Granular certificates explained: hourly clean energy matching for data centre buyers

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Short answer: granular certificates are energy attribute certificates that record clean electricity supply by hour and location, so a buyer can compare its consumption with generation at the time it actually used power. Google reported on 19 November 2026 that trading volume on a marketplace in the US PJM grid region rose 437% in a year, and that most registries it funds expect the needed capability in early 2027. It matters for anyone buying power for data centres or reporting electricity emissions.

TL;DR The short version

- Granular certificates record clean electricity by hour and location, so a buyer can match consumption with generation at the time power was used.
- Google reported on 19 November 2026 that trading on a marketplace in the US PJM region rose 437% in a year, and most registries it funds expect the capability in early 2027.
- Data centre buyers can start by measuring hourly consumption by site and asking suppliers about hourly certificates.

Read online, listen to it, or change the text size: https://blogs.iictp.org/granular-certificates-hourly-clean-energy-data-centres

What are granular certificates?

Most corporate buyers track clean energy with monthly or annual energy attribute certificates held in registries, which also guard against double counting. A granular certificate adds the specific hour and geographic location. That reveals gaps an annual total hides, such as consumption at night matched with daytime solar.

How the market works

- A generator or storage operator receives certificates tied to hours.
- Registries issue, transfer, verify and retire them with hourly data and a clear owner.
- Marketplaces set prices by hour.
- Buyers purchase certificates for hours where their own contracts fall short.
- Higher prices in scarce hours signal where new supply or storage would help.

What is new compared with annual certificates

Time and place become part of the claim. Google and partners also piloted certificates for battery storage, which shift solar energy to the hours a buyer targets, creating a possible revenue stream for storage operators.

Results reported by Google

- A marketplace in PJM launched in October 2025 with LevelTen, the Granular Certificate Trading Alliance and Intercontinental Exchange; volume grew 437% in a year, with Google in every monthly spot auction.
- Higher premiums appeared in evening hours.
- A registry fund made grants to five large registry organisations that together issue or track 4,000 TWh of certificates in more than 70 countries; one has met its technical milestones.
- Google says its use of a smaller amount of marketplace certificates alongside long-term agreements helped lower its market-based Scope 2 emissions by 3% from 2024 to 2025 while electricity load rose 37%.

Limitations and open questions

- This is a buyer’s account of a market it participates in and funds.
- A growth rate without a starting volume says little about market size.
- The 3% figure comes from certificates and long-term agreements together; the post does not isolate the certificate effect.
- Accounting rules are still developing: the post says the Greenhouse Gas Protocol is evaluating hourly reporting, and a new Science Based Targets initiative standard will require hourly matching reporting for large energy users. Sources were read on 26 November 2026. Products, rules and standards change, so check the linked originals before you rely on any detail.

How a technology organisation can start

1. Collect hourly electricity use for each site and, where available, from cloud and colocation providers.
2. Match it with contracted clean supply hour by hour to find the gap.
3. Move flexible workloads to better hours or regions where latency and data rules allow.
4. Ask your registry and supplier whether hourly certificates are available in your market.
5. Confirm with reporting advisers how any purchase may be claimed before making statements.

What it means for infrastructure and sustainability teams

Hourly data turns a yearly procurement exercise into an engineering input. Scheduling batch and training jobs by hour and location only works if you measure power per workload. See carbon as a service level objective for one way to set targets.

Frequently asked questions

- **What are granular certificates?** Clean energy certificates stamped with the hour and location of generation.

- **How do they differ from annual certificates?** Annual or monthly certificates do not show whether supply matched demand in each hour.
- **Are they available everywhere?** No. Registry capability is still being built.
- **Do they reduce reported emissions?** Treatment depends on the reporting standard; check before claiming.

Related reading

- Carbon as an SLO
- Green software and carbon intensity
- IEA outlook on data centre electricity
- Cloud Architecture Practitioner certification

> Related credential: Cloud Architecture Practitioner. Explore the exam facts and syllabus.

Sources and further reading

1. Jenna Stauffer, Google. A smarter way to track and buy clean energy. 19 November 2026. blog.google/company-news/outreach-and-initiatives/sustainability/granular-certificates-clean-energy-2026

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