AEO2018 Industrial Working Group meeting 2: Preliminary results

Industrial Working Group

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Preliminary Results. Do not Cite or Disseminate.

Overview

- AEO2018 – Reference case and potential side cases
- Scorecard – what's been done, what remains
- Preliminary Industrial Demand Module results – excludes refining EXCEPT for CHP
  - Total energy consumption and energy intensity AEO2018 vs. AEO2017
  - Energy by energy source and industry
  - CHP
- Discussion

AEO2018 is a full year with major model updates and variety of side cases

- AEO Reference case projections assume laws / regulations currently on books (including those that take effect in future); some examples
  - California carbon policies and 2030 reduction goal in effect – planning Issues in Focus for AEO2018
  - Clean Power plan in AEO2018 Reference case
- Side cases
  - Usual: Hi/Low Price, Hi/Low Macro, Hi/Low Resource and Technology
  - General categories of cases – new thinking this year
    - Renewable and electricity policy
    - Efficiency – may be role for IDM Energy Efficiency side case from AEO2016

AEO2018 Scorecard

- Done
  - CHP: new archetypes, new data, & regional cooperation coefficients
  - SEDS (State Energy Data System) benchmarking
- Almost done
  - MECS2014 upgrade – today's results reflect this
  - Renewables/waste in cement - figured out energy use, need to implement in model
- Still to be done
  - Chemical history and near term projections
  - New physicals – working on steel
  - Individual industry benchmarking: found the reason for the 50 trill problem

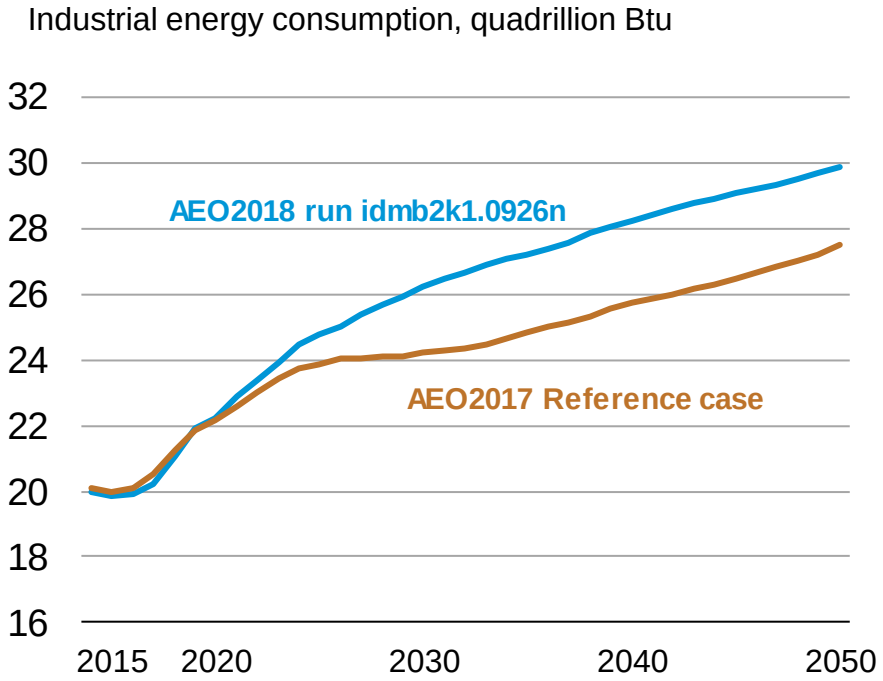
Preliminary findings

- Energy consumption shares similar to AEO2017: natural gas share about 40% in both AEO2018 and AEO2017 renewables share slightly higher in AEO2018

- Energy consumption grows at 1.2%/yr, Shipments 1.7%
  - Energy intensity declines but projected energy intensity higher than AEO2017
  - Some explanations
    - Greater shares of energy intensive manufacturing shipments for AEO2018
    - More bulk chemicals CHP than last year

- CHP higher than last year, especially for bulk chemicals

AEO2018 industrial energy consumption considerably higher than AEO2017 consumption

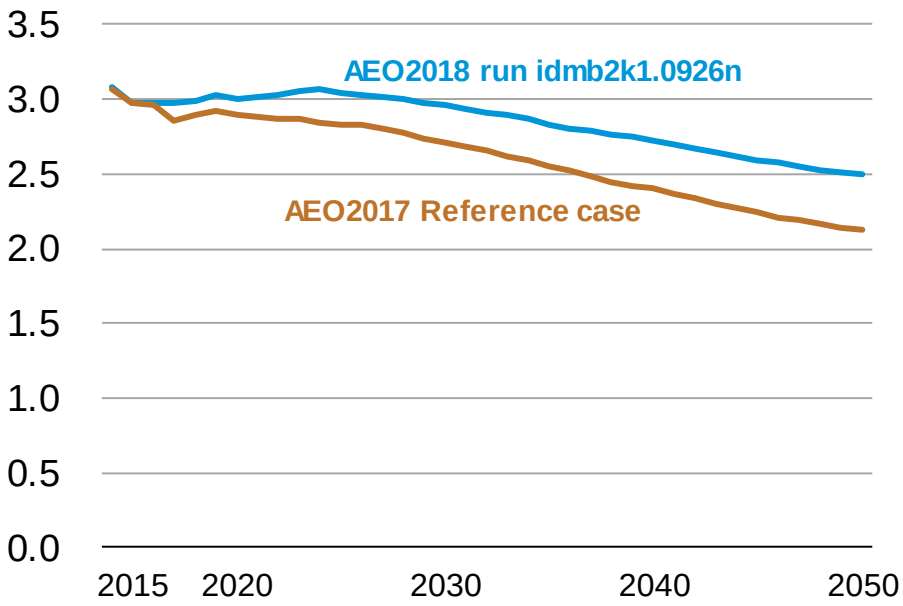


- Energy consumption grows steadily through the projection period – no lull in the 2020s
- Energy intensive manufacturing shipments share greater in AEO2018, including bulk chemicals

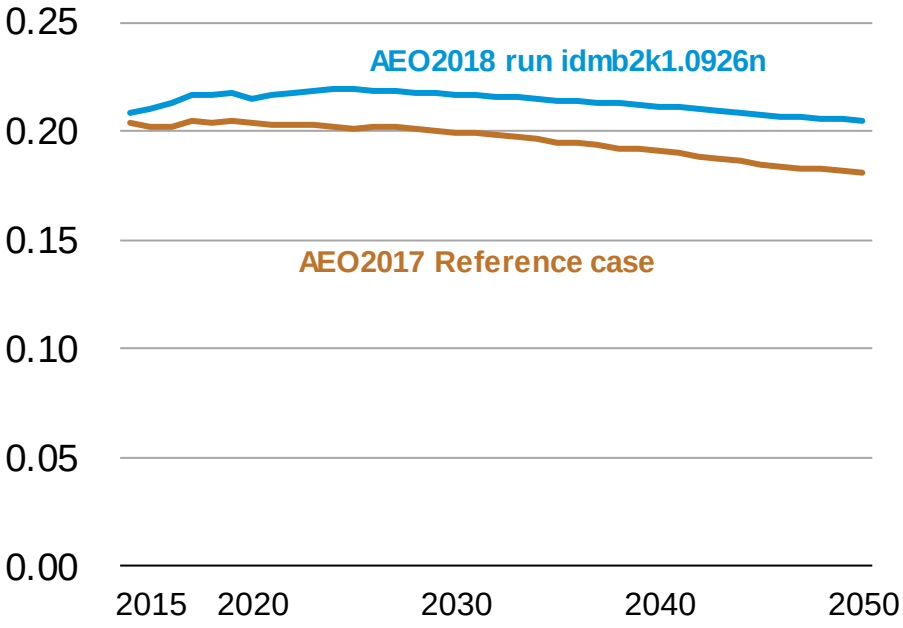
EXCLUDES REFINING. Source: NEMS runs AEO2017.0920a, AEO2017.0920_nocpp and AEO2016 Reference case

AEO2018 energy intensity greater than AEO2017 and generally declining; higher share of energy intensive shipments

Energy intensity, thousand Btu/2009$ shipments



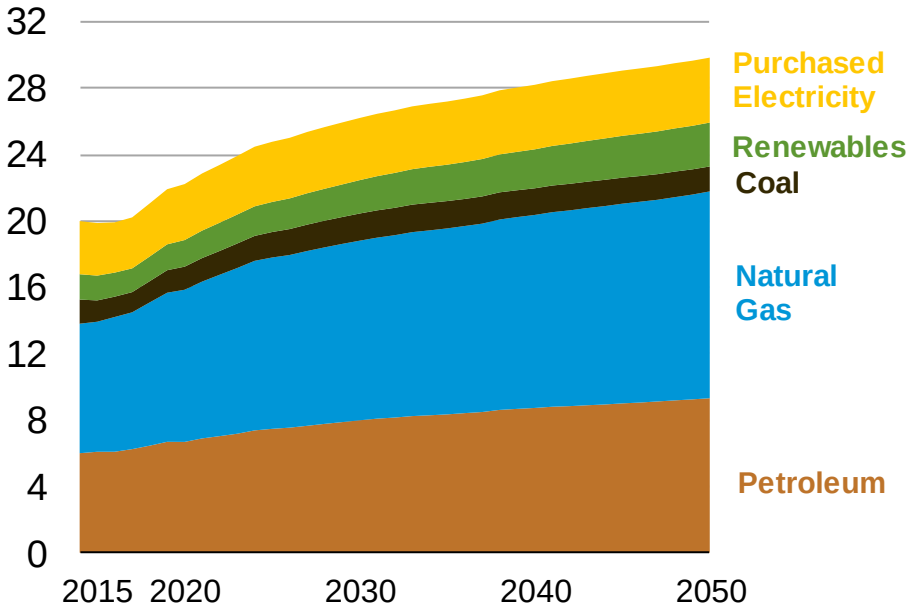
Energy intensive manufacturing share of shipments



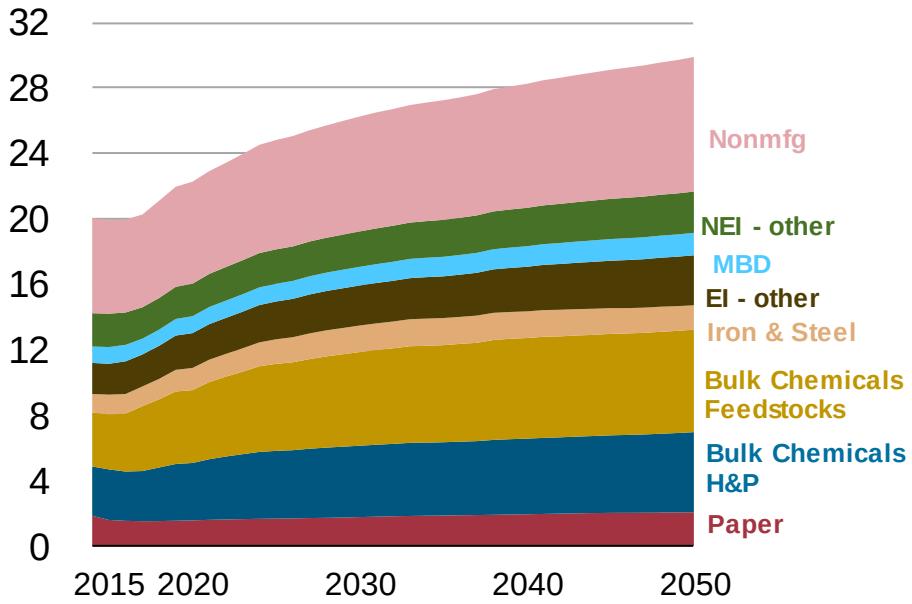
EXCLUDES REFINING. Source: NEMS runs AEO2017.idmb2k1.0926n and AEO2017 Reference case

Natural gas share is at or slightly above 40% throughout the projection; bulk chemicals becomes a 10 quad industry by 2030

Energy consumption by source, quadrillion Btu



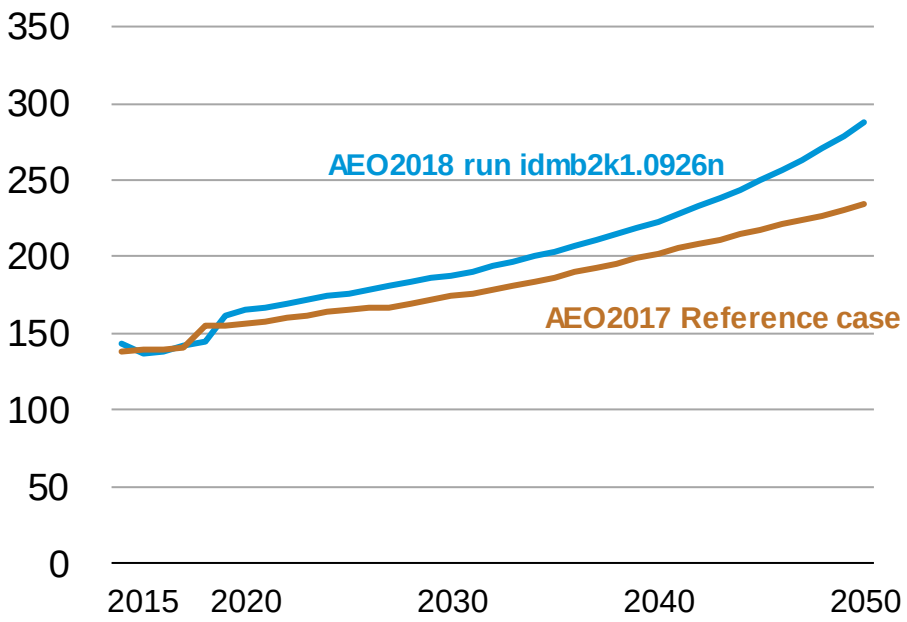
Energy consumption by industry, quadrillion Btu



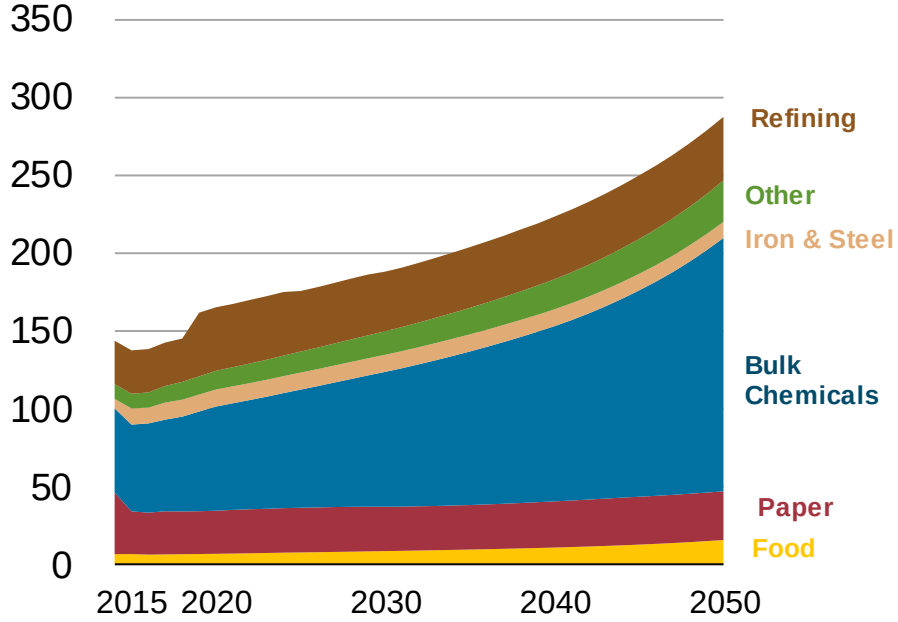
EXCLUDES REFINING. Source: NEMS runs AEO2017.idmb2k1.0926n and AEO2017 Reference case

CHP generation considerably higher in AEO2018 vs. AEO2017

Industrial CHP generation
billion kWh



Industrial CHP generation by industry
billion kWh



INCLUDES REFINING. Source: NEMS runs AEO2017.idmb2k1.0926n and AEO2017 Reference case

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**Joined within last year*

Bonus slide

MECS changes

- Manufacturing
  - All manufacturing industries will be benchmarked to MECS
  - New Unit Energy Consumption (UEC) and Technology Possibility Curves (TPC)s for the end use industries change
  - Starting values for manufacturing for the process flow industries
- Nonmanufacturing changes too
  - Base year (2014) nonmanufacturing energy is total energy less manufacturing – with some adjustments
    - Formula: Non-manufacturing energy = (2014 SEDS – 2014 MECS)
    - We adjust if the result is implausible using series such as EIA's Fuel Oil and Kerosene Sales (FOKS), Economic Census, and USDA products
  - Bring back the agriculture TPCs by activity – irrigation, vehicles and buildings
- Base year reset to 2014 from 2010 – year model results start