

Coordinating Research Council 2017 and 2018 MOVES related projects

Presented to the
EPA MOVES FACA
December 6, 2017

Susan Collet, Toyota, CRC AIC Co-Chair
Scott Mason, Phillips 66, CRC EC, Co-Chair

Aim of Presentation

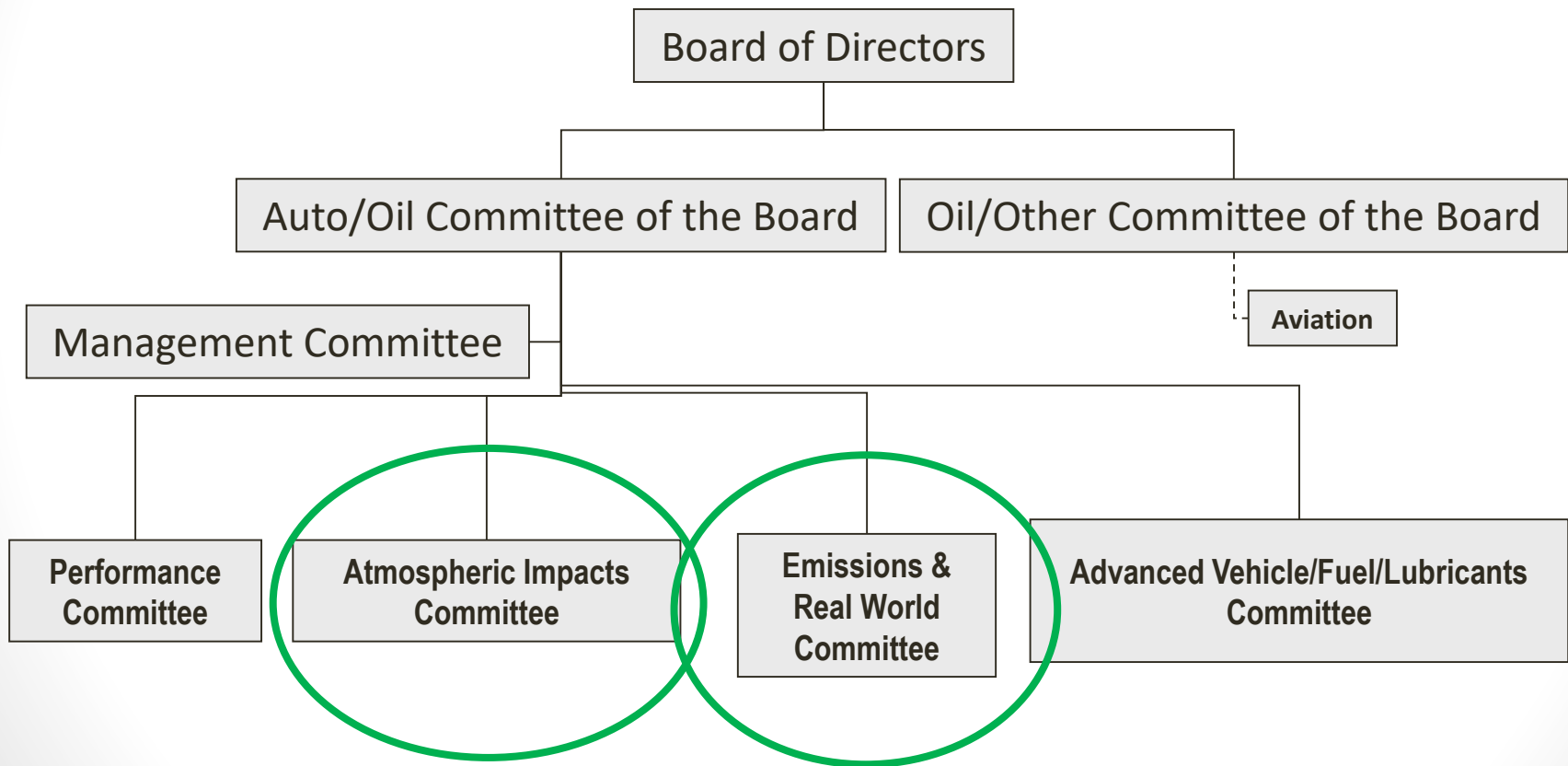
- Introduce the Coordinating Research Council (CRC)
(More info at: <http://www.crcao.org>)
- Emissions/Real World Committee (EC)
 - 2017 Projects
 - 2018 Planned projects
- Atmospheric Impacts Committee (AIC)
 - 2017 Projects
 - 2018 Planned projects

CRC Scope and Objectives

- To serve as a focal point for cooperative, precompetitive research between the mobility and energy industries and provide a forum for other important stakeholders to participate in the research
- To make technical information available to be used:
 - by industry to ensure compatibility and customer satisfaction
 - by industry, Government and the public to achieve clean air and other goals
- CRC is not involved in regulation, hardware, or fuel development; setting standards; or involved in advocacy

CRC Organization

- API and Auto Industry members equally support projects
- Outside organizations support many projects



AIM of CRC Emissions & Real World Committee

- To define interactions between automotive hardware and fuel composition and their effects on emissions
- To measure vehicle emissions contribution to pollutant inventory
- Real World Committee is open to all, good participation from CARB & EPA

Current Projects

Project No.	Title	Description
E-93-5	2017 5th LCA Workshop	Focusing on Life Cycle Impacts of Biofuels
E-110-27	Real World Vehicle Emissions Workshop	240 attendees, 50+ papers, March 18-21, 2018
E-99-2	Very Low PM Mass Measurement 2: Evaluation of partial flow diluters	Technology associated with PM measurement
E-102-2	E-102-2 LCA Fuel Pathway Min/Max Within Existing Models	Analysis of corn ethanol N ₂ O emissions and plant energy use
E-120	Literature Review: Anthropogenic / Biogenic PM Sources (including non-mobile)	Update model inputs for biomass burning
E-123	RSD Measurements - Multiple Cities 2017-2020	Long term project, shows improvement over years
E-119	EDAR Measurements: RSD on-road Pilot Study with DU Fall 2016 Campaign	RSD measurement using a new technology (HEAT)
E-119-2	HEAT-DU RSD Data Mining	Comparing HEAT vs. mature technology

Current Projects

E-123-2	RSD Meta-analysis: RFG vs non-RFG	Compare emissions in RFG vs non-RFG
E-123-3	RSD Evap High Emitter Meta-analysis	Data mining looking for high emitters
E-122	Light Duty PEMS Phase 1	Conduct LD PEMS testing with 3 PEMS units under real-road driving conditions and chassis roll emissions testing and compare results
E-124	RSD in Lynwood, CA	Revisit the Lynwood, California site to collect and compare emissions measurements to data from 27 years ago
RW-104	Carbon Stock Flow Life Cycle Analysis Scoping Study	New type of carbon modeling
RW-107	Feasibility of a "PM Index" Based Only on Volatility Properties	Evaluate the accuracy of various PM indices using common sets of fuel and vehicle data
E-94-3	Effect of Splash Blending EtOH on PM	Continuation of previous work
E-117	Combustion and Emissions Characteristics of a LDD vehicle Operating on a Renewable Diesel	Investigate how changes in renewable diesel properties and composition impact the emissions and combustion performance

2018 Projects

Project No.	Project Title	Description
RW-110-28	28th Real World Emissions Workshop	Emissions and air quality, 50+ papers over 3 days, March 18-21
E-119-3	HEAT Evaporative Emissions and PM Measurement	Measure on-road emissions (including evaporative and PM) using EDAR/laser based equipment.
RW-108	Investigate Appropriate Limits for Fe, Si, and Pb	Estimate the concentration limits of Fe, Si, and Pb at which selected vehicles would exceed the emission standards to which they were certified.
RW-114	PM/GHG Source Apportionment	Better estimate an overall biomass burning emission factor
RW-105	Liquid Leaker Test Vehicle Detection in E-123 DU RSD/ E-119-3 HEAT Test Campaigns	Liquid Leaker Test Vehicle Detection in E-123 DU RSD/ E-119-3 HEAT Test Campaigns to direct collection of real world measurements.
RW-112	MOVES Modeling With Different Fleets	EVAP inventory for several selected modern fleet inputs as compared to the baseline inventory (with updated RSD measurements).
RW-109	Evap/Fuel System Leak Rate Investigation	Inputs on evap leak frequency/ magnitude for MOVES may be overestimating leaks and should be re-examined with PZEV-type hardware which is becoming a larger portion of the EVAP fleet.
E-129	Effects of Alternative Oxygenates on PM	Improve understanding of fuel impacts on PM (Ethanol, MTBE, Isobutanol)
E-122-2	Light Duty PEMS- Phase 2	Continue work on PEMS, Provides a more comprehensive understanding of PEMS capabilities to measure tailpipe emissions
E-117-2	Renewable Diesel Fuel Property Effects on Light Duty Diesel (LDD) Vehicles (Phase 2)	Investigate how changes in renewable diesel properties and composition impact the emissions and combustion performance of diesel vehicles

Aim of CRC Atmospheric Impacts Committee

- **AIC Goal:** Focus AIC resources to improve the science used for regulations.

- **AIC Objectives:**

Improve ability to predict effect of emissions on air quality by:

Improving inventories

Improving air chemistry

Improving air quality models

Predict importance of emerging data

- **Project Funding Timeline:**

Year	Month	Steps
1	Feb	Request & compile project ideas
	April	AIC meet, prioritize projects for year 2
	June	CRC BOD review & approve year 2 projects
	Oct	CRC BOD approve revised year 2 projects
2		Project funds must be committed

Reference

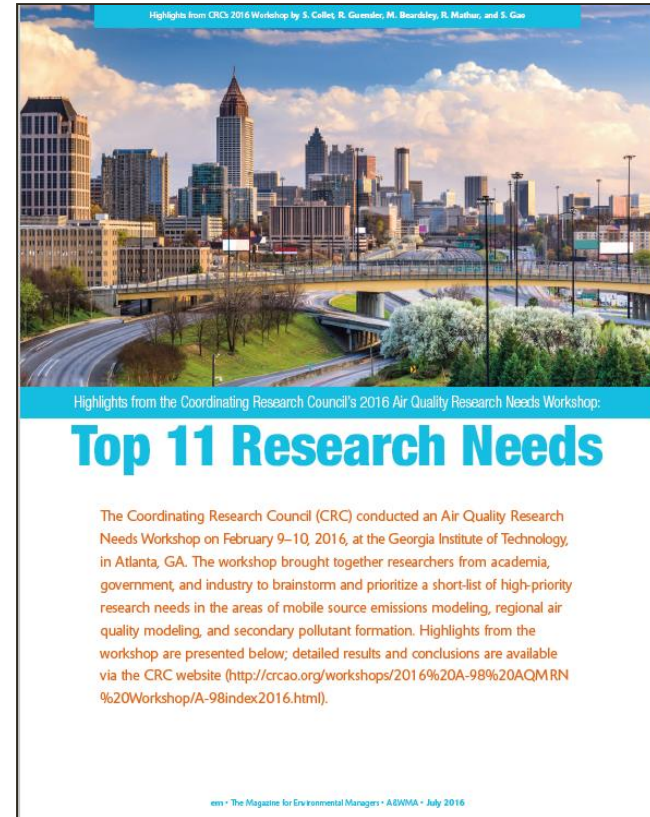
A-98: Air Quality Research Needs Workshop (2016)

Objective: Communicate AIC research to external community. Predict importance of emerging data by conducting the workshop.

Conclusion: 3 main topics were brainstormed: MOVES, SOA, and Regional Air Quality.
Overall, 11 priority areas were identified.

Status: Workshop completed, CRC Report issued, “em” article July 2016, and JAWMA articles.

Results used to help identify projects.



2017 Projects

Project #	Contractor	AIC Project Name	Status
A-105	Rambol-Env	Influence of NOx on Secondary Organic Aerosol (SOA) and Ozone	Study phase
A-106	ERG	Evaluate the Sensitivity of MOVES2014a to Local Data on Start Activity	Study phase
A-107	UCAR/ NCAR	Atmospheric Impacts of VOC Emissions: Formation Yields of Organic Nitrates in Reactions of Organic Peroxy Radicals with NO	Study phase
A-108	UCR	Development and Evaluation of Databases and Estimation Methods for Predicting Air Quality Impacts of Emitted Organic Compounds	Study phase
A-109	UTEP/DRI	Relationship Between Simulated PM2.5 to Varying Reductions of Ammonia Emissions over the South Coast Air Basin	Study phase
A-111	Rambol-Env	Improving West Coast Ozone Boundary Conditions for Regional Air Quality Models (with BAAQMD and CARB)	Study phase
A-110	ERG	Scoping Study for Rewrite of MOVES for Efficiency	Report Published

2018 AIC Projects

A-107	Atmospheric Impacts of VOC Emissions: Formation Yields of Organic Nitrates in Reactions of Organic Peroxy Radicals with NO
A-108	Development and Evaluation of Databases and Estimation Methods for Predicting Air Quality Impacts of Emitted Organic Compounds
A-113	The Influence of NO _x on SOA and Ozone Formation: Chamber Study
A-114	Characterizing Primary Organic Aerosol Emissions from In-Use Motor Vehicles
A-115	Developing Improved Vehicle Population Inputs for 2017 National Emissions Inventory
A-112	Relative Reduction Factors Using Anthropogenic Ozone Increments

Summary

CRC Emissions / Real World Committee:

- Projects published at:
<https://www.crcao.org/publications/emissions/index.html>
- MOVES related projects: 5 current, 5 in 2018

CRC Atmospheric Impacts Committee (AIC):

- Projects published at:
<http://www.crcao.org/publications/atmosphereImpacts/index.html>
- MOVES related projects: 2 current, 2 in 2018