AEO2018: review and your feedback

For
First Industrial Working Group
May 22, 2018 | Washington, DC

By
OEA Industrial Team
Overview

• Recap of AEO2018
  – Overview of recently released AEO2018
  – Some larger industry results
  – A word about paper

• Your feedback on AEO2018 so we can improve AEO2019
Value of Shipments: Nonmetallic minerals (NMM) and metal-based durables (MBD) show fastest growth in the AEO2018

average annual growth rate 2017-2050 (bars)

2017 shipments billion 2009 USD (squares)

Source: AEO2018
Natural gas is the most consumed energy source in the Industrial sector, while industry consumption shares remain mostly steady.

Source: AEO2018 Reference case
Natural gas fuel consumption is crucial to many manufacturing industries, though 3 industries consume the majority of it.

**Natural gas fuel use intensity by manufacturing industry**
percent of industry fuel consumption

- Glass
- Bulk chemicals & heat and power
- Food
- Aluminum
- Metal based durables
- Steel
- Refining
- Paper
- Other non-energy intensive

**Natural gas fuel consumption in manufacturing**
quadrillion btu

- 2017
- 2050

Source: AEO2018 Reference case
CHP is increasingly natural gas fired, with bulk chemicals constituting an ever increasing share.

Source: AEO2018 Reference case
Bulk chemicals – what a difference a MECS makes

- Bulk chemicals will come to increasingly rely on natural gas for heat and power
- Substantial increase in LPG & other feedstocks in MECS – about 340 trillion Btu - increase of 18% between MECS 2010-2014
- Shares in LPG & other and petrochemical feedstocks don’t change much over time

Source: AEO2018 Reference case
Iron and steel and aluminum industries both increasing secondary processing more quickly than in past.

Steel electric arc furnace (EAF) proportion steady at ~67% throughout projection.

Energy intensity declines slightly 2017-2050.
Paper energy consumption increases 1%/year; renewables and natural gas fastest growing

- Renewables share increases from 56% in 2017 to 66% by 2050

- Total electricity consumption
  - Total electricity (purchased + generated) declines 5% 2017-2050
  - CHP generated increases 15%

- Intensity (energy/$) increases to 2035 – increased CHP doesn’t explain all of it
But this does: Bug discovered in ironstlx.xlsx input file, which will be fixed for AEO2019

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• Shifted inputs for two recovery furnace technologies increased black liquor output

• Technology 6 – most efficient - chosen less often than it should have been

• Less CHP was used because Technology 6 is a CHP technology

Source: ironstlx.xlsx input file
After fix, paper energy consumption increases 0.6%/year; “Before” on the left, “After” on the right.

Sources: AEO2018 Reference case and AEO2018 run with corrected input file.
Your feedback on AEO2018 – how can we improve for AEO2019?

• What would you like to see more of?
  – Coverage?
  – Content?

• What can be improved?

• What insights from your industry can help us?

• Visuals
  – New?
  – Improve existing?
Industrial meeting materials will be posted in about a month

Link:
https://www.eia.gov/outlooks/aeo/workinggroup/industrial/

Next meeting – TBA – may be working group or smaller workshop
Thank you for your attention!

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Preview of AEO2019 and beyond

• Review relationship between types of pulp & paper; paper composition changes over time pulp composition doesn’t

• Retire Coal CHP units to reflect recent history; bulk chemicals CHP coal retirements accelerating

• Physical output updates for the process flow industries

• Get ready for a recycling side case

• Expand data sources – EPA GHGRP

• One day data update
Changes in energy intensity between AEO2018 and AEO2017 occur as a result of MECS2014 and historical updates

- 2017 values result of different starting values
  - Quadrennial MECS update
  - Annual data updates
    - State Energy Data System for history and manufacturing allocation
    - Benchmarking
      - STEO short run
      - Individual industries
- New MECS changes non-manufacturing

Source: AEO2018 and AEO2017 Reference cases