

<b>Webinar: Marginal Emission Rate and Its Application in Voluntary Clean Energy Investments</b>	
<b>Question</b>	<b>Answer</b>
Where can I find the white paper you mentioned?	<a href="https://www.tcr-us.com/paths-to-carbon-neutrality-tcr-white-paper.html">https://www.tcr-us.com/paths-to-carbon-neutrality-tcr-white-paper.html</a>
Can you comment on the revenue-emissions trade-off in an area with both natural gas and coal (PJM), where coal may be both cheaper and dirtier than natural gas?	There is currently no trade off as all thermal generation power plants is revenue driven. As we can see from last years data, high natural gas prices increase coal output and total system emission. There are a few ways to combat that: (1) a carbon price such as RGGI, and (2) more renewables pushing coal off the market, which we hope to do as more investors adopt LMER emission informed procurement. Grids with coal generally have high LMER, which make them prime locations to site new renewable products.
Do you think it would be feasible/worthwhile to account for lifecycle emissions in LMER?	It is definitely feasible and worthwhile. Some assets have high fabrication emission (i.g. PV and lithium battery), they need to operate or cycle enough to displace their own inherited emission. This can be important to some stranded assets that are curtailed > 30% of the time. the challenge is vPPAs only cover part of the operating life of an asset so some new instrument and/or framework is needed to take lifetime emission into PPA procurement decisions.
What is the difference between accounting for a resources production intensity and any avoided emissions it causes? Are the units of measure the same?	I assume "resource production intensity" refer to the direct emission of generators. LMER reflects the resource's system wide emission impact, as shown in the three bus example. Direct emission intensity only accounts for the resource's operation alone.
Reducing 1 ton of CO2e in a 90% clean grid is much harder than in a 20% clean grid. Should that be considered into the GHG and cost in future analysis?	Carbon emission is a global phenomenon, it is not constrained by state or RTO borders. Our goal is to guide captial to invest in projects and grids where it can maximize carbon displacement globally. Investing in a 20% clean grid is more preferable to investing in a 90% clean grid because the same amount of investment can displaced much more carbon and have larger impact on global emission.
how to size energy storage based on LMER? can you make an example?	LMER is more useful in storage siting than sizing. storage siting can be optimized by studying LMER volatility. For example, CAISO is a good place to site storage due to the duck curve.
how do you know the nodal disclosure is accurate?	nodal disclosure directly from RTOs can be as accurate as LMPs because it come out of the same market engine. For thrid part estimates, we need to review their methodology to ensure accuracy.

<p>Following up on the double counting question-- RECs today don't capture avoided emission rates, for good reason. Where would the tracking of these exist?</p>	<p>There is now time and location stamped RECs (<a href="https://www.mrets.org/">https://www.mrets.org/</a>). In LMER accounting, time/location stamped RECs would received the appropriate LMER and be retired in order for buyer to claim carbon credit. So there is no double counting of REC and emission.</p>
<p>It was stated that LMER can be used for procurement decision-making. Is there a perspective on whether the LMERS should also be used in a GHG inventory?</p>	<p>Yes, I presentated an example of LMER based GHG accounting to assign system emission across all assets on the grid, including transmission. The latest GHG protocol update process also saw the most reponses asking for more granular emission data (both time and location) for corporate carbon accouting.</p>
<p>Is GHG accounting really what is holding back corporate voluntary investment in transmission development??</p>	<p>it is one of many things holding it back. While building new transmission lines is a monumental undertaking, investing in Grid Enhancing Technology (GET) is feasible for voluntary buyers. Although some stakeholders have expressed interest in this, they need a framework to allow them to take credit for the carbon impact of GET investment. A LMER based accouting system can help with that.</p>
<p>how do you ensure nodal disclosure is available and accurate?</p>	<p>see above questions about nodal disclosure</p>
<p>Are there any case studies that illuminate the tradeoff between transmission and storage investments under LMER based evaluation of \$/CO2</p>	<p>I'm not aware of any such study yet, but I hope to see a study like this.</p>
<p>Is the low carbon emissions in the COMED area due to the renewables there or concentration of nuclear power?</p>	<p>it is due to a variety of factors, including occasional curtailment of wind generation that drive LMER to 0.</p>