Greenhouse Gas Accounting in Regional Electricity Markets

Regional Issues Forum
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Sydney Welter, Energy Markets Policy Analyst

Vijay Satyal Ph.D., Regional Energy Markets Manager

Context and Relevance of GHG Accounting

- **WRA perspective:** Decarbonization is essential. Resource mix is changing. Grid economics warrants change – regional coordination (for energy needs) is timely.

- **WRA & Western PIOs (last 5-8 years):** Great strides - state clean energy policies and/or mandates. Respect state compliance criteria for GHGs; REC policies etc.

- **Current knowledge gap:**

  - *What are the pathways for a "future" regional market construct in West that can explicitly account for GHG across various states?*

  - *Which approach would be pragmatic and yet robust? What are the best practices to accomplish this?*

  - *What is the current level of GHG emissions across the Western Interconnection and potential future reductions due to a regionally coordinated wholesale market?*

Need for GHG Accounting

Overall Recognition of Challenges:

- Lack of consistency in "accounting" for GHG emissions that are associated with energy transfers across the West (CARB, 2021)
- Co-mingling (unintentional) of RECs for GHG measurement in some western states' RPS laws.
- Need for understanding how GHG accounting can take place that is NOT competing with western states' state-specific goals / needs… BUT, still allow for/facilitate regional dispatch of power in market constructs.
- **Our proposal: Create a framework – platform and protocols – to account for GHG emissions at a regional level:**
  - Tracking – piece together/unearth/run down/trace
  - Accounting – calculating/auditing/book-keeping
- WRA looks to partnering in 2022 to work through semantics and focus toward a common goal →

Western PIOs Interest in Regional Market Expansion

Reliability & Efficiency

Enable a reliable and efficient west-wide wholesale market (RTO)

- Facilitates “automation” and “situational awareness” of a larger footprint
- Enables efficient and cost-effective dispatch
- Exposes “physical and economic” inefficiencies - transmission path flows & and generators dispatch
- Breaks down the pancaked transmission system which sustains opaqueness and monopolistic control by T. Owners / T. Providers

Decarbonization

Support a carbon-free electricity system

- Ensures market design enables decarbonization of electricity sector
- Triggers further economy wide decarbonization
- System that can explicitly quantify GHG reductions*

Fairness & Transparency

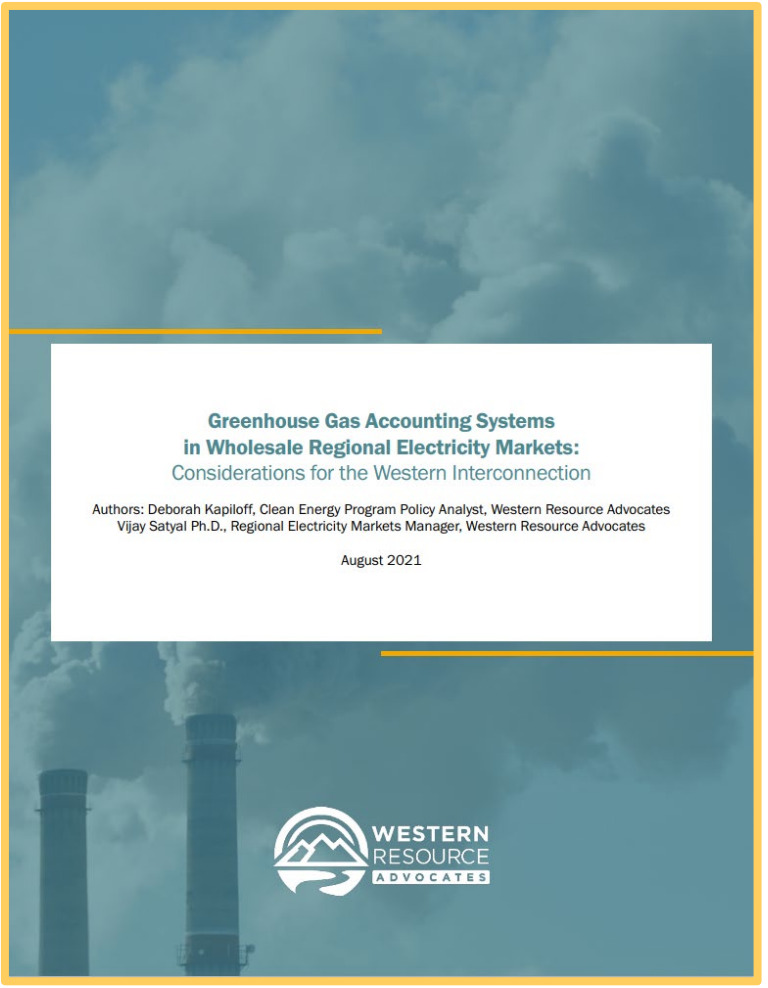
Create a governance structure with: fairness; transparency, and ease of entry/exit

- Fairness and transparency in - market design of the rules; process for governing body members and decision making; and entry/exit rules for participation
- Market based system that incentivizes lower-cost resources and enables states’ clean energy goals to be reflected

GHG Accounting & Wholesale Energy Markets 2021

Purpose: To develop an attribute-based GHG accounting framework that meets Western states' needs and facilitates ***robust***, ***practical***, and ***transparent*** accounting through a ***singular*** system.

WRA 2021 Deliverables: Updated whitepaper w/ FAQ, three factsheets, issue brief and matrix, initial design team session.



Problem Statement

*Develop a GHG accounting system in the West that provides a **framework and data** for state policy compliance while supporting market transactions and potential market expansion.*

Desired realities of the end-state:

- States with GHG emissions reductions policies necessitate the **tracking and accounting of the GHG emissions** associated with electricity dispatched and delivered via markets
- This accounting process must also **not interfere with a least-cost multi-utility resource dispatch**
- Accounting for GHG should capture **attributes** associated with the power transacted or contracted

Key questions:

1. How can a system **track GHG attributes regionally** without interfering with regional market expansion and functionality, but also give states the detailed emissions profiles they need to meet their GHG reductions and policy goals?

2. How can this occur **throughout markets and transactions** that with a footprint in multiple states?

Consumption-Based Accounting

Measuring ***delivered Renewable Energy***, and ***Direct Emissions consumed***, delivered, sold to, or serving a specific electric load or retail consumer(s).

Potential confusion: Sometimes consumption-based accounting is used as an umbrella term, other times it is used interchangeably with flow-based or load-based accounting.

GHG terms defined!

Real-time matching/flow-based

Using real-time data about resource generation and dispatch to attempt to identify which resources are serving load and using this to attribute RECs, emissions, etc.

Resource-based

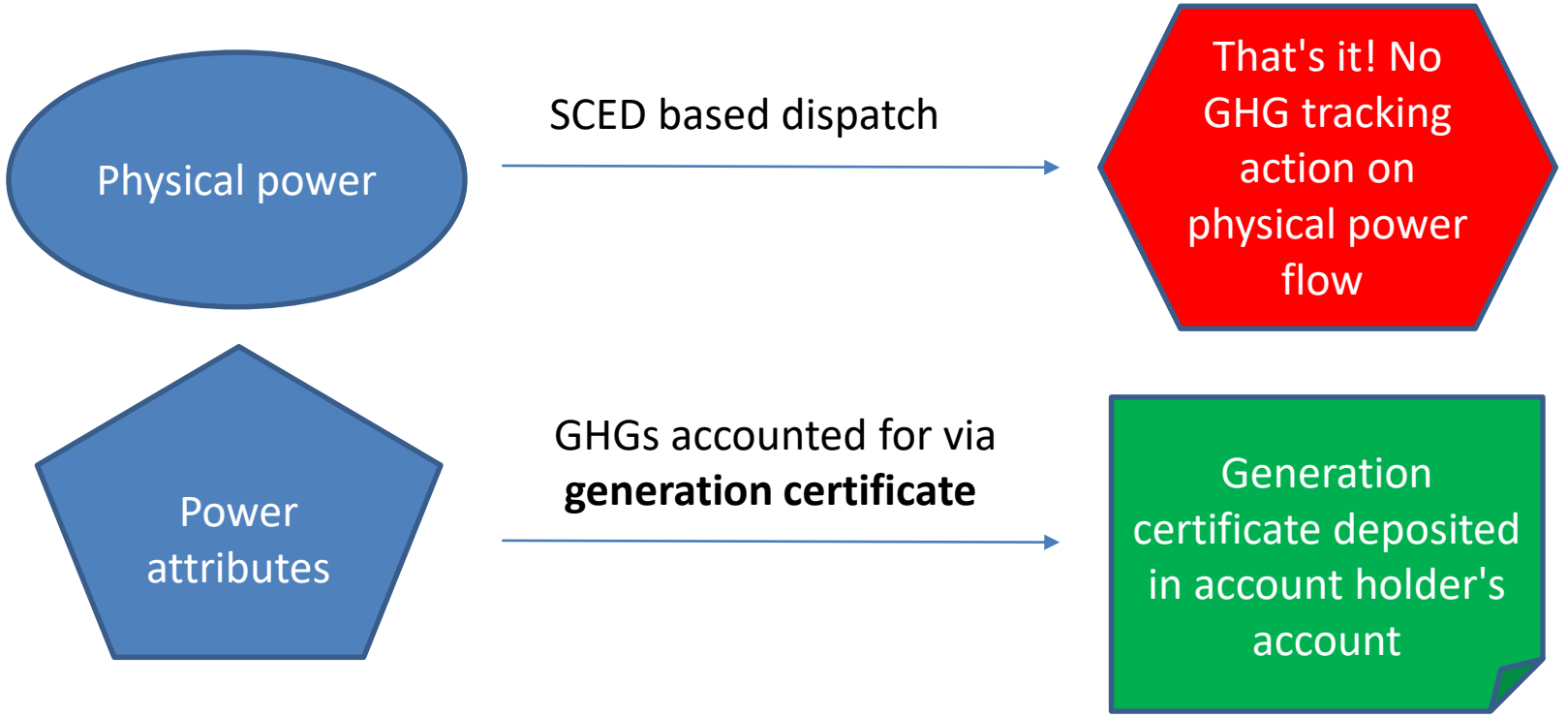
Tracking attributes with certificates (usually generation certificates) and assigning them to load

Load-based

Tracking generation attributes, such as RECs and GHG emissions, which are not physically delivered on the grid but are **consumed, delivered, or sold to a specific load.**

Attribute-Based Accounting

- Separates the physical power and the attributes of the power
- Focused on contractual delivery and transaction history instead of physical delivery
- No reconciliation/matching with physical load necessary
- Option to include eligibility criteria for attribute-based accounting
- Syncs with future regionally coordinated and predictable energy transfers in West



Generation Certificates In Practice

All - Generation certificates are used by RTOs to track generation attributes, including environmental attributes.

For imports, this field will show a certificate's original registry.

Type of generation signified here, as well as whether or not the generation is renewable and there is an associated REC. Possibility to include emissions rate here or elsewhere.

Generator ID links to a specific generator, which has an available emissions rate even if the information is not explicitly included on a generation certificate.

Generation certificates are unique for each MWh of generation and are searchable in a central database by characteristics listed on the generation certificate.

Identifier	Display Order	Data Type	Length	Range of Codes	Comments
Originating Registry	1	Alpha-numeric	3	NYG, GIS, PJM, and NAR	Used to identify originating registry
Unit type	2	Alpha-numeric	4	REC = Renewable Energy Certificate issued for a Generating Unit CERT = Non-Renewable Certificate issued for a Generating Unit	Used to identify if the generation is Renewable or Non Renewable
Generator ID	3	Numeric	6	1-999999	Unique ID assigned to each Project record in NYGATS
State	4	Alpha-numeric	2	Location of Generating Unit pulled from Static Data (i.e. NY)	State abbreviation identifying the State in which the generation occurred.
Vintage Month	5	Numeric	2	01-12	The month in which the generation occurred.
Vintage Year	6	Numeric	4	00-99	The year in which the generation occurred.
Batch Number	7	Numeric	5	Numeric value assigned to each batch of credits created 1 – 99,999 unique per originating generator or project per vintage.	
Serial Block Start	8	Numeric	9	Numeric values assigned by registry from 1 - 999,999,999.	A number to identify the first Certificate in a block of Certificates.

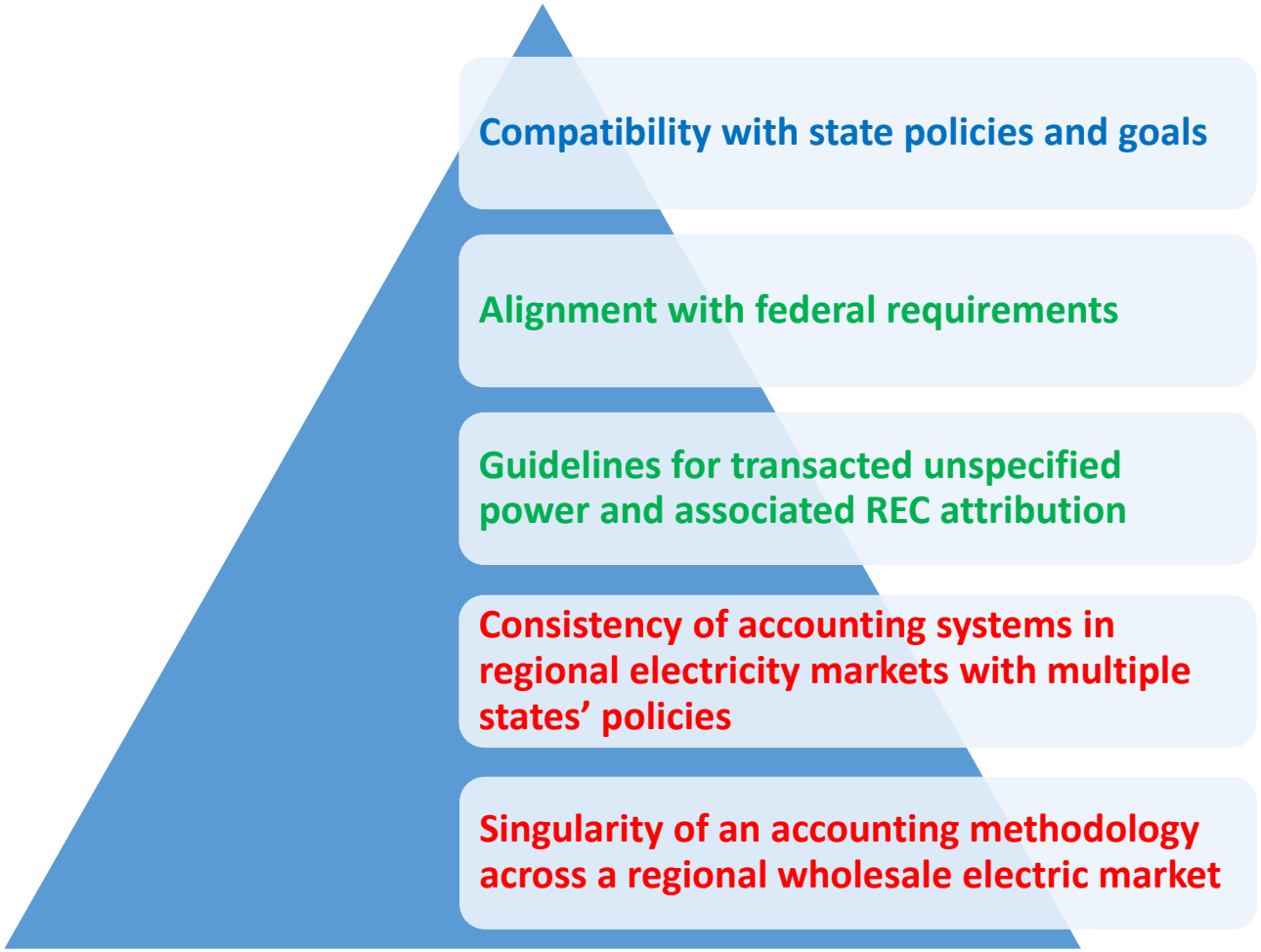
Source: NYGATS Operating Rules

Best Practices for GHG Accounting

Alignment with state-based carbon pricing requirements	Proportional assignment of system mix resources with potential for attribute purchases and border adjustments if needed
"One-stop" GHG collection and verification system design	Regular verification of GHG system data - transparent and centralized
Information flow and real-time tracking	Use of appropriate tools specific to market-construct to aid in GHG tracking, preferably dynamic data flows
Emissions rates for unspecified power	Use of best available data to assign accurate environmental attributions to unspecified power

Robust, practical, and transparent GHG accounting system

Recommended Best Practices



- ❑ Adequate information for participating entities to comply with their state's policies.
- ❑ Compliance with mandatory reporting requirements for applicable federal programs.
- ❑ Guidelines for unspecified power to avoid misleading environmental attributes.
- ❑ Setting up a system for markets which is compatible or interoperable with state policies or mandates.
- ❑ Use one accounting methodology across a market, avoids double counting, market fragmentation and info getting "lost in translation." **CARB presentation*

Recommendations for the Western Interconnection: Market Constructs

Status Quo

1. Focus on transactions through energy imbalance markets
2. Potentially create a resource tracking system for EIM purchases
    a. Generation certificates inputted for EIM resources into a system administered by EIM market operator and assigned to purchasers' accounts.
    b. Require RECs for renewable attributes

Energy Imbalance and Day-Ahead Market

1. Same/similar EIM GHG accounting as in status quo
2. Institute parallel or integrated tracking system with certificates for day-ahead market
3. Require RECs for renewable attributes

West-wide RTO Construct

1. Opportunity to start from a blue-sky framework: Create GHG accounting procedures that are: transparent; flexible to states' needs and robust in design
2. Centralized data management/tracking
3. Utility and environmental regulators coordination

Moving forward with GHG accounting

- **Present efforts:**
  - WRA outreach to regional market allies (WCEA); RE trade alliances and other supporting RE customer groups; Utilities; Western States Commissions; WIEB Staff; CNEE

- **Future efforts:** Create a **policy-outreach strategy** and a **platform** for GHG accounting across the West
  - Q1-Q2 2022: Facilitate outreach with environmental regulators and planners on state requirements
  - Refine best practices to **ensure double-counting and leakage is addressed** in compliance w/ state laws
  - Develop in partnership with LSEs / multi-state utilities, **dispatch scenarios** to test this framework

- **Eventual (and hopeful) goal:**
  - Ensure a western solution for an RTO shows **PIOs are thinking ahead** – *resource guide & outreach*
  - Thinking about GHG accounting "after" a market is agreed upon – *not a good framework for the West*
  - Develop an **outreach strategy that includes sustained awareness** of a western GHG accounting framework that can **be compatible with a western RTO**

2022 GHG Accounting Platform Operational Goals

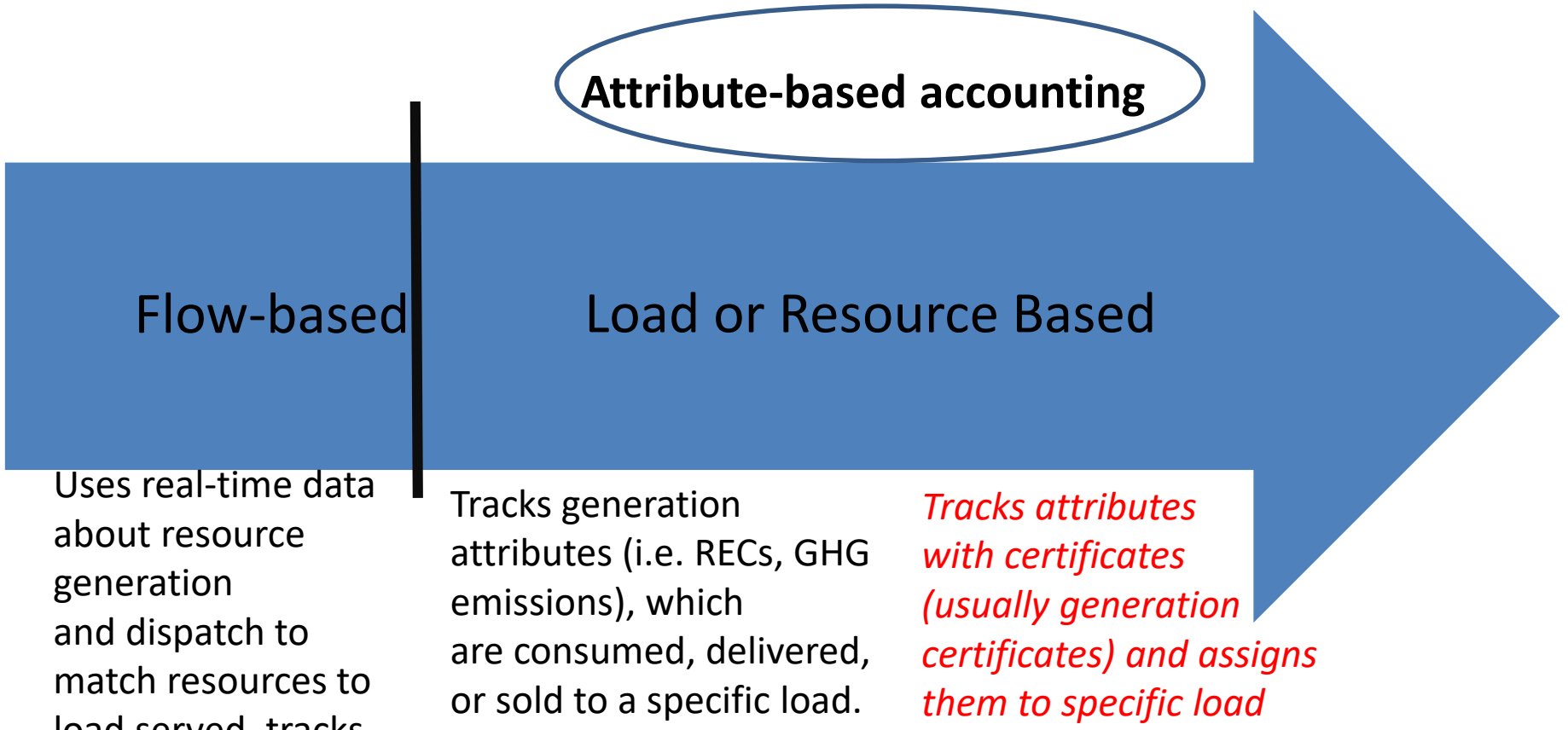
1) Complete listening tour to understand needs and capabilities of Western states for GHG accounting
2) Evaluate existing platforms for GHG accounting
3) Identify metrics to support best practices
4) Influence and leverage regional markets initiatives with this concept

WESTERN RESOURCE ADVOCATES

westernghg-accountingcomments@westernresources.org

Vijay Satyal, Regional Energy Markets Manager
Sydney Welter, Energy Markets Policy Analyst

A partial spectrum of (existing) GHG accounting approaches



Eastern Regional Markets: Summary

	ISO-NE	NY-ISO	PJM
RGGI membership	Yes, all states	Yes	Some states, not all
Data management system	Administered by APX - tracks all electricity generated in footprint	Administered by APX - real-time fuel mix data for all electricity generated in footprint	Administered by PJM Environmental Information Service -tracks all generation in footprint
Import GHG policy	Assigns system mix GHG rate by importing area	Assigns GHG rate based on latest eGRID data for source's Power Control Area	Assigns GHG rate based on latest eGRID data for source's Power Control Area
Undifferentiated system power	GHG rate based on eGRID data	GHG rate based on residual rate from real-time fuel mix	GHG rate based on eGRID data
Transactions supported within the data management system	REC registry, lumping	Fuel-mix information, REC registry	REC registry

Value proposition for attribute-based accounting

Attribute-based accounting offers:

- **Practical** accounting that **does not track physical power flows** and **captures regional transactions**
- **Flexibility** in compliance with state requirements
- **Consistency** regardless of transaction and/or resource type
- **Transparency** in accounting
- A **credible and functional** framework for ensuring that greenhouse gases and renewable resources (as represented by RECs) are accurately accounted for

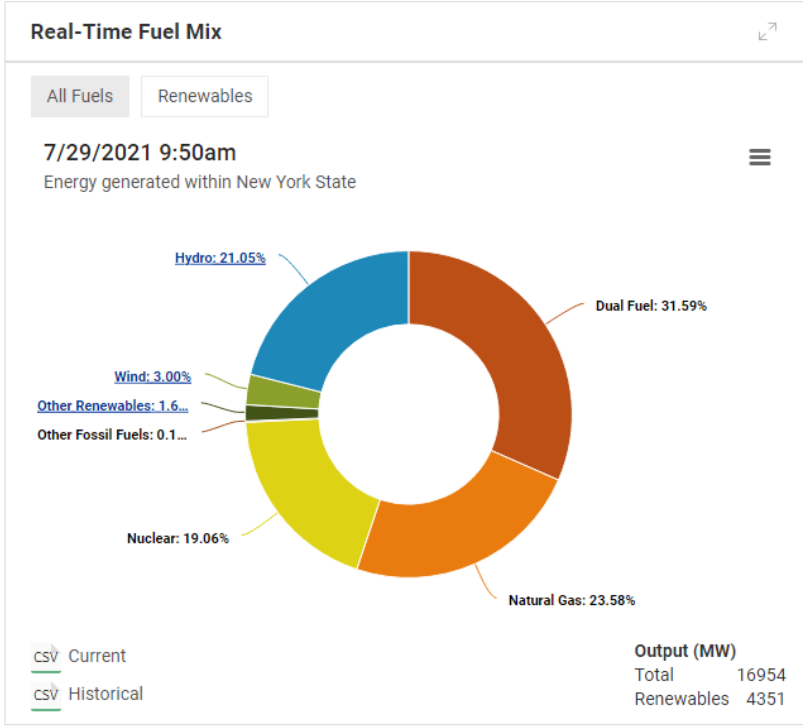
Generation Certificates cont.

Other existing and possible data fields on generation certificates:

- State RPS/CES eligibility
- Fuel source
- Generation emissions rate
- Associated REC ID information
- Default emissions rate based on fuel source (when specific generator data is unavailable)

What about null power/system mix power?

- System mix certificates with residual thermal rate for the whole market
- Can be dynamic or static data



Source: NYISO Real-time dashboard