

Exploring a Potential Two-Zone Approach for EDAM GHG

Jan 26, 2022

A Potential Two-Zone Approach – Background

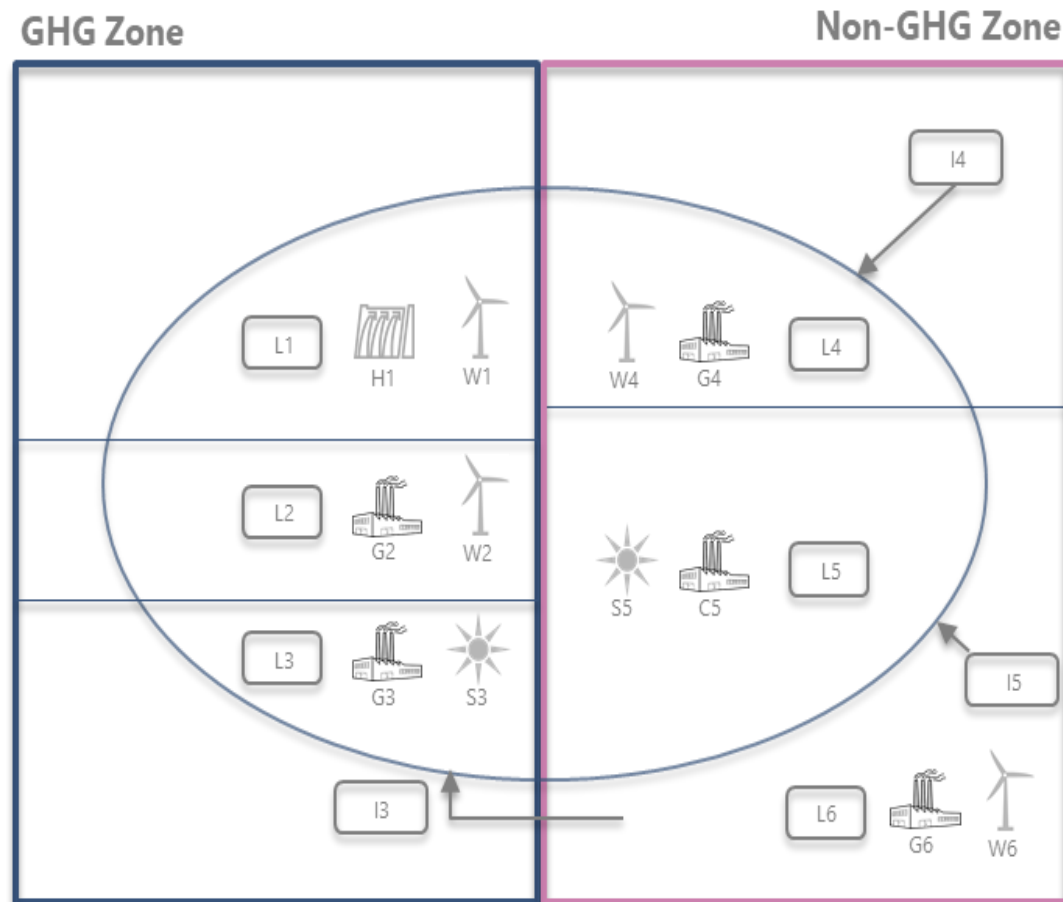
These informal notes were previously discussed by a group of EIM Entities and were a “work in progress”

- May be useful to help inform one potential concept for consideration and further discussion
- Still at conceptual stage – not yet a fully developed proposal
- EIM Entities wanted to consider potential solutions for EDAM that were not based on current approach in EIM; there were both technical and policy considerations:
 - Current EIM approach depends on base schedules and EDAM may not have same functionality
 - Concern with solutions that require the market operator to assign specific resources to specific loads on a granular basis over all market intervals
 - In light of other jurisdictions adopting similar or modified cap-and-trade programs, there was a desire to seek a simpler solution that could more easily scale across multiple jurisdictions

A Potential Two-Zone Approach - Introduction

- Solving for state GHG pricing policies involves many layers of complexity
- The following slides introduce a “base case” concept and do not solve all layers of complexity –further issues would need to be addressed
- It is unlikely that a market design is achievable that perfectly reflects each state’s greenhouse gas policy – complementary out-of-market mechanisms will be needed
- The proposed concept only addresses greenhouse gas pricing policies – it does not address RPS requirements

Two-Zone Approach – Overview

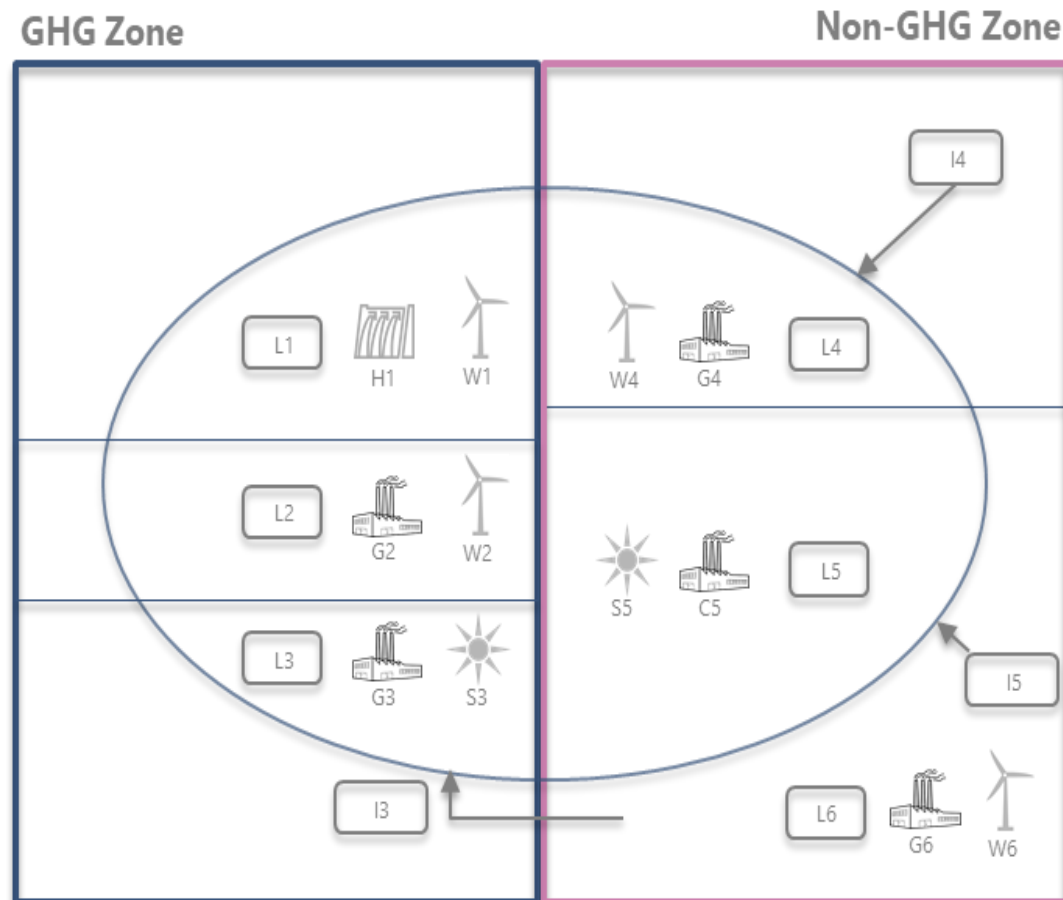


Facility Specific intensity within GHG zone, imports at unspecified rate (or specified if no leakage)

No GHG pricing at source, transfers to GHG Zone at unspecified or specified rates

- Zones are made up of individual loads and resources, not based on balancing area or transmission topology
- Resources outside the zone are dispatched without greenhouse gas cost
- Resources inside the zone are dispatched with greenhouse gas cost
- Imports into the zone are treated under a common approach
 - Default assumption is that imports are unspecified
 - Define criteria to enable clean resources access to the GHG zone, while minimizing risk of leakage

Two-Zone Approach – Overview

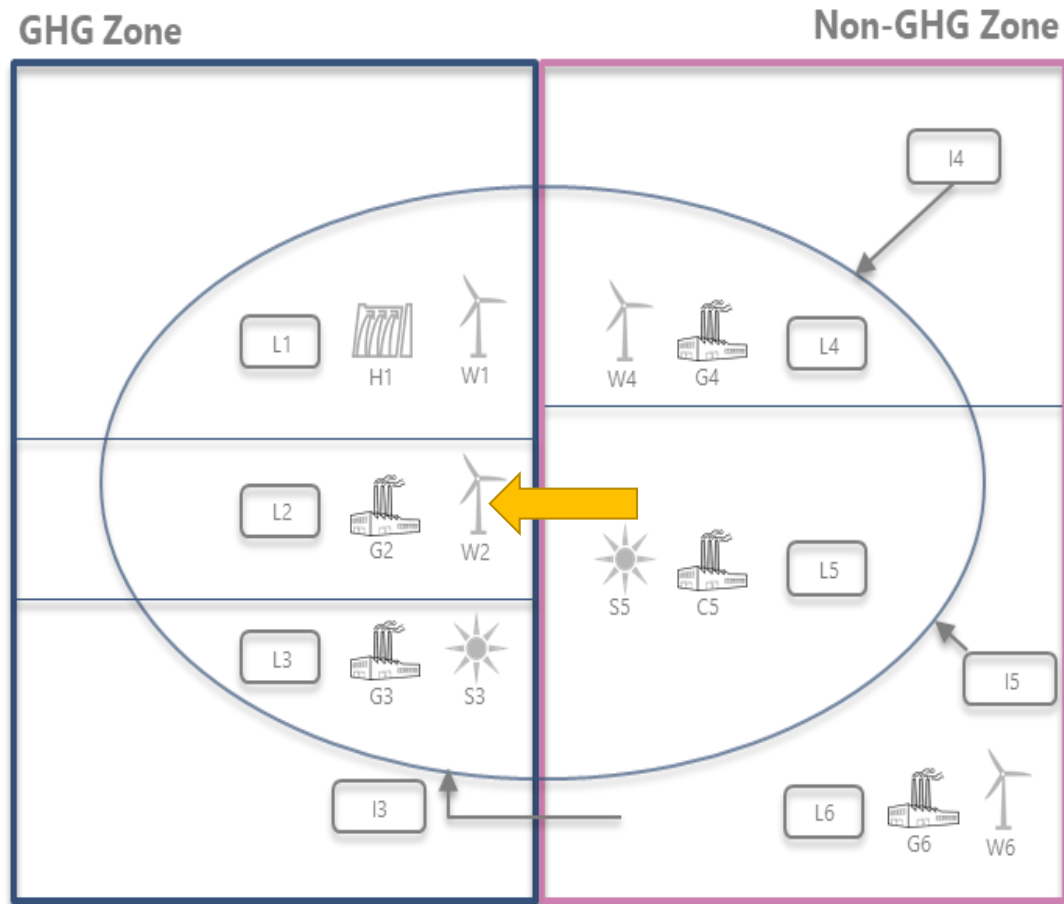


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- The GHG zone could contain multiple jurisdictions with different GHG policies
 - A single GHG zone could enable transactions to occur efficiently between individual GHG jurisdictions within the zone
- Would likely require agreement on certain common elements
 1. A common minimum GHG price applied to resources within the GHG zone
 2. A single, uniform approach to accounting for imports from the non-GHG zone into the GHG zone
 - A common GHG price for imports
 - A common GHG intensity assumption for imports (i.e., “unspecified rate”)

Two-Zone Approach – Imports to GHG Zone

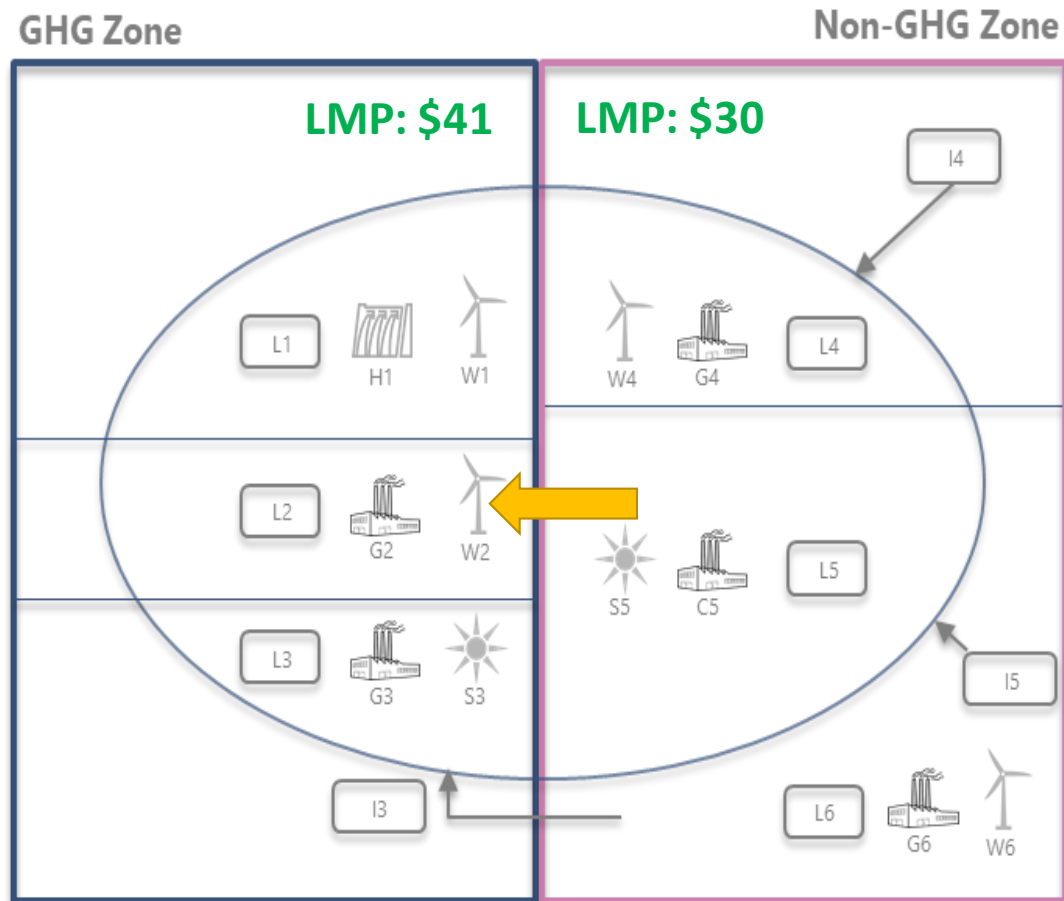


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- Assume all jurisdictions within GHG zone regulate emissions associated with imports
- An emissions (hurdle) rate is applied to imports into the GHG zone from the non-GHG zone
 - Hurdle is not on any specific transmission path
 - If the zone price difference is enough to overcome the hurdle, transfers will occur
- Import volumes are calculated by summing resources and loads within each zone
 - $\sum \text{GHG Zone Supply} - \sum \text{GHG Zone Load} - (\sum \text{Non-GHG Zone Supply} - \sum \text{Non-GHG Zone Load})$

Two-Zone Approach – Imports to GHG Zone

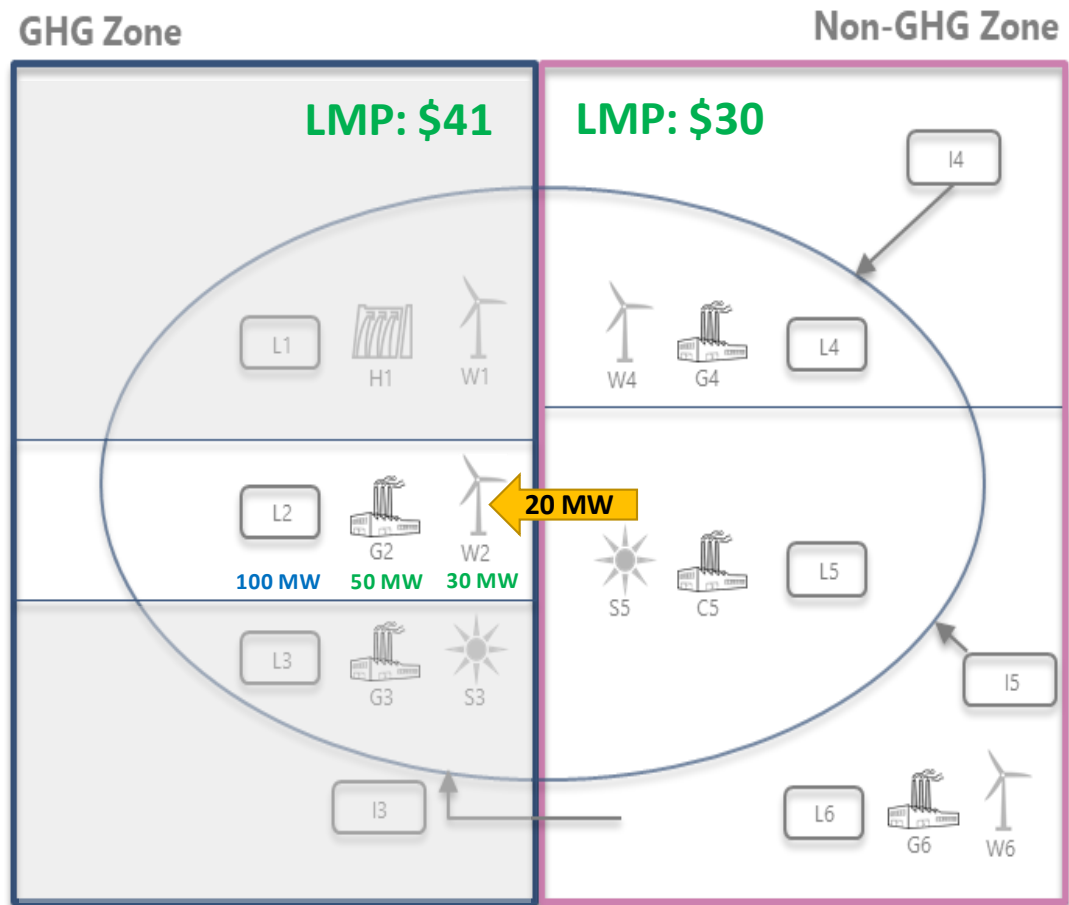


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No GHG pricing at source, transfers to GHG Zone at unspecified or specified rates

- GHG zone energy price will be separated from non-GHG zone energy price when GHG Zone is net importing
 - Price separation based on common GHG intensity x common import carbon price
- Market operator therefore collects surplus revenues for imports into GHG zone
 - Market operator or other entity distributes GHG costs collected to different GHG jurisdictions (method would need to be developed)

Two-Zone Approach – Dispatch Logic

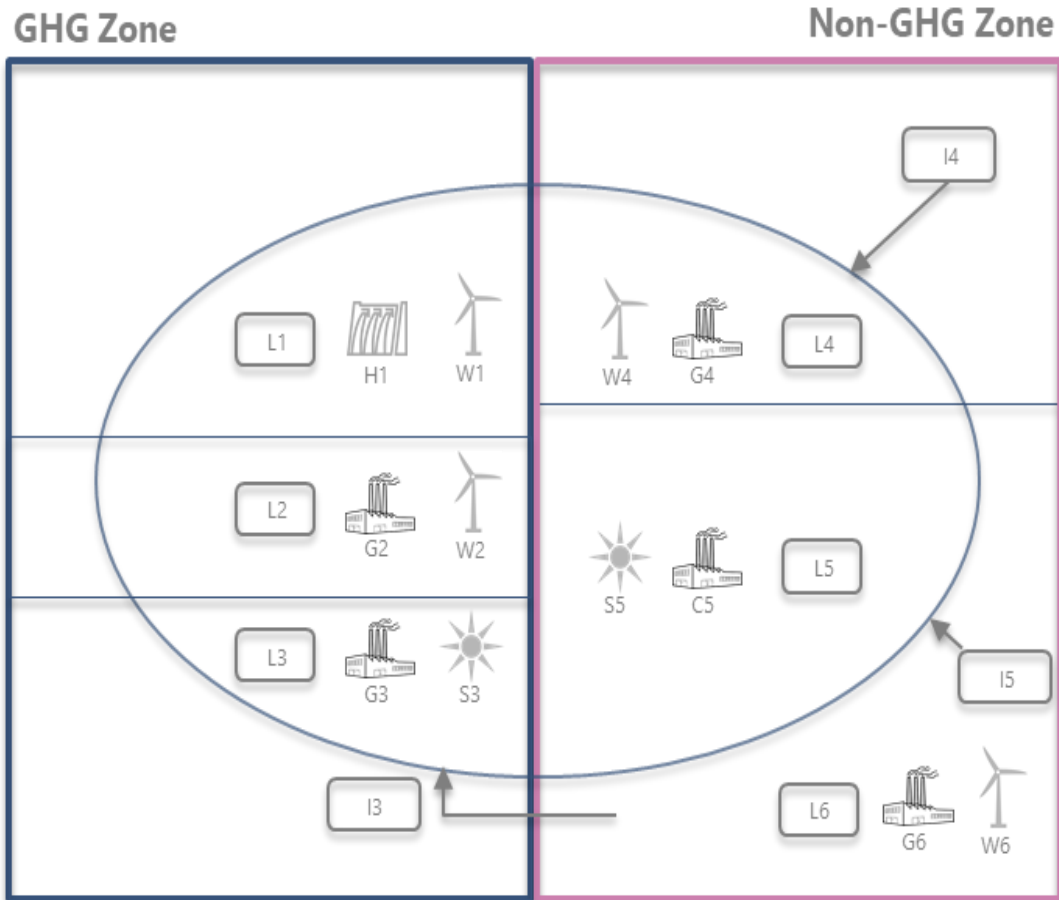


Facility Specific intensity within GHG zone, imports at unspecified rate (or specified if no leakage)

No GHG pricing at source, transfers to GHG Zone at unspecified or specified rates

- L2 = 100MW
- G2+W2 = 80MW
- Everything else in GHG zone is balanced
- Imports from non-GHG zone = 20MW
- The resources from the non-GHG zone are only dispatched to be imported to provide 20MW needed in GHG zone if they can overcome the hurdle rate
- Transfers will create hurdle rate revenue at an “unspecified” rate
 - Market operator or other centralized entity must collect and redistribute hurdle rate revenue
 - Revenue redistributed based on ratio of imports to specific jurisdictions for purchase and retirement of compliance instruments

Enabling Access to GHG Zone

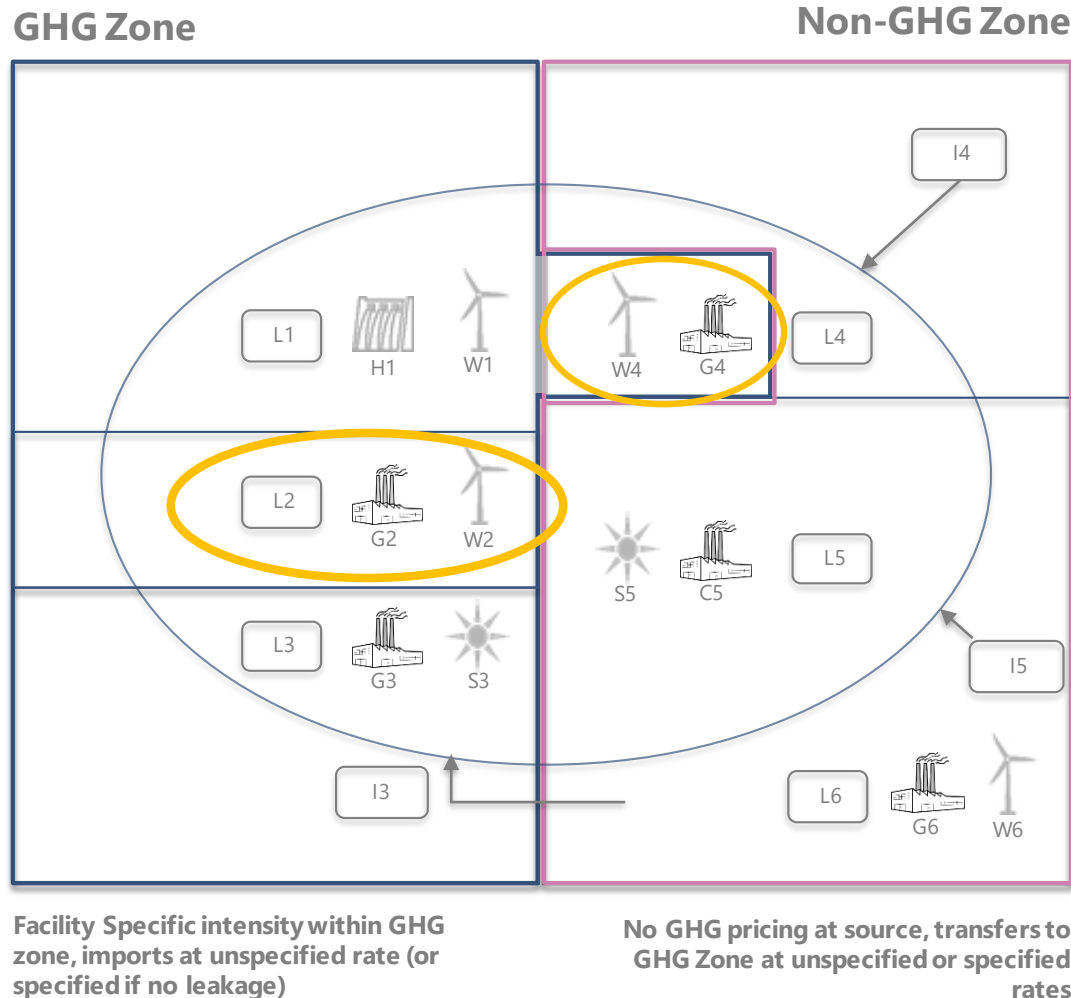


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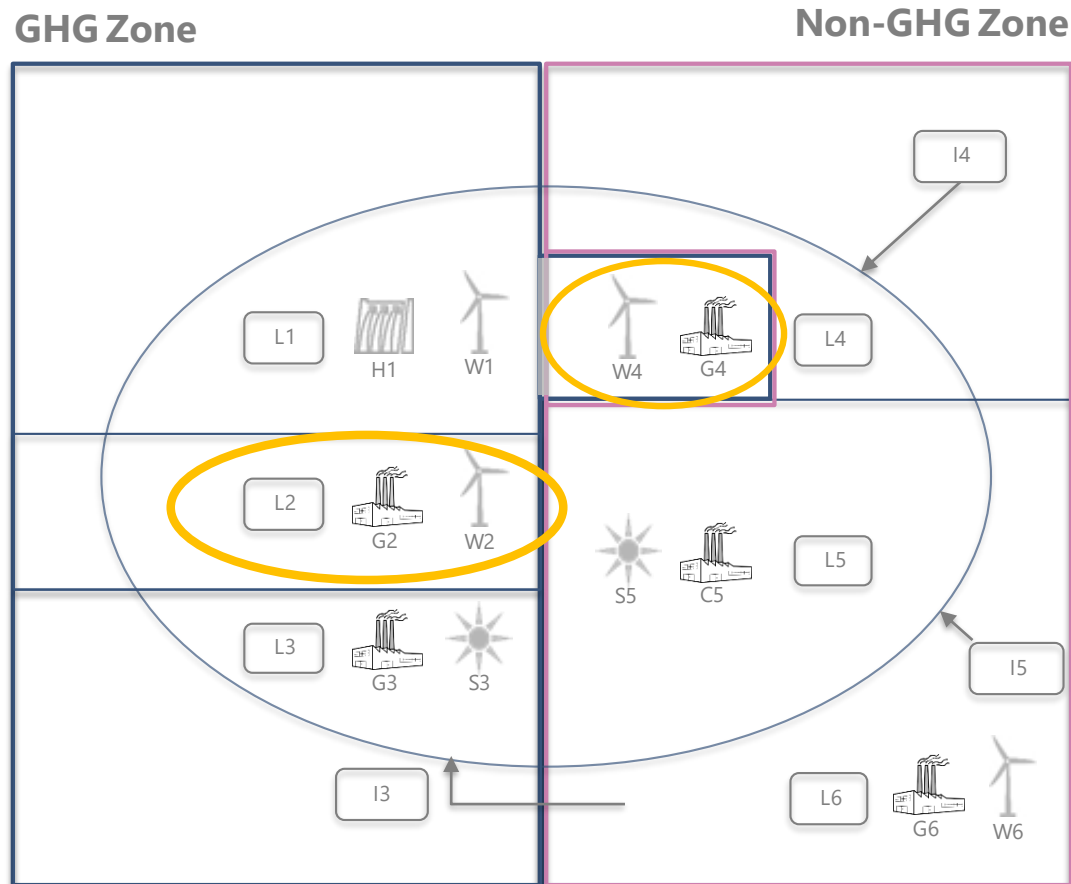
- Default assumption is that imports are unspecified
- Must support non-discriminatory access for clean resources to GHG zone, while seeking to minimize leakage
 - e.g., excess solar, hydro surplus, IPPs, multi-jurisdictional entities, other
- Identify workable categories/criteria to enable clean participation, such as:
 - Verifiable surplus clean/renewable output
 - Full portfolio opt-in into GHG zone
 - Others?
- Aim for simplicity of requirements
 - Some opportunities/complexities may best be addressed outside of the market

Example: Voluntary Portfolio Opt-in



- All of a single entity's resources and loads may be opted-in to the GHG zone, regardless of physical location
 - Opt-in should not be recurring (e.g. one time decision) and should have a justification (e.g. entity subject to state compliance)
- Example:
 - W4 and G4 are contracted by OR utility and opted-in to the GHG zone
 - W4 is not discriminated against as compared to W1
 - G4 is dispatched in alignment with OR state policy
 - Dispatch reflects state policy and OR utility collects \$\$ needed to purchase required allowances
- Total portfolio opt-in avoids leakage

Example: Voluntary Portfolio Opt-in Dispatch Logic



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Full Opt-In: W4 and G4 are now in the GHG zone

- L2 = 100MW
- G2+W2= 80MW
- Assume G4 is the most economic resource to meet remaining 20 MW
- Everything else in GHG zone is balanced

What has changed?

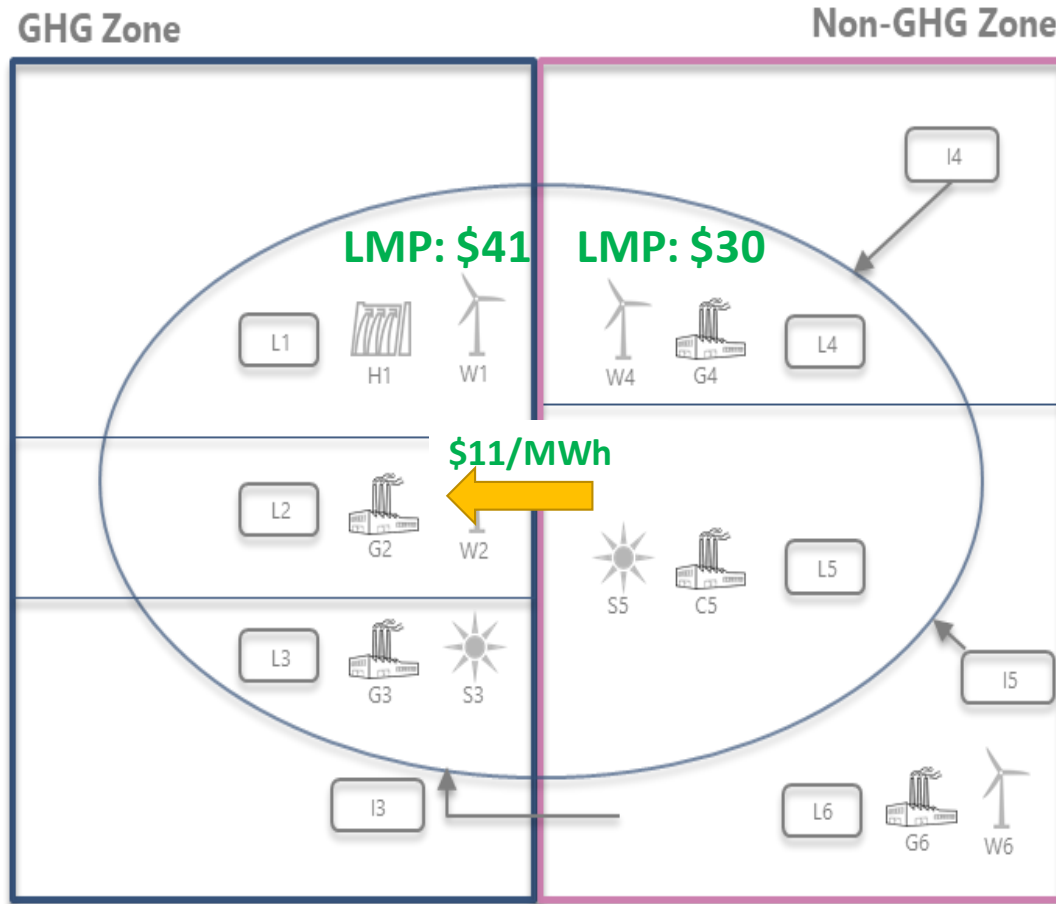
1. Market now considers G4's unit-specific GHG costs in dispatch
 2. G4 pays the GHG cost at its specific emissions rate which can be used to fund GHG compliance instruments
 3. G4's LMP reflects GHG price (as it is in the GHG zone)
 4. G4's dispatch no longer faces an import hurdle, as the calculation of imports reflects that G4 is in the zone
 - Load in zone (L2) = 100 MW
 - Generation in the zone = G2 + W2 + G4 = 100 MW
 - No import to zone in this dispatch scenario
- The remaining resources from the non-GHG zone would only be dispatched to be imported if they can overcome hurdle rate

Discussion Questions

- What are other circumstances in which loads and resources may or should be incorporated into the GHG zone?
 - A resource physically located in the non-GHG zone that is fully committed to serve load inside the GHG zone. Can this resource be moved permanently in to the zone? What are criteria for doing so? What are concerns with doing so or not doing so?
 - A resource physically located in the non-GHG zone that is partially committed to serve load inside the GHG zone and is used for RPS compliance in one or more states within the GHG zone?
 - How will IPPs be treated?
 - A situation where there is verifiable non-emitting surplus. What are the criteria?
- Can a portion of a resource be in the GHG zone or is the full output of a resource either in or out of the GHG zone?
- How often can a resource switch zones?
- What is hurdle rate based on? Can it or should it change based on a forecast or an seasonal or daily shape? What are the pros and cons of a static versus dynamic rate?
- Are there transmission requirements for a resource to be in the GHG zone? If so, what are they?
- How are jointly-owned resources treated? Is there a way for a single entity's ownership to be in the GHG zone?
- What consequences stem from the reality that there may be multiple justifications for non-emitting resources to be inside the GHG zone but fewer justifications for requiring emitting resources to be inside the GHG zone?
- What out-of-market solutions are needed to reconcile the two-zone approach with state compliance requirements?

APPENDIX

Two-Zone Approach – Imports to GHG Zone – Cash Flow



Facility Specific intensity within GHG zone, imports at unspecified rate (or specified if no leakage)

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- Assumptions:
 - L1+L2+L3 = 100MW
 - L4+L5 = 50MW
 - H1+W1+G2+W2+G3+S3 = 80MW
 - W4+G4+S5+C5 = 70MW
 - 20 MW Import to GHG zone
 - External entities balanced and no tie imports
- GHG Zone +\$820
 - Load: 100MW x \$41 = \$4100
 - Gen: 80MW x \$41 = \$3280
- Non-GHG Zone -\$600
 - Load: 50MW x \$30 = \$1500
 - Gen: 70MW x \$30 = \$2100
- Surplus Revenues/GHG costs: +\$220
 - \$820-\$600 = \$220
 - 20MW x \$11 = \$220
- Revenue redistributed based on ratio of imports to specific jurisdictions for purchase and retirement of compliance instruments