OPGEE Revisions and Updated Crude CI Values

March 5, 2013
Agenda

• OPGEE Revisions: Professor Adam Brandt, Stanford University

• ARB Staff Discussion
  – Effect of model changes on crude CI estimates and 2010 Baseline Crude Average
  – Preliminary estimate for 2012 Crude Average CI
  – Additional crude CI estimates for Crude Lookup Table

• Future Work
Effect of OPGEE Changes on CI Estimates

- **WOR smart default**
  - Reduced CI estimate especially for older fields and fields using gas lift

- **Corrections to Bitumen Extraction and Upgrading**
  - Reduced CI values for Alberta oil sands crudes

- **Corrected time horizon for LUC emissions**
  - Increased CI values especially for fields located in tropical forest areas

- **Added demethanizer emissions for NGL separation**
  - Increased CI values especially for fields with high GOR

- **Correction to heater-treater calculations**
  - Reduced CI values especially for fields with large WOR
Effect of OPGEE Changes on CI Estimates

• Effect on 2010 Baseline Crude Average is small
  – OPGEEv1.0 estimate was 11.39 g/MJ
  – Preliminary OPGEEv1.1 estimate is 11.44 g/MJ
Preliminary 2012 Crude Average CI

- Surveyed California refineries for 2012 crudes
- Obtained 2011 crude production data
  - California DOGGR
  - Alaska Oil and Gas Conservation Commission
  - Alberta Energy Resources Conservation Board
  - Nigerian National Petroleum Corporation
  - NOAA National Geophysical Data Center
  - Oil and Gas Journal
  - North Dakota Industrial Commission, Texas Railroad Commission, Colorado Oil and Gas, etc.
- Estimated CI values using OPGEEv1.1_DraftA
- Preliminary 2012 Crude Average CI of 11.45 g/MJ
Additions to Crude Lookup Table

• All crudes supplied during 2011 and 2012
• Most crudes supplied during 2006 to 2009
• Other crudes for which data are available
• Crude names supplied by refiners
• Default CI values
  – TEOR, mining, synthetic crude
  – Conventional recovery
Future Work

• Stakeholder comments due April 5, 2013
  – OPGEE revisions
  – Crude production data and modeling
  – Additional crudes to assess
• Collect additional data
• Revise OPGEEv1.1 and CI estimates
• Propose LCFS amendments
  – Incorporate OPGEEv1.1
  – Revise 2010 Baseline Crude Average CI
  – Update and make additions to Crude Lookup Table
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Thank You