

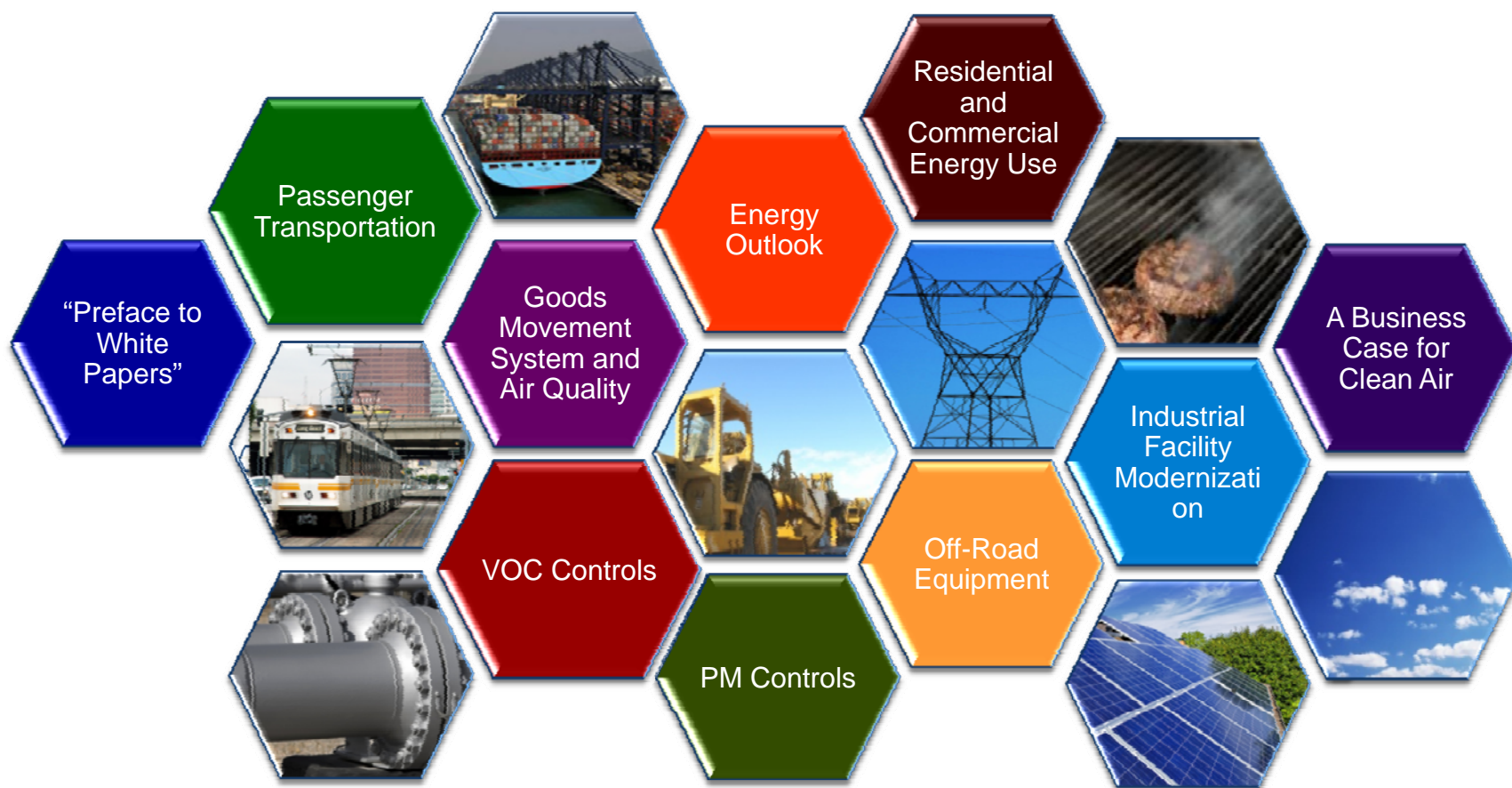


Off-Road Equipment White Paper

**Working Group Meeting
February 24, 2015**

Cleaning The Air That We Breathe...

White Papers for 2016 AQMP



2016 AQMP and White Papers

- AQMP Objectives
 - 2023, 2024, 2032 federal ozone standards
 - 2021-2026 federal PM2.5 standard
- White Papers
 - Facilitate understanding and input
 - Advanced control technology review/assessments with focus on zero- and near-zero emission technologies
 - Several of the White Papers focus on trade-offs among emissions categories within a sector

Off-Road Equipment White Paper

- Focus on the various off-road equipment categories that make up the sector
- Examines advanced control technologies that go beyond existing Tier 4 off-road emission standards
- Potential application of advanced control technologies in various off-road equipment categories

Off-Road Equipment White Paper Working Group

- Advise in preparation of White Paper
 - content, analyses, text

Draft for Discussion: Potential Outline of White Paper

- Purpose
- Background
- Overview of potential technology and efficiency strategies
- Potential application of advanced control technologies/efficiency strategies in various emissions source categories
- Examine costs and return on investments

Potential Outline, cont'd

Purpose

- Facilitate stakeholder and public understanding and input
- Examples of advanced control technologies and applications (include costs where available)

Potential Outline, cont'd

Background

- Off-road equipment sources and emissions
- Emission reduction progress to date
- Needed regional emission reductions, and implications on off-road equipment sectors

Potential Outline, cont'd

Emission Inventories

- Source Categories
 - Construction equipment
 - Mining equipment
 - Airport ground support equipment
 - Cranes
 - Forklifts
 - etc.

Potential Outline, cont'd

Overview of Potential Technology and Efficiency Strategies

- Engine Modifications
- Aftertreatment
- Alternative fuels and power
- Hybridization
- Efficiency measures

Potential Outline, cont'd

Potential Application of Advanced Control Technologies

- Discuss Examples:
 - Minimize economic impacts (capital and O&M costs, stranded assets, jobs, etc)
 - Minimize operational impacts (facility, system)
 - Potential for business case
 - Performance standards to generally be fuel and technology neutral
 - Energy availability; required infrastructure
 - Co-benefits: local toxics & EJ, GHG, energy cost certainty, etc

Next Steps for Working Group

- Initial draft Late Spring/Early Summer 2015
- Working Group meeting schedule