

BIOCON 2026

The European Market for Biomethane

Guarantees of Origin

Past, Present, Future

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Renewable Power
GOs | REGOs | Global EACs | PPA's

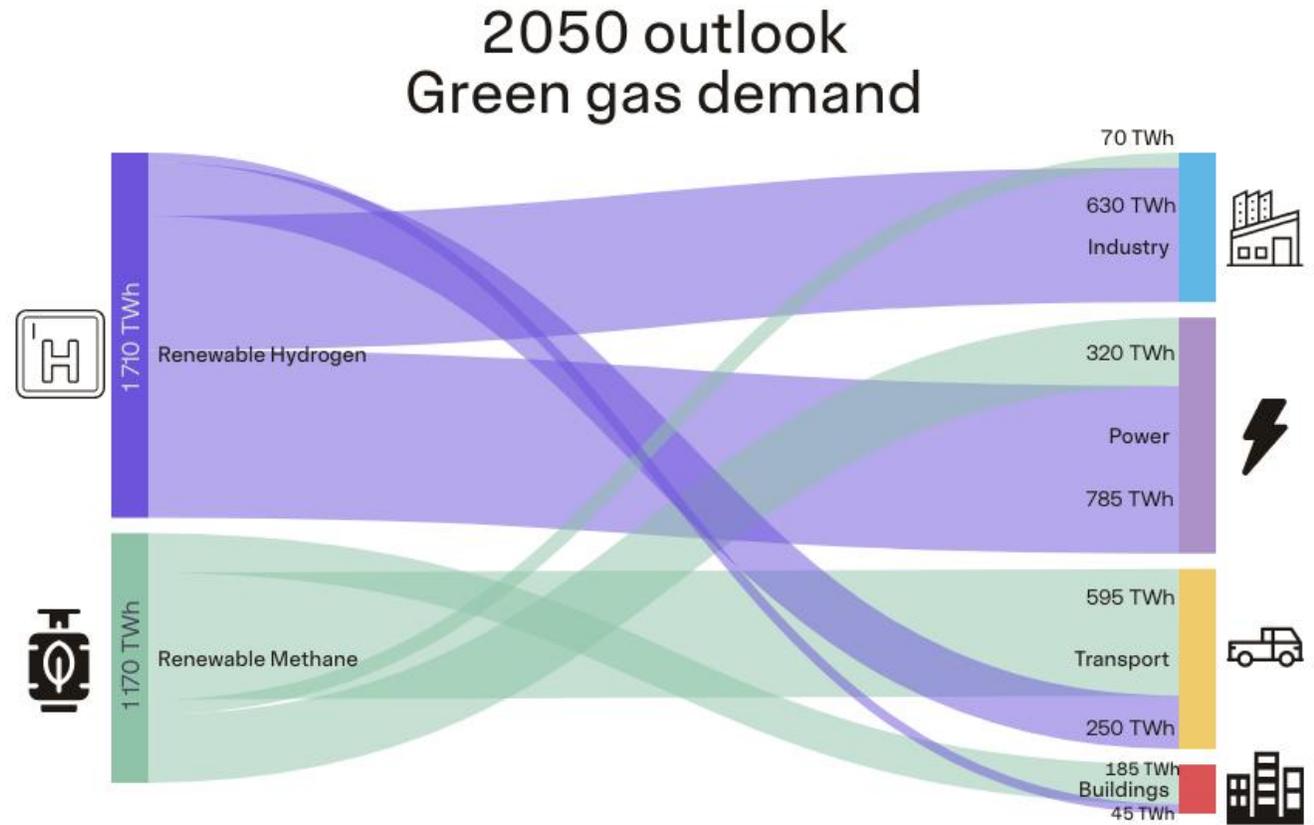
Renewable Fuels
Biomethane | Biofuels

European Carbon
EU ETS | UK ETS | EU ETS 2

Global Carbon Credits
Art. 6 | VCM | Corsia | Removals

Overview

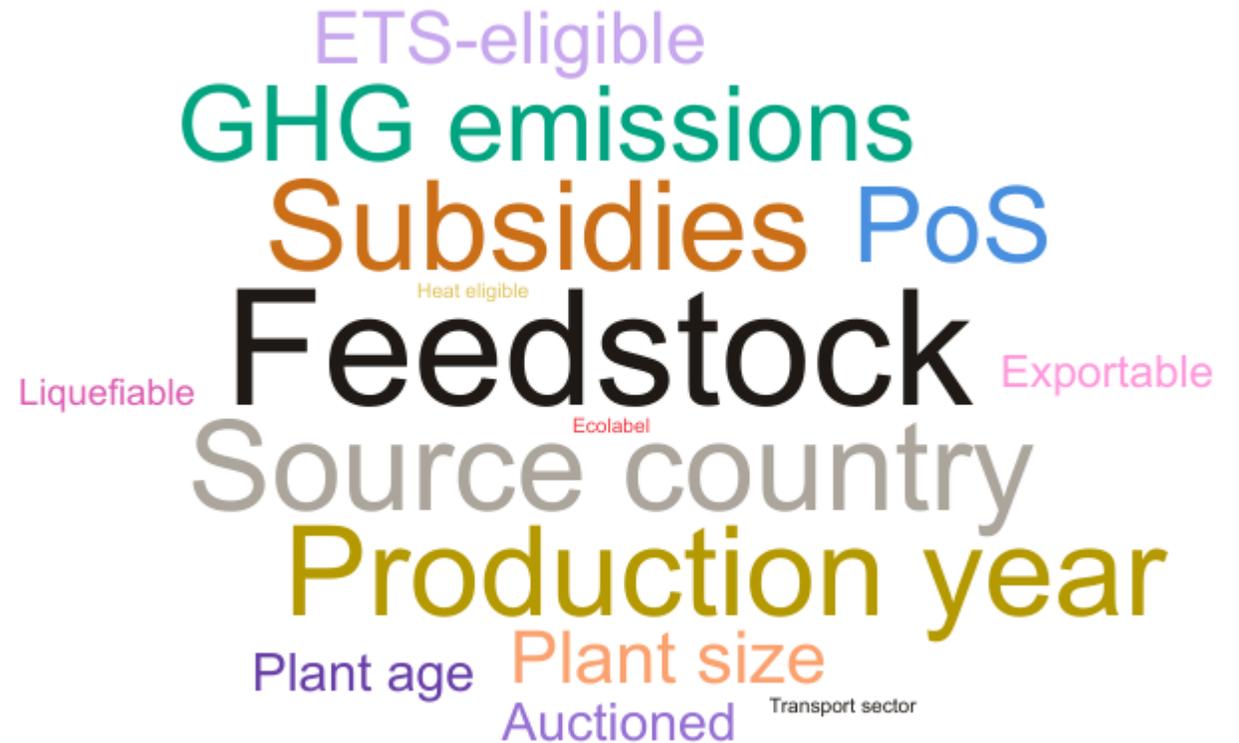
- Recap – what is a GO?
- Relation to PoS
- Subsidised versus unsubsidised
- How green value arises
- Historic markets
- Voluntary market usage
- GOs for FuelEU Maritime
- Summary



Gas for Climate, 2020

Guarantee of Origin

- Book-and-claim chain of custody system, specific to EU
 - RED I (2009/28/EC) – applied to renewable electricity
 - RED II (2018/2001) – explicit extension to **renewable gas**
- Demonstrates quantity of renewable energy supplied to customers
 - 1 MWh claimed (cancelled, retired) is back by 1 MWh of RE production
- Much like the biomethane gas they represent, GOs (and associated markets) are fragmented

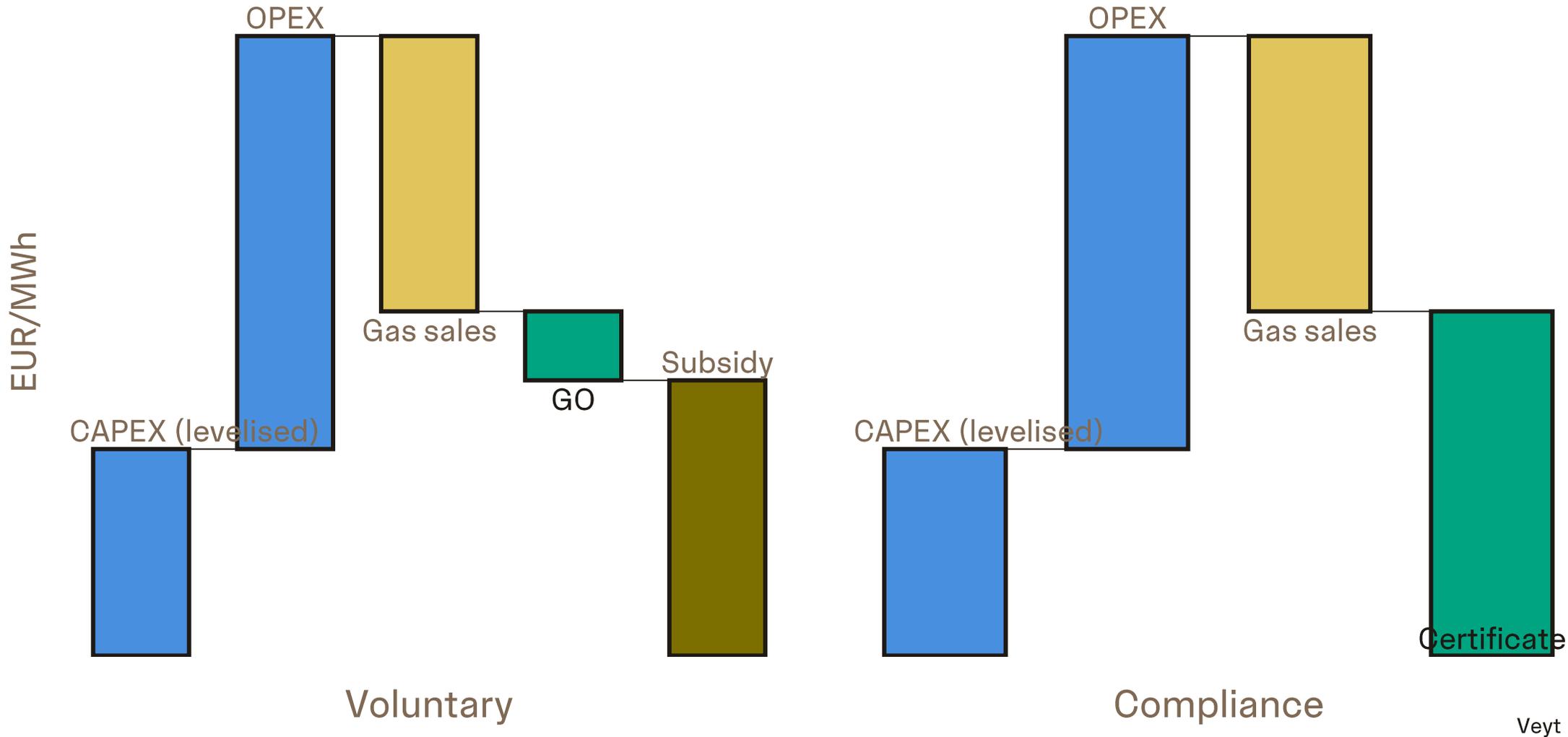


GOs and PoS (Proof of Sustainability)

- While PoS has always been critical in compliance markets, the GO has not had such prominence
- Where there is a compliance market claim, a separate GO cannot be claimed elsewhere
 - GO cancelled for compliance claim
 - GO unable to be issued in the first place
- There is a growing demand for “certified” GOs
 - GO plus PoS

	<i>Guarantees of Origin</i>	<i>Proof of Sustainability</i>
Main purpose	Supplier/Consumer disclosure for evidence of renewable energy delivery/usage Voluntary claims (ESG)	Regulatory compliance Detail GHG savings according to RED criteria
Issuer	National appointed bodies , under RED GO framework	Verified via voluntary schemes (e.g. ISCC) <u>EU 2022/996</u>
Link to gas	Can be (and often) decoupled	Follows physical flow (mass balance chain of custody rules)

Subsidised versus Unsubsidised



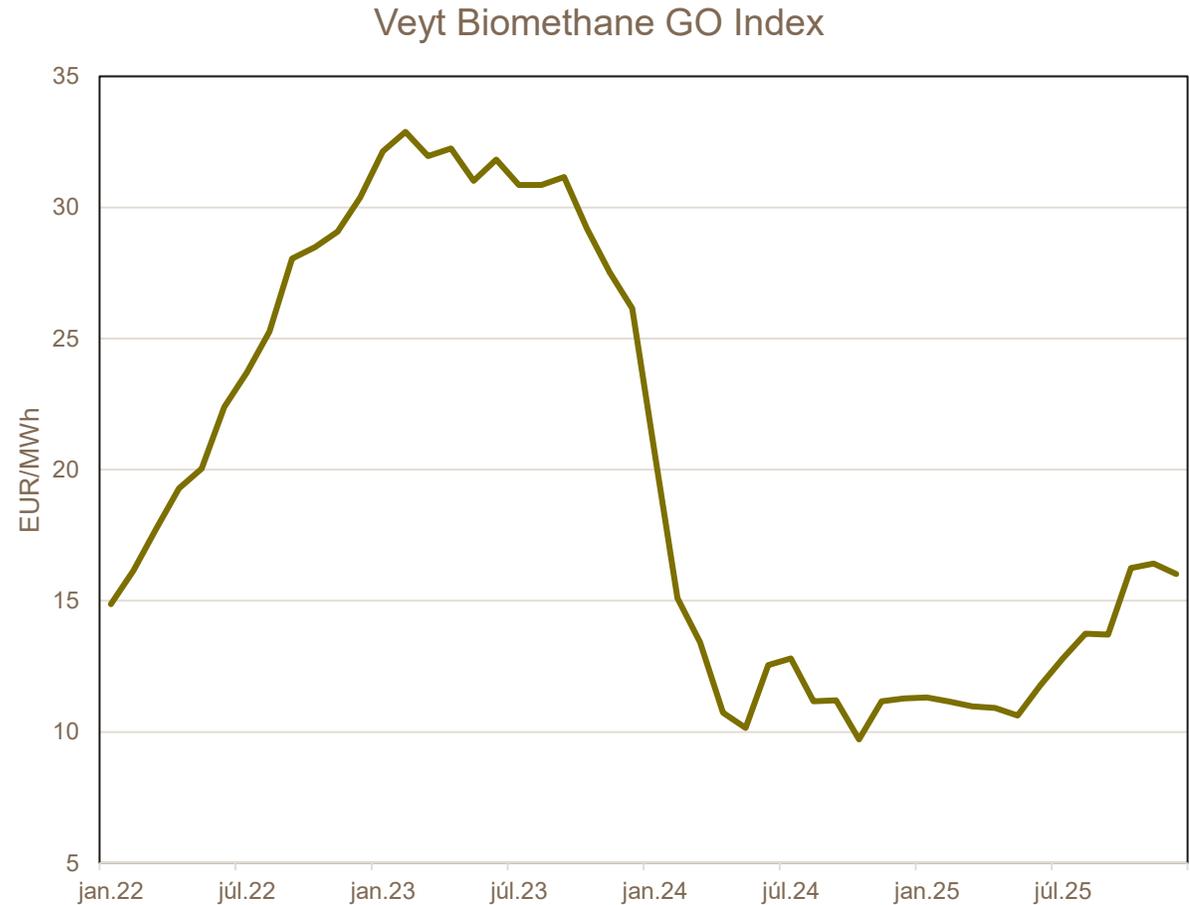
How green value arises for GOs

- Fundamentally, biomethane avoids fossil fuel CO2 emissions associated with the natural gas it replaces
- Practically it is promoted/monetised in two ways
 - Emissions avoided
 - Renewable energy uptake
- What about the high premium applications?

	Promotion	Accepts subsidised	PoS also required?	Price levels (EUR/MWh green premium)	Accepts imports
Voluntary	Renewable Energy	Yes	No	12-30	Yes
ETS 1	Emissions	Yes	Mostly	15-20	Mixed
FuelEU Maritime	Renewable Energy	Yes	Yes	30-40	Yes
Domestic heat	Emissions	Mixed	Mostly	20-30	Mixed
Grid blending	Renewable Energy	No	Yes	80-100	No
RED III mandates	Renewable Energy	No	Yes	80-110	Yes

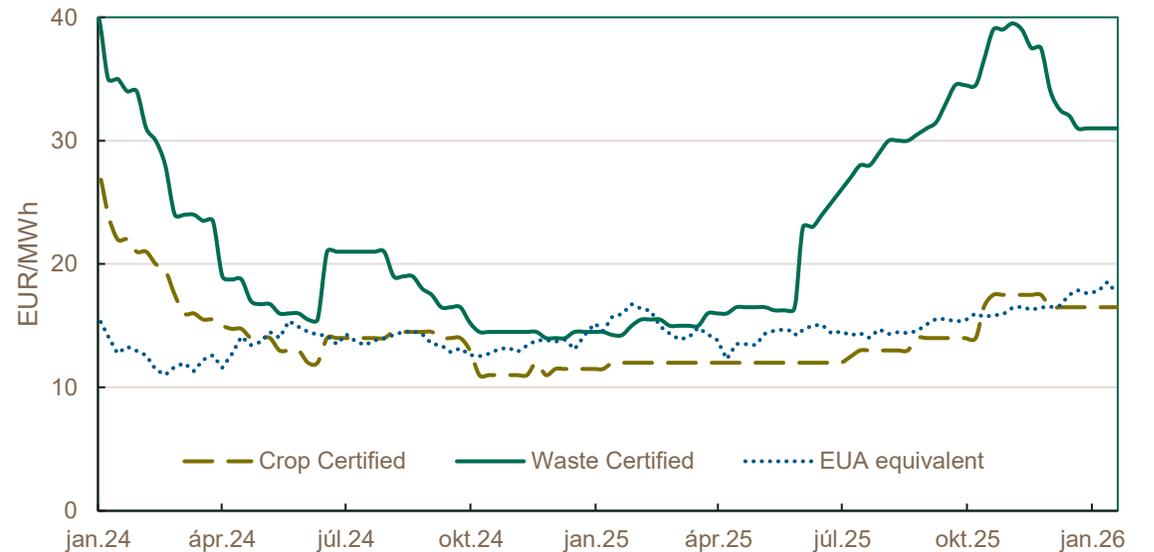
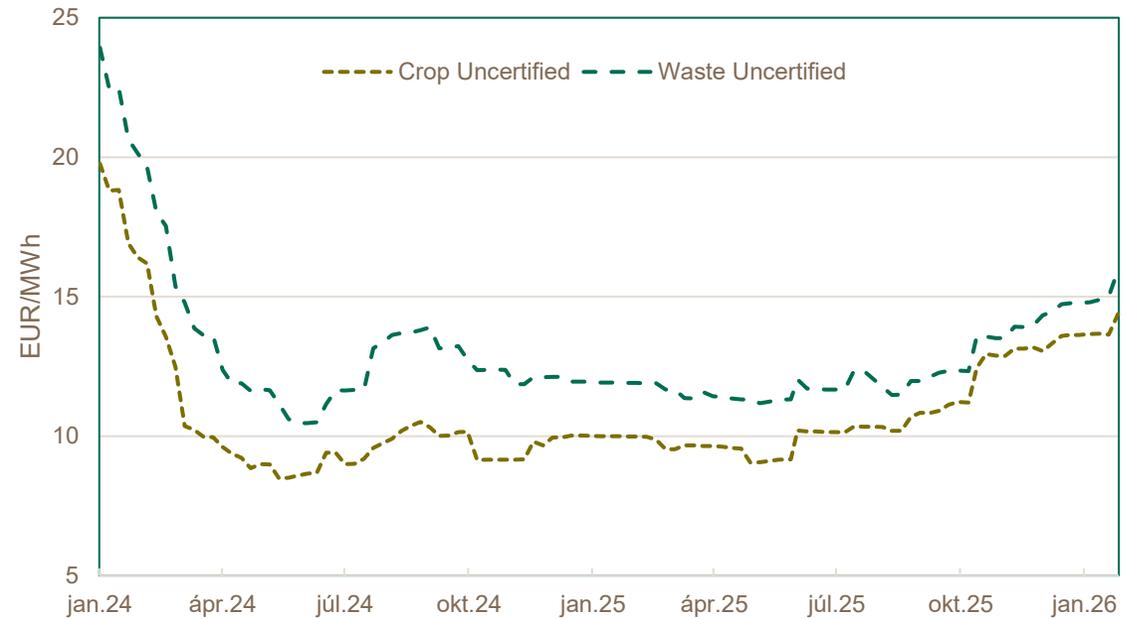
Historically – niche market

- Pre-2020
 - Active markets - UK, DK and NL
 - UK RGGGO levels in 2017 ~ GBP 1/MWh
 - FR – GOs, but domestic, no third-party participation
 - At discount to UK
- DE – GO imports, for lower value use (voluntary disclosure)
- Recently OTC, characterised by spot volumes ~ 5 GWh lots
- First “boom” – 2022
 - Energy crisis



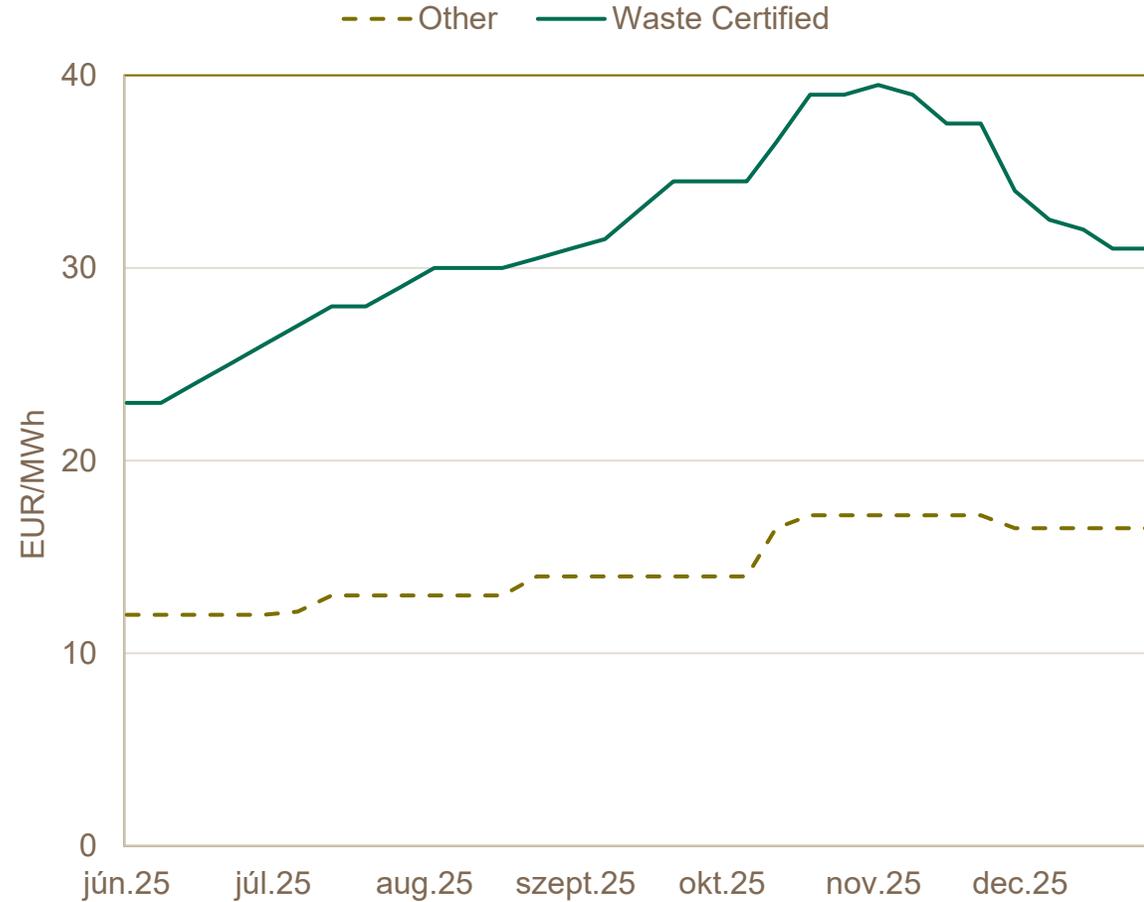
Voluntary market usage of GOs

- Voluntary market driven by consumer demand for 'green' credentials
 - Renewable energy (ESG)
 - Reducing emissions (Scope 1 & 3)
- However, the use of GOs to represent Scope 1 & 3 reductions not widely accepted
 - Guidelines have been slow in developing (GHG Protocol)
 - Compare to RES-E and Scope 2
- General EU case to represent Scope 1 emissions reductions via the ETS
 - Linking carbon price to GO price
 - Further RED III implementation will help
 - ETS 2 expands demand pool (transport, heating cooling)



Maritime an avenue for GOs?

- FuelEU Maritime
 - BioLNG is a ready solution
 - Subsidised production accepted
- Value based on sustainability and GHG savings
 - Annex IX only
 - PoS necessary
 - Low/negative emissions - higher premiums
- Strictly speaking, GOs not required
 - GO prices correlate with DK/NL FuelEU volumes



Summary

- GO market historically associated with subsidised production
 - Revenue was an afterthought, but is gaining importance
- GOs used for end-user/supplier disclosure
 - Clarification over Scope 1 and 3 usage still required
 - Use case for GOs to represent reduced ETS obligations growing
- Increased focus on sustainability and certification (PoS)
 - Key to unlocking higher premiums
- For unsubsidised biomethane, will likely require targeting non-GO markets (blending schemes, RED III)

	Accepts subsidised?	PoS also required?	Price levels (EUR/MWh green premium)	Predicted Trend (to 2035)
Voluntary	Yes	No	12-30	▶
ETS 1	Yes	Mostly	15-20	▲
FuelEU Maritime	Yes	Yes	30-40	▲
Domestic heat	Mixed	Mostly	20-30	▼