US EPA Emissions Inventory Conference

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Consistency in Greenhouse Gas Emissions Estimation for Oil and Gas Industry Operations – A Non-Trivial Pursuit

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Topics for Discussion

- API Climate Challenge Program
- Consistency and Comparability in Emission Estimates
- Outreach Efforts and Special Studies
- Conclusions

API Climate Challenge Programs

I.	Climate Action Challenge	➔ Strategies for reducing GHG emissions
II.	Climate R&D Challenge	➔ Support for enhanced research & development
III.	Climate GHG Estimation & Reporting Challenge	➔ Implementing robust methods for calculating, reporting and tracking emissions industry-wide.

API Methodology Compendium

- Issued in April 2001 for “road-testing” and “learning by doing”
- Main Attributes include,
  - Consistent, standardized methodologies
  - Compilation of recognized estimation approaches
  - Focussed on carbon dioxide (CO_2) and methane (CH_4) emissions
  - Combustion sources have broad industry application
  - Non-combustion sources specific to oil and natural gas industry

Role of Compendium in Climate Challenge Program

Participants in API's GHG Estimation & Reporting Challenge will use the compendium to estimate their GHG emissions and report the estimates on US emissions to API.

API will aggregate member company emissions data for annual reporting and track progress toward the President's goal via industry sector appropriate GHG-intensity metrics.

An expanded API GHG Benchmarking program will allow participants to compare their progress with sector averages.

Consistency and Comparability in Emission Estimates

- **Need for Consistency –**
  - Data aggregation,
  - Performance evaluation, and
  - Identification of trends
- **Elements of Comparability –**
  - Estimation approaches,
  - Organizational boundaries,
  - Emission sources included, and
  - Data presentation and report approach

Greenhouse Gas Calculation Tool SANGEA™

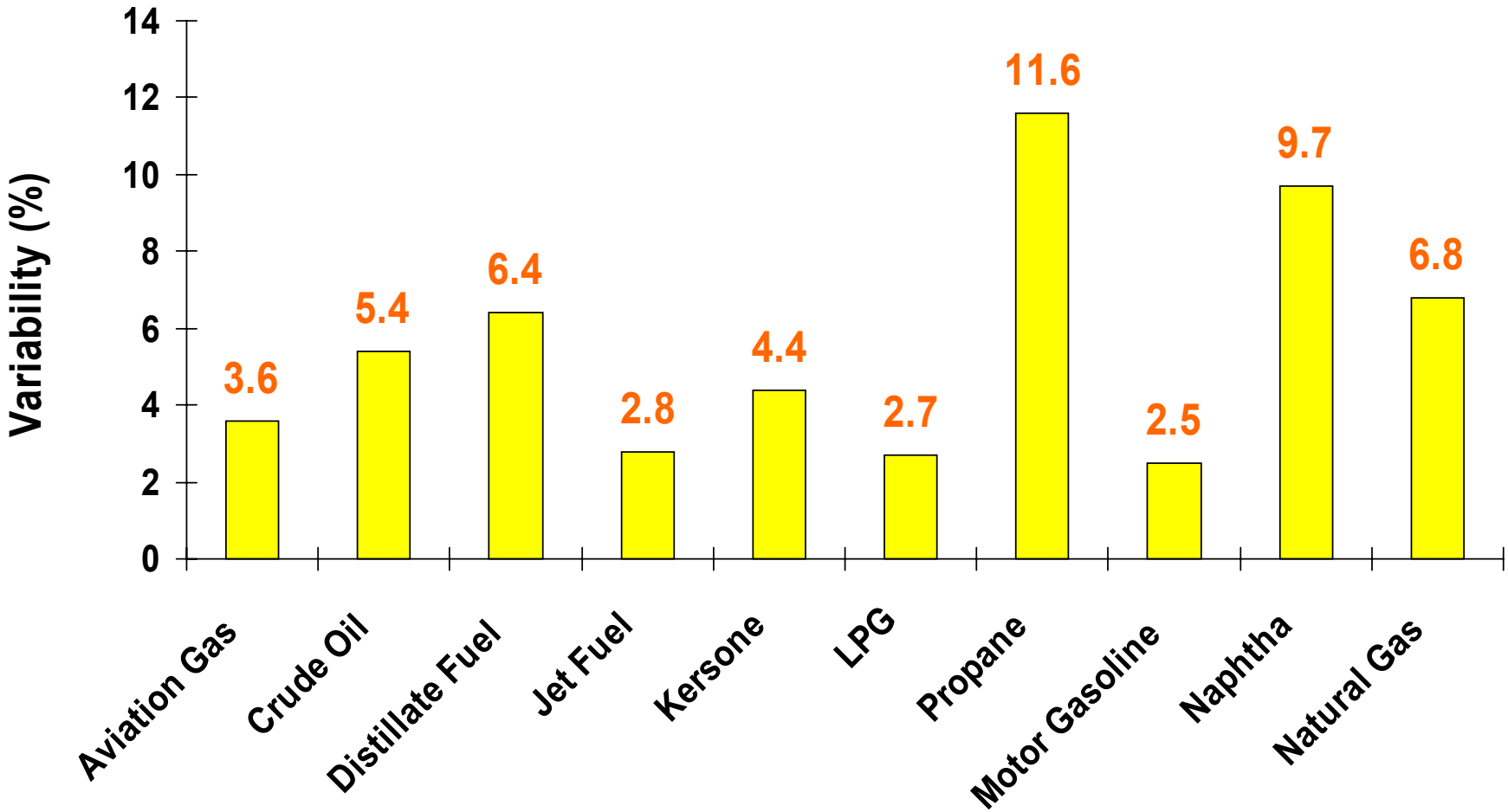
Emission Factors Comparison

- **Evaluation of root sources of the emission factors used for estimating GHG emissions**
  - **Ensured that they are current**
  - **Ascertained transparency and documentation of their development**
  - **Reviewed proper application of literature factors**
- **Presentation of observed variability in a subset of currently used combustion emission factors**
  - **Focused on factors that have broad application to all industry operations utilizing fossil fuels**

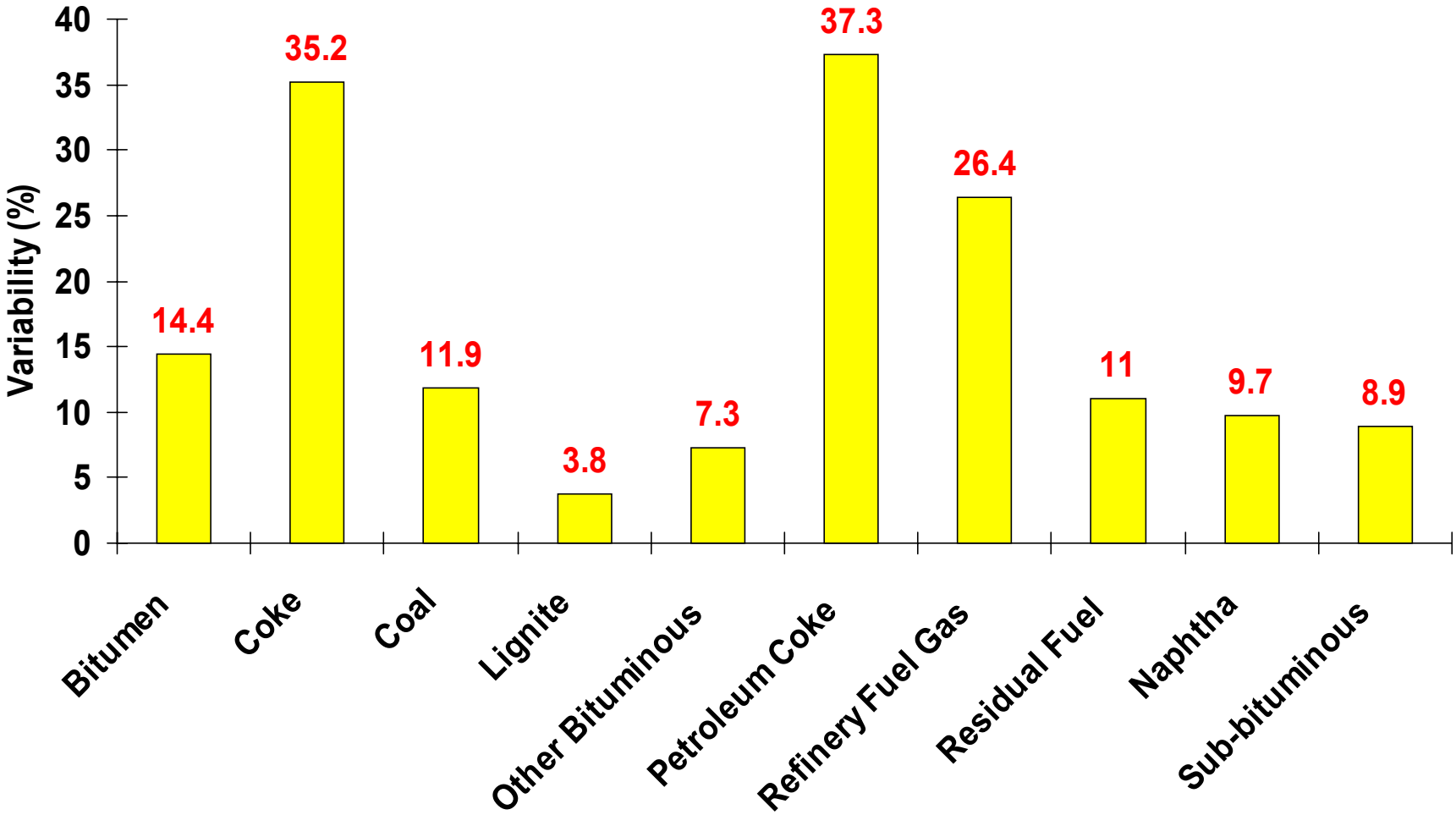
GHG Protocols Included in The Comparison

- API Compendium, "Road-Test" Draft;
- Australian Greenhouse Office (AGO), Workbook for Fuel Combustion Activities;
- Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC) memorandum on "Guide for the Consumption of Energy Survey";
- Intergovernmental Panel on Climate Change (IPCC), Guidelines for National GHG Inventories;
- UK Emissions Trading Scheme (UK ETS);
- World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD), The Greenhouse Gas Protocol.

Comparison of CO_2 Emission Factors: Gas & Liquid Fuels



Comparison of CO_2 Emission Factors: Solid Fuels



Key Findings from CO_2 Emission Factors Comparison

I. **Need for unambiguous specification of heating value convention used**
   - "High Heating Value" Vs. "Low Heating Value"

II. **Variability of fuel-based emission factors is linked to deviation from average fuel specifications**
   - For high quality results need fuel specific data (e.g. composition, heating value, density, etc.)

III. **Uniform application of fractional conversion of carbon to CO_2 is highly desirable**
   - Complete vs. fractional oxidation for various fuels

API Synopsis Report, 2002

Outreach Efforts and Special Studies

- Dialogue among oil and gas associations worldwide
- Discussions with other protocols developers
- Protocols comparisons and emissions reduction studies
- New initiative for Global GHG Reporting Guidelines

Attaining global consistency will ensure national and regional comparability in estimation techniques and the eventual fungibility of emission reduction credits among those nations with comparable crediting or trading regimes.

Global GHG Reporting Guidelines Initiative

- **A new joint effort of the global Oil & Gas Industry**
  - **Spearheaded by API** *(American Petroleum industry),* **IPIECA** *(International Petroleum Industry Environmental Conservation Association*) **and OGP** *(International Association of Oil & Gas Producers)*
- **Guidelines will address:**
  - **Corporate or facility accounting principles;**
  - **Ownership accounting;**
  - **Direct and indirect GHG emissions boundaries;**
  - **Establishing and revising baselines;**
  - **Retrospective business portfolio changes;**
  - **Estimation reliability (accuracy and completeness);**
  - **Assurance processes for confirming integrity;**
  - **Determination of applicable GHG species; and**
  - **Normalizing absolute emissions.**

Conclusions

- Robust methods for calculating, reporting, and tracking emissions are essential for cost-effectively managing GHG emissions.
- Consistent methodologies lend credibility to the estimates and enable aggregation and comparison.
- Initial “road testing” of the API Compendium and special studies undertaken further support the pursuit of consistency.
- These activities have spurred new initiatives to progress toward harmonization of methodologies and improved global compatibility of oil and gas industry emission estimates.