

EnergyTag



# Ensuring Clean Electrification with 24/7 Procurement

*Killian Daly - Executive Director*

*3th November*

# NGO Enabling 24/7 Granularity, Globally

1

## Standards

### *Set Granular Certificate Standard*

✓ Published **world's only granular emissions tracking standard**

✓ **Supported by** 100+ organisations including UN Energy

2

## Markets

### *Coordinate & Drive Better Markets*

✓ **14 Pilots** with 1 TWh tracked.

✓ **Optimal PPA and tracking design**

3

## Policy

### *Advocate For Better Corporate Policy*

✓ EU - RED III / H2

✓ US - Clean H2

✓ Global - GHG Protocol

# Global Stakeholders



## Consumers



We connect a global granular tracking ecosystem



## 24/7 Tracking



## Suppliers/Markets



500+ Organisations

5 Continents

\$4+ trillion Market Cap

## Governments & NGO

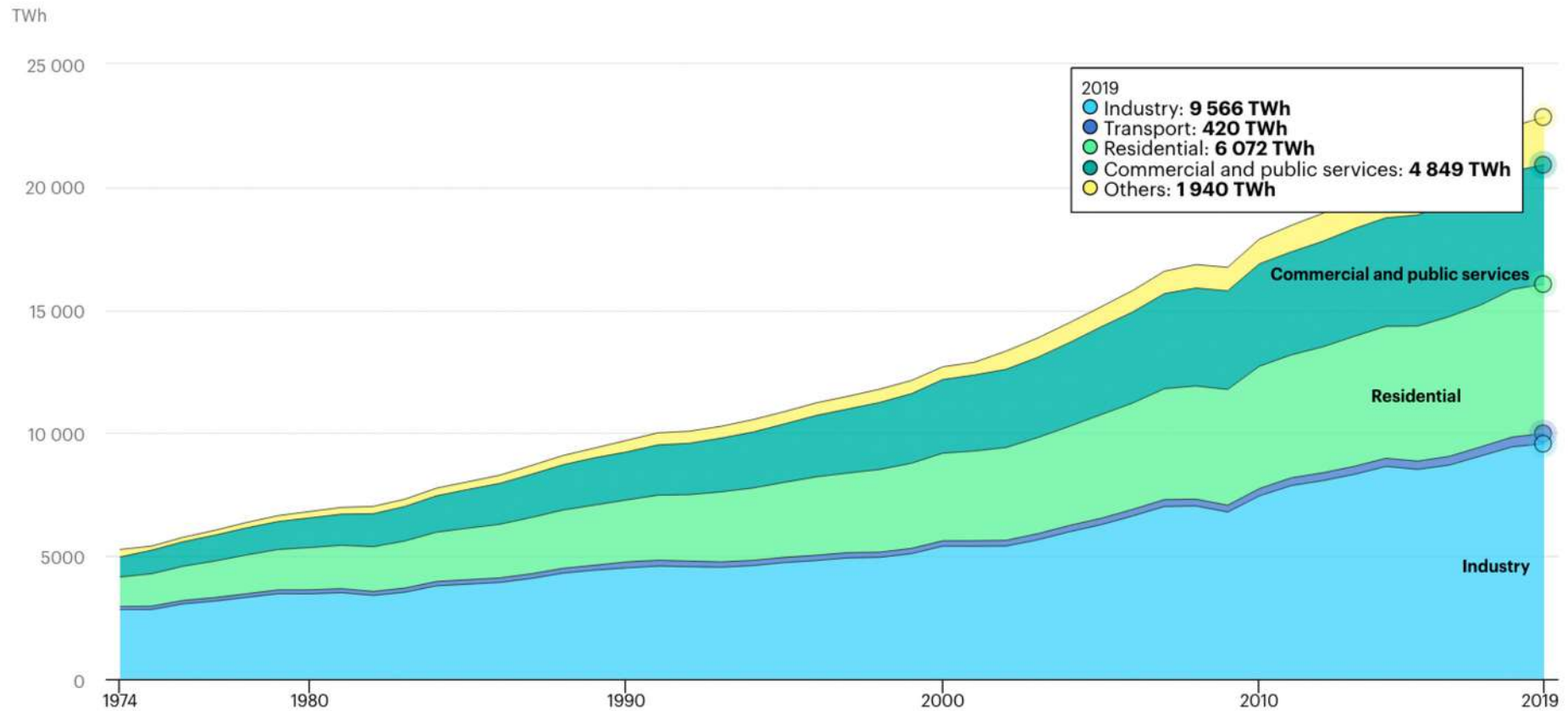


A landscape photograph featuring a hill with several wind turbines silhouetted against a sunset sky. The sky transitions from a deep blue on the left to a bright orange on the right. The foreground shows a body of water and some vegetation. The text "The Framework" is overlaid in a large, white, sans-serif font across the center of the image.

# The Framework

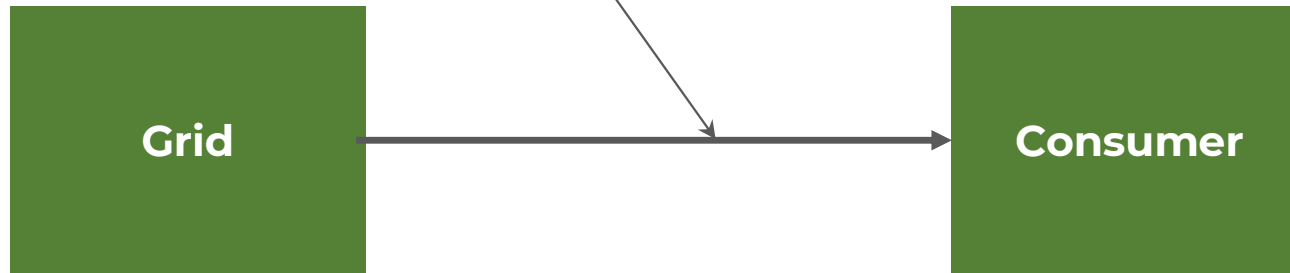


# Why focus on procurement?



Source: [IEA - World electricity final consumption by sector, 1974-2019](#)

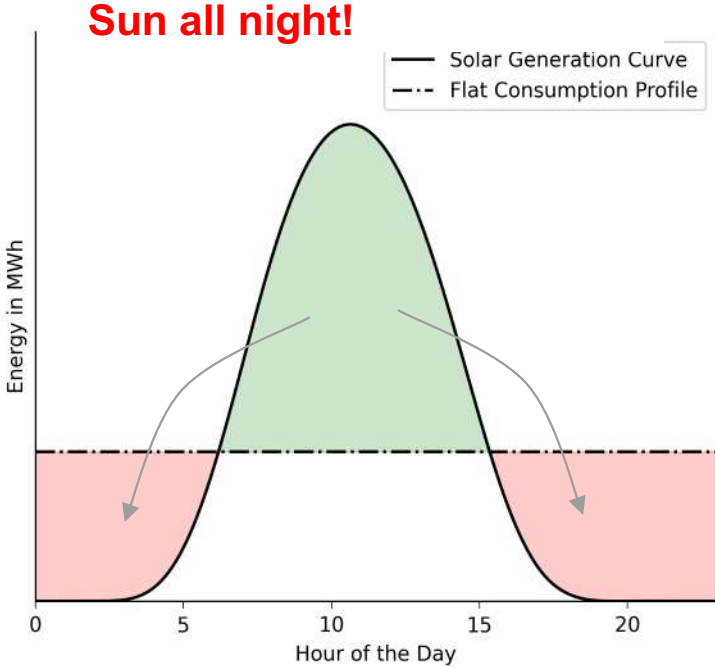
# What is truly clean procurement?



# Problem: Today's Coarse Answer Doesn't Cut it

**Temporal Mismatch** between Consumption and Generation

**Locational Mismatch** between Generation and Consumption



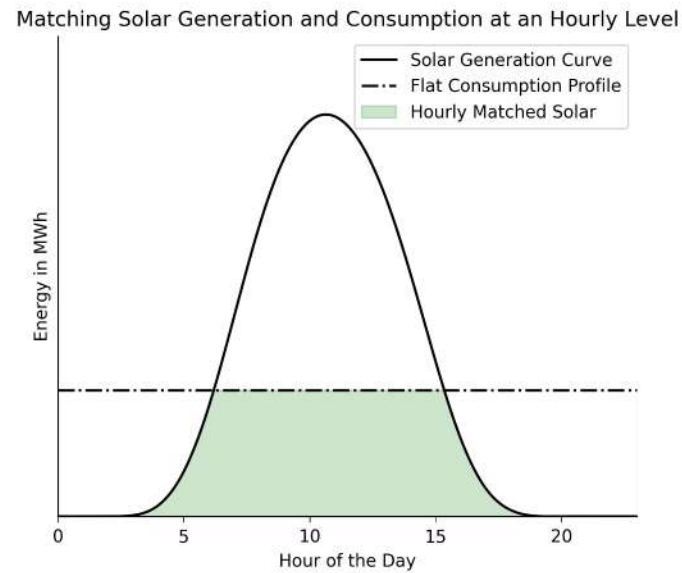
**Uncongested Grids!**



# Solution: Granular Matching to Reflect Reality



**Hourly Matching** of Generation and Consumption with Granular Certificates

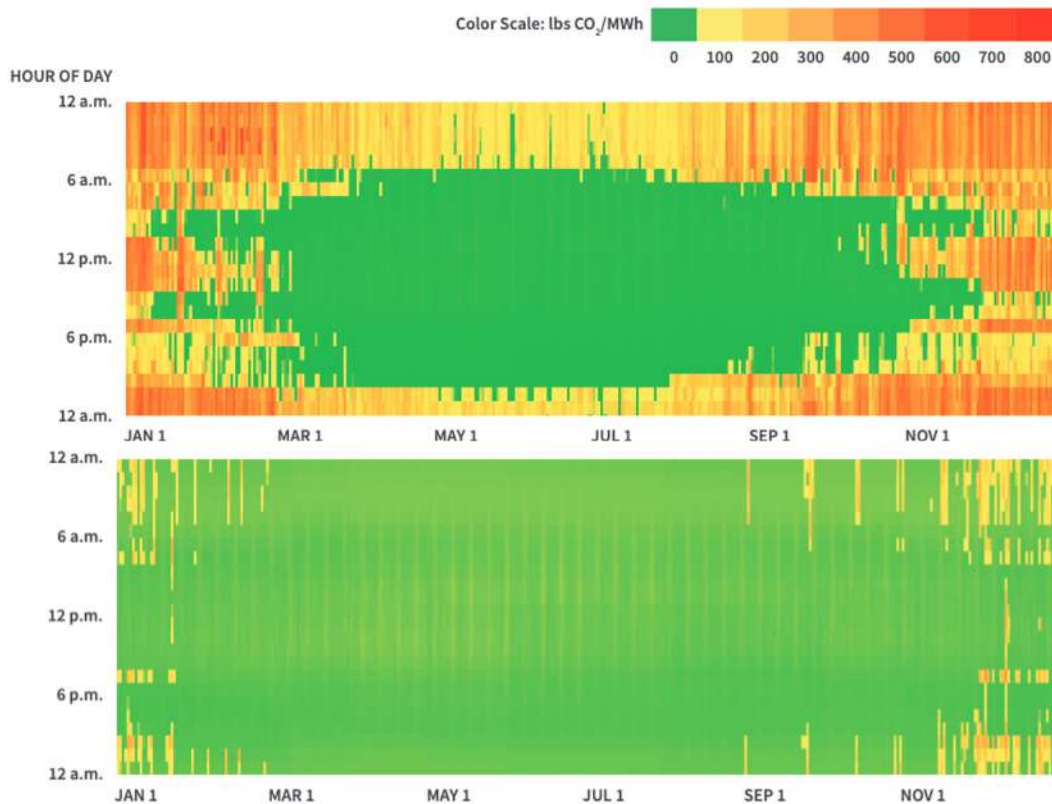


**Local Matching** of Generation and Consumption for Deliverability





# Granular Emissions Tracking Is More Precise



## Coarse

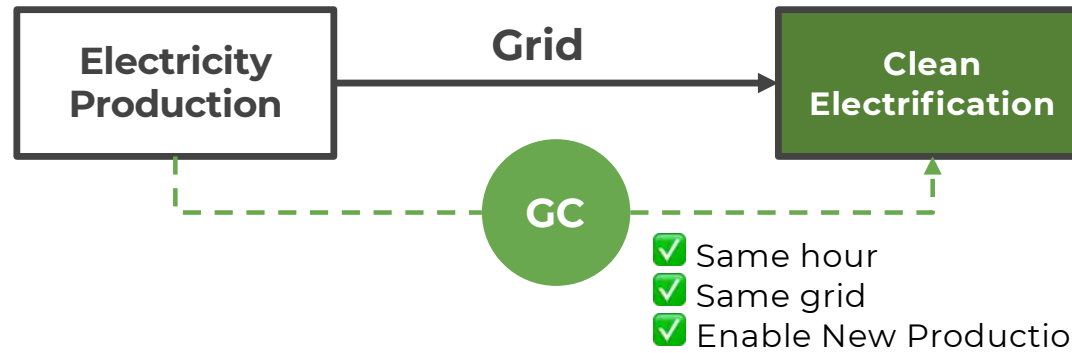
- **100% Annual** matching leaves **gaps** in the portfolio.
- **Zero-emissions is not True Zero**

## Granular

- **99% hourly** fill the gaps with a signal for **storage / clean-firm.**
- **Zero means zero**

[Source : Peninsula Clean Energy](#)

# 3 Pillars of Clean Electrification



**ANY!**  
 CBAM, Steel, H<sub>2</sub>,  
 Data Center etc..

	Coarse		Granular
Temporal	<b>Annual</b> (⚠ Forget Flexibility)	→	<b>Hourly</b> ✓ Incentivise
Deliverable	<b>Continental</b> (⚠ Ignore Grids)	→	<b>Same grid</b> ✓ Focus on Congestion
Age	<b>All Assets</b> (⚠ Old Assets)	→	<b>New power</b> ✓ New/repowered



# The Benefits

# System Operators Want & Enable More Granularity



ENTSO-E Position Paper

## Views on a Future-Proof Market Design for Guarantees of Origin

July 2022

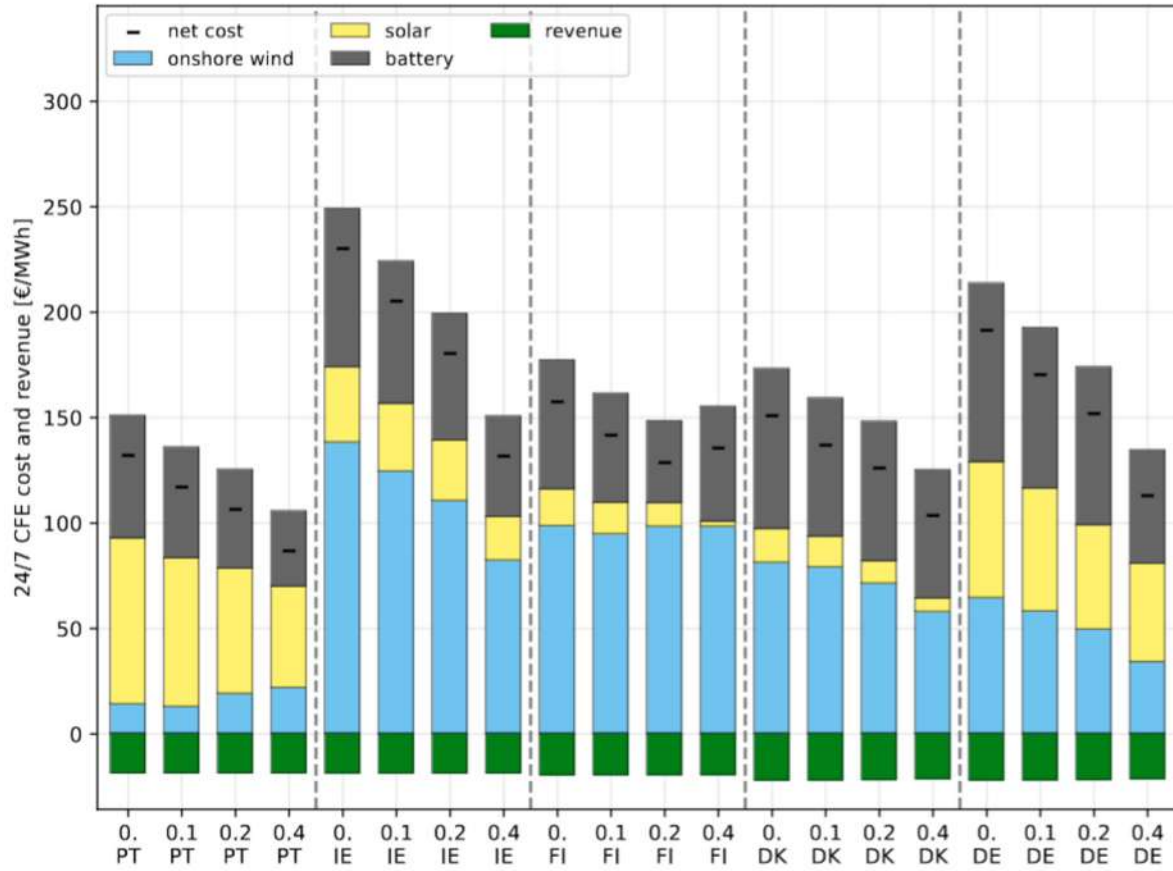
1. “The introduction of **temporal matching**”.
2. “The **consideration of the available capacity** between countries.”



ENTRANCE

*“Alliander’s own score for how well it matches the two is **59%... may seem disappointingly low**. But we already know that it is **not yet possible to match consumption with 100% green energy 24/7**. The only way organisations can make **real progress** with decarbonising their energy supply **is to acknowledge their true position.**”*

# 24/7 CFE Goals Incentivise Flexibility



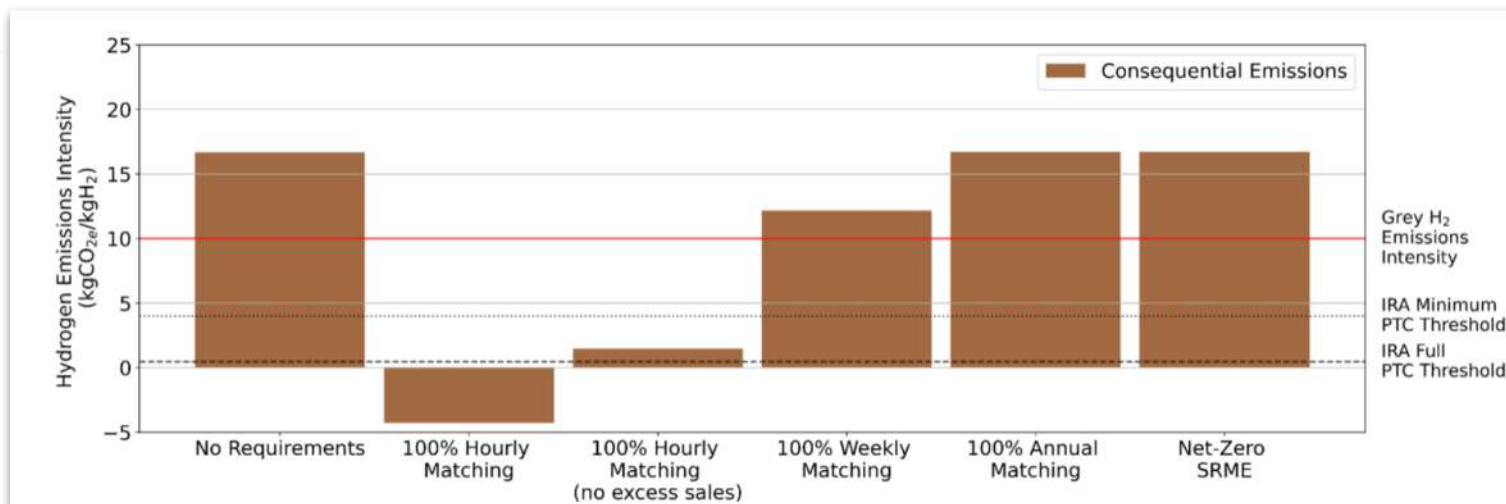
→ TU Berlin study on Data Center Load Shift in Europe

→ Flexibility makes 24/7 CFE goals more competitive.

Source : [TU Berlin](#)



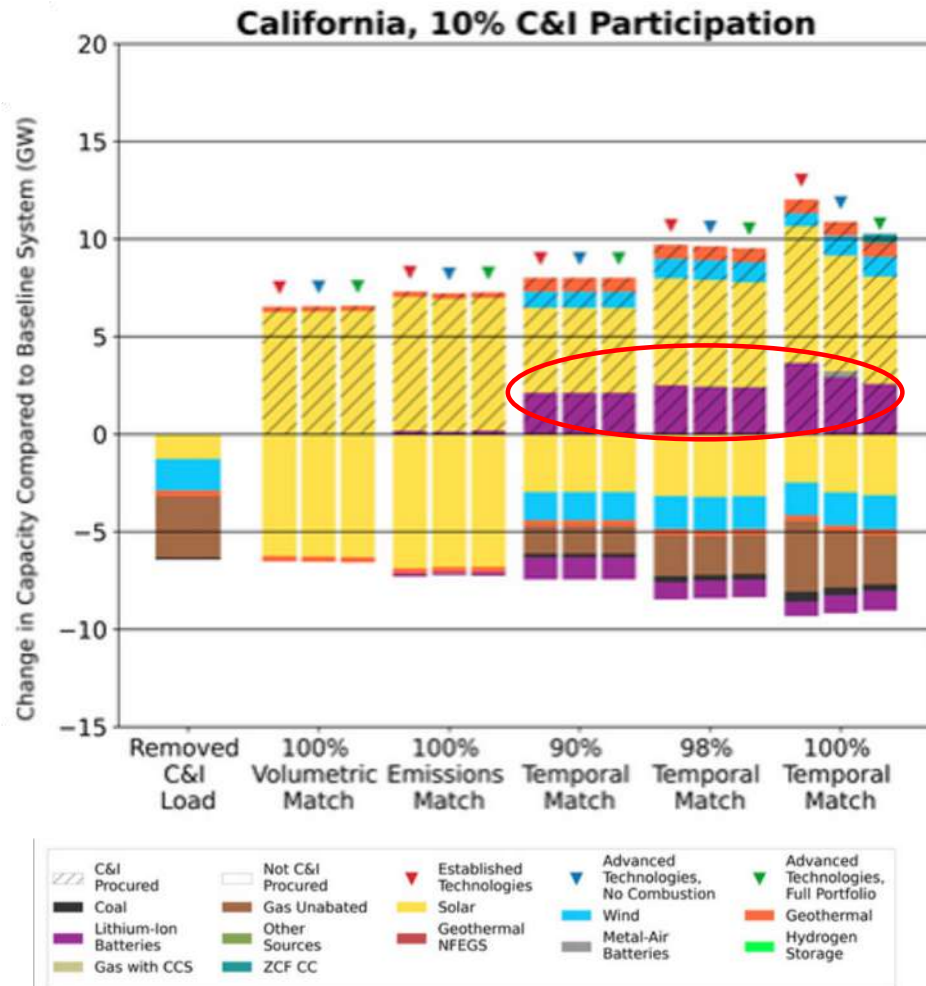
# Only Hourly Matching Delivers Clean Hydrogen



Source: Ricks et al. *Environmental Research Letters*, Volume 18, Number 1

- Clean H<sub>2</sub> debate is a “what’s clean electricity usage”?
- **Only hourly, deliverable and new supply** work for large new loads.
- Other approaches **ineffectively “offset”** emissions.
- Accounting matters! → bad rules could add **~100 million tCO<sub>2</sub>/a in U.S from “Clean” H<sub>2</sub>**.

# Granular Matching Drives More Storage



- **Annual matching** allows solar credits from sunny hours to “clean-up” the night
  - ◆ **No Storage/Flex Incentive.**
- **Hourly matching** means storage is needed when the sun is down.
  - ◆ **Strong Storage/Flex Incentive.**

Source : Princeton University

# Academic Consensus Grows



Study / Standard	Title	Institution	Geography
<a href="#">TU Berlin 24/7</a>	System-level impacts of 24/7 carbon-free electricity procurement in Europe	TU Berlin	Ireland, Denmark (zone DK1), Germany and the Netherlands
<a href="#">TU Berlin H2</a>	Hourly versus annually matched renewable supply for electrolytic hydrogen	TU Berlin	Germany, Netherlands
<a href="#">Princeton Voluntary Procurement</a>	"System-level Impacts of Voluntary Carbon-free Electricity Procurement Strategies"	Princeton University	US
<a href="#">Princeton 24/7</a>	System-level Impacts of 24/7 Carbon-free Electricity Procurement	Princeton University	California and PJM, US
<a href="#">Princeton T-EAC Trading</a>	Electricity System and Market Impacts of Time-based Attribute Trading and 24/7 Carbon-free Electricity Procurement	Princeton University	Western Interconnect US
<a href="#">Princeton H<sub>2</sub></a>	Enabling grid-based hydrogen production with low embodied emissions in the United States	Princeton University	California, US
<a href="#">IEA 24/7</a>	Advancing Decarbonisation Through Clean Electricity Procurement	International Energy Agency	India and Indonesia
<a href="#">Florence School</a>	Green hydrogen: - how grey can it be?	Florence School of Regulation	Germany
<a href="#">MIT - Clean Hydrogen</a>	How modeling additionality drives the emissions impact of time-matching requirements	MIT	United States

[Source: 24/7 in Action \(EnergyTag\)](#)

A landscape photograph featuring a hill with several wind turbines silhouetted against a sunset sky. The sky transitions from a deep blue on the left to a bright orange on the right. The foreground shows a body of water and some vegetation. The text "The Rules" is overlaid in a large, white, sans-serif font across the center of the image.

# The Rules



# Granular Matching Becoming Law

Law	Institution	Government Doc	Doc Citation	Status
EU 24/7 Hydrogen Standard	European Commission	<a href="#">Adopted Delegated Act</a>	Article 4.2.(c) "The renewable liquid and gaseous transport fuel of non-biological origin is produced: (i) during the same one hour period as the renewable electricity produced under the renewables power purchase agreement."	Adopted ▾
US Government 24/7 Target	US Government	<a href="#">Presidential Executive Order 14057</a>	Sec 203 "match use on an hourly basis to achieve 50 percent 24/7 carbon pollution-free electricity"	Adopted ▾
UK 24/7 Hydrogen Standard	UK Department for Transport	<a href="#">RTFO Guidance for Renewable Fuels of Non-Biological Origin</a>	Para 2.19 "temporal correlation between electricity generation and electricity consumption must be demonstrated. This can be demonstrated over a settlement period of up to 30 minutes"	Adopted ▾
UK 24/7 Low Carbon Hydrogen Standard	UK Department for Business, Energy & Industrial Strategy	<a href="#">Low-carbon hydrogen standard</a>	Sec 7.1.3 "Real time tracking of generation and consumption (temporal correlation) is required across all 30-minute consignments."	Adopted ▾
VertVolt 24/7 Green Label	ADEME (French Agency for Ecological Transition)	<a href="#">French Government VertVolt Standard</a>	Criteria 4.4 (Translated) "Half-hourly rate of coverage of customer supply consumption by the production of contracted facilities."	Adopted ▾
Irish Climate Action Plan (24/7 for Large Energy Users)	Irish Government	<a href="#">2023 Climate Action Plan</a>	Pg 134 "More granular certification processes will be required, including 'time stamped' guarantees of origin, so that energy intensive users can demonstrate that they are using zero emissions electricity during the same hour and geographical location to match all of their consumption on a 24-hours a day, seven days a week basis."	Adopted ▾
German Ammonia Import Tender, 24/7 (900 m€)	German Government	<a href="#">Government Tender</a>	<a href="#">English Summary</a>	Adopted ▾

- Regulators use Granular Accounting to **ensure fossil free green products** and claims
- **100 TWhs of granular matching** are already embedded in law.
- A **template is emerging** for ensuring "clean electrification" in policy.
- US/India Clean Hydrogen Next Battles



# Granular Certificates Emerge In Regulation & Standards



- In September 2023, REDIII introduced Granular GOs in EU Law and encouraged their rollout.

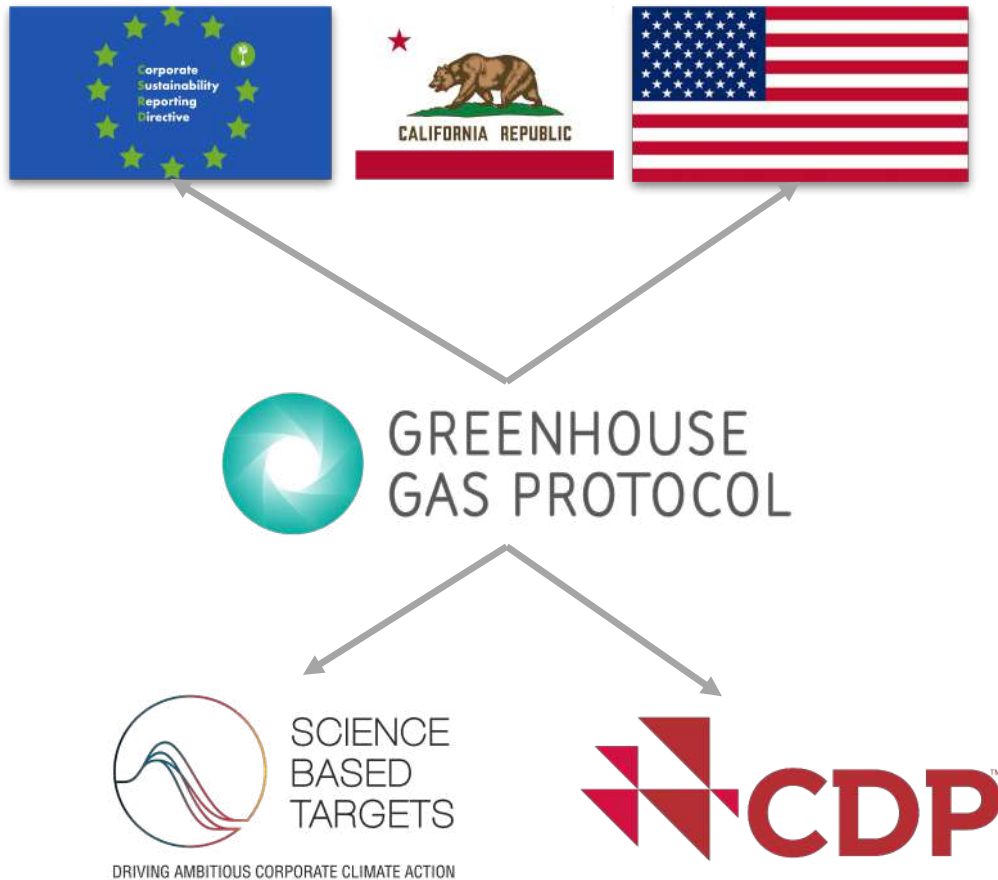


- Granular Certificates now available from two of the largest registries M-RETS and PJM, others are planning rollout.



- Taiwan Already Requires 15-minute matching
- Australia announces plans to introduce time-stamping.
- I-REC rolling out GCs across its 50 country Network.

# GHG Protocol Is Changing The Rules of Game



- **90% of Fortune 500 Companies** use GHG Protocol.
  - >1000 SBTi targets based on it.
  - Governments are mandating.
- **Loopholes in Scope 2** hobble transparency and NetZero goals.
- **Unless we fix the GHG Protocol,** Mandatory and Voluntary reporting will be weak.

# Ireland's Granular Approach, a new model?



An hourly-matched PPA needed:

*“The **new renewable** energy generation shall relate to energy that is not being generated at the date of grant of this permission. e) The amount of electricity generated by the new renewable energy projects shall be equal to or greater than the electricity requirements of the data centres in operation at **any given time.**”*

[Source: Fingal County Council](#)

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## Amazon gets OK for three new data centers in Dublin

Company seemingly already has grid connection permit from EirGrid



**It's Happening**

# NextGen PPAs Are Here

> 1 GW

**New!**

- Less fossil reliance
- Better clean hedging

**New!**

- Storage
- Clean-firm

Deal	Buyer	Supplier	Volume	Hourly	Region	Deliverable	Additional	Signed In	Term	Price	Techno
<a href="#">Google Virginia 24/7</a>	Google	AES	500 MW	90%	US - PJM	Same Grid	YES	2021	10 Years	Fixed	Solar PV, Wind, <b>Li-Ion Battery</b>
<a href="#">Google 24/7 Germany</a>	Google	Engie	152 MW	~80% <i>(by 2022)</i>	Germany	Same Grid	YES	2021	3 Years	Indexed	Wind, Solar
<a href="#">Google 24/7 California</a>	Google	SVCE	-	92% <i>(by 2027)</i>	US - California	Same Grid	YES	2022	10 Years	Indexed	Solar PV, Wind, <b>Storage, Geothermal</b>
<a href="#">Microsoft 24/7 Virginia</a>	Microsoft	AES	576 MW	90%	Global	Bidding Zone	Old/New Assets	2021	15 Years	-	Solar PV, Wind, <b>Storage</b>
<a href="#">Pure Statkraft PPA</a>	Mercedes-Benz	Statkraft	-	100%	Germany	Same Grid <i>(mainly)</i>		2020	-		Solar PV, Wind, Hydro
<a href="#">AES/Microsoft California</a>	Microsoft	AES	165 MW	100%	California, US			2022	20 Years		Solar PV, <b>Storage</b>

**Remember: Deals done today have a Granular Accounting score already!**



# TWh of Granular Matching Already Happening

