LEEM currently reports LMEs for 5 harmful pollutants:
- Carbon dioxide
- Sulfur oxides
- Nitrogen Oxides
- Lead
- Mercury

Electricity Production changes over **space & time**... and so do emissions.

Example: Changes in locational marginal prices (LMP) for electricity production and the corresponding locational marginal emissions (LME) between Buffalo, NY and Chicago, IL demonstrate emission levels changing over time and space.

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**Locational marginal prices (LMP)** can change every 5 minutes depending on generating type, transmission pathways, fuel costs, and market demand.

LMPs can differ greatly between two locations at one time... or at different times in a single place.

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<table>
<thead>
<tr>
<th>Day</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffalo, NY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago, IL</td>
<td></td>
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</tbody>
</table>

As LMP goes up and down, electricity production shifts between generators causing fluctuations in **locational marginal emissions (LME)** throughout the day.

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LEEM’s high granularity can provide the detailed real-time data needed to actively reduce your emissions footprint.

**LEEM** calculates **REAL-TIME LME** information & can identify crucial opportunities to shift flexible energy load toward specific times & places that REDUCE EMISSIONS.

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The LEEM team is led by Dr. Carol Miller of Wayne State University’s College of Engineering in Detroit, supported in part by funding from the Chicago-based Great Lakes Protection Fund. Current industry partners include MISO, PJM, Siemens Energy, DTE Energy, Consumers Energy, Commonwealth Associates, ILLUME, and EcoWorks.

Check out our short video: vimeo.com/118138647

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leem.today
leem.wayne@gmail.com
Welcome to LEEM
Shifting Electricity Usage to Reduce Emissions Impact

LEEM provides customized emissions information based on the user’s location. Key features of the power grid (1) and environmental data are gathered to the cloud-based LEEM server (2). This data is selected by proprietary LEEM algorithms (3) that select the applicable ISO and the relevant commercial pricing information from databases (4) and workflow models (5) so emissions can be estimated (6), organized (7), analyzed (8), normalized (9), and reported (10) to LEEM users (11). Output information is delivered in a variety of flexible formats and is used to guide energy use decisions across time and space to reduce environmental impacts (12).

Accelerating toward environmentally sensitive electrical futures

LEEM currently provides data for users in 18 states from New York to North Dakota whose electric grids are managed by MISO, PJM, and NYISO. In the future, LEEM will expand nationally and will include a broader range of emission levels, emissions savings tracking, and will be able to signal when renewable energy is providing a significant supply and when the grid is in a high peak-power condition.

LEEM guides electricity users to reduce emissions by shifting electrical load away from times of day when the marginal generator produces the most negative emission impacts.

Providers of energy management systems use LEEM to enhance products to optimize performance and energy use to reduce emissions and cost.

LEEM helps utility companies track load-driven marginal emissions at the local level, improve customer engagement, optimize energy efficiency efforts, and signal when high peak power events are likely.

LEEM emissions data helps regulators to model and account for load-driven electricity-related emissions in real-time.