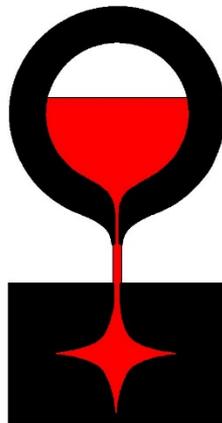


Steel Founders' Society of America

2017 Industry Market Forecast





Marketing Committee Role as defined by SFSA Board

The function of the Marketing Committee is to **broaden the market for and promote the use of steel castings** by investigating and developing new markets, developing and implementing an effective marketing program, and communicating the advantages of steel castings to present and prospective consumers in an effective manner.

To carry out its mission, the committee maintains liaison with other committees of the Society through the staff, identifies technical, business and market topics of interest to customers and SFSA members, directs development of the material and delivery of the information. The committee develops the deliverables for the marketing program such as messaging, competitive input, target market, and specific planning, The committee also performs related market research to help guide the work of the Society and **prepares each year for the Society an annual forecast of steel casting demand.....**



Forecast Process

- Segmented primary markets
- Identified key customers and users in each market
- Analyze customer top line sales
- Marketing committee input
- Review analyst reports



Steel Founders' Society of America 2017 Industry Forecast

Market Segment	Estimated 2015 (tons)	Projected 2016 (tons)	2016 Change (%)	2017 Forecast (tons)	2017 Change (%)
Railroad	682,500	505,000	-26%	430,000	-15%
Mining - OEM	94,300	85,000	-10%	82,500	-3%
Mining - Consumables	152,000	122,000	-20%	122,000	0%
Construction	101,100	93,000	-8%	91,000	-2%
Trucks	52,300	37,000	-29%	35,000	-5%
Valves & Pumps	45,400	45,000	-1%	45,000	0%
Oil Field	39,800	32,000	-20%	32,000	0%
Military	14,900	15,200	2%	15,500	2%
Other Markets	107,200	104,000	-3%	105,000	1%
Total	1,289,500	1,038,200	-19%	958,000	-8%



Steel Founders' Society of America

2017 Industry Forecast w/o Rail

Market					
Segment	Estimated 2015 (tons)	Projected 2016 (tons)	2016 Change (%)	2017 Forecast (tons)	2017 Change (%)
Mining - OEM	94,300	85,000	-10%	82,500	-3%
Mining - Consumables	152,000	122,000	-20%	122,000	0%
Construction	101,100	93,000	-8%	91,000	-2%
Trucks	52,300	37,000	-29%	35,000	-5%
Valves & Pumps	45,400	45,000	-1%	45,000	0%
Oil Field	39,800	32,000	-20%	32,000	0%
Military	14,900	15,200	2%	15,500	2%
Other Markets	107,200	104,000	-3%	105,000	1%
Total	607,000	533,200	-12%	528,000	-1%



Forecasts for Manufacturing and Related Production

	Annual Percent Change			
	2015	2016	2017	2018
Housing starts	11	5	17	9
Motor vehicles and parts	6	4	-2	-1
Household appliance	4	5	3	2
Pharmaceutical and medicine	3	1	2	3
Iron and steel products	-12	-3	-2	-3
Alumina and aluminum production and processing	-1	-4	-1	2
Fabricated metal products	-1	-2	1	2
Basic chemicals	3	4	3	5
Paper	-2	-2	-1	0
Construction machinery	2	-8	2	2
Mining and oil and gas field machinery	-13	-18	4	10
Industrial machinery	9	-4	5	4

Source(s): MAPI Foundation



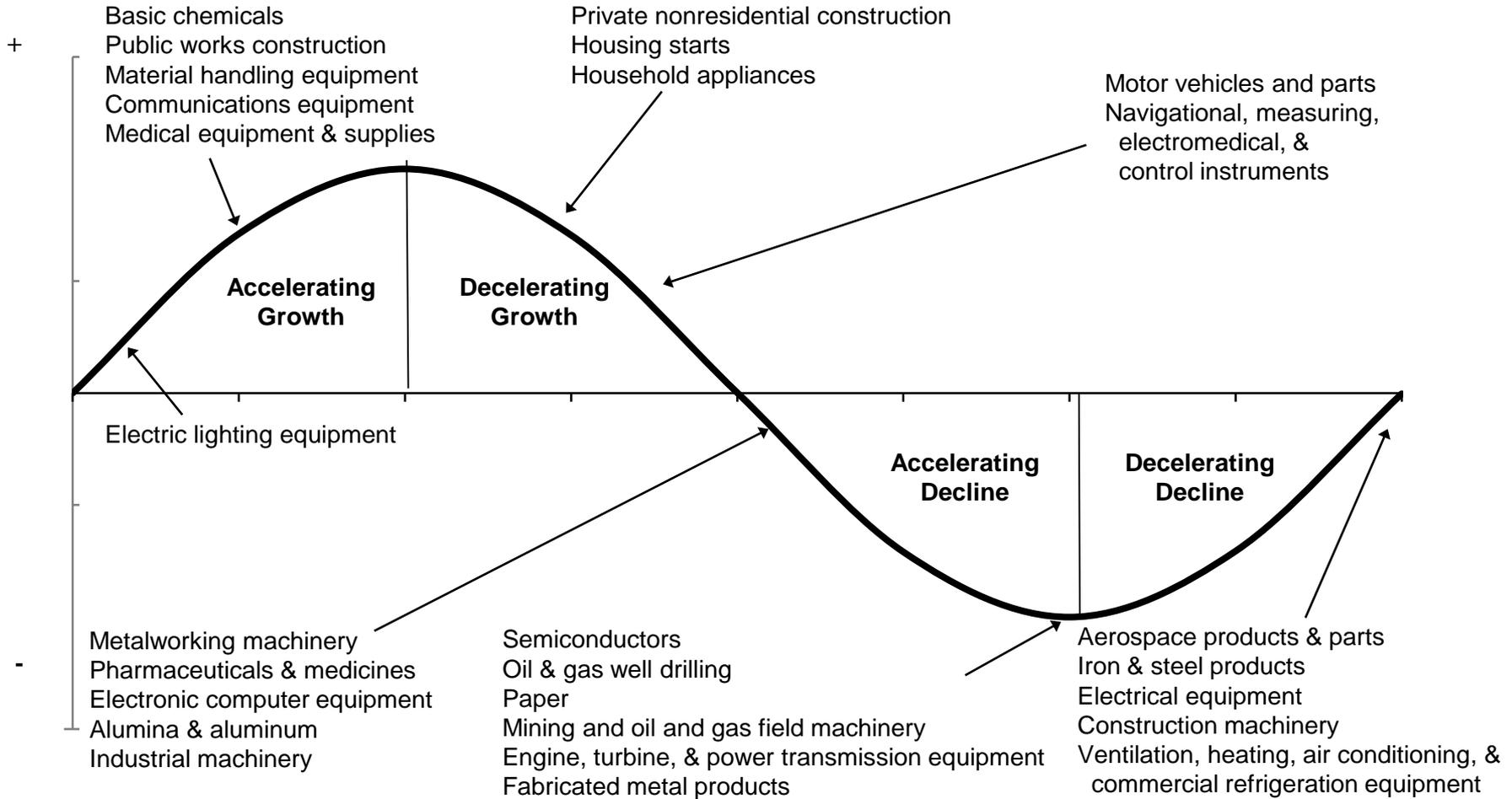
Forecasts for Manufacturing and Related Production (continued)

	Annual Percent Change			
	2015	2016	2017	2018
Ventilation, heating, air conditioning, and commercial refrigeration equipment	2	-4	6	4
Metalworking machinery	-3	-5	2	2
Engine, turbine, and power transmission equipment	1	-10	2	4
Communications equipment	0	3	4	6
Navigational, measuring, electromedical, and control instruments	3	3	3	3
Electric lighting equipment	1	1	2	3
Electrical equipment	-5	-2	1	1
Medical equipment and supplies	-1	6	3	3
Aerospace products and parts	0	1	3	4
Private nonresidential construction	3	9	-1	-2
Public works construction	1	4	1	1

Source(s): MAPI Foundation

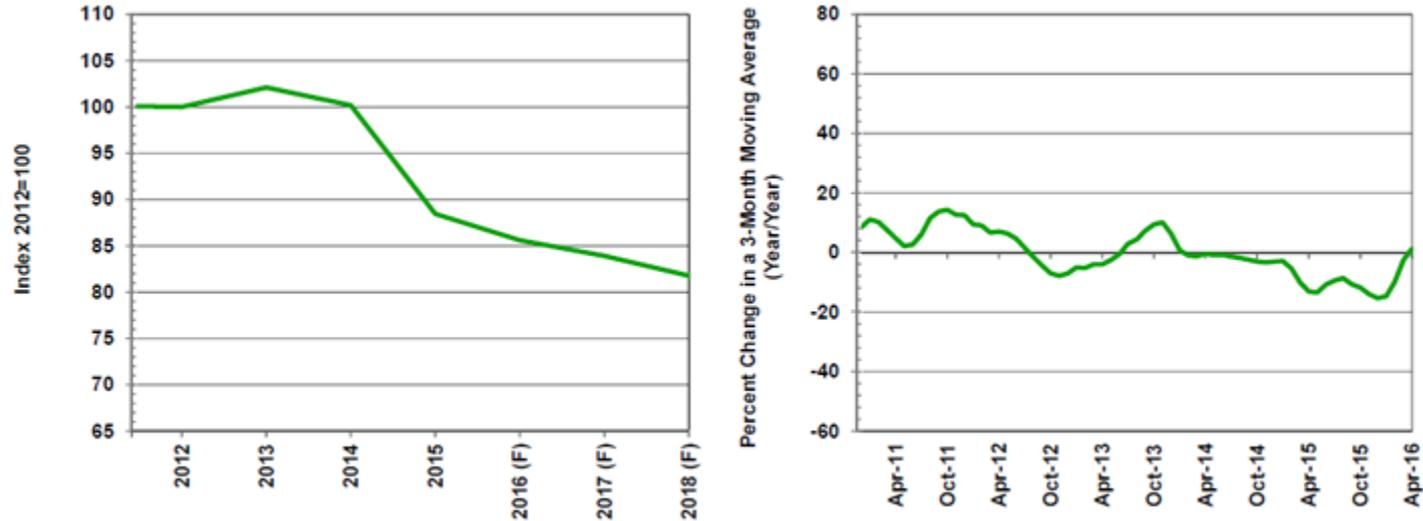


Industrial Sector by Phase of Cycle, April '16





Iron and Steel Products Production

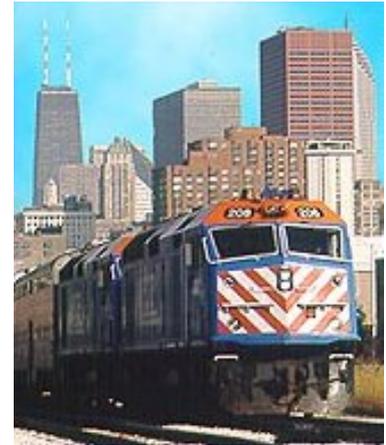


- The steel industry is predicted to decline 3% in 2016, 2% in 2017, and 3% in 2018.
- Output rose 1% in the three months ending April 2016 versus the same period one year ago. Compared with November to January, the production momentum expanded at a 30% annual rate.
- Capacity utilization in the U.S. steel industry was 75.9% in the week of May 28, 2016 (higher than the 72.1% one year earlier).
- U.S. durable goods manufacturing industries' production momentum rose 0.5% during February to April 2016 compared with November to January; these are predominantly steel-intensive industries.
- Steel inventories are being drawn down. In April 2016, U.S. service center steel shipments decreased by 6.3% from April 2015. Steel product inventories decreased 19.3% from April a year ago.
- Tariffs imposed on imported steel have increased domestic prices.
- World steel production fell 1% in the three months ending in April compared with one year ago. Steel production was down 6% in Europe (28 countries), was off 2% in Russia, and fell 2% in Korea. In the three months ending April 2016 compared with year-ago levels, China's steel production was flat and Taiwan's was down 10%. Steel production in Brazil fell 13%.
- Steel product imports fell 47% (because of trade tariffs) while exports fell 26%. Steel's import to export ratio is 2.1, so the trade deficit was \$4.4 billion less negative in the first quarter of 2016 compared with one year ago. A 21% decline in steel mill product prices for imports accounts for a large portion of the decline in dollar trade in steel.



Railroad Forecast

- Railroad industry
 - 2015 estimated 682,500 tons
 - 2016 projected 505,000 tons
 - 2017 forecast 430,000 tons
- Railcar deliveries
 - 2015 actual 85,000 units
 - 2016 projected 61,000 units
 - 2017 forecast 46,000 units
- Low Oil Prices
- Tank car fleet surplus, fleet utilization down
- Collapse in energy-related new car demand





Customer Market Sales Forecast

% change from prior year

Railroad	2016	2017
Railroads	-5.5%	4.7%
Equipment	-15.6%	-12.6%
SFSA Forecast	-26%	-15%

Note: Customer market data is percentage change in revenue, SFSA forecast is percentage change in tonnage.



Mining Forecast

- **Mining equipment and consumable castings**



– Year	Equipment	Consumables
– 2015 estimated	94,300 tons	152,000 tons
– 2016 projected	85,000 tons	122,000 tons
– 2017 forecast	82,500 tons	122,000 tons

- Weak global commodity markets
- Strength of the dollar
- Increased government rules and regulations



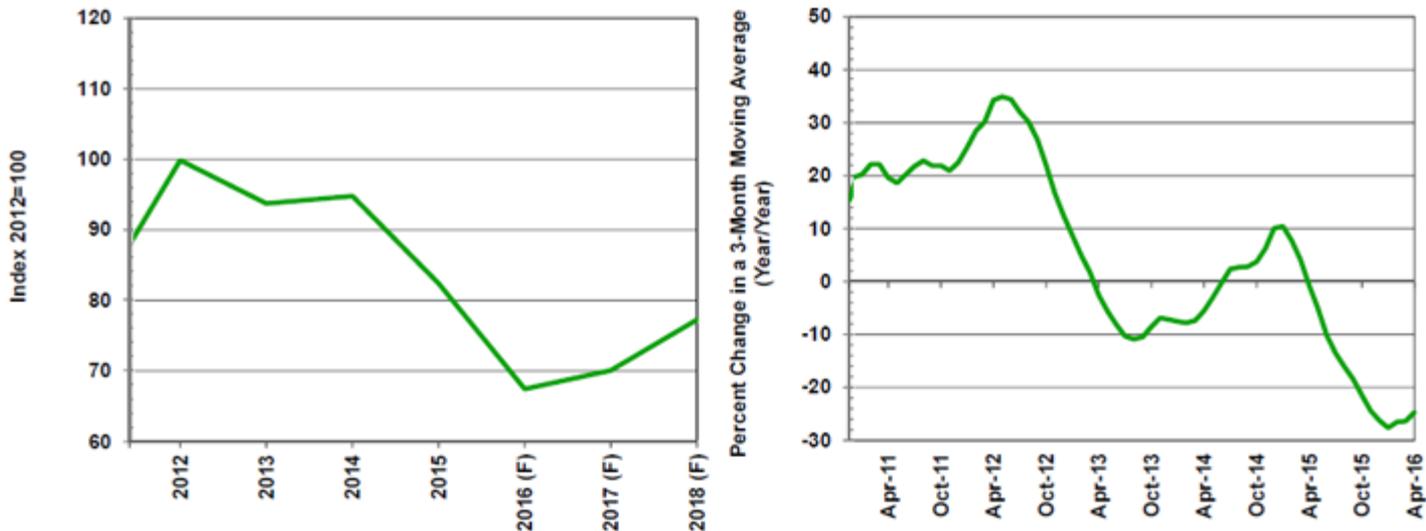
Customer Market Sales Forecast

% change from prior year

Mining	2016	2017
Mines	-18%	4%
Equipment	-6%	-8%
SFSA Consumables	-20%	0%
SFSA Equipment	-10%	-3%
MAPI	-18%	4%



Mining and Oil and Gas Field Machinery Production



- Mining and oil and gas field machinery production should fall 18% in 2016 and then grow 4% in 2017 and 10% in 2018.
- Production fell 25% in the three months ending April 2016 compared with one year earlier and the quarter-to-quarter momentum was very negative.
- WTI oil prices were \$49 at the end of May. A price of \$50 is thought to be the approximate breakeven point for new shale oil drilling, so U.S. oil production is close to being profitable again. The Energy Information Administration (EIA) forecasts a 9% decline in U.S. crude oil production this year.
- The EIA forecasts that coal production will decline 17% in 2016 and then rise 4% in 2017.
- Gold and silver mining in the United States increased 4% in the three months ending April 2016 compared with the same period one year earlier.
- Oil and gas well drilling fell 56% in the three months ending May 2016 compared with one year earlier. Recent momentum in the drilling market is very negative.
- Mining and oil and gas field machinery production is very export-oriented—the import to export ratio is only 0.3. Imports fell 43% while exports fell 42%; the trade surplus was \$486 million less positive in the first quarter of 2016 compared with one year earlier.



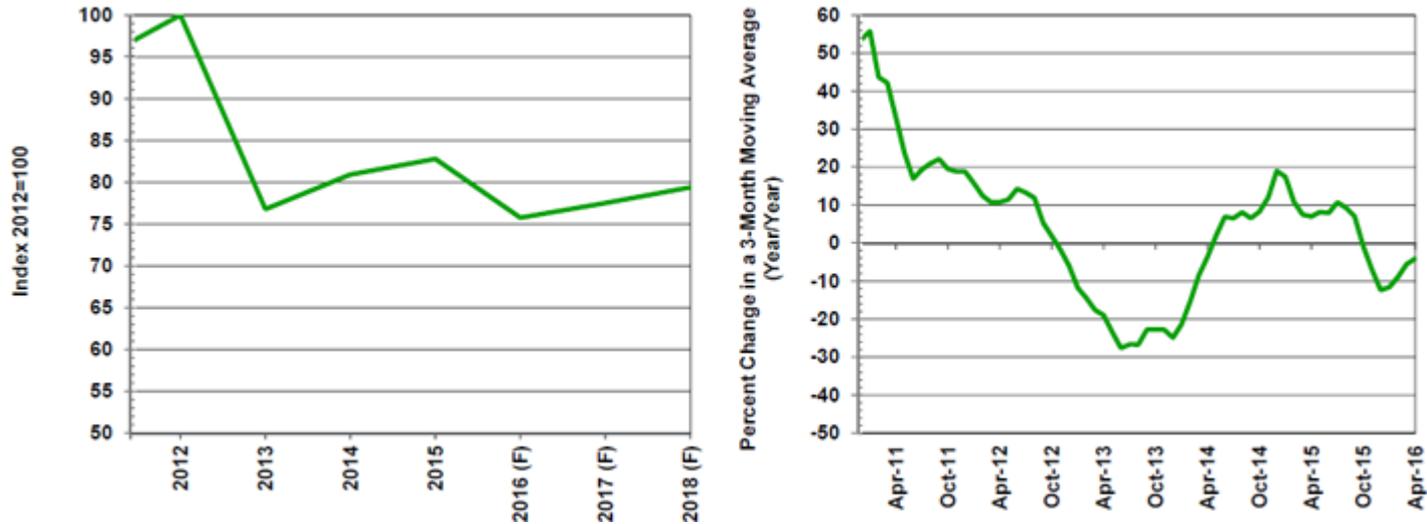
Construction Forecast

- **Construction equipment**
 - 2015 estimated 101,100 tons
 - 2016 projected 93,000 tons
 - 2017 forecast 91,000 tons
- Slowdown in demand from China
- Large inventory of used equipment





Construction Machinery Production



- Construction machinery production is forecasted to post an 8% decline in 2016 before growing 2% in both 2017 and 2018.
- Production fell 4% during February to April 2016 versus the same period one year earlier. The quarter-to-quarter momentum was, however, strongly positive.
- Private nonresidential construction activity expanded 9% and public works construction grew 10% in the three months ending March 2016 compared with the same period one year ago.
- Logging production dropped 1% from February to April 2016 versus one year ago.
- Mining and quarrying production fell 14% in the three months ending April 2016 compared with the same period one year ago. There was growth in precious metals mining and nonmetallic minerals and quarrying but a huge decline in coal mining.
- Construction equipment's import to export ratio was 1.9 in the three months ending March 2016. Imports fell 12% and exports declined 27%; the trade deficit became \$250 million more negative in the first quarter of 2016.
- Caterpillar reports that their worldwide machine deliveries to users for retail sales, adjusted for inflation, were down 12% in the three months ending April 2016 versus the same period one year earlier. Construction industries' sales were down 7%, resources industries' equipment fell 28%, and energy and transportation retail sales dropped 34%.

Source(s): MAPI Foundation



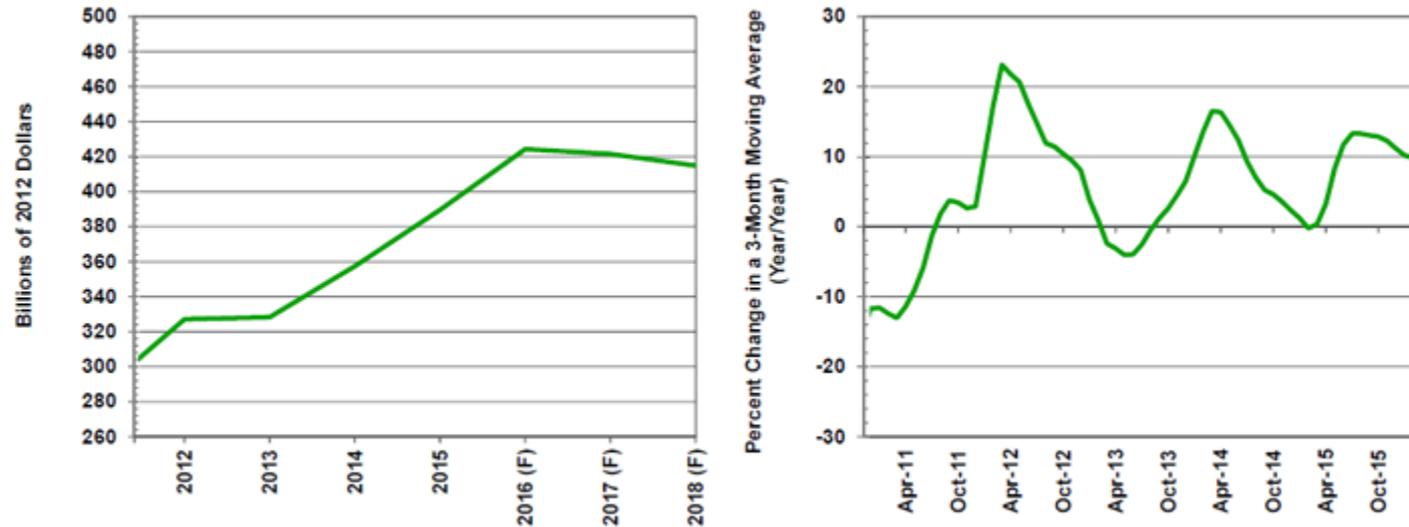
Customer Market Sales Forecast

% change from prior year

Construction	2016	2017
Equipment	-6%	8%
MAPI	-8%	-2%
SFSA Forecast	-8%	-2%



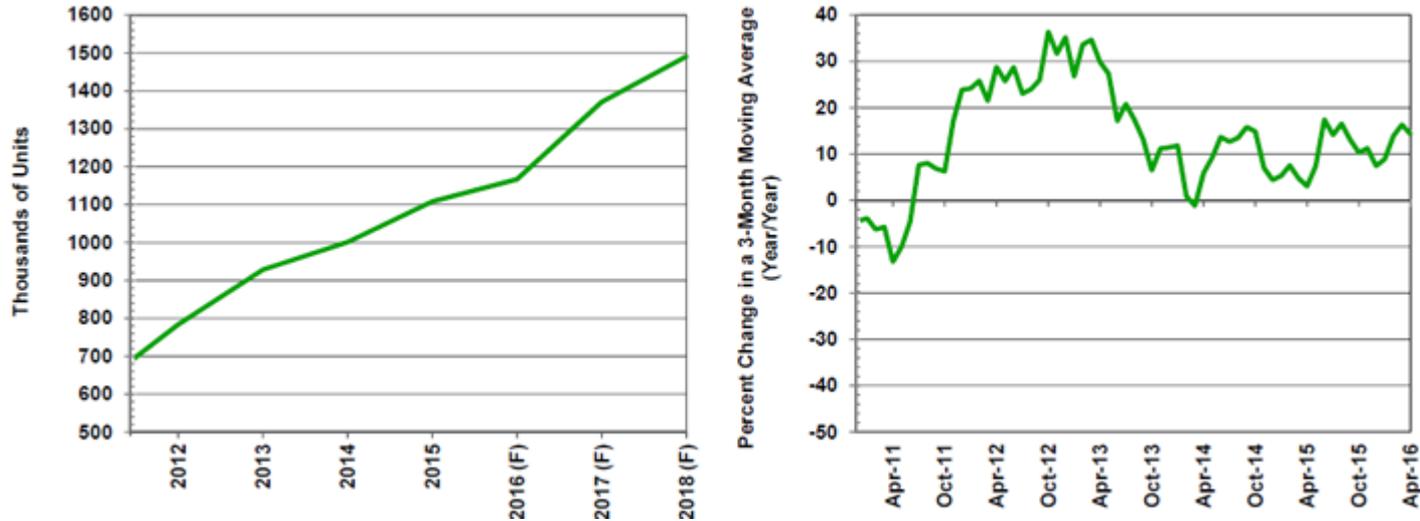
Private Nonresidential Construction Put-in-Place



- Inflation-adjusted nonresidential spending should increase 9% in 2016, decline 1% in 2017, and fall 2% in 2018.
- Nonresidential construction was up 9% in the three months ending March 2016 versus year-ago levels.
- There was very strong construction growth in lodging (hotels), office buildings, private education, amusement and recreation, and communications in the three months ending March 2016. Moderate growth occurred in commercial, transportation, oil and gas pipelines and storage, and transportation. There were small gains in electric utility, healthcare, and religious construction.
- Construction spending for factories, adjusted for inflation, was unchanged during January to March 2016 from one year earlier. The strongest growth was in transportation equipment and fabricated metal products. Small changes occurred in chemicals, plastics and rubber, and computers, electronics, and electrical. Food and beverages and nonmetallic minerals posted large declines. We forecast industrial construction spending to increase 5% in 2016, fall 9% in 2017, and drop 5% in 2018.
- Private electric power construction should post 1% growth this year and then decline in 2017 and 2018 because of overcapacity and potential greenhouse gas emissions regulations.
- The architectural and engineering firm billing index—a leading indicator—signaled a decline in January but then rebounded, showing modest growth in activity for February through April 2016. An employment indicator supports the growth premise. Architectural and engineering employment is up 2% in the three months ending May 2016 versus one year ago.



Housing Starts



- The forecast is for housing start gains of 5% to 1,167,000 units in 2016, 17% to 1,371,000 units in 2017, and 9% to 1,491,000 units in 2018.
- The Case-Shiller housing price index was up 5% in the three months ending in March compared with the previous year.
- Home sales are encouraging. In the three months ending April 2016, new home sales were 8% above year-ago levels and up 33% at an annual rate from the previous three months.
- The inventory of new homes was 4.7 months of supply in April 2016, indicating tightening supply, since it is down from 5.0 months in April 2015.
- On December 16, 2015, the Federal Reserve decided to start raising the target range for the federal funds rate in $\frac{1}{4}$ percentage point increments. The infrequent upward move in the very short-term interest rate does not seem to be having any adverse effect on mortgage rates. In late May, mortgage rates were 3.6%, a little below the 3.9% one year ago.
- At the end of the first quarter of 2016, the combined percentage of all mortgage loans in foreclosure or delinquent was 6.5%; the rate is down to third quarter 2006 levels.

Source(s): MAPI Foundation



Truck Forecast

- **Trucks Class 8**

- 2015 estimated 52,300 tons
- 2016 projected 37,000 tons
- 2017 forecast 35,000 tons



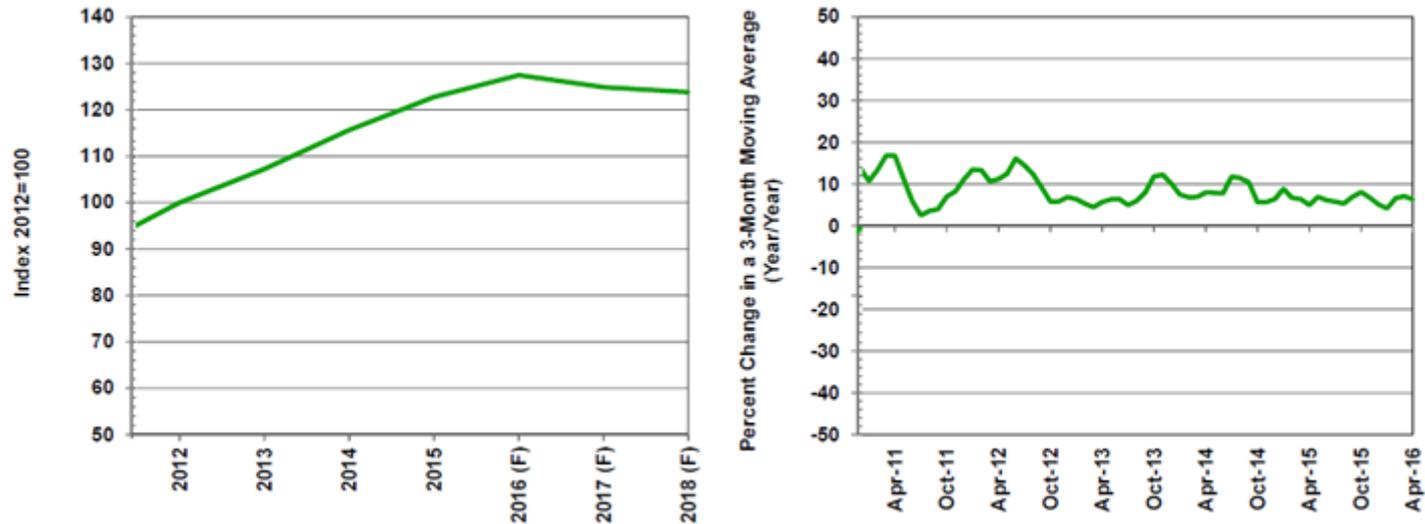
- **Truck sales in US**

- 2015 estimated 323,000 units
- 2016 projected 230,000 units (4 year low)
- 2017 forecast 220,000 units

- Excess new truck inventory
- Mediocre freight volumes
- Declining prices on new trucks



Motor Vehicles and Parts Production



•Motor vehicles and parts production should grow 4% in 2016, fall 2% in 2017, and drop 1% in 2018. Auto and light truck sales are forecast to be 17.8 million units in 2016, 18.2 million units in 2017, and 18.1 million units in 2018.

•Overall production was up 6% in the three months ending April 2016 compared with the same period one year ago. Production was flat for automobiles but was up 10% for light trucks and utility vehicles. Auto parts production increased 7% over year-ago levels.

•Heavy-duty truck production fell 3% in the three months ending April 2016 over the same period one year ago; truck trailer production dropped 5%.

•Heavy-duty truck production should decline 8% in 2016 and increase 1% in both 2017 and 2018.

•The production of campers and travel trailers rose 8% in the three months ending April 2016 over the same period one year earlier; big-ticket motor home production rose 15%.

•Motor vehicles and parts imports were up 8% while exports rose 2%. For every dollar of exports there were \$2.60 of imports, so the sizable trade deficit was \$5.0 billion more negative in the first quarter of 2016 compared with one year earlier.



Customer Market Sales Forecast

% change from prior year

Trucks	2016	2017
Manufacturers	-4%	2%
SFSA Forecast	-29%	-5%



Pump and Valve Forecast

- **Pump and Valve industry**

– 2015 estimated	45,400 tons
– 2016 projected	45,000 tons
– 2017 forecast	45,000 tons

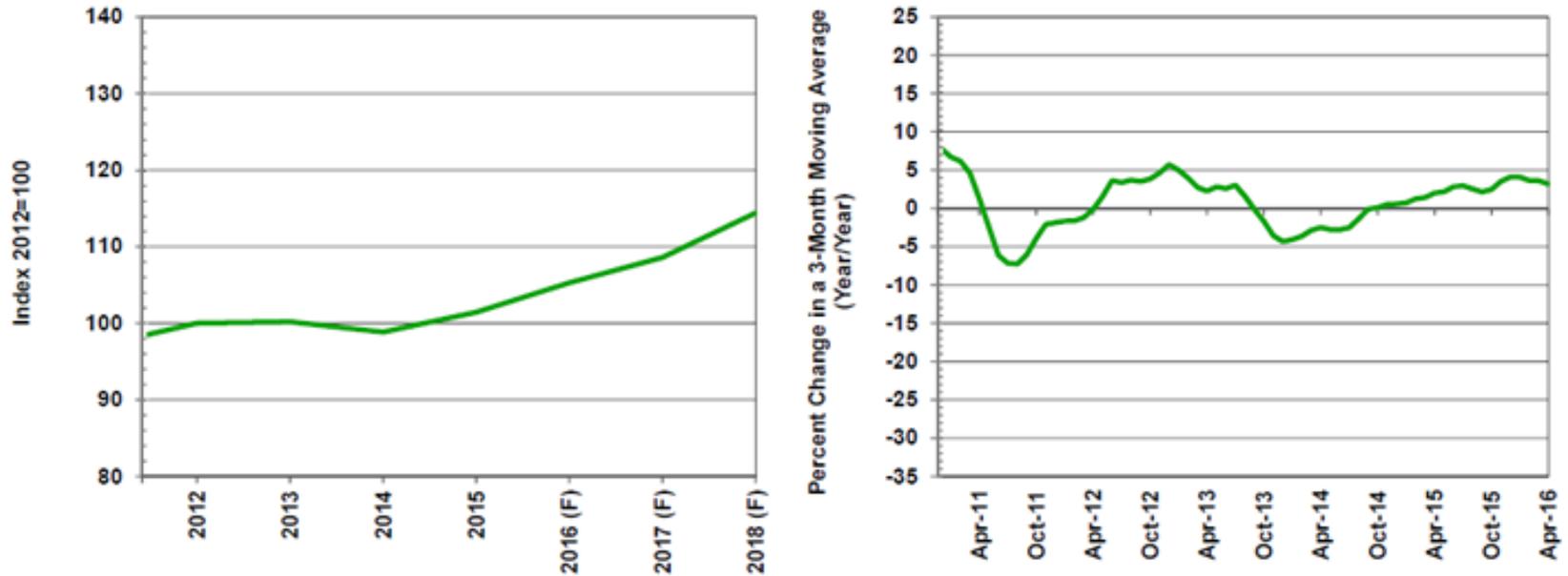


- Price of oil
- Industry consolidation – product lines eliminated or combined
- Chemical production market growing





Basic Chemicals Production



- Basic chemicals production should post growth of 4% in 2016, 3% in 2017, and 5% in 2018.
- Overall production was up 3% in the three months ending April 2016 compared with the same period one year ago and the quarter-to-quarter momentum was a positive 1%.
- Petrochemical and other organic chemicals production was up 4% in the three months ending April 2016 versus one year ago. Petrochemical manufacturing includes ethylene, propylene, butylene, toluene, styrene, xylene, ethyl benzene, and cumene made from petroleum and natural gas.
- Inorganic chemicals production was flat in the three months ending April 2016 compared with the same period one year ago.
- A report from U.S. freight railroads indicates that chemical car loadings were up 4% in May 2016 versus year-ago levels.
- Basic chemicals imports were down 9% while exports declined 10%. The import to export ratio is 0.9, so the trade surplus became \$280 million less positive in the first quarter of 2016 relative to one year earlier.

Source(s): MAPI Foundation



VMA Market Outlook

- Turnaround in demand for equipment used for oil production not until 2018
- International opportunities for valves and pumps to electric generation market
- US manufacturing competitiveness at risk due to growing shortage of skilled labor





Customer Market Sales Forecast

% change from prior year

Pumps and Valves	2016	2017
Manufacturers	-4%	1%
SFSA Forecast	-1%	0%



Oil Field Forecast

- **Oil field equipment**

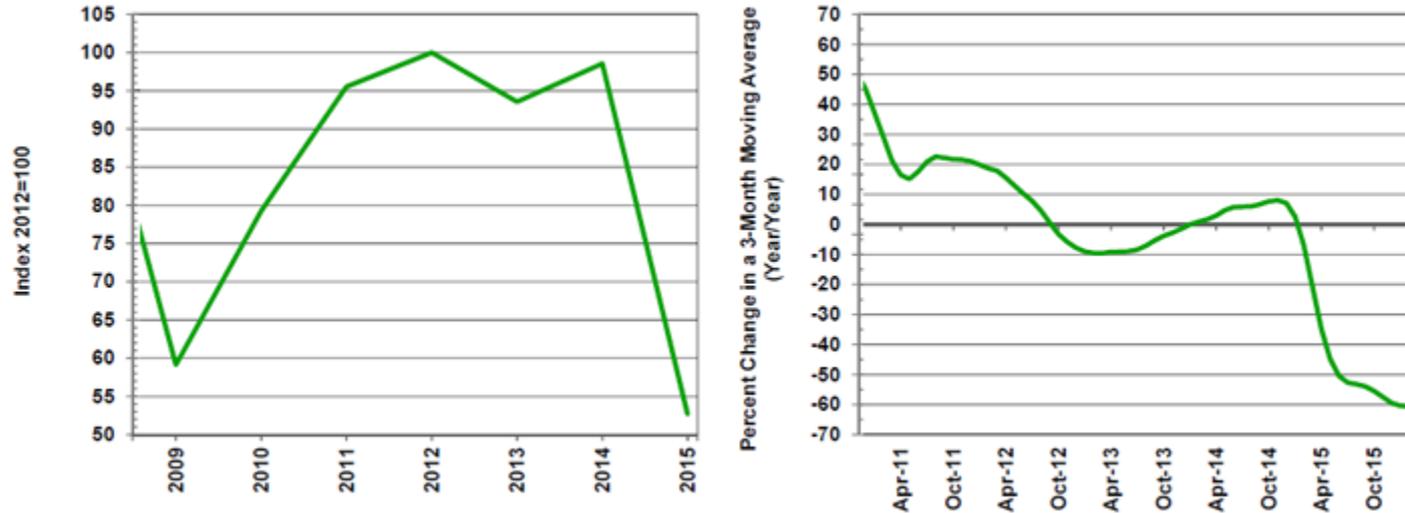
– 2015 estimated	39,800 tons
– 2016 projected	32,000 tons
– 2017 forecast	32,000 tons



- Increasing oil production, demand flat
- Parts sourced from idle equipment
- Increase R&D spending



Oil and Gas Well Drilling Production



- The MAPI Foundation does not forecast drilling production.
- Drilling activity declined 56% in the three months ending April 2016 relative to one year ago and has sizable negative momentum.
- Brent oil improved from \$34 per barrel in late February to \$49 at the end of May. The EIA predicts that U.S. crude oil production will decline 9% in 2016 and fall 5% in 2017.
- Henry Hub natural gas rose from \$1.78 per million cubic feet in late February 2016 to \$2.12 in late May. Natural gas production is forecast to increase 1% in 2016 and 3% next year.
- Baker Hughes reports that 78% of operating U.S. rigs looked for oil in May. The U.S. rig count for oil drilling was down 51% in May 2016 versus the same four-week period one year ago. The U.S. rig count for natural gas drilling was down 61% in the same period.



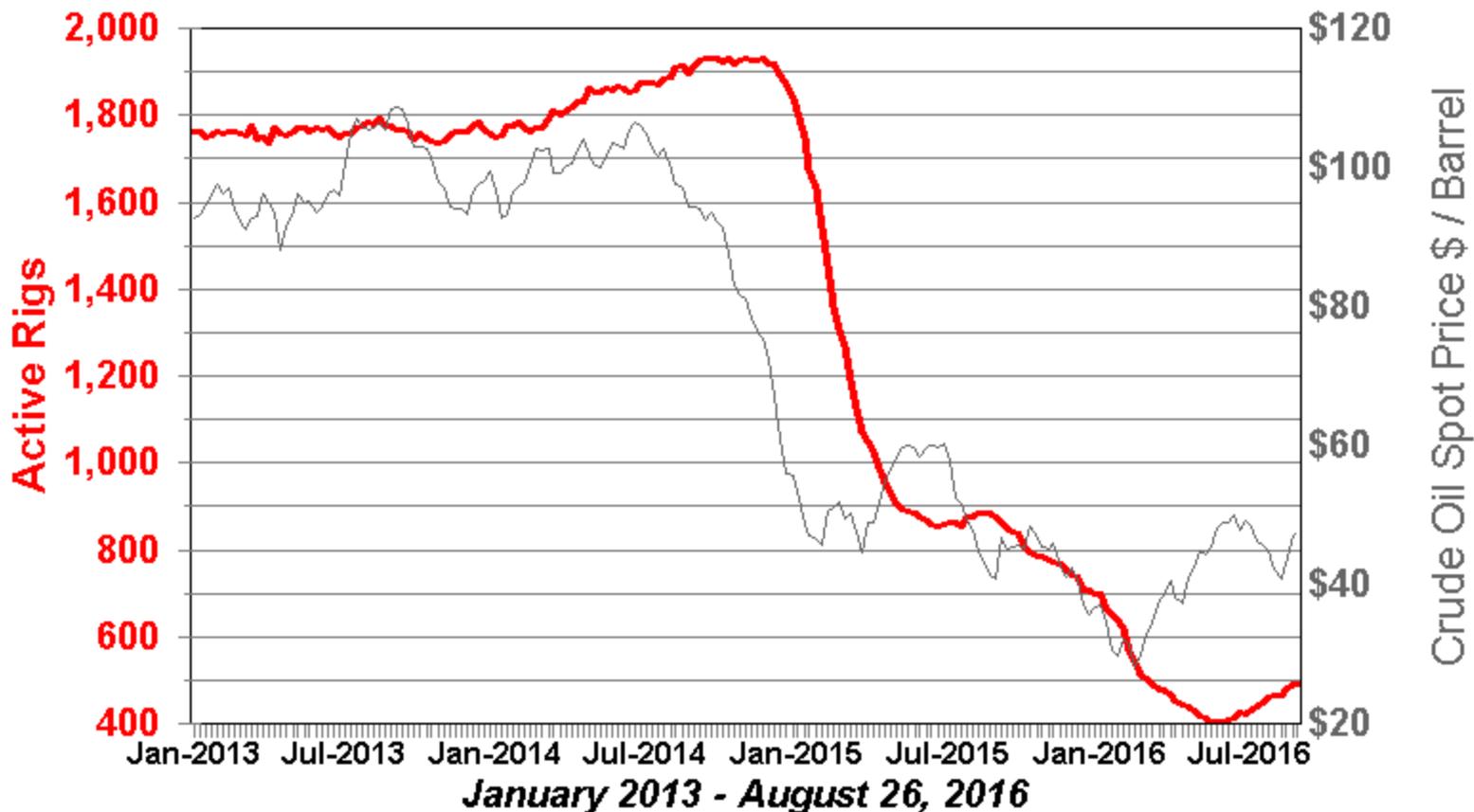
Customer Market Sales Forecast

% change from prior year

Oil Field	2016	2017
Manufacturers	-26%	4%
SFSA Forecast	-20%	0%



U. S. Rotary Rig Count Total Active Rigs



WTRG Economics ©2016

Sources: Baker-Hughes, Energy
Information Administration (DOE),
WTRG Economics

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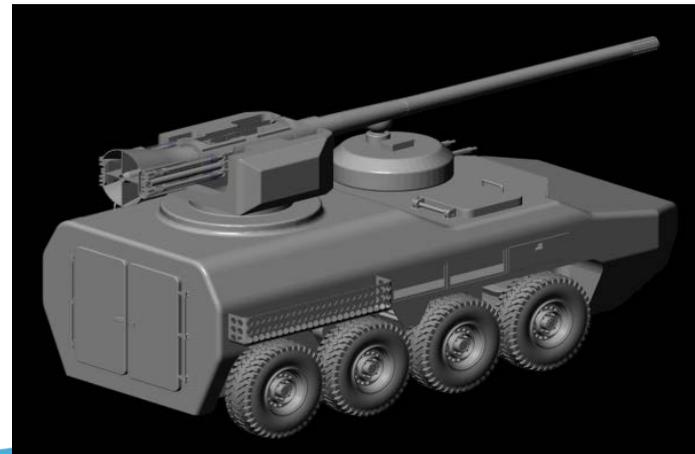


Military Forecast

- **Military equipment**

- 2015 estimated 14,900 tons
- 2016 projected 15,200 tons
- 2017 forecast 15,500 tons

- Defense demand stable





Customer Market Sales Forecast

% change from prior year

Military	2016	2017
Ground Systems	0%	4%
Naval Systems	1%	1%
SFSA Forecast	2%	2%



Other Market Forecast

- **Other markets**

- 2015 estimated 107,200 tons
- 2016 projected 104,000 tons
- 2017 forecast 105,000 tons





Forecast Summary

1,038,200 tons	958,000 tons
Projected 2016	Forecast 2017
-8% Change	

Excluding Rail

533,200 tons	528,000 tons
Projected 2016	Forecast 2017
-1% Change	