FaStGO – Facilitating Standards for Guarantees of Origin

Energy carrier conversion

Conversion Issuance, as a facilitator of sector integration

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Conversion Issuance of guarantees of origin

1) Conversion Principles:
   - Cancel GOs for measured input energy carrier
   - Issue new GOs for measured output energy carrier

2) Attributes from cancelled GOs to be passed on to the newly issued GOs:
   - energy source
   - support (accumulated)
   - Label, if the label provider supports it
   - Optional: GHG emission data

3) Other attributes on the newly issued GOs:
   - Relate to the conversion production device
Generic GO issuing – Attributes on the GO

**Input**
- Energy source
  - Fxxxxxxxx

**Production Device**
- Technology, described in one of the following codes:
  - Txxxxxx (electricity)
  - Mxxxxxx (network compatible gas)
  - Hxxxxxx (hydrogen)
  - Gxxxxxx (other gas)
  - Qxxxxxx (heating and cooling)

**Output (1 MWh)**
- eligible for issuing GO

**GO**
- **Attributes on the GO**:
  - Unique Identification number
  - Energy source: Fxxxxxxxx
  - Technology: Txxxxxx /Mxxxxxx /Hxxxxxx/Gxxxxxx/Qxxxxxx
  - Production Device details
  - Production period
  - Energy Carrier
  - Purpose
  - (...)
GO issuing with energy carrier conversion - generic

**Input**

Energy carrier A  
Attributes: See GO_A

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**GO_A => Cancelled**

**Attributes on the GO:**
- Unique Identification number A
- Energy source: Fxxxxxx A
- Technology: Txxxxx /Mxxxxx /Hxxxxx/Gxxxxx/Qxxxxx A
- Production Device details A
- Production period A
- Energy Carrier A
- Purpose A
- Support: A
- Label: A
  (optional: Carbon Footprint: A)
  (...)

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**Production Device**

**Technology, described in one of the following codes:**

- Txxxxxx (electricity)
- Mxxxxxx (network compatible gas)
- Hxxxxxx (hydrogen)
- Gxxxxxx (other gas)
- Qxxxxxx (heating and cooling)

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**Output (1 MWh of energy carrier B)**

eligible for issuing GO_B

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**GO_B => issued**

**Attributes on the GO:**
- Unique Identification number B
- Energy source: Fxxxxxx A
- Technology: Txxxxx /Mxxxxx /Hxxxxx/Gxxxxx/Qxxxxx B
- Production Device details B
- Production period B
- Energy Carrier B
- Purpose A
- Support: A+B
- Label: A+B if supported by label operator
  (optional: Carbon Footprint: A+B, full GrG input quantity to be maintained)
  (...)

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Biomethane converted into electricity

Input:
Energy carrier: Hydrocarbon gas, type Network Compatible Gas,
Attributes: see GO

Output
(1 MWh of **Electricity**) eligible for issuing GO

**GO_A**

Attributes on the GO:
- Unique Identification number A
- Energy Carrier: Hydrocarbon gas, Network Compatible Gas
- Energy source: F01010502 Agricultural by-products, residues & waste
- Technology: M010100 Anaerobic Digestion
- Production Device details A
- Production period A
- Purpose: Disclosure
- Supports: A
- Label: A
- (optional: Carbon Footprint: A)

(...)

**GO_B**

Attributes on the GO:
- Unique Identification number B
- **Energy Carrier: Electricity**
- Energy source: F01040100 Agricultural by-products, residues & waste
- Technology: T050502 Combustion engine CHP
- Production Device details B
- Production period B
- Purpose: Disclosure
- Supports: A+B
- Label: A+B if supported by label operator
- (optional: Carbon Footprint: A+B, full GHG input quantity to be maintained)

(...)

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Electricity converted into Hydrogen

Input: Electricity
Attributes: see GO

Production Device

Technology:
H010100 Electrolyser

Output (1 MWh of hydrogen)
eligible for issuing GO

GO_A
Attributes on the GO:
Unique Identification number A
Energy Carrier: Electricity
Energy source: F01040100 Solar
Technology: T010101 Photovoltaic
Production Device details A
Production period A
Purpose: Disclosure
Support: A
Label: A
(optional: Carbon Footprint: A)
(...)

GO_B
Attributes on the GO:
Unique Identification number B
Energy Carrier: Hydrogen
Energy source: F01040100 Solar
Technology: H010100 Electrolyser
Production Device details B
Production period B
Purpose: Disclosure
Support: A+B
Label: A+B if supported by label operator
(optional: Carbon Footprint: A+B, full GHG input quantity to be maintained) (...)

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GO issuing for hydrogen injected into natural gas network, (a) hydrogen produced at the grid injection site

Production Device

Output (1 MWh of hydrogen) eligible for issuing GO

Consumer receives 1 MWh of Hydrocarbon gas

Input: Electricity Attributes: see GO

GO_A
Attributes on the GO:
Unique Identification number A
Energy Carrier: Electricity
Energy source: F01040100 Solar
Technology: T010101
Photovoltaic
Production Device details A
Production period A
Purpose: Disclosure
Support: A
Label: A
(optional: Carbon Footprint: A)
(...)

GO_B
Attributes on the GO:
Unique Identification number B
Energy Carrier: Hydrocarbon gas – type Network compatible gas
Energy source: F01040100 Solar
Technology: H010100 Electrolyser
Production Device details B
Production period B
Purpose: Disclosure
Support: A+B
Label: A+B if supported by label operator
(optional: Carbon Footprint: A+B, full GHG input quantity to be maintained) (...)

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GO issuing for hydrogen injected into natural gas network, (b) hydrogen from other production location

Input
Hydrogen
Attributes: see GO

1 MWh of Hydrogen injected in gas grid

GO_A
- Attributes on the GO:
  - Unique Identification number A
  - Energy Carrier: Hydrogen
  - Energy source: F01040100 Solar
  - Technology: H010100 Electrolyser
  - Production Device details A
  - Production period A
  - Purpose: Disclosure
  - Support: A
  - Label: A
  (optional: Carbon Footprint: A)
  (...)

GO_B
- Attributes on the GO:
  - Unique Identification number B
  - Energy Carrier: Hydrocarbon gas, type 'Network Compatible Gas'
  - Energy source: F01040100 Solar
  - Technology: H010100 Electrolyser
  - Production Device details A
  - Production period B
  - Purpose: Disclosure
  - Support: A
  - Label: A+B if supported by label operator
  (optional: Carbon Footprint: A+B, full GHG input quantity to be maintained) (...)

Consumer receives 1 MWh of Hydrocarbon gas

Conversion issuance rule exception

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Facilitating sector integration

Building blocks:

- Generic GO system for all energy carriers
- Conversion issuance rules
- Install processes: Issuing body shall verify cancelled GOs of input energy carrier
  ⇒ Link cancelled GOs to measurements of new production
  ⇒ Allocation of Issuing Body roles / communication between issuing bodies
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Thank you for your attention

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