

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DO NOT QUOTE OR CITE AS RESULTS ARE SUBJECT TO CHANGE

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MEMORANDUM FOR:

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FROM: MACROECONOMIC & INDUSTRIAL ENERGY  
CONSUMPTION & EFFICIENCY ANALYSIS TEAMS

SUBJECT: First AEO2016 Macro-Industrial Working Group Meeting  
Summary, presented on 12-03-2016

Attendees:

Bob Adler (EIA)  
Gale Boyd (Duke University)  
Robert Hershey, Consultant  
Keith Jamison (Energetics)  
Tom Lorenz (EIA)  
David Daniels (EIA)  
Vipin Arora (EIA)  
Michael Chow (National Federation of Independent Business)  
Meegan Kelly (ACEEE)  
Colin McMillan (NREL)  
Carl Bozzuto (Alstom Power)  
David Gibson (Kaiser Associates)  
David Rosner (DOE)  
Frances Wood (OnLocation)  
Joel Bluestein (ICF)  
Kevin Dubina (BLS)  
Matthew Hansen (National Energy Board of Canada)  
Michael Pickens (IHS Energy)  
Prakash Rao (Lawrence Berkeley Lab)  
Robert Bessette (CIBO – Council of Industrial Boiler Owners)  
Walt Tunnessen (US EPA)

William Morrow (Lawrence Berkeley Lab)

Presenters: Kay Smith, Elizabeth Sendich (Macro)  
Kelly Perl, Peter Gross, Susan Hicks (Industrial)

*Macro:* The macro presentation provided preliminary *AEO2016* projections using IHS Global Insights' (IHS) long-term macroeconomic forecast and EIA's preliminary energy prices. Key differences between last year's *AEO2015* and the *AEO2016* include:

- Historical baseline changes were made in GDP, gross output (for some industries), and physical-to-dollar values for goods and services.
- IHS now uses explicit modeling of industrial gross output beyond 2025 instead of employing trends.
- Dynamic IO is now extended throughout the forecast.
- Changes in productivity data which affect employment projections (*AEO2016* assumes lower productivity, resulting in higher employment in the projections) were made.
- GDP growth in *AEO2016* is 0.1% lower than in the *AEO2015*.
- Both import and export growth are lower in the *AEO2016* compared to the *AEO2015*, but the export growth takes a larger dip, resulting in a decline in net exports.
- Gross output projections of basic materials (metals, non-metallic minerals, bulk chemicals) are stronger in the *AEO2016* due to larger assumed consumer demand in the U.S. and lower feedstock prices in the *AEO2016* (compared to IHS prices).

*Industrial:* The industrial part of the working group presentation provided general model development plans associated with major changes and updates for the *AEO2015* version of the Industrial Demand Module (IDM). These include:

- Process flow modeling is now complete (steel and paper completed for *AEO2016* in addition to the previously completed cement & lime, aluminum, and glass industries). These allow for explicit tech choice within each of process flows of these industries, and they will allow for better representation of the new *AEO2016* "Energy Efficiency" side case as well as future carbon policy constrained side cases. Some expected outcomes in the *AEO2016* results include better representation of future CHP additions (especially in the new paper & pulp process flow model) and lower petcoke fuel consumption in the aluminum sector.
- Benchmarking and calibration: individual industrial published tables are now benchmarked to total industrial sector energy consumption; non-manufacturing data updates (Economic Census and EIA data) are complete; *AEO2016* efforts to calibrate model output with fuel-specific EIA and non-EIA sources are underway.
- Regulation updates for the *AEO2016* include updated motor efficiencies which now reflect the latest motor efficiency standards (10 CFR 431 Part B, Federal Register Cite FR 79 pp 30934-310104 (2014)).

*Discussion/questions:*

1. (Reflecting the lower baseline productivity change for the *AEO2016*): Is *total* (not just industrial) U.S. employment higher? Answer: Yes.
2. Do the current *AEO2016* runs shown in today's presentation include effects from the Clean Power Plan (CPP)? Answer: No, but they ultimately will through NEMS feedback from the Electricity Market Model (EMM) which will be based on the investment base differential between a CPP and non-CPP model run.
3. Why is there a projected dip in the single housing starts midway through the projections? Answer: This reflects the demographic end of the baby boomers in the U.S.
4. (In regards to the macro bulk chemical projections): Does ethane price follow the oil price? Answer: No, not necessarily, because the new ethane pricing methodology implemented in the *AEO2015* allows for the ethane price to vary in its dependence on the natural gas or oil price over the course of the projection period.
5. (In reference to the notable flatness in the long-term U.S. projections of the paper & pulp industries): Can it be assumed that overall world growth in paper and pulp is positive, so that the flatness in the U.S. is then explicitly compensated by growth in other regions of the world? Answer: Our current IEO global paper industry growth is 2.2% average annual growth 2014-2040.
6. Are productivity levels different in different industries? Answer: Yes, there is a calculation to differentiate durable goods and non-durable goods manufacturing, but the Macroeconomic Activity Model (MAM) does not differentiate between individual industrial productivities.
7. Does industrial CHP as modeled in the AEO receive credit for the Clean Power Plan (CPP)? Answer: No, the IDM does not participate in the CPP. We will look into this further as other entities (like ACEEE) believe there is some opportunity for industrial CHP to receive credits under the CPP.
8. How does the "delta" between the *AEO2015* and the *AEO2016* CHP projections in slide 5 reflect the larger growth in bulk chemicals in the preliminary *AEO2016* macro projections? Answer: It is true that one of the largest users of CHP is the chemicals industry, and thus the increased growth pattern in shipments in this industry should be reflected somewhat in the *AEO2016* total industrial CHP projections. However, the preliminary CHP projections are an aggregate of all industries, and thus the change in how the paper & pulp industry is modeled could be significant enough to mute the change in bulk chemical CHP growth. We will investigate further.

The next scheduled joint macro-industrial work group meeting will occur on January 26, 2016 from 10:30 to 12 noon.