

Carbon Tracking and Emissions Transparency

ESIG Fall Technical Workshop

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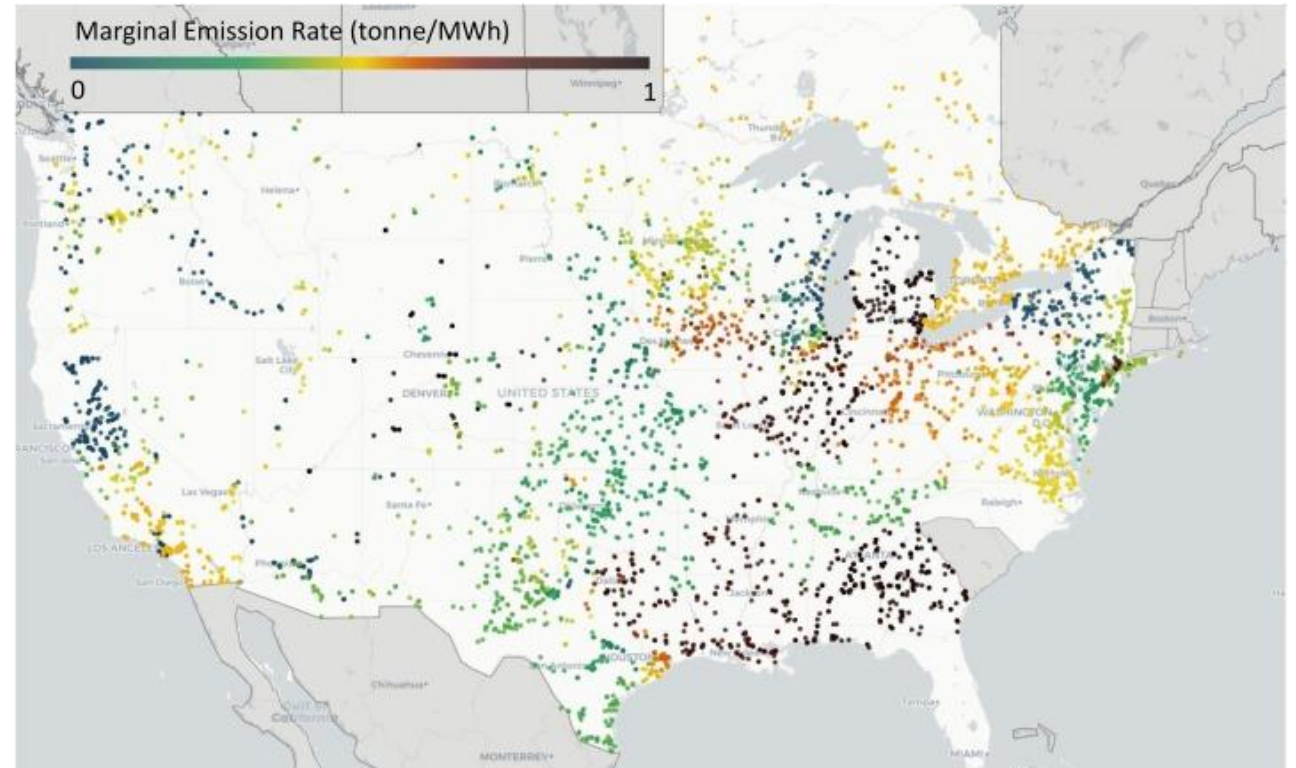
Energy+Environmental Economics

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Clean energy accounting \neq carbon accounting, but differences are small

- + The CO₂ savings associated with clean energy depend on which generator is displaced, i.e., is “on the margin”
 - Marginal resource varies by time and location
- + However, these differences are relatively small and getting smaller over time
 - Gas is on the margin during most hours and will increasingly be the resource that is displaced by incremental clean generation
- + The key driver of different modeled outcomes for alternative accounting frameworks is additionality

Marginal carbon emissions rates vary by location



<https://tcr-us.com/paths-to-carbon-neutrality-tcr-white-paper.html>

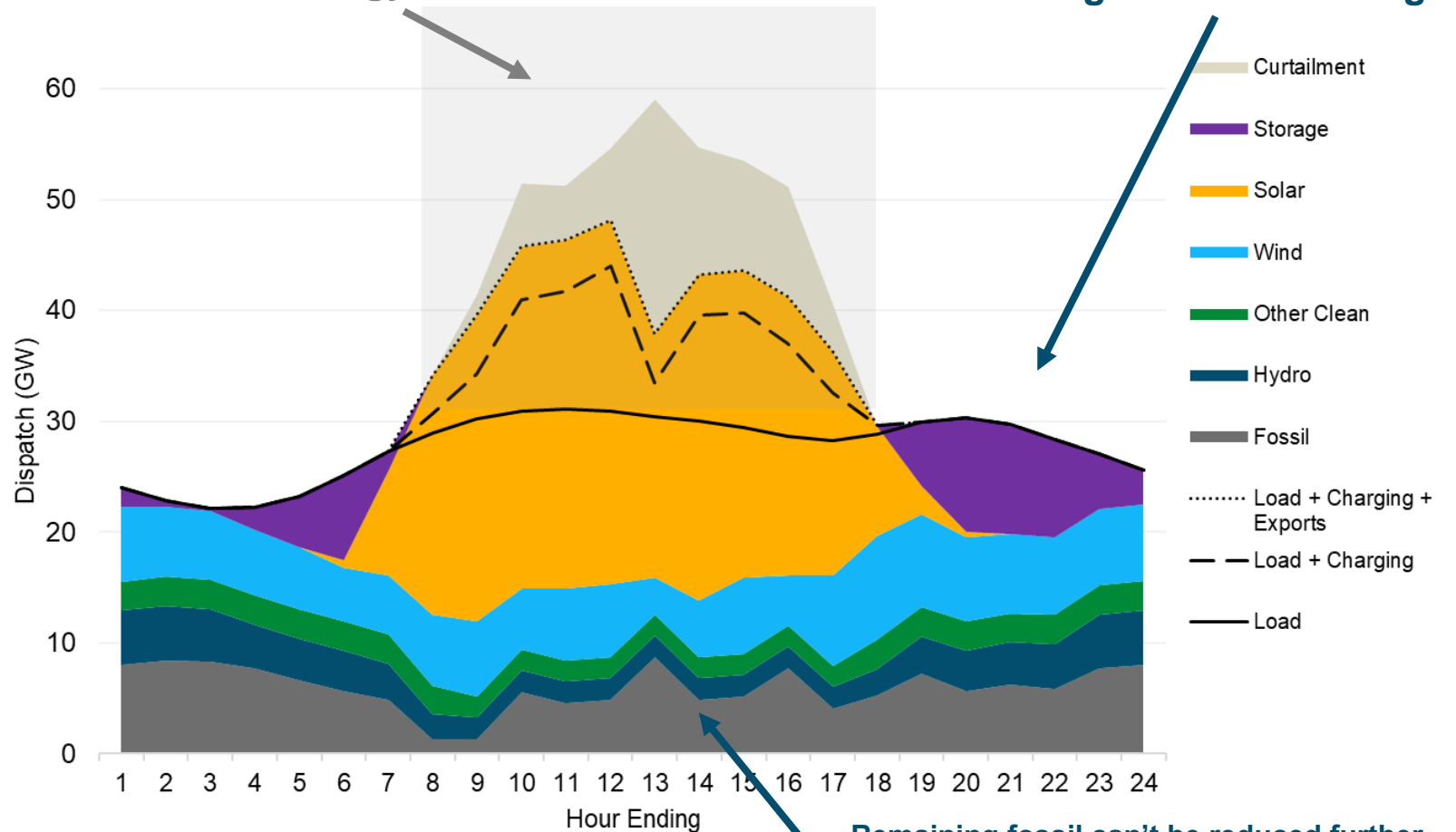
Non-emitting resources reduce carbon emissions even on days with systemwide curtailment

+ Clean energy reduces carbon emissions in every hour

- RECs are only created when clean energy is delivered to the grid
- All clean energy delivered to the grid displaces fossil generation
- When clean energy is on the margin, no new RECs can be created without reducing the supply of RECs from existing generators

Grid is saturated: Every MWh of delivered clean energy is avoiding fossil gen, but no new clean energy can be delivered

New RECs can only be created during hours when fossil gen is on the margin



Remaining fossil can't be reduced further (e.g., reliability) otherwise it would have been, reducing curtailment

What characteristics would we like clean energy markets to have?

Key Characteristic	Description
Scalability	Should be robust enough to drive high penetrations of clean energy, e.g., 85% of generation
Economic efficiency	Can achieve high clean energy penetration and deep carbon reductions at lowest nationwide cost
Stability	Provides a stable and predictable investment signal for the value of new clean energy resources
Liquidity	Creates a liquid market for clean energy attributes, resulting in low transaction costs and low compliance costs and risks
Urgency	Does not require creation of extensive and complicated new compliance infrastructure
Accuracy	Accurately measures and assigns responsibility for carbon emissions