

Macro-Industrial Working Group Meeting 2: Industrial updates and Preliminary results



Macro Industrial Working Group (MIWG)

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Preliminary Results. Do not Disseminate.

AEO2016 additions for the Industrial Demand Module (IDM)

- Technology choice models complete; end of 5 year effort
- Benchmarking improvements
 - Individual industry benchmarking of tables complete
 - On-going effort to coordinate reporting and benchmarking with refinery model (LFMM)
- Data updates
- Regulation updates

Preliminary Results. Do Not Disseminate.

Technology choice for process flow industries

- Allow for technology choice within individual *process flows* for energy-intensive industries (e.g., anode production for primary aluminum smelting)
- All submodules complete: Cement & Lime (AEO2012), Aluminum (AEO2013), Glass (AEO2014) , Steel (AEO2016), Pulp & Paper (AEO2016)
- Benefits of Technology choice models
 - Flexibility in modeling primary vs. secondary processing
 - Allows for an explicit industrial energy efficiency side case
 - Allows for technology deployment based on economics of capital and fuel costs

Data updates & regulation

- Data

- Economic Census (2012) for nonmanufacturing – completed
- Calibration to achieve greater precision in historic data and benchmarking; will start with natural gas
- Did complete 860/923 CHP data update this year for 2013 & 2014

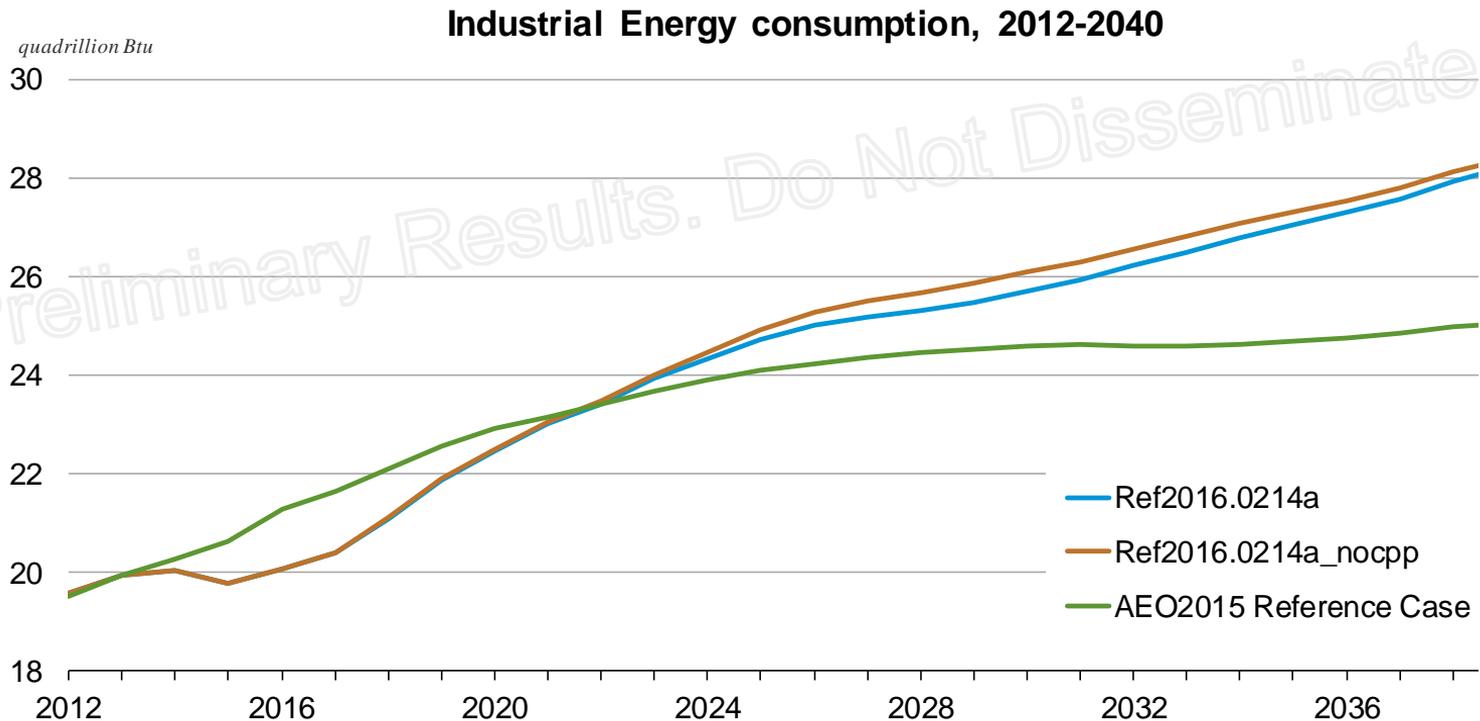
- Regulation updates

- Updated motor efficiencies to reflect latest motor efficiency standards & pump standards
- Clean Power Plan: Part of AEO2016 Reference Case; IDM does not model, but responds to price changes that other modules cause

Preliminary Results. Do Not Disseminate.

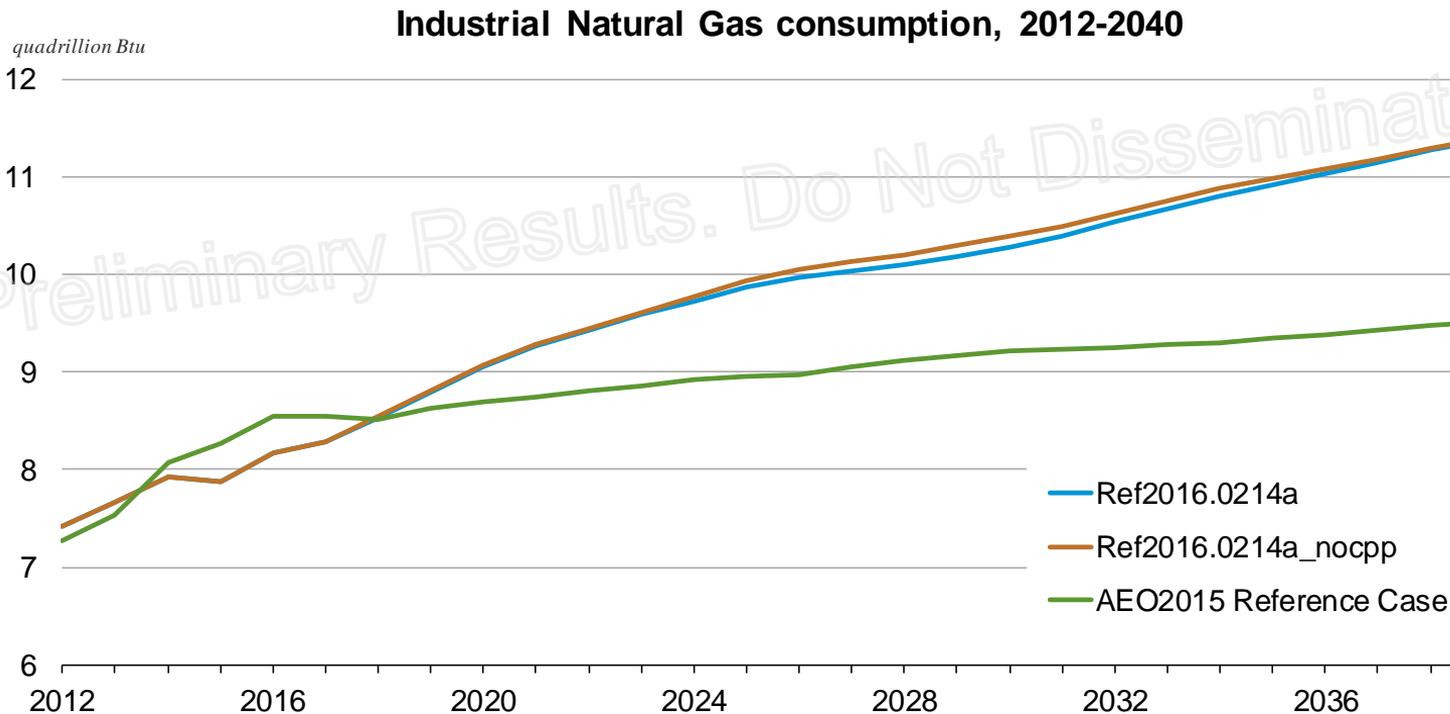
Industrial results Excludes Refining

Industrial energy consumption higher for AEO2016 reference case on higher out-year shipments



Source: AEO2016 runs Ref2016.0214a & Ref2016.0214a_nocpp; AEO2015 Reference case

Industrial natural gas consumption higher for AEO2016 reference case; bulk chemicals largely responsible

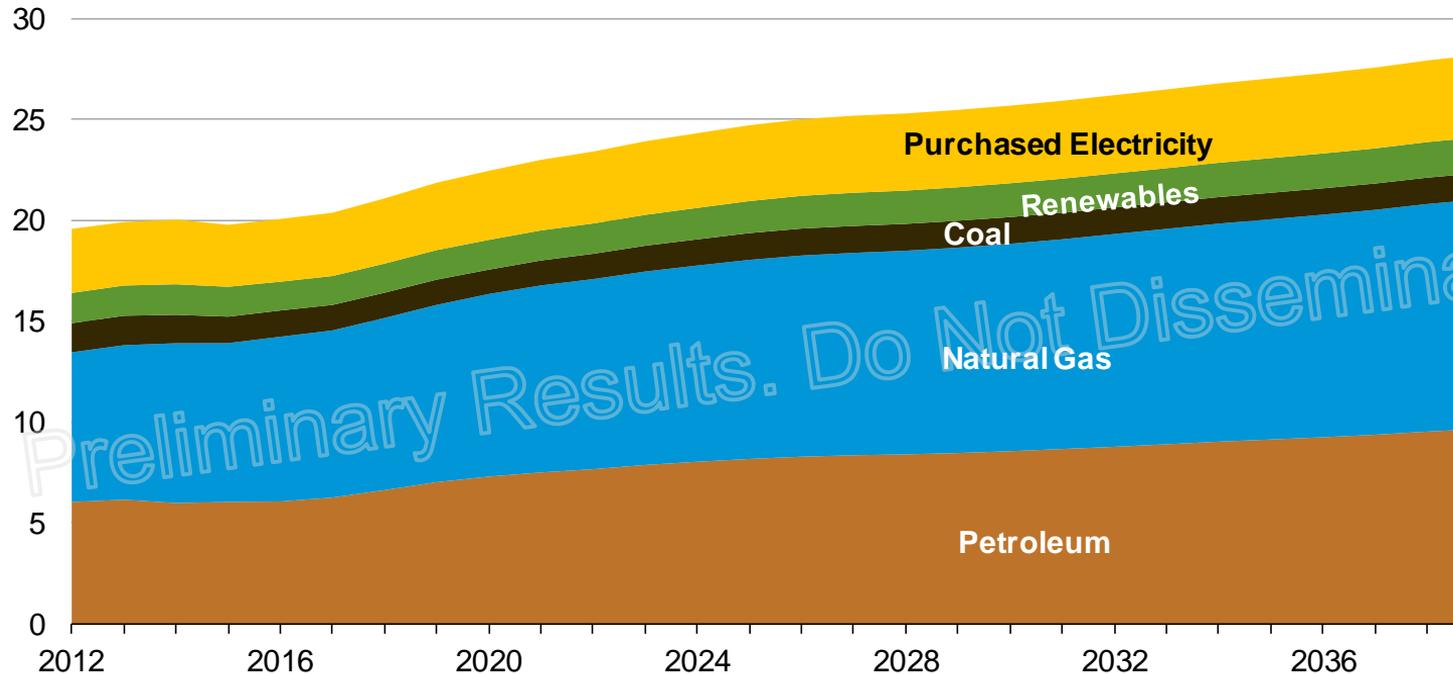


Source: AEO2016 runs Ref2016.0214a & Ref2016.0214a_nocpp; AEO2015 Reference case

Industrial natural gas consumption and petroleum shares increase modestly; other fuel shares decrease modestly

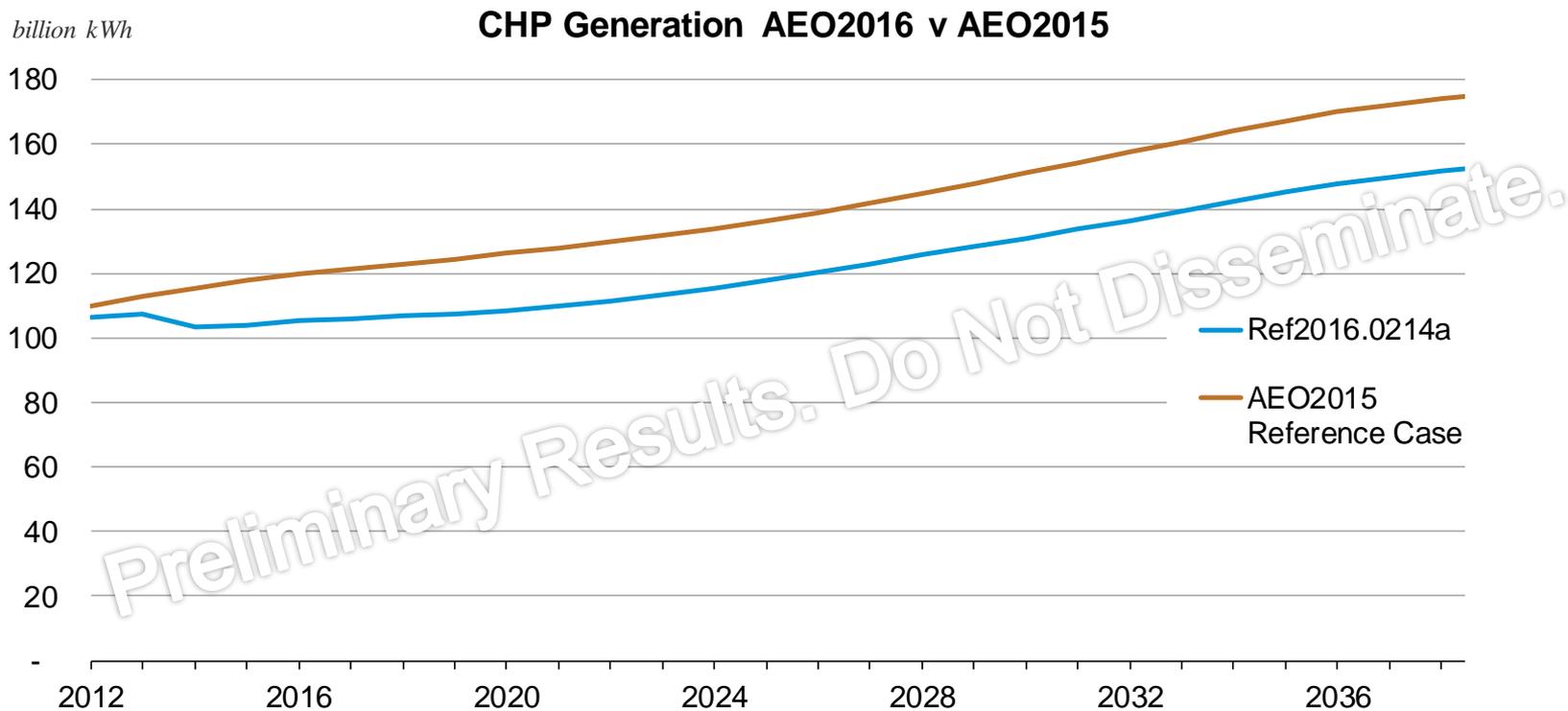
Preliminary AEO2016 Industrial Energy Consumption by Fuel

quadrillion Btu



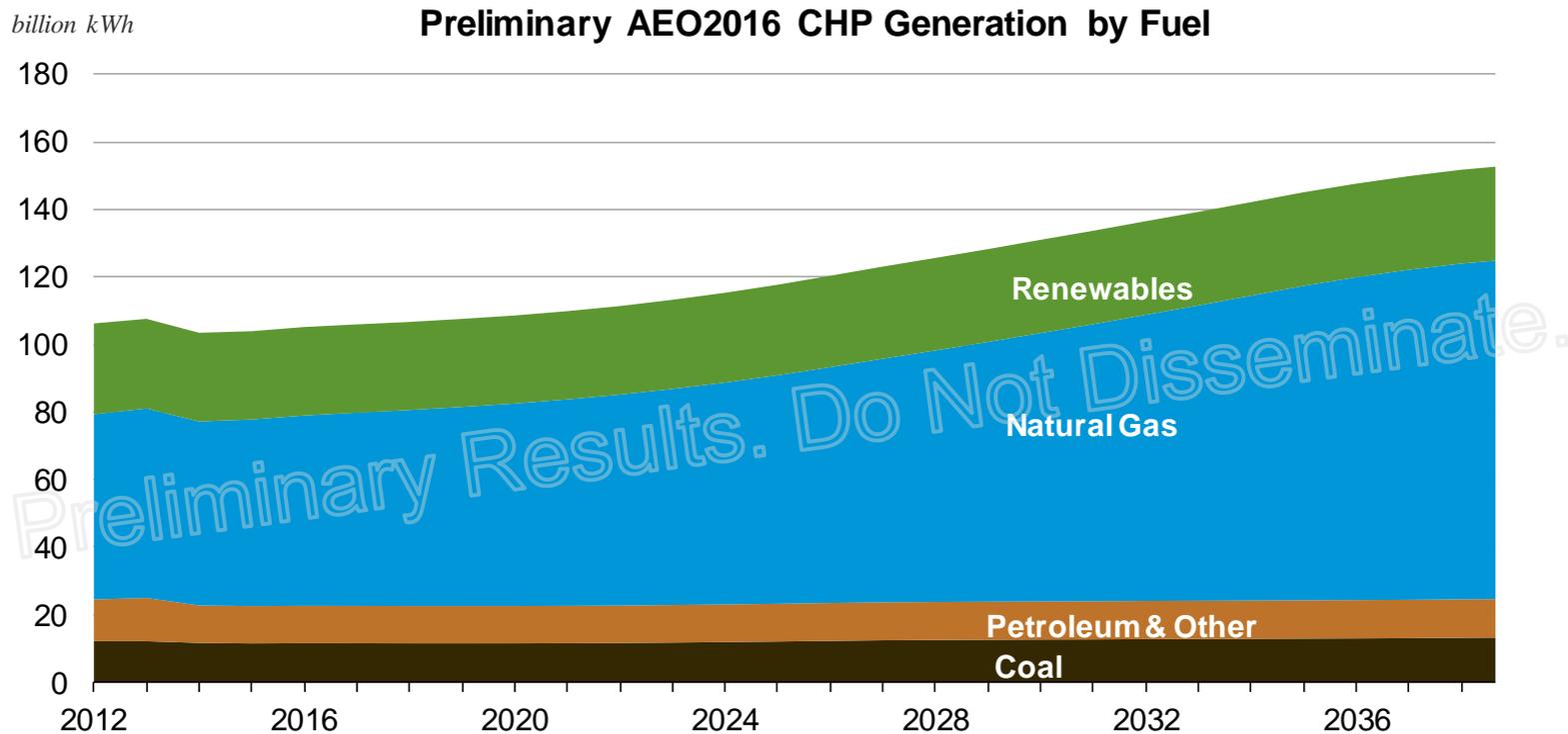
Source: AEO2016 run Ref2016.0214a

AEO2016 CHP generation lower owing to model changes & new history



Source: Ref2016.0214a; AEO2015 Reference case

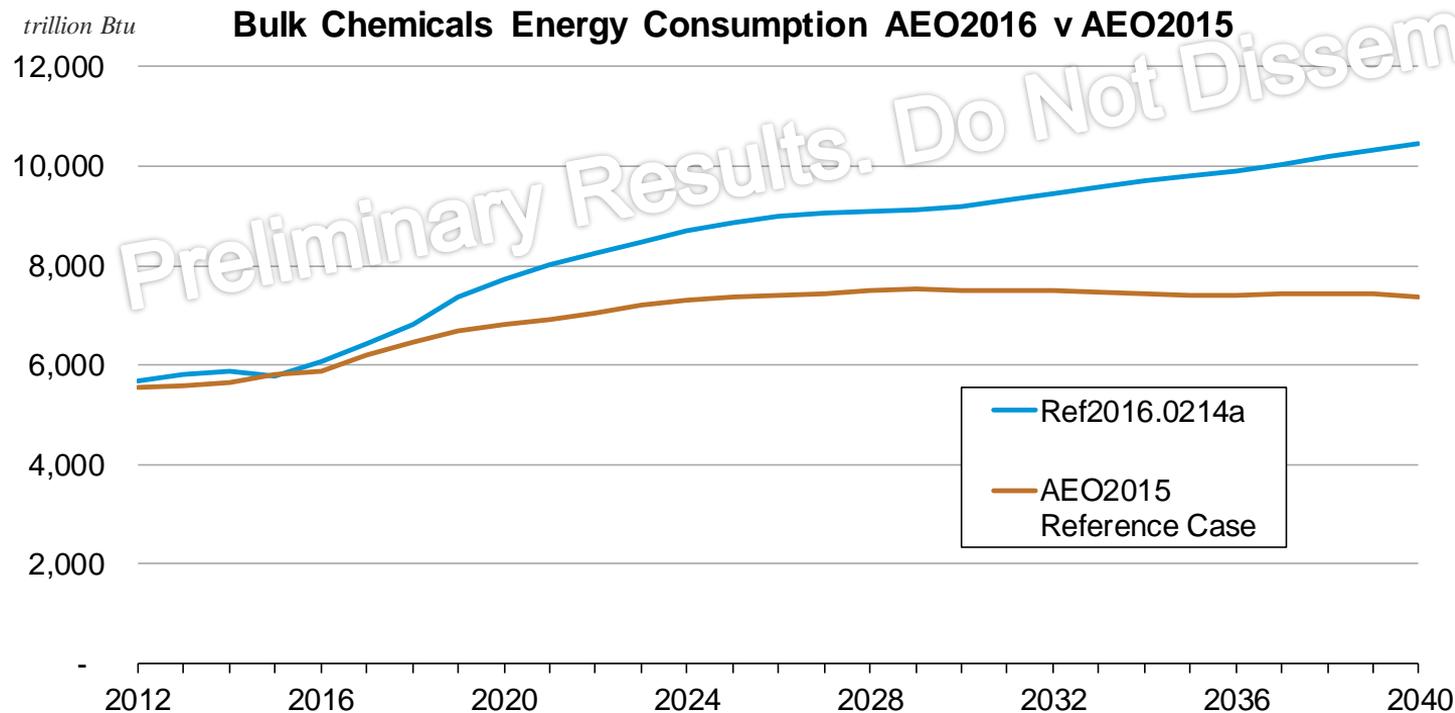
AEO2016 CHP generation – renewables have higher relative share because of paper modelling changes



Source: Ref2016.0214a

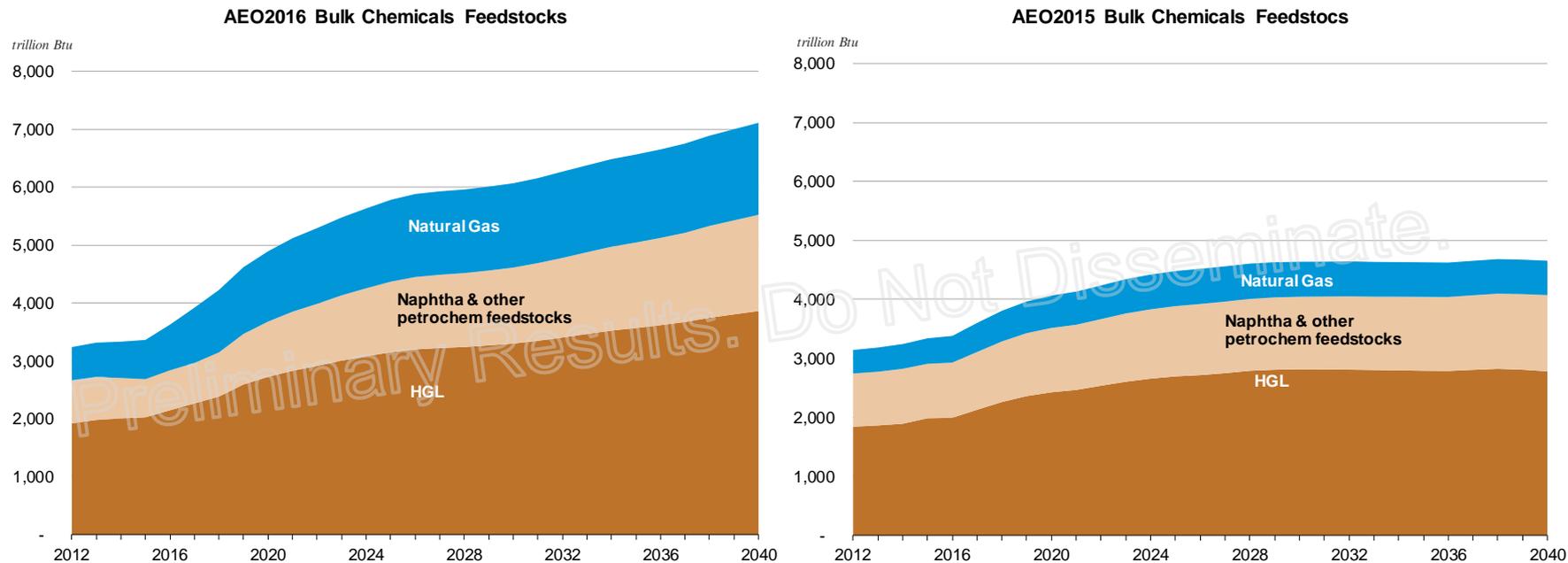
Individual industry results

Bulk chemicals energy consumption considerably higher in AEO2016; shipments higher in out years



Source: Ref2016.0214a; AEO2015 Reference case

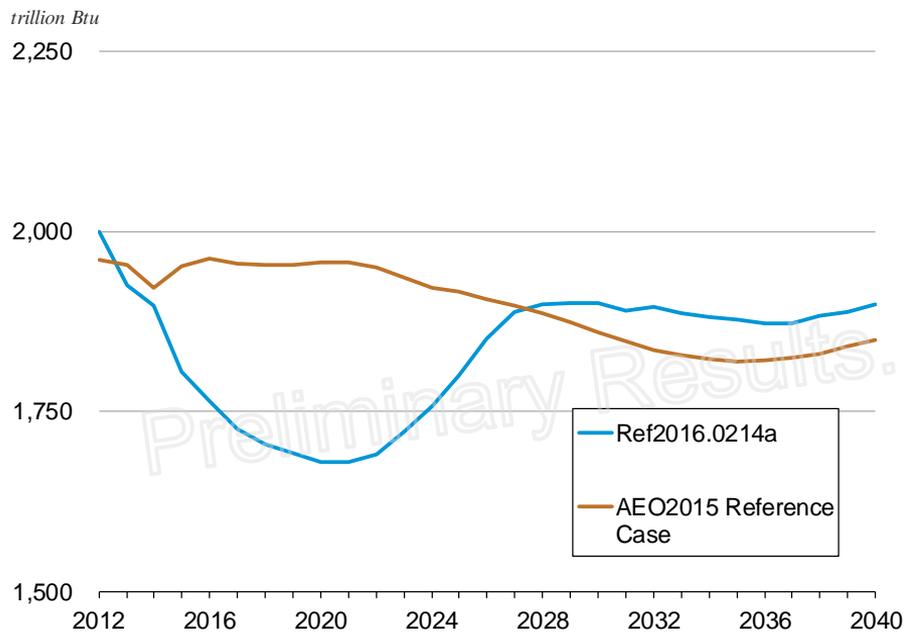
Bulk chemicals feedstock consumption much higher in AEO2016, especially for natural gas



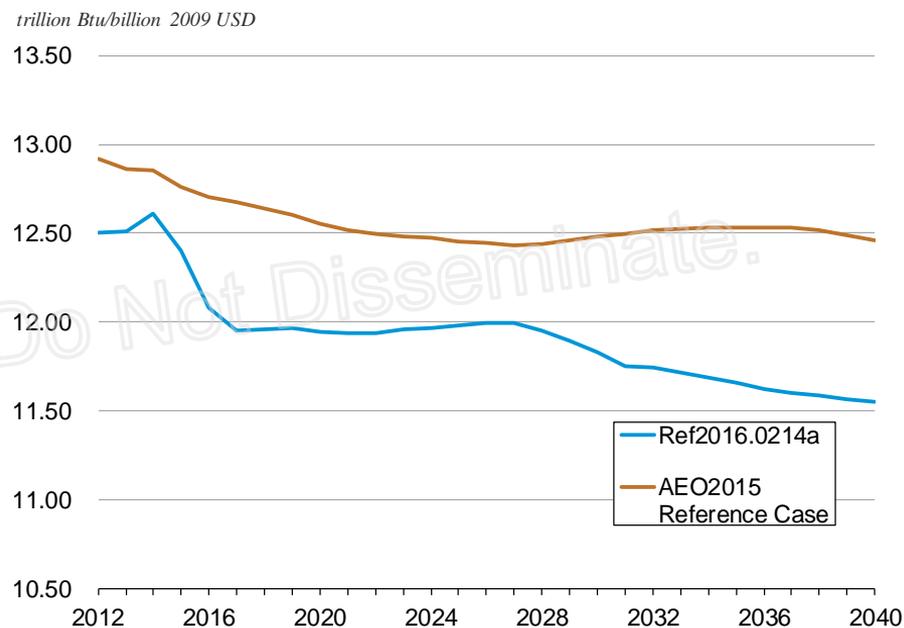
Source: Ref2016.0214a; AEO2015 Reference case

Paper shipments and accounting for recycled steam in new model explain AEO2016 vs. AEO2015 energy differences

Paper Energy consumption AEO2016 v AEO2015

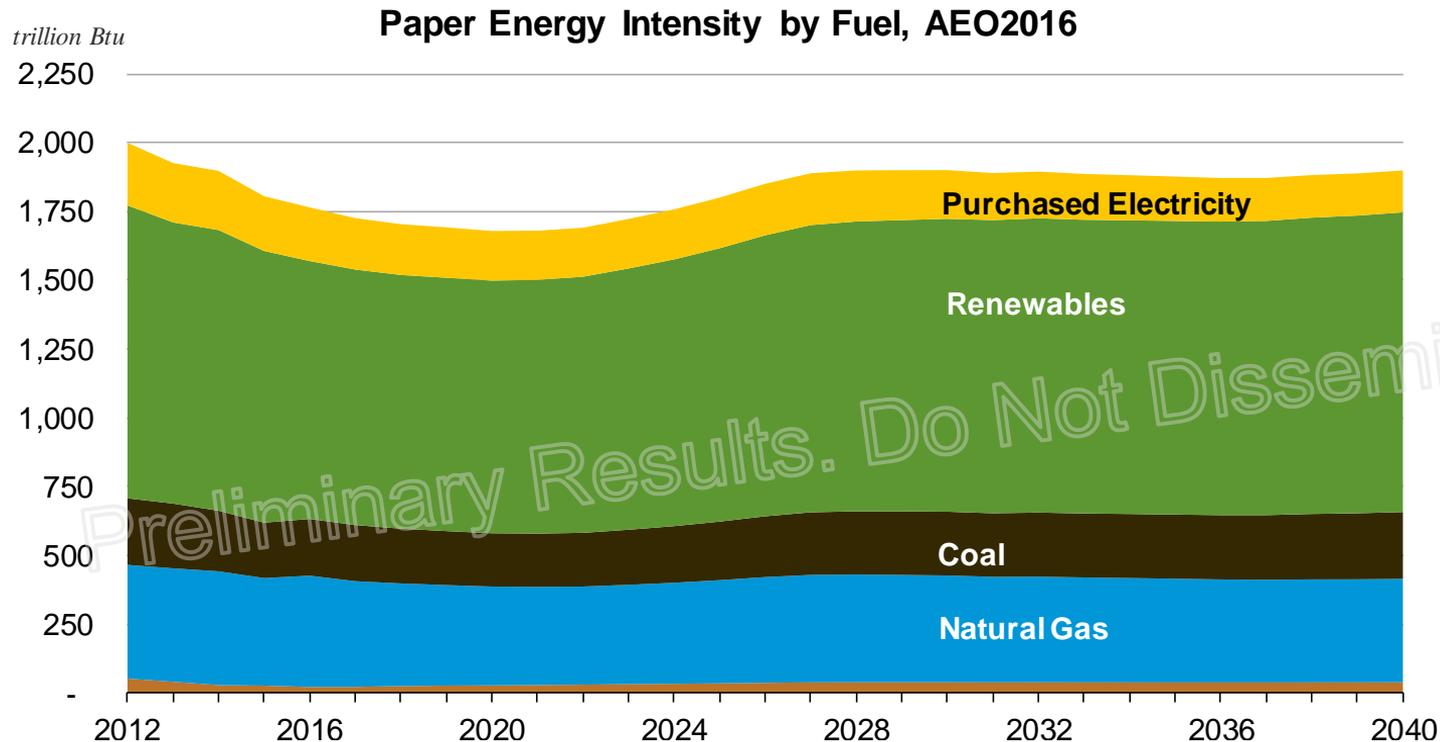


Paper Energy Intensity AEO2016 v AEO2015



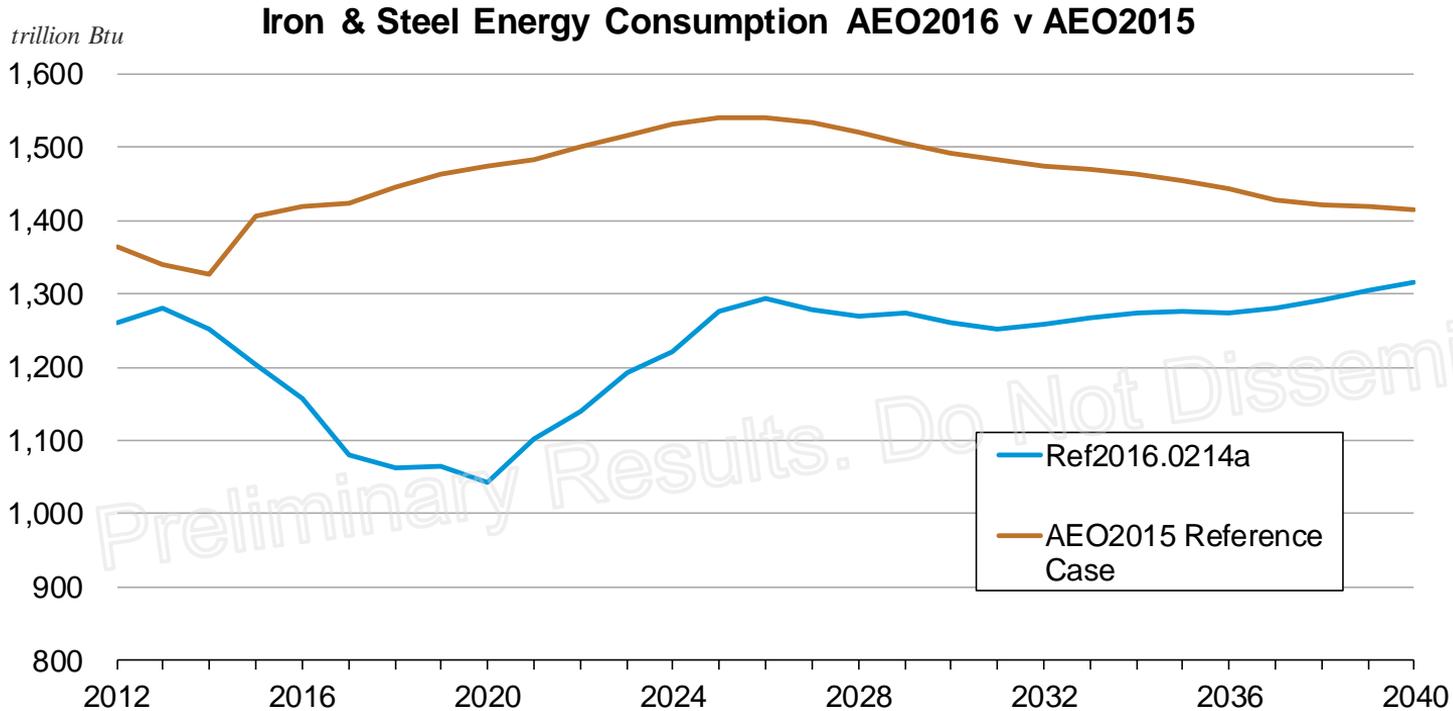
Source: Ref2016.0214a; AEO2015 Reference case

Paper: Renewables largest share of energy consumption; relatively higher renewable CHP for AEO2016



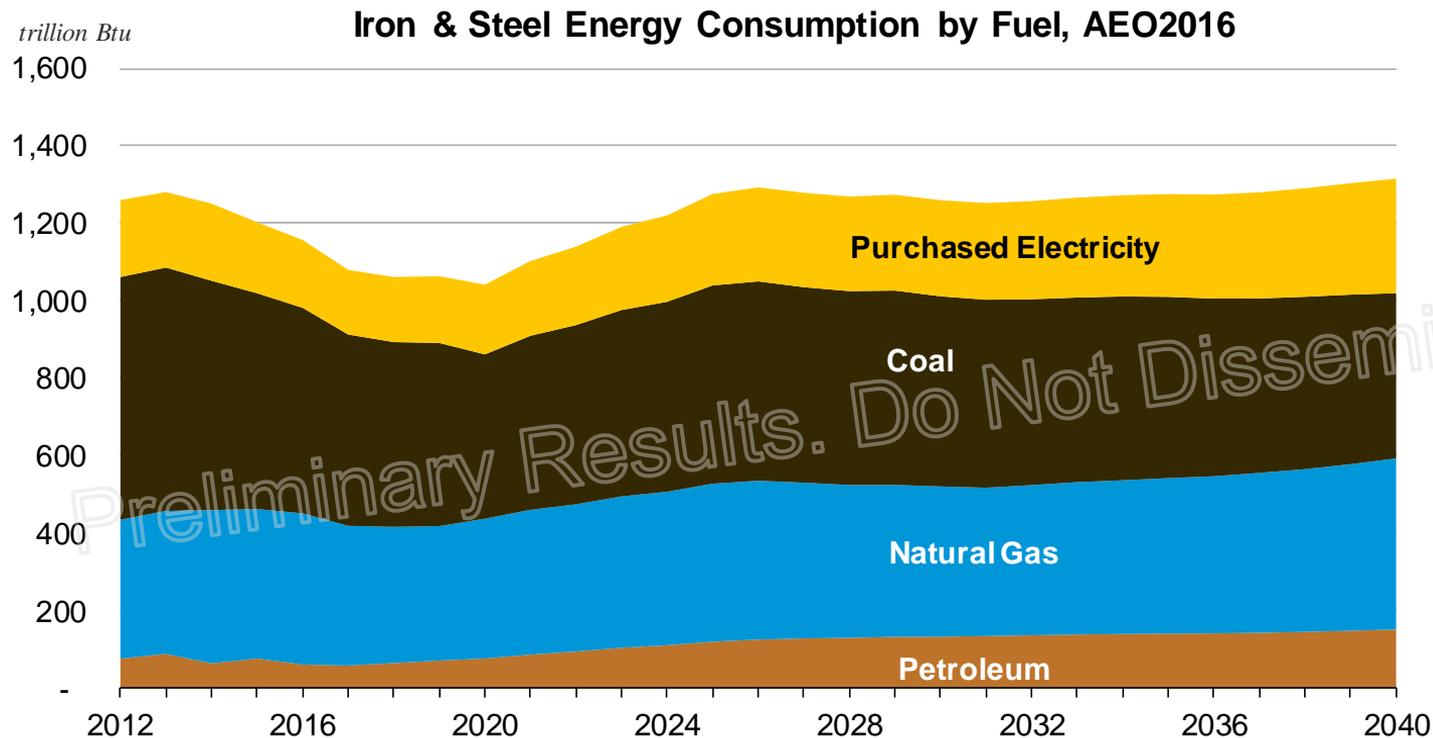
Source: Ref2016.0214a

Iron & Steel: Lower near term shipments, stagnant blast furnace additions explain different AEO2016 energy consumption



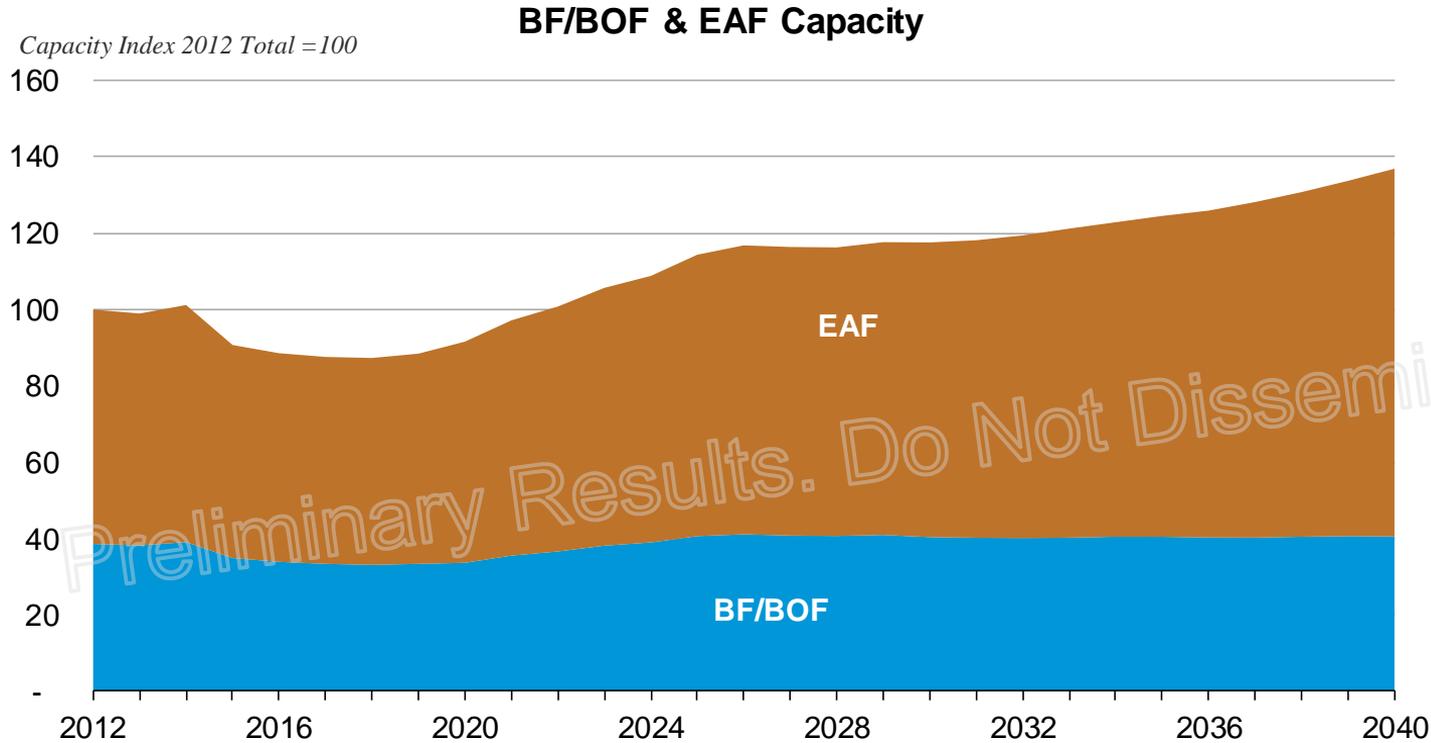
Source: Ref2016.0214a; AEO2015 Reference case

Iron & Steel: Capacity mothballed in early prediction years, starts coming back online in early 2020s



Source: Ref2016.0214a

Iron & Steel: almost all growth is in electric arc furnaces

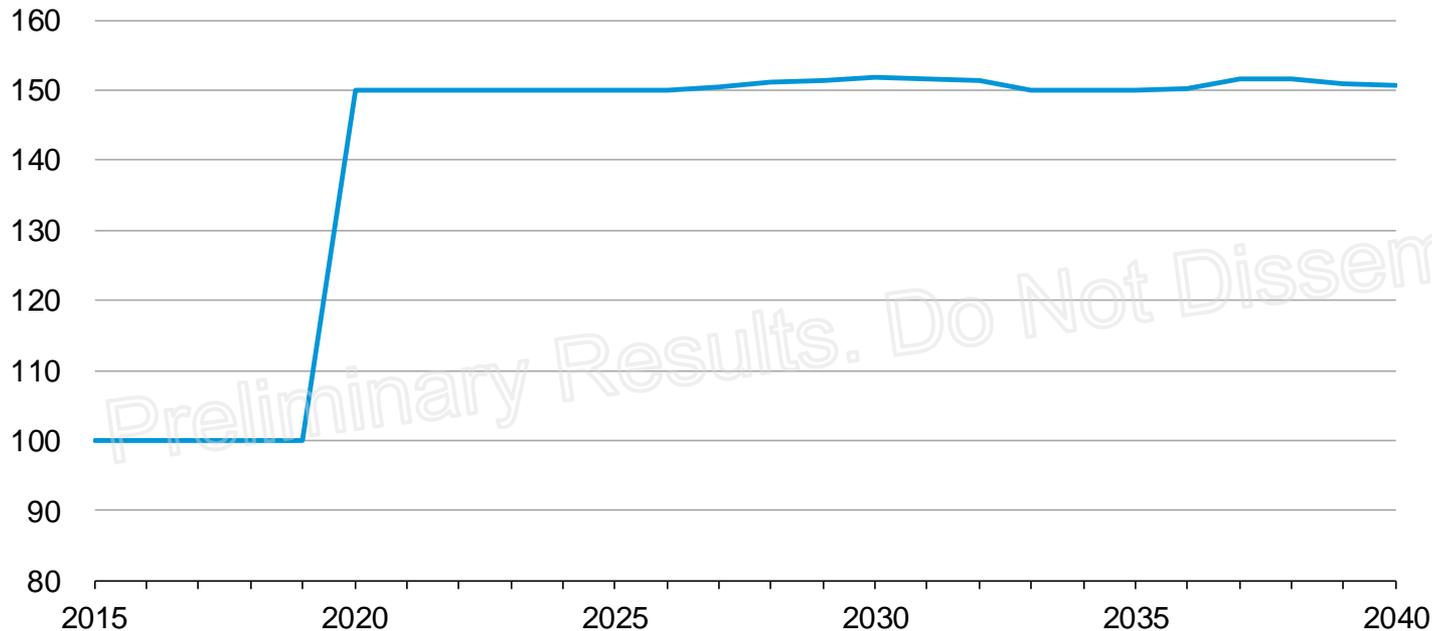


Source: Ref2016.0214a

Iron & Steel: Direct Reduced Iron capacity adopted relatively early

DRI (Direct Reduced Iron) Capacity

Capacity Index 2015 Total = 100



Source: Ref2016.0214a

Memo on this meeting and presentation can
be found here in about a month:

<http://www.eia.gov/forecasts/aeo/workinggroup/macroindustrial/>

Thank you for your attention!

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