

U.S. Department of Energy Clean Hydrogen Production Standard (CHPS) Draft Guidance

Dear Secretary Granholm,

EnergyTag appreciates the opportunity to provide comments to the Department of Energy (DOE) regarding its draft guidance for a Clean Hydrogen Production Standard (CHPS). EnergyTag is a non-profit bringing together over 500 organisations to define and build a market for Granular Certificates (i.e. GCs/ T-EACs/hourly RECs) and enable a 24/7 carbon-free energy future across the globe. We are based in Europe, but have a significant presence in the United States with representatives from Google, Microsoft, AES and the Clean Energy Buyers Alliance all sitting on our Advisory Committee. Minneapolis based M-RETS are one of the world's largest energy tracking software providers and are a key partner. We believe robust market-based accounting documented with GCs is a crucial lever to ensure clean hydrogen production and grid decarbonization.

Clean hydrogen is an important tool to enable deep decarbonization of our own operations and value chain, as well as the global economy. Strong standards are essential to ensure the environmental integrity of clean hydrogen. Without such standards, hydrogen production could lead to significant increases in carbon dioxide emissions, undermining its effectiveness and legitimacy as a key decarbonization lever.

Given our area of expertise, we shall limit our comments to question 3(c) use of contractual instruments for verifying clean hydrogen produced from grid-based electricity:

24/7 Quality Criteria to Ensure Clean Electricity for Clean Hydrogen

Princeton University researchers² have done the only rigorous, system-level analysis to examine under which criteria grid based electricity can produce zero-carbon hydrogen in the US. The results are clear: hourly, local and additional clean electricity is required to ensure low-carbon hydrogen production and relaxation of these criteria leads to high emission hydrogen. In line with our position on Green Hydrogen in Europe, EnergyTag therefore recommends that Granular Certificates be required to demonstrate clean electricity supply to an electrolyser that should have following the criteria:

- **Temporality:** Hourly correlation of consumption with production based on GC timestamp to ensure fossil-electricity is not being used at times when clean supply is not available.
- **Deliverability:** Proving deliverability of electricity (by sourcing from the same balancing authority / RTO) based on GC location information to ensure that congestion does not cause local fossil generation to supply electrolysers.

¹ Contact killian@energytag.org

² Ricks, Wilson, Xu, Qingyu, & Jenkins, Jesse D. (2022). Enabling grid-based hydrogen production with low embodied emissions in the United States. Zenodo. <https://doi.org/10.5281/zenodo.7183516>

- **Assets:** Subsidised new hydrogen demand should drive new clean electricity supply for grid-based hydrogen to be considered zero-carbon. This can be demonstrated on the GC by asset age (or potentially repowering, life-extensions). As guidance, Princeton University proposes a maximum asset age of 18 months older than the electrolyser, with the European Commission presenting 36 months in their regulatory proposal. GCs should be able to be sourced bundled (i.e. PPAs) or unbundled, provided the quality criteria are met.

Granular Certificates to ensure Robust Implementation

New tools are quickly becoming available to assess and verify the use of carbon-free electricity at an hourly level. Time-based Granular Certificates are instruments that, in addition to tracking how and where electricity is produced, also certify specifically when.

EnergyTag, through a rigorous consultation process with the support of 100+ leading organizations (e.g. Google, Microsoft, UN Energy, AES...) published the world first and only GC standard in March 2022³ and is currently auditing the first formally audited GC system across the world. **GCs are technically proven** with over a dozen [GC projects around the world](#) and over 1 TWh tracked already with over 15 TWh/a expected next year.

M-RETs, the largest US REC registry, has already issued hourly RECs to Google on its registry in a pilot project and is actively working on scaling up this system across the US. **Scaling a US GC system is far less complex and lengthy than building large scale electrolysers**, leaving ample time for the tracking system to be updated. Therefore, GCs are highly likely to be a key enabler, rather than a roadblock for 24/7 clean hydrogen.

The **contracting structure** required to deliver the hourly matching criteria discussed above are already tested in a number of deals by Google (in [Virginia](#) and [California](#)) and Microsoft (in [Virginia](#)) contracting structures are also being developed to enable the sourcing of clean energy around the clock. These same three criteria have also [been proposed](#) by the European Commission as part of their own approach for defining the minimum requirements to demonstrate that renewable hydrogen from grid-based electricity is actually clean.

We hope this information is useful and remain available for any questions.

Best regards,

Killian Daly

General Manager

EnergyTag

³ Granular Certificate Scheme Standard: Version 1. EnergyTag.

<https://energytag.org/wp-content/uploads/2022/03/20220331-EnergyTag-GC-Scheme-Standard-v1-FINAL.pdf>

Annex : GCs are Standardised, Proven and Scaling

This short paper presents an overview of the state of play for Granular Certificates (GCs or T-EACs), the tracking instrument needed for the robust implementation of 24/7 carbon-free energy (CFE). GCs are a standardised and technically proven solution ready to be implemented at scale.

Research Shows Why We Need GCs

1. [TU Berlin EU research](#) shows that 24/7 “leads to **lower emissions for both the buyer and the system**”.
2. [Princeton University](#) demonstrates **benefits of 24/7 PPAs and T-EAC trading**.
3. [Princeton University research](#) shows 24/7 for US Green Hydrogen is needed to **avoid “significant excess emissions”**.
4. [Florence School of Regulation Study](#) shows significant benefits of **24/7 for Green Hydrogen** at little extra cost.
5. [University of California Davis research](#) shows **hourly accounting increases accuracy over annual** by up to 35%.

Projects Show How to Get There

- Various [projects](#) prove GCs are a technical reality, with over **1 TWh of hourly tracking already performed with over 10 TWh expected next year**. Some examples:
 - EnergyTag [demos](#) provide multiple implementation cases.
 - [Google hourly tracking](#) with T-EACs (i.e. GCs) around the world.
 - [M-RETs hourly tracking](#) in the US.
 - FlexiDAO [working with various partners](#) on Granular Certificates.
 - [Energy Track and Trace](#) - 3 EU TSO launching alpha in Q4 2022.
 - [Nord Pool and Granular Energy](#) set up a GC spot market in the UK.
- The next key step is **full scale-up** by registries. M-RETs (US largest) predicts that, with sufficient investment, this can be done in **~12 months across 50 states**.
- [WRI webinar](#) gives detail on state of play.

EnergyTag Standard Ensures Trust

- [EnergyTag](#) is a non-profit with **500+ organisations** “to define and build a market for Granular Certificates”.
- Our [Advisory Committee](#) has the **world’s top experts** overseeing GC adoption.
- Collaboration with leaders like [CEBA](#), [Eurelectric](#), [Linux Foundation Energy](#).
- The [EnergyTag Standard](#) is a first of its kind and sets criteria for robust GC schemes.
- [Auditing](#) is led by Katrien Verwimp & Phil Moody, who have decades of experience overseeing EU’s Guarantee of Origin.

Voluntary Demand is Growing

- [Google’s 24/7 carbon-free energy](#) goal set to achieve by 2030.
- [Microsoft 100/100/0 goal](#) to run 100% of the time on energy with 0 emissions by 2030.
- Eurelectric gathers **EU suppliers and buyers in its 24/7 Hub** to drive demand.

Growing Institutional Support

- [The United Nations](#) has a **24/7 carbon free energy compact** to build demand.
- [US Federal Government goal](#) to run on at least 50% 24/7 CFE by 2030.
- [The EU Commission](#) proposes **24/7 matching** for green hydrogen.
- [The EU Parliament](#) positions **in favour of Granular Certificates** in draft law.
- C40 cities Paris, London, and Copenhagen [launch 24/7 initiatives](#).
- [EU System operators say](#) GCs develop renewables “**in the right time and in the right geographical location**”.