



Locational Marginal Emissions

Confidently measure and maximize the carbon impact of your load and clean energy

What are Locational Marginal Emissions (LMEs)?

LME is a metric that measures the tons of carbon emissions displaced by 1 megawatt-hour (MWh) of clean energy injected to the grid at a specific location and a specific point in time. LMEs are calculated at each power system node in a manner very similar to the Locational Marginal Prices (LMPs) used to set wholesale electricity market prices. LMEs measure emissions by identifying the marginal generators that would have been producing energy but for the renewable injection to the grid at that location at that moment.

LMEs can amplify the impact of clean energy programs. The scale of the decarbonization challenge ahead of us is daunting. Fortunately, governments and organizations are increasingly rising to the challenge by setting ambitious targets and following through with action. As we enter the next phase of climate mitigation efforts, it is critical to adopt a more robust means of measuring the impact of project choices through the use of LMEs.

LME data enables organizations to more closely calculate the estimated impact of their activities at each location on the grid. LME data offers visibility into why emissions are what they are. For example, they show how much gas or coal is displaced or how much wind energy is curtailed due to their activities. The data also provides insight that helps companies evaluate new market opportunities. Using LMEs ensures a focus on locations that can significantly impact carbon reduction efforts.

Locational Marginal Emissions empowers clean energy buyers, investors and advisors to take three impactful steps on their path to decarbonization:

- Measure: use high quality emissions data to accurately calculate your company's net carbon impact.

Benefits to your business:

- ✓ Better clean energy procurements
- ✓ More accurate accounting of carbon footprint
- ✓ Better generation technology selection
- ✓ Higher overall carbon abatement per dollar
- ✓ Alignment of interest between investors and power system operators
- ✓ Better siting decisions
- ✓ Accurate assessment of the carbon value of energy storage

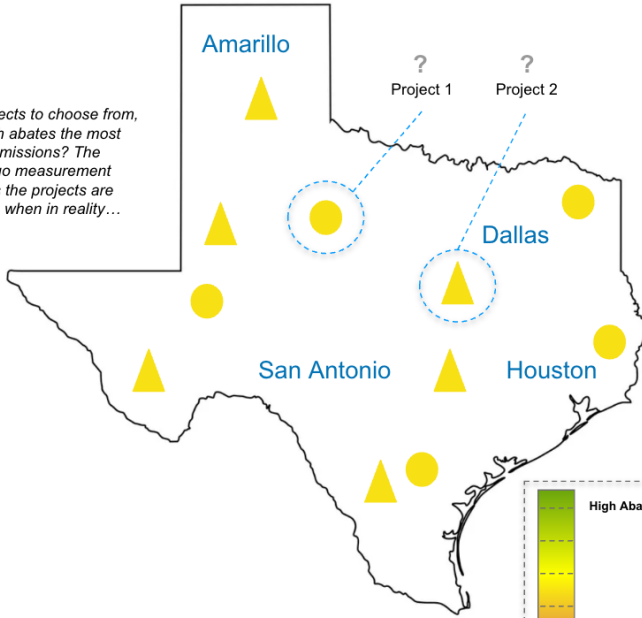
- Maximize: make long-term decisions informed by the carbon impact signal (PPA procurement, load siting & scheduling, etc.).
- Monetize: differentiate your assets based on their carbon impact, and consider carbon credits for energy storage.

Understanding renewable abatement impacts helps organizations make meaningful progress towards their net-zero goals. Instead of relying on 8760s, companies can incorporate LMEs into their long-term approach and better understand the full impact of their renewable projects based on their hourly abatement. A highly precise measurement helps corporations track progress and be more deliberate in reaching their ambitious net-zero goals.

Better information about the carbon impacts of clean generation and consumption can help ensure that decarbonization investments are cost effective and do not have unintended consequences for the grid.

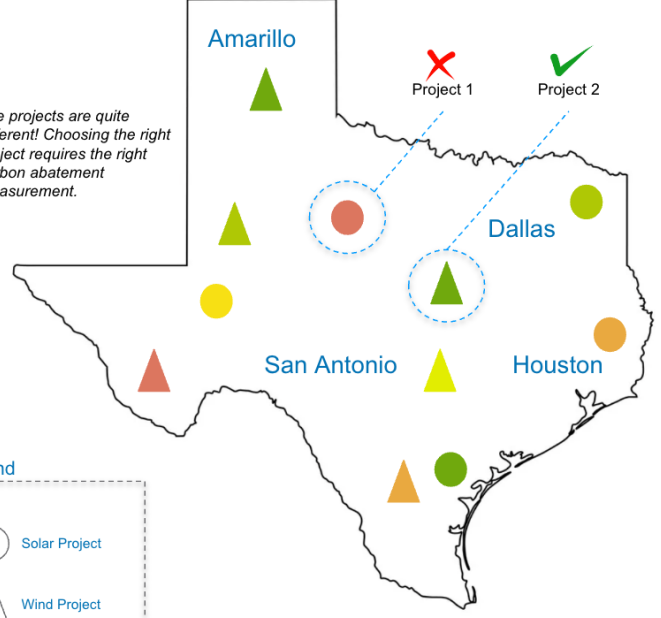
Status Quo Carbon Abatement Value

Two projects to choose from, but which abates the most carbon emissions? The status quo measurement suggests the projects are identical, when in reality...



Actual Carbon Abatement Value

The projects are quite different! Choosing the right project requires the right carbon abatement measurement.



Map Legend



The status quo ignores differentiated emissions impact.

Other Resources:

Learn more about customers' practical use of Locational Marginal Emissions:

- [The Akamai 2022 ESG Impact Report](#)
- [Carbon Confidence in Climate Finance](#), white paper authored by HASI

LME data is available via RESurety's Market Analysis platform, REmap, via API access, or as custom reports.

For specific market availability, please email us at: info@resurety.com.

About RESurety

RESurety is the leading analytics company empowering the clean energy economy. Operating at the intersection of weather, power markets, and financial modeling, we enable the industry's decision-makers to thrive by providing best-in-class value and risk intelligence, and the tools to act on it. With the world's most sophisticated clean energy investors, advisors, buyers, and developers as clients, RESurety empowers clients to thrive in the dynamic, complex, clean energy-fueled future.

For more information, visit resurety.com or follow RESurety on [LinkedIn](#).

...LMEs bring the environmental community five steps closer to the measurement accuracy needed to solve the global emissions crisis.

- Mike Mattera, Director of Corporate Sustainability and ESG Officer, Akamai Technologies

Understanding the carbon impact for all current and future portfolio projects is central to our purpose as a climate positive investor.

- Rich Santoroski, EVP, Chief Analytics Officer and Co-Head - Portfolio Management, HASI