

Briefing on Macroeconomic Reference Case for the Annual Energy Outlook 2015



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Macro/Industrial Working Group

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Macro's FY2015 AEO initiatives met

- Review incorporation of completed AEO macroeconomic initiatives.
 - Incorporation of 2009 based GDP
 - Use of 2007 supply matrix and its extension to 2012
 - The extension of the supply matrices means the use of an additional 10 years of supply chain relationships will inform our industrial projections
- Highlight upcoming initiatives.
 - Supply matrices change throughout forecast.
 - Remaining macro initiatives focused on IEO
- Short Description of Proposed Reference Case
 - Highlight short-term vs. long-term growth
 - Forecast comparisons
 - Highlight macroeconomic concepts that other NEMS modules use

AEO2015's GDP growth similar to last year's projection, though GDP components growth show differences

- Real GDP growth is 2.4% from 2013 to 2040, matching AEO2014's forecast, although consumption and import growth is higher and investment and export growth lower.
 - Most differences occur within first 7 years: GDP growth of emerging markets is lower and U.S. dollar appreciates more, driving lower export and higher import growth.
 - Consumption of durable goods explain most of increase in consumption, with motor vehicle growth 0.4% higher than AEO2014, as disposable income growth is slightly higher
 - Growth in consumer prices are slightly lower, reflecting lower import prices, although U.S. producer prices show higher growth
- The next 30 years will probably not be similar to the last 30 years. We expect slower GDP, disposable income and labor force growth, and higher export growth compared to the last 30 years. Projected productivity growth is 1.9 percent, about 0.2 percentage points lower than the last 30 year growth.
- Growth in productivity, population, and labor force explains most of long-run GDP growth.

Productivity, capital stock and labor explain long-run growth

- Uses Global Insight's macroeconomic model, whose forecast horizon matches NEMS
- The level of inflation-adjusted demand is driven by the price level, income, wealth, and financial conditions. Supply is keyed to a production function combining inputs of labor hours, energy, and capital stocks of business equipment, structures and government infrastructure.
- Major drivers: total factor productivity, labor supply, capital stock
- The updates to the macroeconomic model included:
 - 2009 GDP rebasing adding investment categories (R&D and intellectual property);
 - and updated supply chains to 2012

Macro provides regional industrial output, employment, and commercial floorspace

- Industrial input output model provides 64 gross output for manufacturing, service, agricultural, construction and mining sectors. Energy mining and utilities come from NEMS. All others uses the input output model whose initial baseline comes from IHS. Most industries are at the 3- and 4-digit NAICS levels. From the 64 industries, we aggregate it to 52 industrial sectors for NEMS use and the industrial energy demand model uses 39 of these industries.
- Employment model is based on the industrial model though has slightly less detail. For example, agriculture, food processing and chemical employment has less detail than its corresponding output in NEMS.
- Commercial floorspace model is a stock adjustment model covering thirteen commercial floor space types in each of nine Census divisions.
- Regional model is a regional share model we estimate by using pooled data

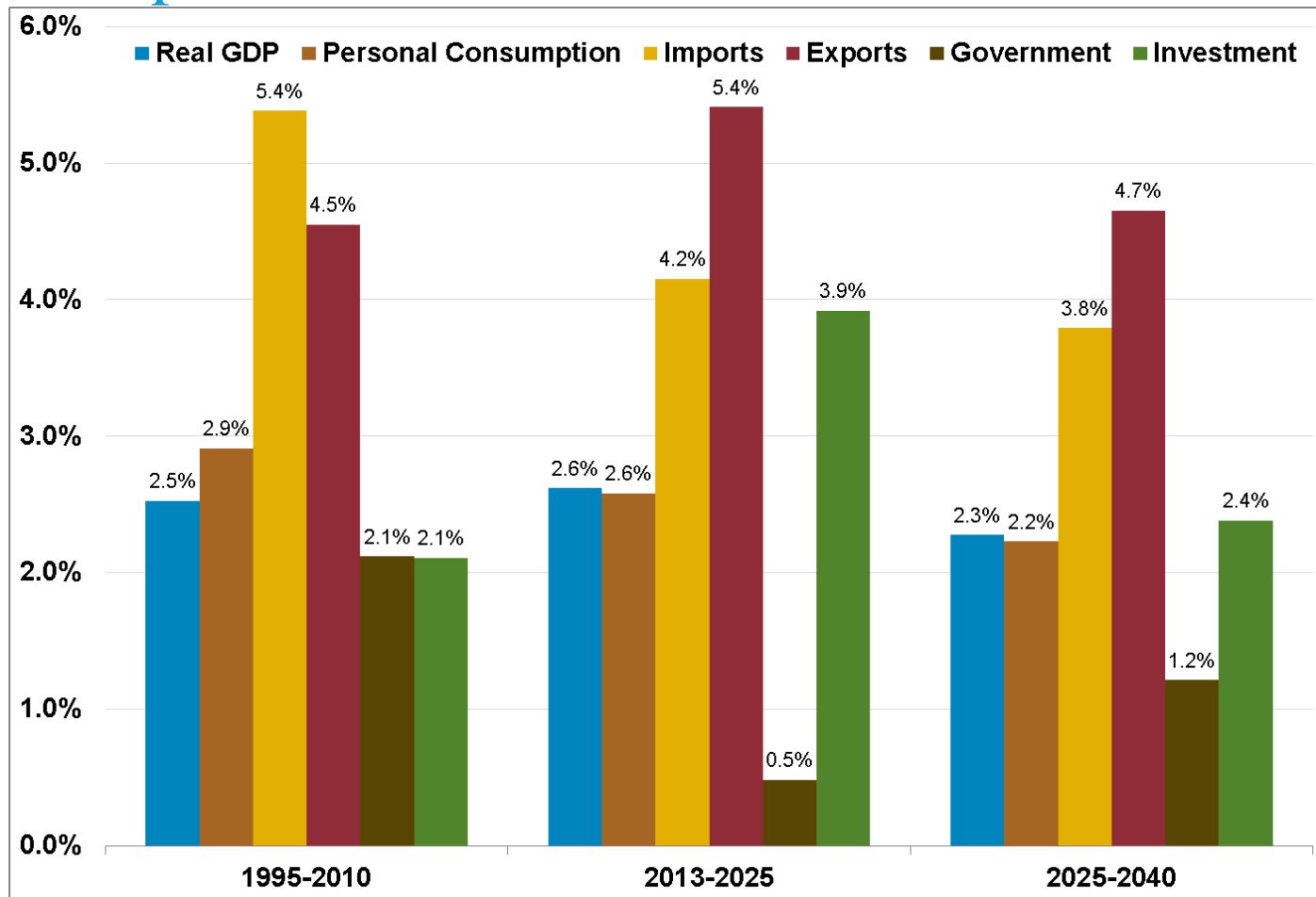
Preliminary AEO2015 macroeconomic Reference Case shows slower growth compared to history

	Previous 30 Year Growth (1983-2013)	AEO 2015 Forecasted 27 Year Growth (2013-2040)	AEO2014 Forecasted 27 Year Growth (2013-2040)
Real GDP	2.8%	2.43%	2.46%
Consumption	3.1%	2.4%	2.2%
Investment	3.5%	3.1%	3.3%
Government	1.7%	0.9%	0.7%
Exports	6.1%	5.0%	5.6%
Imports	6.0%	4.0%	3.9%

More uncertainty in short-term growth

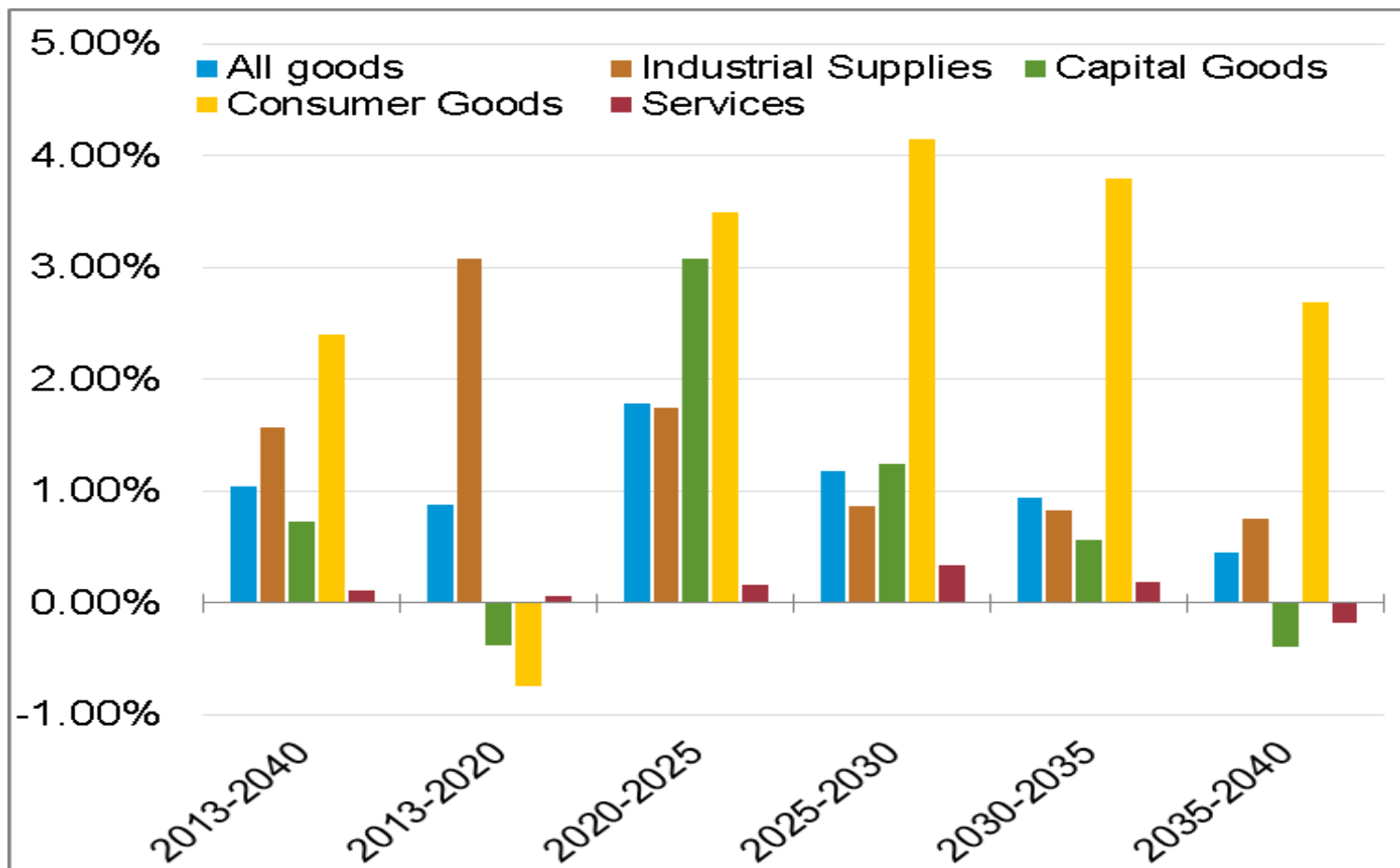
- More uncertainty in short run due to continuing slow recovery from 2007-09 recession; uncertainty about duration and extent of slow growth prospects in the Eurozone; uncertainty about the type and duration of central bank policies; the extent and length of the Chinese 'slowdown' in growth and world political uncertainty impacting economic growth.
- The final AEO2015 macroeconomic Reference Case will be similar to the simulation used in the September STEO.

Initial half of projection growth driven by investment and exports; latter half more even contribution from all GDP components



Average growth rates of net exports by category for different projection periods shows strong net export growth in “waves”

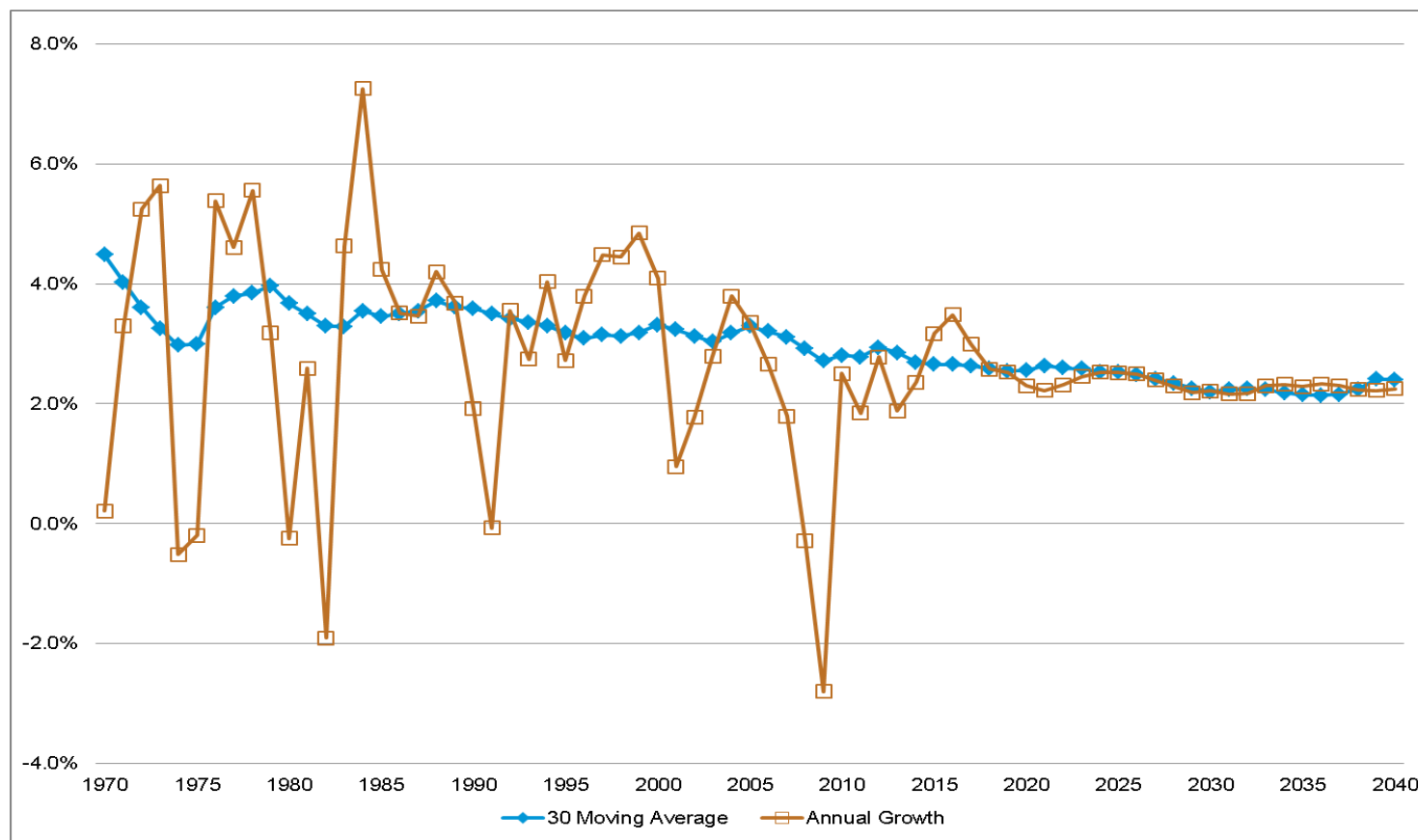
Net annual average growth rate



Source: ref2015/defaults/FSFix/d071814a

Moving 30-year average versus annual GDP growth

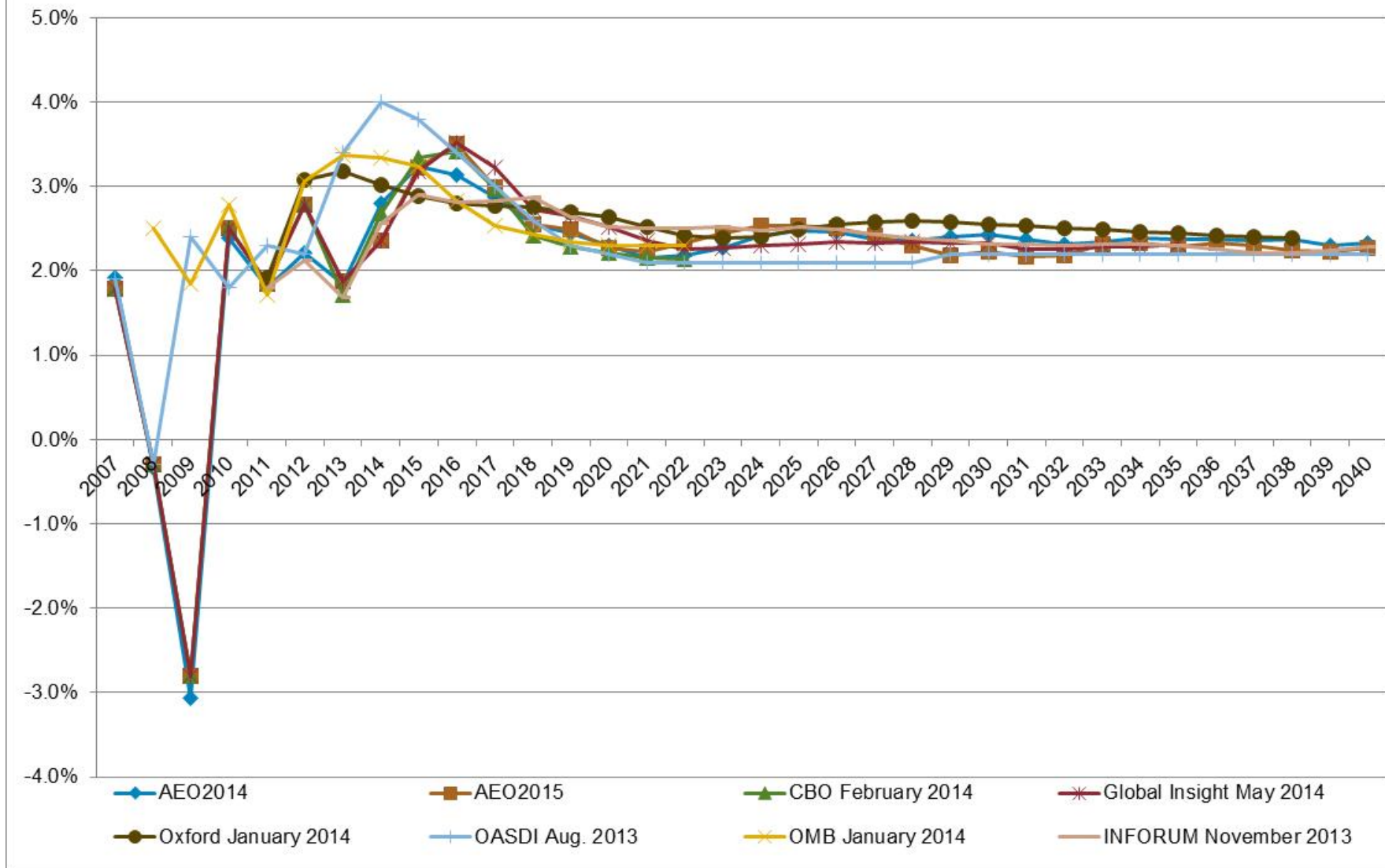
The Reference Case is a trend forecast; thus the annual GDP forecast settles into a long-run growth path.



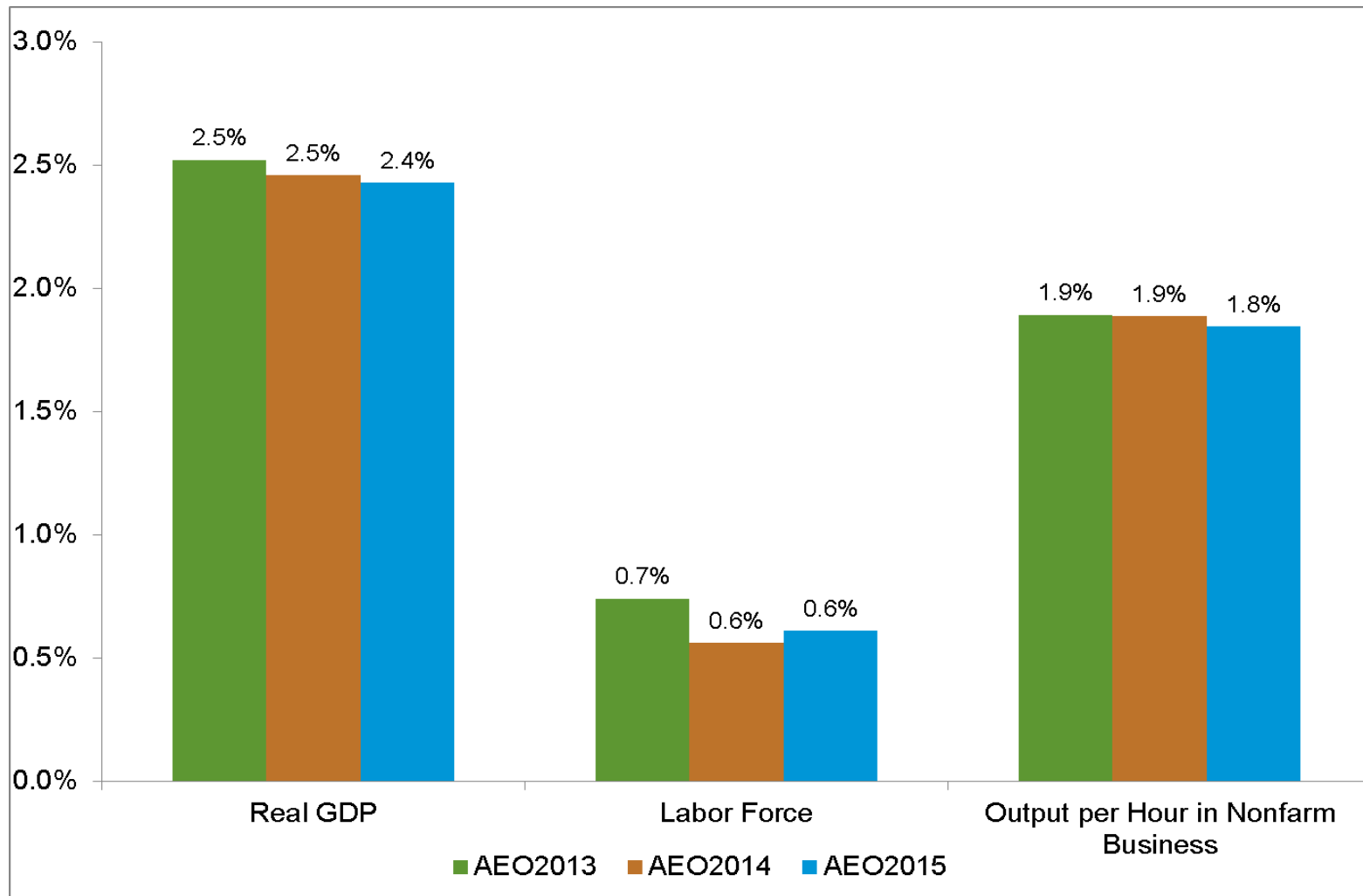
Comparisons with other projections

- More similarity in long run growth across projections compared to short run forecasts
- Relatively fewer long-run growth comparisons available
- The administration and CBO forecasts are updated twice yearly, the OASDI forecast is updated annually, and other forecasts update their long run projections quarterly

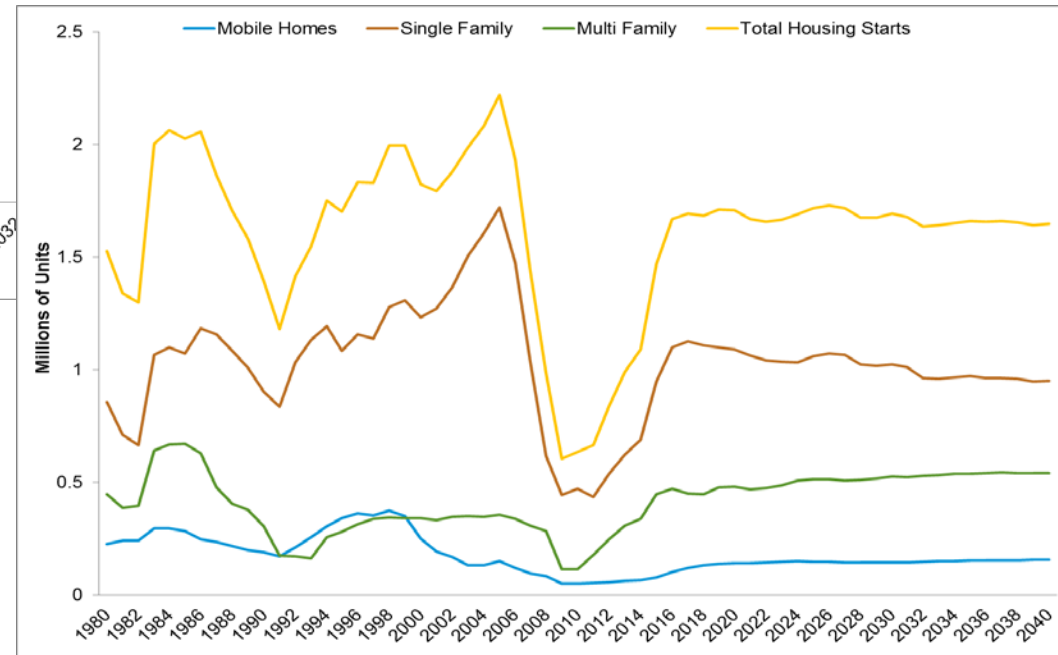
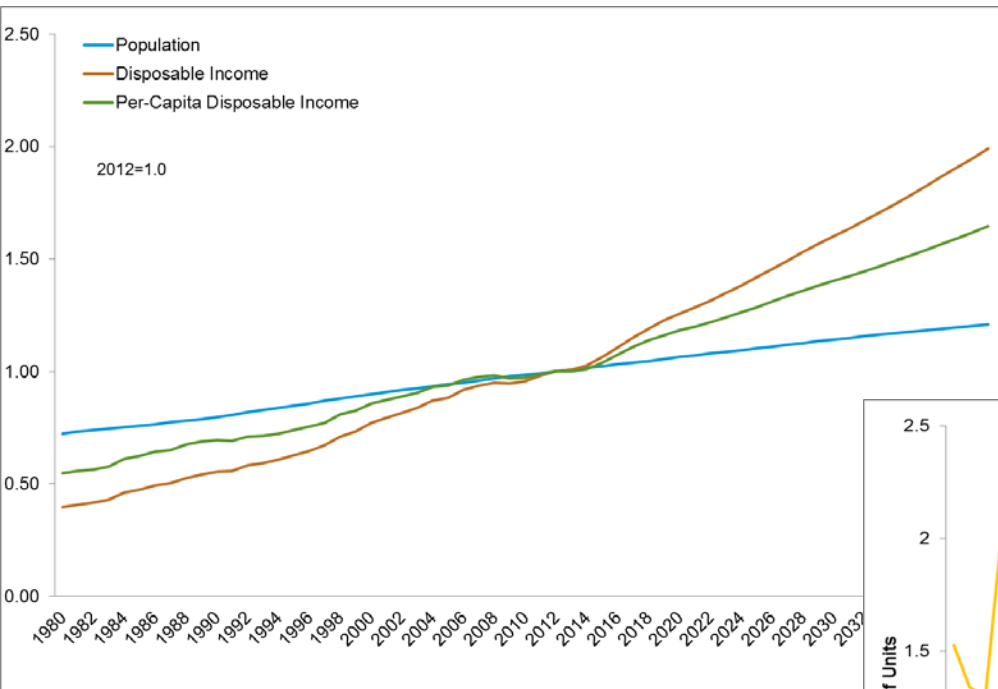
Real GDP, Annual Percent Change



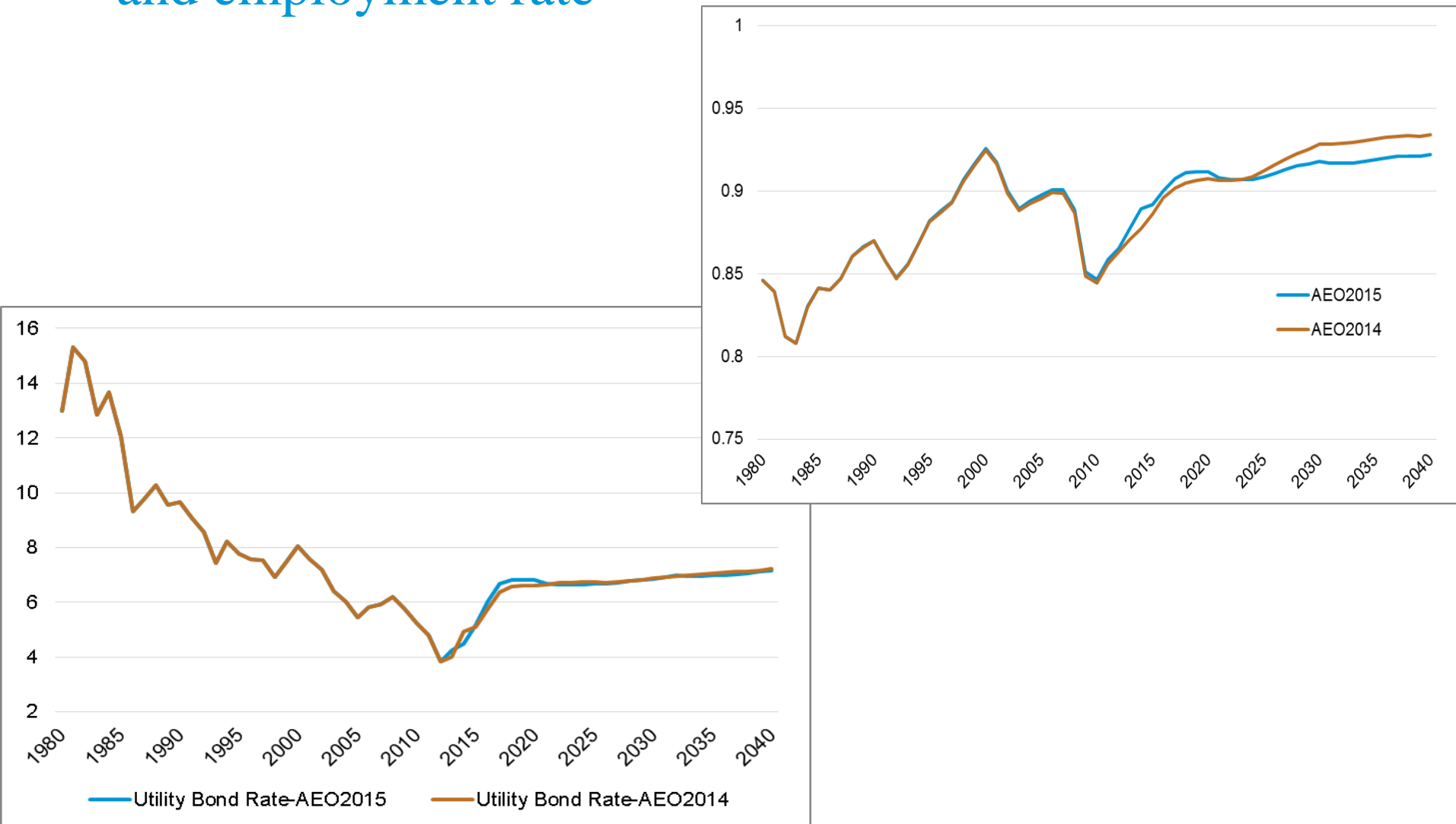
Long-run growth has been declining slightly over past several AEO forecasts



Proposed Reference Case projections that other NEMS models use



Most energy supply NEMS modules use interest rates and employment rate



Industrial economic model changes

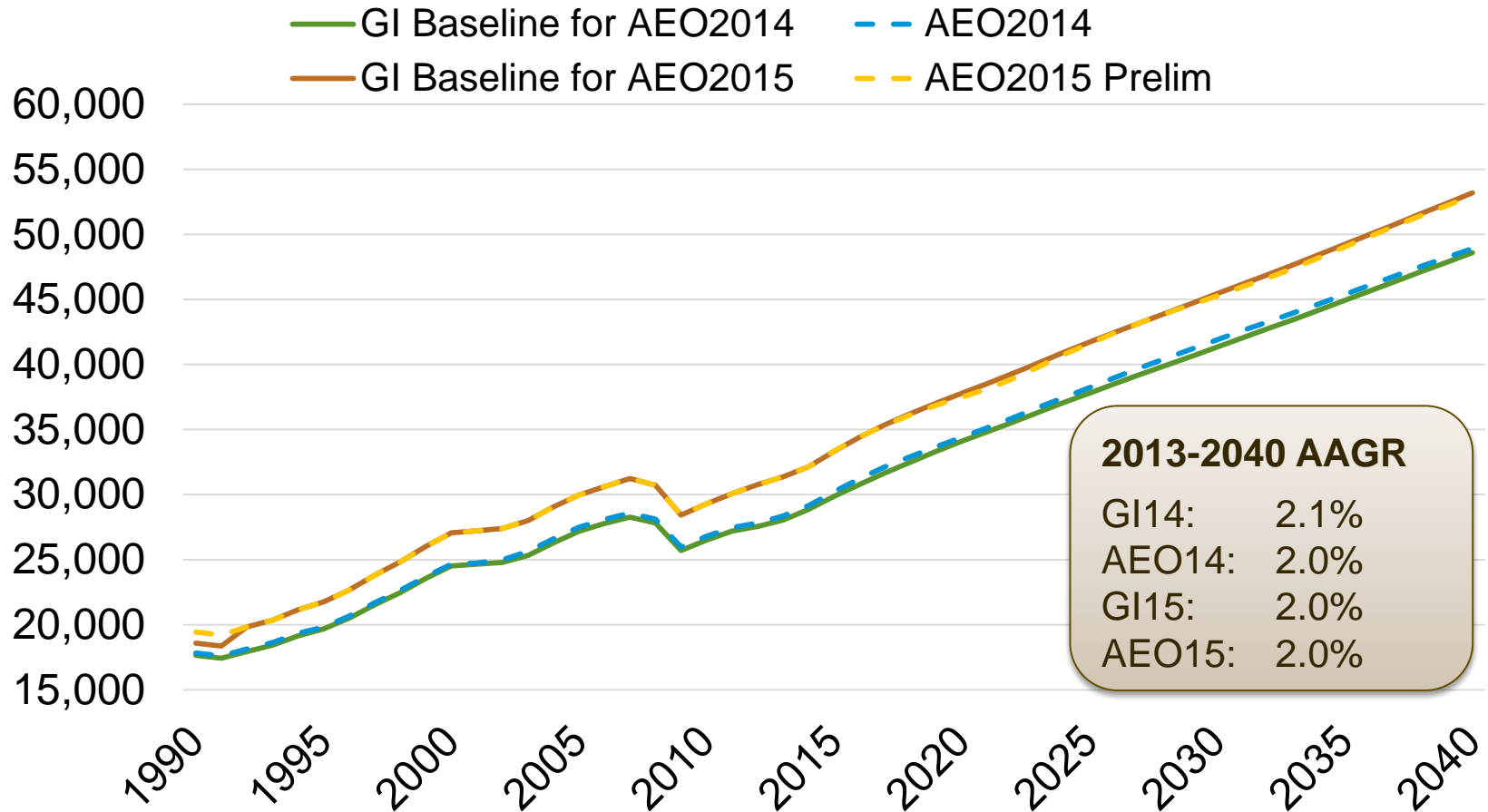
- We have updated our base year from 2002 to 2007.
- We introduced a dynamic IO to bring the 2007 base year input up to 2012 for model estimation.
- We have the initial industrial forecast from IHS which shows slightly lower gross output growth compared to last year's IHS forecast. Bulk chemicals, related to further account of shale effects, show slightly higher growth. Agriculture and services, especially trade services, show slower growth.

Initial AEO2015 runs consistent with new macro simulation

- Overall gross output growth is unchanged compared to the AEO2014 projection.
- Overall composition nearly unchanged, with same manufacturing share of gross output (17 percent).
- Consistent with increased growth in consumption offset by reduced exports.

Preliminary industrial output projections (includes services) similar to last year

Billion X dollar

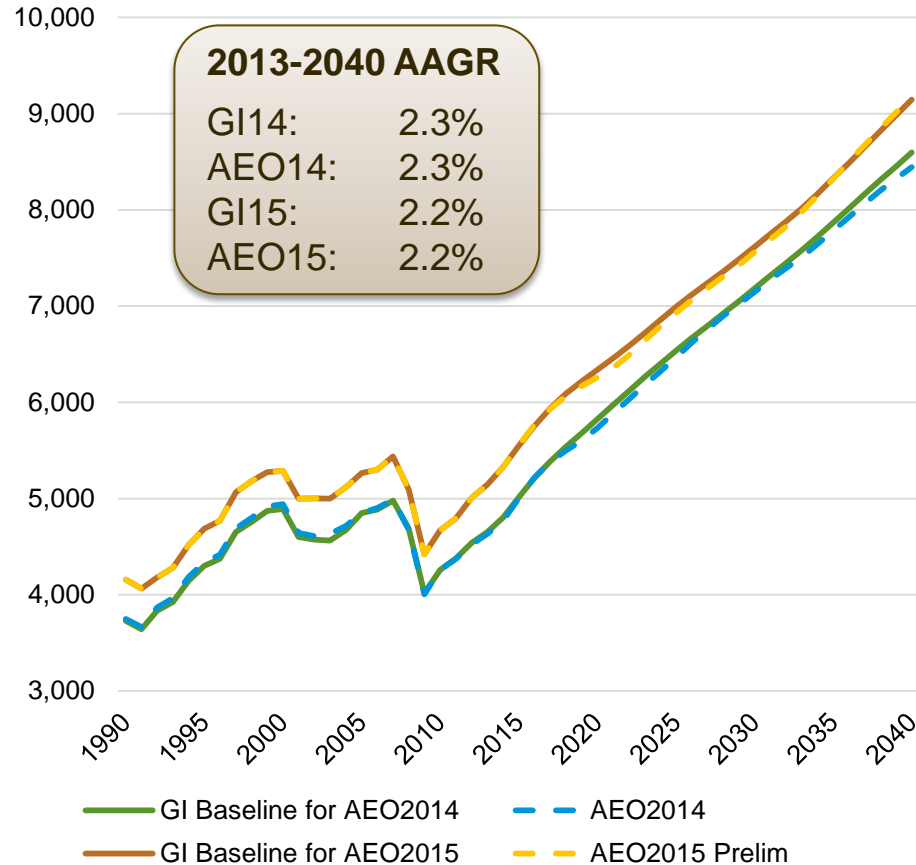


Prelim source: ref2015.defaults.FSFix.d071814a; X 2014 runs are 2005 \$, 2015 runs are 2009 \$

Industrial sub-sector outputs

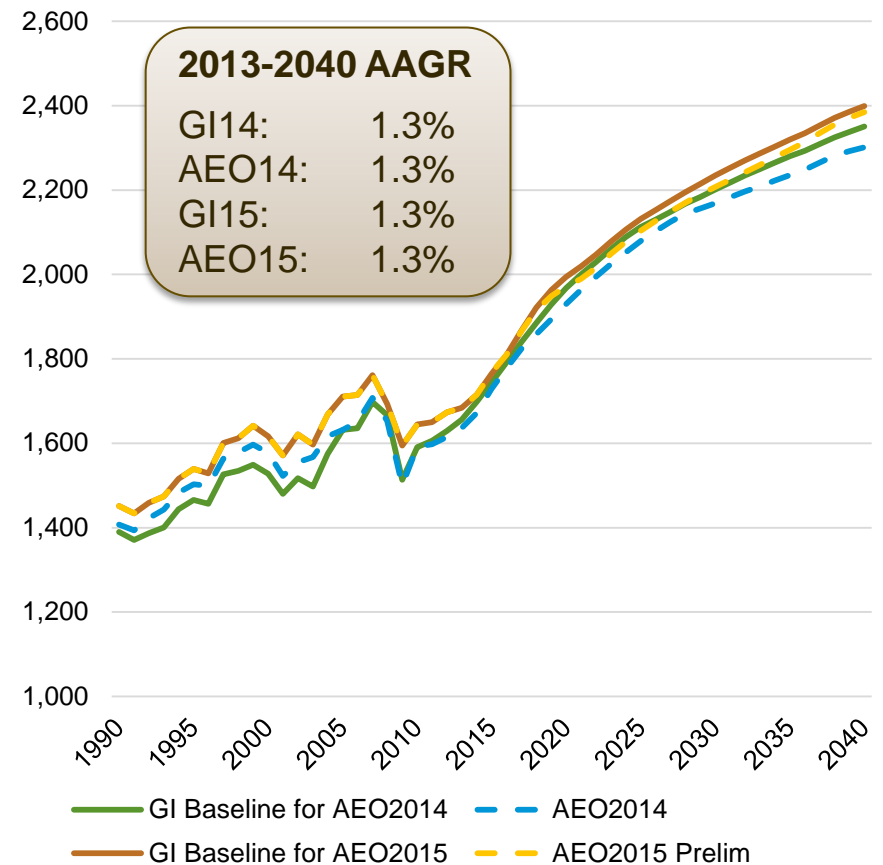
Manufacturing*

Billion X dollar



Energy Intensive Industries*

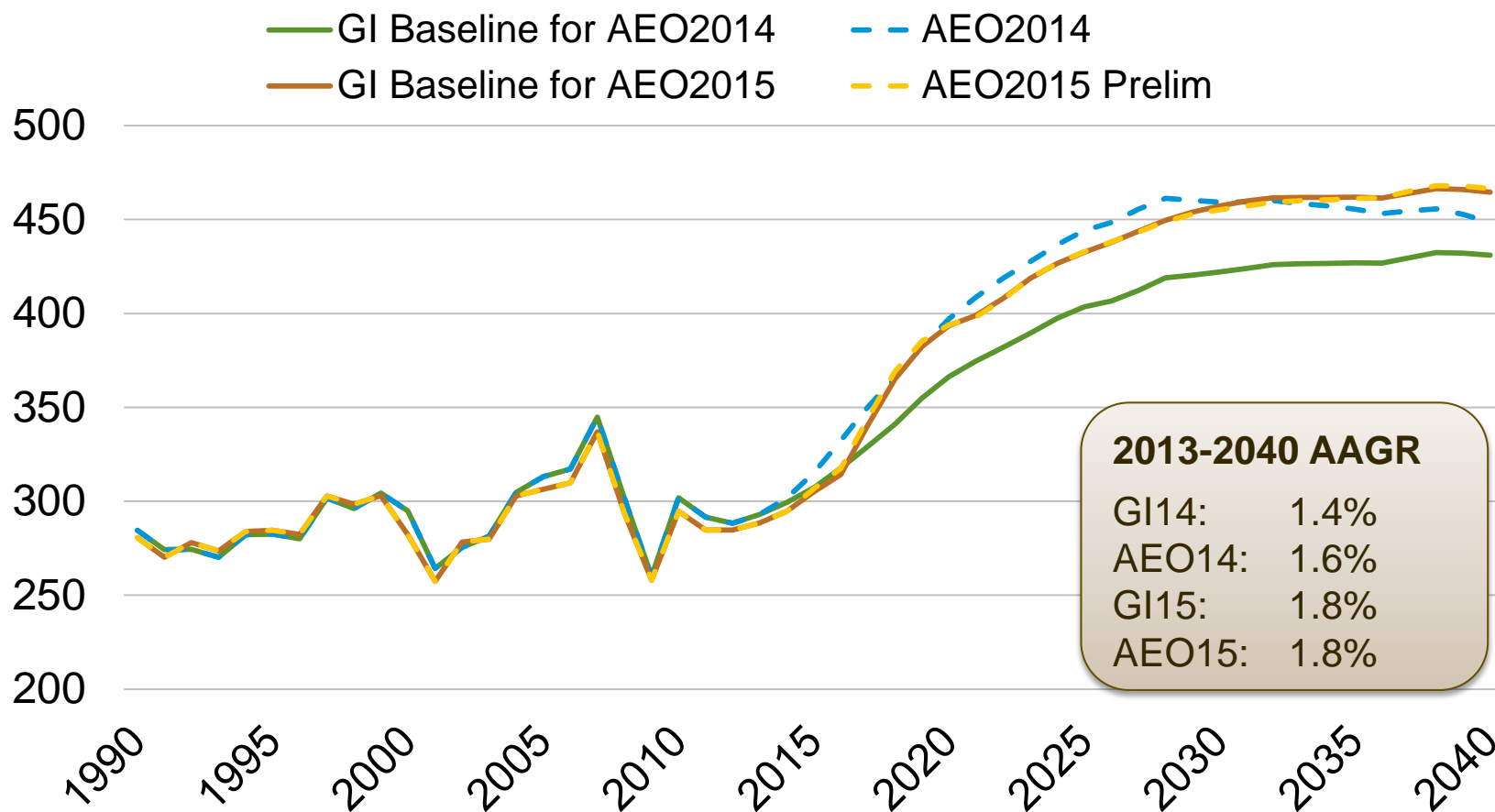
Billion X dollar



Prelim source: ref2015.defaults.FSFix.d071814a; X 2014 runs are 2005 \$, 2015 runs are 2009 \$; *includes refining

Bulk chemicals output reflects greater trade and consumption impacts, specific categories important

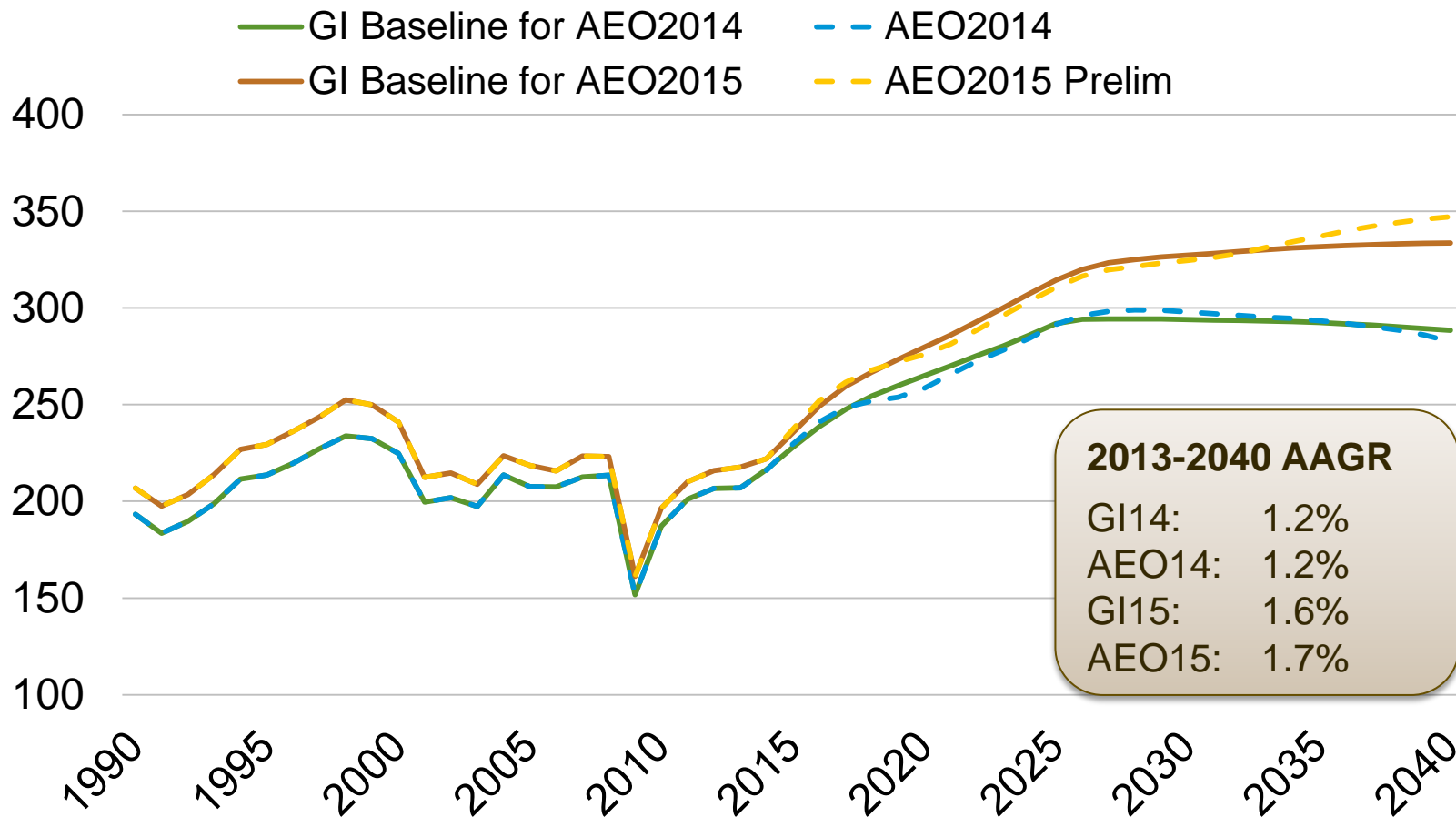
Billion X dollar



Prelim source: ref2015.defaults.FSFix.d071814a; X 2014 runs are 2005 \$, 2015 runs are 2009 \$

Primary metals output reflects changed investment and trade impacts, consumption influences long-term

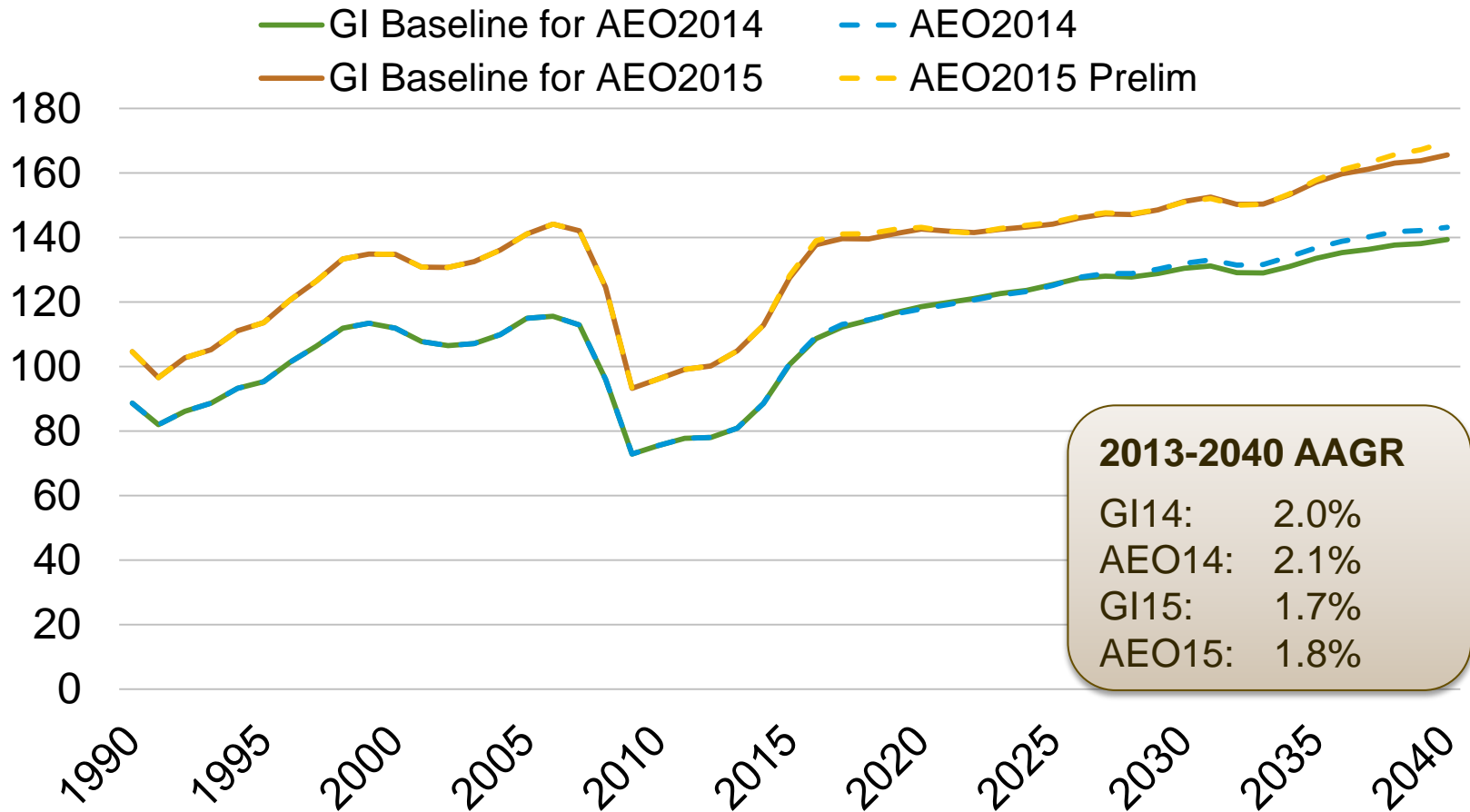
Billion X dollar



Prelim source: ref2015.defaults.FSFix.d071814a; X 2014 runs are 2005 \$, 2015 runs are 2009 \$

Non-metallic minerals output slightly lower as trade influence slightly outweighs consumption effects

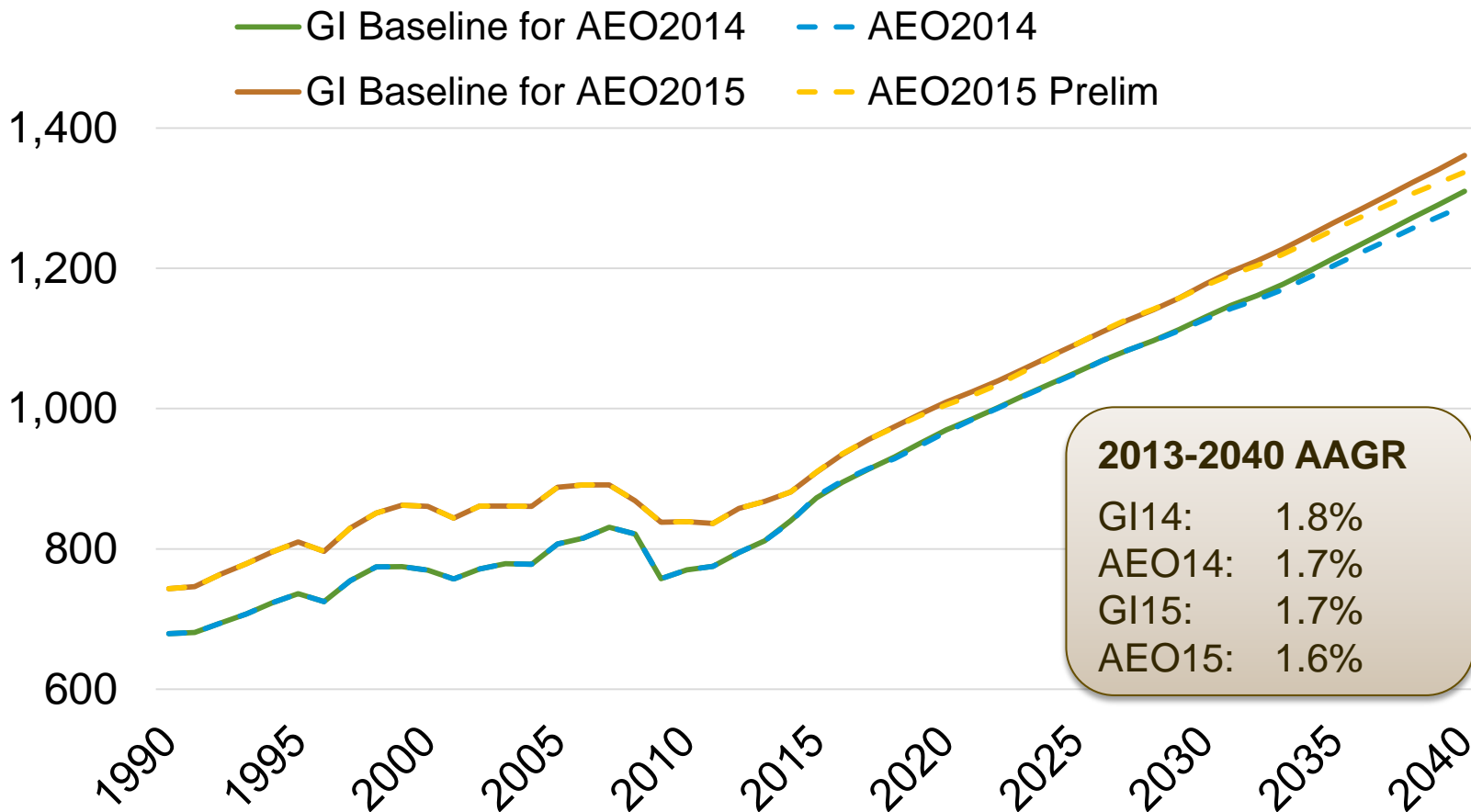
Billion X dollar



Prelim source: ref2015.defaults.FSFix.d071814a; X 2014 runs are 2005 \$, 2015 runs are 2009 \$

Plant-based (food, wood, and paper) output reflects decreased investment impacts, changed trade and consumption categories

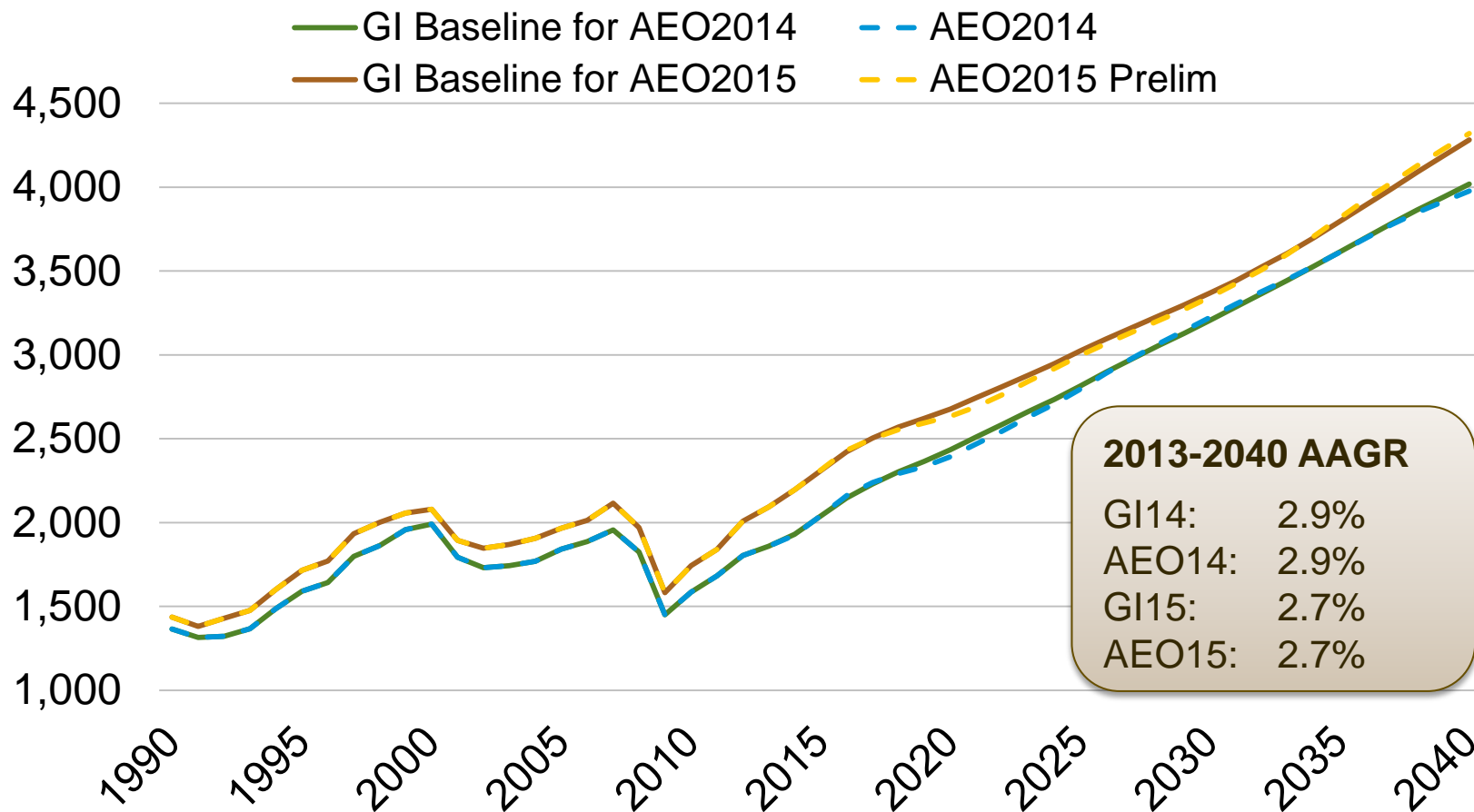
Billion X dollar



Prelim source: ref2015.defaults.FSFix.d071814a; X 2014 runs are 2005 \$, 2015 runs are 2009 \$

Metal-based durables output down slightly due to trade effects, technological progress visible

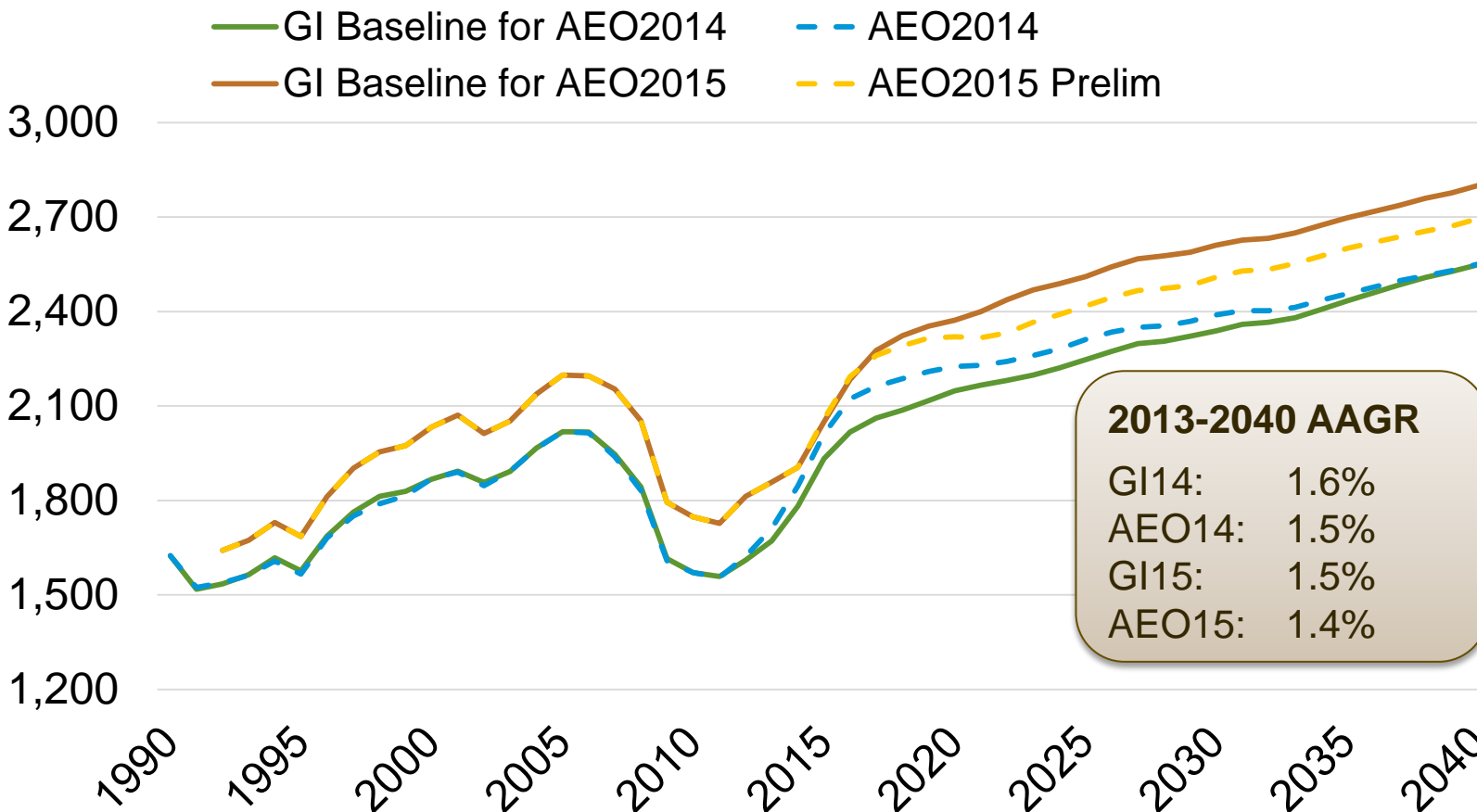
Billion X dollar



Prelim source: ref2015.defaults.FSFix.d071814a; X 2014 runs are 2005 \$, 2015 runs are 2009 \$

Non-manufacturing output reflects structural changes, lower agricultural expectations, and mining production*

Billion X dollar



Prelim source: ref2015.defaults.FSFix.d071814a; X 2014 runs are 2005 \$, 2015 runs are 2009 \$; * mining output is modeled in a separate part of NEMS, which will host its own Working Group meetings

Questions

U.S. Energy Information Administration home page | www.eia.gov

Short-Term Energy Outlook | www.eia.gov/steo

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