

Executive Summary: The Western EIM's Approach To Applying California's Cap and Trade Program To Imports Is Undermining The Program's Core Objectives

The Western EIM claims to satisfy the rules and objectives of California's Cap and Trade Program by identifying the specific external resources dispatched to serve load in California, and incorporating the GHG emissions of those external resources into its dispatch, pricing, and settlements. But a deeper examination of the actual design of the Western EIM's GHG framework, and an analysis of the actual outcomes in the Western EIM, leads to a very different conclusion. Namely, the Western EIM's market design leads it to dispatch additional electricity from relatively low-cost external coal and natural gas resources, providing electricity imports into California, while incorrectly treating those imports as being sourced from clean hydro resources.

Previous inquiries into the accuracy of the Western EIM's GHG "deeming" framework led the CAISO to acknowledge the potential for "secondary dispatch," whereby an external clean resource is notionally dispatched to serve California load, but that production is simultaneously "backfilled" by an external GHG-emitting resource (that notionally serves load in the clean resource's jurisdiction). CARB has recognized that this secondary dispatch results in a GHG leakage problem, with CARB retiring additional GHG allowances to offset this leakage. But a new detailed analysis performed by Powerex shows that the Western EIM's GHG attribution problem is far more extensive than the "secondary dispatch" problem previously identified by CAISO. This analysis demonstrates that under the Western EIM's GHG framework, a clean resource can be "deemed" to be the source of an import into California *even if* that resource does not produce any additional electricity at all, *even if* that resource is not economic to be incrementally dispatched to serve California (or any other jurisdiction's) load, and *even if* no transmission is available to deliver the output of that resource to California if it was economic and dispatched. Consequently, external coal and natural gas resources can, and routinely are, dispatched in the Western EIM to provide electricity imports into California, while clean hydro resources that do not increase their production are incorrectly deemed to be the source of that supply. The Western EIM's GHG attribution challenges extend well beyond the "secondary dispatch" problem, and in fact result in a broad and pervasive "primary dispatch" problem.

The root cause of this primary dispatch problem is the design of the least-cost dispatch algorithm employed by the Western EIM. Instead of arranging imports to California based on each resource's fuel cost *plus* its GHG emissions costs, as is required under the California Cap and Trade Program's "specified-source" approach, the Western EIM's "deeming" approach is best understood as a "mix and match" of two separate and independent decisions: (1) produce additional electricity from the external resource with the lowest *fuel cost*, regardless of its GHG cost; and (2) attribute the resulting import into California to a (entirely different) resource with the lowest *GHG cost*, regardless of its fuel cost. The resulting mismatch between the external resources that increase electricity production and the resources that are "deemed delivered" to California is not "secondary" or incidental. It is the inevitable and primary consequence of the manner in which the Western EIM arranges imports into California.

This understanding is confirmed by Powerex’s detailed analysis of 2021 data from the Western EIM, which shows that:

- When California was importing, it accounted for most of the imports in all of the Western EIM, while the majority of Western EIM BAA exports (supplying those imports) were from external BAAs that generated most of their electricity from fossil fueled resources, including a large portion from coal units. Such resources were located predominantly in the Southwest region (including the Rockies), particularly in the PacifiCorp East BAA;
- Despite this, half of all “deemed deliveries” to California were attributed to non-emitting resources, primarily to clean hydro resources located in the Northwest region. When individual BAAs are examined, the quantities of “deemed deliveries” from hydro resources were so overstated that they often exceeded the source BAA’s total Western EIM exports in the same period. This occurred most clearly for resources located in the Idaho Power and Seattle City Light BAAs, but also in the PacifiCorp West and Portland General Electric BAAs; and
- The inaccurate identification of the external source of electricity imports into California significantly under-stated the GHG emissions of those imports by an estimated 54 percent.

The systemic inaccuracy of the Western EIM’s “deeming” approach leads to several harmful consequences that are contrary to the key goals of California’s Cap and Trade Program:

- By understating the GHG emissions of electricity imports, wholesale electricity market prices in California are suppressed—distorting the price signals necessary to drive GHG reductions, while reducing the compensation to both in-state and external clean resources that actually do produce clean electricity and deliver it to California;
- External coal (and inefficient natural gas) units are dispatched when California is importing, but routinely do not report or pay for their GHG emissions;
- External clean resources that do not produce and/or deliver any additional clean electricity to California receive substantial compensation for merely being “deemed delivered”; and
- No jurisdiction is taking environmental accountability for consuming the electricity from the high-emitting coal and natural gas generating resources that is clearly being exported to serve load somewhere. There does not even appear to be a general recognition that either load in California or load in the Northwest BAAs (that have the hydro resources that are excessively “deemed delivered”) is being served by the high-emitting coal and natural gas generation that others are selling.

Perhaps most concerning of all, the Western EIM has created what is arguably the most favorable wholesale market for out of state coal resources to sell their output. This is because

out of state coal resources are able to be dispatched to meet California demand, yet they are routinely able to avoid any GHG reporting and compliance costs, with such transactions arranged automatically by the Western EIM software, and without the need to arrange for any transmission service or to pay any associated costs. But the benefits to external coal resources participating in the Western EIM go even further: they also reap the rewards of the very existence of California's Cap and Trade Program, by selling at increased wholesale market prices that reflect the GHG emissions costs of in-state natural gas generators, while enjoying a new-found competitive advantage over those in-state generators (by avoiding the GHG costs imposed on in-state resources). Consequently, the Western EIM has incrementally increased the use of coal resources to serve California demand outside of the solar hours, and may have even enabled some coal units to remain in operation that otherwise would have been retired (and replaced as necessary to maintain reliability).

By failing to recognize the GHG emissions of external coal and other external high-emitting resources, ***the Western EIM's algorithm is causing a shift in electricity production from lower-emitting California natural gas resources to higher-emitting out-of-state resources, increasing the total GHG emissions of electricity production serving California load outside of the solar hours.***

These outcomes are clearly contrary to the goals of the California Cap and Trade Program (or any GHG-pricing program for that matter). And notably, they undermine the very activity that has been the greatest contributor to GHG reductions throughout the economy over the last three decades: decreasing electricity production from coal resources and replacing it with electricity production from natural gas and renewable resources. While some may argue that meaningful GHG reductions can be achieved through new and expanded clean and renewable procurement programs alone, this overlooks the complementary nature and critical role of GHG-pricing programs. When accurately implemented, GHG-pricing programs are a powerful tool that drives better selection of which installed resources to operate (*e.g.*, producing electricity from gas instead of coal), and better selection of which particular clean or renewable resources to install (*e.g.*, identifying the renewables that produce electricity during the hours of the day when high-emitting resources are operating). The ability to *select* which resources to install—and which installed resources to operate—complements clean and renewable resource procurement programs, which are focused on the *quantity* of new additions.

Some may also suggest that any GHG emissions challenges in the Western EIM should be ignored, considering the relatively small volume of imports to California that are occurring in that market. Such a perspective is misplaced for several reasons. First, it will be necessary to utilize *every* material opportunity to reduce GHG emissions in order to meet California's GHG targets. A Western EIM design that fails to reduce—and actually incrementally increases—GHG emissions when California is importing, creates unacceptable headwinds to meeting those goals. Second, the consequences of the Western EIM go beyond the specific imports that occur in that market, since the Western EIM also creates powerful wholesale market price signals to generators throughout the west. Under the current design, those price signals fail to indicate the value of producing and delivering clean supply to California, and instead encourage coal and higher-emitting natural gas resources to increase *their* availability, production and

deliveries. Third, the CAISO is proposing to extend the “deeming” algorithm to the much larger volume of transactions that occurs in the day-ahead timeframe through its Extended Day Ahead Market (EDAM) initiative, with only minor modifications to the design applied in the Western EIM. For all of these reasons, the Western EIM “deeming” algorithm must be replaced.

Proposals now exist that would much more effectively apply GHG-pricing programs to organized markets than the Western EIM’s “deeming” approach, leading to more efficient dispatch decisions and more accurate wholesale market prices, while properly assigning the costs and benefits associated with increased or reduced GHG emissions. But such proposals can be expected to face opposition from entities with interests that benefit from the inaccuracies inherent to the “deeming” framework, including from entities with an interest in ensuring that California wholesale market prices do not fully reflect the cost of GHG emissions. It will be necessary to see past these interests and ensure that all organized markets that are developed in the west accurately implement the applicable GHG-pricing programs.

A more detailed analysis of the Western’s EIM’s approach to applying GHG-pricing programs is contained in a comprehensive paper written by Powerex. This paper includes:

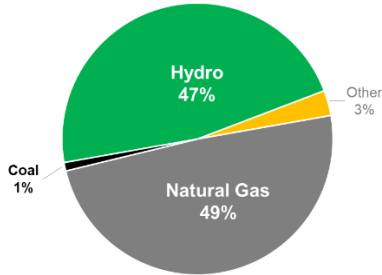
1. A detailed description of how the Western EIM’s algorithm actually works, illustrating the extent of the problem through a comprehensive numeric example.
2. A thorough examination of 2021 Western EIM data, including:
 - a. a comparison of the estimated fuel mix of the external resource output exported to California to the fuel mix that was “deemed delivered”;
 - b. an analysis of which BAAs provided the exports supplying California imports;
 - c. an analysis of which BAAs were *insufficiently* “deemed delivered” and the magnitude of their GHG cost savings; and
 - d. an analysis of which BAAs were *excessively* “deemed delivered”, and the magnitude of the GHG-related payments they are receiving.

This paper is available to be downloaded [here](#). Selected charts of the key analytical findings are reproduced on the following page.

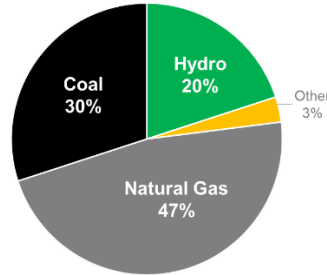
In reviewing these charts, it is important to note that the myriad problematic outcomes under the Western EIM’s “deeming” approach are not caused by the entities receiving the benefits of these outcomes—including both the entities that are avoiding the application of GHG reporting and compliance costs for the portion of their electricity production that is serving California load, as well as those entities that are being paid for being “deemed delivered” when they are not incrementally producing and/or delivering anything at all. Rather, it is the Western EIM’s highly flawed algorithm that is responsible for these results, as it is the algorithm that engages in systemic resource shuffling, dispatching coal and other high-emitting resources to serve California demand while labeling it as clean hydro supply. The solution to the problems created by the Western EIM’s “deeming” algorithm is to replace it with a framework that applies California’s GHG-pricing program in a robust and accurate manner.

“Deemed Deliveries” And Estimated External Resource Mix Delivered To California By Fuel Type, 2021

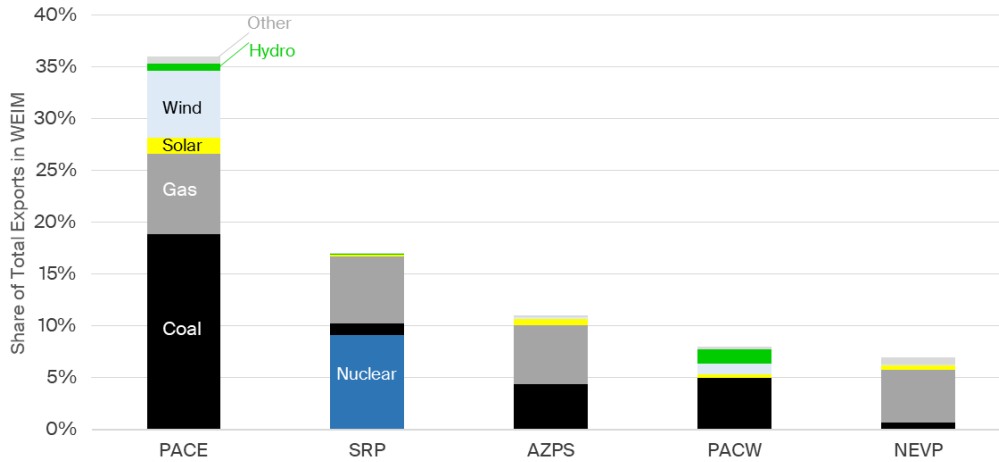
Western EIM “Deemed Deliveries” to California, By Fuel Type



Estimated External Resource Mix Delivered to California, By Fuel Type

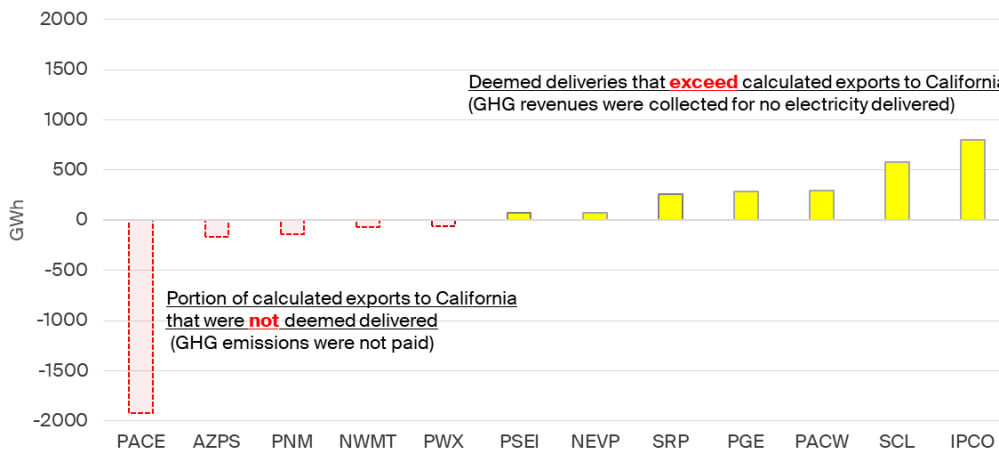


Total Energy Production By Fuel Type Of Top Exporting BAAs When California Is Importing, 2021 (Scaled To BAA's Share Of All BAA Exports)



Source: EIA-930 Hourly Electricity Balancing Authority Data, CAISO OASIS

Western EIM BAAs With Excessive Or Insufficient Deemed Deliveries To California, 2021



Source: CAISO OASIS, Powerex WEIM Settlements Data