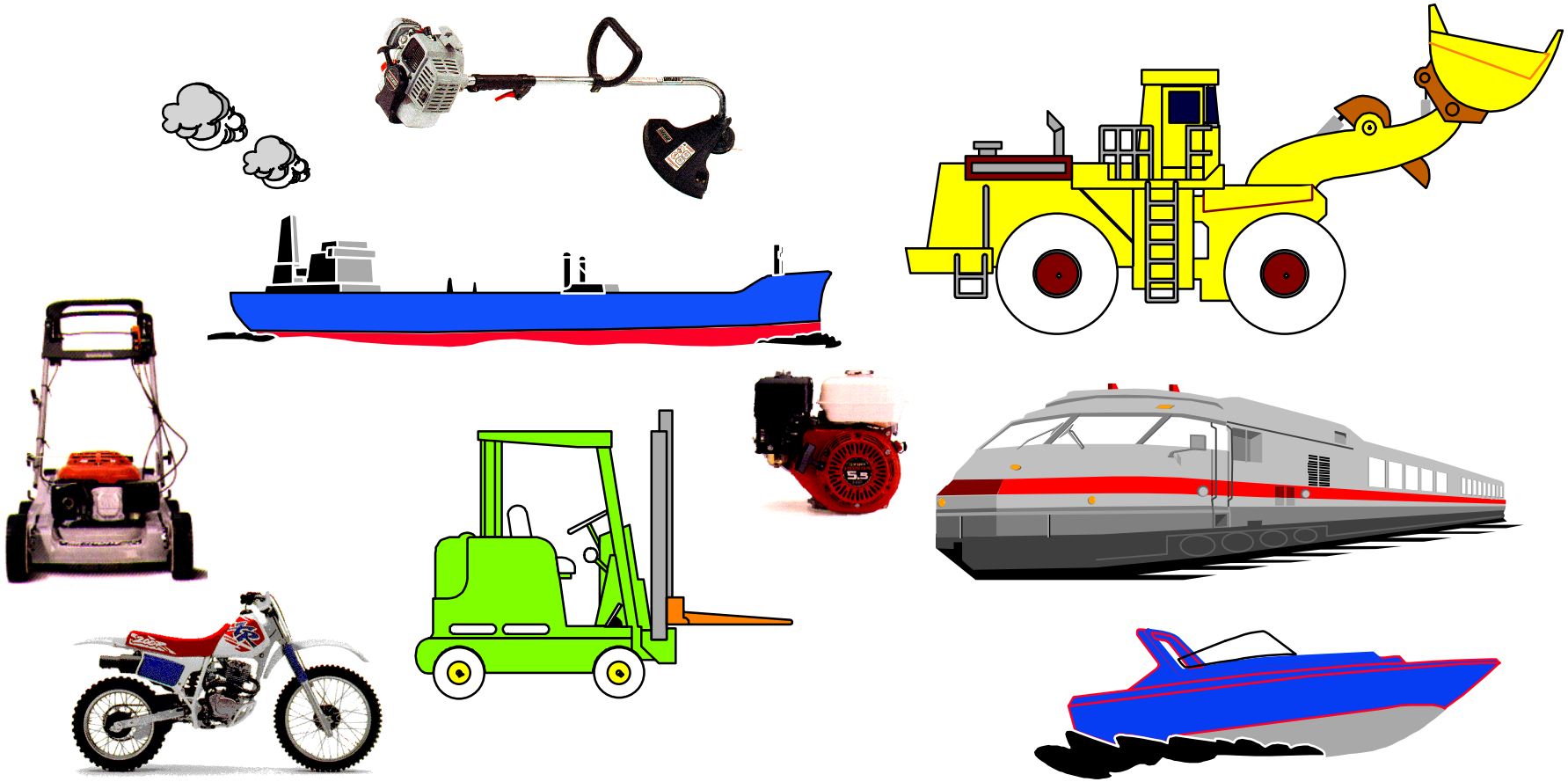
OFF-ROAD MOBILE SOURCE TECHNOLOGY REVIEW WORKSHOP

DAY 1 - Spark-Ignition

What are Off-Road Mobile Sources?



Why a Technology Review?

- Board directed staff to prepare a review of technologies available for use in off-road sources.
- Determine industry progress towards meeting the existing standards and requirements.
- Ensure staff and industry are fully aware of possible options for future control, including benefits and detriments.

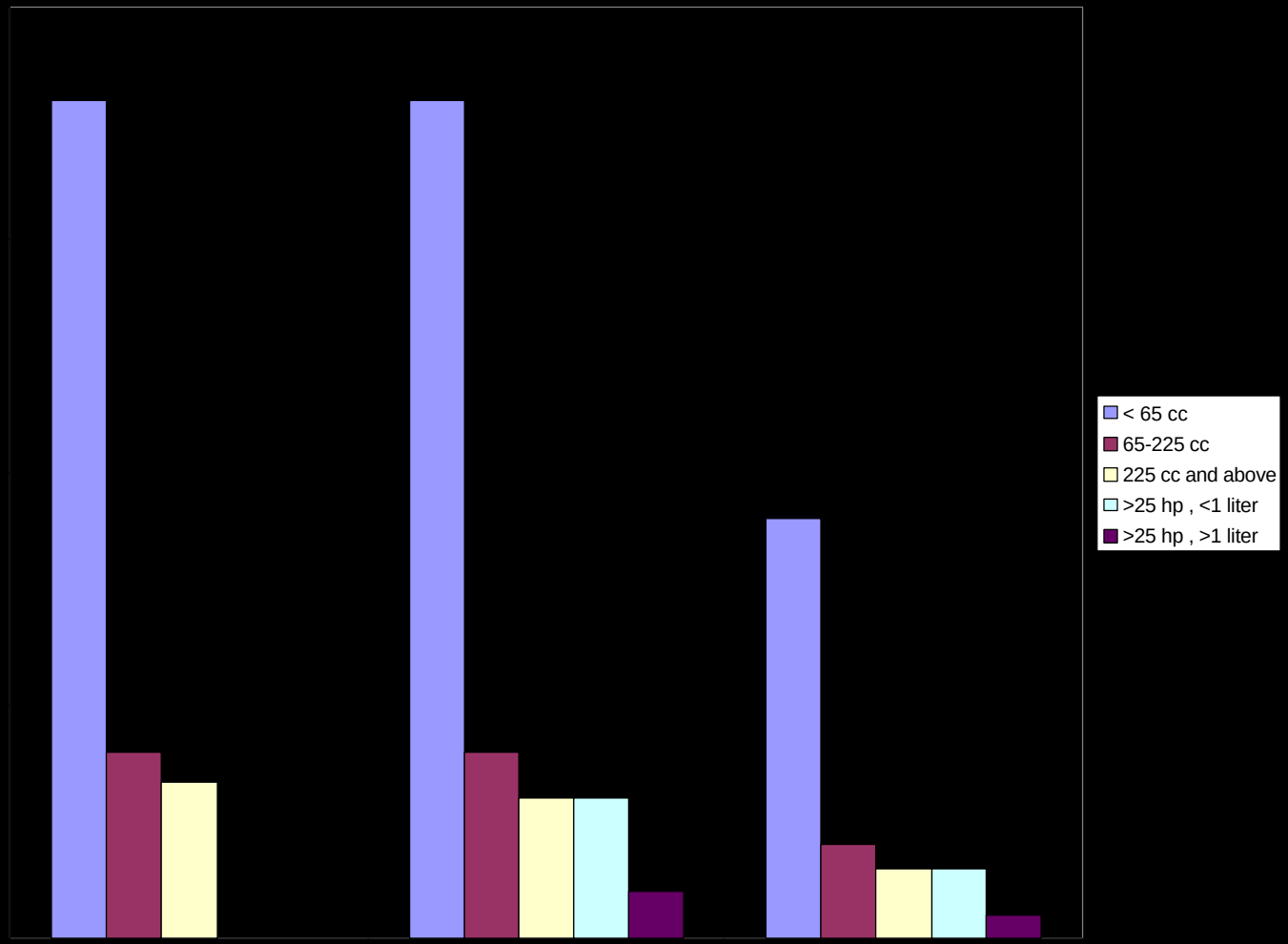
Technology Review

- Comment period extended to March 15
- Comments should address issues noted in the workshop notice
- Sign Up for individual meetings
- Report tentatively scheduled for November of this year

Today's Workshop

- Spark-Ignition Engines
- Early step in preparing technology review report for the Board
- Stimulate thought and inform

HC+NOx Emissions Standards



ARB Spark-Ignition Engine Research

- In Conjunction with EPA, contracts with Southwest Research
  - to determine LSI durability
  - to evaluate catalyst use on marine engines

Spark-Ignition Agenda

- Emissions Control Technologies for Off-Road Spark-Ignition Engines - Dale McKinnon, Manufacturers of Emissions Controls Association
- Case Study: The Results of IMPCO's GM 3.0 Liter Certified Engine Program - Josh Pietak, IMPCO

Spark-Ignition Agenda

- Induction Control and Fuel Preparation - George Boswell, Boswell Energy Systems
- John Deere LE Engine Technology - Pat McCreery and Britt Cobb, John Deere Consumer Products

Spark-Ignition Agenda

- Advanced Spark Ignition Technology for Reduced Emissions - Norman Garrett, Pyrotek
- Durability Experience with Electronically Controlled CNG and LPG Engines - Dr. Alex Lawson, GFI Control Systems, Inc.

Spark-Ignition Agenda

- LPG and CNG in Small Off-Road Engines - Dr. Brian Sun, IMPCO
- Professional DC Electric Powered Lawn Care Products - Larry Will, Echo Inc.

Spark-Ignition Agenda

- Secondary Air Injection for Single-Cylinder four-Cycle Engines - Paul Maurer, Maurdyne Industries
- Two-cycle Design Innovation - Matt Wilson, Maruyama Manufacturing Co.