<table>
<thead>
<tr>
<th><strong>DOCKETED</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Docket Number:</strong> 21-IEPR-05</td>
</tr>
<tr>
<td><strong>Project Title:</strong> Natural Gas Outlook and Assessments</td>
</tr>
<tr>
<td><strong>TN #:</strong> 239540</td>
</tr>
<tr>
<td><strong>Document Title:</strong> Presentation - Short-Lived Climate Pollutants</td>
</tr>
<tr>
<td><strong>Description:</strong> S2.5B Jeff Kessler, CARB</td>
</tr>
<tr>
<td><strong>Filer:</strong> Raquel Kravitz</td>
</tr>
<tr>
<td><strong>Organization:</strong> California Air Resources Board</td>
</tr>
<tr>
<td><strong>Submitter Role:</strong> Public Agency</td>
</tr>
<tr>
<td><strong>Submission Date:</strong> 8/30/2021 11:47:32 AM</td>
</tr>
<tr>
<td><strong>Docketed Date:</strong> 8/30/2021</td>
</tr>
</tbody>
</table>
Short-Lived Climate Pollutants

AUGUST 31ST

JEFF KESSLER, AIR RESOURCES ENGINEER
INDUSTRIAL STRATEGIES DIVISION
Overview – Short-Lived Climate Pollutants

• SLCPs are potent climate forcing gases with relatively short atmospheric lifetimes
  o Methane
    ▪ Dairy & Livestock
    ▪ Landfill Organic Waste
    ▪ Oil & Gas
  o Hydrofluorocarbons (HFC)
  o Black carbon
Short-Lived Climate Pollutants Policy Framework

• Senate Bill 1383 (Lara, 2016) requires CARB to adopt and begin implementing the Short-Lived Climate Pollutant (SLCP) Reduction Strategy

• In 2017, CARB approved and began implementing the comprehensive SLCP Reduction Strategy to reduce statewide emissions to below 2013 levels by 2030 for:
  o methane by 40 percent
  o hydrofluorocarbon gases by 40 percent, and
  o anthropogenic black carbon by 50 percent
Methane Emissions

Statewide Total Methane Emissions in 2018: 39.8 MMTCO$_2$e

- **Leading emission sources:**
  - Dairy and Livestock Sector (54%)
  - Landfilled Organic Waste (22%)
  - Oil & Gas (14%)

* California Methane Inventory for 2000-2018; using 100-year AR4 Global Warming Potential
Dairy and Livestock Methane Sources

- Dairy and livestock methane comprises 54% of the annual 40 MMTCO$_2$e methane emissions
  - 10 MMTCO$_2$e from manure management
  - 11 MMTCO$_2$e from enteric fermentation

### 2018 Methane Emissions

- 26% Dairy Manure
  - ~10 MMTCO$_2$e
- 18% Dairy Enteric
  - ~7 MMTCO$_2$e
- 10% Non-Dairy (primarily enteric)
  - ~4 MMTCO$_2$e
- 46% All Other Sources
  - ~18 MMTCO$_2$e
Dairy and Livestock Methane Emissions Reduction Programs

- Cap-and-Trade
- Low Carbon Fuel Standard
- Dairy Digester Research and Development Program
- Alternative Manure Management Program
- Bioenergy Market Adjusting Tariff (BioMAT)
- SB 1383 Dairy Biomethane Pipeline Injection Pilot Projects
- AB 2313
- Renewable Fuel Standard (RFS)
Landfill Methane

• Californians disposed of approximately 22 million tons of organic waste in 2018, making up over half of all landfilled waste
  o Landfill gas capture systems (required under CARB’s Landfill Methane Regulation) avoid the release of up to 80% of methane generated
  o Landfill fugitive methane makes up over 8 MMTCO$_2$e statewide, the second largest source of methane emissions (22%)
Actions to Reduce Methane Emissions from Organic Waste

Prevention
- Food waste prevention and rescue programs to recover edible food

Recycling
- Expand Organics Recycling and Recovery Infrastructure
- Ensure best management practices are instituted at compost and AD facilities; promote use of compost to restore soil health and reduce fertilizer use.

Gas Capture
- Improve landfill operations and cover practices to control fugitive emissions
- Explore automated monitoring and control systems to improve capture efficiency

Monitor and Respond
- Develop remote sensing capabilities to monitor and respond to methane leaks
- Methane Source Finder and Carbon Mapper Projects
Organic Waste Methane Emissions Reduction Programs

- Organic Waste Grants and Loans
- Low Carbon Fuel Standard
AB 32 Climate Change Scoping Plan

- Scoping Plan(s) are action plans to ensure CA meets statewide GHG reduction targets (mandated in AB 32)
  - Scoping Plan(s) rely on a suite of climate policies to address emissions across all sectors
  - Required to be updated at least every 5 years
  - 2017 SP (most recent) – cost-effective and technologically feasible path to achieve the 2030 target

Goals for Scoping Plan:
- Provide direct GHG emissions reductions and air quality benefits
- Minimize emissions “leakage” – increase to non-CA GHG emissions
- Facilitate sub-national and national collaboration
- Support cost-effective and flexible compliance
AB 32 Climate Change Scoping Plan

• Key Objectives for 2022 Scoping Plan:
  o Assess progress towards achieving the 2030 target
  o Lay out a path for achieving carbon neutrality no later than 2045
  o Identify endpoints in transition to clean technology and energy deployment

• Timeline:
  o Workshops and EJ Advisory group meetings and workshops began in June and are ongoing
  o Draft SP released in Spring 2022, followed by CARB Board discussion
  o Final SP release in Fall 2022, followed by CARB Board decision in Winter 2022
SLCPs in the Scoping Plan

• The upcoming Scoping Plan Workshop (Sept 8th):
  o Evaluation of progress towards the 2030 targets for SLCPs and challenges to achieving those targets
  o Identification of post-2030 SLCP emissions and mitigation opportunities
  o Discussion on ways to achieve deeper emission reductions and on pathways for fugitive methane end-uses for deep decarbonization
Thank You