

WORKING GROUP PRESENTATION FOR DISCUSSION PURPOSES
DO NOT QUOTE OR CITE AS RESULTS ARE SUBJECT TO CHANGE

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FROM: MACROECONOMIC & INDUSTRIAL ENERGY
CONSUMPTION & EFFICIENCY ANALYSIS TEAMS

SUBJECT: Second *AEO2013* Macro-Industrial Working Group Meeting
Summary (presented on 09-11-2012)

Attendees: Frances Wood (OnLocation)
Keith Jamison (Energetics)
Tom Lorenz (EIA)
Bob Adler (EIA)
Russ Tarver (EIA)
David Henry (Commerce Dept.)
Susan Hicks (EIA)
Paul Otis (EIA)
Peri Ulrey (Natural Gas Supply Association)
Chris Yuan (Univ. Wisconsin – Milwaukee)
David Schmalzer (ANL)
John Meyer (SAIC)
Martha Moore (American Chemistry Council)

Presenters: Kay Smith, Elizabeth Sendich (Macro)
Kelly Perl, Mark Schipper, Peter Gross (Industrial)

Macro: The macro presentation provided a near-final round of GI's (Global Insights') long-term forecast of GDP, employment, productivity, and industrial gross output for a number of industries. In comparing the *AEO2013* macro forecast with the *AEO2012*, the presenters stressed the importance of incorporating EIA's shale gas expectations (both in terms of robust supply and low price) and how this influenced GI's growth expectations for natural-gas intensive industries. In addition, GI's lower expectations for imports of commodities such as basic chemicals, primary metals, and metal-based durables also contribute to the *AEO2013*'s higher gross output expectations in the short to medium term. Finally, it was pointed out that the *AEO2013* reflects a more optimistic view of growth than the *AEO2012* in metal-based durables, especially transportation equipment and machinery, on the basis that the United States' technical advantage in this area would allow its export market share to remain strong through 2025. Finally, an error in the pharmaceuticals and miscellaneous manufacturing shipments number was corrected for the *AEO2013*.

Specific discussion/questions:

1. Invitees asked the macro presenters what helped drive the optimism in trade which helped to drive up gross output forecasts in *AEO2013* relative to *AEO2012*. Kay Smith reminded everybody of the strong influence of cheap natural gas on industries' plans for increasing utilization and even domestic capacity...this is especially true in the bulk chemicals industry, primary metals, and metal-based durables. While both imports and exports are lower in the *AEO2013*, growth in imports is lower by a wider margin from *AEO2012* to *AEO2013*, and thus the overall the trade balance remains more favorable and allows for more domestic demand to be provided by domestic production, at least through 2025.
2. One invitee asked how the employment rate behaved in the long-term, and Kay Smith said it flattened out due in part to fact that the US population is aging along with a growing retiree percentage of the population.
3. The decline in industrial shipments for chemicals and primary metals did not go unnoticed by the invitees. Elizabeth Sendich and Kay Smith explained that this decline was based on the assumption that the United States' competitive advantage in these industries (driven by cheap natural gas and its associated liquids) was assumed to decline as the age (and associated efficiency) discrepancy between the bulk of the manufacturing equipment here and abroad begins to affect the results more strongly in the later years.

Industrial: The industrial part of the working group presentation provided major changes/updates for the *AEO2013* version of the Industrial Demand Module (IDM) and some preliminary results. These included:

- (1) implementation of the new aluminum process flow model, along with new assumptions regarding primary aluminum production leading to a greater consumption in electricity;
- (2) implementation of new models for non-manufacturing sectors including construction, coal mining, oil & gas extraction, and other mining; emphasis placed on tying energy consumption in these sectors with NEMS-endogenous variables such as coal mining

- productivity, oil & gas well productivity, transportation equipment efficiency, and buildings efficiency;
- (3) enhancement of the combined heat and power (CHP) model with diversified utilization to include industrial sub-sectors and four census regions;
 - (4) updating of the CHP database with 2011 data from EIA's Office of Energy Statistics;
 - (5) upgrading the LPG (liquefied petroleum gases, mainly propane) price equations to include Bayesian regression coefficients; propane prices in near-term forecast reflect more strongly the current cheap natural gas prices;
 - (5) expansion of the chemical model to include price-driven feedstock choices between LPG and naphtha;
 - (6) implementation of the environmental regulations from Assembly Bill 32 (State of California greenhouse gas regulations) and boiler MACT (Maximum Available Control Technology, a Clean Air Act emissions reduction requirement). Boiler MACT implementation included a capital cost adder in the macro model as well as an increased price penalty on oil-based and coal fired boilers relative to natural gas boilers – the influence of these changes on industrial shipments and energy consumption was estimated to be minimal.

Specific discussion/questions:

1. A participant asked if the lower LPG prices affected chemical output. Elizabeth Sendich responded that no, not directly, but that a coefficient comprised of the natural gas price to oil price ratio was used to inform the chemical shipments forecast in the *AEO2013*. For *AEO2014*, Elizabeth said it is a goal to use feedstock prices directly.
2. It was asked if a lower consumption of naphtha as feedstock in the chemical sector projections would lead to lower oil imports. Peter Gross responded that it would possibly, but that refineries could likely make up most of that difference by producing other products, either for export or for domestic consumption (such as LPG).
3. One participant asked if the industrial model's documentation for *AEO2012* had been published...answer: no, not yet, although documentation will come soon.
4. In a discussion about the chemicals industry, one invitee pointed out that while China's ability to fully exploit its shale gas resources in the future is uncertain, it is currently working on plans to develop its huge coal resources as a feedstock ("coal-to-olefins"). The industrial team will further investigate this possibility and possibly investigate how this could affect some of GI's macro forecast assumptions.