Energy Track and Trace

Partner Meeting – March 2023

European partnership on next generation energy tracking.

March 22nd , 2023

March 2023 - Agenda

Intro

1. Welcome
2. Brief intro – VertiCer
3. Intro to ETT (Not in Webinar)

Product Development

1. Status
2. Roadmap 2023
3. Join Project Origin on Github

Conceptual Development

1. GC and carbon emission
2. Thoughts on Storage
3. We need your input on format

Closing and goodbye

Dutch issuing body for guarantees of origin (GO) for:

- electricity
- renewable heating and cooling
- renewable gas (incl. hydrogen)

Subsidiary of

Why Energy Track and Trace?

- granular certification improves transparency compared to traditional GO
- combine expertise to find solutions for commonly shared challenges

ENERGY TRACK&TRACE

Energy Track & Trace

Quick Introduction

ENERGY TRACK&TRACE

“Concerns over greenwashing are leading lenders to try and attach more demanding performance metrics to their borrowing terms”.

(Source: The Global Treasurer)

ENERGY TRACK&TRACE

"To overcome the risk of greenwashing, some companies have committed to around-the-clock carbon-free energy (24/7 CFE)".

(Source: World Economic Forum)

The 24/7 CFE journey of energy buyers

1. Education

- **Learn** what, why and how to run 24/7 CFE projects
- **Get** C-level approval to engage

2. Baselining

- **Understand** your starting point and identify your hourly gaps
- **Calculate** your current 24/7 CFE performance score in all regions

3. CFE Strategy

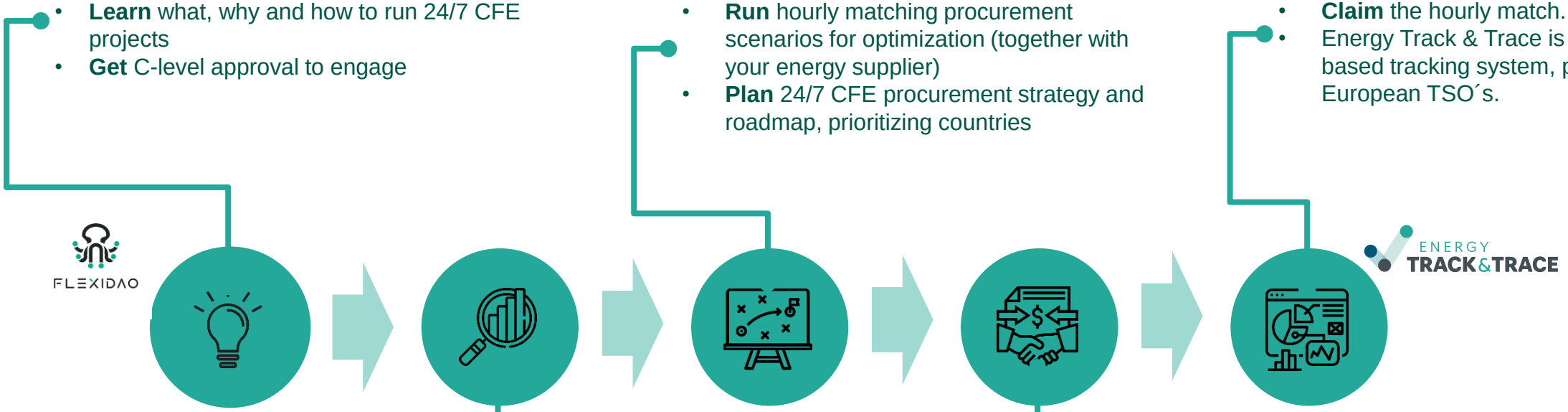
- **Run** hourly matching procurement scenarios for optimization (together with your energy supplier)
- **Plan** 24/7 CFE procurement strategy and roadmap, prioritizing countries

4. CFE Procurement

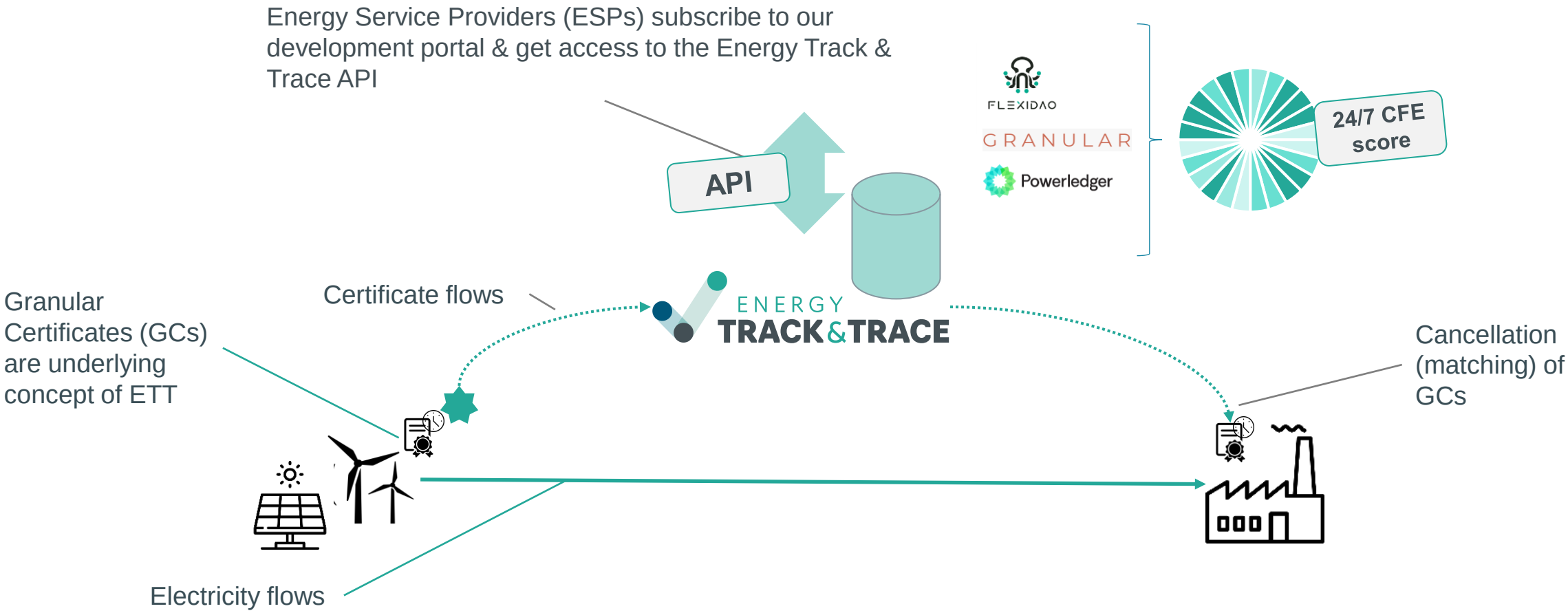
- **Sign** 24/7 CFE procurement contracts with energy suppliers in specific countries.

5. Accounting and reporting

- **Claim** the hourly match.
- Energy Track & Trace is a trustworthy, API-based tracking system, provided by European TSO´s.



What is Energy Track & Trace?



Who is Energy Track & Trace?

Int. TSO set-up to provide the tracking system

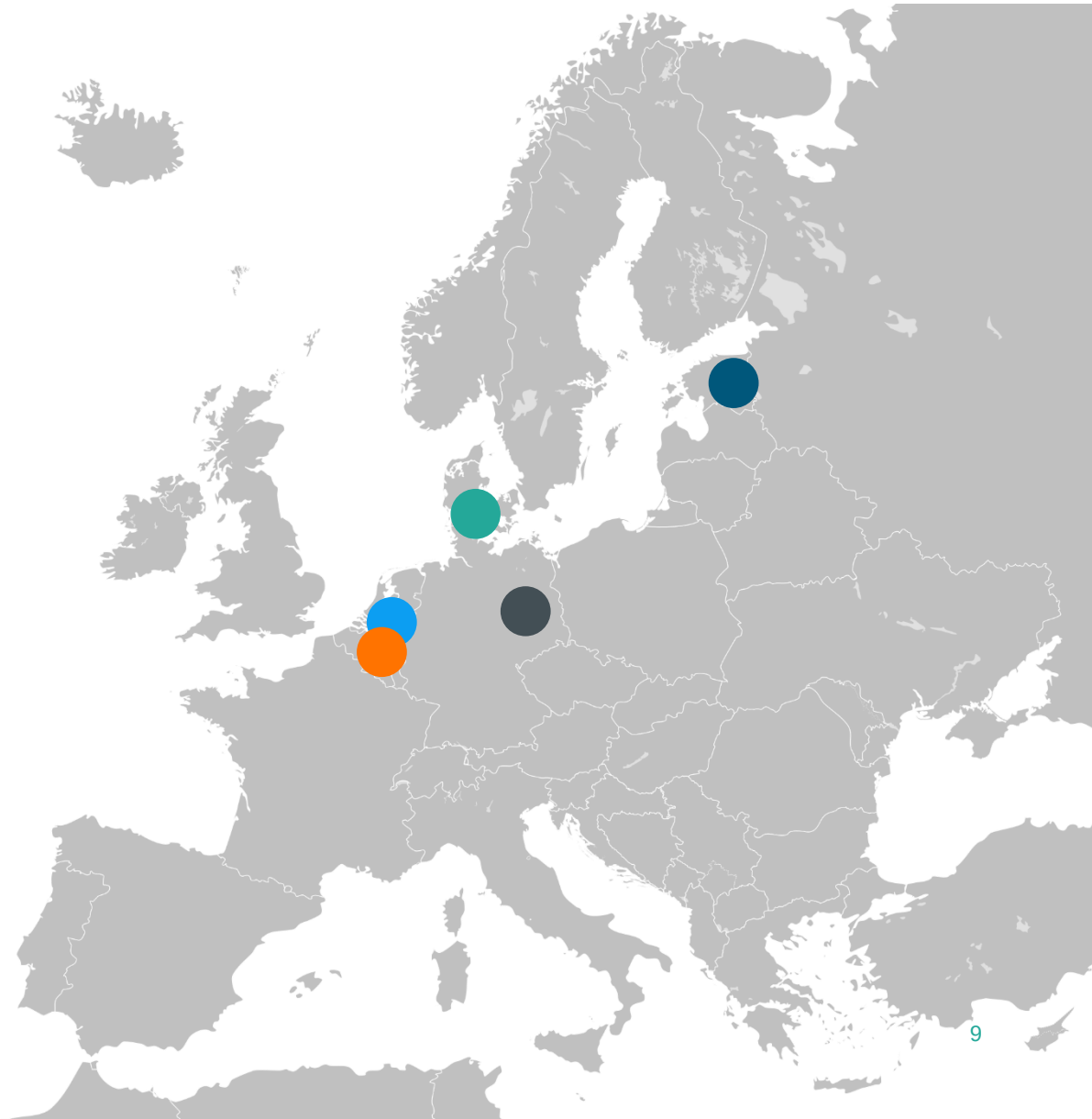
Purpose: Development of a **granular tracking solution** for 24/7 Carbon-Free Energy (CFE) that is applicable on European scale and includes cross-border exchange.

elia group (Elia | 50Hertz | EGI) — *East Germany and Belgium*

elering (ÜHENDAME ENERGIAD) — *Estonia*

ENERGINET — *Denmark*

vertiCer — *Netherlands*



And a strong group of partners

Energy Suppliers that provide clean energy and want to offer 24/7 CFE products.

Energy Buyers that develop and execute 24/7 CFE procurement strategies.

Service providers that offer market solutions, management systems and matching algorithms for Granular Certificates (GCs).

When: ETT product phases

<u>2023:</u> Testing & Maturation phase.

- APIs exposed for testing ETT registry operations
- Development of new product features (such as energy storage, GO compliance, cross-border functionality)

<u>2024 onwards</u>: Live-phase as voluntary product

- Front-end and APIs for registry operations to allow **trustworthy 24/7 CFE claims**
- (Automated) integration into GO scheme(s) for compliance
- Cross border functionality and storage integration
- Product governance & on-boarding of new parties (TSO´s or IB´s)

External Events:

A shifting regulatory landscape: *EU enables Member States to issue GOs with higher granularity (?)*

European Commission

EnergyTag

A shifting accounting & reporting landscape*: WRI publishes revision of the GHG protocol...*

GREENHOUSE GAS PROTOCOL

Green hydrogen must be produced with locational and temporal matching

European Commission

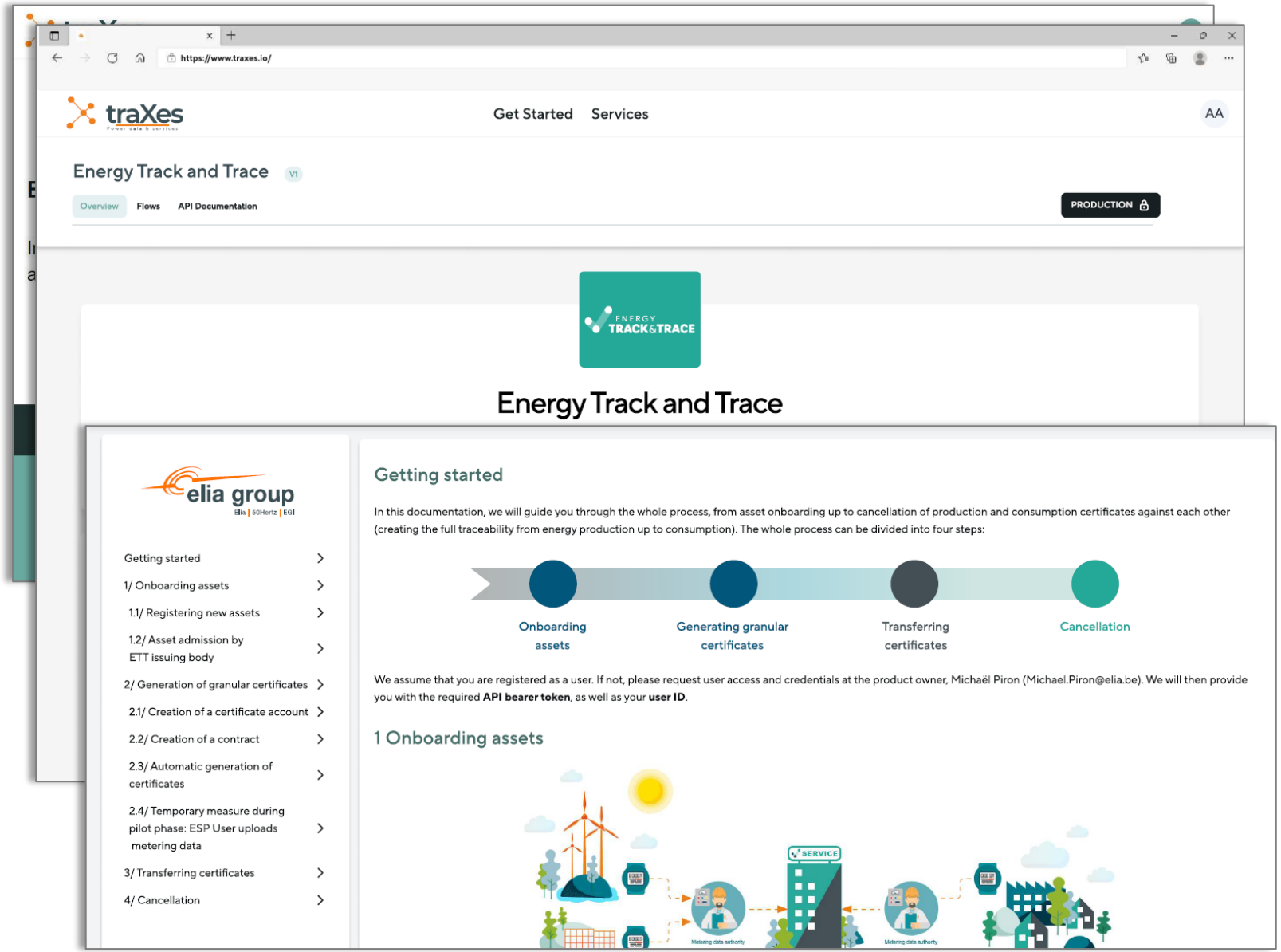
2023 | 2024 | 2025 | 2026 | 2027

ENERGY TRACK&TRACE

Product Development

1. Status
2. Roadmap 2023
3. Join Project Origin - Github

Elia Group – Energy Track & Trace service
> Registry open for pilot users



Powered by Elia Group traXes platform

- Energy Track & trace is a service built and published on the Elia group traXes developer portal.
- Alpha version of the ETT service is open to interested pilot users.
  5 companies are currently using the service.

Elia Group – Energy Track & Trace service
> Evolutions

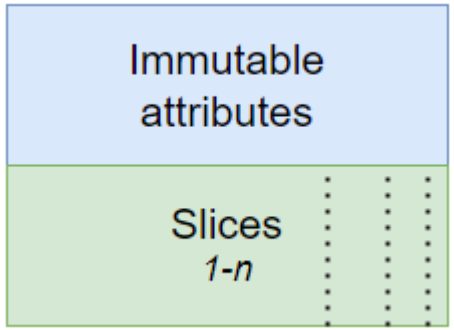
ENERGY TRACK&TRACE

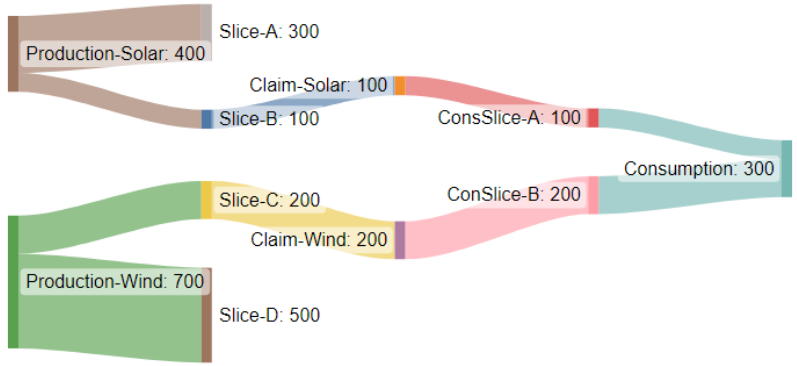
API improvements

- Valuable feedback from first users allowed us to make improvements on our API.
- Alignments with EnergyTag on API standard are ongoing. ETT API comes closer to the Energy Tag API standard.

Further alignment with Project Origin

- We further aligned on nomenclature and business concepts with Project Origin.
- We adopted the concept of Slices under immutable Granular Certificates





Elia Group – Energy Track & Trace service

> More to come in 2023

Storage assets in Energy track & trace

GO-GC integration in Germany

GO-GC integration in Belgium

Integration with the **proof layer** offered by **Project Origin**

Cross-border claiming

Multiple scenarios to be tested, as stated in our concept note in 2022

“Market-based” CO2 intensity calculations based on Granular Certificates

Under consideration

Overview of the implementation in Elia Group

Production Asset

Eligibility check (capability) needed before asset can participate in ETT Service

"GC Issuance" Contract

15min metering data (ex post) linked to asset

Collecting consent from Data Owner

1. Onboarding assets

2. Issuing granular certificates

Certificate Account

Production certificate

Slice

Slice

3. Transfer slices

Certificate Account

Slice

Consumption Asset

"GC Issuance" Contract

15min metering data (ex post) linked to asset

Certificate Account

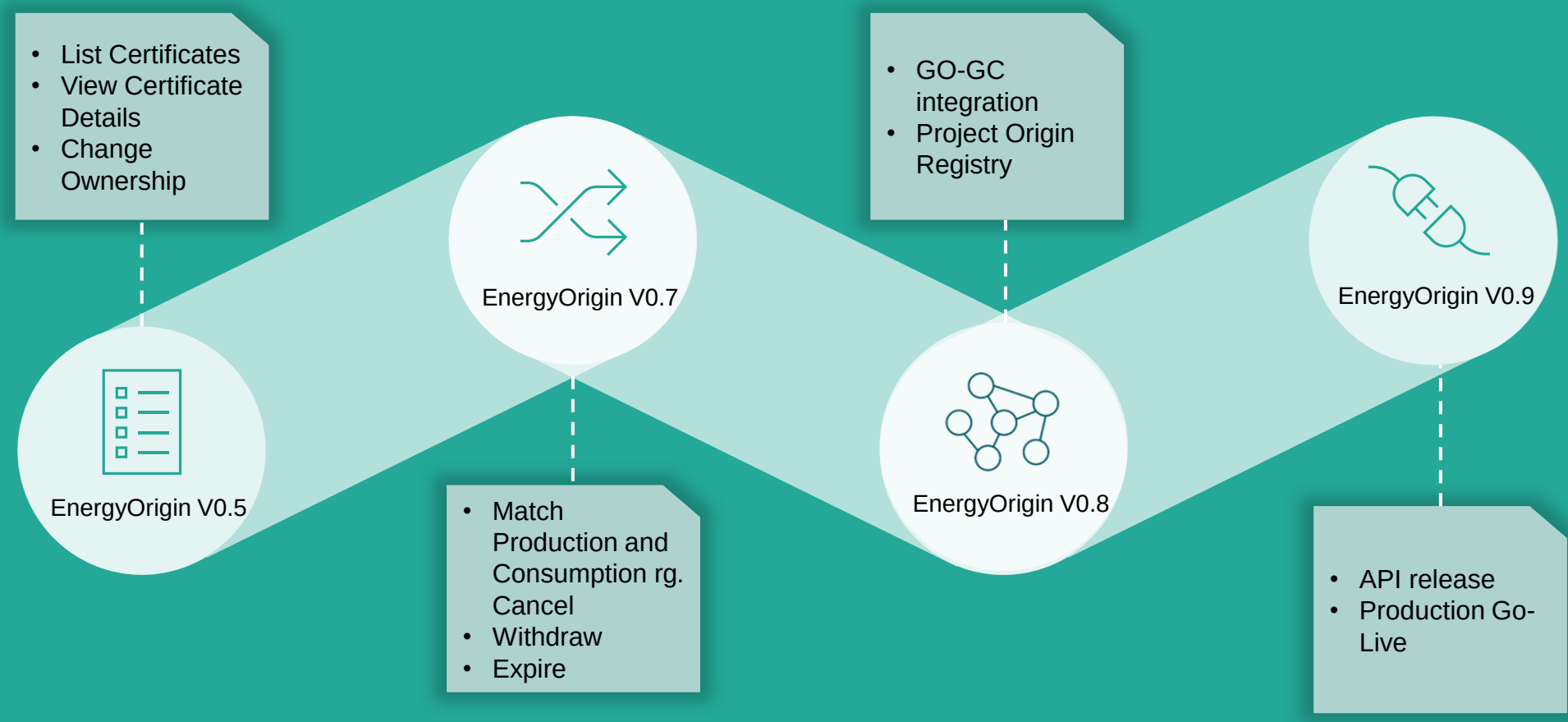
Consumption certificate

Slice

Slice

4. Claiming production & consumption slices

Development roadmap Energinet



Access to test of 3rd party API's for development

Project Origin Integration	GO GC	Cross border
Q2 2023	Q3 2023	Q4 2023

If you want to test or setup a pilot project

Belgium/Germany:
Michaël Piron
Product Owner
michael.piron@elia.be

Denmark:
Søren Pedersen
Product Owner
datahub@energinet.dk

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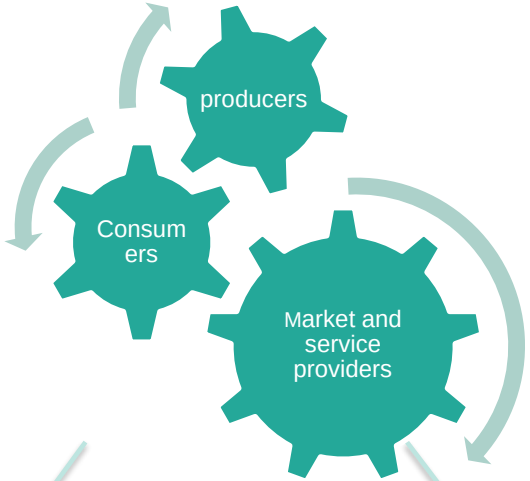


Unique Verifiable Digital Proofs

Open Source Available for partners

Project Origin

ENERGY ORIGIN

GC issuance and registry for DK

ENERGY TRACK&TRACE

Cross border exchange of GC´s

Project Origin – status

Workshop:14th/15th march.
Attendants:

-Energy Origin production team
-Project Origin partners

Goal: Integration between the two systems:

- Proof of working code
- An integration between existing eventstore infrastructure
- The publication of the first merkleproofs to a blockchain test-net.

PROJECT ORIGIN

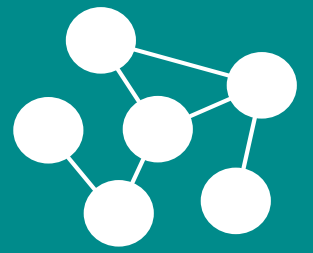
OUR MISSION TO MARS

- Open access to a working prototype of the solution.
- Run your own instance, contribute if you like and fork it if you do not.
- Open for pull-requests.
- All available on github.

code

docs

discussion



Project-Origin

How to follow or join Project Origin on Github

Follow the Github Repository

1. Find the public info here

Join Project Origin as an organisation in Github

1. Create Github account here
2. Share Github name with Thomas (xthow@energinet.dk)
3. Check in-box for invitation

ENERGY TRACK&TRACE

Conceptual Development

1. GC and carbon emission
2. Storage
3. We need your input

Certificates as part of carbon accounting

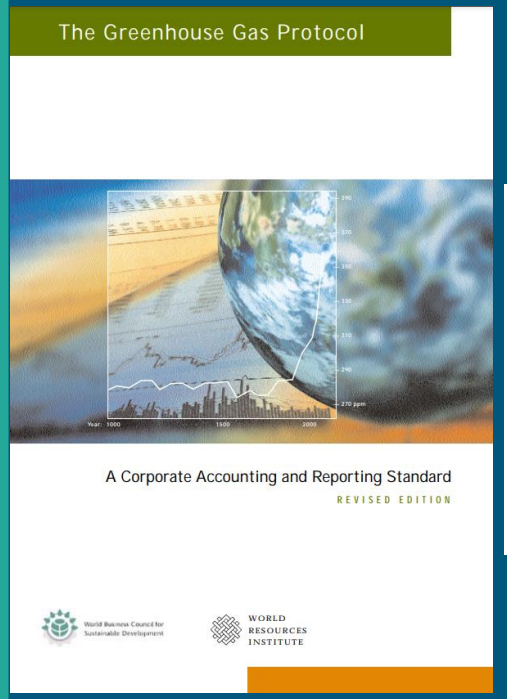
Trustworthy certificates are the starting point

Trustworthy carbon emission data are needed to perform reporting

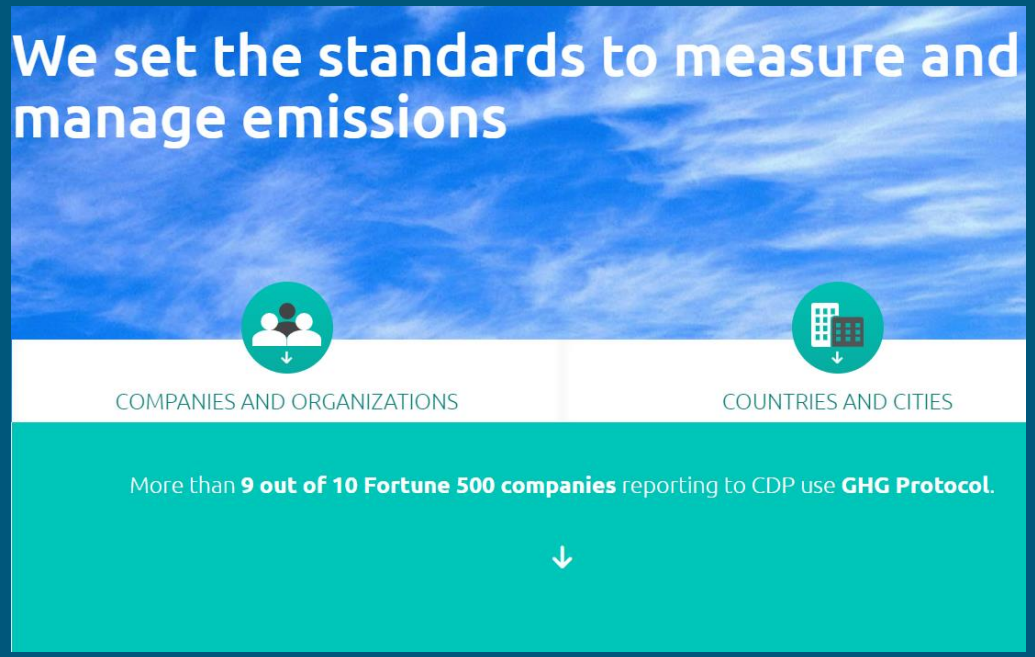
Standardization is needed for benchmarking and understanding

The Greenhouse gas protocol (GHG protocol)

- The GHG was launched in 1998 by the world resource institute (WRI) and gives detailed information to corporates and other companies regarding carbon emission accounting
- Today the GHG protocol is widely used by most companies and thus defines a de facto standard for carbon emission accounting
- **Currently the WRI is asking for inputs for a revision of the GHG protocol – deadline 15th of March 2023**



GREENHOUSE GAS PROTOCOL



GHG protocol in a nutshell

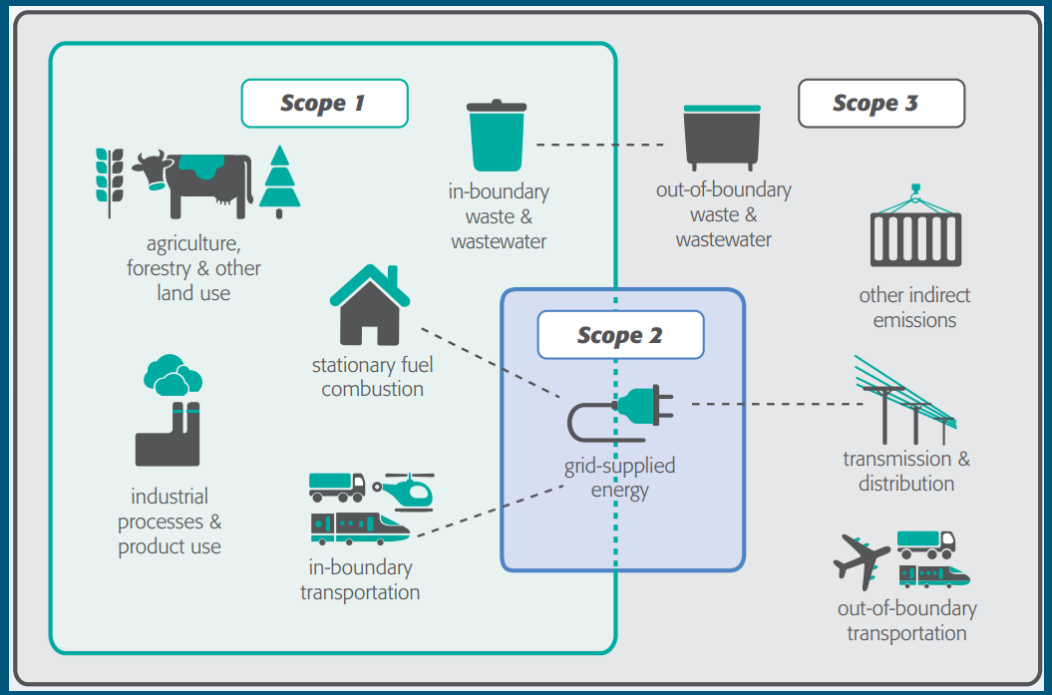
- **Scope 1**: Locally (onsite) emitted emissions from
- (combustion, agriculture and others)
- **Scope 2:** Grid carried energy supply (electricity, gas and others)
- **Scope 3:** Out of boundary emitted emissions based on the company's activities

- **The GHG protocol is already widely used by many companies and referred to by EU entities (fx "Draft European Sustainability Reporting Standards"**

5. Key changes introduced by the Guidance

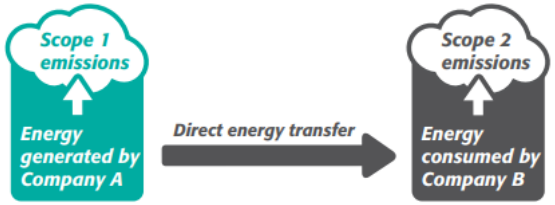
5.1 For most companies, scope 2 is no longer one number—it is two.

For companies with any operations in markets providing product or supplier-specific data in the form of **contractual instruments**, companies shall report scope 2 according to a location-based method and a market-based method. Each method's results reflect different risks and opportunities associated with emissions from electricity[1] use, and can inform different decisions and levers to reduce emissions. Companies shall choose which method's results to use for goal setting and other benchmarks.

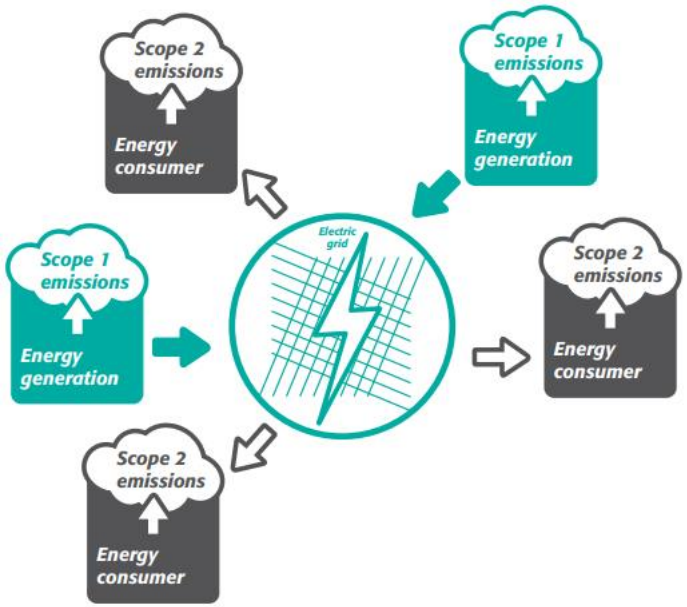


Location based

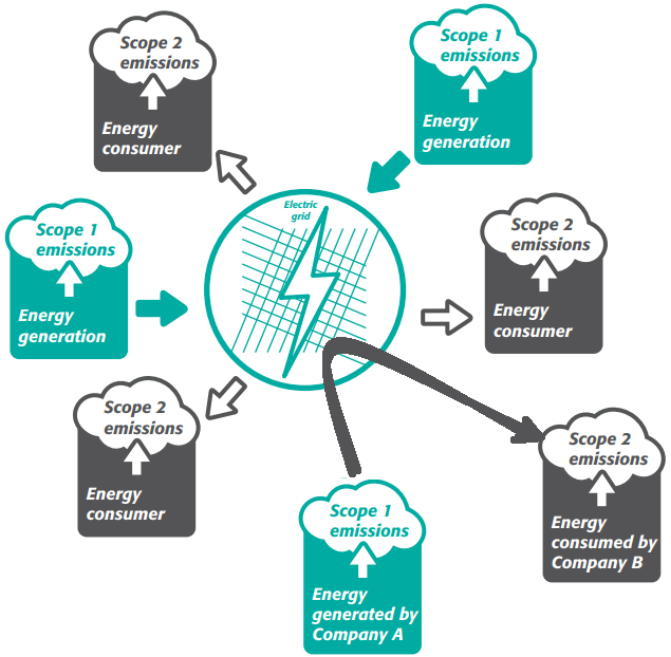
FROM



Or



TO



Direct transfer via granular certificates

Other comments to the GHG protocol

Granular data/certificates are key for decarbonization

Guidance that thrives for grid decarbonization and better (hourly) emission data are needed

https://blog.google/outreach-initiatives/sustainability/greenhouse-gas-protocol-comments/

https://www.gstatic.com/gumdrop/sustainability/google-2023-GHGP-Survey-Submission.pdf

Google

Building more accurate and effective greenhouse gas accounting

Google's comments on the Greenhouse Gas Protocol Update

Need for storages in Energy Track & Trace

Existing GoO scheme

Tracking **energy storages** (charge and discharge) is **not relevant** in existing EU GoO scheme, since temporal aspects are neglected.

Storages in GCs

Energy storage is an **essential component** to improve temporal matching score, **since it allows to shift Granular Certificates (GCs) in time.** It becomes necessary to track GCs through storage units, including conversion losses.

Potentials through integration

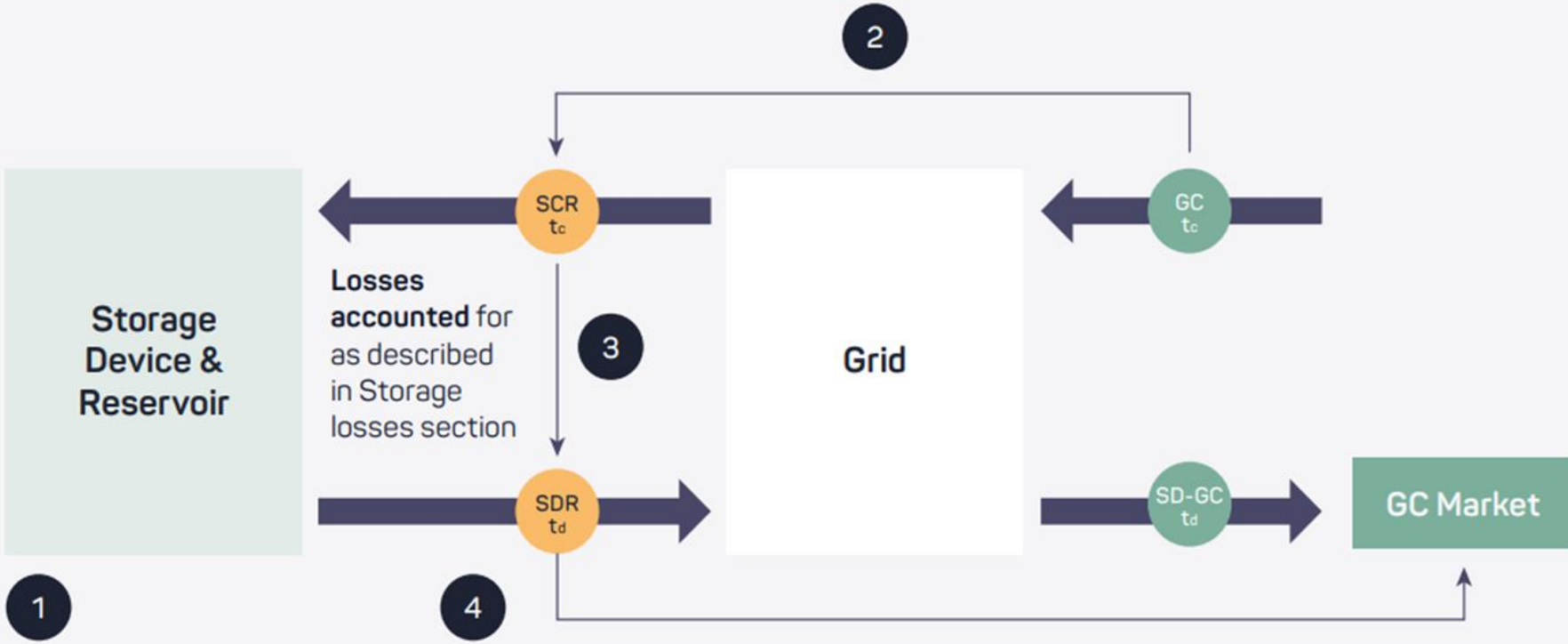
By integrating storages, companies can achieve 24/7 green power.

Additional revenue streams through certificates provide incentives to invest in storages

Storages as "time machine" for Granular Certificates

Integration of storages

According to
Energy Tag Use Case Guidelines



Key Definitions

SCR — **Storage Charge Record**
Registry record of energy charged to storage in a time period

GC — **GC**
GC issued from production device and cancelled for storage

SDR — **Storage Discharge Record**
Registry record of energy discharged from storage in a time period

SD-GC — **Storage Discharge GC**
GC issued after storage discharge

t_c — **Storage Charging Time Interval**

t_d — **Storage Discharge Time Interval**

Graphic source: EnergyTag

Quantifying storage losses

ENERGY TRACK&TRACE

Method 1: Measure in and out

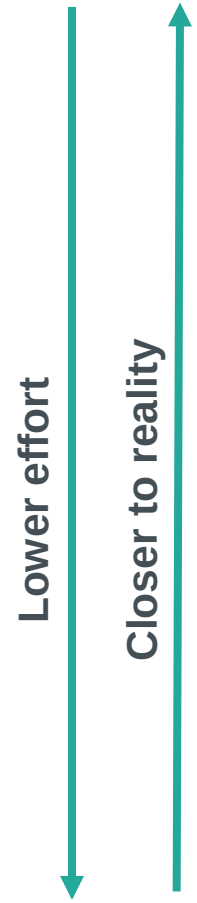
Measure all input into the storage **as well as all output** from the storage. The delta between input and output is the storage losses which get applied to the Storage Discharge Record (SDC).

Method 2: Asset-specific efficiency

Perform a **periodic capacity test** (e.g. annually) of the storage to measure the storage losses. Any Storage Charge Record (SDC) would be multiplied by one minus the asset-specific efficiency value.

Method 3: Storage default technology efficiency

Use a globally **accepted standard storage efficiency value by technology type** (e.g. lithium ion, pumped hydro etc.). Any Storage Charge Record (SDC) would be multiplied by one minus the default efficiency value for that technology type.



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Method 3: Storage default technology efficiency

Starting point for ETT

Use a globally **accepted standard storage efficiency value by technology type** (e.g. lithium ion, pumped hydro etc.). Any Storage Charge Record (SDC) would be multiplied by one minus the default efficiency value for that technology type.

Lower effort

Closer to reality

Storage Record Allocation Methodologies

Option 1: First in first out („FIFO“)

The **SCRs stored first** by loading the storage are **the first ones to be converted back to SDRs** when storage gets discharged. The creation of the certificate happens **automatically** when the storage gets discharged.

\+ Easy to implement procedure without manual intervention.

– When participation in ancillary services (FCR): successive generation of SDRs.

Option 2: Storage Operator Decides

The storage operator can decide by himself how to allocate SDRs to the SCRs. The assignment does not have to follow any particular order.

\+ More freedom for storage operators, opportunities for ancillary services without certificate loss.

– Possibilities for arbitrage that are not physically possible (holding GCs for a long time even though storages has been unloaded), prevention only with complex monitoring

Further options

We do not consider other approaches such as “last in first out" or “weighted-average”.

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Further options

We do not consider other approaches such as “last in first out" or “weighted-average”.

Your opinion about Storages

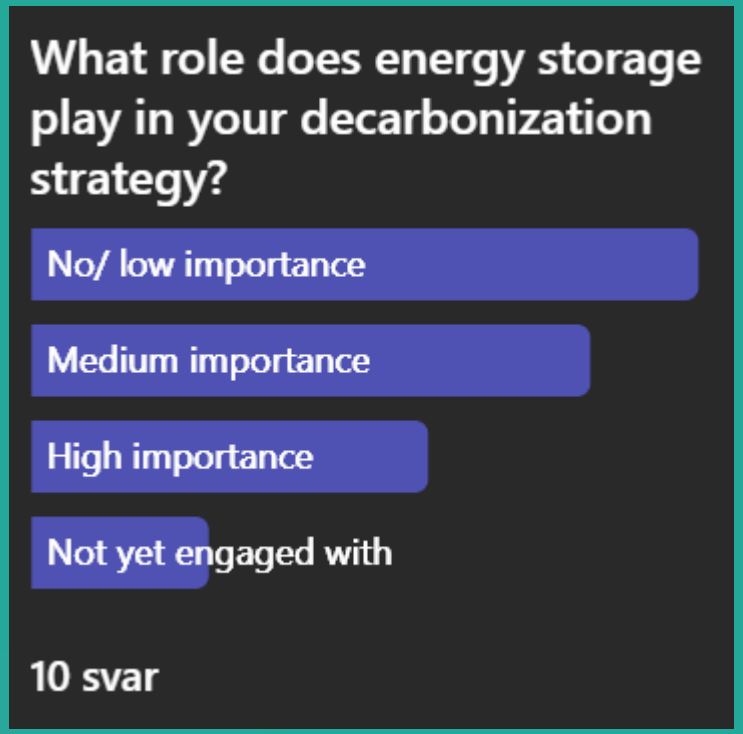
We want to ask you for your opinion.

The survey is anonymous.

Storages – first question

What role does energy storage play in your decarbonization strategy?

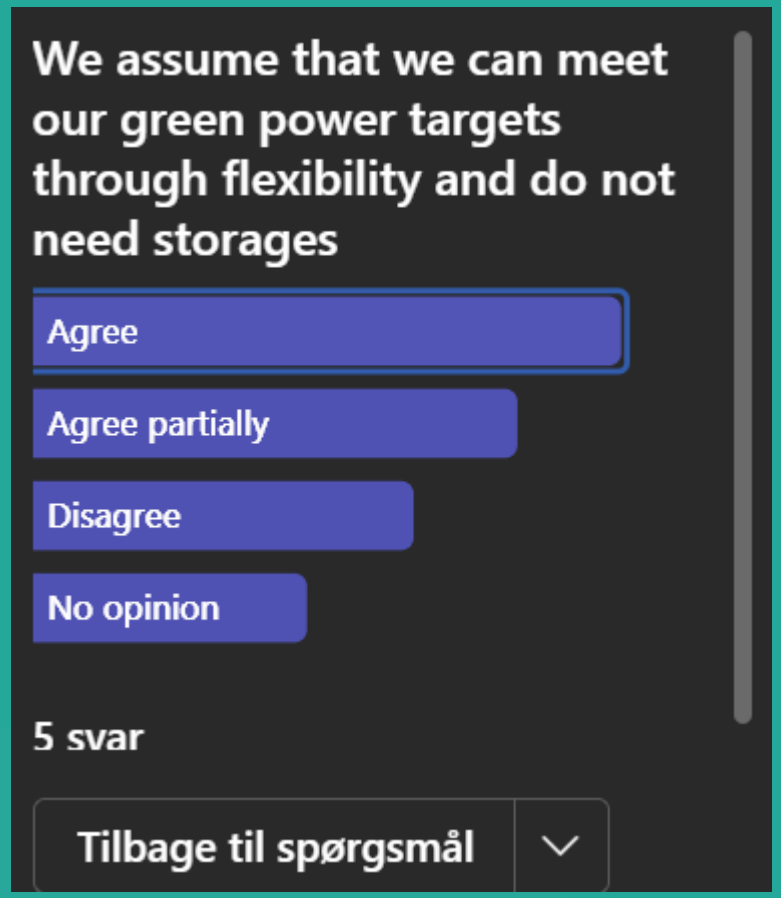
- No/ low importance
- Medium importance
- High importance
- Not yet engaged with



Storages – second question

We assume that we can meet our green power targets through flexibility and do not need storages

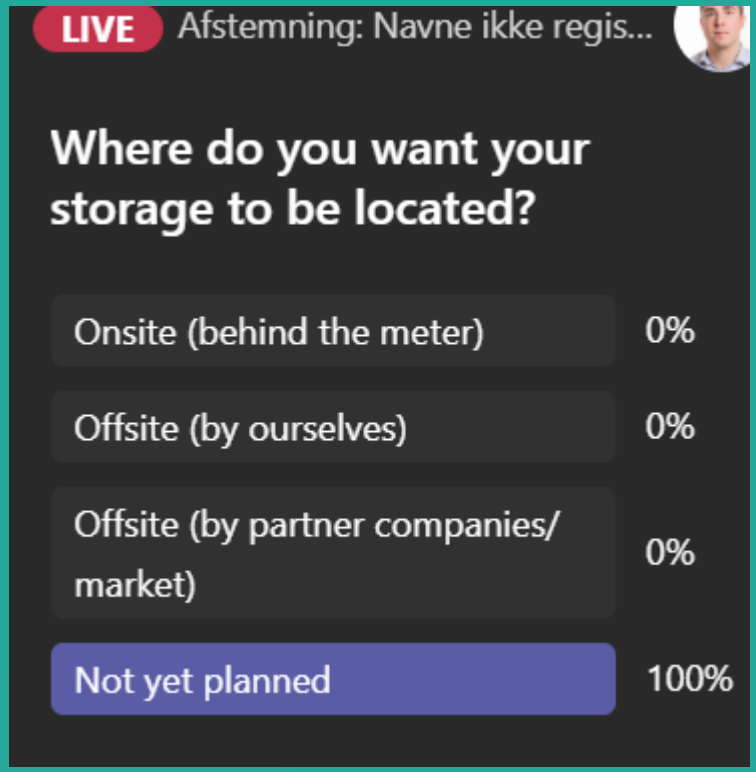
- Agree
- Agree partially
- Disagree
- No opinion



Storages – third question

Where do you want your storage to be located?

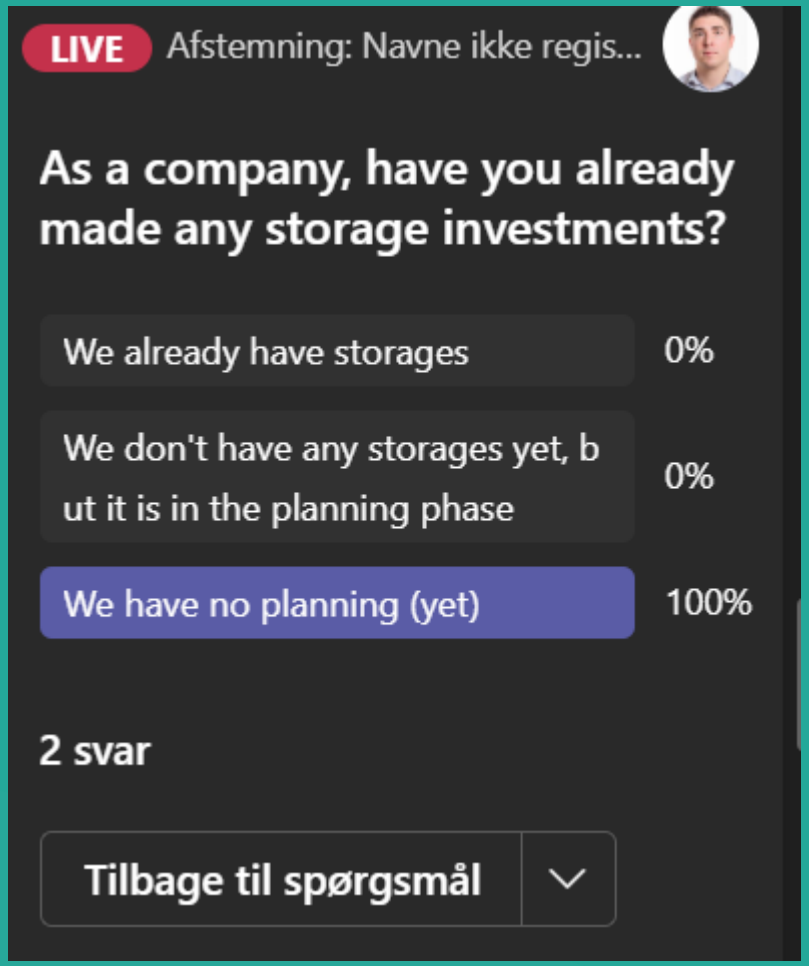
- Onsite (behind the meter)
- Offsite (by ourselves)
- Offsite (by partner companies/ market)
- Not yet planned



Storages – fourth question

As a company, have you already made any storage investments?

- We already have storages
- We don't have any storages yet, but it is in the planning phase
- We have no planning (yet)



Going forward - we need your additional input..

- *How can we stay relevant to you?*
  - *Are the topics relevant to you?*
  - *Less topics with deep dives or more high-level topics?*
  - *Format?*
  - *Guest speakers?*
  - *Other ideas?*

Send input to: MHU@energinet,dk

THANK YOU FOR PARTICIPATING TODAY!

Reach out to us for ideas regarding topics, format or other points of interest

We look forward to see you all again, June 15th 2023 – 10:00 to 11:30

Register online at www.energytrackandtrace.com Or via the link here