Agenda Item: XX

Rule Development: Methane Strategy Update

Jacob Finkle
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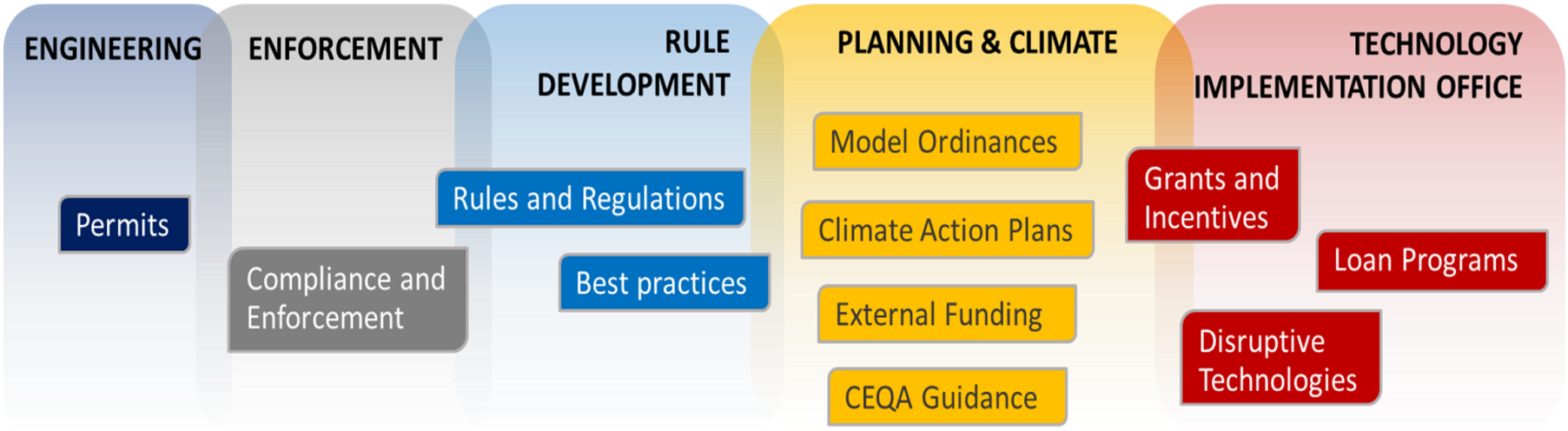
September 9, 2019

Outline

- Methane Strategy Overview
- Update on key efforts
  - Methane Emissions Inventory
  - Regulatory Efforts
- Rule Development Timeline

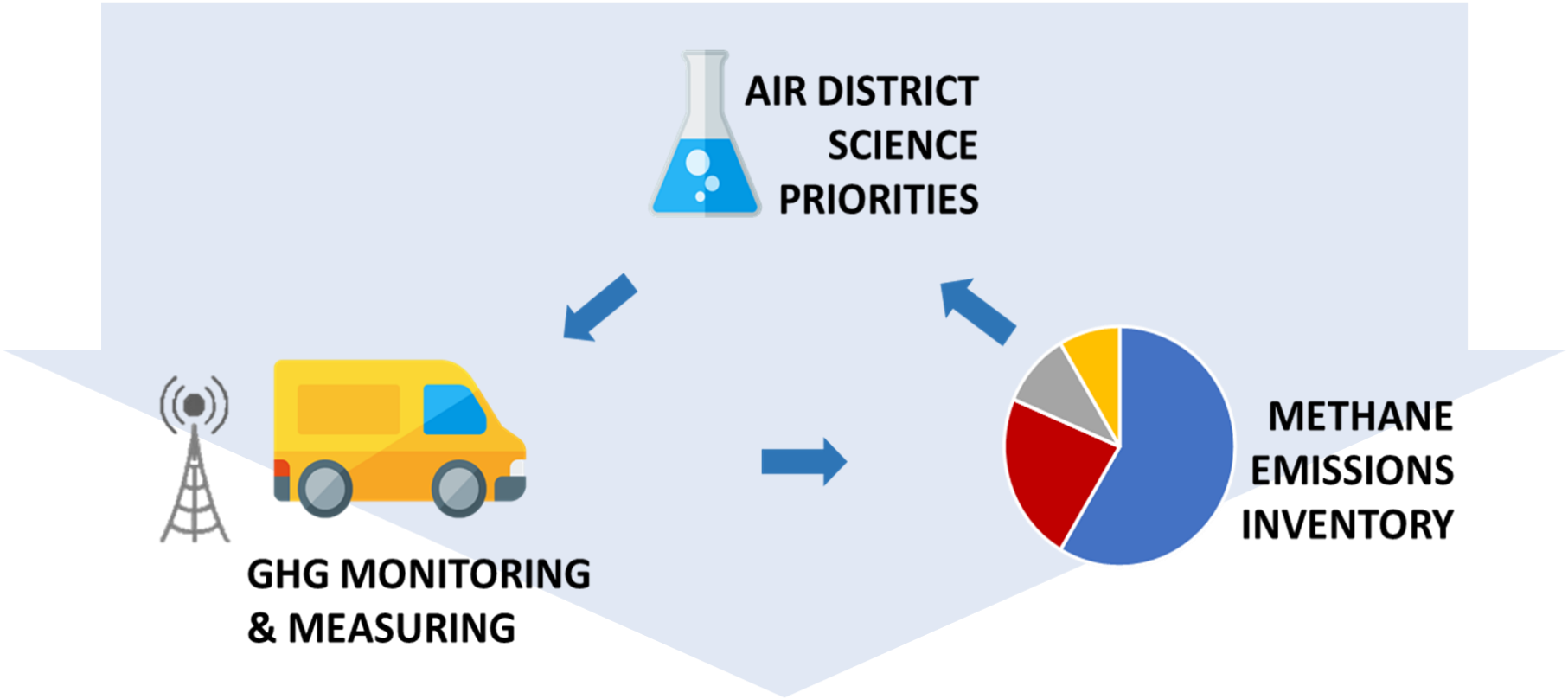
Air District's Methane Strategy

METHANE REDUCTION EFFORTS



Air District's Methane Strategy

METHANE QUANTIFICATION EFFORTS



Regulatory Update: Methane Strategy

Rules and Regulations

	GHGs	Odors	VOCs	Toxics
Rule 13-2: Organic Material Handling	CH_4	Yes	Yes	Yes
Rule 13-3: Composting Operations	CH_4	Yes	Yes	Yes
Rule 13-4: Sewage Treatment / AD*	CH_4, N_2O	Yes	Yes	Yes
Rule 13-5: Hydrogen Plants	CH_4	Yes	Yes	Yes
Rule 8-34: Solid Waste Disposal Sites	CH_4	Yes	Yes	Yes

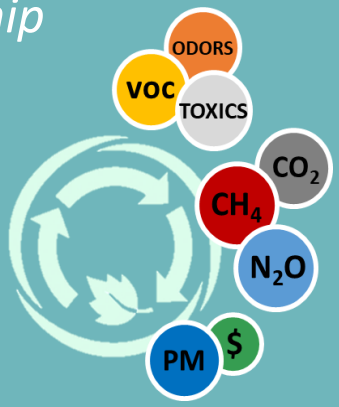
*Anaerobic Digestion

Regulatory Update: Methane Strategy

Rule 13-2 ORGANIC MATERIAL HANDLING

PURPOSE *To reduce methane and other emissions from storing, transferring and processing organic materials at transfer stations, chip and grind operations, and materials recovery facilities.*

CONCEPT *Rule 13-2 will address emissions from organic material handling operations by establishing industry-specific standards, best management practices, and record keeping requirements.*



SCHEDULE

WORKSHOP
Q2 2019

TO BOARD
Q4 2019

Regulatory Update: Methane Strategy

Rule 13-3 COMPOST OPERATIONS

PURPOSE *To reduce methane and other emissions from composting operations.*

CONCEPT *Rule 13-3 will incorporate industry best management practices to reduce methane and other emissions from composting operations, and will align definitions and recordkeeping requirements with SB 1383 regulations.*

CH_4

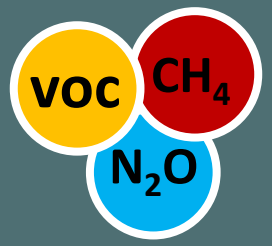
SCHEDULE

WORKSHOP	TO BOARD
Q1 2020	Q3 2020

Regulatory Update: Methane Strategy

Rule 13-4 SEWAGE TREATMENT & ANAEROBIC DIGESTION

PURPOSE *Adopt a rule to reduce methane, volatile organic compounds, and other climate pollutant emissions from sewage treatment and anaerobic digestion operations.*



CONCEPT *Provide requirements necessary to reduce climate pollutant and volatile organic compounds from sewage treatment and anaerobic digestion operations in one place.*

SCHEDULE

WORKSHOP	TO BOARD
Q1 2020	Q3 2020

Regulatory Update: Methane Strategy

RULE 8-34 SOLID WASTE DISPOSAL SITES

PURPOSE *Update Rule 8-34 to more effectively address methane from landfills.*

CONCEPT *Align Rule 8-34 with current state and federal regulations and require landfill operators to follow best management practices to reduce methane emissions.*

SCHEDULE

WORKSHOP	TO BOARD
Q1 2020	Q3 2020

Tentative Schedule

Rule #	Rule Name	Workshops	Public Hearing
13-2	Organic Material Handling	Q2 2019	Q4 2019
13-3	Composting Operations	Q1 2020	Q3 2020
13-4	Sewage Treatment & Anaerobic Digestion	Q1 2020	Q3 2020
13-5	Hydrogen Plants	Q4 2019	Q1 2020
8-34	Solid Waste Disposal (Landfills)	Q1 2020	Q3 2020

Discussion / Questions

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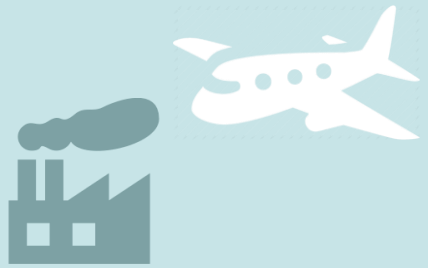
Methane Emissions Inventory

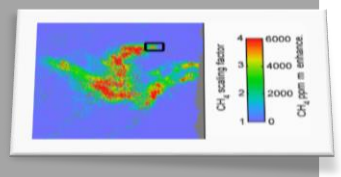
Identifying Underestimated CH_4 Sources

TIERED APPROACH

Aircraft-based flux estimates with in situ measurements



Aircraft surveys with visible/infrared imaging spectrometer (AVIRIS-NG)

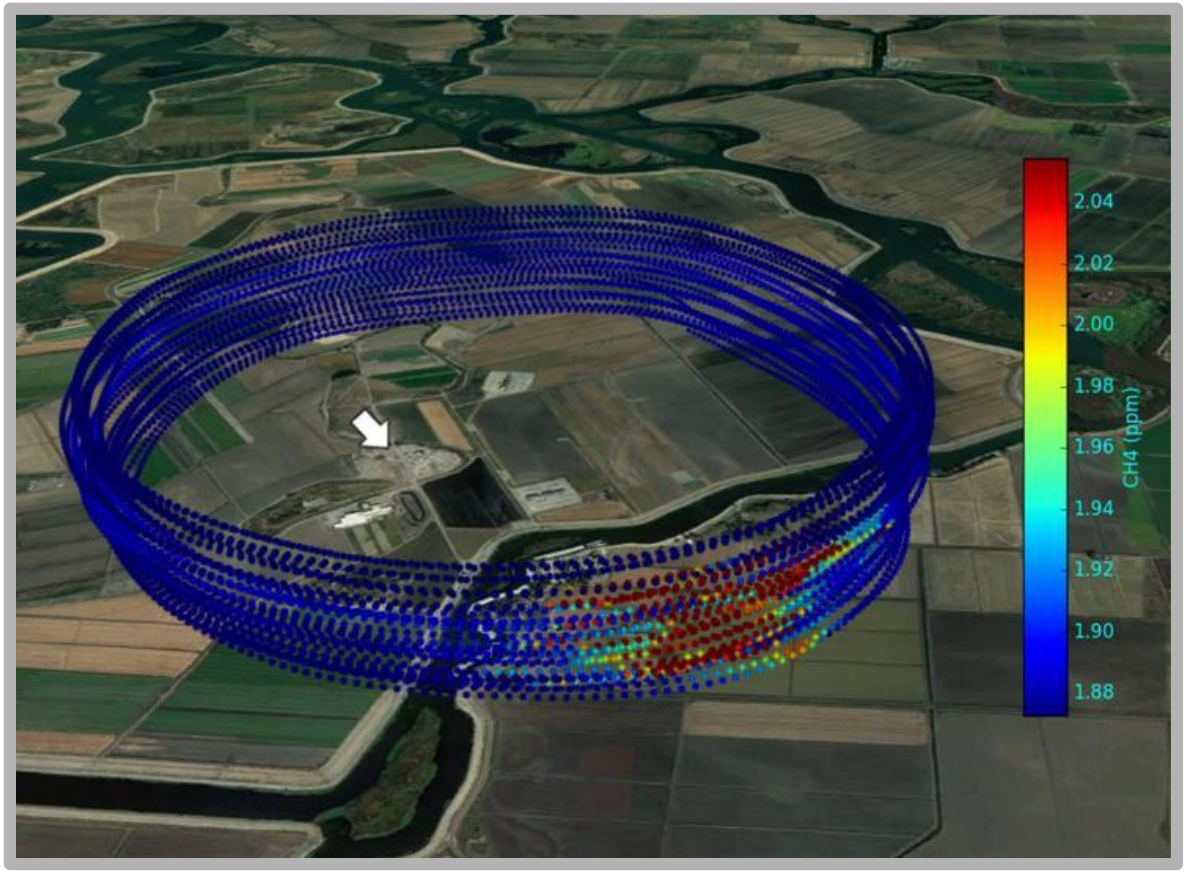


On-site leak detection (mobile van) and flux evaluation (infrared cameras)

Slide 12

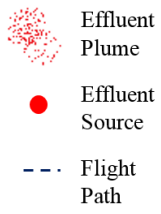
Tier 1: Estimating Facility-wide Emissions

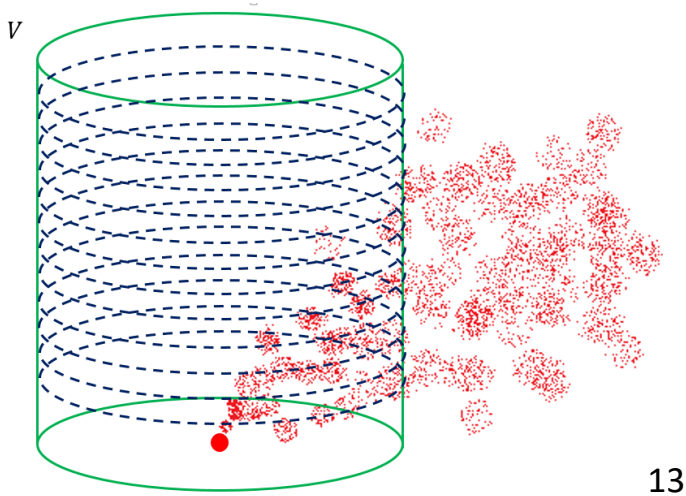
Curtain flights



Methane emissions from facility are carried downwind while being mixed upward to turbulent air motion

All methane emissions pass through the curtain, eventually!





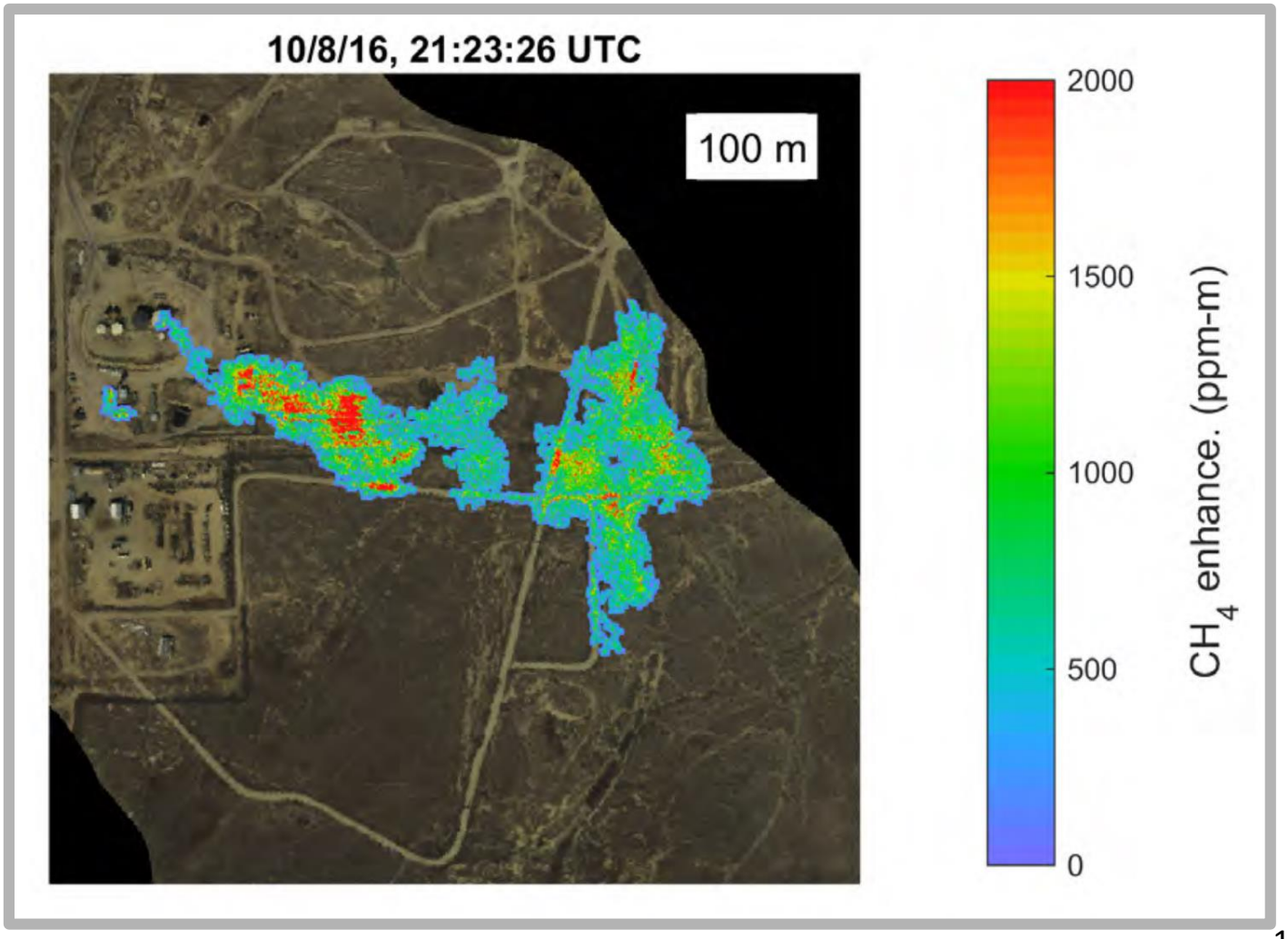
Conley et al., 2017

Tier 2: Locating Emissions Inside Facilities

NASA JPL Flights with AVIRIS-NG

Typical methane plume

Picture: Natural gas storage tank at Kern Front oil field



Duren et al., 2017

Tier 3: Measuring Source Emissions

Onsite Leak Detection and Quantification

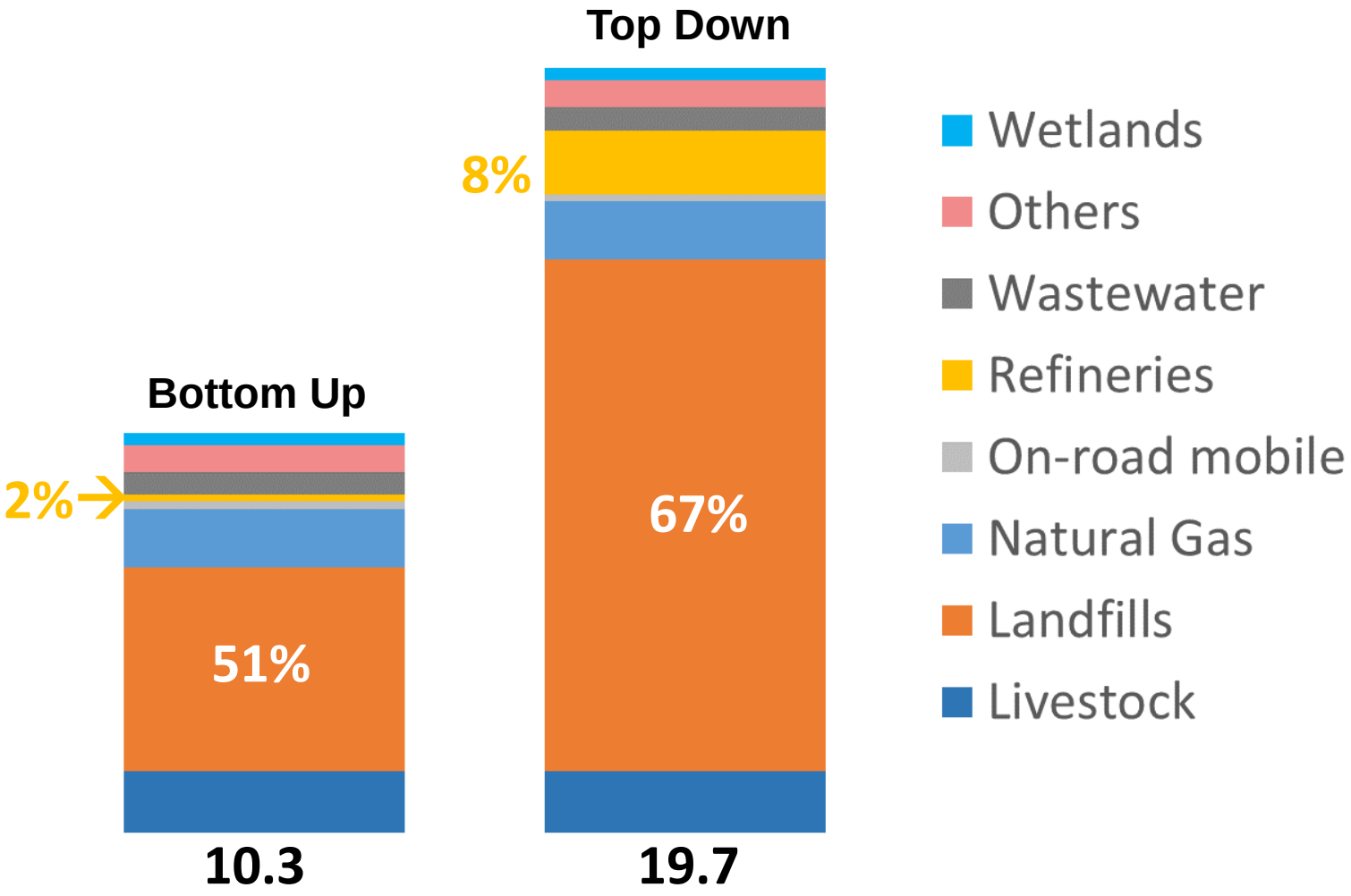
Identify emission 'hotspots', perform source attribution, and quantify emissions from processes or equipment

- *FLIR Camera*
  - Screening
- *GHG Research Van*
  - Fast measurements of CO_2, CH_4, & N_2O
  - Source apportionment using chemical tracers
- *Source Testing / other*
  - Quantifying emissions

Slide 15

Methane Emissions Inventory

Bottom-up inventory vs. top-down scaling



Organics Recovery Strategy

Supporting the State's diversion goals while protecting public health

CORE VALUES

- Support 50% organics diversion by 2020, and 75% by 2025
- Methane reduction without net greenhouse gas increase
- Robust local infrastructure and resilient supply chains
- Healthy regional and neighborhood air quality
- Partnership and ongoing learning