

Briefing on Macroeconomic Reference Case for the Annual Energy Outlook 2014 Macroeconomic/Industrial Working Group Meeting



July 30 2013

*Macroeconomic team: Kay Smith, Russ Tarver, Elizabeth Sendich and
Vipin Arora*

Presentation Goals

- The Reference Case presented is the GI May Long-term Trend forecast. Due to the comprehensive revision of the GDP accounts, released at the end of July, we will not update the macro projection to an August baseline in order to keep on the AEO2014 schedule. The GI August monthly simulation probably will be released at the end of August, with the long-term simulation by the end of September.
- Short Description of Proposed Reference Case
 - Highlight short-term vs. long-term growth
 - Forecast comparisons
 - Highlight macroeconomic concepts that other NEMS modules use

National Macroeconomic Model

- Uses Global Insight's macroeconomic model, whose forecast horizon matches NEMS
- Keynesian model capturing short-run cyclical developments with long-run equilibrium as specified by production function
- Model of output, prices and financial conditions allows depiction of both monetary and fiscal policies.
- 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

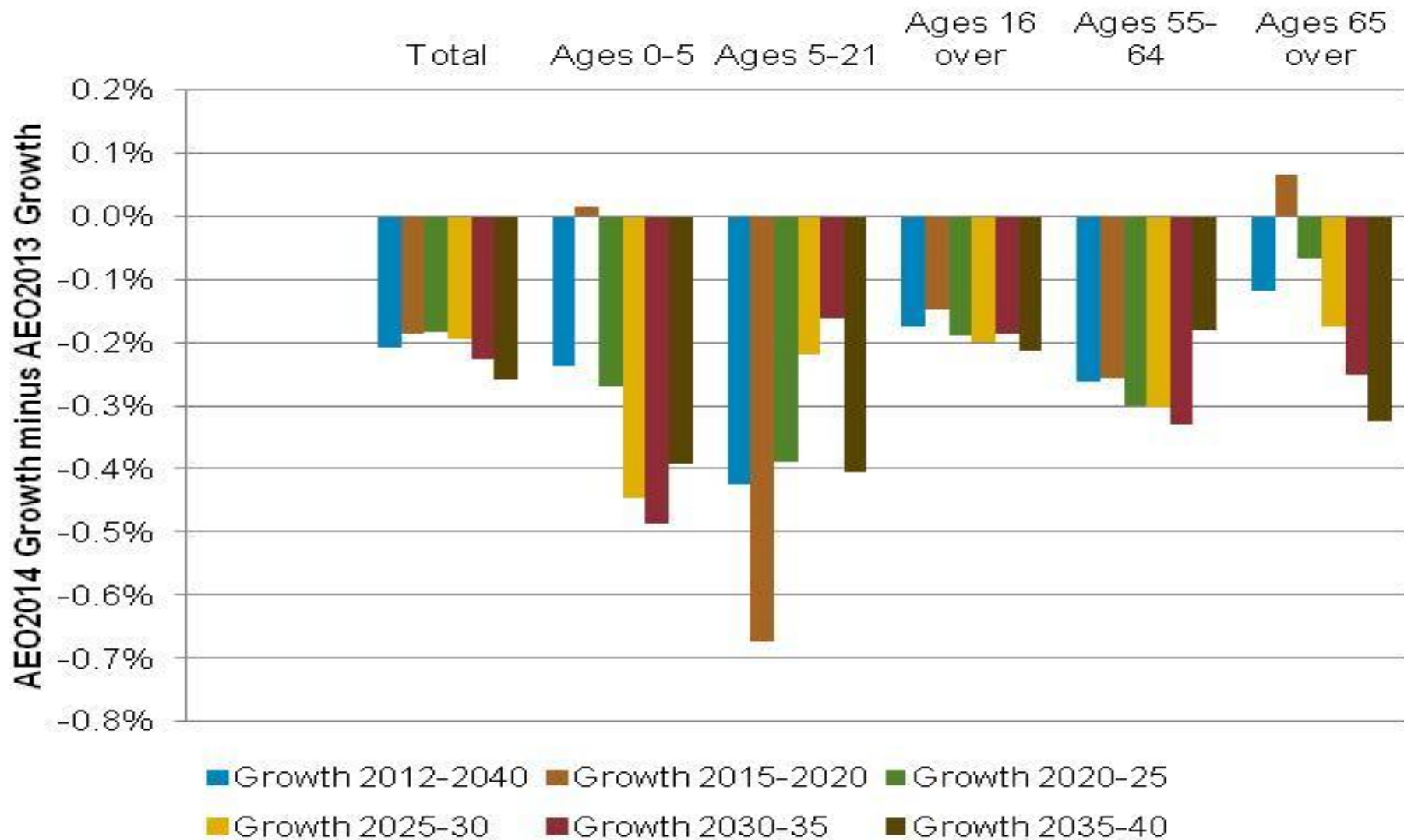
Four Components of MAM

- Industrial input output model provides 64 gross output for manufacturing, service, agricultural, construction and mining sectors. Mining and utilities come from NEMS. All other uses the input output model whose initial baseline comes from Global Insight. Most industries are at the 3 and 4 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 Macroeconomic Forecast for AEO2014

- Initial runs use the May 2013 long term forecast, going out to 2040 (GI baseline goes out to 2043). Real GDP growth is 0.1 percent per year slower than AEO2013's forecast, coming in at 2.4 percent growth from 2012 to 2040.
- This forecast incorporates the Census Bureau's new long-term population projections released in December 2012. Lower immigration, lower projected births and a smaller population in 2010 contributes to a lower growth in population and labor force. Population 16 and over is about 5 percent lower in 2040 compared to AEO2013 projection.
- 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 1.8 percent, about 0.3 percentage points lower than the last 30 year growth.
- Growth in productivity, population, and labor force explains most of long-run GDP growth.

Lower Population Growth in AEO 2014, Especially Young Ages



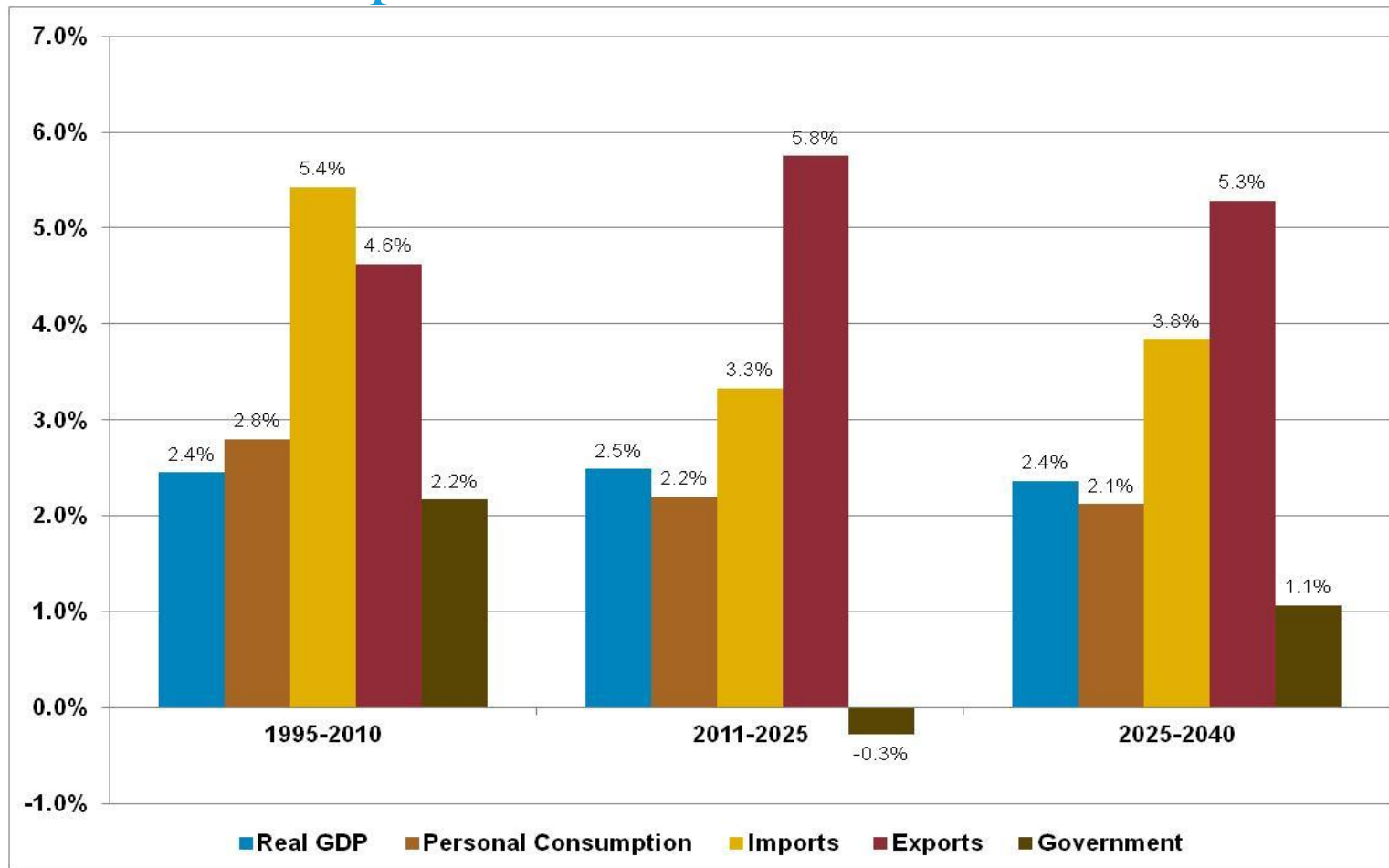
More Uncertainty in Short Run Growth

- 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 AEO2014 macroeconomic Reference Case will be similar to the simulation used in the September STEO. We expect that the first macro forecast that uses the revised GDP data will be released in mid-August—too late for the September STEO to incorporate the revision. As a result, the September STEO will use a July forecast, the same simulation that the August STEO will use.

Preliminary AEO2014 Macroeconomic Reference Case, cont

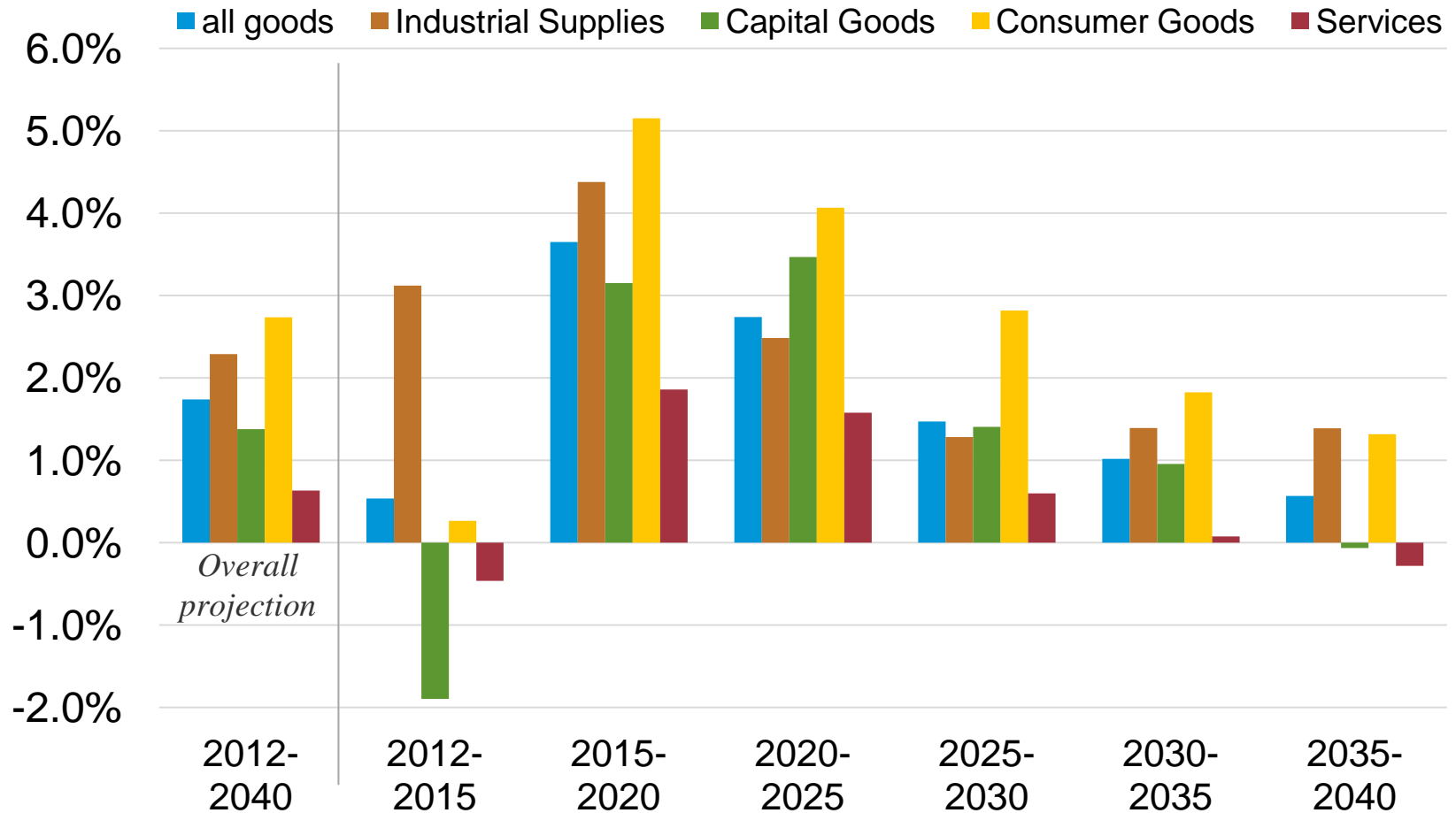
	Previous 30 Year Growth	Forecasted 28 Year Growth
Real GDP	2.8%	2.4%
Consumption	3.1%	2.2%
Investment	3.1%	3.4%
Government	2.1%	0.6%
Exports	5.3%	5.4%
Imports	6.2%	3.7%

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 export impacts from industrial supplies and consumer goods

Net annual average growth rate



Source: ref2014/d062113a

Moving 30-Year Average vs Annual GDP Growth

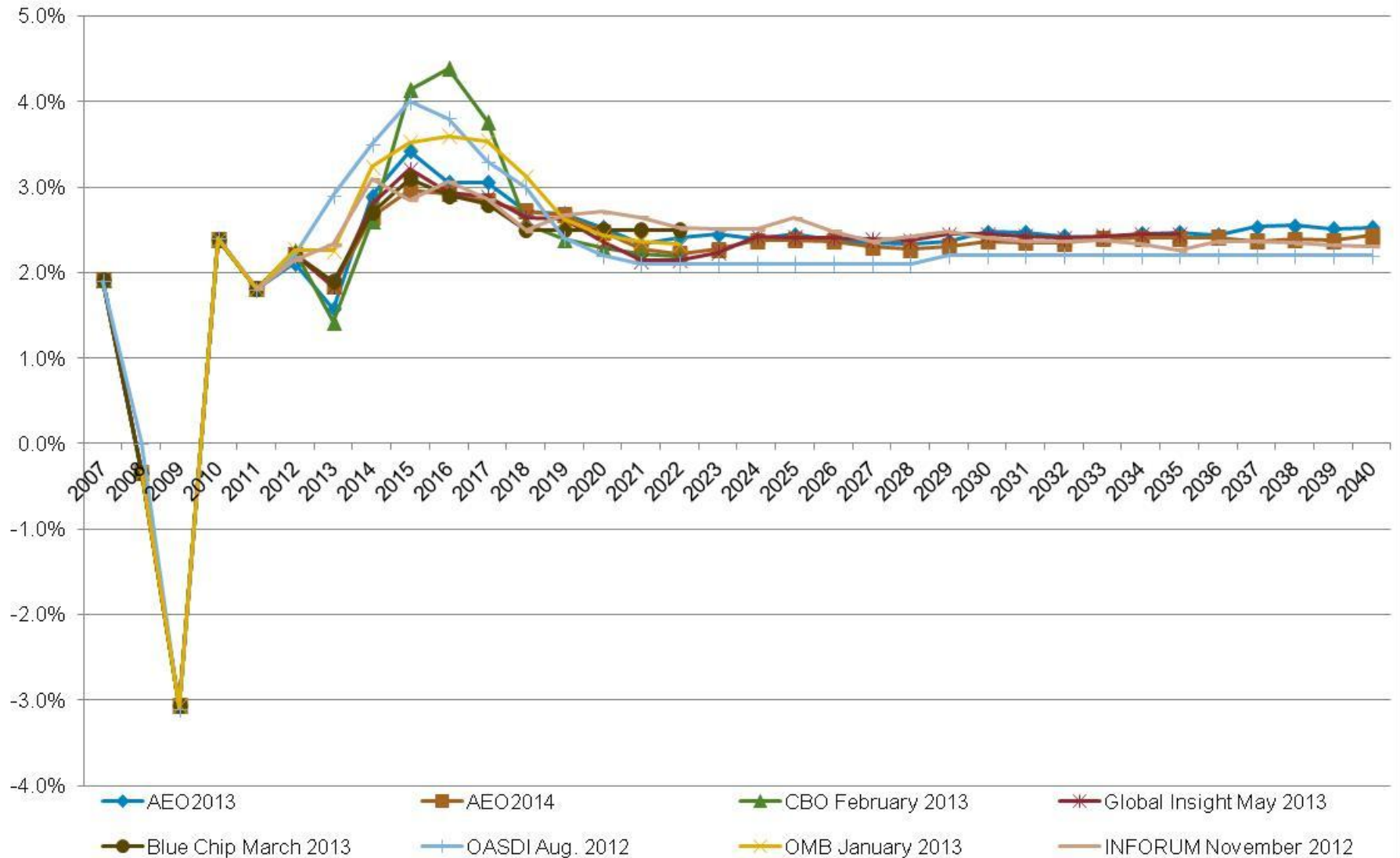
The Reference Case is a trend forecast; thus the annual GDP forecast settles into a long-run growth path.



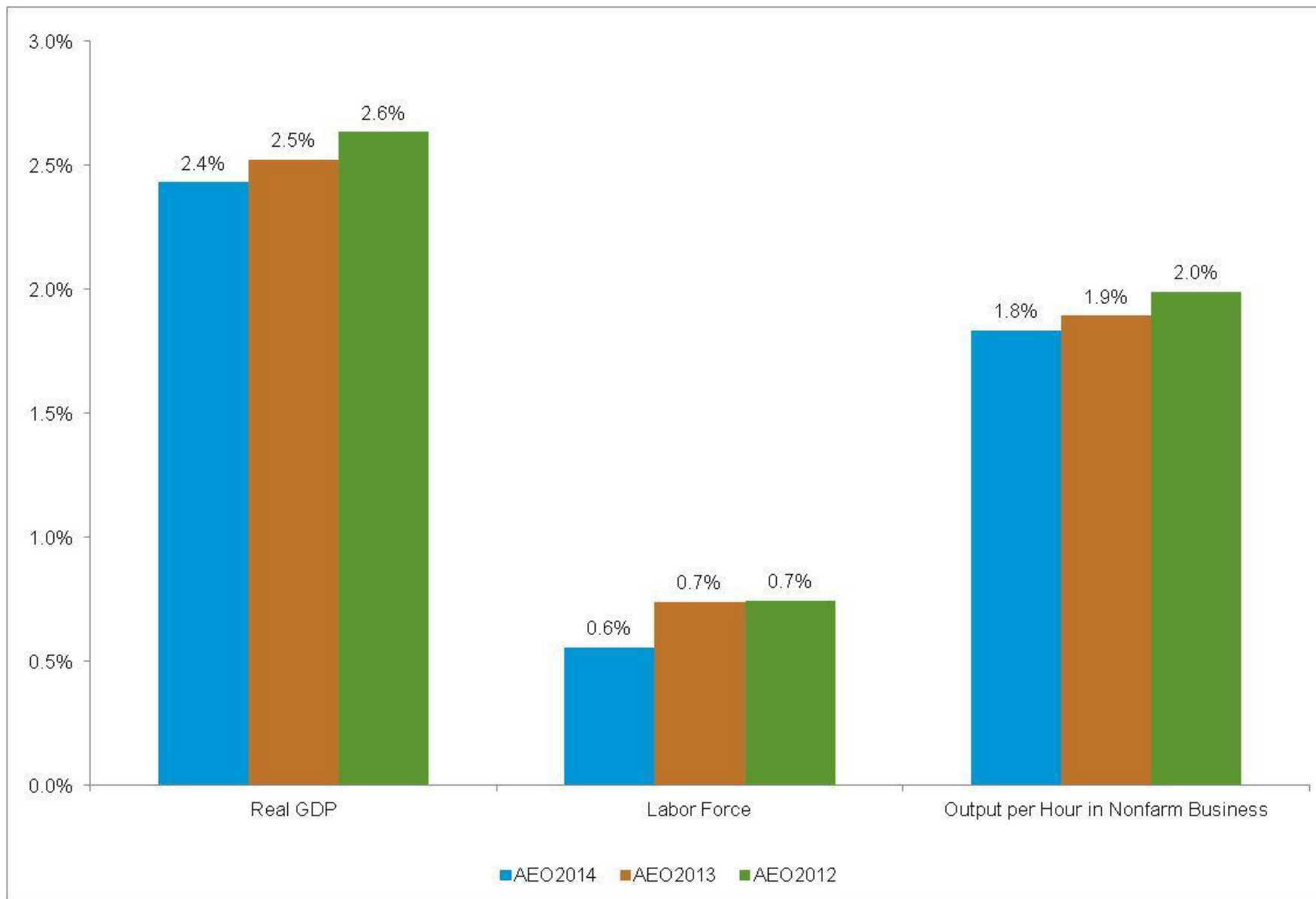
Comparisons with other Projections

- 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

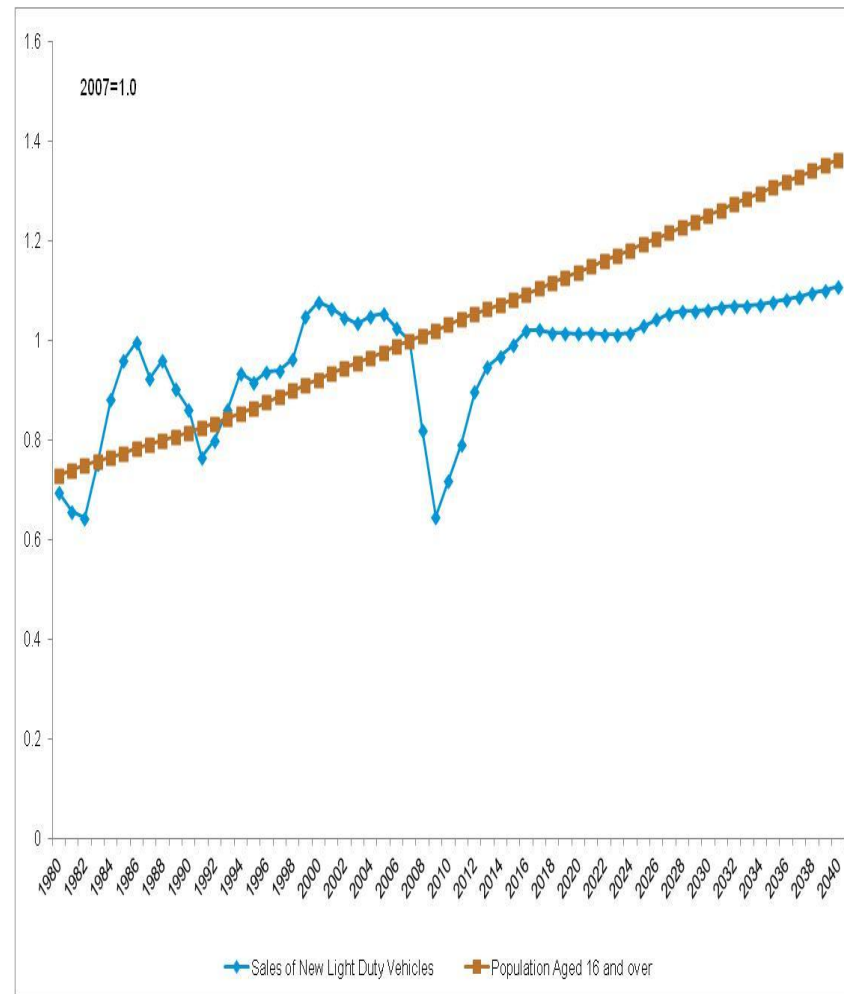
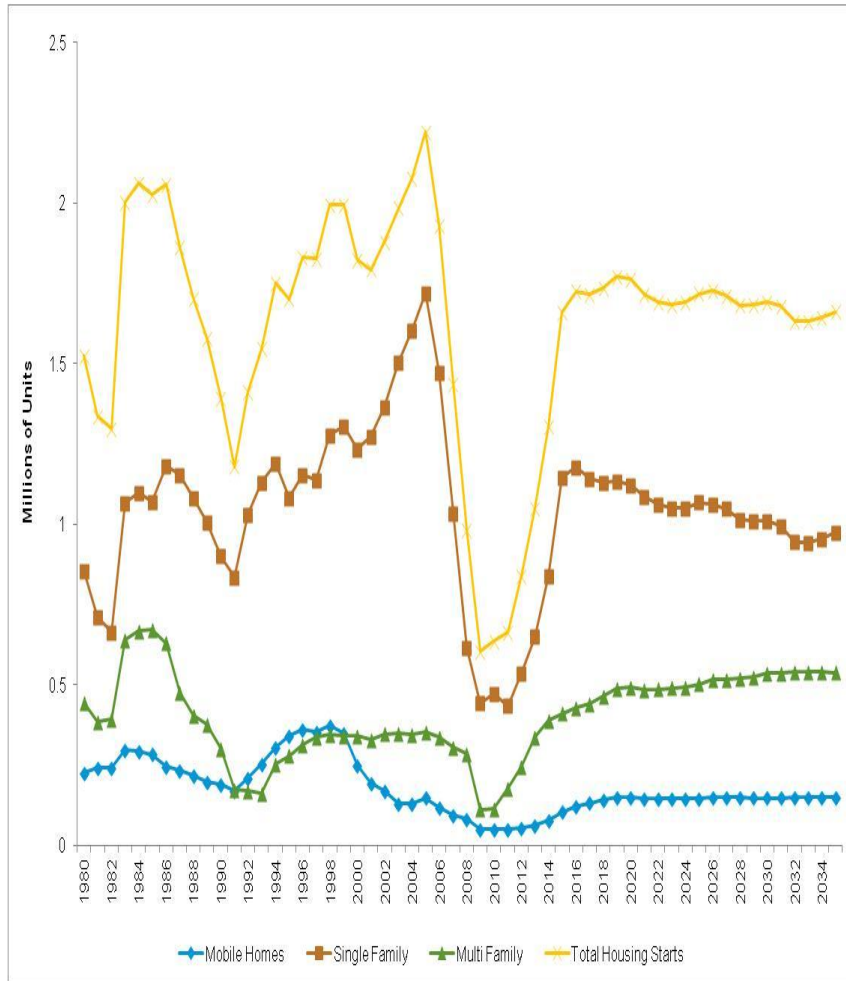
Real GDP, Annual Percent Change



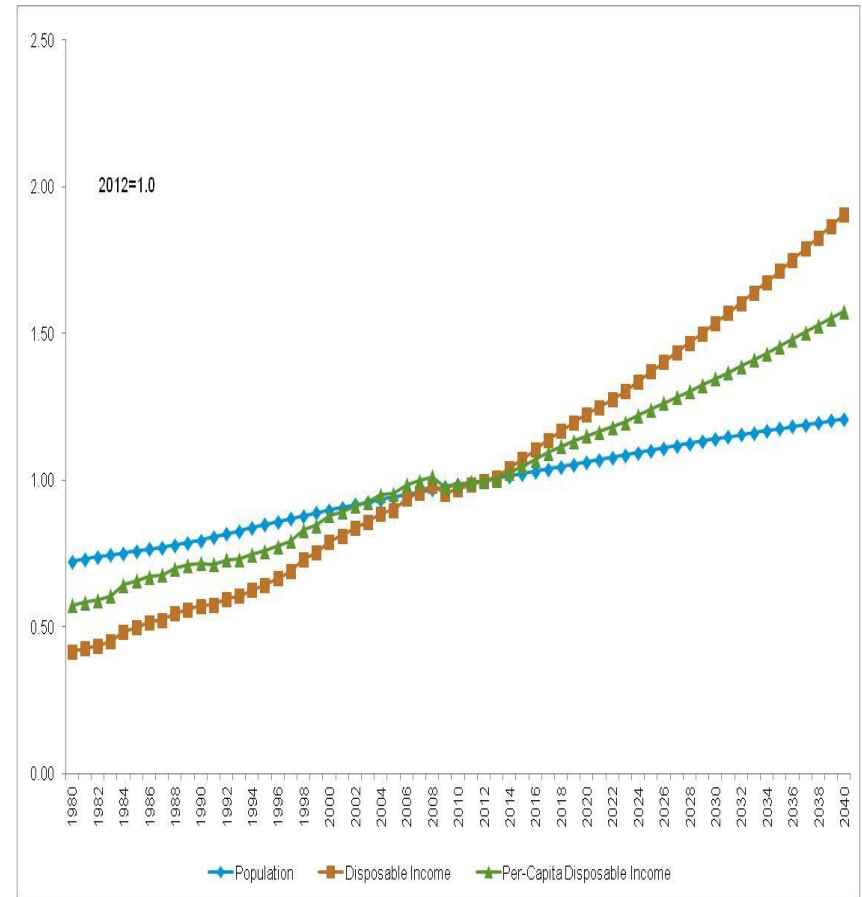
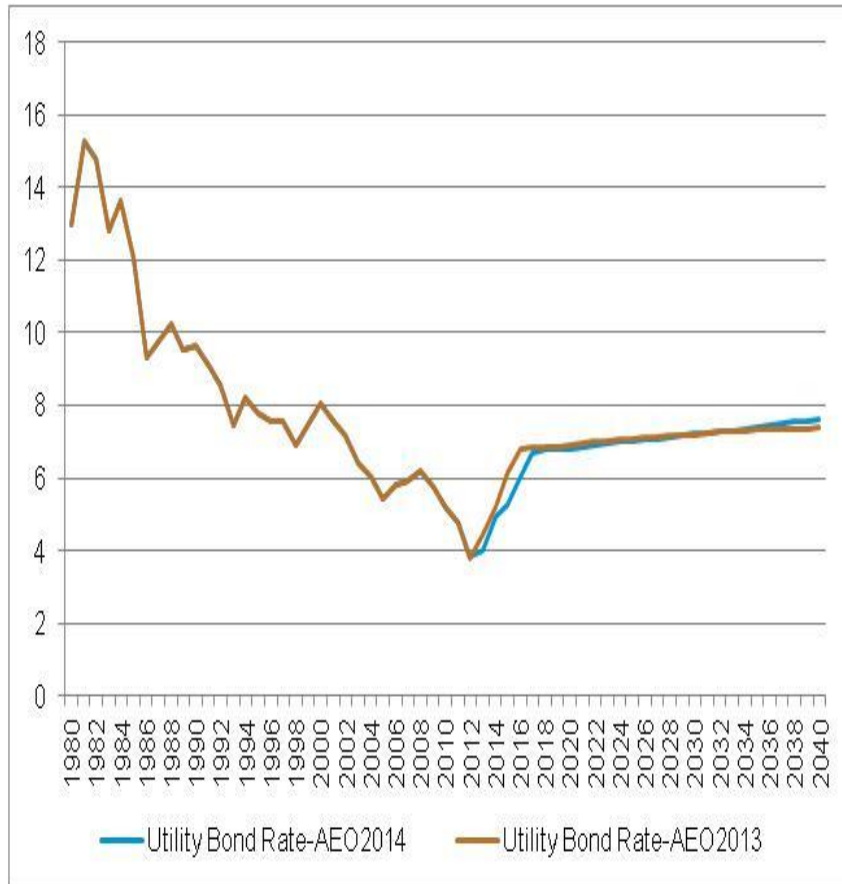
Long-run Growth has been declining over past several AEO forecasts



Proposed Reference Case Projections that other NEMS Models Use



Most Energy Supply NEMS Modules use Interest Rates, Population and Disposable Income



Industrial Economic Model Changes

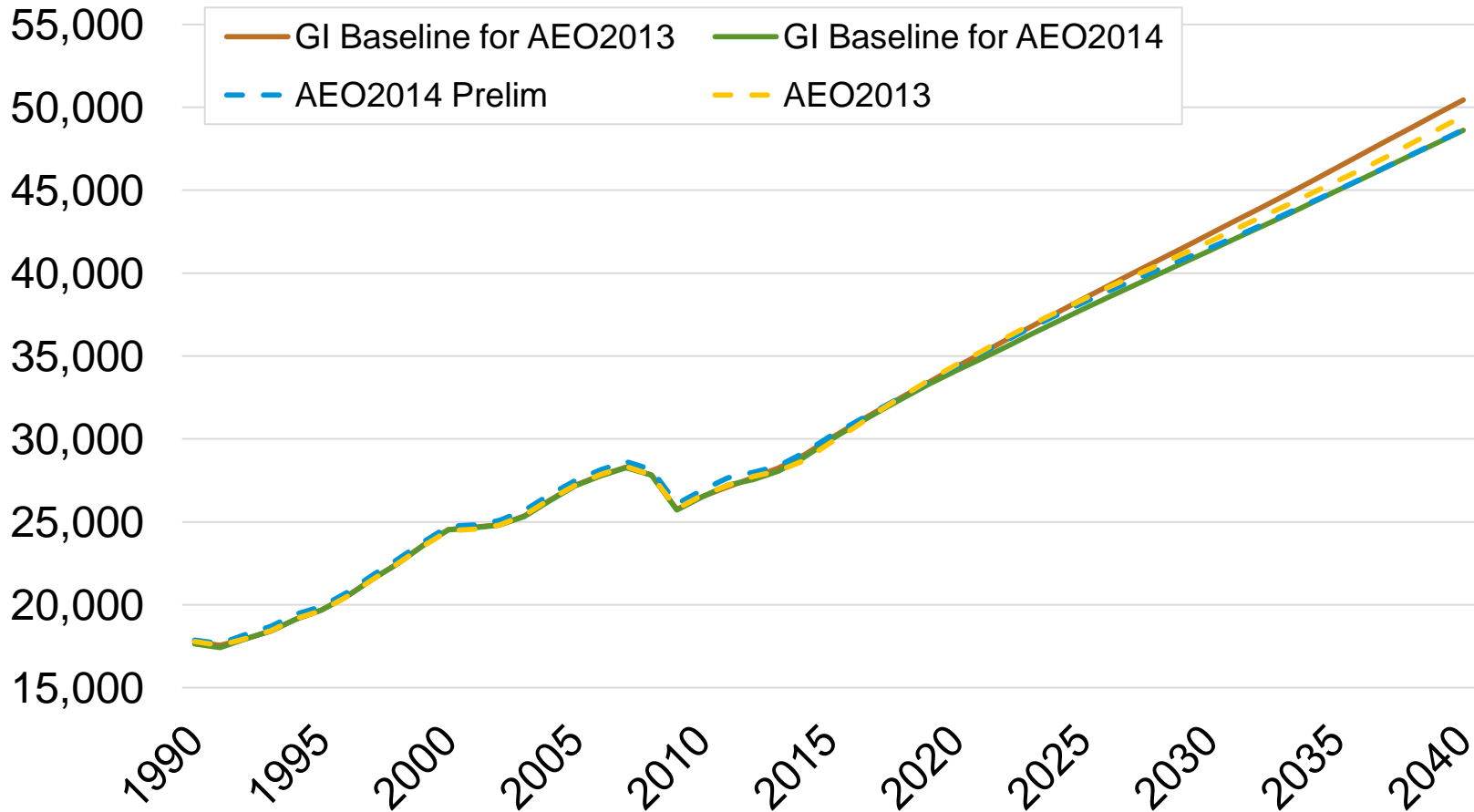
- We have combined textiles, apparel and leather into one industrial category in a model simplifying attempt.
- We plan to introduce a relative price term of naphtha and ethane in the equations for resins and organic chemicals.
- We have the initial industrial forecast from Global Insight which shows slightly lower gross output growth compared to last year's Global Insight forecast, although manufacturing growth is higher. Basic chemicals, primary metals and fabricated metals, all related to increased production of shale oil and gas, show higher growth. Services show slower growth, especially retail trade and finance.

Initial AEO2014 Runs consistent with new macro simulation

- Overall gross output growth is about 0.1 percent lower in initial AEO2014 runs, similar to the differential in GDP growth compared to the AEO2013 projection.
- Composition of industrial growth shifts, with manufacturing gaining share of gross output. By 2040, manufacturing is about 17 percent of gross output; in AEO2013 manufacturing share reached 16 percent.
- Consistent with slower growth in consumption, services growth is lower, especially retail trade and financial services.

Preliminary Industrial (includes Services) Output Projections

Billion 2005 dollar

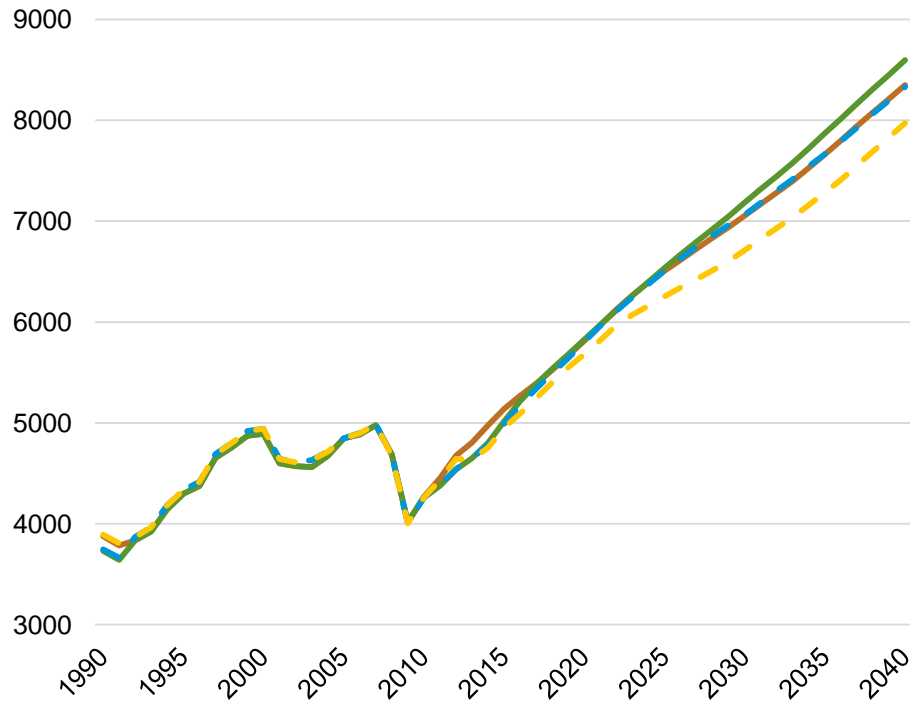


Source: ref2014.d072313a

Industrial sub-sector outputs

Manufacturing

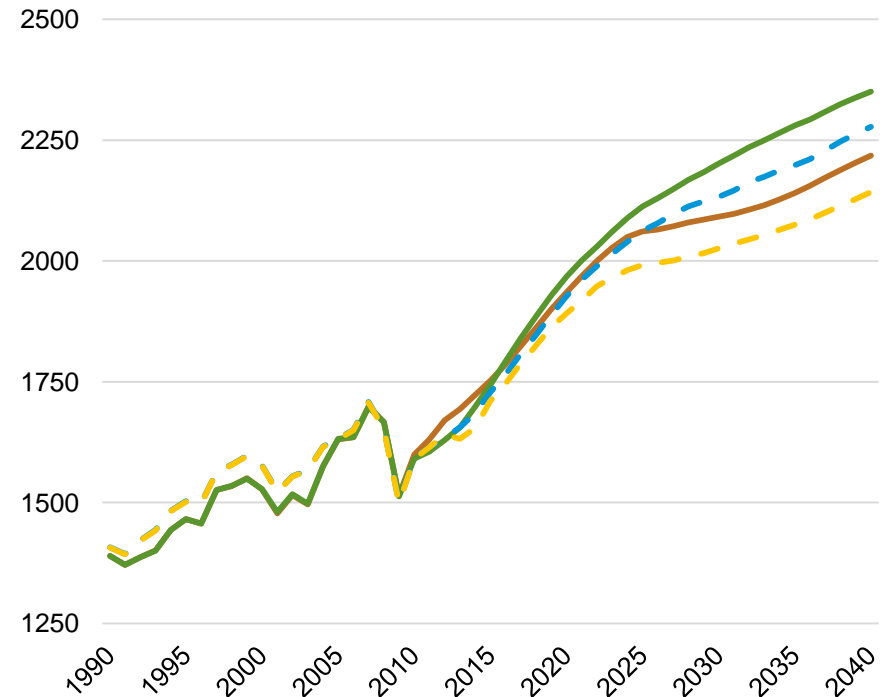
Billion 2005 dollar



— GI Baseline for AEO2013 — GI Baseline for AEO2014
- - - AEO2014 Prelim - - - AEO2013

Energy Intensive Industries*

Billion 2005 dollar

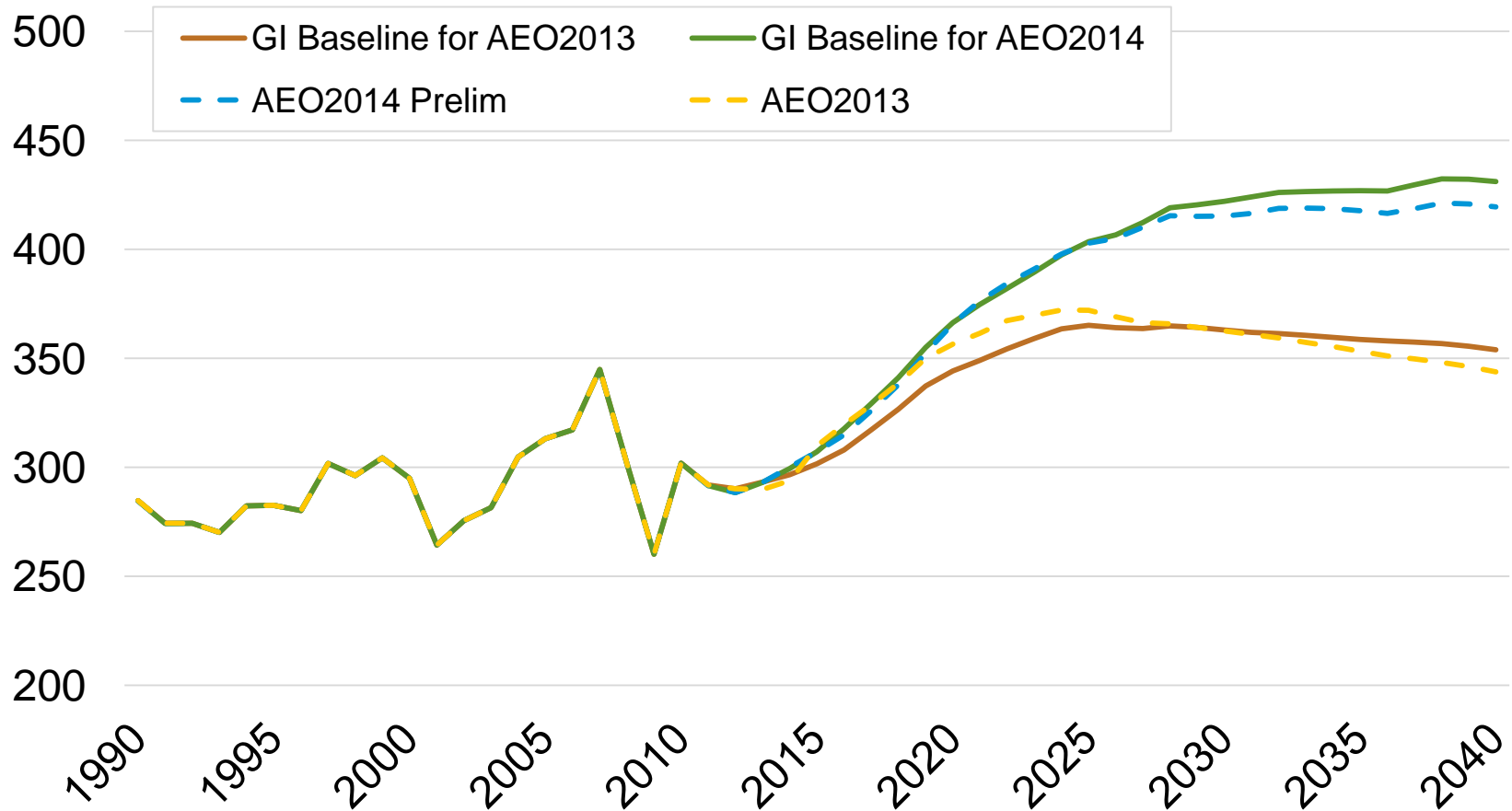


— GI Baseline for AEO2013 — GI Baseline for AEO2014
- - - AEO2014 Prelim - - - AEO2013

Source: ref2014.d072313a, * includes refining

Bulk chemicals output reflects greater investment and action from shale

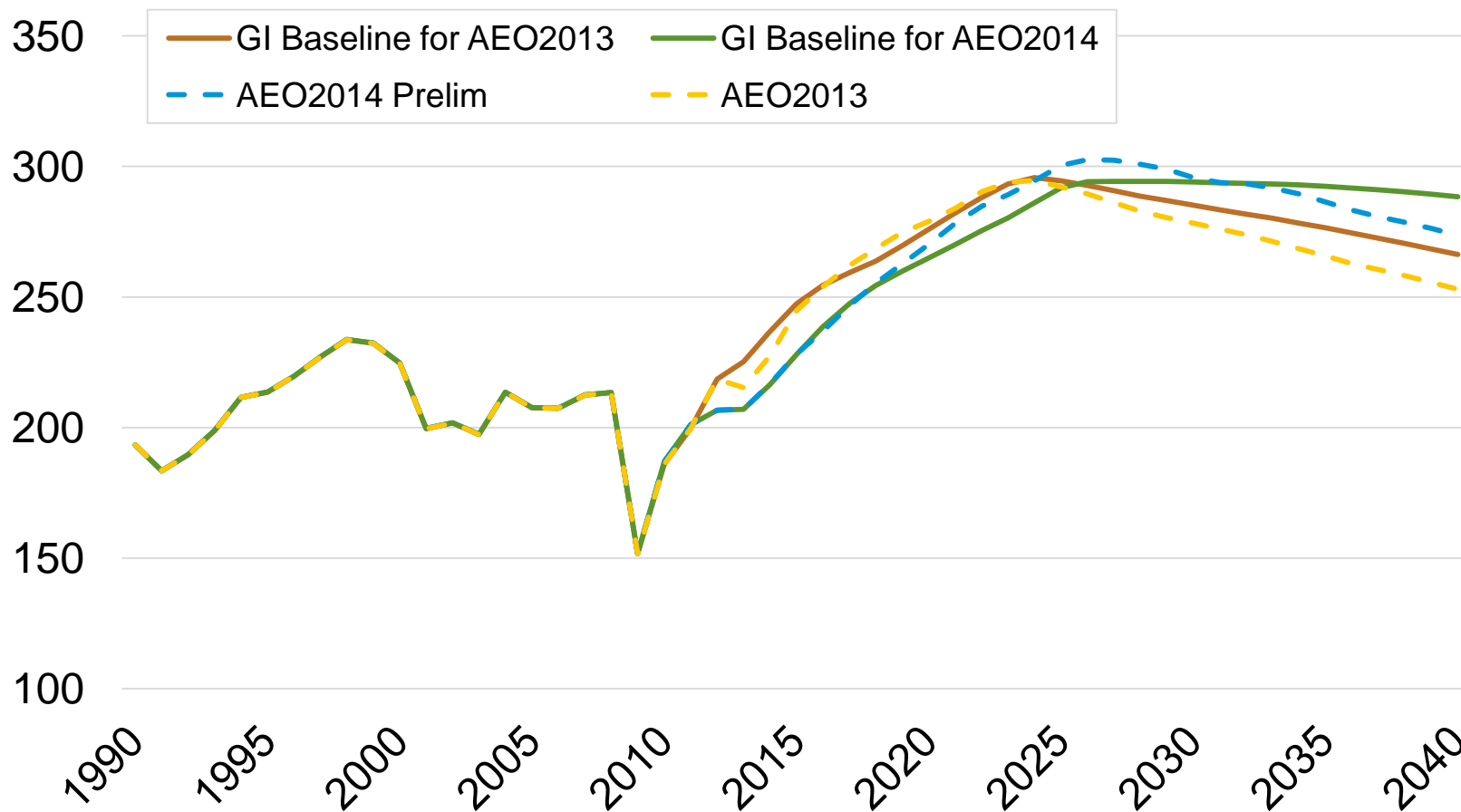
Billion 2005 dollar



Source: ref2014.d072313a

Primary metals output reflects prolonged effect of shale and changing product demands

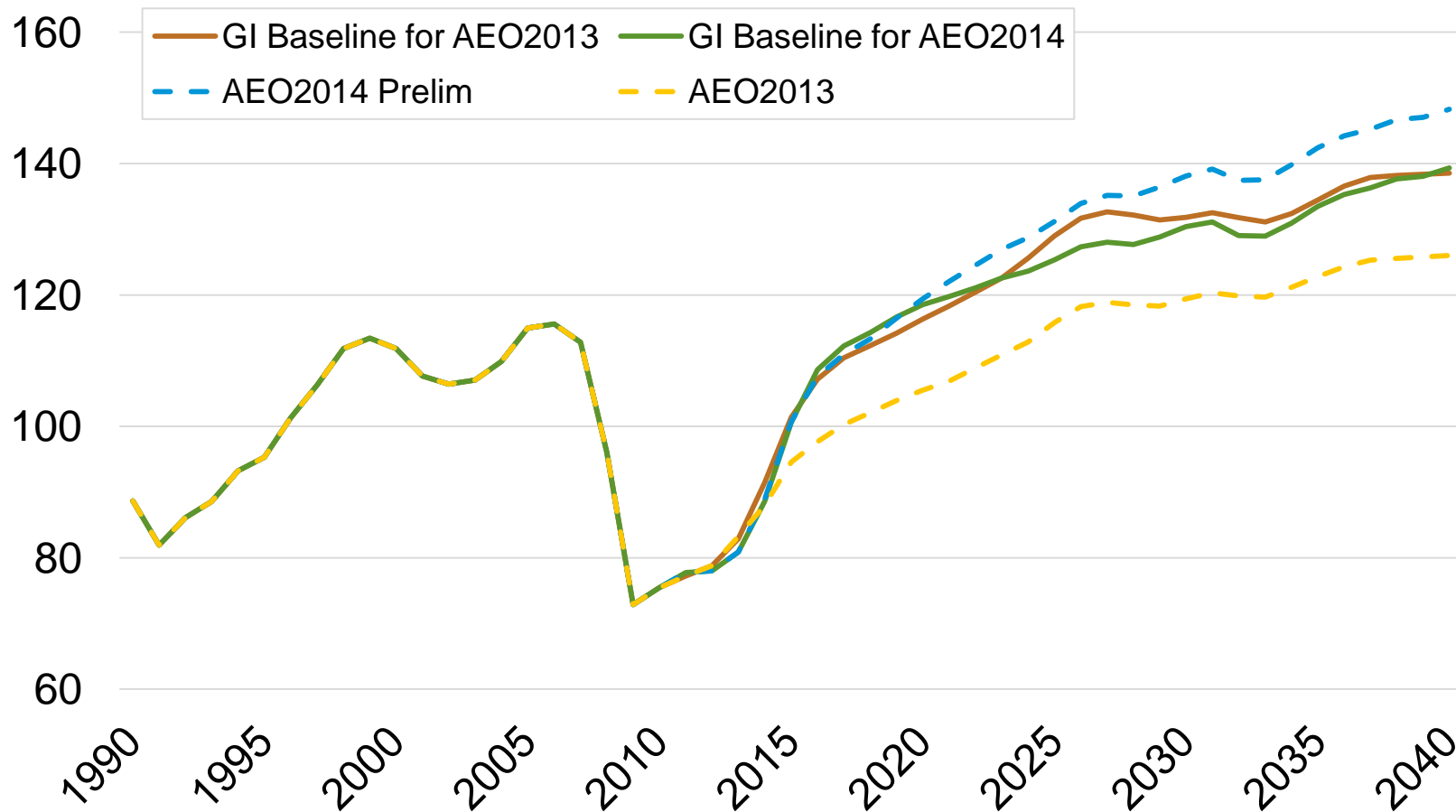
Billion 2005 dollar



Source: ref2014.d072313a

Non-metallic minerals output also reflects prolonged effect of shale and changing product demands

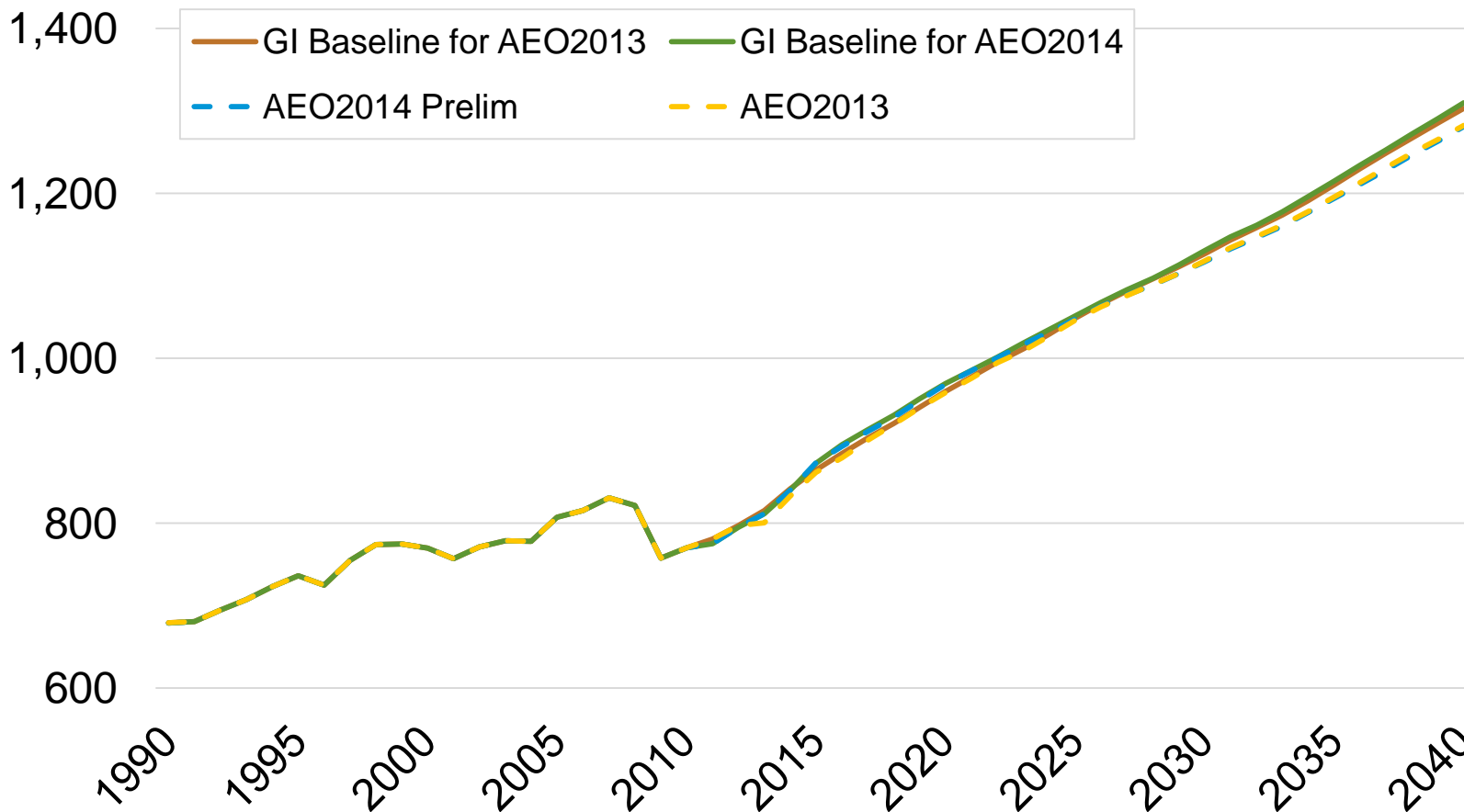
Billion 2005 dollar



Source: ref2014.d072313a

Plant-based (food, wood, and paper) output reflects changing product demands

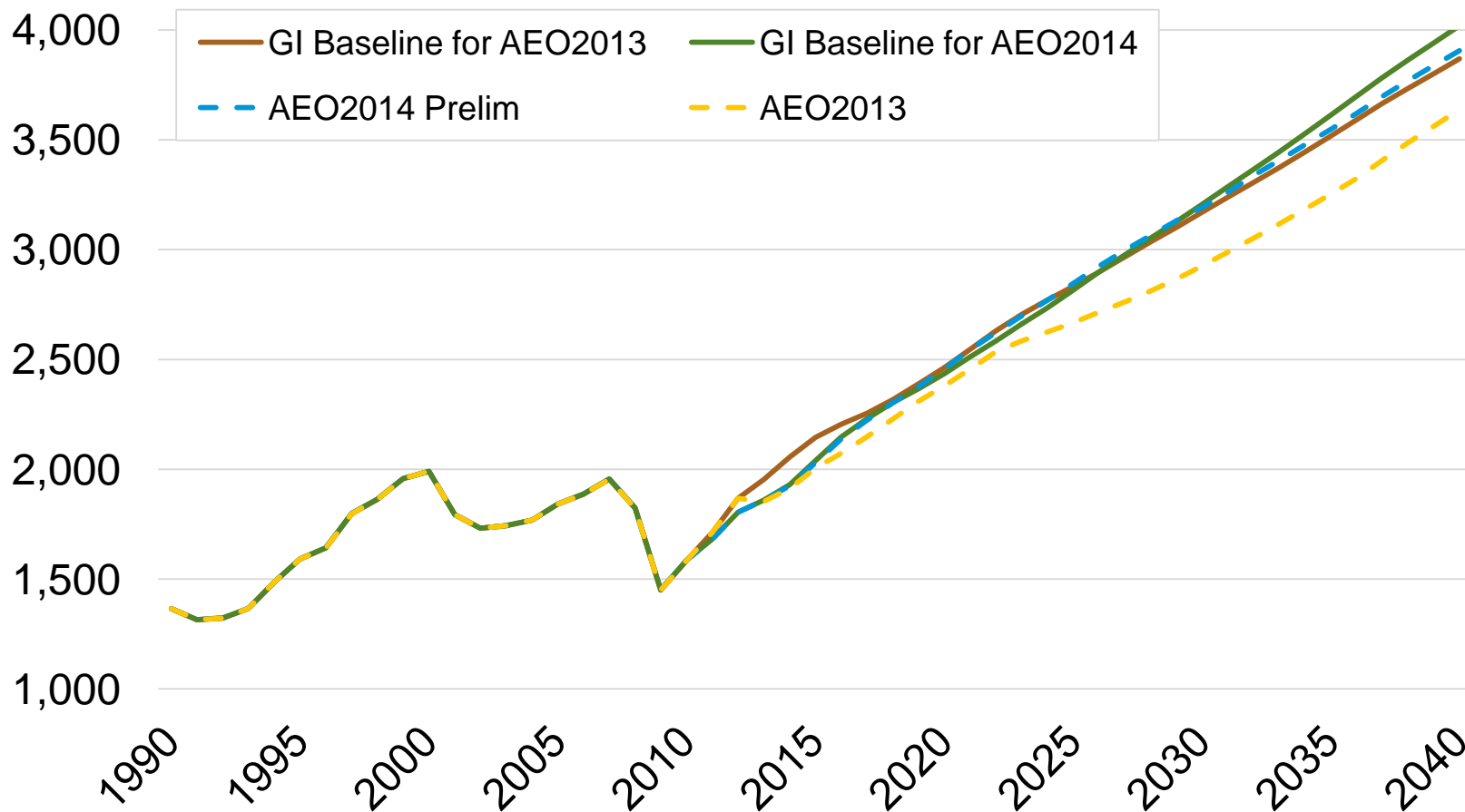
Billion 2005 dollar



Source: ref2014.d072313a

Metal-based durables output begins to reflect effect of shale and changing consumer product demands

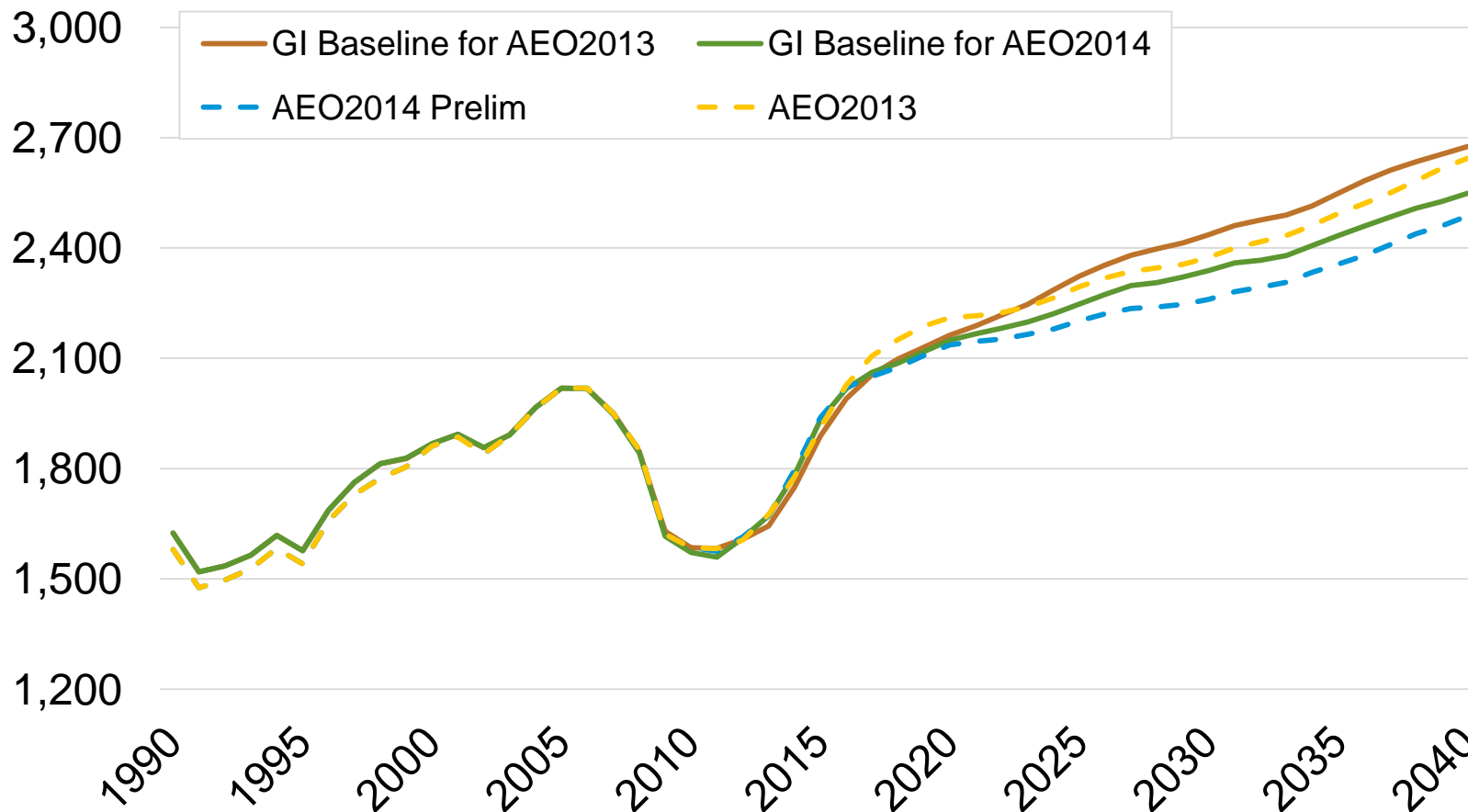
Billion 2005 dollar



Source: ref2014.d072313a

Non-manufacturing output reflects new mining and construction modeling approaches*

Billion 2005 dollar



Source: ref2014.d072313a, * mining output is modeled in a separate part of NEMS, which will host its own Working Group meetings

For more information

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

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

Annual Energy Outlook / www.eia.gov/aeo

International Energy Outlook / www.eia.gov/ieo

Monthly Energy Review / www.eia.gov/mer

Today in Energy / www.eia.gov/todayinenergy