



ANALYSIS GROUP

Achieving Western States Greenhouse Gas (GHG) Reduction Objectives:

**Least-Cost Compliance in a Constantly Evolving Policy
Environment**

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I. Executive Summary

This paper focuses on details of designing effective and least-cost compliance mechanisms within the electricity sector, and identifying the complications and trade-offs that can emerge in designing these mechanisms given the physical nature of electricity as an energy source and the structure of interstate electricity markets.

Many states are embarking on aggressive state policies aimed at reducing GHG emissions. Policies aimed at reducing GHG emissions from the electricity sector have been particularly aggressive, with many states implementing measures aimed at largely or fully reducing GHG emissions from the sector over medium-term horizons (e.g., by 2040). While many different policy approaches can be used to achieve deep decarbonization, at present most states are pursuing reductions through renewable portfolio standards (RPS), clean energy standards (CES), or some variant thereof.

This paper also looks at key aspects of Washington’s Clean Energy Transformation Act (CETA), how it interacts with wholesale electricity trading in the West, and how it is likely to interact with other Western states’ policies to promote growth in the reliance on non-emitting resources.

The complications that can emerge in designing regulatory compliance are illustrated by considering Washington State’s efforts to decarbonize within the broader structure of a complex Western electricity market. A close examination of the recently passed CETA identifies challenges in implementing regulations to achieve the legislation’s targets and developing a framework for demonstrating compliance. The interaction of Western states’ non-emitting resource policies with wholesale electricity trading is complex, given the rich set of existing bilateral arrangements, the patchwork of independent balancing authority areas, California’s cap-and-trade program, the expansion of the Western Energy Imbalance Market (EIM), and the potential implementation of a Western Extended Day-Ahead Market (EDAM), all of which significantly impact resource dispatch and energy transactions.

A key consideration for compliance strategies is the relationship to centralized markets. The rapid expansion of the Western EIM has demonstrated how centralized markets offer the opportunity to lower the cost of integrating renewable resources by centralizing the least-cost resource dispatch and automating market clearing price reporting to more efficiently utilize available resources and transmission, thereby increasing the use of supply from zero-cost resources and reducing curtailment.

Greater penetration of renewable resources leads to the displacement of supply from fossil fuel resources and lower electricity sector GHG emissions, thus achieving clean energy policy goals. An EDAM has the potential to further improve the market’s ability to efficiently schedule resources and integrate both existing resources (including a large network of hydroelectric facilities) and new renewable resources. Ensuring that state policies and regulations are harmonized with the short-term hour-to-hour centralized energy markets and the longer-term bilateral electricity markets that underpin resource planning over a large portion of the West is important to cost-effectively achieving clean energy policy goals for consumers.

As states increase reliance on non-emitting resources, and adopt new and evolving policy approaches that may vary significantly, frameworks for measuring compliance have important consequences for environmental and economic outcomes. States have alternatives in developing these frameworks that address the complexity

of electricity systems and markets in different ways. The framework chosen by the state will impact the effectiveness of the policies (see **Table ES 1**).

Some compliance proposals recommend methods seeking to match the “flow” of electricity generated with consumer consumption at very granular time intervals; this paper explores several limitations to that approach:

1. **Market efficiency relies on “system” transactions.** As many common types of electricity transactions involve electricity supplies from a “system” rather than a specific source, requirements that all electricity used flow from particular sources would impair market functioning, reduce operational efficiency, and limit the market’s ability to efficiently integrate non-emitting resources;
2. **Electricity flows are not tracked from resource to load.** In the normal course of business, electricity system operators do not “track” electricity flows from specific sources – within or outside the operator’s balancing area – to specific utilities and their consumers; and
3. **After-the-fact estimates of flows are impractical.** Ex post efforts to assign individual resource flows to retail loads would be impractical due to computational complexity, and inconsistent with flows defined by contractual relationships.

Thus, while it may seem straightforward in some respects to align generation resource production with actual consumer consumption, electricity flow tracking is impractical, likely to be very costly, and unnecessary to ensure climate policy objectives are achieved.

By comparison, a resource-based compliance proposal avoids these problems and can achieve policy environmental objectives, support well-functioning electricity markets and the integration of non-emitting resources, facilitate cost-effective achievement of climate policy objectives, and provide an administratively efficient and effective system for achieving compliance.

Rather than tracking all individual electricity flows, this approach first accounts for electricity at the generation resource and then load-serving entities comply by assigning these resources to their compliance obligations subject to administrative rules. The design of these rules can reflect policymakers’ environmental and economic goals. The Western states should consider working toward establishing a framework that allows for consistent accounting across the region, similar to compliance frameworks in the mid-Atlantic and Northeastern regions of the US.

Determining the framework for compliance is but one of the many important decisions that need to be made to develop an effective compliance system. Many important decisions will remain, including: determining the criteria for resource types eligible to comply with non-emitting resource requirements, including geographic criteria reflective of resource deliverability; determining how compliance requirements will account for the timing of when the electricity is generated; developing regulatory accounting systems for both resources producing electricity and load-serving entities’ (LSEs’) compliance with requirements; rules related to accounting for production outside the state’s jurisdiction (e.g., double-counting, leakage); the relationship between compliance requirements and integrated resources plans; and unique issues raised by multistate

utilities and balancing authorities. These details will have important consequences for both the environmental benefits created by new climate policies, as well as their economic consequences.

Table ES 1: Options for Compliance with State Decarbonization Policies

Category	Resource-Based	Flow-Based
Accurate Measurement	Actual production Deliverability based on predetermined locations (approximation) Timing granularity flexible	Actual and scheduled production Deliverability determined for each flow (contract paths, approximate and actual) Timing constrained (e.g., within the hour)
Administrative Feasibility	Low/moderate complexity, high transparency – standardized systems of WECC-wide accounts would improve reliability	High complexity, low transparency
Cost-Effectiveness	Supports any type of out-of-state resources Temporal flexibility can lower costs Supports market structures with ability to integrate renewables	May limit supply from certain out-of-state resources Lack of temporal flexibility may raise costs May constrain market ability to integrate renewables
Transactions and Administrative Costs	Low/moderate – standardized systems of WECC-wide accounts may lower costs, after initial development	High – flow-based accounting (e.g., resource hourly scheduling and E-Tag tracking) more complex; currently no system capturing all flows; developing proxies for system flows would be time-consuming and subject to error
Support Well-Functioning Markets	Yes. Accommodates all transactions and market structures.	No. May not accommodate system supply and centralized markets.
Out-of-State Activities	Can accommodate provisions aimed at accounting for out-of-state activities	Can accommodate provisions aimed at accounting for out-of-state activities

State clean energy compliance methods that align with and support the broad use of electricity markets will be critical to provide utilities and policymakers confidence that electric sector decarbonization policies are being implemented at least cost to consumers.

The Western states cooperatively developed an extensive electric transmission network that reduced consumer costs and allowed sharing of resources over hundreds and thousands of miles. As studies have shown, fully utilizing the potential for the region’s grid to balance variable renewable supplies will be important to help meet Western states’ climate policy objectives. It is critical to ensure that the pathway to zero emissions from the electricity sector preserves and reinforces the benefits available from this expansive and unique electricity network. Highly efficient wholesale electricity markets are a key component for ensuring that this network is fully utilized, thus reducing consumer costs while achieving environmental objectives.