de W.B. (Wim)

Your 2FA code: 371841



EASEE-Connect
gasunie@quintor.nl

933 204 ²⁵



Two-factor authentication

Your login is protected with Email 2FA. Enter the code you received by e-mail below.

Authentication code

☐ Remember this machine

[Log in](#)

Licenses

- Standard license = 1 to 5 profiles
- Premium license = 6 to 15 profiles
- Service provider license = no limit in n° of profiles

Full EASEE-gas members

- Basic +0, Premium +€XXXX, Service provider +€XXXX

Paying non-members (only for the EASEE-connect service)

- Basic €XXX, Premium €XXXX, Service provider +€XXXX

Non-members not paying (small companies, by invitation of a member)

- Restricted access: only maintenance of own profile

Launch of EASEE-connect



Due to current COVID circumstances and staffing we had to postpone the planned launch beginning of this year.

Currently we have some TSWG volunteers to bring EASEE-connect live in the next few months.

- 1st phase: Launch for full members
- Price plan and availability for all companies
- More information at <https://easee-gas.eu/easee-connect> (check the video!) and <https://easeeconnect.eu/>

7. GRT gaz an application of AS4.

Marc Duhamel

GRT Gaz

AS4 focus

BeeCube, the B2B platform for AS4 exchange



Summary



01

Context

02

GRTgaz B2B platform solution

03

Details about AS4

Context

Data exchange to proceed gas delivery

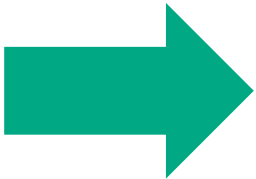
Partners

- TSO (~10)
- Shippers (~100)

Data

- TSO
 - Matching
- Shippers
 - Nominations
 - Allocations
 - Measurement
 - Balancing

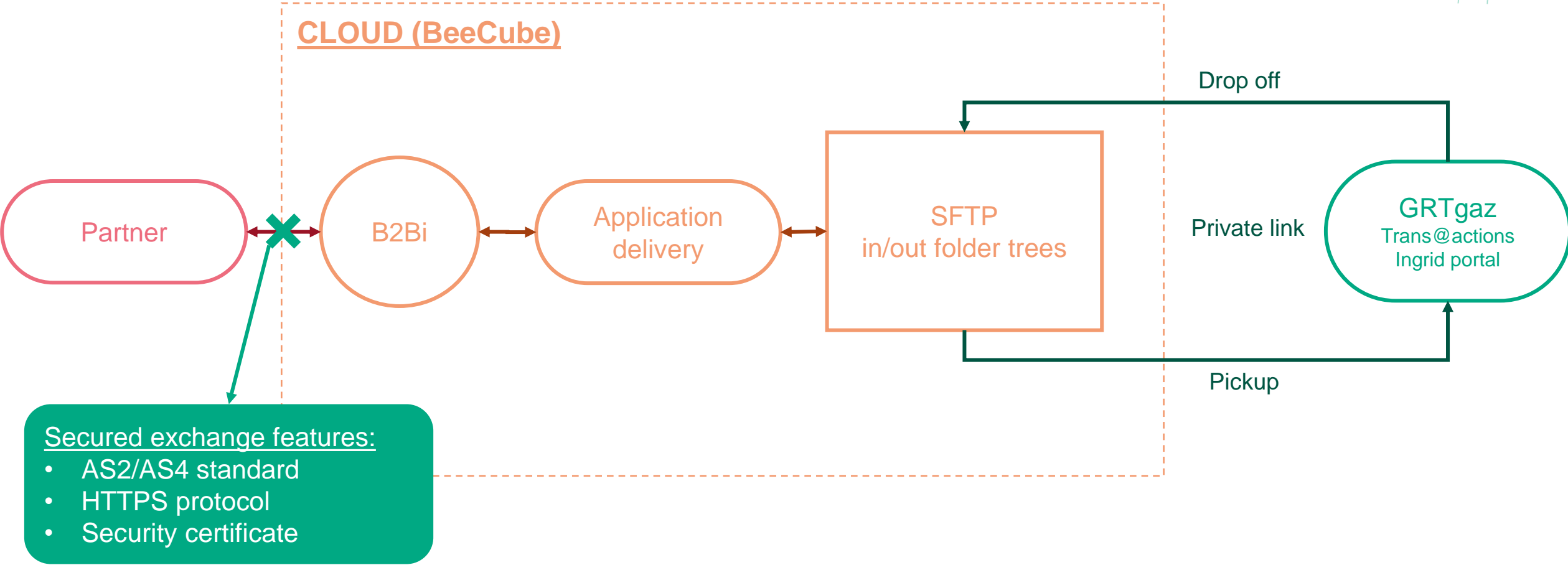
150K up to 170K a month



BeeCube

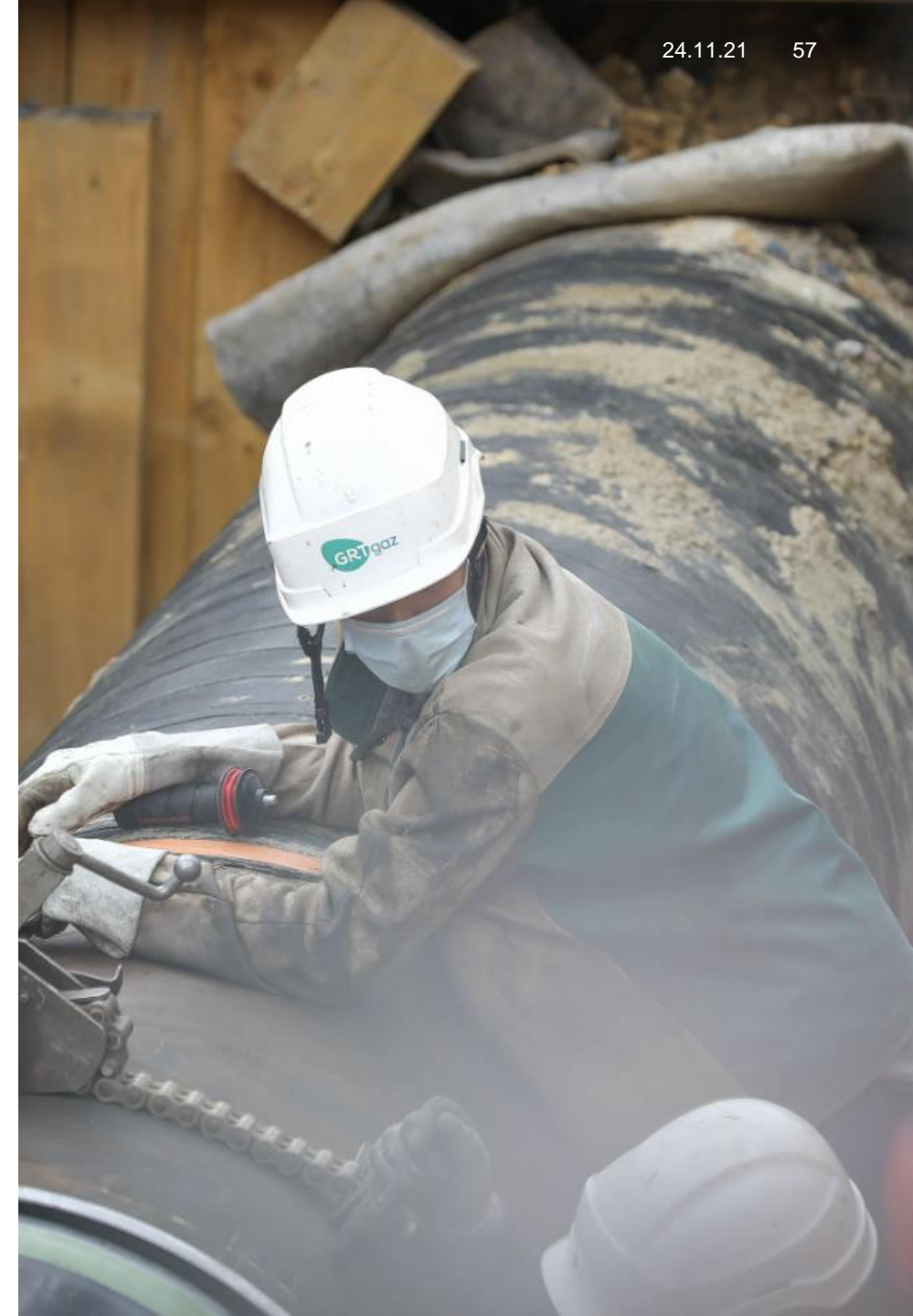
solution to protect commercially sensitive information

GRTgaz B2B platform solution (inbound/outbound)



A few details about AS4

- 'AS4' stands for Applicability Statement 4.
- Standard protocol to ensure B2B data exchange security through web services.
- Main features:
 - ⇒ End-to-end encryption.
 - ⇒ Connection to partner through HTTPS protocol.
 - ⇒ Ability to exchange files of any size.
 - ⇒ Security based on WS-Security standard (compared to AS2), guaranteeing integrity and confidentiality.





Thank you



8. Use of EDI@GAS

Jarle Rønnevik
Chair EDIG@S
Equinor ASA

Edig@s

The international message format for Gas Exchange

Jarle Rønnevik

Equinor ASA

About EASEE-gas



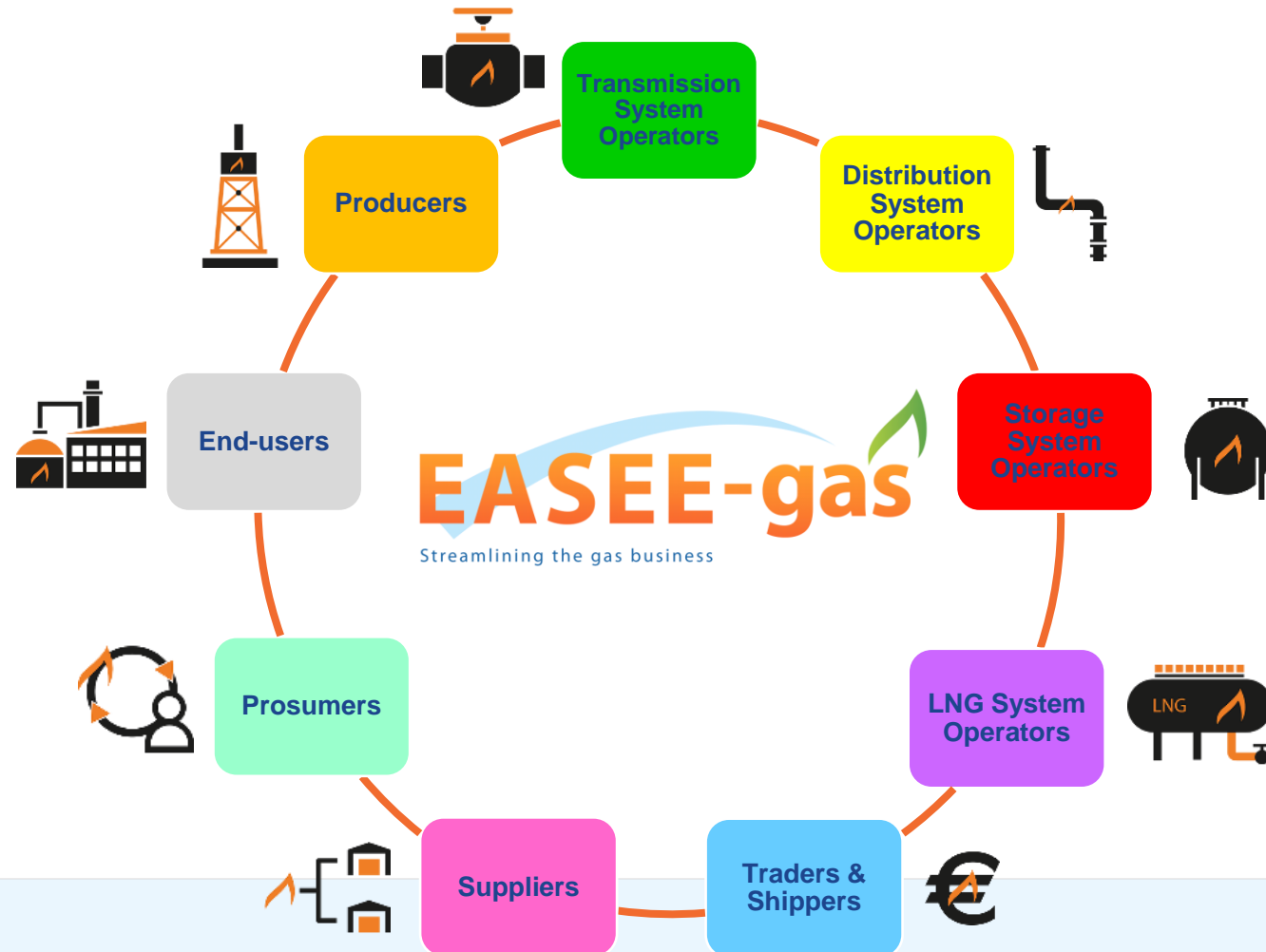
**FOUNDED IN
2002**

**80+
EUROPEAN
MEMBERS**

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



EASEE-gas represents the entire gas value chain



EASEE-gas members across Europe

- Producer/ Production Facility Operator
- Transmission System Operator
- Distribution System Operator
- Storage System Operator
- LNG System Operator
- Trader & Shipper
- Supplier
- End-User / Final Customer
- Prosumer
- Service Provider



Edig@s Version 6

- Version released 27th of August 2020.
 - The main goal was to eliminate the differences in implementation
 - Alignment with the gas role model
 - Introduction of decision tables
 - Further harmonised
 - Document to describe the differences between version 5 and 6 available
- Possible to download the new version: www.edigas.org
- Questions can be sent to us via our contact form at: <https://www.edigas.org/edigs-contact/>
- Questions will be answered latest after each workgroup meeting.



Implementation status among MWDWG

Company	Version 6.1 Implementation Plan	Messages to be implemented	Current Status
Conexus Baltic Grid	Q4 2022	NOMINT, NOMRES, MARSIT, OFFCAP and other Capacity Allocation messages	Early planning - not confirmed yet
Equinor ASA	Q1 2022	NOMINT, NOMRES	Planning
Fluxys	Q3 2022	NOMINT, NOMRES	Early planning - not confirmed yet
GTS	Q2 2022	8-9.	In progress
OGP Gaz-System S.A.	Q4	Flowreq, offcap, aucres, maocap, acknow	
SWISSGAS	Q3/Q4 2022	NOMINT, NOMRES, DELORD, DELRES, ACKNOW	Planning
VNG Handel & Vertrieb	Q1/Q2 2022	NOMINT, NOMRES, ACKNOW	Planning

- In our last MWDWG meeting with 12 companies participating, we did our first implementation query.
- 58% of the companies have put Edig@s version 6 into their IT plans for 2022.

Release of Edig@s v 6.1

- Namespace:
 - Standardised across all business areas for all messages in Edig@s 6.1
 - Ensure backwards compatibility, same namespace for any evolution of MIG document and code list (do not need to keep track of schema used by each counterparty).
 - `xmlns="urn:easee-gas.eu:edigas:BrpNominationAndMatching:NominationResponseDocument:6:1" schemaVersion="1">`

Release of Edig@s v 6.1

- PRODOC/PROCON
 - The process around PRODOC and PROCON will be phased out in the Netherlands for most BRPs.
 - Since this is connected to legislation it will take some time.
 - PRODOC and PROCON put back into version 6.1
 - Existing users of PRODOC/PROCON can use existing version of PRODOC/PROCON (v5).

Release of Edig@s v 6.1

- SSO messages:
 - Limits
 - Inventory level
 - Transfer in a facility
- Details will be presented later.

Ongoing work

- **Capacity taskforce**
 - Reviewing existing version of capacity allocation process.

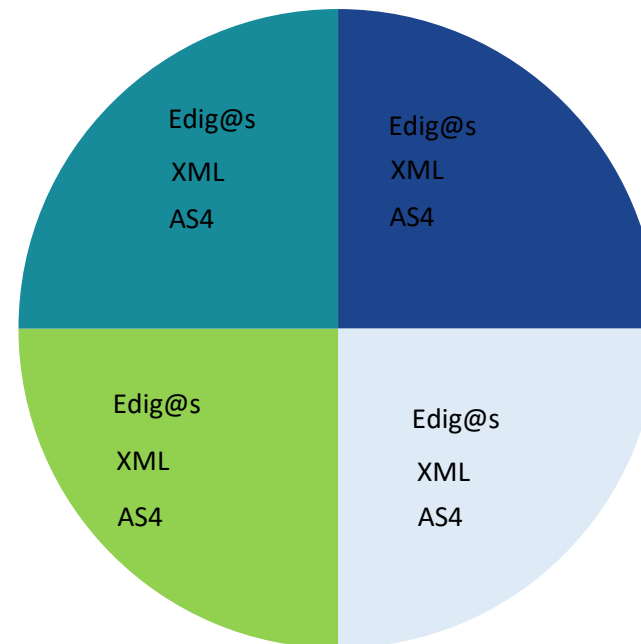
- **Invoice taskforce**
 - Planned a new kick-off in the coming weeks.
 - Reviewing existing EU standard (UBL and Peppol).

- **SSO taskforce**
 - Creating messages for Storage and LNG system operators.

Processes, technology and format

Our goal

■ Nomination and matching ■ Balancing ■ Settlement ■ Capacity allocation



One solution that fits the business process for Europe.

Decreased IT cost.

Open markets for everyone.

Coordinated change of technology and format.

Digitalisation.

Why should we harmonise and standardise our processes and tools?

- BRPs can use the same solution in every market.
- Software companies can develop standard solutions to be used by BRPs
- Lower cost for all involved parties
- Give small BRPs the possibility to challenge the bigger BRPs in all markets.



- Thank you for your attention

9. System operations with EDIG@S.

Oliver Schirok
Data Exchange Manager
VNG Handel & Vertrieb

System Operation in Edig@s 6

Oliver Schirok

VNG Handel & Vertrieb GmbH

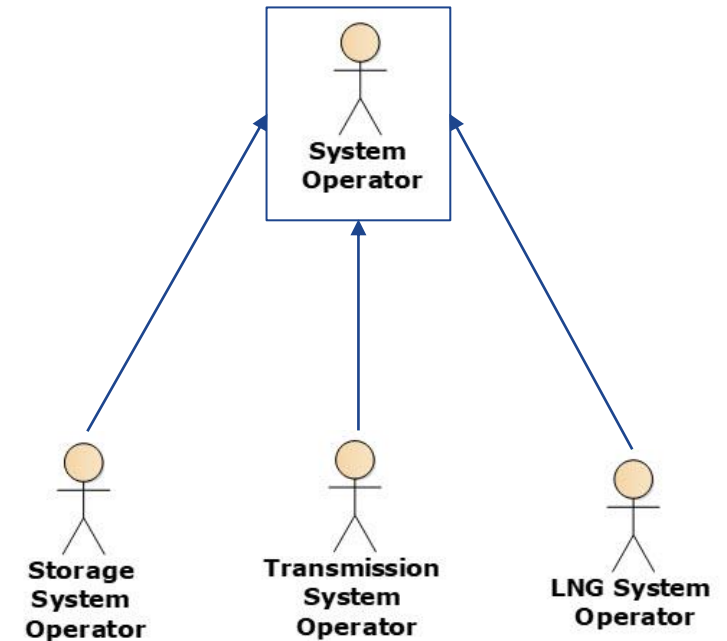
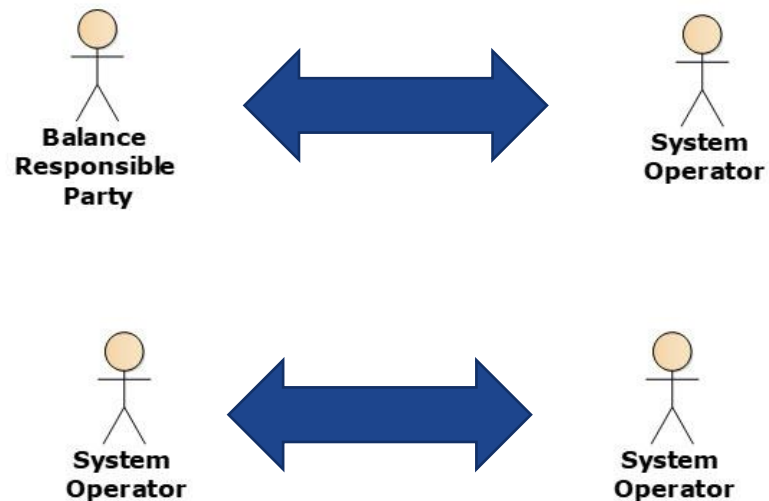
- Where do we come from?
- System Operation – Who is involved?
- Flow Request message
- Sending Limits
- Inventory Level
- Transfers in a facility
- Conclusion

Where do we come from?

- 2007 Edig@s 4: First steps: Gasdat message and Transfer Advice
 - 2013 Edig@s 5 continues: Limits message
 - 2020/21 Edig@s 6: New possibilities
-
- Most Storage System Operators use Edig@s messages only in Nomination & Matching
 - Messages in Edigas 4 and partly 5 were not designed for the way they are used
 - Many different APIs or portal solutions cover other information
 - Edigas 6 proposes a set of harmonized messages for SSOs and LSOs

System Operation – Who is involved?

- Various interactions between:



Flow Request 1 – Minimum offtake/sendout

A System Operator can request a Balance Responsible Party to offtake / sendout a minimum from the facility and inject it into the transport grid.



Flow Request 2 – Flow commitment

A Transmission System Operator can request a Balance Responsible Party to flow a minimum amount of gas and inject it to or withdrawal it from the transport grid.



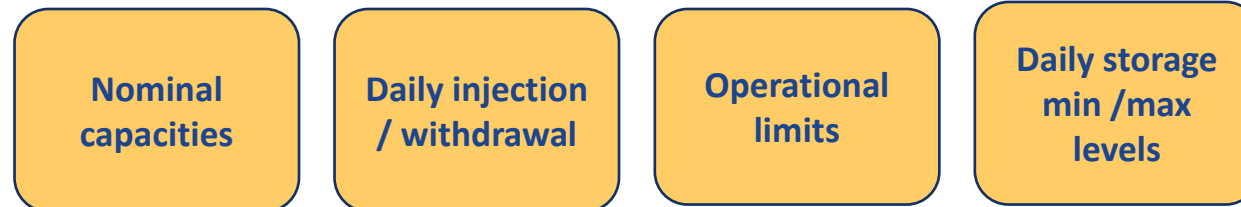
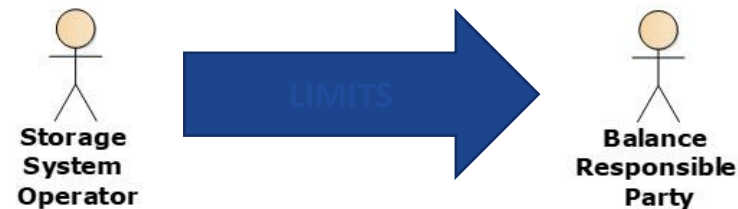
Flow Request 3 – Gas flow requirements

A Transmission System Operator can inform an adjacent Transmission System Operator of the physical flow that is required for System Operation.



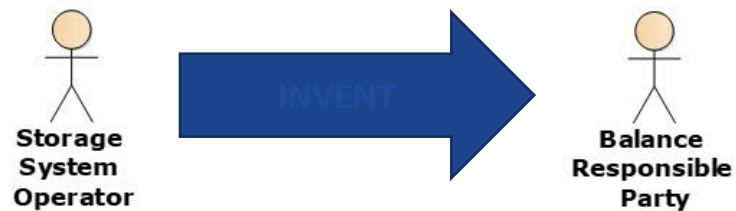
Sending limits

The Storage System Operator provides to the Balance Responsible Party storage limits corresponding to rights and capacities for the current and coming period.



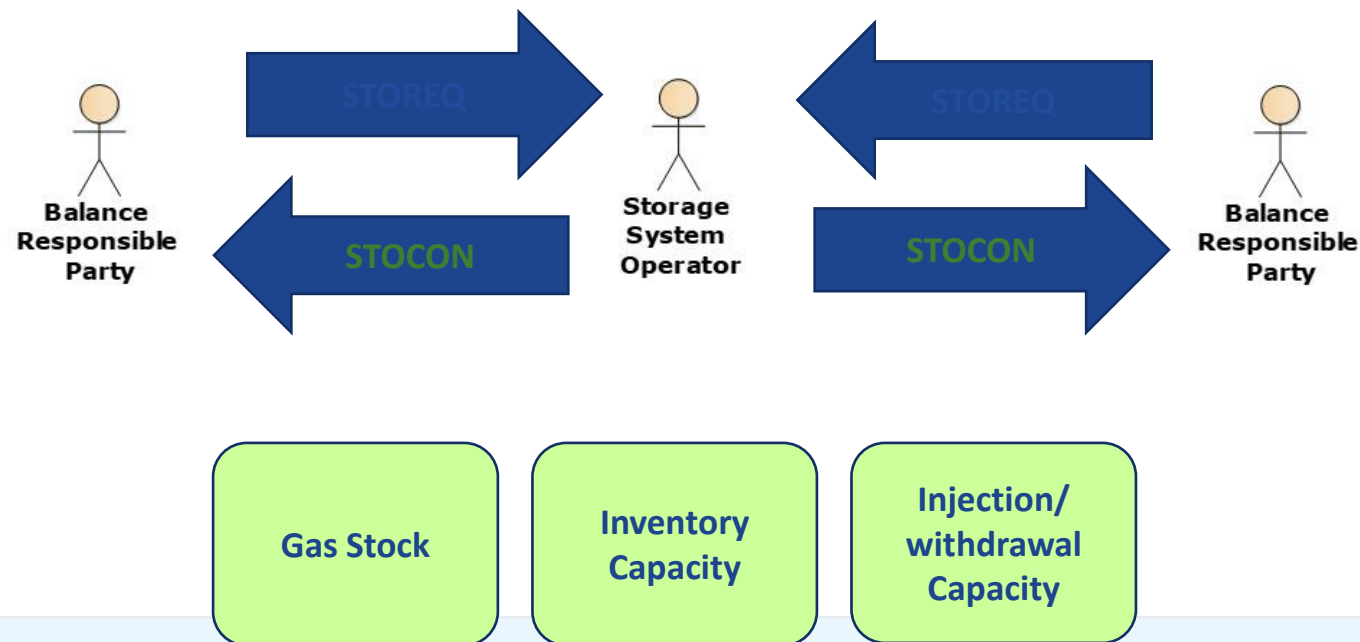
Inventory level

The Storage System Operator provides to the Balance Responsible Party the storage inventory level at a given time.



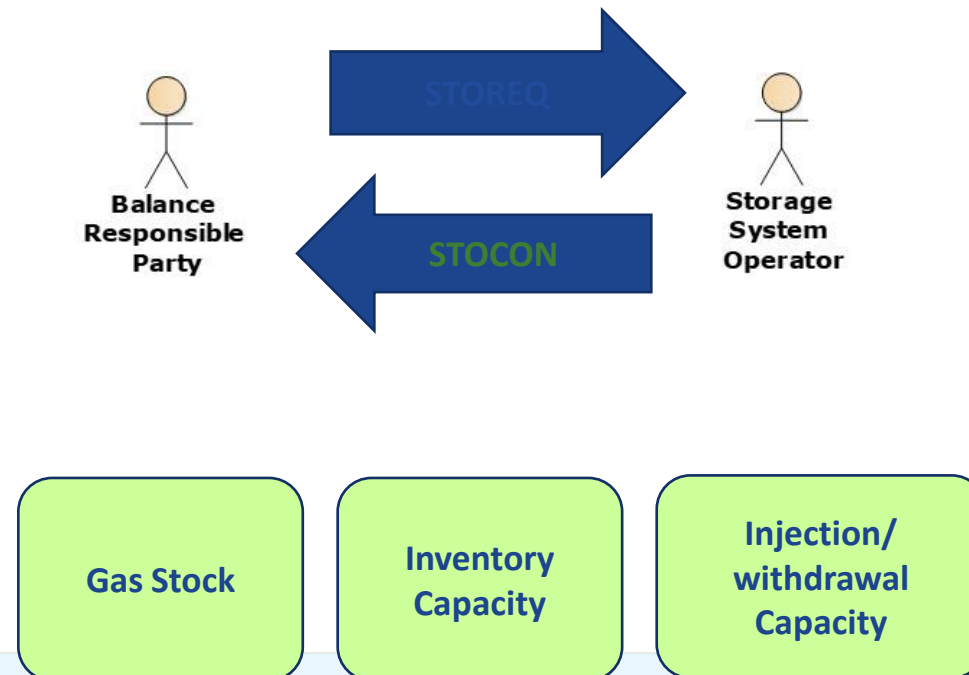
Transfers in a facility – 2 BRPs

Two Balance Responsible Parties can request to a Storage System Operator a transfer or receipt of stock or ownership in a storage facility.



Transfers in a facility – 1 BRP

A Balance Responsible Party can request to a Storage System Operator a transfer or receipt of stock or ownership in a storage facility.



Conclusion

The new Edig@s Process System Operation enables System Operators to provide additional information in relation to their specific processes to Balance Responsible Parties and other System Operators. It covers not only data exchange inside a transmission grid, but also takes LNG and storage facilities into account.

Hence System Operation will help in further harmonising the data exchange between market partners.



- Thank you for your attention

10. Questions & Answers: Data exchange



Douglas Walker Hill
Interoperability & Data Exchange
ENTSOG

ENTSOG



Enjoy your lunch
See you at 12:45 ☺

266 409 91 TS:42 ☺

CYBER SECURITY SESSION

Cyber security session

	Topic and speaker	Timings
11	Setting the scene: The Colonial pipeline attack. Hendrik Pollex	12:45-13:00
12	A potential Gas & Hydrogen Cyber security NC. Stefano Bracco	13:00-13:30
13	Three real cases of cyber incidents in SNAM: Lucrezia Tunesi <ul style="list-style-type: none">• CEO Fraud• Potential Ransomware Infection• Supply Chain Attack	13:30-13:45
14	A review of the NIS 1.0 and NIS 2.0 Directive. Stefano Mele	13:45-14:00
15	Future cyber security and challenges. Andrea Chittaro	14:00-14:15
16	Q&A. Douglas Hill	
17	Closing remarks. Hendrik Pollex	14:50-15:00

11. Setting the scene: Cyber security session



Hendrik Pollex
System Operations Director
ENTSOG

Verbal update – no slides available

12. A potential Gas & Hydrogen Cyber security NC.

Stefano Bracco
Security Officer at ACER
ACER

A presentation and discussion on a potential Gas & Hydrogen Cyber security NC



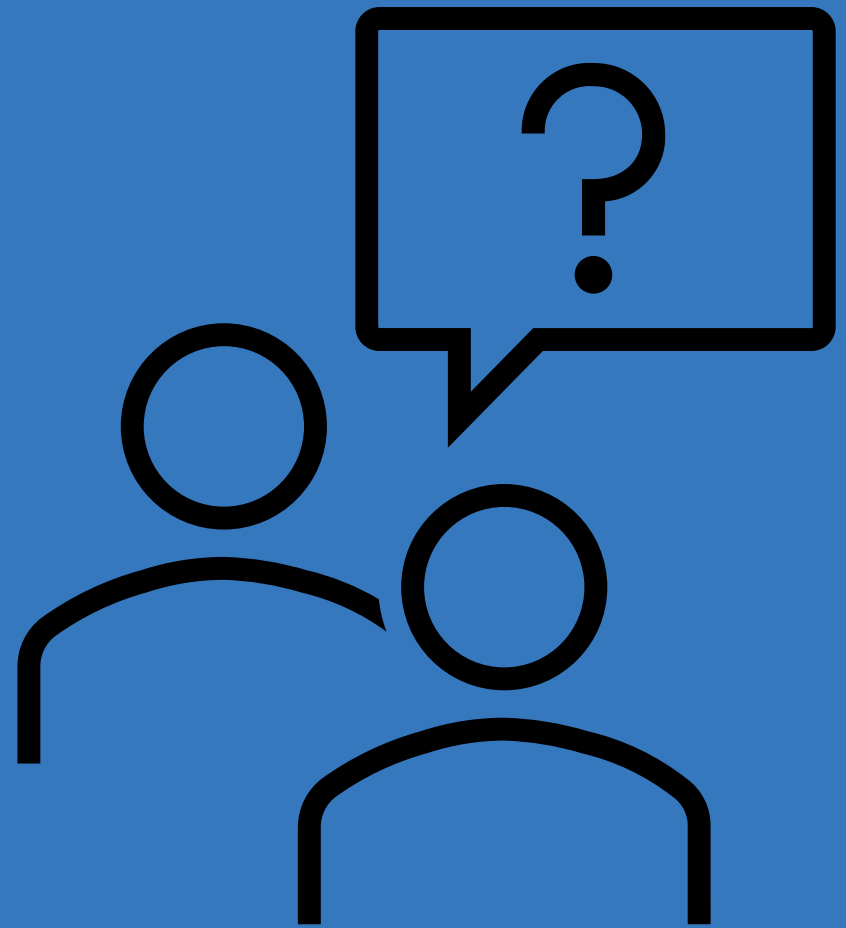
PLEASE REQUEST THE SLIDES DIRECTLY FROM:

Stefano BRACCO – Security Officer at ACER

Stefano.BRACCO@acer.europa.eu

Virtual Event, 17th November 2021

Stefano BRACCO es@acer.europa.eu



European Union Agency for the Cooperation
of Energy Regulators

✉ info@acer.europa.eu
🖱 acer.europa.eu

🐦 [@eu_acer](https://twitter.com/eu_acer)
🌐 [linkedin.com/company/EU-ACER/](https://www.linkedin.com/company/EU-ACER/)

13. Three real cases of cyber incidents in SNAM:

Lucrezia Tunesi
Cyber security expert
Snam



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THREE REAL CASES OF CYBER INCIDENTS IN SNAM

CEO FRAUD, POTENTIAL RANSOMWARE INFECTION & SUPPLY CHAIN ATTACK

Lucrezia Tunesi – Cyber Security Expert

17-11-2021

1 - CEO FRAUD

August 2021



CEO FRAUD

A type of **cyber attack** where the **fraudster impersonates** a member of the **top management**, targeting a **specific person or organization**

The criminal expresses a series of **awkward and unfeasible requests** to the victim by leveraging on the **urgency** of the demand and on to their **authority**

The aim is to **gain access** to personal and corporate **credentials, information, confidential documents or money**

1. TRANSMISSION OF **MALICIOUS EMAILS** VIA «GMAIL» ACCOUNTS IMPERSONATING **SNAM CEO**

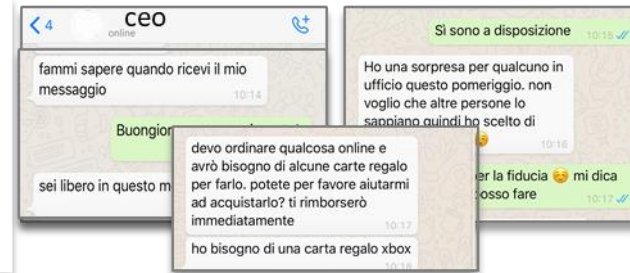
Da: I **ceo** ceo@gmail.com
Inviato: lunedì 23 agosto 2021 09:52
A:
Oggetto: BUON GIORNO
Ciao Alberta,
Spero tu stia bene?
Ho bisogno di poco del tuo spazio stamattina,
fammi sapere gentilmente se sei disponibile.

2. THE POSITIVE **FEEDBACK** FROM THE **VICTIM** CAN BRING THE CRIMINAL TO REQUEST **TELEPHONE CONTACT**

Da: **ceo** ceo@gmail.com
Inviato: lunedì 23 agosto 2021 10:02
A:
Oggetto: Re: BUON GIORNO

Grande.
Fammi avere il tuo numero whatsapp ti mando un messaggio con il mio numero internazionale. Grazie

3. WHETHER THE VICTIM SHARES THEIR **PHONE NUMBER** THE ATTACK CAN AFFECT **PERSONAL DEVICES TOO**



CAUSES

Human Vulnerabilities (eg. Lack of knowledge on the most common cyber attacks and **social engineering techniques**)

MAIN ACTIONS

- **Blockage of the sender address and/or phone number**
- **Communication of the attack** to corporate employees
- **E-mail Black List** updating
- Activation of the **Anti-Ceo Fraud filter**

CONSEQUENCES

- **Economic impact**
- **Reputational impact**
- **Information loss, data leak**



The **promptly intervention** of the **Snam Cyber Security Team** limited the impact of the attacks on corporate and personal assets by implementing a series of **threat containment measures**

2 - RANSOMWARE

July 2021

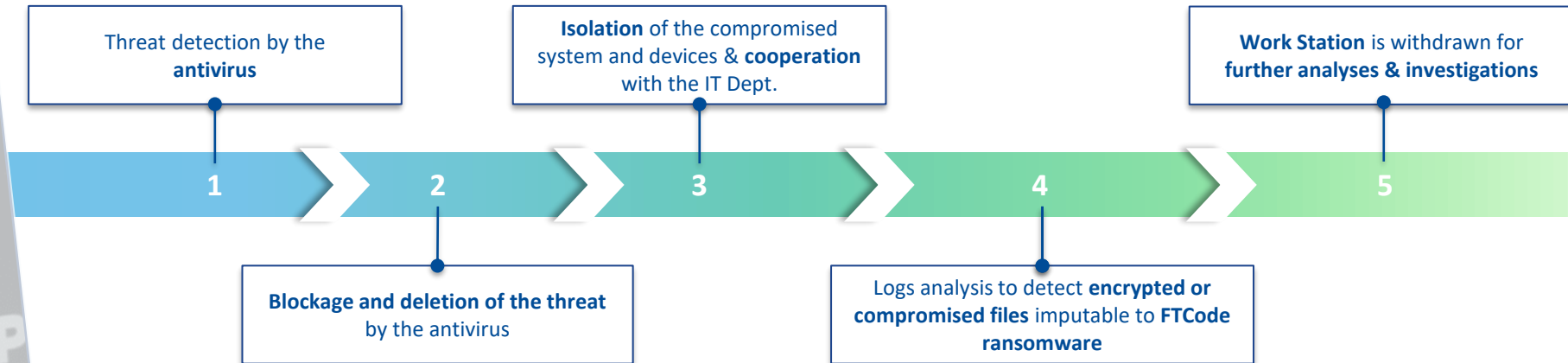


RANSOMWARE

A **malware** that employs **encryption** to make user or organization's critical data not accessible

The aim is to **force the victim to pay a ransom** in exchange for decryption keys to regain access to locked data

Generally, the request of ransom comes along with a strict deadline: **if the victim does not pay in time, data can be sold to the best offeror** or the value of the ransom can increase



CAUSES

- **Human Vulnerabilities**
- **Technical Vulnerabilities** (eg. Java, Adobe Flash, Operating Systems) and **backdoor** exploitation

MAIN ACTIONS

- **Isolation of the infected devices and servers**
- **Investigation to detect critical vectors**
- **Analysis of vulnerabilities and definition of an action plan**
- **Threat monitoring to prevent further attacks**

CONSEQUENCES

- **Economic impact**
- **Reputational impact**
- **Information loss, data leak, data encryption**



The **promptly intervention** of the **Snam Cyber Security Team** limited the impact of the attacks on corporate and personal assets by implementing a series of **threat containment measures**

3 - SUPPLY CHAIN ATTACK

July 2021



'CONTI' RANSOMWARE

The systems of a critical supplier are infected by **CONTI ransomware**

All the files affected are encrypted and get the extension "**CONTI**"

Critical suppliers are under **contractual obligations** that impose them to **notify any incident** that might have an impact on Snam

1
CONTI Ransomware attack notification sent by the supplier

3
On-site workstation activation to ensure the continuity of the service

5
Reactivation of users access to corporate network

1

2

3

4

5

6

2
VPN and accounts suspension

4
Triggering of an *ad-hoc* monitoring rule for the already known IOCs

6
Change of users password

CAUSES

Human Vulnerabilities

- **Technical Vulnerabilities** (eg. Java, Adobe Flash, Operating Systems) and **backdoor** exploitation

MAIN ACTIONS

- **Account suspension**
- **Rule monitoring** on SIEM for known IOCs attributable to ransomware
- Monitoring on **Cyber Threat Intelligence** platforms
- **Continuous monitoring** for future evidence

CONSEQUENCES

Any cyber incident that impacts a critical supplier might lead to **critical direct and indirect consequences** for the organization itself



The **prompt notification** of the event let the **Snam Cyber Security Team** to intervene and **mitigate** the chance of **subsequent impacts** on Snam



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THANK YOU

14. A review of the NIS 1.0 and NIS 2.0 Directive.

Stefano Mele
Lawyer

Verbal update – no slides available

15. Future cyber security and challenges.

Andrea Chittaro
Senior Vice President
Global Security
SNAM



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THE FUTURE OF CYBERSECURITY IN THE GAS SECTOR

Andrea Chittaro - Senior Vice President
Global Security & Cyber Defence Dpt.

17-11-2021



JUST IN THE LAST 50 YEARS



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Cybersecurity: Past, Present and Future

YESTERDAY

ICT & INFORMATION SECURITY



TODAY

CYBERSECURITY

BLOCKCHAIN

DRONES

DEEP/DARK WEB

SMART DEVICES (IOT)

VIRTUAL REALITY

INDUSTRIAL ROBOTS

CLOUD COMPUTING

5G

AUGMENTED REALITY

AUTONOMOUS VEHICLES

ARTIFICIAL INTELLIGENCE

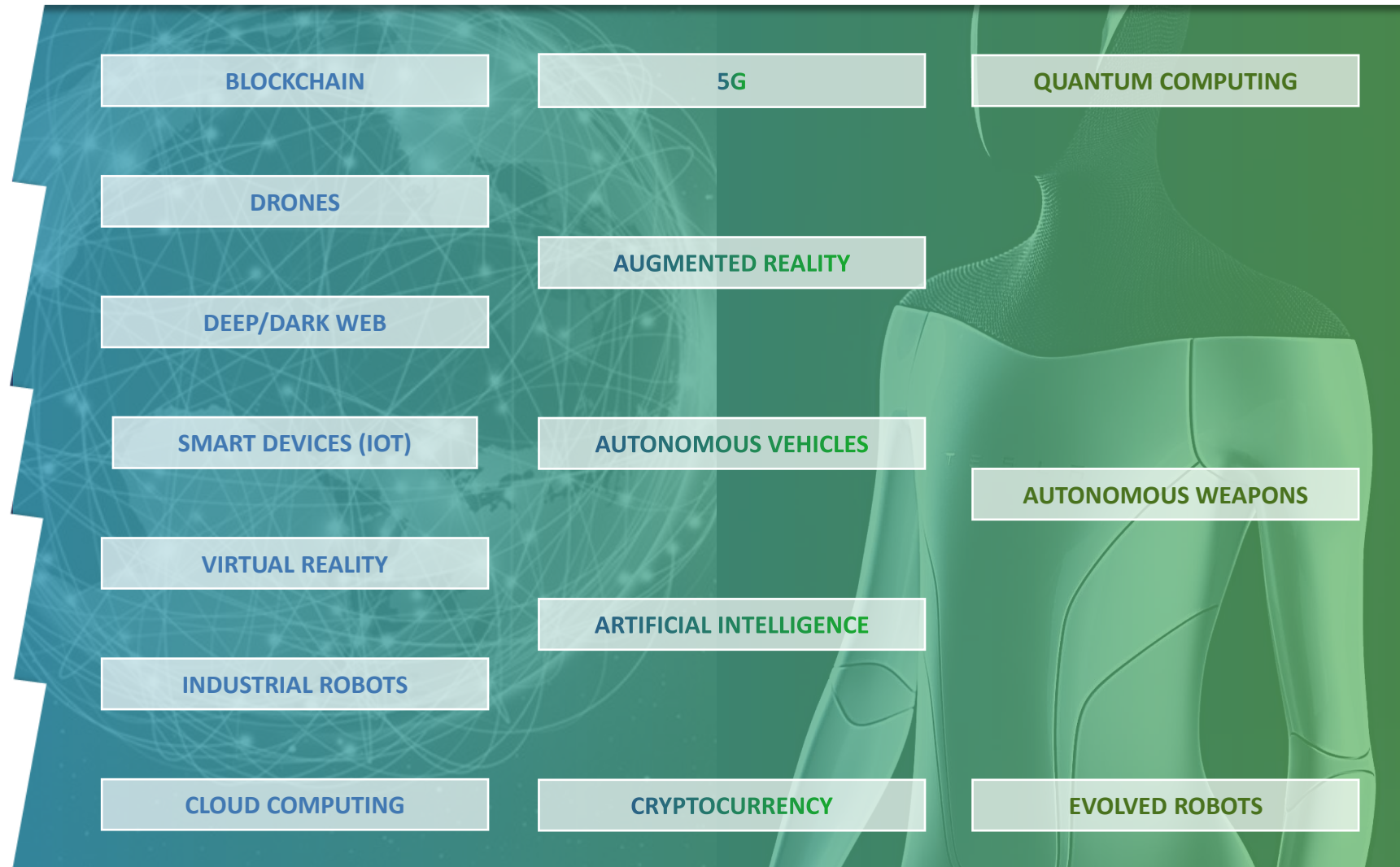
CRYPTOCURRENCY

TOMORROW

QUANTUM COMPUTING

AUTONOMOUS WEAPONS

EVOLVED ROBOTS



Cybersecurity – implications in the physical world




Vulnerabilities in Medtronic Product Can Allow Hackers to Control Cardiac Devices




Artificial intelligence could be used to hack connected cars, drones warn security experts

Cyberattacks on vulnerabilities in connected vehicles could have very real physical consequences if security isn't managed properly.




The human cost of ransomware: Disruption to Irish health service will continue for months

Tesla Car Hacked Remotely From Drone via Zero-Click Exploit



Smart doorbells 'easy target for hackers' study finds



A cyber attack in Saudi Arabia failed to cause carnage, but the next attempt could be deadly

At a time when the world faces a dangerous escalation in cyber warfare, a series of assaults on petrochemical companies in Saudi Arabia – possibly backed by nation states – has caused alarm



Hackers Remotely Kill a Jeep on the Highway—With Me in It

I was driving 70 mph on the edge of downtown St. Louis when the exploit began to take hold.



Hacker tries to poison water supply of Florida city



A Hospital Hit by Hackers, a Baby in Distress: The Case of the First Alleged Ransomware Death

A lawsuit says computer outages from a cyberattack led staff to miss troubling signs, resulting in the baby's death, allegations the hospital denies





Cybersecurity – major attacks / energy sector 2021



FEBRUARY 2021

A hacker **remotely illegally accesses** the computer **systems of a water treatment plant in Florida**, which serves about **15,000 people**.

The attack was made possible by **exploiting a vulnerability in the system's remote management software** (out of support as of January 14, 2020) and the **use of weak password policies**.

KEY FACTS

- The attacker **increased sodium hydroxide levels in the water stream**. The compound, used in controlled doses to increase the pH of the water, is **extremely dangerous to health** if used in larger quantities
- The **attack was intercepted by an employee physically present in the facility** who then directed the correction of the reagent levels



MAY 2021

Ransomware attack by DarkSide criminal group against Colonial Pipeline; **one of the largest pipelines in the United States** carrying fuel along the east coast from Texas to New York.

KEY FACTS

- **Forced Shut Down of the ICT systems** in order to contain the damage, resulting in the **temporary interruption of all line operations for 8,850 km of pipelines that guarantee 45% of supplies on the EAST coast of the United States**
- The **US President decrees a state of emergency** in order to start restoring supplies (hauler working hours extension)
- Alleged ransom payment of **\$ 5 million**



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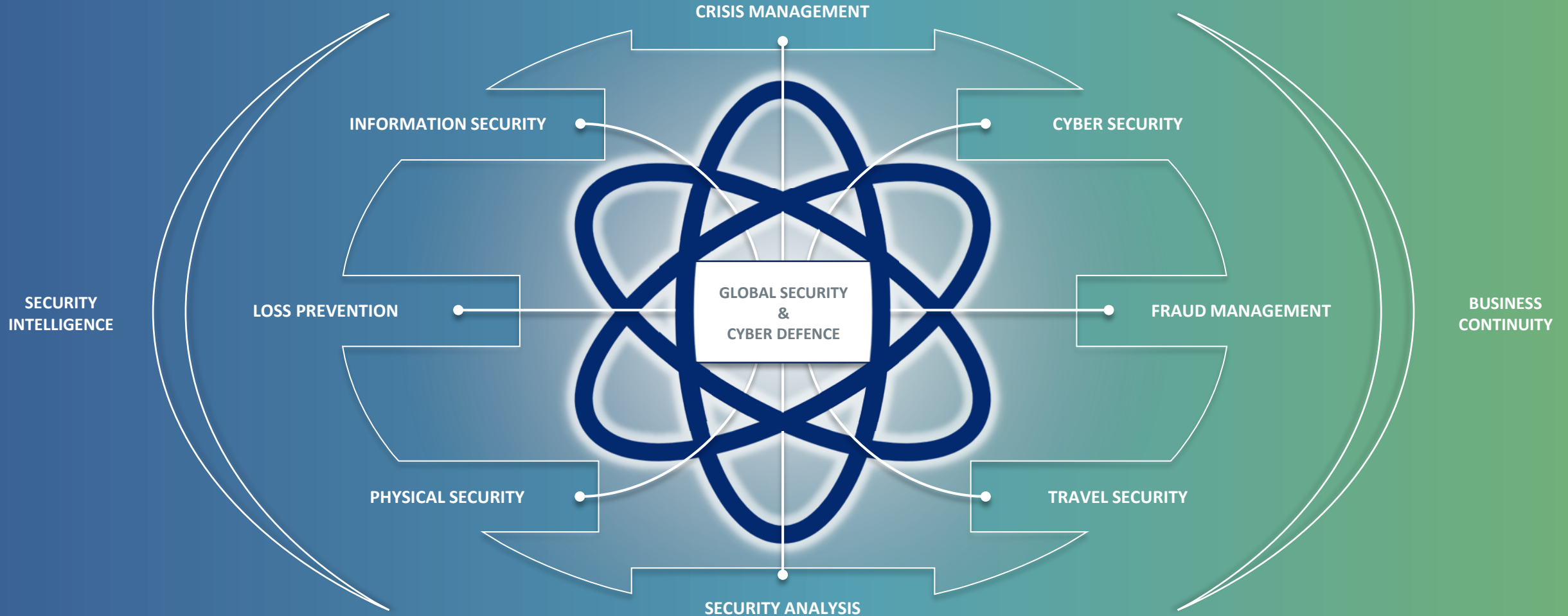


IT'S NOT A MATTER OF 'IF'; IT'S A MATTER OF 'WHEN'



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The need for a security holistic approach



Cybersecurity through Public/Private Partnerships (PPP)



Cybersecurity - Priorities

Engaging the boards in Cybersecurity matter

Realization of a security trusted network among peers & partners

Creation and diffusion of the cyber security culture within the organization

Reengineering of resilience processes, methodologies and Crisis management approach



Boards and cybersecurity

February 2, 2021 | Podcast

WORLD
ECONOMIC
FORUM

Cyber security is no longer enough: businesses need cyber resilience

How boards should prepare for the rising cybersecurity threat

McKinsey
& Company



Cybersecurity as an ESG value



Cyber security and ESG

In terms of cyber security, certain social (S) and governance (G) aspects of ESG investing matter to investors and regulators.



Putting Cybersecurity on the ESG Radar

Brought to you by **GLIENDE**
impactivate

Cybersecurity ranked as the most pressing ESG issue for 67% of institutional investors surveyed by RBC Global Asset Management in its [2019 Responsible Investment Survey](#). Of note, the poll emphasized that the potential legal liabilities stemming from expanded regulations represented a significant governance concern.

ESG and Cyber Risk: How Both Measure Responsible Corporate Behavior for Investors

ISS INSIGHTS

Cybersecurity Ethics: Why Do Cybersecurity Ethics Decisions Matter?

SecurityIntelligence

Businesses and nations around the world have become more aware of the importance of digital protection and the possible negative outcomes of attacks. They heavily rely on the work done by CSIRTs and SOC's for keeping their systems and data safe and trustworthy. Because of this, security professionals should consider creating a standard code of cybersecurity ethics for business.

Cybersecurity: A Growing ESG Concern

S&P Global

Design, adoption and management of IT / OT / IoT systems according to the logic of security by design. Protection and guarantee of the principles of privacy in the methods of treatment, access and use of data.

Adoption of Cyber Security Policies in harmony with regulations, standards and dissemination of the best security principles at all levels of the organization to protect know-how and strategic information as well as continuity in the provision of essential services

Creation of a virtuous supply chain that adopts common cyber security requirements and best practices, providing the necessary support for extending the culture of security to the world of SMEs (digital empowerment)

Guidance to the growth of the awareness of the corporate population regarding cyber threats by providing the tools to deal with them both in work and private life (digital wellbeing)





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THANK YOU

16. Q&A : Cyber security session



Douglas Walker Hill
INT & Data Exchange
ENTSOG

ENTSOE

17. Closing remarks



Hendrik Pollex
System Operations Director
ENTSOG



Thank you for your attention & being an active part at this event

Douglas Walker Hill, Interoperability & Data Exchange Adviser

douglas.hill@entsog.eu

ENTSOG - European Network of Transmission System Operators for Gas

Avenue de Cortenbergh 100, 1000 Bruxelles

www.entsog.eu | info@entsog.eu

