Tackling Methane in California

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Part 1.

Meet Methane
Methane (CH₄) is a colorless, odorless, flammable gas.

It forms when organic material decays in sealed spaces (e.g., shale formations, landfills, cow stomachs).

Methane accounts for one-third of Earth’s warming to date.
The Methane Opportunity

1. Cutting carbon emissions is not enough to avoid catastrophic climate “tipping points.”
2. Methane is far more potent than carbon dioxide, but it decays quickly in the atmosphere.
3. This means that cutting methane emissions can quickly reduce the pace of Earth’s warming, alongside decarbonization.
Methane often represents wasted energy that can be captured or redirected for profit.

More than half of methane mitigation measures pay for themselves.

Image: CH4IQ
Part 2.

Methane Policies
SB 605 (2006)

Required CARB to develop a strategy for methane and other super-pollutants
SB 1383 (2016)

Requires a 40% reduction in methane by 2030 and a 75% cut in organic landfill waste by 2025

For livestock, provides grants for digesters and alternative manure management (CDFA) and includes manure biogas in the Low Carbon Fuel Standard (CARB)

For landfills, invests in recovery infrastructure and mandates organics collection
Scoping Plans (Latest in 2022)

CARB blueprint for climate mitigation, including methane strategies for livestock, landfills, and energy
Inflation Reduction Act (2022)

Federal law that funds methane research and monitoring

Taxes methane from high-emitting oil and gas facilities, making methane the first GHG to be federally taxed

Fee applies to facilities emitting over 25,000 tons of CO2 equivalent; Starts at $900/ton (2024) and increases to $1,500 per ton (2026)
Part 3.

Sectors
Human Methane Sources

- Agricultural activities: 42%
  - Enteric Fermentation: 27%
  - Rice Cultivation: 7%
  - Manure Mgmt.: 3%
  - Other Ag Sources: 5%
- Industrial sources: 25%
  - Oil & Gas: 24%
  - Coal Mining: 9%
  - Stationary & Mobile Sources: 4%
  - Municipal Solid Waste: 11%
- Natural sources: 8%
  - Wastewater: 7%
  - Biomass: 3%
Solutions: Agriculture

1. **Enteric**: Improved nutrition, feed supplements
2. **Manure**: Dairy digesters, liquid separation, non-lagoon storage methods
3. **Rice**: Water and fertilizer management, improved rice breeds
Dairy Sector Progress Gap

Additional Reductions Necessary to Achieve the 2030 Target
Solutions: Waste

1. **Landfills:** Organics diversion, gas capture, anaerobic digesters, biocovers
2. **Wastewater:** Gas capture, anaerobic digesters, aerobic treatment
## Waste Sector Capacity Gap

<table>
<thead>
<tr>
<th>Technology</th>
<th>Estimated Anticipated Capacity, 2025*</th>
<th>Estimated Needed Capacity, 2025</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compost</td>
<td>5.3</td>
<td>9.6</td>
<td>(4.3)</td>
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<tr>
<td>Anaerobic Digestion</td>
<td>1.0</td>
<td>2.7</td>
<td>(1.7)</td>
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<tr>
<td>Co-Digestion†</td>
<td>0.21</td>
<td>2.4</td>
<td>(2.2)</td>
</tr>
<tr>
<td>Chipping and Grinding</td>
<td>3.5</td>
<td>3.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td>10.0</td>
<td>18.0</td>
<td>(8.0)</td>
</tr>
</tbody>
</table>
Solutions: Oil and Gas

1. **Operational wells:** Monitoring & intervention
2. **Spent wells:** Capping & plugging
3. **Refinery operations and pipelines:** monitoring hundreds of potential leaks, updating equipment and engineering

**LCFS:** 20 year equivalency vs. 100 year
Don’t use EPA pre-set methane leak estimates!
Thank you.

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