

Why Experts Say GHGP-Proposed Hourly Matching Is a Fictional Fix



The clean energy world is buzzing about "hourly matching" (the idea that companies should prove the megawatt-hours of clean energy that they buy matches their consumption hour-by-hour, in the same grid-region). At first glance, it looks like an improved standard for sustainability, but as the Greenhouse Gas Protocol (GHGP) weighs new rules, a chorus of leading experts is sounding the alarm that this will do more harm than good.

From academics to NGOs, the message is clear: Don't fight the physics, and don't break the markets that the Scope 2 framework has played a critical role in establishing. Here are the big takeaways from the experts.

1. The physics problem: deliverability lacks scientific rigor

The most common critique takes us back to simple physics: You can't track an individual electron from a specific wind farm to a specific data center in modern-day grids. In a complex, meshed power grid, the idea of "matching" consumption to generation is more accounting magic than actual physical reality.

Professor Bill Hogan at Harvard stresses this concept in his recent paper, and warns that the current direction of the GHGP risks a repeat of past regulatory failures, one addressed 30 years ago:

"In short, the lesson from the experience with electricity markets is: don't fight the underlying physics. To maintain its avowed scientific integrity, the GHGP should abandon the fiction of physical matching of contracted load and generation." [1]

"Although we cannot connect individual generation and load, despite the underlying presumption of Scope 2 accounting, there is much that can be done. For example, within the framework of central economic dispatch, we can define and calculate the system marginal emission impact of small changes in generation and load." [1]

Professor Yury Dvorkin at Johns Hopkins agrees, arguing that as the grid adds more batteries and electric vehicles, these distinctions become even murkier.

"Achieving hyper-resolution (e.g., asset level) in emissions accounting is fundamentally infeasible when anchored to individual load-generation matching." [2]

2. Hourly matching adds costs and complexity, but only sometimes improves accuracy

While hourly matching aims for "accuracy," it might actually stifle the very investments needed to decarbonize the grid. By making it harder and more expensive for companies to sign long-term Power Purchase Agreements (PPAs), the new rules could backfire.

Aaron Bergman (Resources for the Future) warns that the obsession with hourly "accuracy" misses the forest for the trees.

"The focus, instead, should be on the policy decisions and intentional definitions of categories and how emissions are distributed among the accounted entities. These incentives and how they translate to emissions outcomes, along with other characteristics such as implementability and complexity, are the appropriate criteria for examining the GHGP revisions... Unlike many goods, electricity cannot be tracked from its generation to its consumption." [3]

If the GHGP's changes lead to a reduction in the use of long-term contracts, we could see less clean energy being built and higher greenhouse gas emissions." [4]

Some experts are more optimistic towards the hourly matching scenario, but warn about its applicability and costs, and acknowledge that support of these scenarios excludes additionality tests (the third pillar of 24/7). While supportive of temporal matching in some cases, **Princeton's Qingyu Xu and Jesse Jenkins** note:

"Temporal matching incurs a greater cost premium, as this strategy requires the generation of CFE even in hours when output from low-cost wind and solar is at a minimum. They also require the operation of procured generation and storage capacity in a manner that is not necessarily aligned with price incentives from the broader electricity market." [9]

"Absent a full portfolio of clean firm resources, the cost of 100% temporal matching can be significantly greater than 98% temporal matching." [9]

Similarly, **MIT's Anna Cybulsky et al.** weigh in on the implications for green hydrogen:

"...enforcing an hourly time-matching requirement in the near-term, when the risk of high emissions from annual time-matching is low, creates additional cost and implementation barriers for scaling up electrolytic H2 production." [10]

“These requirements may constitute additional barriers for practical implementation....requiring hourly time-matching in this decade may work against the policy objectives of the PTC [Production Tax Credit] to scale green H2 production.” [10]

Igor Riepin and Tom Brown at TU Berlin support hourly matching at a certain threshold, but also echo the warning against the costs and impacts on procurement in the near-term:

“24/7 CFE procurement creates an early market for advanced energy technologies the system will need later: long-duration energy storage and clean firm generators... analogous to the base scenario, hourly matching commitments facilitate a more profound decarbonisation compared to 100% annual renewable matching, provided that CFE targets surpass a particular threshold.” [8]

“However, what stands out in the plot is the rapid increase of procurement costs for high 24/7 CFE targets. For example, 98% CFE target has cost premium of 54% over 100% the annual matching policy; while the last 2% of hourly matching more than doubles the costs.” [8]

“It is noteworthy that, for an 80% CFE target, participating consumers procure less capacity than under a 100% RES policy, as they rely more on grid imports.” [8]

3. The integrity problem: hourly matching does not always translate to emissions impact

If a company matches its hours but isn't actually causing new clean energy to be built, is it really making an impact? Experts are worried that the new rules double down on "market-based" accounting that lacks real-world causality.

Professor Matthew Brander (University of Edinburgh) points out that hourly matching can lead to misleading claims if it doesn't account for how the grid actually operates.

“The current proposed revisions for market-based scope 2 accounting are inconsistent with the requirements for accurate value chain GHG inventories... Failure to address this issue will result in companies reporting false information, which undermines the integrity of corporate GHG disclosures and creates exposure to regulatory, litigation and reputational risk.” [5]

“The proposal for time and location matching is not sufficient for accurate value chain inventory claims.” [6]

“There are a number of reasons for expecting that the proposed revisions have a low likelihood of achieving impact.. [and] the proposals do not differentiate between companies that undertake impactful forms of attribute procurement... and companies that undertake actions with a lower likelihood of impact.” [6]

Experts at WattTime, TU Denmark, the University of Edinburgh, and Sweco also came together to call out the lack of additionality (the “third pillar”), a key concept in ensuring real carbon impact, in the hourly matching proposal:

“...the proposal contradicts broad academic consensus that unless time and location matching also includes additionality requirements, it is unlikely to achieve decarbonization... using studies of all three [pillars] to justify adopting only two undermines the Protocol’s stated decision-making criteria of integrity and impact” [11]

“This omission is deeply concerning, as nearly all published research on hourly matching and deliverability concludes that the effectiveness of such frameworks depends on the inclusion of additionality. Without any additionality requirements, this proposal merely increases the accounting burden on reporting entities without protecting against low-quality RECs that do not correspond to real emissions reductions—which is in direct conflict with the GHG Protocol’s stated goals for this revision.” [11]

4. The majority consensus: move to marginal impact

If hourly matching is a "fictional" pursuit, what's the alternative? Most experts suggest shifting the focus from hourly matching to marginal impact. [12]

Instead of trying to pin down where electrons came from, companies should look at how their consumption changes the total emissions on the grid (marginal emissions) and align their accounting with actual power market prices (Locational Marginal Prices).

As **Yury Dvorkin** puts it:

"Emissions accounting should align with the temporal and spatial resolution of already functioning power markets... reflecting both technical feasibility and operational transparency." [2]

In the race to net zero, we can't afford to get bogged down in perceived accuracy conundrums. It's time to listen to the experts: focus on the physics, protect the contracts, and prioritize real-world impact over perfect hourly charts.

Sources:

- [1] William Hogan, Harvard, [Scope 2: Physical Power Usage Accounting Is Fictional, Pricing And Marginal Impact Accounting Are Real](#)
- [2] Yury Dvorkin, Johns Hopkins University, [Some Considerations for Scope 2 Accounting](#)
- [3] Aaron Bergman, Resources For the Future, [Is Accuracy the Right Criterion for Updating Greenhouse Gas Accounting Standards?](#)
- [4] Aaron Bergman, Resources For the Future, [How Will Changes to the Greenhouse Gas Protocol Affect Long-Term Contracts?](#)
- [5] Matthew Brander, University of Edinburgh, [Proposed revisions for scope 2 market-based accounting are inconsistent with value chain GHG inventory accounting](#)
- [6] Matthew Brander, University of Edinburgh, [Six things wrong with the GHG Protocol's proposals for market-based scope 2 accounting](#)
- [7] Pieter Gagnon and Maxwell Brown, Colorado School of Mines, [Impacts From Procuring Clean Electricity Under Different Inventory Accounting Methods](#)
- [8] Iegor Riepin and Tom Brown, TU Berlin, [On the means, costs, and system-level impacts of 24/7 carbon-free energy procurement](#)
- [9] Qingyu Xu et. al., Princeton, [System-level impacts of voluntary carbon-free electricity procurement strategies](#)
- [10] Anna Cybulsky et. al., MIT, [Producing hydrogen from electricity:How modeling additionality drives the emissions impact of time-matching requirements](#)
- [11] Sinha Das et. al., [WattTime](#), Technical University of Denmark, University of Edinburgh, Sweco,
- [12] [GHGP Technical Working Group Meeting #16 Minutes](#),