Draft for TWG discussion

GREENHOUSE GAS PROTOCOL

Scope 2 Technical Working Group Meeting

Meeting #10

March 19, 2025

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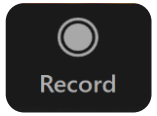

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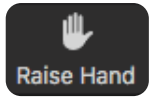
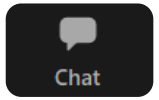


Please use the Raise Hand function to speak during the call.



You can also use the chat function in the main control.

Recording, slides, and meeting minutes will be shared after the call.

Be mindful of sharing group discussion time; keep comments as succinct as possible.

Agenda

1. **Housekeeping & goals for meeting**
2. **Location-based: EF hierarchy, certificate sales, and next steps**
3. **Market-based Issue 2b: Continuation of discussion on additional restrictions to eligible voluntary procurement**
4. **Next steps**

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Goals of today's meeting

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Goals of today's meeting

1. **Enable outcome of a single final draft of location-based revisions for review by TWG**
   a. Poll the group on which proposed emission factor hierarchy more appropriately fits the decision-making criteria
   b. Introduce proposed changes on certificate sale and net metering scenarios for consideration by TWG
   c. Share expectations on next steps for reviewing a single LB revision proposal

2. **Align on whether additional restrictions are necessary for the market-based method and for what purpose**
   a. Poll the group on whether additional restrictions for voluntary procurement better align the market-based method with the decision-making criteria

Location-based method: EF hierarchy, certificate sales, and next steps

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Recap on location-based method discussion in Meeting 7

What we covered in Meeting 7:

1. Defining necessary criteria for location-based emission factor selection
2. Using hierarchies for emission factor selection criteria or a single requirement
3. Defining location-based method emission factor hierarchies
4. Within hierarchies, requiring, recommending, or allowing the most precise data available
5. Using estimated vs. actual activity data

Key takeaways from Meeting 7:

- **93%** support a hierarchical approach to emission factor selection.
  - Strong support that emission factor hierarchy should include levels of precision for grid-average emission factors that relate to temporal resolution, spatial boundaries, and consumption versus production-based data types.
  - Different ideas for how a hierarchy should prioritize data quality and allow for regional variations.
- **67%** prefer requiring the use of the most precise available data, with some discussion about establishing thresholds to guide flexibility in limited data contexts.
- **49%** support that estimated hourly profiles *may* be used to enhance precision when actual data is unavailable, while others preferred either 'should' or 'shall' requirements.

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One new LB proposal submitted, merging revisions from 8 proposal authors

Round 2 draft proposal addressed the following:

1. Clarify definition of LB method
2. Edits to emission rate approach of scope 2
3. Purposes: Allocation
4. Purposes: Risk assessment
5. **Purposes: abatement planning**
6. Activity data: estimates vs. actual
7. Clarify transmission & distribution losses
8. Certificate sale scenarios and net metering
9. LB emission factors (EFs): should to shall
10. Matching EFs to electricity consumption
11. LB EFs: emphasize consumption and granularity
12. LB EFs: do not self calculate
13. **LB EF hierarchy option 1 and 2***
14. Matching granularity of activity and EF data
15. **Use of LB method for target setting**
16. Removal of "advanced grid studies" language
17. Treatment of biogenic emissions
18. Syncing with market-based edits
19. Report additional metrics (carbon exposure and intensity)

- **Bolded** indicates broader TWG input requested by proposal author group
- Highlight indicates topics for today's meeting, Asterisk (*) indicates polling

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Round 2 LBM Proposal took feedback from TWG & ISB to further balance integrity and impact with feasibility

- 6. **May** use of estimated hourly activity data where actual hourly data is not available
- 9. **Shall** use the most appropriate, accurate, precise, and highest quality EF available
- 10. **Shall** use the smallest (most precise) accounting interval for which BOTH activity data AND EFs exist for each facility
- 11. Clarifies the sources of "consumed" electricity, including electricity that may be imported, or stored from a previous time. Clarifies that consumed electricity must be generated in the same accounting interval (unless stored).
- 12. **Should not** self-calculate LBM EFs; **Should** use publicly-accessible data
- 13. LBM EF hierarchy option 1 and 2*
- 14. Pre-aggregating activity and EF data to match in temporal resolution

(*) To be discussed on following slides.

Item 13. Options for LB emission factor hierarchy

Overview of poll question for today:

1. Which proposed LBM emission factor hierarchy is best supported by the decision-making criteria?
    a. Option 1: Prioritize consumption-based data before spatial and temporal granularity
    b. Option 2: Prioritize spatial and temporal granularity before data type
    c. Further work needed

Summary of GHG Protocol decision-making criteria and hierarchy:

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Item 13, Option 1: Prioritize consumption-based *before* spatial and temporal granularity

- **Hierarchy Order:** Consumption → Spatial → Temporal
- Prioritizes less granular consumption-based factors over more granular production-based factors (e.g., annual consumption-based BA factors over hourly production-based BA factors)
- **Justification for prioritizing data type:**
  - Importance of C > P depends on how much of supply mix is served by imports and storage discharge
  - Importance of tracking stored emissions also depends on temporal granularity (only important for hourly accounting interval)
  - See supplementary slides for additional detail.

Type	Spatial Boundaries	Temporal Granularity	Example
Consumed / consumption-based	Local (e.g., Nodal, city, county, BA zone/subregion)	Hourly or subhourly	MISO (U.S.) consumed emission rates
		Monthly	
		Annual	
	Grid balancing area / control area / ISO region / LFC area (can sometimes align with national or subnational boundaries)	Hourly or subhourly	EIA Hourly Electric Grid Monitor (U.S.) Electricity Maps (international) Open Grid Emissions Initiative (U.S.)
		Monthly	
		Annual	
	Synchronous Grid / Grid Interconnection	Hourly or Subhourly	
		Monthly	
		Annual	
Produced / production-based	Grid balancing area / control area / ISO region / LFC area (can sometimes align with national or subnational boundaries)	Hourly	
		Monthly	
		Annual	eGRID (U.S.) BA total output emission rates
	Synchronous Grid / Grid Interconnection (if smaller than national boundary)	Hourly	
		Monthly	
		Annual	
	National	Hourly	
		Monthly	
		Annual	IEA Emission Factors eGRID (U.S.) total output emission rates

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Item 13, Option 2: Prioritize spatial and temporal granularity *before* data type

- **Hierarchy Order:** Spatial → Temporal → Consumption/production
- Prioritizes more temporally granular data over consumption-based data (e.g., hourly production-based over monthly consumption-based)
- **Justification for prioritizing spatial granularity**
  - Transmission congestion and power flows affect where generated electricity is delivered.
    - E.g., New York City, which has local dirty generation and limited transmission capacity relative to load. NYC consumed emissions are much dirtier than the NYISO average.
  - Importance depends on spatial distribution of generators and transmission congestion between generation and load
  - High spatial granularity is only appropriate for consumption-based factors.
  - See supplementary slides for additional detail.
- **Justification for prioritizing temporal granularity:**
  - Annual accounting has been shown to decrease the accuracy of LBM inventories (research) across different use types
  - Monthly accounting is slightly better than annual
  - Importance depends on how much supply changes seasonally or daily, such as from large amounts of variable renewables
  - See supplementary slides for additional detail.
- NOTE: includes allowance for national IEA factors if no better data available.

Spatial Boundaries	Temporal Granularity	Type	Example
Local (e.g., Nodal, city, county, BA zone/subregion)	Hourly or subhourly	Consumed	MISO (U.S.) consumed emission rates
	Monthly	Consumed	
	Annual	Consumed	
Grid balancing area / control area / ISO region / LFC area (can sometimes align with national or subnational boundaries)	Hourly or subhourly	Consumed	EIA Hourly Electric Grid Monitor (U.S.) Electricity Maps (international) Open Grid Emissions Initiative (U.S.)
		Produced	Open Grid Emissions Initiative (U.S.)
	Monthly	Consumed	Electricity Maps (international) Open Grid Emissions Initiative (U.S.)
		Produced	Open Grid Emissions Initiative (U.S.)
	Annual	Consumed	Electricity Maps (international) Open Grid Emissions Initiative (U.S.)
		Produced	eGRID (U.S.) BA total output emission rates
Synchronous Grid / Grid Interconnection	Hourly or Subhourly	Consumed	
		Produced	
	Monthly	Consumed	
		Produced	
	Annual	Consumed	
		Produced	
National (if larger than synchronous grid)	Hourly	Produced	
	Monthly	Produced	
	Annual	Produced	IEA Emission Factors eGRID (U.S.) total output emission rates

Item 8: Clarification of certificate sale and net metering scenarios in the LBM

Proposed changes:

- Previous language required accounting for all on-site generation where EAC was not retained be included as null power in scope 2 LBM
- Change suggests EAC retention is not relevant to LBM accounting
- Proposes rules for both LBM and MBM accounting when there is on-site generation, depending on whether it is net metered or metered separately
- Clarifies that on-site fossil-based generation emissions appear in scope 1
- Clarifies that reporters do not receive "credit" (negative activity data) for exporting power to the grid

Justification:

- Certificate sales are a pure MBM construct and should have no bearing on LBM accounting, which is physics-based
- Aligns guidance with hourly accounting – power exported to grid in one accounting interval cannot be used to reduce activity data in another interval

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Next steps for location-based method revisions

- Using results from today's poll and discussion, proposal author group is asked to make remaining edits and submit a final draft to Secretariat by Monday, March 31st.
- Secretariat will make final draft available to TWG members for review and comments. Members are encouraged to work with the proposal author group and/or use the template for revisions previously provided to members to present alternative options.
- TWG review period for final draft of LBM recommendations will extend through May 2nd.
- Secretariat will consolidate TWG feedback as needed to determine the need for additional discussion and polling on LBM topics.
- Note the below LBM issues will be considered in combination with forthcoming TWG discussions on the MBM:
  - Estimated vs. actual activity data
  - Dual reporting, goal setting and tracking, and additional metrics
  - Refinement of purposes, uses, and claims; clarifications on reporting impacts

Issue 2b: Market-based method additional restrictions on voluntary procurement

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Recap on Meeting 9 outcomes of Issue 2a: Treatment of standard supply service

- Treatments for "standard delivery" or "standard supply service" (SSS) were proposed by revision author groups in first draft submissions on January 31st. Some, but not all, proposals also included additional restrictions for eligible claims to voluntary procurement.

- TWG Meeting 9 on March 5th covered polling on Issue 2a (Treatment of SSS and order of operations), and initial discussion of Issue 2b (are additional restrictions for voluntary procurement necessary).

- **Summary of Issue 2a polling outcomes:**
  - **SSS Eligibility**: 86% of TWG respondents agreed that reporters should have the right to claim a pro rata share of SSS CFE deliverable to their facilities, provided it meets Scope 2 Quality Criteria.
  - **Unclaimed SSS**: 100% agreement that unclaimed pro rata shares should not be eligible for voluntary claims by other entities.
  - **Voluntary Procurement Requirements**: 85% indicated that voluntary procurement should only be required for the unmet portion of load after SSS allocation (e.g., if 20% is covered by SSS, only the remaining 80% needs voluntary procurement).

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Recap on Meeting 9 discussion of Issue 2b: Additional restrictions on voluntary procurement

Today's discussion on Issue 2b is a continuation from Meeting 9, with the intent of polling at the end of the discussion to determine whether further evaluation is needed.

Summary of Meeting 9 discussion on Issue 2b: Members provided clarifications for their proposed approaches, reflecting a range of views on whether further restrictions on voluntary procurement are necessary:

I. **Eligible supply restrictions: Incrementality criteria, bundled procurements and/or grid-based limits**, were proposed as necessary for the MB method to sufficiently influence electricity suppliers and the generation resource mix across the grid.

II. **Causality tests**, were proposed as necessary to ensure the accuracy of the value chain inventory claim.

III. **Temporal matching, deliverability, & SSS** alone were proposed as consistent with inventory accounting methodology. It was further noted that combining deliverability and temporal requirements with SSS allocation would support accurate and impactful outcomes.

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Types of additional restrictions on voluntary procurement posed by TWG members in revision submissions

Options included one or a combination of the following:

- **Incrementality criteria** – Voluntary procurements can only be counted if they meet criteria that indicates the procurement contributes to incremental CFE generation (e.g., facility age, original off taker, subsidy limits).
- **Grid-Based Limit** – Voluntary claims cannot exceed the share of clean energy on the grid at a given time.
- **Bundled procurements** – Voluntary procurements can only be counted if a reporter procures contractual instruments associated (e.g., "bundled") with generation in combination with electricity.
- **Causality tests** – Voluntary procurements can only be counted if they meet criteria that indicates proof of causality (e.g., regulatory, financial, and timing-based tests, positive lists).
- **Temporal and spatial granularity + SSS allocation only** – Voluntary claims are required to meet temporal matching, deliverability, and other Quality Criteria, without further tests or restrictions.

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What is the purpose of additional restrictions on voluntary procurement?

Summary of GHG Protocol decision-making criteria and hierarchy:

1. Integrity
Science and principles

- Does adding additional restrictions on voluntary procurements improve the market-based method's *alignment with GHG Accounting and Reporting principles*? (i.e., accuracy, transparency, relevance, consistency, completeness)
- Are adding additional restrictions *supported by evidence/science* to achieve accuracy and/or impact?

2. Impact
Support ambitious global climate action and programs

- Are adding additional restrictions on voluntary procurements necessary for informing company strategies *to drive clean energy investments that influence electricity suppliers, and the generation resource mix across the grid*?
- Would additional restrictions on voluntary procurements *improve alignment with GHG programs and disclosure frameworks based on GHG Protocol standards*?

3. Feasibility
to implement

- Can adding additional restrictions on voluntary procurements *be implemented equally by all reporting entities*?
- Is it necessary to apply additional restrictions to all regions globally *to achieve accuracy and/or impact*?

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Eligible supply restrictions: Incrementality criteria, bundled procurements, and/or grid-based limits

TWG Member shared…

Rationale in favor:

- Spatial and temporal restrictions, with standard supply service, are not sufficient drivers of the scarcity required in the market to influence the generation resources on the grid.
- Especially true in markets with significant existing eligible CFE
- Incrementality criteria (restricting supply to "new" projects), requiring bundled procurements, and/or limiting voluntary claims to the share of CFE on the grid at any time, can sufficiently restrict supply of eligible carbon-free energy, which, in turn, would incentivize impactful procurements.

Potential drawbacks:

- May not represent inventory accounting, more a "performance accounting" metric.
- May be overly restrictive in some markets with limited existing CFE

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Causality tests

TWG Member shared…

Rationale in favor:

- A causal relationship between a reporting organization and a specific claimed emission rate is necessary to ensure the accuracy of a value chain inventory.
- For many claims today, there is not a "meaningful financial relationship" between reporting organizations and projects.
- Some forms of procurement, like unbundled energy attribute certificates, can be especially lacking in causal relationships.

Potential drawbacks:

- May be difficult to implement and verify in all markets, or for all types of renewable energy procurement.
- Introduces elements of consequential accounting into an attributional inventory.

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Temporal matching, deliverability, and standard supply service allocation alone

TWG Member shared…

Rationale in favor:

- Consistent with inventory accounting principles and methodology
- A combination of allocating SSS, temporal matching, and defining deliverability regions will build a scarce voluntary market where demand signals would put pressure and price signals on EACs, thereby yielding more clean generation
- A financial relationship is already implied in the MBM.
- Further restrictions of supply could negatively impact market liquidity, cause early retirements of existing resources, or prevent other technologies from taking hold.
- No additional feasibility burden.

Potential drawbacks:

- May not sufficiently restrict supply in some markets for voluntary procurement to achieve decarbonization impact on the grid.
- Without causality tests, may not achieve sufficient accuracy of the value chain inventory claim.

TWG feedback on additional restrictions mapped to Decision Making Criteria

	Supply restrictions	Causality test	Temporal+Deliverable+SSS
Integrity	• Approach may better align grid emissions outcomes with claimed emissions in inventories. • May not be a true emissions inventory.	• Causal relationship necessary for accurate value chain claims. • Requiring causality tests in an attributional inventory may depart from existing accounting approach.	• Consistent with principles of inventory emissions accounting.
Impact	• Generates further scarcity of supply in a way that drives an increased share of CFE on the grid.	• Generates scarcity of supply in a way that increases the share of CFE on the grid.	• Spatial and temporal restrictions alone may be enough to generate scarcity of eligible CFE. • Allocation of SSS may have significant influence on impact
Feasibility	• Standardized definitions and applications may support feasibility. • May overly restrict CFE in some locations, making difficult to implement.	• Standardized definitions and applications may support feasibility. • Potentially difficult to implement and audit in all locations. • May overly restrict CFE in some locations, making difficult to implement	• Most feasible option in relation to other options being considered.

Poll questions for today: Additional restrictions on voluntary procurement

2. Should the Scope 2 standard require voluntary procurement to meet causality tests in the MBM?

a) Yes
b) No
c) Need more information (please describe in chat)

3. Should voluntary procurement of clean energy be required to meet additional criteria that restricts eligible supply of CFE? (*see question 4 for what critera*)

a) Yes, voluntary procurement of clean energy in all markets by all reporters must be required to meet additional criteria that restricts eligible supply of CFE.
b) Mixed, in general voluntary procurement of clean energy must be required to meet criteria that restricts eligible supply of CFE, however exemptions may exist for some reporters and/or markets.
c) No, voluntary procurement of clean energy shall not be required to meet additional criteria that restricts eligible supply of CFE.
d) Need more information (please describe in chat)

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Poll questions for today: Additional restrictions on voluntary procurement (cont.)

4. If additional criteria that restricts eligible supply should be applied to voluntary procurements, which of the following should be further considered by the TWG (select all that apply):

a) **Incrementality criteria** – Voluntary procurements can only be counted under the market-based method if they meet criteria that indicates the procurement contributes to incremental CFE generation (e.g., facility age, original off taker, subsidy limits).

b) **Grid-Based Limit** – Voluntary claims cannot exceed the share of existing clean energy on the grid at a given time.

c) **Bundled procurements** – Voluntary procurements can only be counted under the market-based method if a reporter procures contractual instruments associated with generation in combination with electricity (bundled).

d) **None of the above** – Voluntary claims are only required to meet temporal matching, deliverability, and other Quality Criteria, without restrictions that limit eligible supply.

e) **Need more information** (please describe in chat)

Next steps

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Next steps

- **Next meeting: April 2nd**, 9:00 EDT/15:00 CEST/ 21:00 CST
  - Topics to be discussed:
    - Issue 3: Estimated vs. actual activity data
    - Issue 4: Treatment of residual mix
- **Final location-based revision proposal**: Requested by proposal author group **by March 31st**
  - TWG review period for final draft of location-based recommendation will extend through May 2nd.
- **Next iteration of market-based revisions**: Updates or new revisions are requested **by April 4th**
- **Secretariat to share additional detail on possible in-person meeting**

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Thank you!

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Supplementary slides

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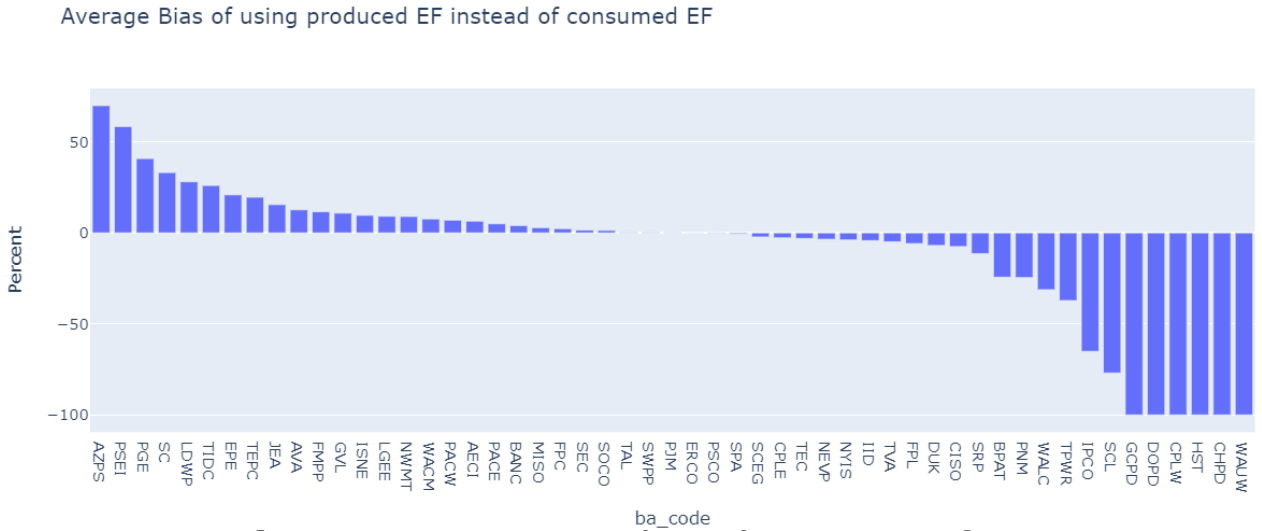
Justification for consumption over production

Importance of C > P depends on how much of supply mix is served by imports and storage discharge

Importance of tracking stored emissions also depends on temporal granularity (only important for hourly accounting interval)



Example: Consumption and Production EFs for U.S. Balancing areas in 2023, from Open Grid Emissions dataset.
+ numbers mean production EF over-allocates emissions,
- mean production EF under-allocates emissions.
BAs on left import cleaner electricity than they generate, BAs on right import dirtier energy than they generate.
In middle, we tend to see larger BAs, and ERCOT (which is its own interconnect, so little interchange)

Justification for higher spatial granularity

Transmission congestion and power flows affect where generated electricity is delivered.

A classic example is NYC, which has a lot of local dirty generation and limited transmission capacity relative to load. NYC consumed emissions are much dirtier than the NYISO average.

Importance depends on spatial distribution of generators and transmission congestion between generation and load

High spatial granularity is only appropriate for consumption-based factors.

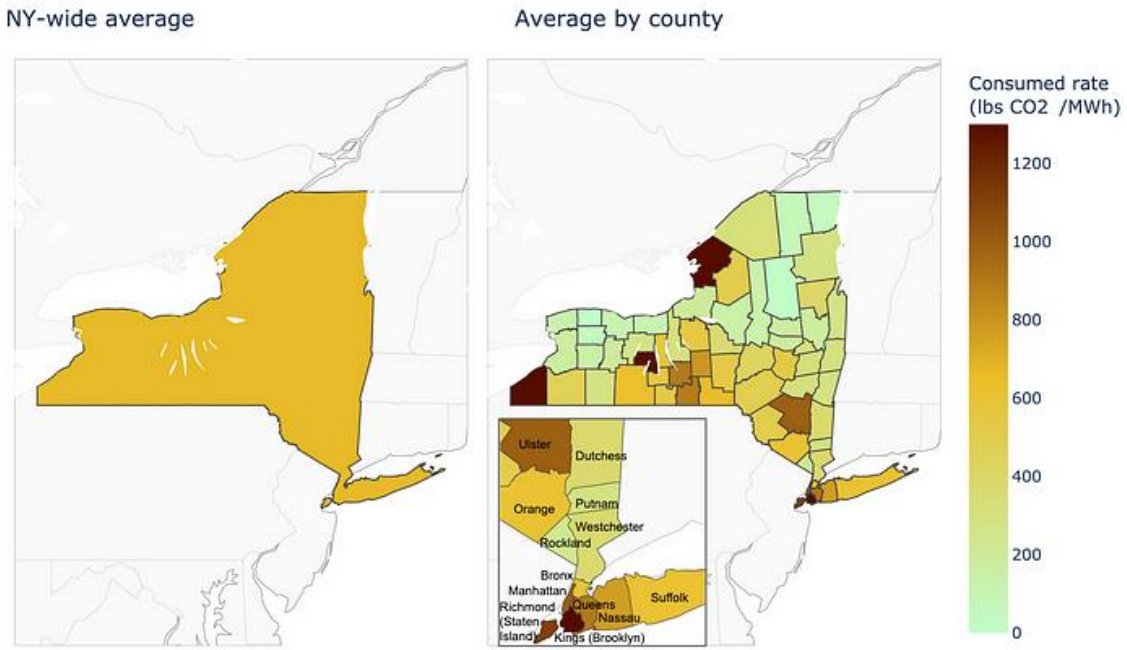


Figure 1: Consumed emission rates across New York averaged over model year 2020. The left panel shows the statewide average; the right panel shows county averages with an inset for New York City. Significant variation in annual average emission rates by location is hidden by the statewide perspective.

Source

Justification for higher temporal granularity

Annual accounting has been shown to decrease the accuracy of LB inventories (research) across different use types

Monthly accounting is slightly better than annual

Importance depends on how much supply changes seasonally or daily, such as from large amounts of variable renewables