

# ***Where is the Industry Heading? It's Time to Prepare...***

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Presented to

***UAW Steel Council***

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**Presented by:**

**Michael Locker, President  
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# **Locker Associates: Client Services**

Serving unions on business issues, campaigns and education

## **Over 35 years of experience**

- 245 U.S. and Canadian engagements focused on steel & other metals, as well as manufacturing, construction and distribution
- Major union clients: USW, UAW, CWA, IBT, IAM, Unite-HERE, Boilermakers, IUE, Ironworkers, NYC Building Trades, independent steel locals and others
- Emphasis on reorganizations requiring operating improvements
  - Joint labor-management efforts to enhance performance
  - Identify & negotiate with union-friendly buyers for distressed companies
  - Evaluate company business & market plans, as well as cap ex
  - Economic and industry analysis for contract negotiations
- Extensive experience protecting union interests in bankruptcies
- Experts on organizing and directing corporate campaigns

# *Major Findings I*

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- Three sectors will drive steel demand growth over the next ten years -- expected to represent 90% of world steel demand growth:
  - Construction (68%) driven by residential, infrastructure in emerging economies
  - Mechanical engineering (13%)
  - Energy transportation (9%), pipelines, OCTG and other tubes
  
- World steel industry consumes about 5% of all primary energy produced and contributes about 7% of global CO2 emissions. The integrated sector represents 71% of world production (in 2012), 82% of energy and 88% of CO2 emissions.

# Major Findings II

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- Accelerating shift to EAF's is threatening integrated mills:
  - Major US consumers -- especially auto -- are increasingly worried about the reliability of aging integrated producers.
  - EAF mills continue to climb the quality ladder by improving the quality of inputs and widening their strip profile.
  - Lower capital and operating costs resulting in higher profitability -- especially if scrap prices go down as predicted.
  - Lower environmental impact -- this advantage will accelerate with the use of renewables.
- The energy needed to melt scrap represents 40% of the energy and 30% of the CO<sub>2</sub> to smelt iron ore in modern BF/BOF mills. In addition, capital costs per ton of capacity is 60% to 70% lower; maintenance decreased in the same proportion and labor productivity is twice as high.

# Major Findings III

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- Temporary spike in the price of electrodes drove up EAF costs, but this will subside.
- Major shift to spot sales over contract -- too much volatility for both producers and consumers.
- In 2017, the threat of Section 232 sanctions and NAFTA negotiations actually drove up imports 20% and destabilized the U.S. steel market! **Noteworthy exception:** hot-rolled coil. Fortunately, exports are up 13%, as well.
- This year there was a steep rally in U.S. steel prices due to 232 expectations, strong material costs (especially scrap) and higher international steel prices.

# Major Findings IV

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- World steel export prices have been rising, easing pressure on U.S. prices. **Crucial factors:** Chinese steel prices are up due to strong domestic demand, the shut down of less efficient capacity and real efforts to reduce pollution. This should continue in 2018 despite rising production.
- China's transition from an export-dependent to a consumer based economy with a strong emphasis on reducing pollution should help the U.S. steel industry
- The average manufacturing wage in China has more than doubled in the last decade, now up to \$607 per month -- more than Mexico or Malaysia.
- Production in Mexico and Brazil is growing, posting double-digit percentage gains in output in the first half of 2017. U.S. managed only a 1.3 % gain.

# ***Major Findings V***

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- U.S. and world capacity utilization rates remain low -- around 75% and 70%, respectively. Excess capacity throughout the world is a major destabilizing factor.
- There's a good chance Trump will introduce some trade restrictions in early 2108, but not a full Section 232 -- too much push back from consuming industries and foreign nations.
- Global stainless steel production rose by 10 percent last year, totaling 45.8 million tonnes, up from 41.5 million tonnes in 2015. This was mostly due to the rise in output in China, the world's largest stainless producer that is planning to add roughly 7.4 million tons per year of domestic capacity in the next two years.
- Electrical steel production is also growing in China and prices are dropping worldwide.

# ***Major Findings VI***

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- Natural disasters in the United States are (1) driving scrap into the steel market, and (2) increasing steel demand, especially in construction and auto.
- Auto production is down 14.4% through August, though this has been slightly offset by an increase in light truck output. Electric vehicles (EV's) are expected to be cost competitive by 2025, resulting in a strong uptick in sales.
- Auto engineers could cut the weight of a typical sedan by as much as 23 percent if they used only commercially available high-strength steel in place of mild steel. If they incorporate advanced grades, the reduction could be as much as 26 percent. But what will the steel cost?



# ***Major Findings VII***

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- Scrap harvesting in China is increasingly out-stripping domestic demand, pushing large supplies of excess scrap into the world market via exports. Going forward, this will sharply depress scrap prices both here and abroad, making EAF production much more competitive -- further challenging integrated producers -- unless Chinese EAF capacity absorbs the scrap.
- Manufacturing remains a pillar of the U.S. economy and the primary industry in 500 of 3,000 counties. It drives 30 percent of the country's productivity growth, 60 percent of exports and 70 percent of private sector R&D. But it only accounts for 9 percent of U.S. employment. And the U.S. has lost marketshare, not only to low cost countries in labor-intensive industries, but also to other advanced economies in knowledge-based industries. We are now the second largest manufacturing nation, trailing China which grew 2.6 percent in 2016. Watch out for AI and robotics.

# *Major Findings VIII*

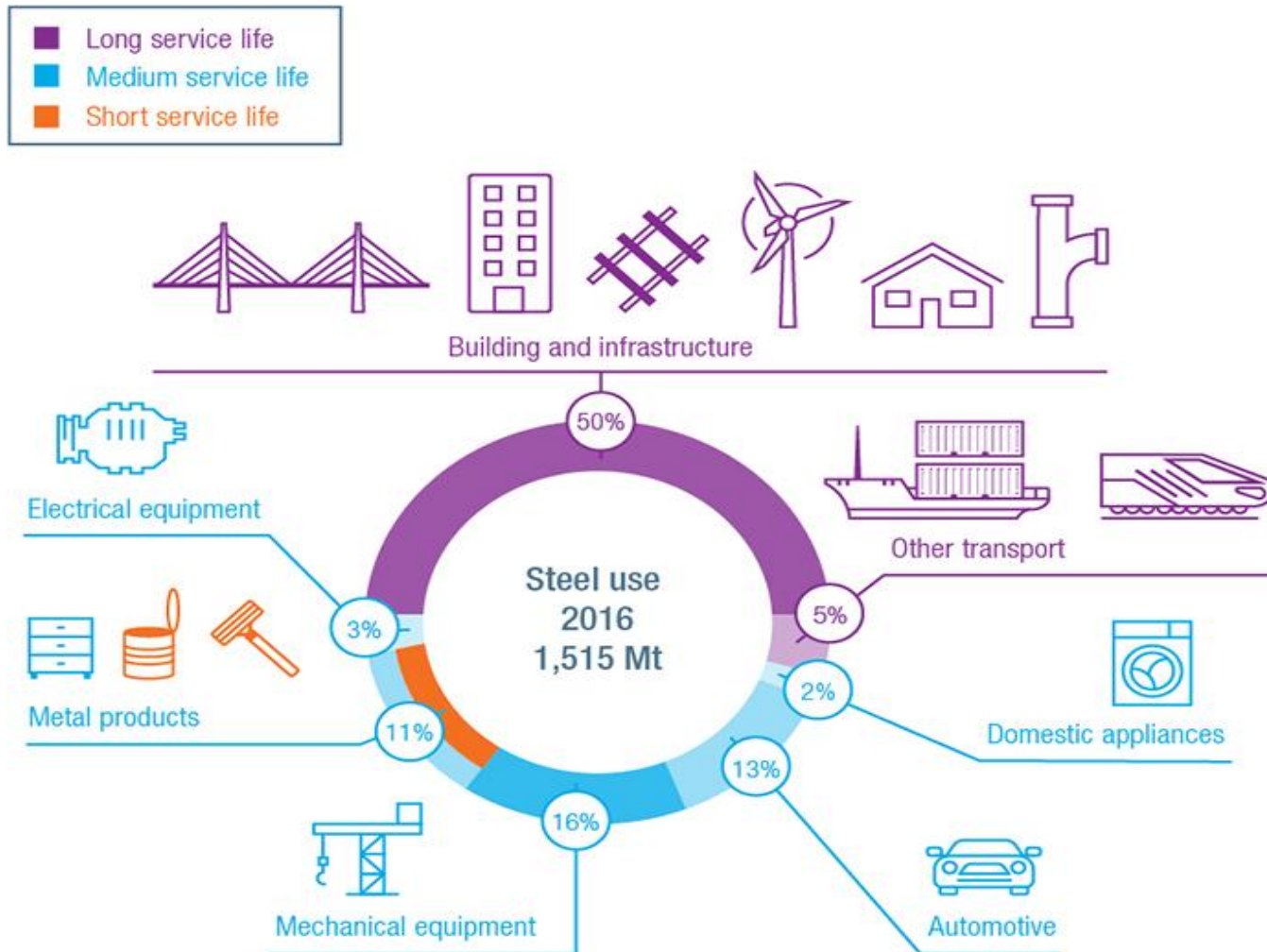
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- The share of national income paid to workers has been failing since the 1980's across the advanced economies, including China. That means wages have not kept pace with gains in productivity and that a greater amount of income is being funneled to capital. In other words, investors are winning out over workers.
  
- Three fundamental factors determine profitability -- not the move to growing demand markets, increasing the share of value added products, mergers or acquisitions or backward integration (iron ore, coal or scrap):
  - Genuine commitment to new ideas and rapidly switching to best technology
  - Genuine commitment to customers and staying close to them
  - Genuine commitment to employees and staying close to them

# WORLD STEEL



# World Steel Usage, 2016

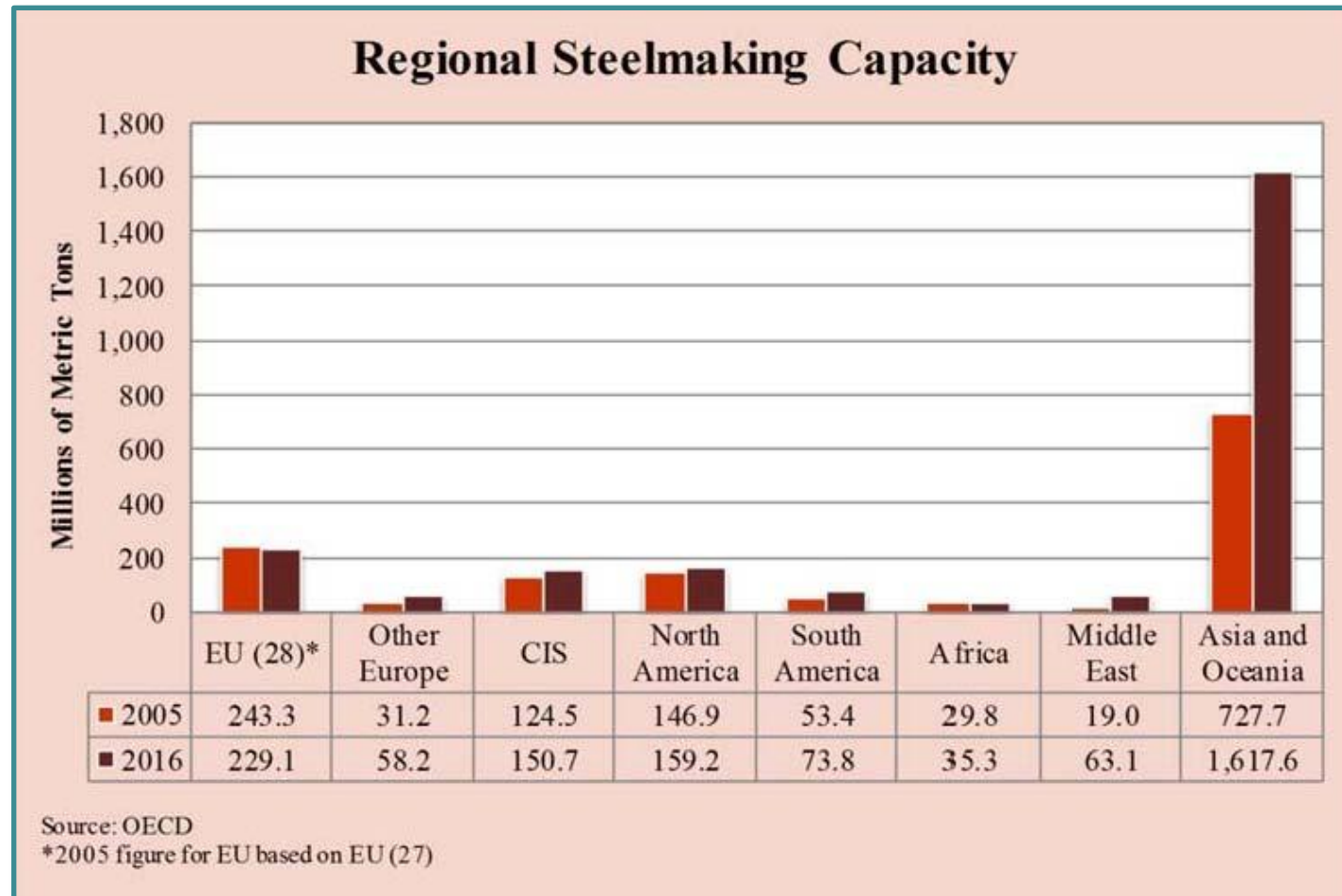


# World Crude Production, 2008-2016

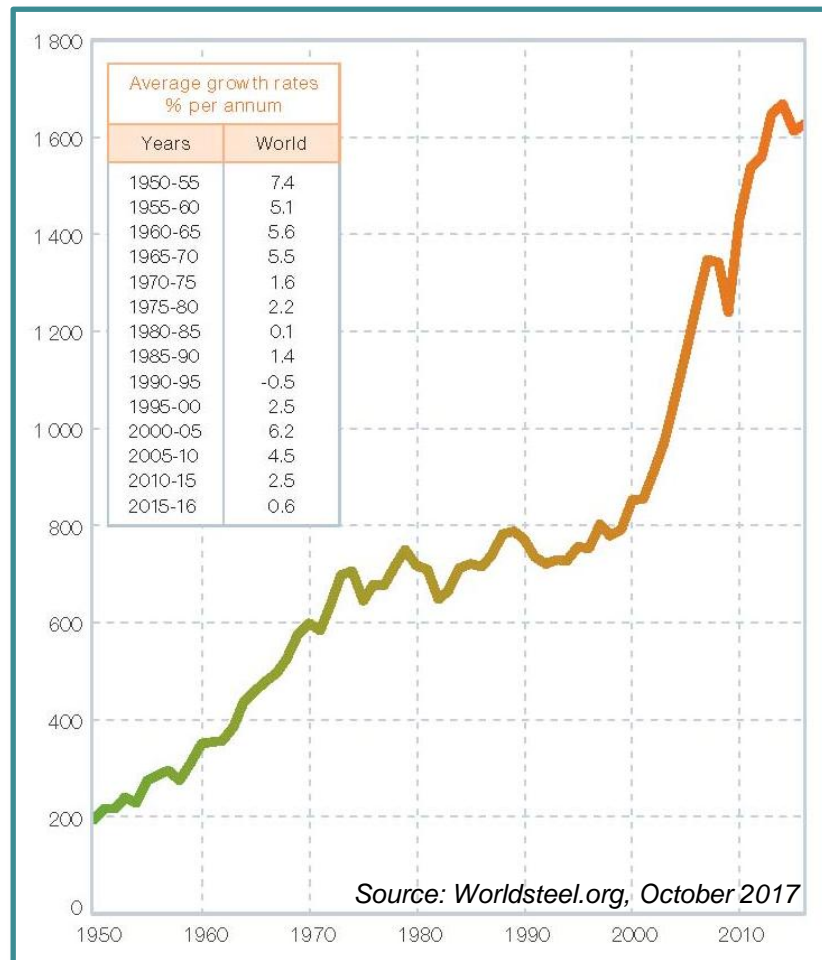
(in million tonnes)	2008	2010	2012	2014	2015	2016	% Chg '15-'16	% Chg '08-'16
<b>Europe</b>	<b>198.7</b>	<b>172.9</b>	<b>168.6</b>	<b>169.3</b>	<b>166.2</b>	<b>162.3</b>	<b>-2.3%</b>	<b>-18.3%</b>
Germany	45.8	43.8	42.6	42.9	42.7	42.1	-1.4%	-8.1%
<b>Other Europe</b>	<b>31.6</b>	<b>33.5</b>	<b>39.9</b>	<b>38.4</b>	<b>36.2</b>	<b>36.0</b>	<b>-0.6%</b>	<b>13.9%</b>
Turkey	26.8	29.1	35.9	34.0	31.5	33.2	5.4%	23.9%
<b>CIS</b>	<b>114.3</b>	<b>108.2</b>	<b>110.7</b>	<b>106.1</b>	<b>101.6</b>	<b>102.2</b>	<b>0.6%</b>	<b>-10.6%</b>
Russia	68.5	66.9	70.6	71.5	70.9	70.8	-0.1%	3.4%
<b>N America</b>	<b>125.1</b>	<b>111.6</b>	<b>121.6</b>	<b>121.1</b>	<b>110.9</b>	<b>111.0</b>	<b>0.1%</b>	<b>-11.3%</b>
US	91.4	80.5	88.6	88.2	78.8	78.5	-0.4%	-14.1%
<b>S America</b>	<b>47.5</b>	<b>43.9</b>	<b>46.4</b>	<b>45.0</b>	<b>43.9</b>	<b>39.2</b>	<b>-10.7%</b>	<b>-17.5%</b>
Brazil	33.7	32.9	34.7	33.9	33.3	31.3	-6.0%	-7.1%
<b>Africa</b>	<b>17.0</b>	<b>16.6</b>	<b>15.3</b>	<b>14.9</b>	<b>13.7</b>	<b>12.2</b>	<b>10.9%</b>	<b>-28.2%</b>
<b>Middle East</b>	<b>16.6</b>	<b>20.0</b>	<b>25.0</b>	<b>30.0</b>	<b>29.4</b>	<b>29.0</b>	<b>-1.4%</b>	<b>74.7%</b>
<b>Asia</b>	<b>784.1</b>	<b>918.4</b>	<b>1,026.8</b>	<b>1,139.7</b>	<b>1,112.9</b>	<b>1,106.3</b>	<b>-0.6%</b>	<b>41.1%</b>
China	512.3	637.4	708.8	822.8	803.8	808.4	0.6%	57.8%
Japan	118.7	109.6	107.2	110.7	105.1	104.8	-0.3%	-11.7%
India	57.8	68.3	76.7	87.3	89.0	95.6	7.4%	65.4%
<b>Oceania</b>	<b>8.4</b>	<b>8.1</b>	<b>5.8</b>	<b>5.5</b>	<b>5.7</b>	<b>5.8</b>	<b>1.8%</b>	<b>-31.0%</b>
<b>World</b>	<b>1,341.2</b>	<b>1,428.7</b>	<b>1,510.2</b>	<b>1,669.9</b>	<b>1,620.0</b>	<b>1,629.6</b>	<b>0.6%</b>	<b>21.5%</b>

Source: Worldsteel.org, October 2017

# Regional Capacity, 2005 vs 2016



# Steel Production Growth, 1950-2016





# World Steel Demand, 2016-2018f

Regions	million tonnes			y-o-y growth rates, %		
	2016	2017 (f)	2018 (f)	2016	2017 (f)	2018 (f)
European Union (28)	158.2	162.1	164.3	2.8	2.5	1.4
Other Europe	40.5	40.1	42.2	1.2	-1.0	5.2
CIS	49.4	51.1	53.0	-2.7	3.6	3.8
NAFTA	132.2	138.7	140.4	-1.5	4.9	1.2
Central and South America	39.4	40.4	42.3	-13.5	2.5	4.7
Africa	37.6	37.0	38.2	-2.7	-1.6	3.3
Middle East	53.1	53.9	56.5	-1.4	1.5	4.8
Asia and Oceania	1 005.4	1 098.8	1 111.1	2.2	9.3 *	1.1
<b>World</b>	<b>1 515.9</b>	<b>1 622.1</b>	<b>1 648.1</b>	<b>1.0</b>	<b>7.0 *</b>	<b>1.6</b>
World excl. China	834.8	856.4	882.4	0.8	2.6	3.0
Developed Economies	398.8	408.1	412.0	0.0	2.3	0.9
China	681.0	765.7	765.7	1.3	12.4 *	0.0
Em. and Dev. Economies excl. China	436.0	448.2	470.4	1.5	2.8	4.9
ASEAN (5)	74.1	77.7	83.0	13.9	4.8	6.8
MENA	72.6	72.6	75.8	-0.5	0.0	4.5

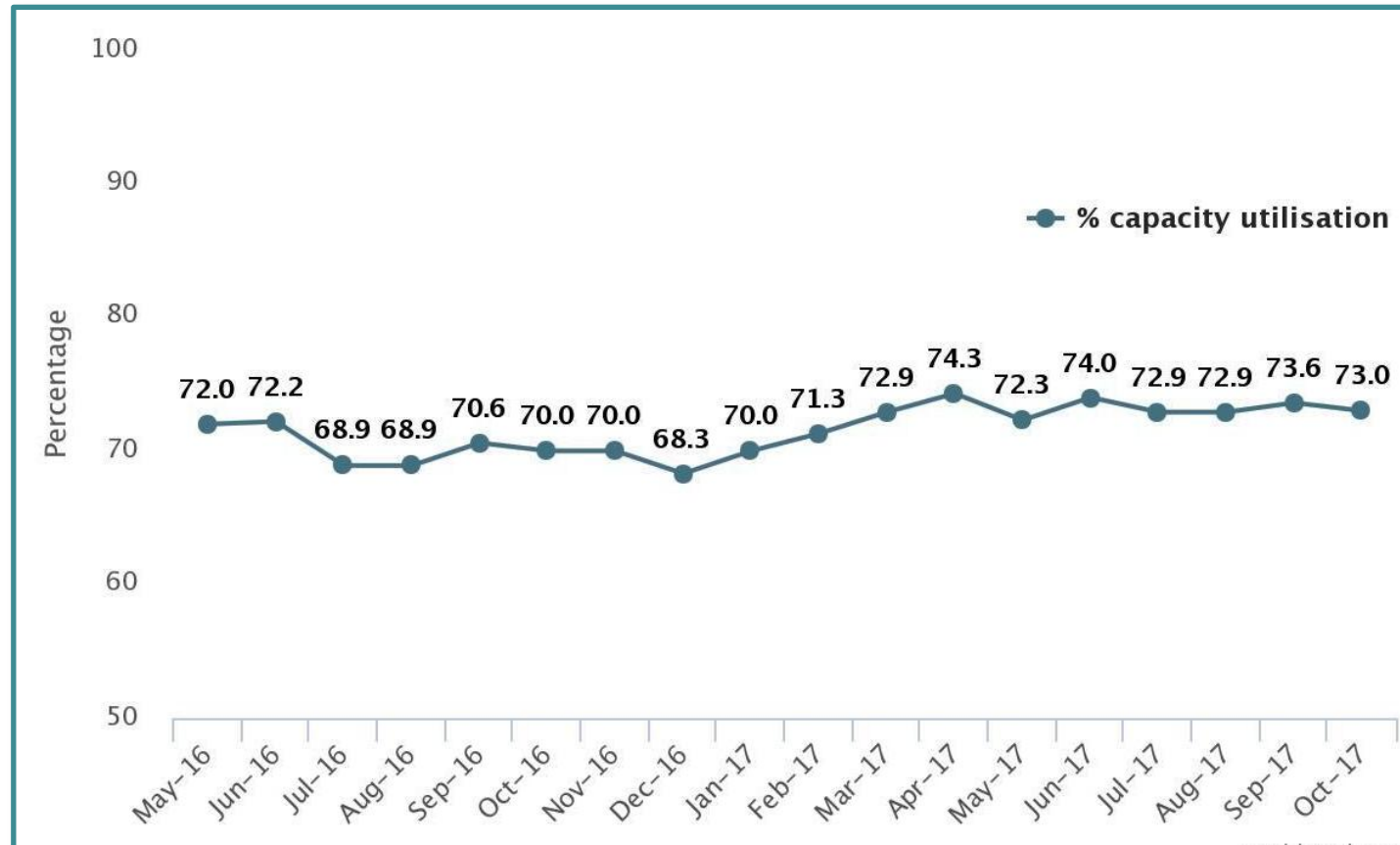
*f - forecast*

ASEAN (5): Indonesia, Malaysia, Philippines, Thailand, Vietnam

Source: Worldsteel.org, October 2017



# World Capacity Utilization, 2017



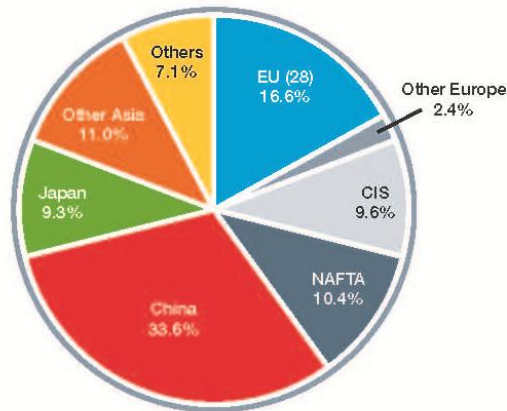
Source: Worldsteel.org, October 2017

# Crude Steel Production, 2006 vs 2016

2006

## Crude steel production

World total: 1 252 million tonnes



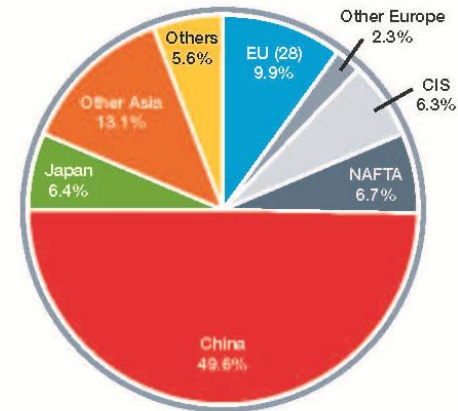
### Others comprise:

Africa	1.5 %	Central and South America	3.7 %
Middle East	1.2 %	Australia and New Zealand	0.7 %

2016

## Crude steel production

World total: 1 630 million tonnes



### Others comprise:

Africa	0.8 %	Central and South America	2.5 %
Middle East	1.9 %	Australia and New Zealand	0.4 %

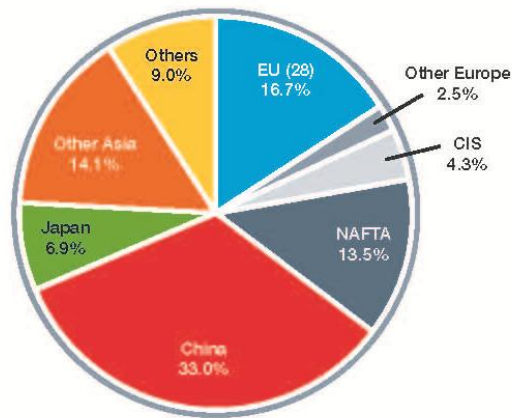
Source: Worldsteel.org, October 2017

# Crude Steel Usage, 2006 vs 2016

2006

Apparent steel use (finished steel products)

World total: 1 146 million tonnes



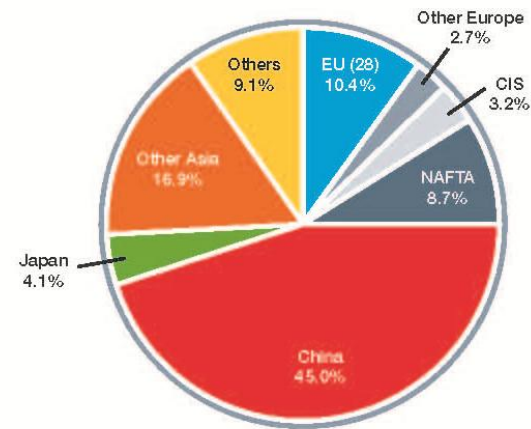
Others comprise:

Africa	1.9%	Central and South America	3.3%
Middle East	3.2%	Australia and New Zealand	0.7%

2016

Apparent steel use (finished steel products)

World total: 1 515 million tonnes



Others comprise:

Africa	2.5%	Central and South America	2.6%
Middle East	3.5%	Australia and New Zealand	0.5%

Source: Worldsteel.org, October 2017

# Top 10 Steelmaking Countries, 1967-2016

## TOP 10 PRODUCING COUNTRIES

(CRUDE STEEL PRODUCTION IN MILLION TONNES)

	1967	(MT)	2000	(MT)	2016	(MT)
1	United States	115.4	China	128.5	China	808.4
2	USSR	102.2	Japan	106.4	Japan	104.8
3	Japan	62.2	United States	101.8	India	95.6
4	F. R. Germany	36.7	Russia	59.1	United States	78.5
5	United Kingdom	24.3	Germany	46.4	Russia	70.8
6	France	19.7	South Korea	43.1	South Korea	68.6
7	Italy	15.9	Ukraine	31.8	Germany	42.1
8	Poland	10.5	Brazil	27.9	Turkey	33.2
9	China	10.3	India	26.9	Brazil	31.3
10	Czechoslovakia	10.0	Italy	26.8	Ukraine	24.2
	Total	407.1	Total	598.7	Total	1357.4

Source: Worldsteel.org, October 2017

# Top 10 Steel Using Countries Forecast

SRO April 2017, finished steel products

Countries	million tonnes			y-o-y growth rates, %		
	2016	2017 (f)	2018 (f)	2016	2017 (f)	2018(f)
China	681.0	681.0	667.4	1.3	0.0	-2.0
United States	91.6	94.3	97.1	-4.7	3.0	2.9
India	83.5	88.6	94.9	4.1	6.1	7.1
Japan	62.2	63.0	63.4	-1.1	1.2	0.6
South Korea	57.1	55.5	54.6	2.3	-2.7	-1.8
Germany	40.3	40.7	40.8	2.6	0.9	0.4
Russia	38.1	38.8	39.9	-3.9	1.8	2.8
Turkey	34.1	35.1	36.5	-0.9	3.0	4.0
Mexico	25.4	25.7	26.4	2.5	1.4	2.4
Italy	24.2	23.6	24.1	-1.6	-2.7	2.1

f - forecast

Source: Worldsteel.org, October 2017

# World's Top 15 Steelmakers, 2016

World's Top Steelmakers, 2016 (in million tonnes)			
#	Company	Country	Tonnes
1	ArcelorMittal	Luxembourg	95.5
2	Baowu	China	63.8
3	HBIS Group	China	46.2
4	NSSWC	Japan	46.2
5	POSCO	South Korea	41.6
6	Shagang	China	33.3
7	Ansteel	China	33.2
8	JFE	Japan	30.3
9	Shougang	China	26.8
10	TATA	India	24.5
11	Shandong	China	23.0
12	Nucor	USA	22.0
13	Hyundai	South Korea	20.1
14	Manshaan	China	18.6
15	Thyssen	Germany	17.4

Source: Worldsteel.org, October 2017

World's Top Steelmakers, 1972 (in million tonnes)			
#	Company	Country	Tonnes
1	Nippon Steel	Japan	34.6
2	US Steel	USA	28.5
3	British Steel	England	25.6
4	Bethlehem	USA	18.7
5	Nippon Kokan	Japan	12.9
6	Thyssen Hutte	Germany	12.2
7	Sumitomo	Japan	11.2
8	Kawasaki	Japan	11.0
9	Finsider	Soviet Union	9.7
10	Republic Steel	USA	8.7
11	Wendel-Sidelor	France	8.2
12	Usinor	France	8.0
13	National Steel	USA	7.6
14	Armco Steel	USA	7.2
15	Broken Hill	Australia	6.8



# Top Steel Producers, Flat vs Long, 2016

**Steel Flat Products: World's Largest Producers - Companies**  
(capacity in million tonnes)

Rank	Company	Base Country	Capacity	Share
1	ArcelorMittal Group	United Kingdom	111.0	13.6%
2	NSSMC Group	Japan	42.8	4.2%
3	Hebei Iron & Steel Group	China	39.4	4.1%
4	Baosteel Group	China	38.9	4.0%
5	Posco Group	Korea, South	34.0	3.7%
6	AnBen Group	China	33.6	3.6%
7	JFE Steel Group	Japan	31.9	3.5%
8	US Steel Group	United States	27.4	2.7%
9	Jiangsu Shagang Group	China	24.9	2.4%
10	Tata Corus Group	India	21.9	2.2%
11	Wuhan Iron & Steel	China	21.6	2.0%
12	ThyssenKrupp Group	Germany	20.2	1.8%
13	Shougang Beijing Group	China	18.0	1.7%
14	MMK - Magnitogorsk Iron	Russia	17.3	1.7%
15	NLMK Group	Russia	16.3	1.6%
16	Severstal Group	Russia	15.8	1.4%
17	China Steel Group	Taiwan	14.4	1.2%
18	Nucor Group	United States	13.6	1.2%
19	Ilva/Finsider	Italy	13.1	1.2%
20	Bohai Iron & Steel	China	11.6	1.1%
Total Top 20			567.5	52.1%
World			1090.2	100.0%

Source: SteelontheNet.com, October 2017

**Steel Long Products: Largest Producers - Companies**  
(capacity in million tonnes)

Rank	Company	Base Country	Capacity	Share
1	ArcelorMittal Group	United Kingdom	59.8	7.7%
2	Gerdau Group	Brazil	27.7	3.4%
3	Hebei Iron & Steel Group	China	25.0	2.8%
4	Evrast Group	Russia	19.0	1.7%
5	Jiangsu Shagang Group	China	18.6	1.6%
6	NSSMC Group	Japan	16.5	1.5%
7	Tata Corus Group	India	14.0	1.4%
8	Shougang Beijing Group	China	13.5	1.3%
9	Wuhan Iron & Steel	China	13.1	1.3%
10	Nucor Group	United States	12.7	1.3%
11	Riva Group	Italy	11.9	1.3%
12	Mechel Group	Russia	11.5	1.2%
13	JFE Steel Group	Japan	10.2	1.1%
14	Baosteel Group	China	9.2	1.0%
15	Metinvest Holding Group	Ukraine	9.2	1.0%
16	Celsa Group	Spain	9.0	1.0%
17	Severstal Group	Russia	8.9	1.0%
18	AnBen Group	China	8.9	0.9%
19	Hyundai Motor Group	Korea, South	8.3	0.8%
20	Shandong Steel Group	China	7.6	0.8%
Total Top 20			314.7	26.6%
World			1184.5	100.0%

Source: SteelontheNet.com, October 2017

# Steel Production, by Process, 2016

	Million Tonnes	BOF	EAF	Open Hearth
Europe	162.0	60.3	39.7%	--
Other Europe	37.7	35.3	64.7%	--
CIS	102.4	67.3	26.0%	6.7%
N America	109.9	34.4	65.6%	--
<b>US</b>	<b>78.5</b>	<b>33.0</b>	<b>67.0%</b>	<b>--</b>
Canada	12.6	55.4	44.6%	--
Mexico	18.8	26.2	73.8%	--
S America	40.9	67.5	31.3%	--
Africa	13.1	38.5	61.4%	--
Middle East	31.5	6.9	93.1%	--
Asia	1,125.0	84.6	15.4%	--
<b>China</b>	<b>808.4</b>	<b>94.8</b>	<b>5.2%</b>	<b>--</b>
Oceania	5.9	75.7	24.3%	--
World	1,628.3	74.3%	25.3%	0.4%

Source: Worldsteel.org, November 2017; 6.7% of Ukraine's steelmaking is open hearth

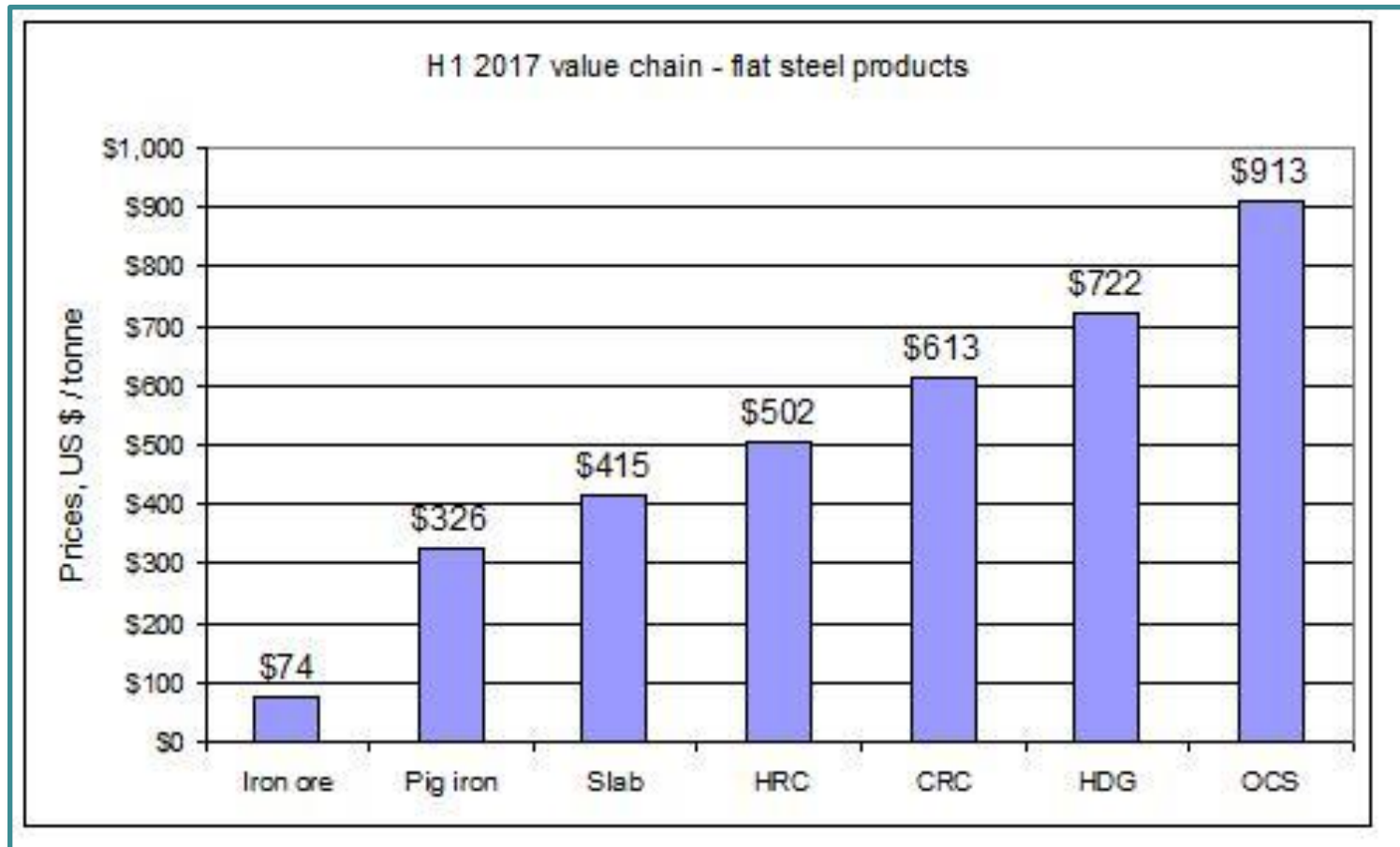


# Apparent Steel Use, per Capita, 2016

(kg's of finished products)	2010	2012	2014	2016
Europe	292.3	279.2	295.4	311.4
Other Europe	276.7	318.5	337.0	363.9
CIS	190.1	220.1	213.2	184.6
N America	241.6	281.3	304.2	270.3
<b>US</b>	<b>257.8</b>	<b>305.6</b>	<b>334.8</b>	<b>282.7</b>
Canada	412.9	446.7	443.3	417.7
Mexico	149.7	171.3	186.8	197.5
S America	98.3	103.5	101.7	80.3
Africa	27.4	30.1	32.5	31.3
Middle East	228.3	228.2	236.1	222.0
Asia	226.4	247.2	260.9	253.6
<b>China</b>	<b>438.2</b>	<b>487.0</b>	<b>519.0</b>	<b>492.7</b>
Oceania	215.4	194.9	191.5	171.0
World	192.6	207.2	216.9	207.9

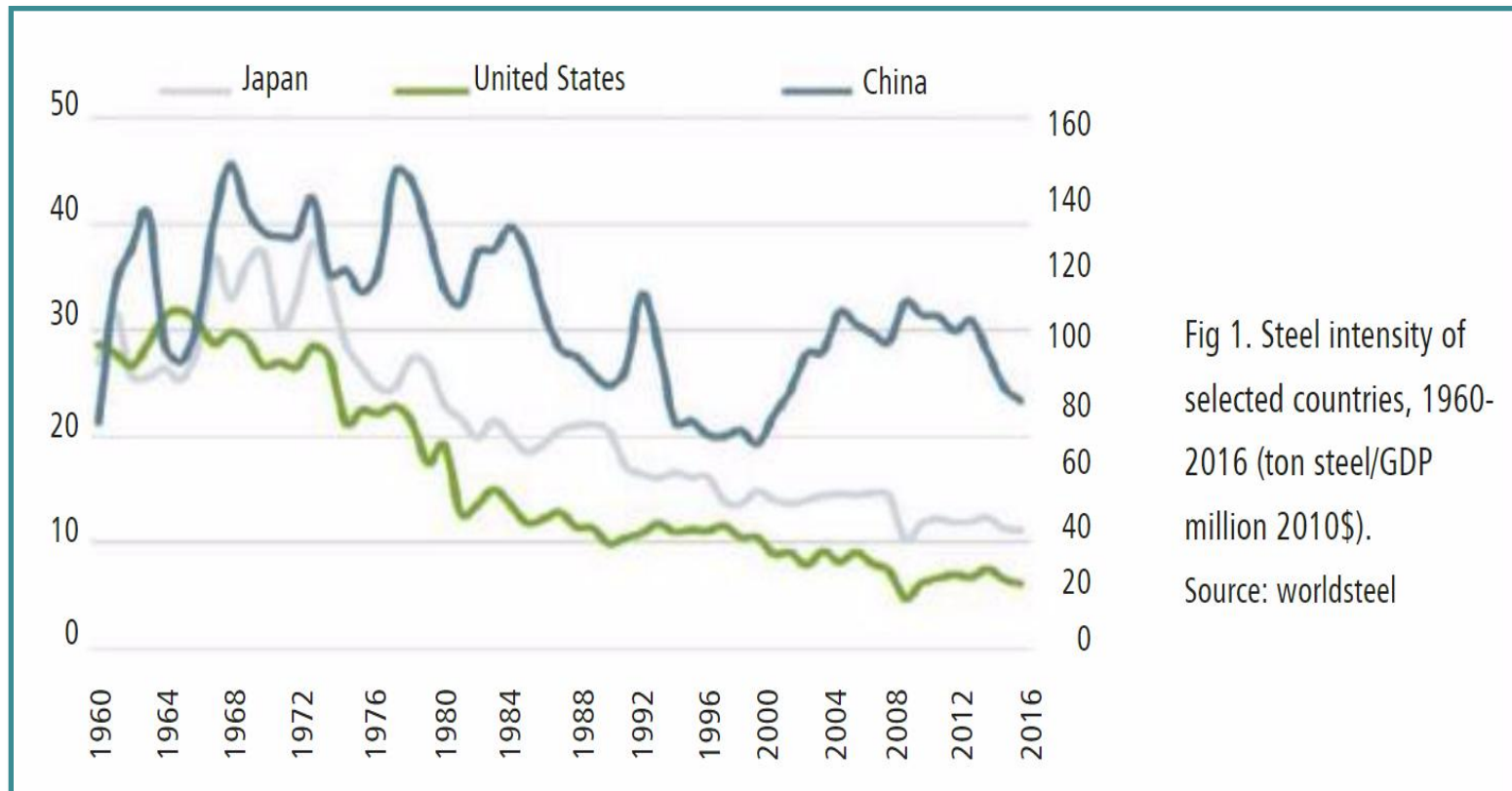
Source: Worldsteel.org, November 2017

# World Steel Industry Value Chain: Flat



Source: SteelontheNet.com, 7/26/17

# Steel Intensity, 1960-2016



Source: Steel Times International, October 2017

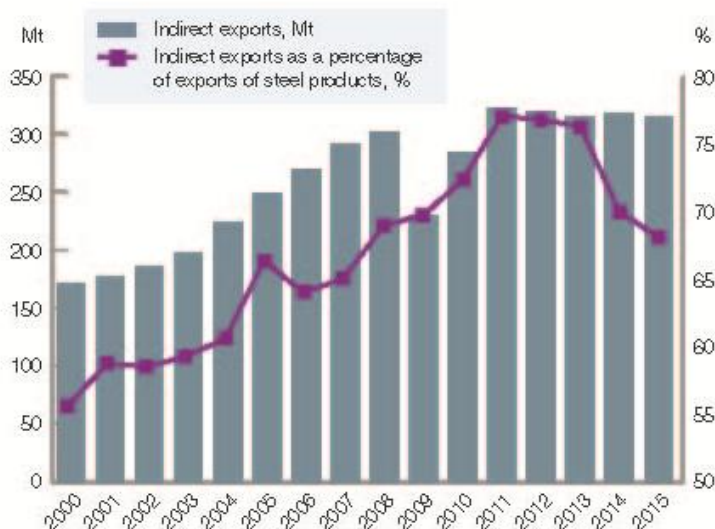
# Top Steel Importers & Exporters, 2016

Top Steel Exporting Countries in 2016						Top Steel Importing Countries in 2016					
Rank	Country	Metric Tons	Rank	Country	Metric Tons	Rank	Country	Metric Tons	Rank	Country	Metric Tons
1	China	106.1	11	Brazil	13.4	1	United States	30.1	11	India	9.8
2	Japan	40.4	12	Taiwan	12.2	2	Germany	25.7	12	Mexico	9.6
3	Russia	31.1	13	Netherlands	10.6	3	South Korea	23.1	13	Spain	9.3
4	South Korea	30.3	14	India	10.0	4	Italy	19.5	14	Netherlands	9.0
5	Germany	24.8	15	Spain	9.2	5	Thailand	17.5	15	Malaysia	8.9
6	Ukraine	18.2	16	United States	8.9	6	Turkey	15.4	16	Philippines	8.1
7	Italy	17.2	17	Austria	7.3	7	France	14.5	17	Taiwan	7.8
8	Belgium	16.8	18	Canada	6.1	8	China	13.4	18	Canada	7.7
9	Turkey	15.0	19	Poland	5.2	9	Belgium	13.1	19	United Kingdom	6.9
10	France	13.5	20	Slovakia	5.0	10	Poland	10.1	20	Czech Republic	6.4

Source: Worldsteel.org, November 2017

# Indirect World Trade in Steel, 2000-2015

million tonnes, finished steel equivalent



Indirect trade in steel takes place through exports and imports of steel containing goods and is expressed in finished steel equivalent of products used.

Further explanation on definitions and methodology of indirect trade in steel can be found in the report 'Indirect Trade in Steel (March 2015)' at

[worldsteel.org/publications/reports](http://worldsteel.org/publications/reports).

Year	Indirect exports, Mt
2000	171.2
2001	177.3
2002	186.9
2003	198.0
2004	223.2
2005	248.8
2006	269.2
2007	291.5
2008	302.5
2009	230.9
2010	284.7
2011	323.2
2012	320.2
2013	314.9
2014	320.6
2015	318.1

Source: Worldsteel.org, November 2017



# Indirect World Steel Imp's & Exp's, 2015

million tonnes, finished steel equivalent

Rank	Indirect exports	Mt
1	China	70.5
2	Germany*	32.2
3	South Korea	22.7
4	Japan	21.7
5	United States	19.9
6	Mexico	14.3
7	Italy*	13.2
8	Poland*	9.4
9	Spain*	9.2
10	France*	8.6

Rank	Indirect imports	Mt
1	United States	42.7
2	Germany*	21.9
3	France*	12.1
4	United Kingdom*	11.9
5	Canada	11.4
6	China	9.9
7	Mexico	9.7
8	Italy*	7.5
9	Spain*	7.3
10	Japan	7.1

Rank	Net indirect exports (exports - imports)	Mt
1	China	60.6
2	South Korea	16.1
3	Japan	14.6
4	Germany*	10.3
5	Italy*	5.7

Rank	Net indirect imports (imports - exports)	Mt
1	United States	22.8
2	United Kingdom*	6.0
3	Canada	5.7
4	Australia	4.9
5	Saudi Arabia	4.0

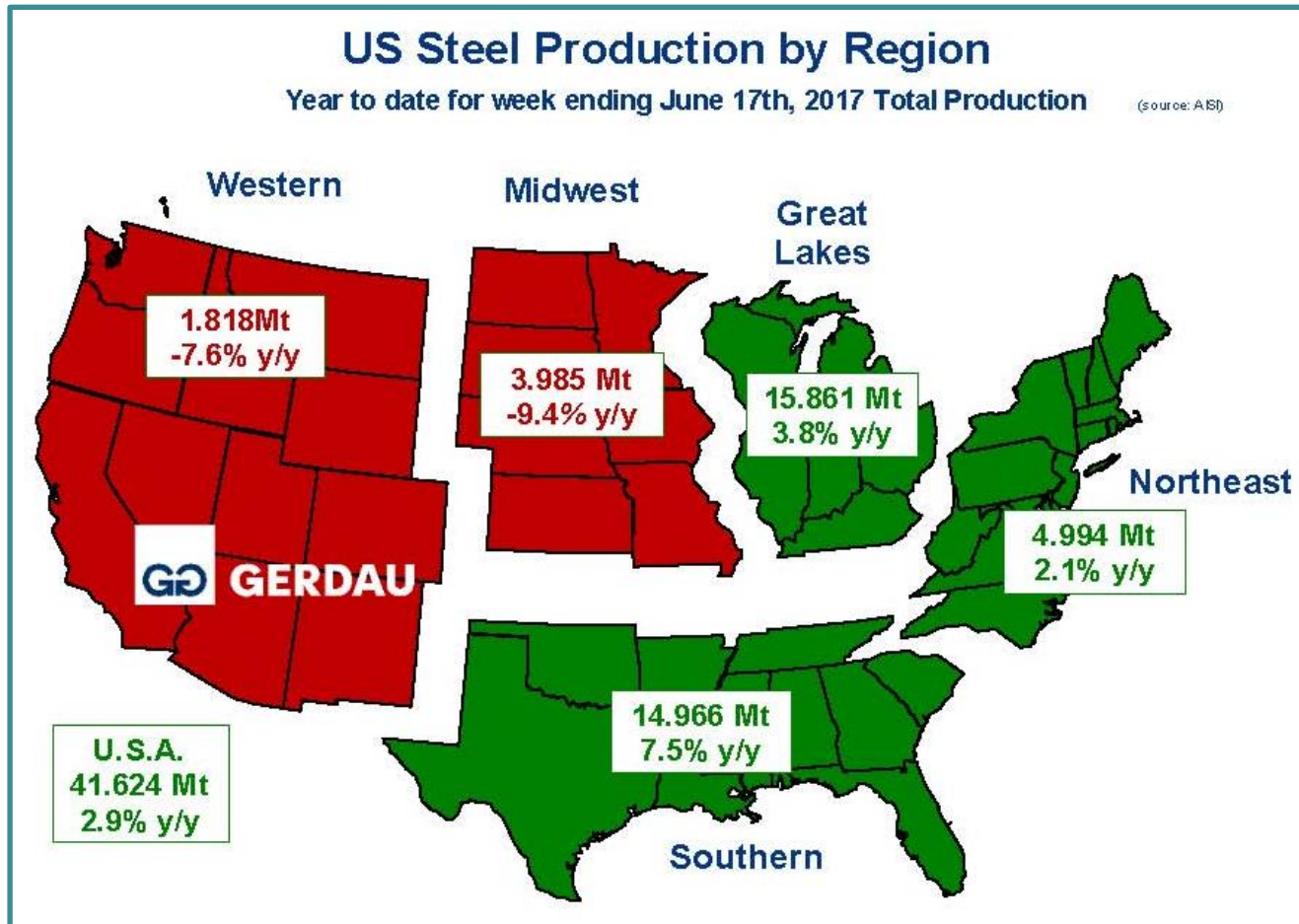
\*Data for individual European Union (28) countries include intra-European trade

Source: Worldsteel.org, November 2017

# U.S. STEEL INDUSTRY



# U.S. Steelmaking by Region, 2017





# ***U.S. Steel Industry: Key Take-Aways I***

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1. The U.S. steel industry operates more than **95** steelmaking and production facilities, producing **79** million tons in steel shipments in 2016.
2. The steel industry directly employs around **140,000** people in the United States, and it directly or indirectly supports almost **one million U.S. jobs**.
3. **Labor productivity** has seen a five-fold increase since the early 1980s, going from an average of ten man-hours per finished ton to an average of 2 man-hours per finished ton of steel in 2015.
4. Today, 97 percent of steel by-products can be re-used and the recycling rate for steel itself is 86 percent.
5. Through recycling, the steel industry saves enough energy to power 20 million homes, for one year.

## ***U.S. Steel Industry: Key Take-Aways II***

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6. Advanced high-strength steel is the only material that reduces greenhouse gas emissions in all phases of an automobile's life: manufacturing, driving and end-of-life.
7. Since 1990, the industry has reduced energy intensity by 31% and CO2 emissions by 36% per ton of steel shipped.
8. The North American steel industry is committed to the highest safety and health standards. Since 2005, U.S. steel producers have achieved a reduction of 70 percent in both the total OSHA recordable injury and illness and lost workday case rates.

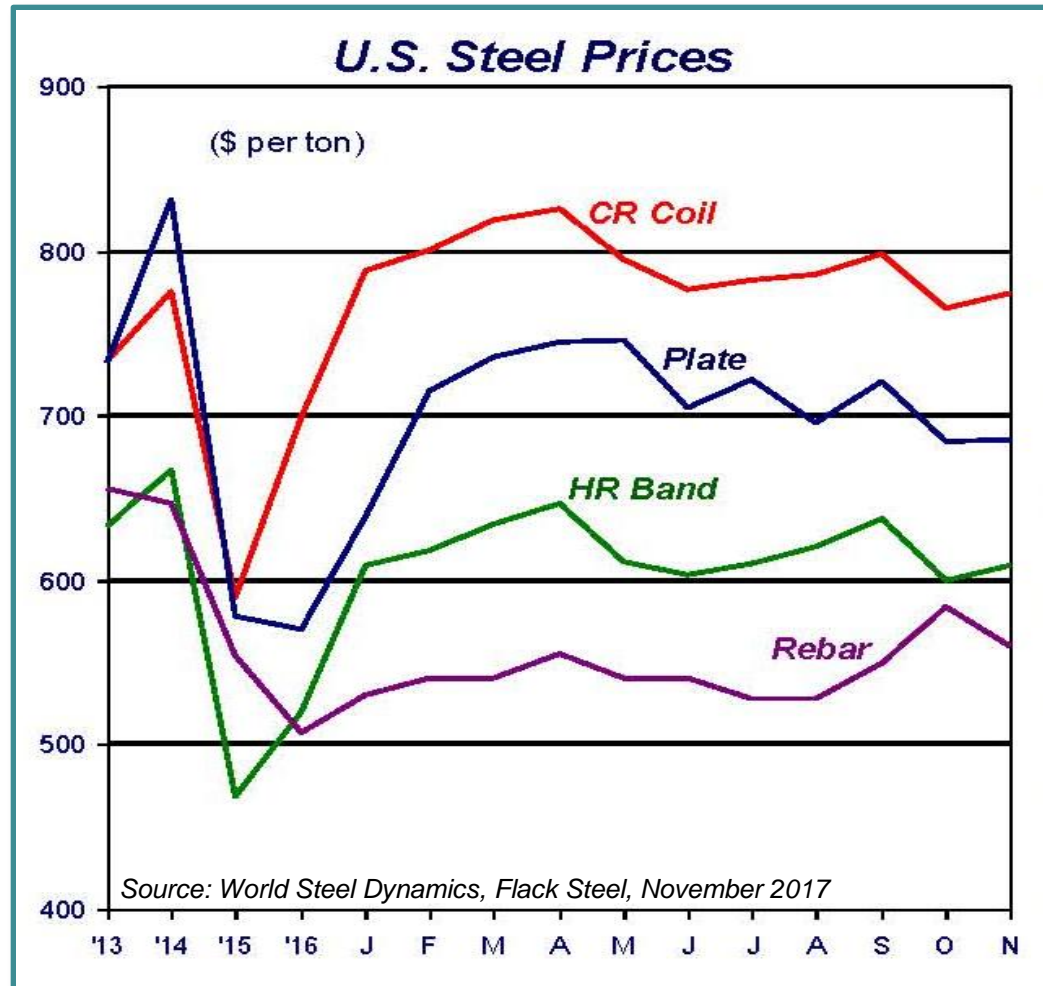
# Overall Domestic Performance, 2013-2016

(million tonnes, except for prices)	2013	2014	2015	2016	'15-'16 % Chg
<b>Raw steel production</b> (mt)	86.9	88.2	78.8	78.6	-0.3%
<b>Mill shipments</b> (mt)	86.6	89.1	78.5	78.5	0.0%
<b>Exports</b> (mt)	12.1	11.5	9.6	8.9	-7.3%
<b>Imports</b> (mt)	29.2	40.3	35.4	30.1	-15.0%
<b>Import penetration</b> (%)	28.1%	34.4%	33.8%	30.1%	-10.9%
<b>Average spot price</b> (US\$/ton)	\$699	\$758	\$546	\$596	9.2%
<b>Average scrap price</b> (US\$/ton)	\$369	\$371	\$240	\$228	-5.0%

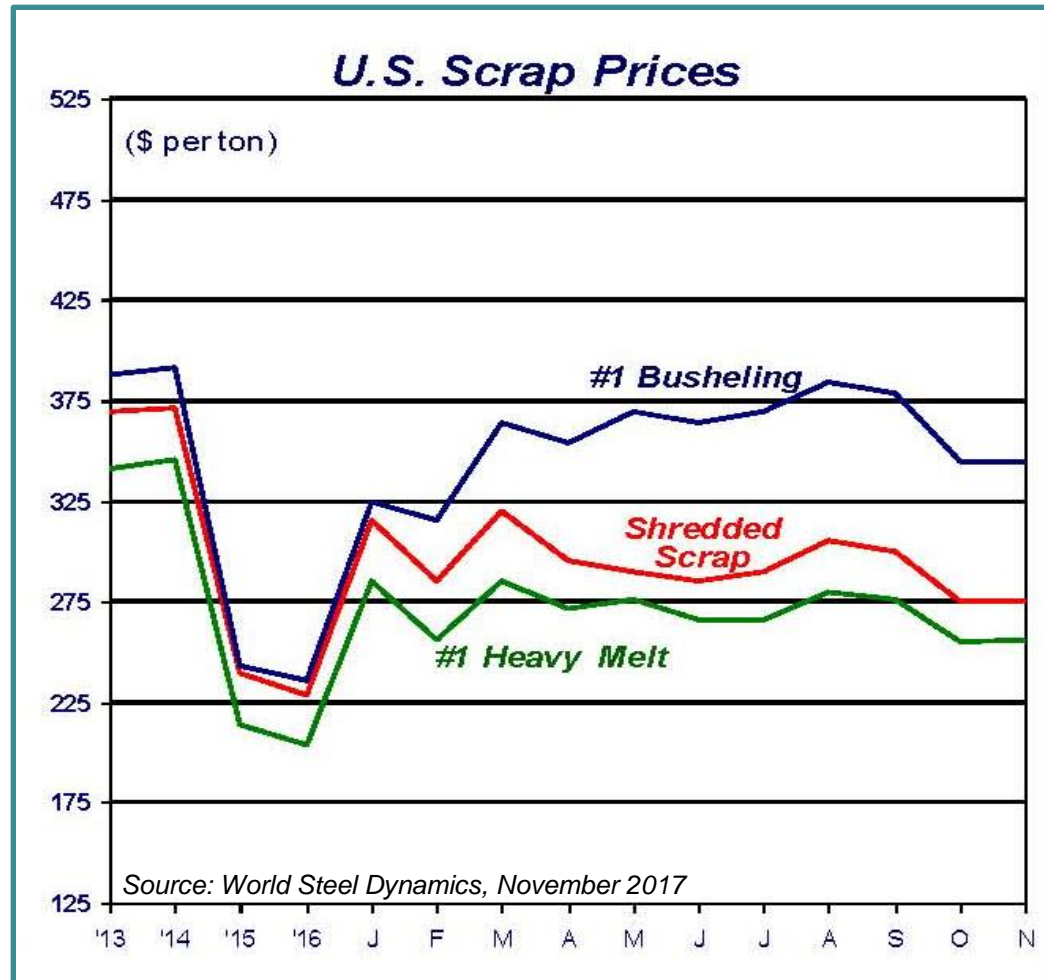
Source: Worldsteel.org, AISI, ITA, 11/17; avg spot price is a composite of 4 carbon steel products; scrap is shredded bundles

**2017 YTD (Jan-Aug): Production: 54,805\* | Shipments: 55,291\***  
**2017 YTD (Jan-Nov): Average Spot Price: \$657**

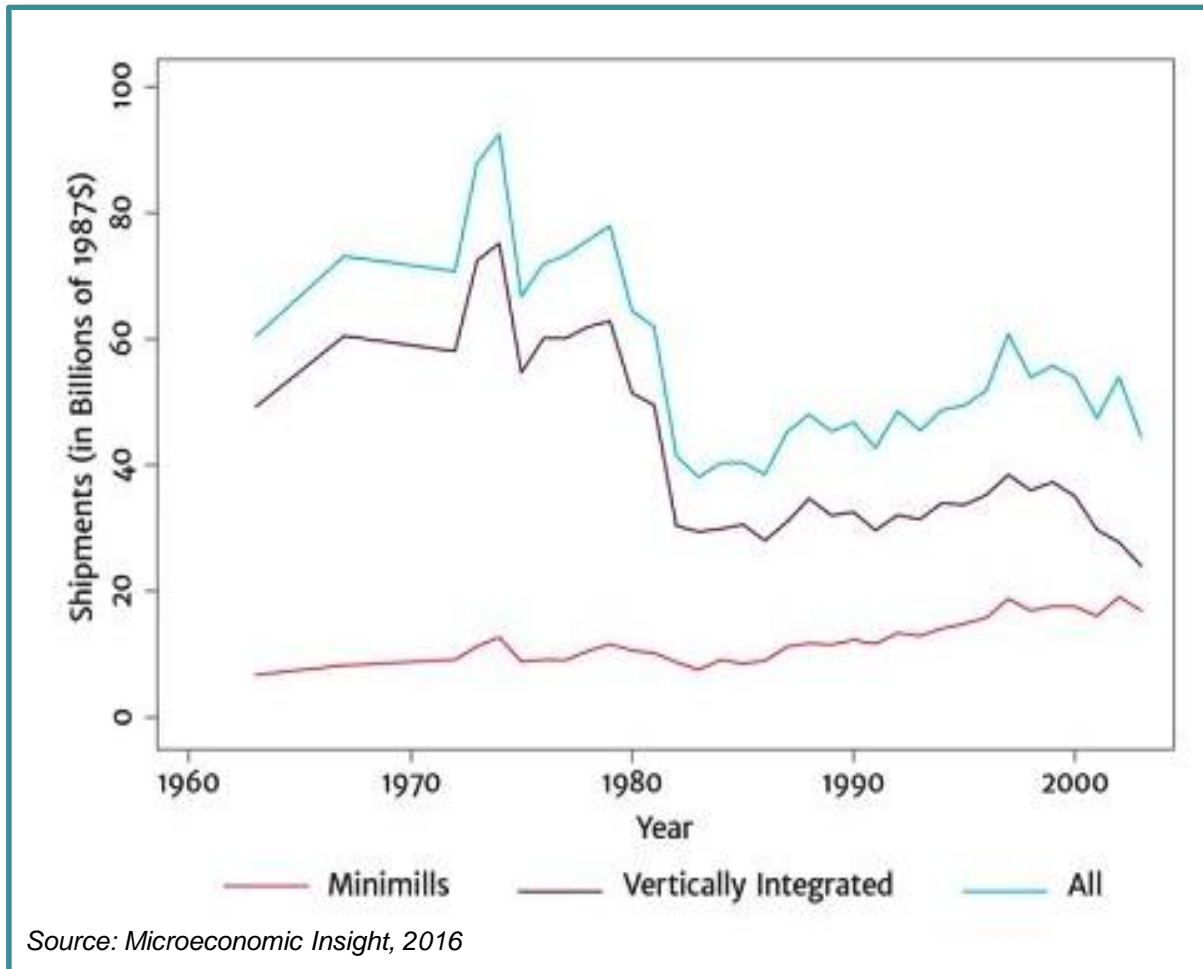
# U.S. Steel Prices, 2013-2017



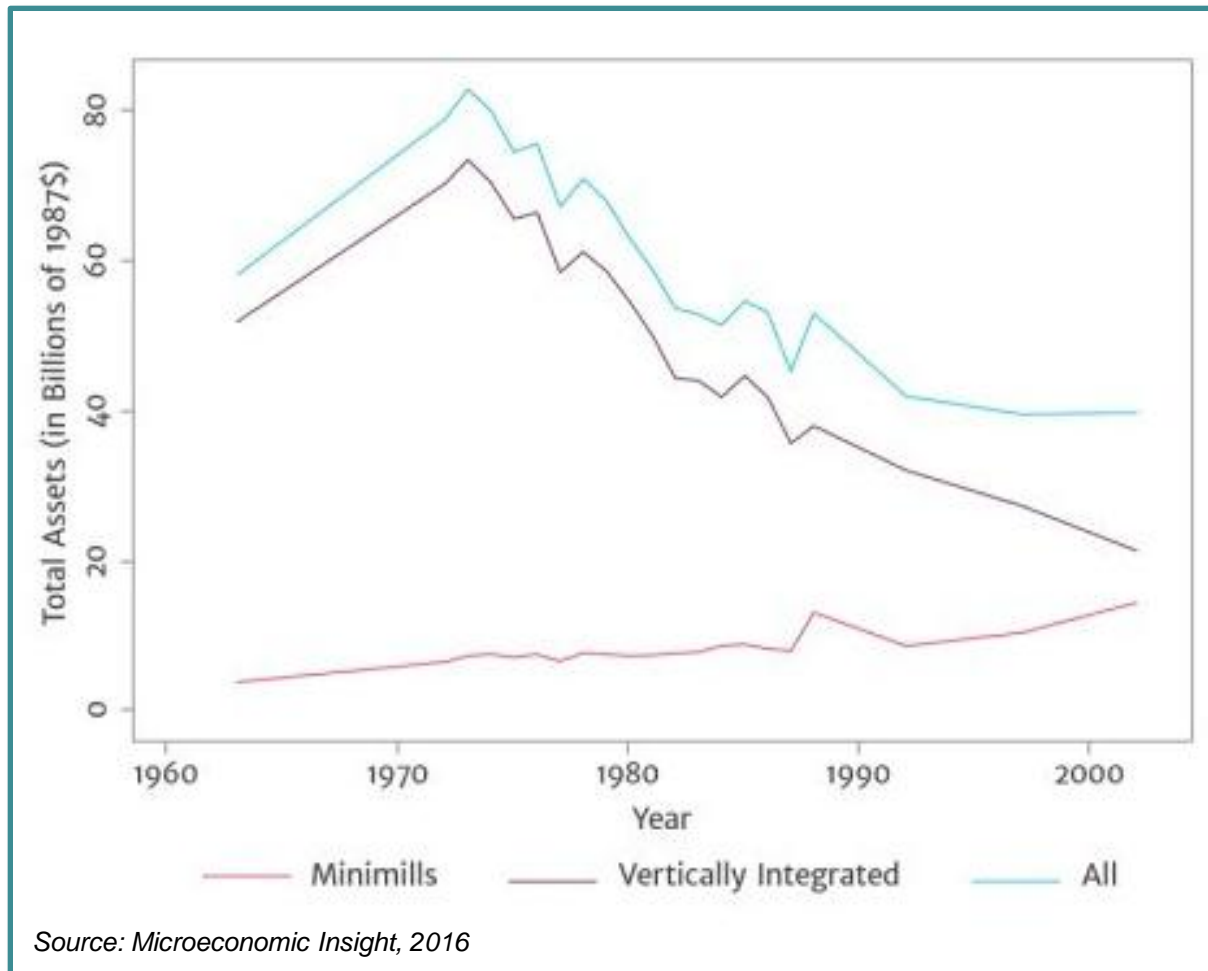
# U.S. Scrap Prices, 2013-2017



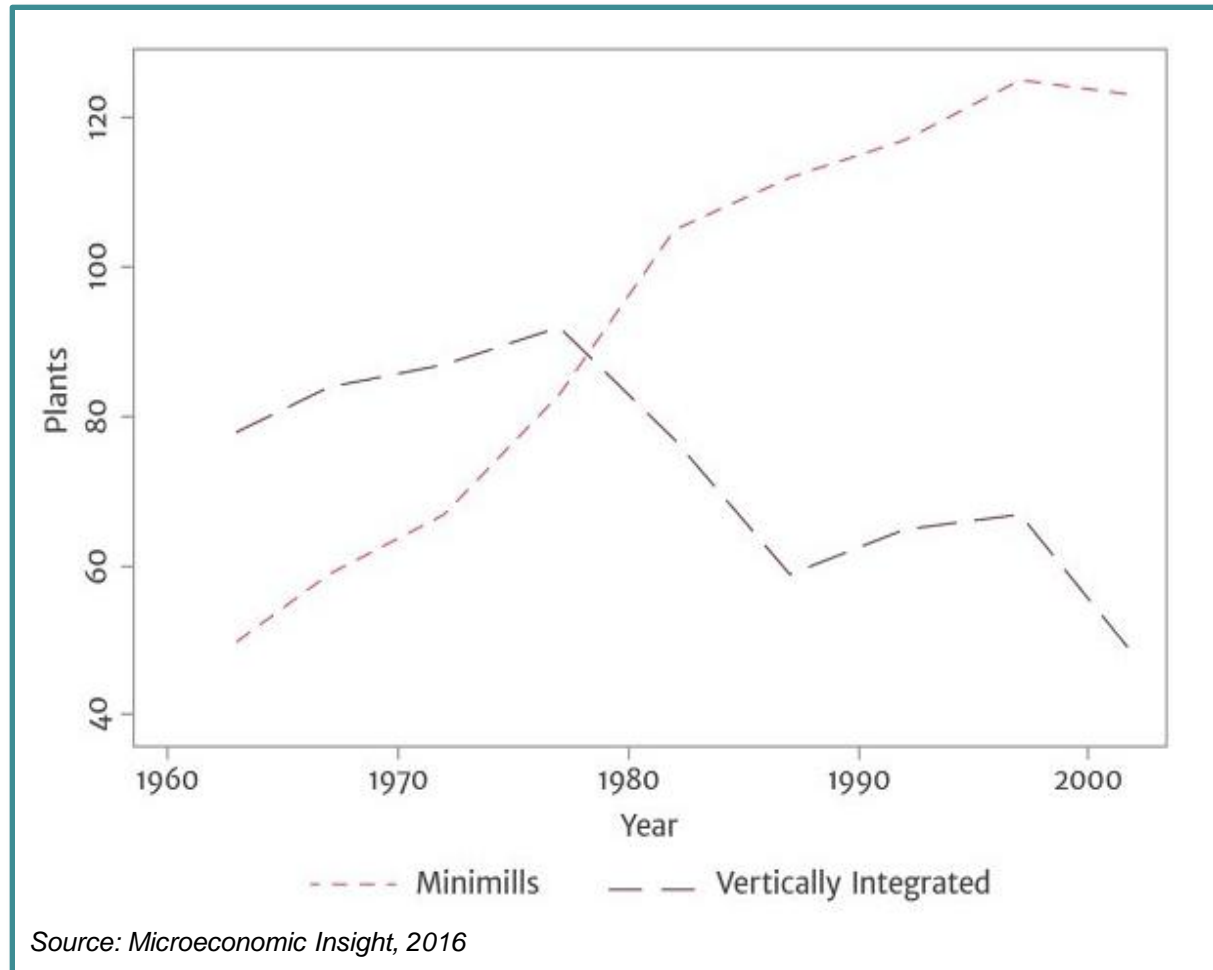
# ***U.S. Steel Shipments*** (in billion \$)



# U.S. Steel Industry Assets

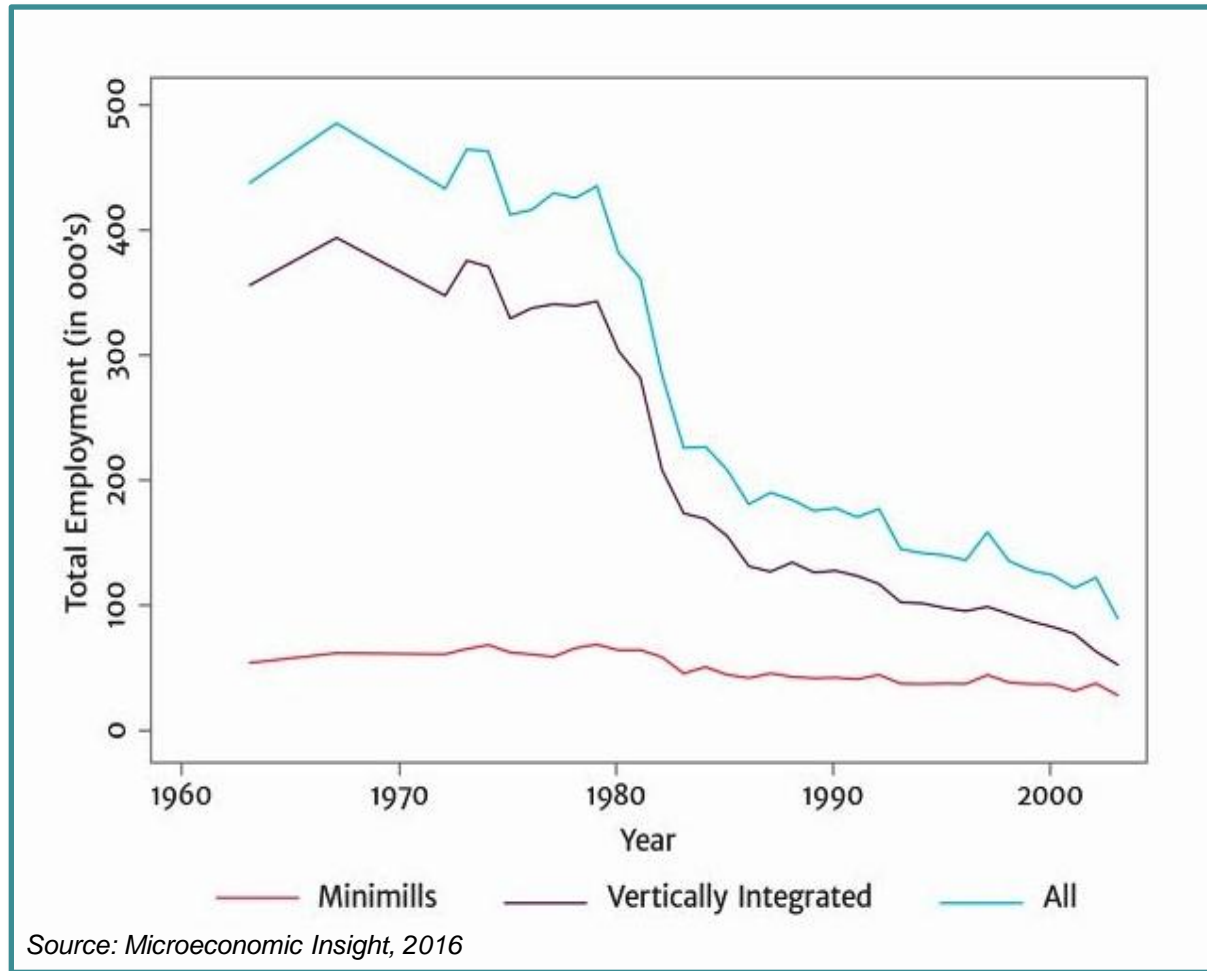


# U.S. Steel Industry Plants

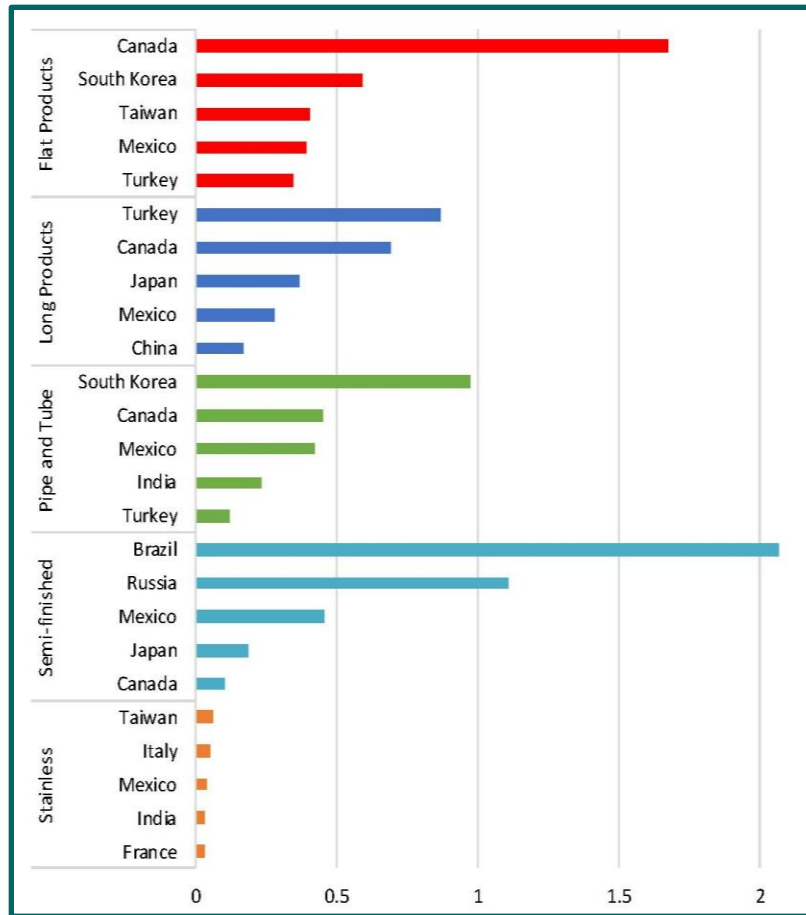




# U.S. Steel Industry Employment



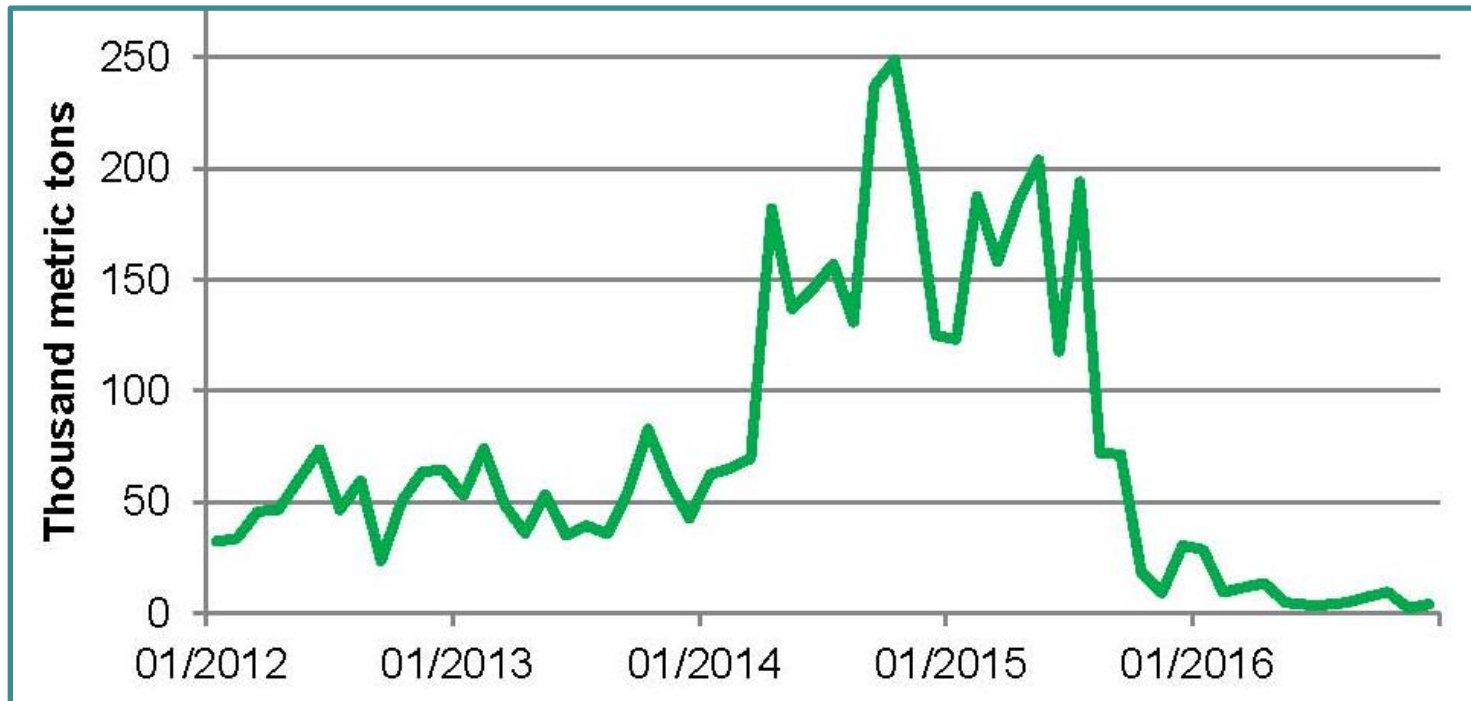
# U.S. Top Imported Steel Sources, 2017



Country	Imports %to U.S.
Canada	16%
Brazil	13%
South Korea	10%
Mexico	9%
Turkey	7%
Japan	5%
Rest of World	40%

Source: ITA, October 2017; data from Jan-Aug, 2017

# ***U.S. Imports of Chinese Sheet Steel***



Source: IHS Markit, March 2017

## ***If U.S. Protectionism Emerges...***

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The harshest possible scenario is that all imports of steel are excluded from the United States. In this case domestic steel companies could supply the market at 2016 levels, but just barely.

History shows that prices tend to rise sharply when utilization exceeds 88%. At 93% utilization -- and absent the threat of imports -- prices would rise extremely sharply and stay high.

*-- IHS Markit, March 2017*

# *Will the Steel Industry Meet Demand?*

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Domestic production	86
Imports	30
<b>Total</b>	<b>116</b>
Domestic full capacity	124
Spare capacity	5
<b>% Utilization</b>	<b>93.5%</b>

*Source: IHS Markit, March 2017; in tons*

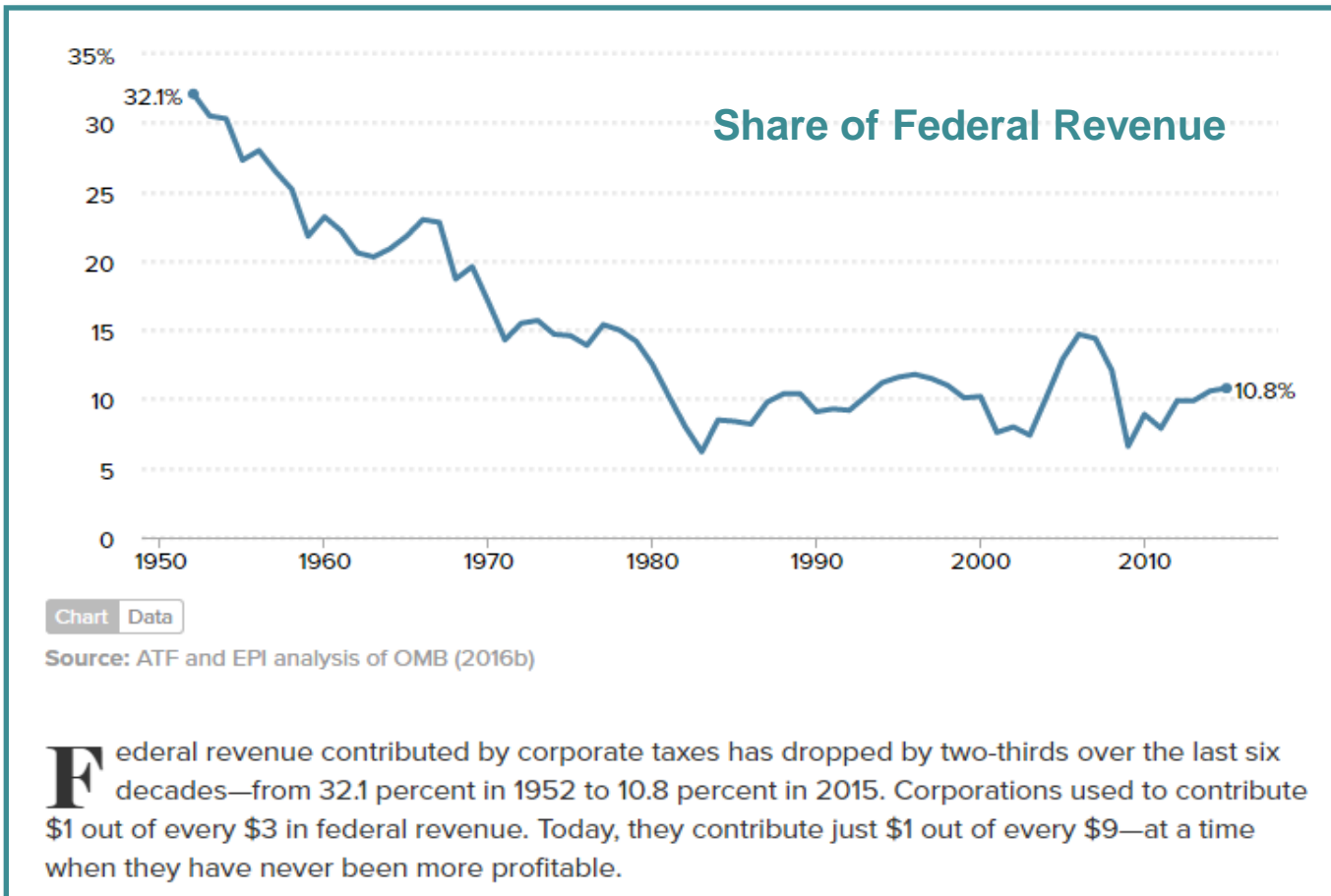
## ***Section 232: Can it Wait Much Longer?***

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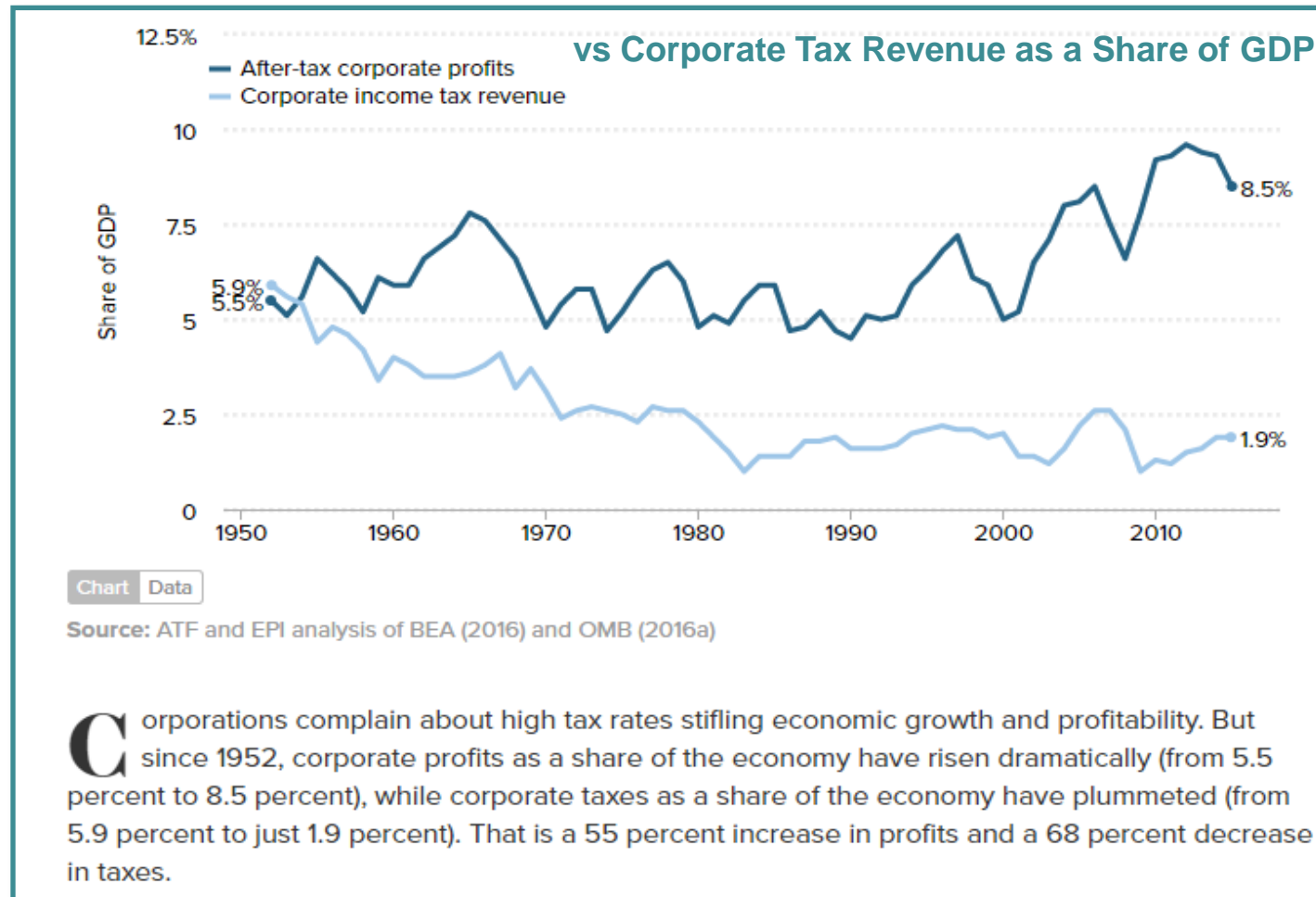
A key report from the U.S. Commerce Department in the Section 232 probe is due in January. The Trump administration then has until April, 2018 to decide whether imports pose a threat to national security and, if they do, what actions to take to stop them.

-- *American Metal Market*, 11/28/17

# Corporate Taxes, 1952-2015



# After Tax Corporate Profit, 1952-2015





# Steel Industry Political Donations, 2016

Rank	Contributor	To Parties & Candidates			
		Total \$	Total \$	Dem%	Repub%
1	Nucor Corp	\$611,335	\$551,335	17.5%	82.4%
2	Worthington Ind	\$580,484	\$30,484	10.5%	89.5%
3	Independence Tube	\$288,808	\$288,808	1.6%	98.4%
4	TimkenSteel	\$203,955	\$203,955	0.0%	100.0%
5	US Steel	\$192,694	\$192,694	52.7%	47.2%
6	Cooper Steel	\$155,850	\$55,850	77.4%	22.6%
7	AK Steel	\$128,875	\$127,975	30.8%	69.2%
8	ArcelorMittal USA	\$103,594	\$103,594	44.4%	55.6%
9	Ellwood Group	\$101,100	\$101,100	0.0%	100.0%
10	Qualico Steel	\$89,900	\$89,900	0.0%	100.0%
11	Kenwal Steel	\$88,500	\$38,500	14.0%	86.0%
12	AISI	\$81,970	\$81,970	31.7%	68.3%
13	Olympic Steel	\$67,292	\$67,292	12.2%	87.8%
14	Pelco Structural	\$61,712	\$61,712	8.8%	91.2%
15	Mill Steel Co	\$60,740	\$56,325	29.5%	70.5%
16	San Antonio Steel	\$60,520	\$60,520	0.0%	100.0%
17	Midwest Steel	\$55,943	\$55,443	0.0%	100.0%
18	Timkensteel Corp	\$52,242	\$52,242	5.2%	94.8%
19	Steel Dynamics Inc	\$49,466	\$47,666	1.0%	99.0%
20	New Process Steel	\$42,540	\$42,540	97.6%	2.4%

Source: OpenSecrets.org, November 2017; election year: 2016

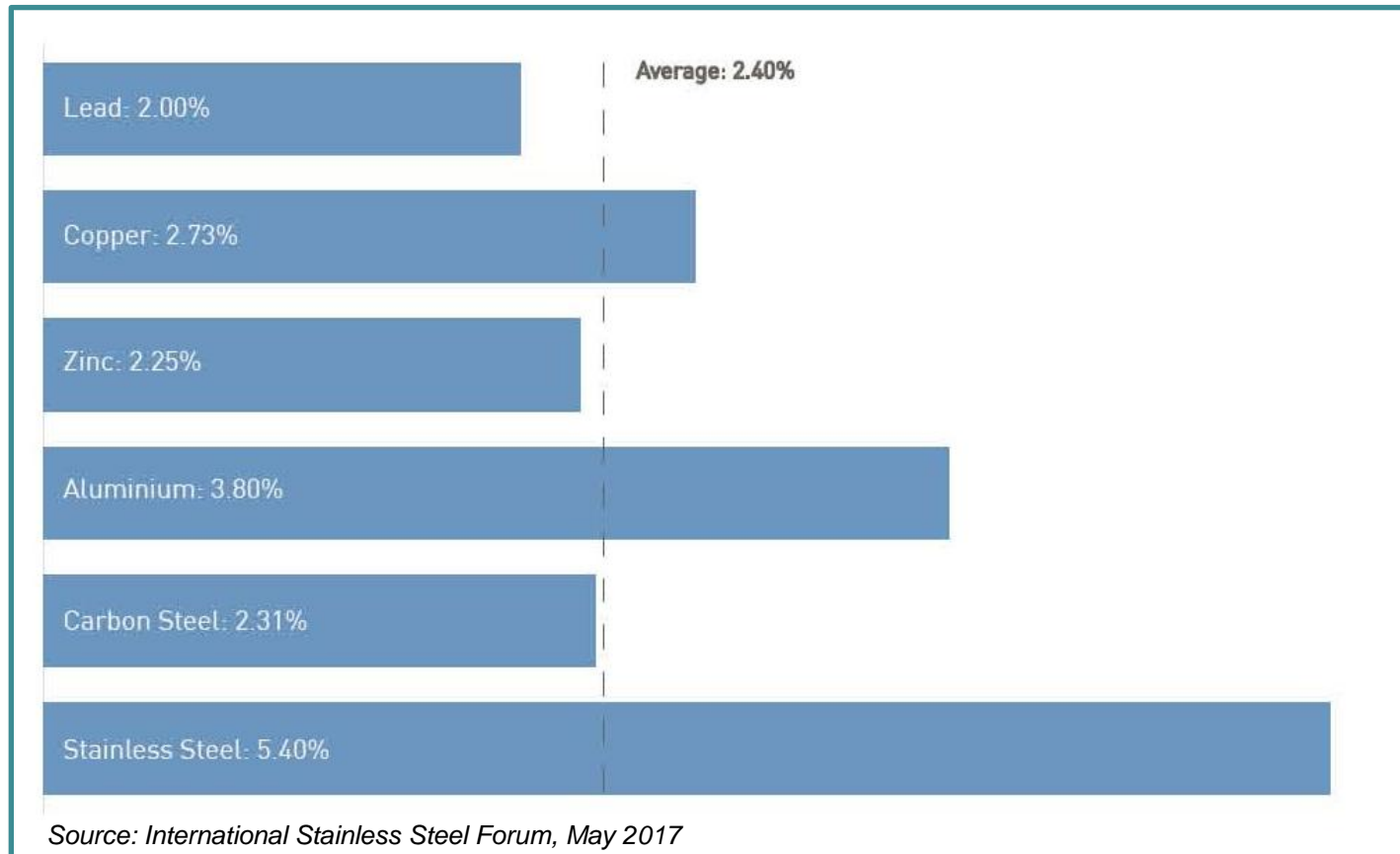
# STAINLESS STEEL

# Major Stainless Steel Producers, 2016

Million tonnes	2014	2016
Tisco	2.6	3.1
Posco	2.5	2.5
Outokumpu	2.4	2.3
Acerinox	2.4	2.5
Yusco	1.8	1.8
Aperam	1.6	1.6
Baosteel	1.2	1.7

Source: Outokumpu, November 2017; Tisco: Taiyuan Iron & Steel

# Growth of Major Metals, 1980-2016



# Stainless Steel Production, 2006-2016

## Stainless & Heat-Resisting Melt Shop Steel Production (Thousand Tonnes)

	Western Europe/ Africa	Central/ Eastern Europe	The Americas	Asia (sans China)	China	Total	World Ex China
2006	9,999	376	2,951	10,081	5,299	28,706	23,407
2007	8,669	363	2,604	9,304	7,207	28,147	20,940
2008	8,272	333	2,315	8,356	6,944	26,219	19,275
2009	6,448	237	1,941	7,473	8,805	24,903	16,098
2010	7,879	340	2,608	9,011	11,256	31,094	19,838
2011	7,883	391	2,487	8,769	14,091	33,622	19,531
2012	7,830	360	2,368	9,274	16,086	35,918	19,832
2013	7,497	295	2,453	9,276	18,984	38,505	19,521
2014	7,570	277	2,814	9,334	22,593	42,588	19,995
2015	7,518	259	2,747	9,461	21,562	41,547	19,985
2016	7,702	247	2,932	9,956	24,937	45,774	20,837

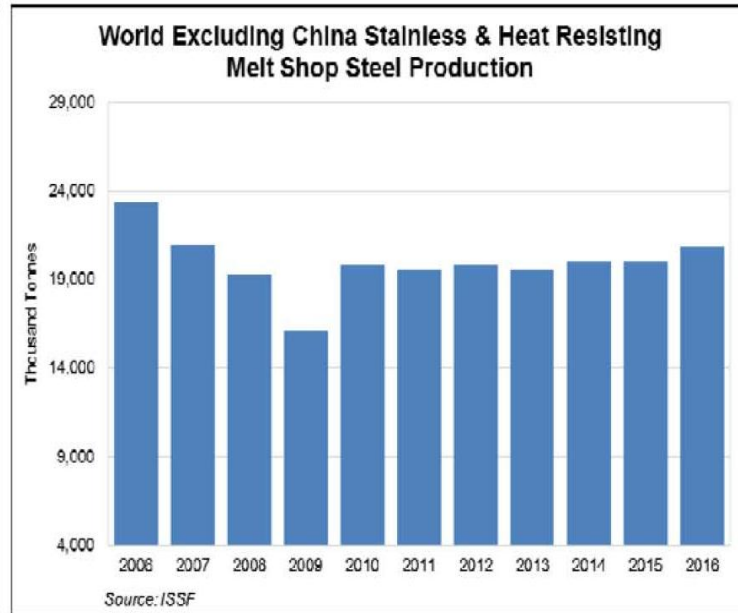
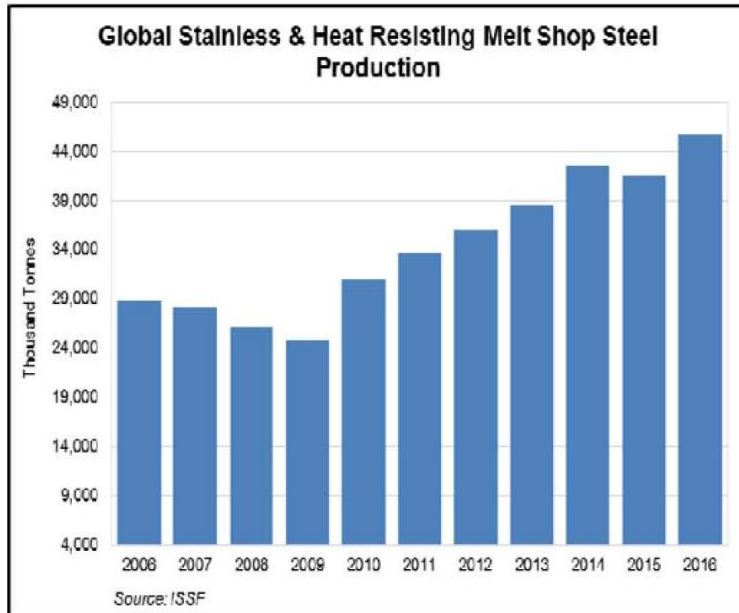
### Annual Growth Rate

2013	-4.3%	-18.1%	3.6%	0.0%	18.0%	7.2%	-1.6%
2014	1.0%	-6.1%	14.7%	0.6%	19.0%	10.6%	2.4%
2015	-0.7%	-6.5%	-2.4%	1.4%	-4.6%	-2.4%	-0.1%
2016	2.4%	-4.6%	6.7%	5.2%	15.7%	10.2%	4.3%

Source: Steel-Insights, LLC; International Stainless Steel Forum

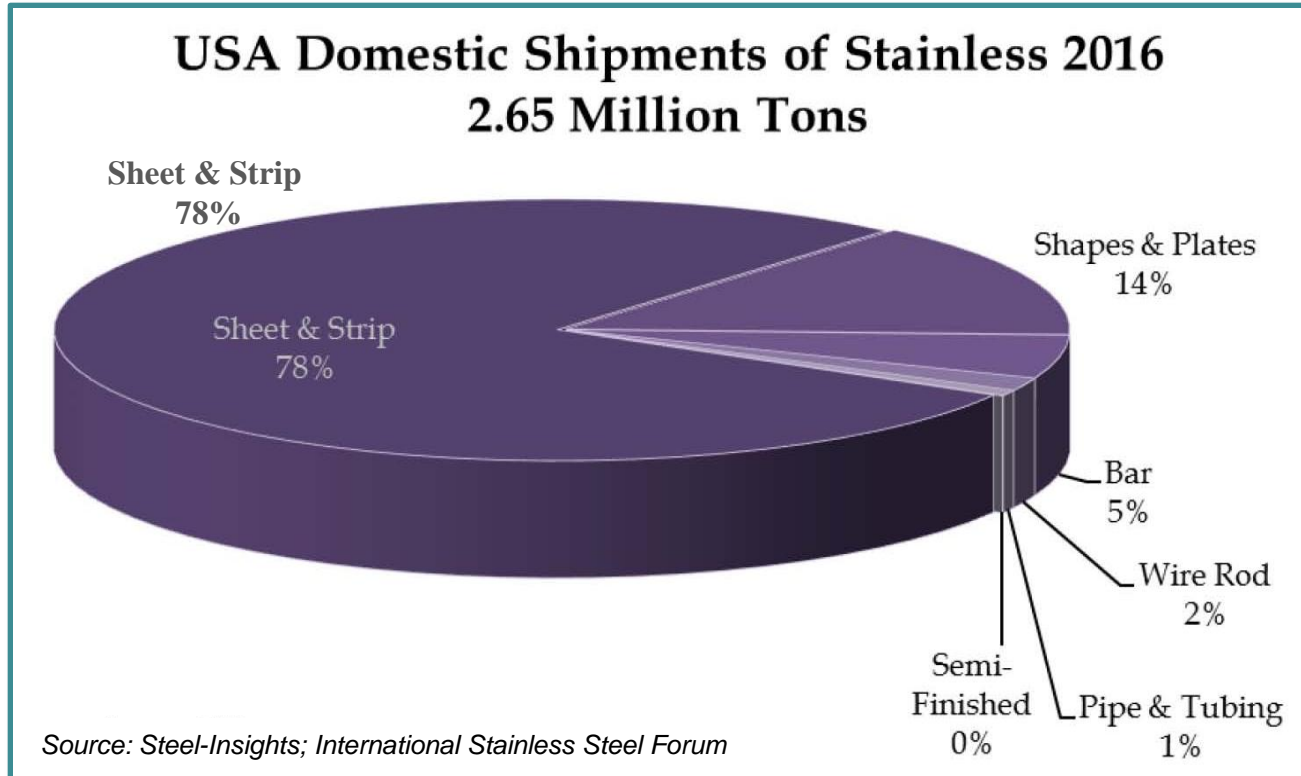


# Stainless Steel Production, 2008-2016



Source: Steel-Insights, LLC; International Stainless Steel Forum

# U.S. Shipments of Stainless, 2016





# U.S. Stainless Usage & Shipments

## USA Stainless Steel Consumption / Shipment Outlook (Million Net Tons)

	Shipments						Plus Imports	Less Exports	Apparent Consumption	% Chg
	Q1	Q2	Q3	Q4	Total	% Chg				
2002	0.46	0.52	0.52	0.45	1.95		0.94	0.30	2.59	
2003	0.48	0.51	0.48	0.48	1.95	0.1%	0.80	0.36	2.39	-7.7%
2004	0.53	0.53	0.53	0.48	2.07	6.4%	1.01	0.36	2.73	14.2%
2005	0.53	0.50	0.44	0.43	1.90	-8.1%	0.98	0.41	2.47	-9.4%
2006	0.52	0.53	0.54	0.50	2.08	9.3%	1.14	0.45	2.77	12.2%
2007	0.52	0.50	0.40	0.46	1.88	-9.8%	1.21	0.60	2.50	-10.0%
2008	0.44	0.47	0.36	0.27	1.52	-18.8%	1.09	0.63	1.99	-20.3%
2009	0.27	0.30	0.41	0.35	1.33	-13.0%	0.62	0.53	1.42	-28.7%
2010	0.43	0.44	0.38	0.41	1.66	25.3%	0.94	0.61	1.99	40.2%
2011	0.60	0.51	0.48	0.49	2.08	25.3%	1.11	0.67	2.52	26.9%
2012	0.55	0.53	0.51	0.50	2.09	0.5%	1.27	0.71	2.64	4.9%
2013	0.57	0.65	0.63	0.60	2.44	16.7%	1.07	0.70	2.82	6.6%
2014	0.64	0.65	0.63	0.58	2.50	2.5%	1.22	0.92	2.80	-0.6%
2015	0.65	0.63	0.62	0.56	2.45	-2.0%	1.16	0.91	2.71	-3.4%
2016	0.65	0.66	0.67	0.66	2.65	7.9%	1.03	0.89	2.79	3.0%
2017e	0.68	0.71	0.70	0.69	2.79	5.4%	1.21	1.07	2.93	5.1%

Source: Steel-Insights, LLC; International Stainless Steel Forum

# SS Product Imports & Exports, 2000-2017e

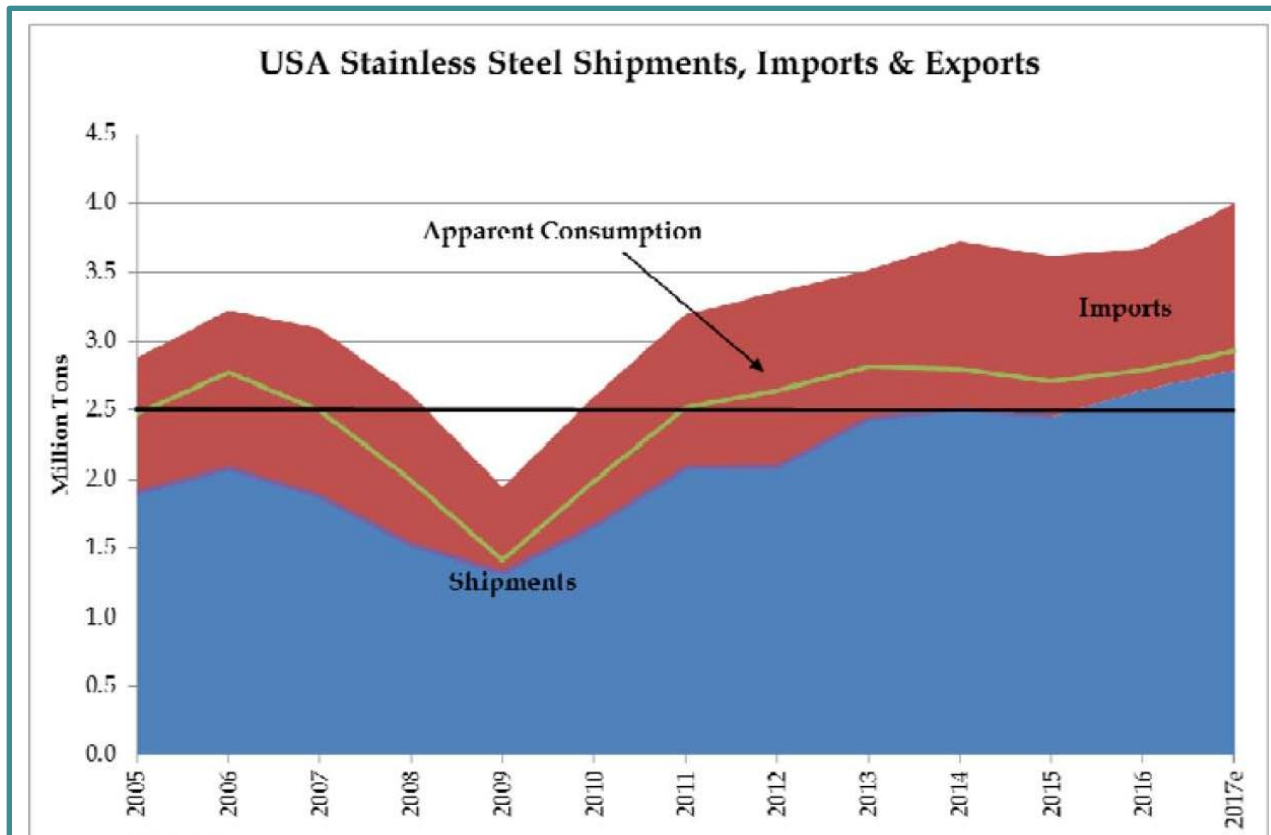
## USA Stainless Shipments, Imports, Exports and Apparent Consumption

(Thousand Net Tons)

	2000	2005	2009	2010	2013	2014	2015	2016	2017e	% Chg
Sheet & Strip	1,688	1,455	980	1,219	1,944	1,928	1,938	2,064	2,206	6.9%
Shapes & Plates	207	264	206	221	265	315	321	380	401	5.5%
Bar	160	136	100	141	166	191	142	142	114	-19.5%
Wire Rod, Drawn & Rolled	46	31	30	53	53	54	36	42	52	22.0%
Pipe & Tubing	17	15	10	11	13	13	17	18	15	-18.7%
Semi-Finished	8	1	1	17	2	3	1	1	1	116.5%
Net Shipments	2,126	1,903	1,326	1,662	2,443	2,505	2,454	2,647	2,789	5.4%
Imports	1,179	976	617	939	1,073	1,221	1,164	1,025	1,207	17.7%
Exports	291	409	526	615	698	925	912	886	1,068	20.6%
Apparent Steel Consumption	3,014	2,471	1,417	1,986	2,818	2,801	2,706	2,786	2,928	5.1%
Growth in ASC	1.8%	-9.4%	-28.7%	40.2%	6.6%	-0.6%	-3.4%	3.0%	5.1%	
Net Imports	888	567	91	324	375	296	252	140	139	
As a % of Consumption	29.5%	23.0%	6.4%	16.3%	13.3%	10.6%	9.3%	5.0%	4.7%	

Source: Steel-Insights, LLC; American Iron & Steel Institute

# ***U.S. Stainless Shipments, etc. 2005-2017e***



Source: Steel-Insights; International Stainless Steel Forum

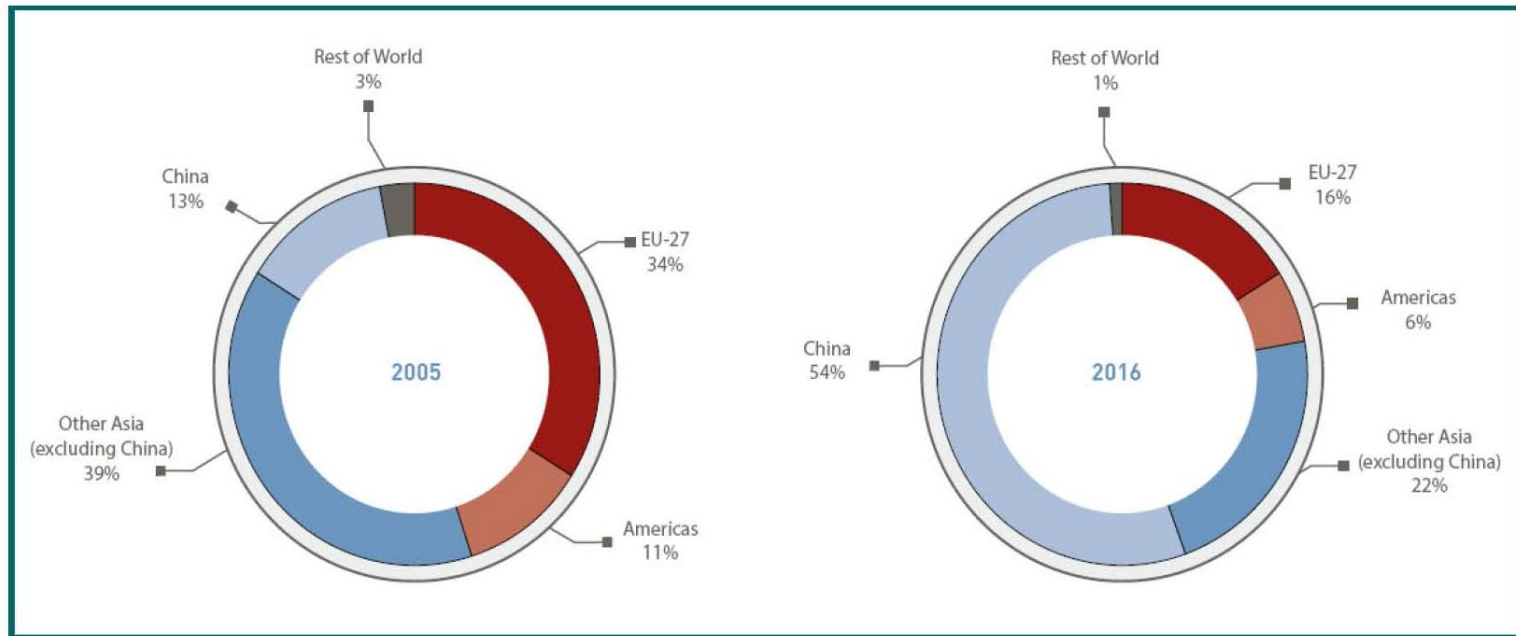
# Highest US\$ Value of SS Exports, 2016

Country	US\$ Value
UK	\$402.9 million (33.5% of SS exports)
Sweden	\$139.1 million (11.6%)
<b>United States</b>	<b>\$120.7 million (10%)</b>
Italy	\$89 million (7.4%)
Austria	\$59 million (4.9%)
Spain	\$57 million (4.7%)
Germany	\$51.2 million (4.3%)
France	\$46.5 million (3.9%)
Belgium	\$33.9 million (2.8%)
Indonesia	\$30.4 million (2.5%)
Taiwan	\$27.5 million (2.3%)
India	\$19.6 million (1.6%)
Poland:	\$12.3 million (1%)
Malaysia	\$11.8 million (1%)
Norway	\$10.1 million (0.8%)

The fifteen countries listed shipped 92.4 percent of world stainless steel exports last year, worth \$1.1 billion.

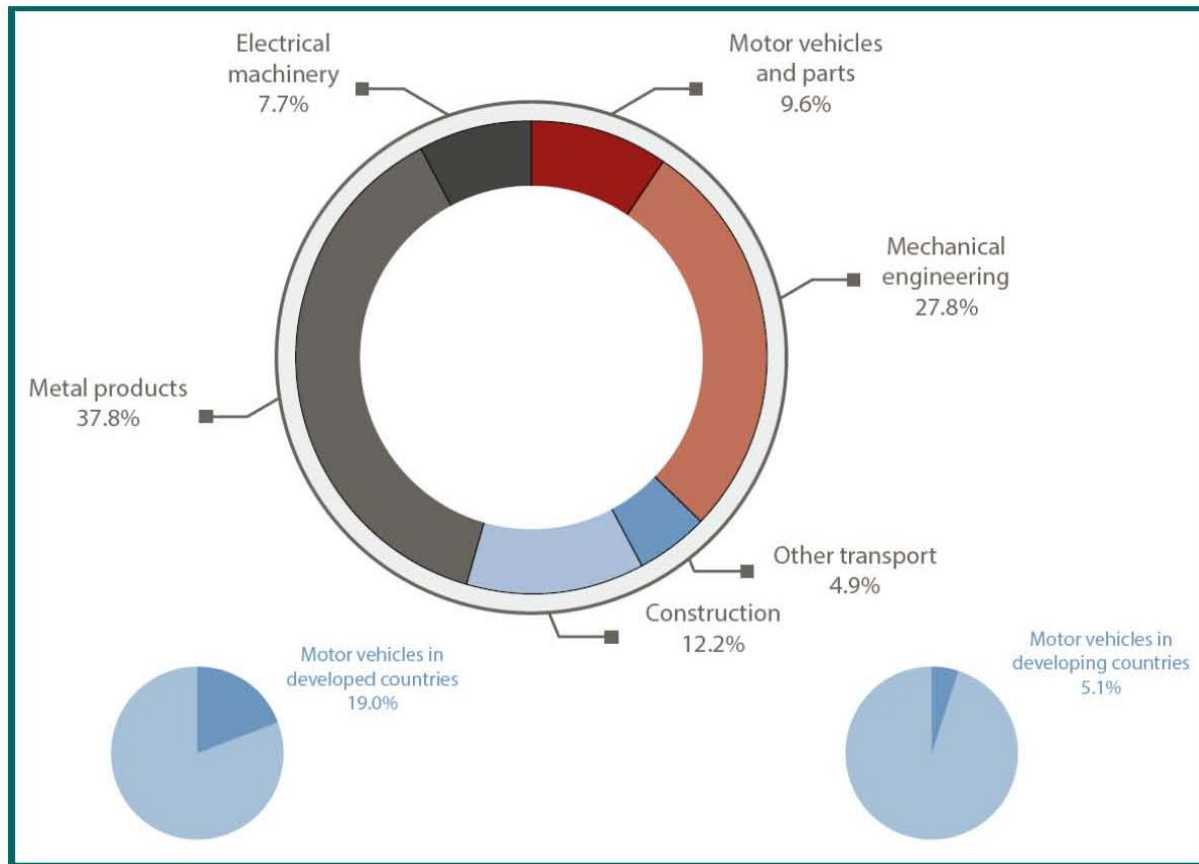
Source: WorldTopExports.com, October 2017

# Regional Share of SS Products, 2005-2016



Source: International Stainless Steel Forum

# Stainless Steel Use per Sector, 2016



Source: International Stainless Steel Forum, May 2017

# RAW MATERIALS





# ***Recycling of Steel Products, 2017***

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The growing **re-use and recycling of existing steel products** is delaying the demand for new crude steel production capacity. Global excess steel capacity is estimated to reach around 650mt / year in 2017. Scrap use in steelmaking totaled 387mt in January-September 2017, up by 15% year-on-year from 336mt in the corresponding period in 2016. In China, steel scrap consumption has risen sharply this year, up to 62mt in January-June 2017, compared with 43mt in the corresponding period in 2016. -- *American Metal Market*, 11/15/17

# World's Top Iron Ore Producers, 2016

Iron Ore: World's Largest Producers - Total (capacity in million tonnes per year)				
Rank	Company	Base Country	Capacity	Share
1	Vale Group	Brazil	539.5	14.7%
2	Rio Tinto Group	United Kingdom	465.0	12.6%
3	BHP Billiton Group	Australia	407.7	11.1%
4	Fortescue Metals Group	Australia	169.6	4.6%
5	ArcelorMittal Group	United Kingdom	97.0	2.6%
6	AnBen Group	China	84.8	2.3%
7	Anglo American Group	South Africa	74.9	2.0%
8	Imidro Group	Iran	59.5	1.6%
9	LKAB Group	Sweden	49.4	1.3%
10	Metallinvest Group	Russia	48.6	1.3%
11	Metinvest Holding Group	Ukraine	48.6	1.3%
12	Evrast Group	Russia	48.2	1.3%
13	Shougang Beijing Group	China	42.4	1.2%
14	Complejo Siderurgico Nacional Venezuela		41.7	1.1%
15	Cliffs Natural Resources	United States	40.8	1.1%
16	NMDC Group	India	40.7	1.1%
17	Usiminas Group	Brazil	37.6	1.0%
18	CSN Group	Brazil	30.3	0.8%
19	US Steel Group	United States	25.6	0.7%
20	Poltavsky	Ukraine	25.3	0.7%
Total Top 20			2296.1	62.4%
World			3676.7	100.0%

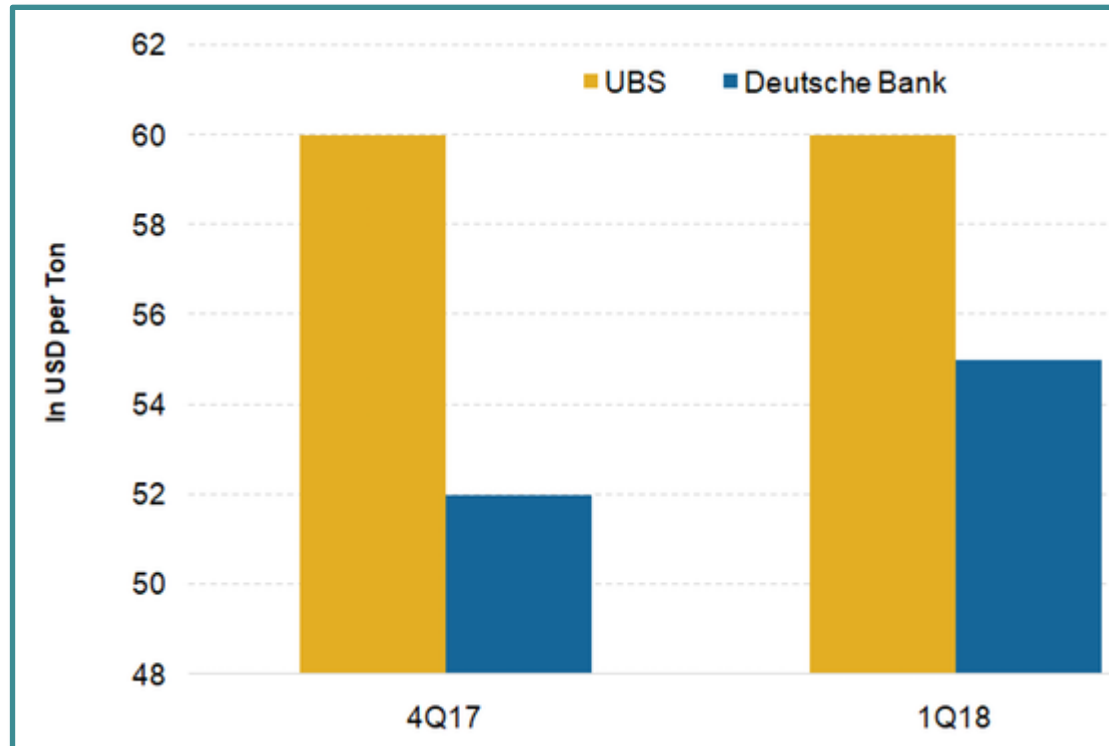
Source: SteelontheNet.com, October 2017

# Iron Ore Prices: 1-Yr Rollercoaster, 2017



Source: Market Realist, November 2017

# Forecast: Iron Ore Prices, 1Q'18



Source: Market Realist, November 2017

# Trade in Ferrous Scrap, 2015-2016

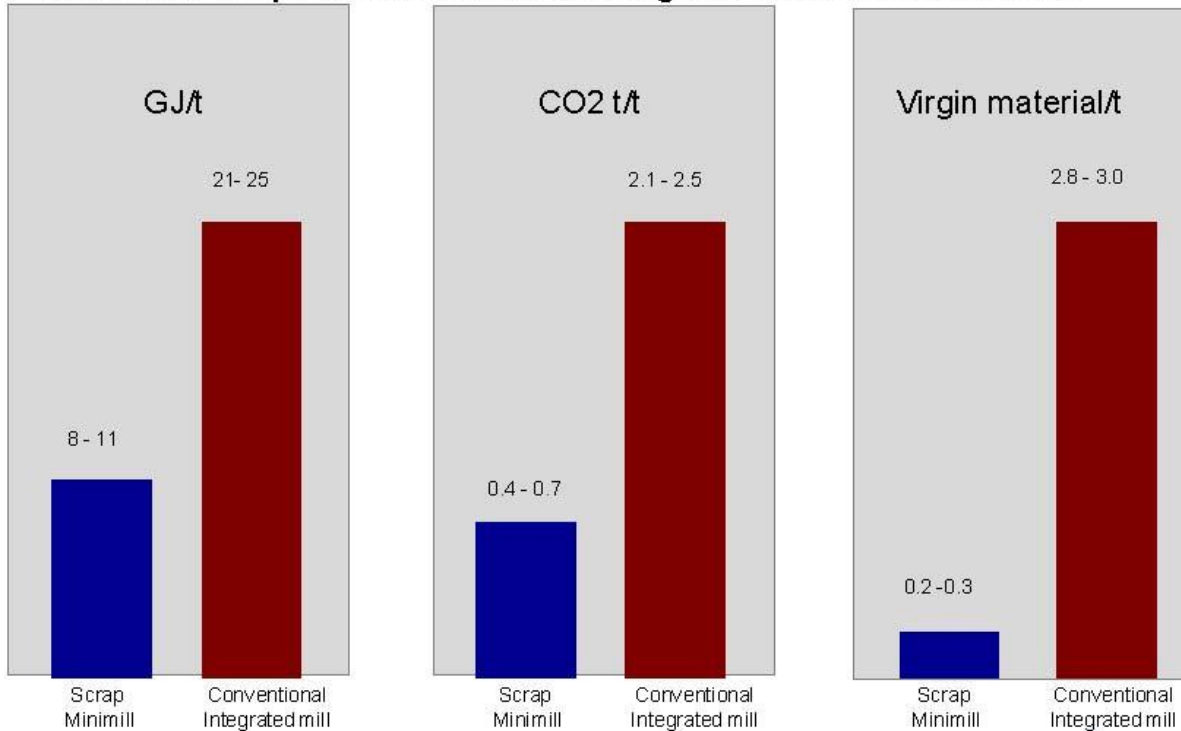
	Exports		Imports	
	2015	2016	2015	2016
Europe	40.1	43.7	29.1	28.9
Other Europe	1.6	1.7	18.5	18.6
CIS	7.1	5.9	2.3	0.6
N America	16.8	17.3	6.5	7.6
<b>US</b>	<b>13.0</b>	<b>13.2</b>	<b>3.5</b>	<b>3.9</b>
Canada	3.4	3.6	1.5	1.8
Mexico	0.5	0.4	1.5	1.9
S America	1.8	1.5	0.7	0.6
Africa	2.0	1.3	1.6	1.3
Middle East	1.5	1.5	0.6	0.7
Asia	9.6	10.8	26.5	27.9
<b>China</b>	<b>0.0</b>	<b>0.0</b>	<b>2.3</b>	<b>2.2</b>
Oceania	2.3	2.2	0.0	0.1
World	82.8	85.9	85.8	86.3

Source: SteelontheNet.com, October 2017; in million tonnes

# Scrap Has Several Advantages

The environmental advantages of scrap recycling over traditional BF/BOF smelting are important

Environmental comparison of minimills and integrated mills in OECD countries\*



Source: Laplace Conseil

# BOF Steelmaking Costs, 2017

Item	unit	factor	unit price (\$)	Costs (\$ per tonne)		
				Fixed	Variable	Total
Iron ore	tonne	1.557	60.31	0.00	93.90	93.90
Iron ore transport	tonne	1.557	8.25	0.00	12.85	12.85
Coal	tonne	0.879	232.89	0.00	204.71	204.71
Coal transport	tonne	0.879	6.06	0.00	5.33	5.33
Steel scrap	tonne	0.150	240.10	0.00	36.02	36.02
Steel scrap delivery	tonne	0.150	5.00	0.00	0.75	0.75
Industrial gases	cubic m	233	0.10	0.00	22.43	22.43
Ferroalloys	tonne	0.006	1986	0.00	11.92	11.92
Fluxes etc	tonne	0.533	44.99	0.00	23.98	23.98
Refractories	tonne	0.007	685	0.00	4.87	4.87
Other costs	unit	1	21.59	5.40	16.19	21.59
By-product credits	unit	1	-10.18	0.00	-10.18	-10.18
Thermal energy, net	GJ	-7.623	6.72	0.00	-51.25	-51.25
Electricity	MWh	0.130	102.50	2.00	11.33	13.33
Labour	hours	0.516	33.26	4.29	12.87	17.16
Capital charges	unit	1	59.48	59.48	0.00	59.48
Total				71.17	395.71	466.88

Source: SteelontheNet.com, October 2017

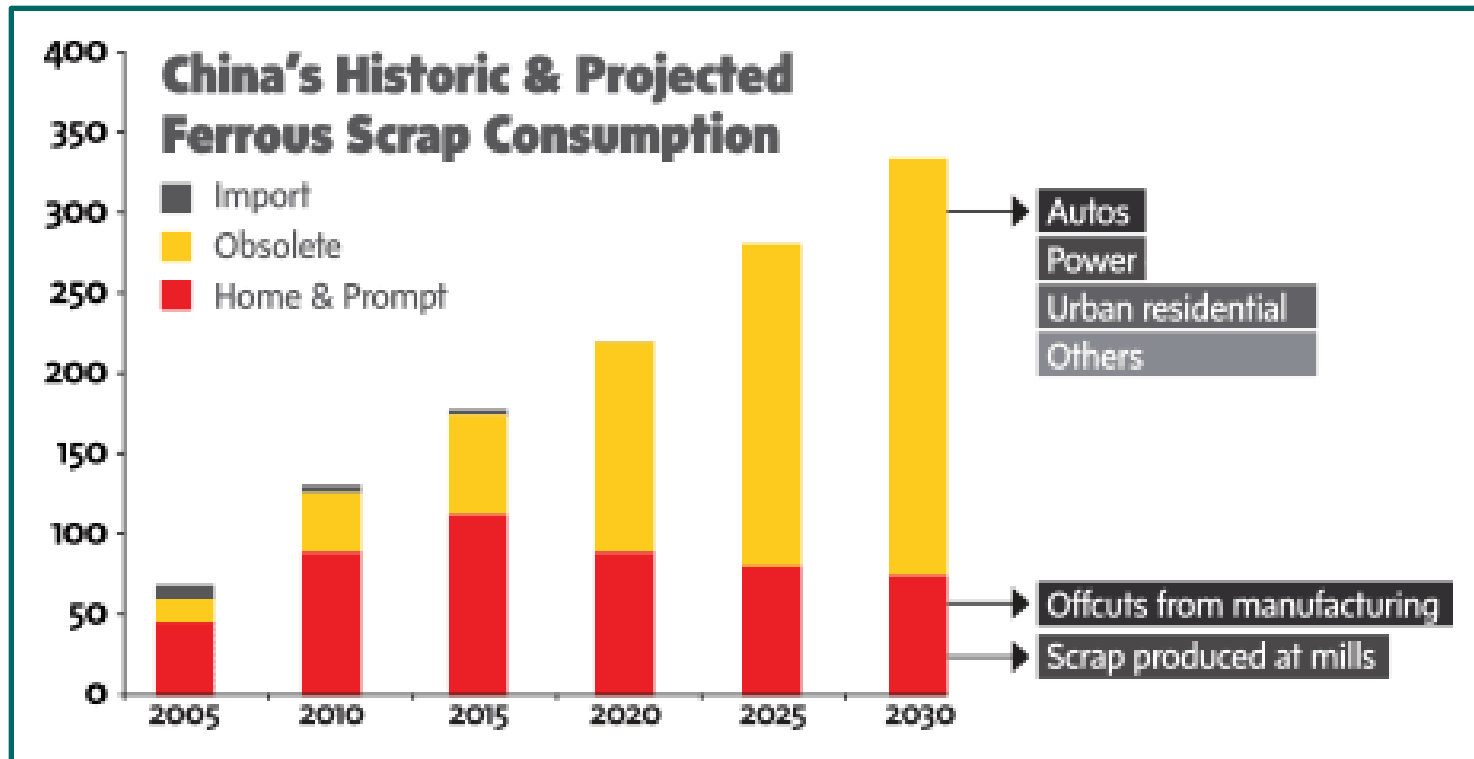


# 

Item	unit	factor	unit price (\$)	Costs (\$ per tonne)		
				Fixed	Variable	Total
Steel scrap	tonne	1.113	240.10	0.00	267.14	267.14
Steel scrap transport	tonne	1.113	5.00	0.00	5.56	5.56
Pig iron/DRI	tonne	0.000	303.44	0.00	0.00	0.00
Pig iron/DRI transport	tonne	0.000	14.00	0.00	0.00	0.00
Industrial gases	cubic m	16	0.09615	0.00	1.55	1.55
Ferroalloys	tonne	0.009	1986	0.00	17.87	17.87
Fluxes etc	tonne	0.031	123.30	0.00	3.82	3.82
Electrodes	tonne	0.007	6206	0.00	43.22	43.22
Refractories	tonne	0.012	685	0.00	8.47	8.47
Other costs	unit	1	10.41	2.60	7.81	10.41
Thermal energy	GJ	-0.425	6.72	0.00	-2.86	-2.86
Electricity	MWh	0.445	102.50	6.84	38.77	45.61
Labour	hours	0.364	33.26	3.03	9.09	12.11
Capital charges	unit	1	29.43	29.43	0.00	29.43
Total				41.90	400.45	442.35

Source: SteelontheNet.com, October 2017

# Chinese Steel Scrap, 2005-2030f



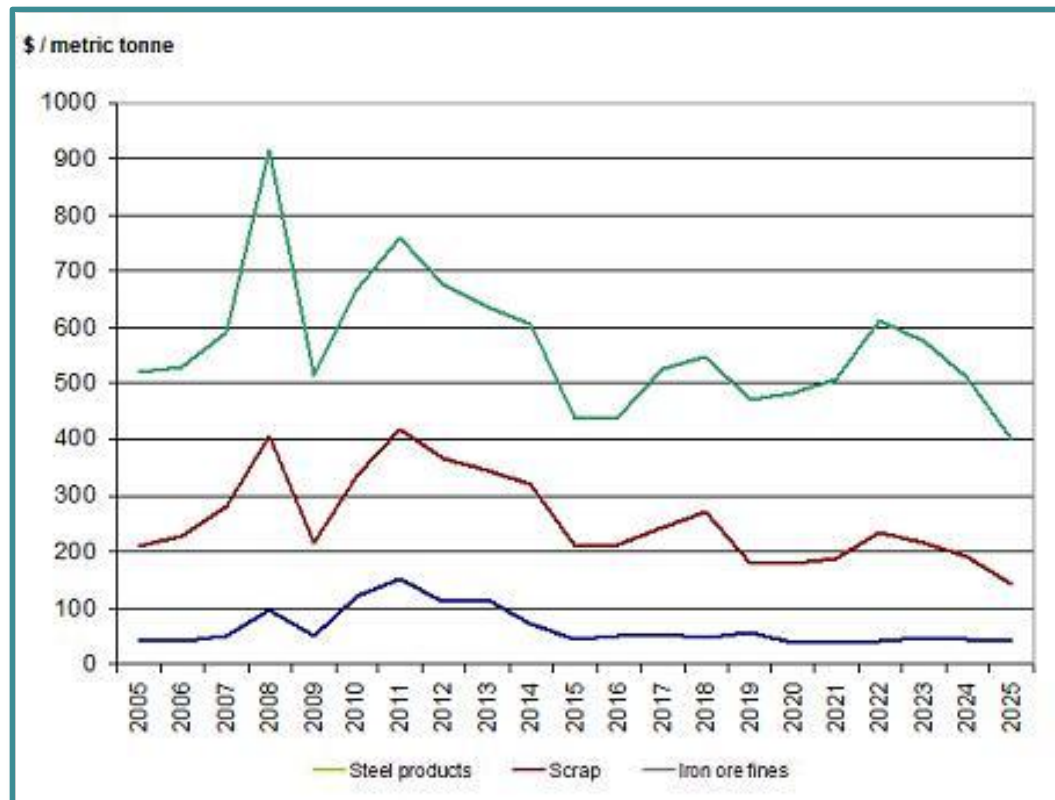
Source: Recycling Today, October 2016

# Chinese Steel Scrap, 2005-2017



Source: Recycling Today, October 2017

# Steel, Scrap & Iron Ore Prices, 2006-2025f



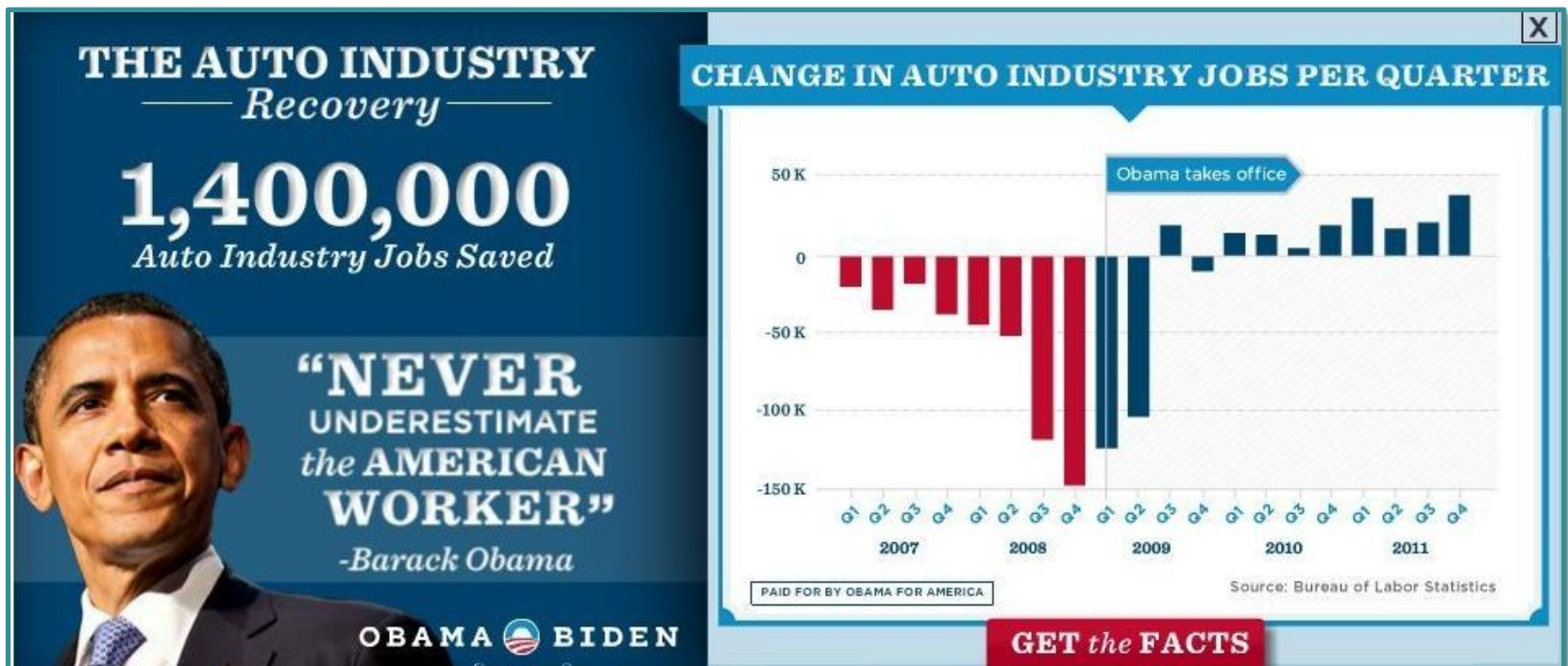
Source: Market Realist, November 2017

# Coal vs Natural Gas Prices, 2011-2016

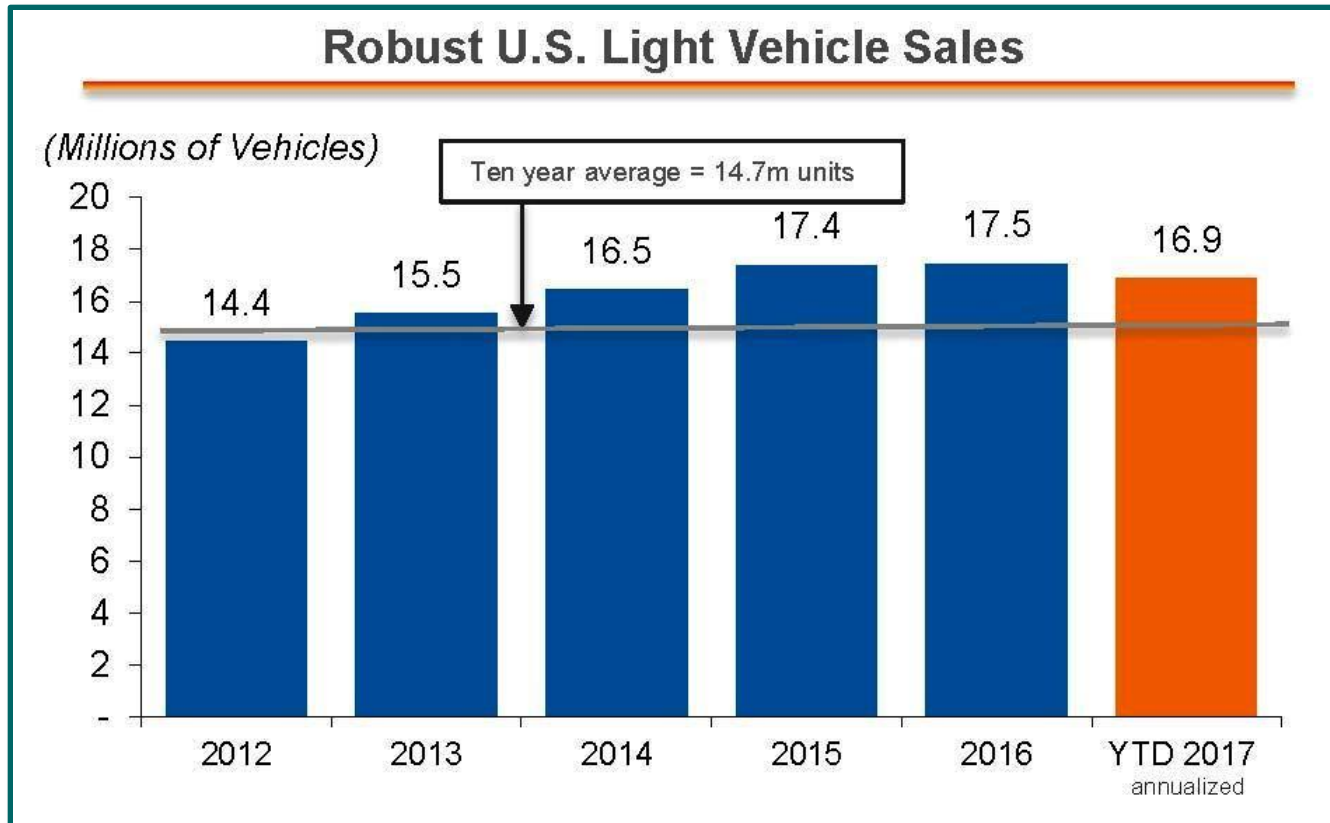


Source: Market Realist, July 2016

# AUTO INDUSTRY



# U.S Auto Sales



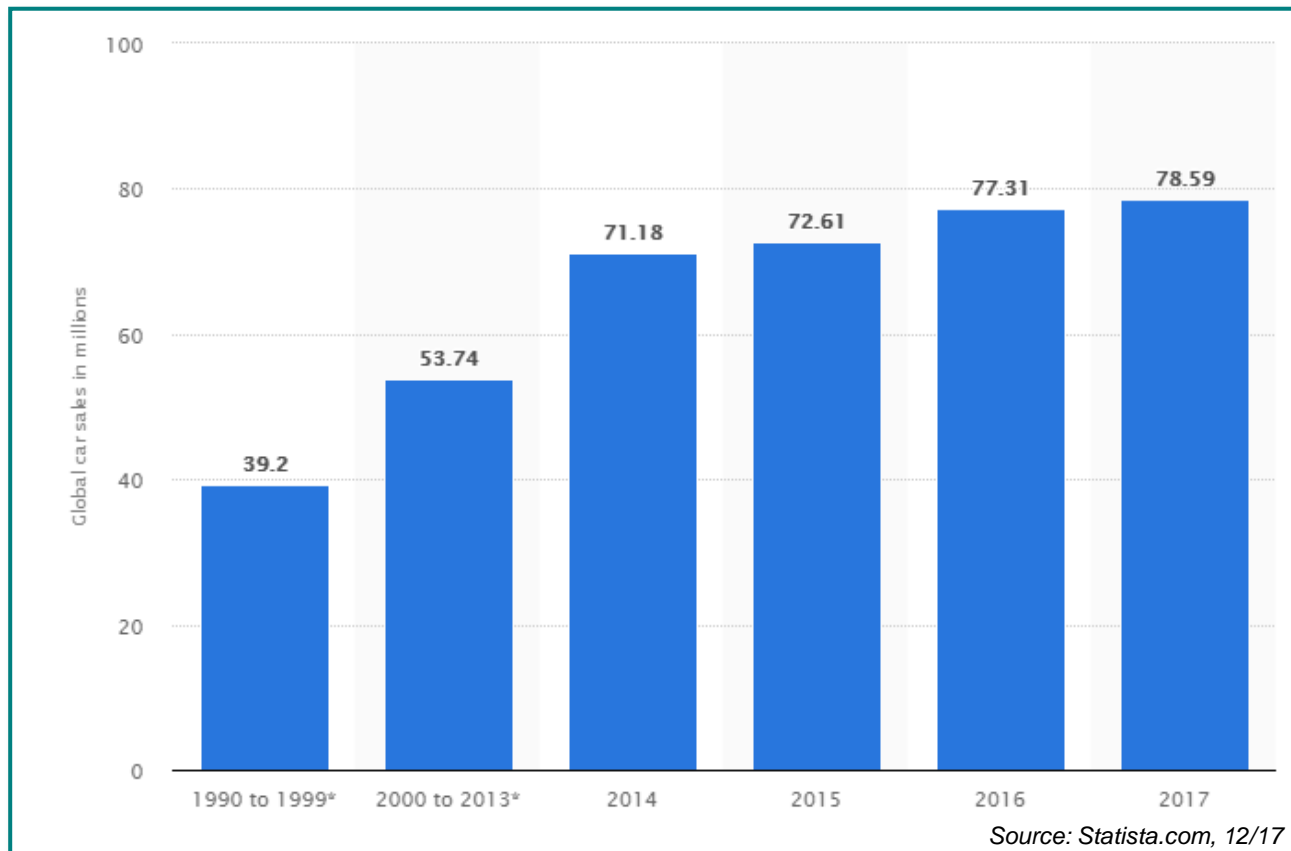
Source: Universal Stainless, December 2017

# Auto & LT Vehicle Sales Recovery

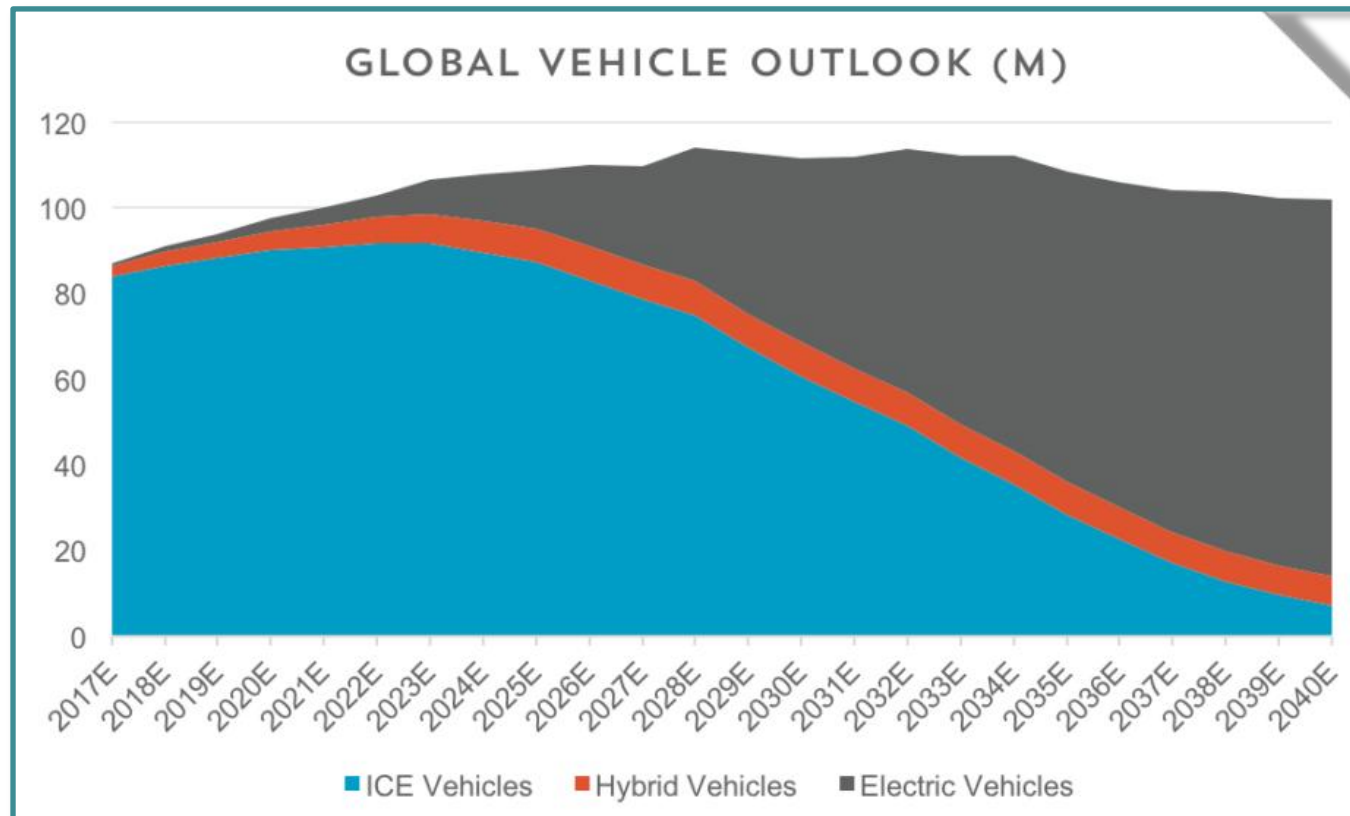




# World Auto Production, 1990-2017

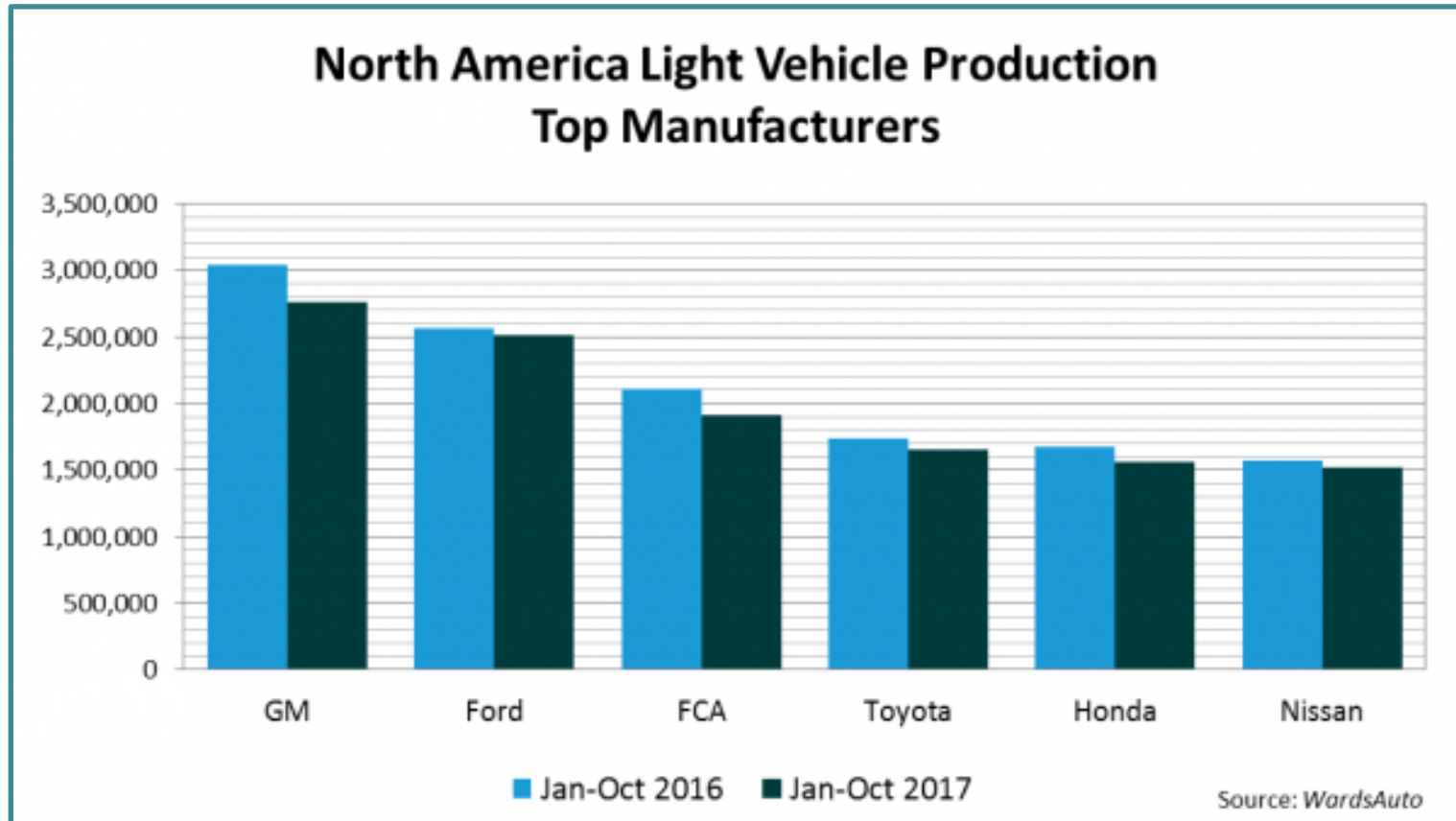


# World Automaking Forecast, '17e-'40e



Source: Loup Ventures, Bloomberg, October 2017

# NA Auto Production, 2016-2017

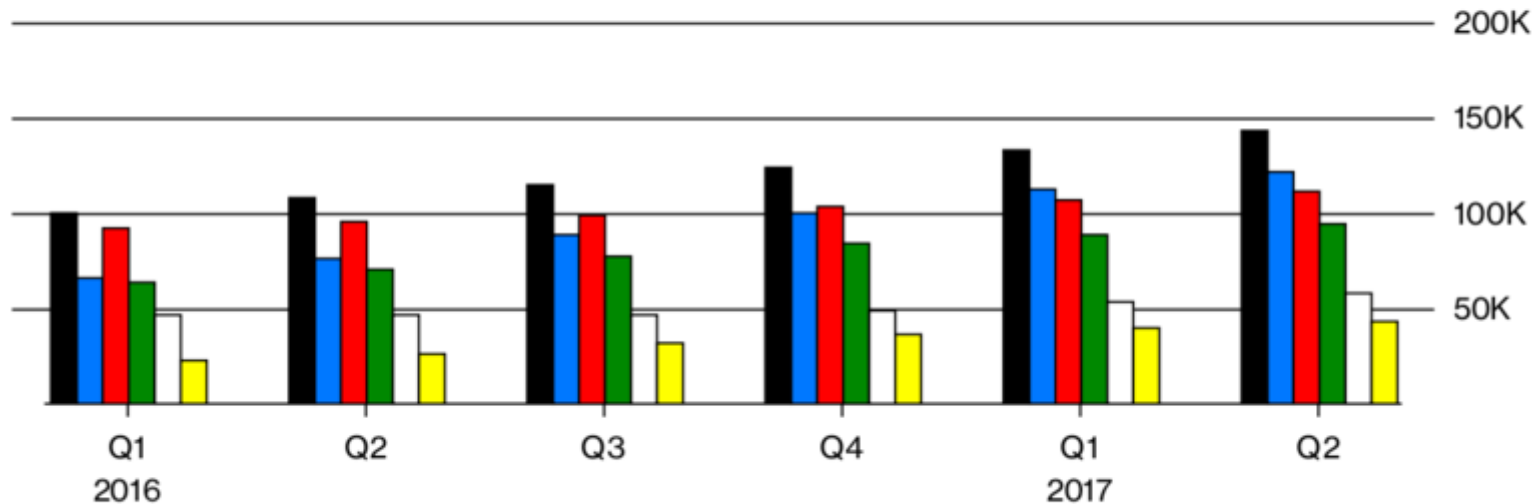


# EV's: The Wave of the Future?

## Approaching the Phaseout

U.S. buyers of the first 200,000 EVs sold by each automaker receive full federal credit

■ GM ■ Tesla ■ Nissan ■ Ford ■ Toyota ■ BMW

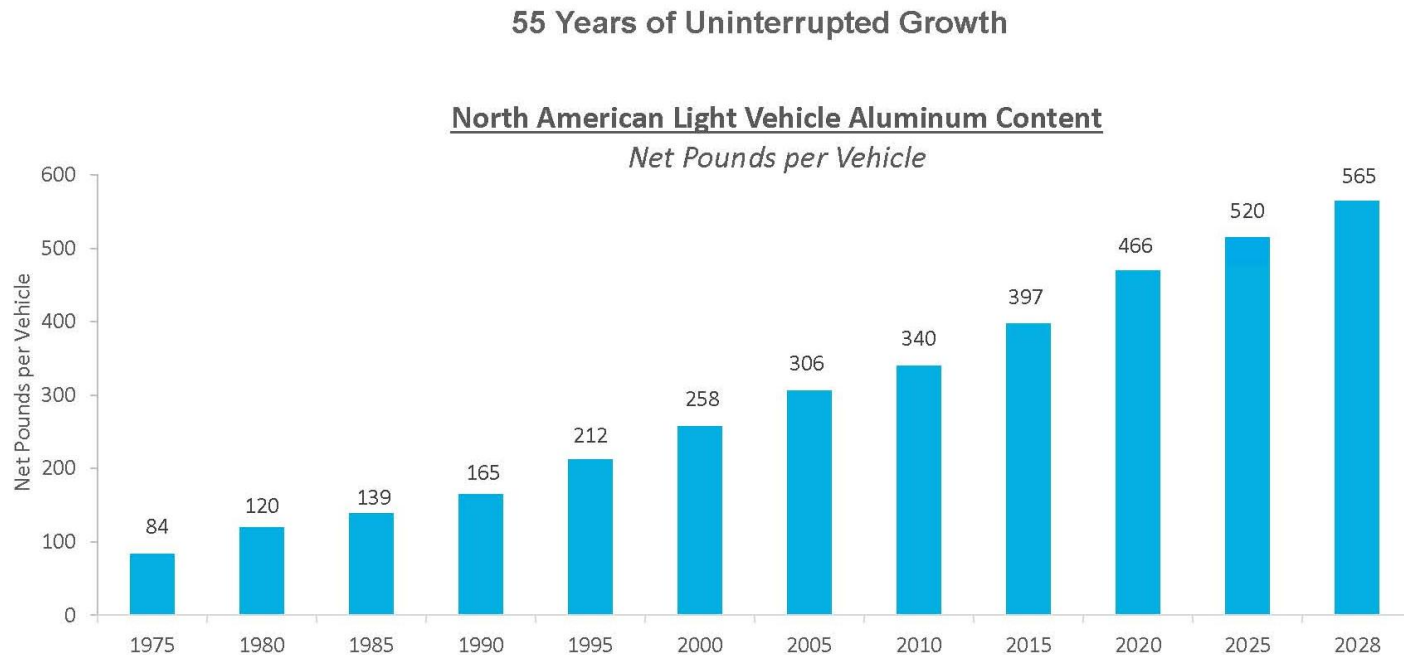


Note: Figures are for cumulative sales qualifying for federal tax credits

Source: Edmunds

# Aluminum's Growth in Automaking

Under all the mass reduction scenarios, aluminum content in North American light vehicles will continue to show uninterrupted growth well into the next decade.

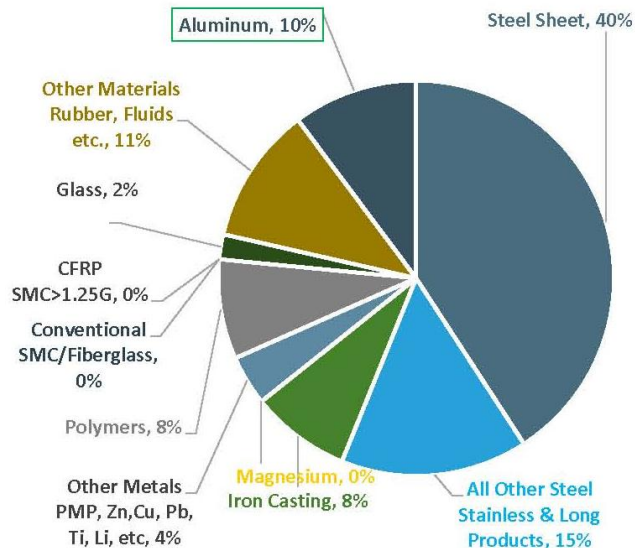


Source: Ducker, July 2017

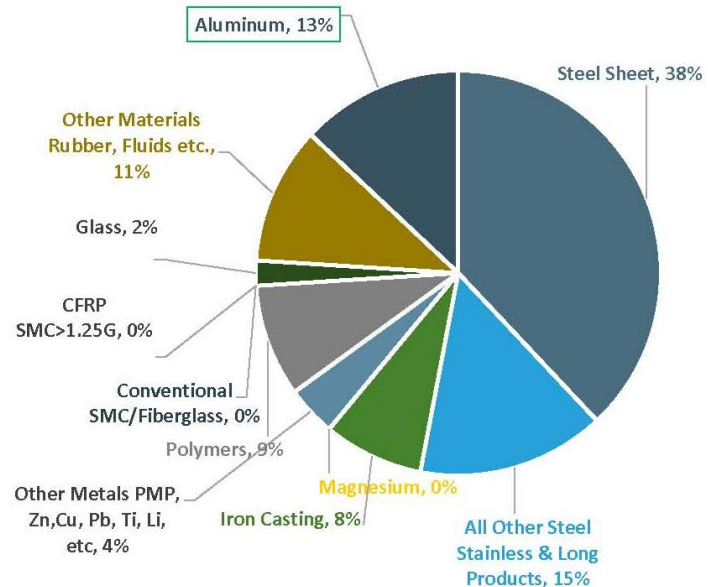
# Aluminum Will Grow to 13% by 2020...

Light Vehicle Material Mix shows aluminum will grow to 13% of total weight by 2020, and the mass savings will be 100 pounds with over 50% attributable to aluminum substitution for steel.

2015 CURB WEIGHT 3835 LBS



2020 CURB WEIGHT 3735 LBS



Source: Ducker, July 2017

# Aluminum Will Grow to 16% by 2025

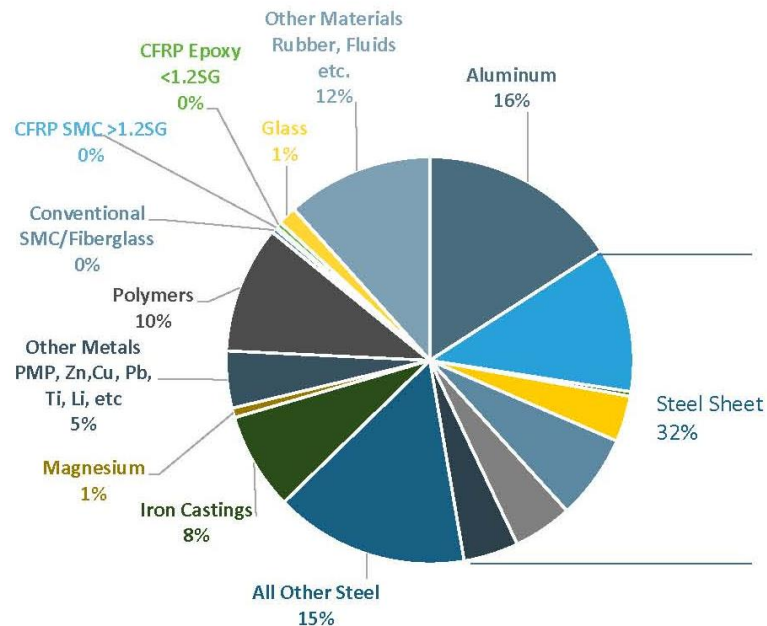
This mix reduces 2015 vehicle weight by 270 pounds or 7% by 2025. The empirical evidence from Ducker's research supports achieving the 270 pound curb weight reduction; however, only by 2028.

## Highlights:

- 565 total aluminum pounds (16% of total vehicle weight)
- Over 550 pounds per vehicle of flat rolled AHSS/UHSS steel content, but only 46% steel overall
- Twenty one pounds for CFRP Epoxy and SMC composites
- Twenty seven pounds of magnesium
- Polycarbonate windows, and fiberglass/composite leaf springs were applied where appropriate
- Aluminum hood penetration of 90% with door penetration near 60%

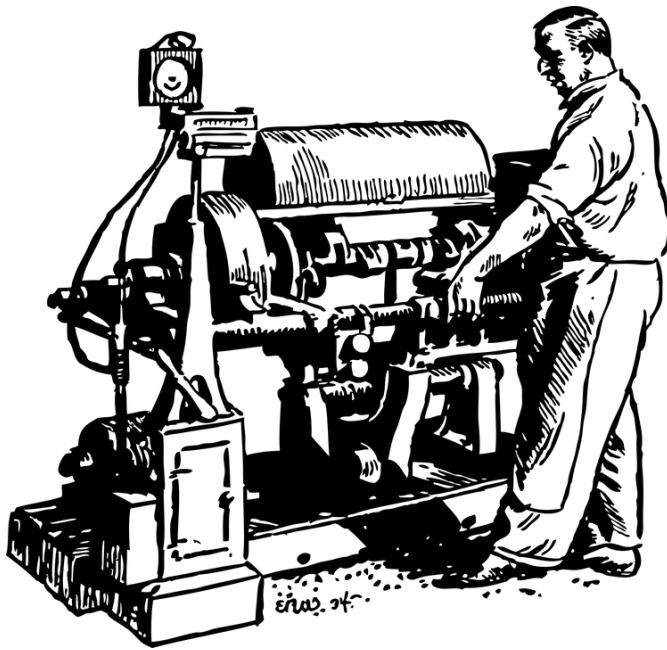
Source: Ducker, July 2017

## 2025 CURB WEIGHT 3565 LBS.





# INCOME INEQUALITY



# *The Rich are Getting Richer...*

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The **richest 1%** now owns more than half of all the world's household wealth. Credit Suisse recently said *"The outlook for the millionaire segment is more optimistic than for the bottom of the wealth pyramid."*

Research showed that there are increasing numbers of millionaires. This is partly because the strength of the euro has created 620,000 more of them in Germany, France, Italy and Spain (conversely, depreciating currencies in the U.K. and Japan have seen 34,000 and over 300,000 millionaires in those countries, respectively, lose the status).

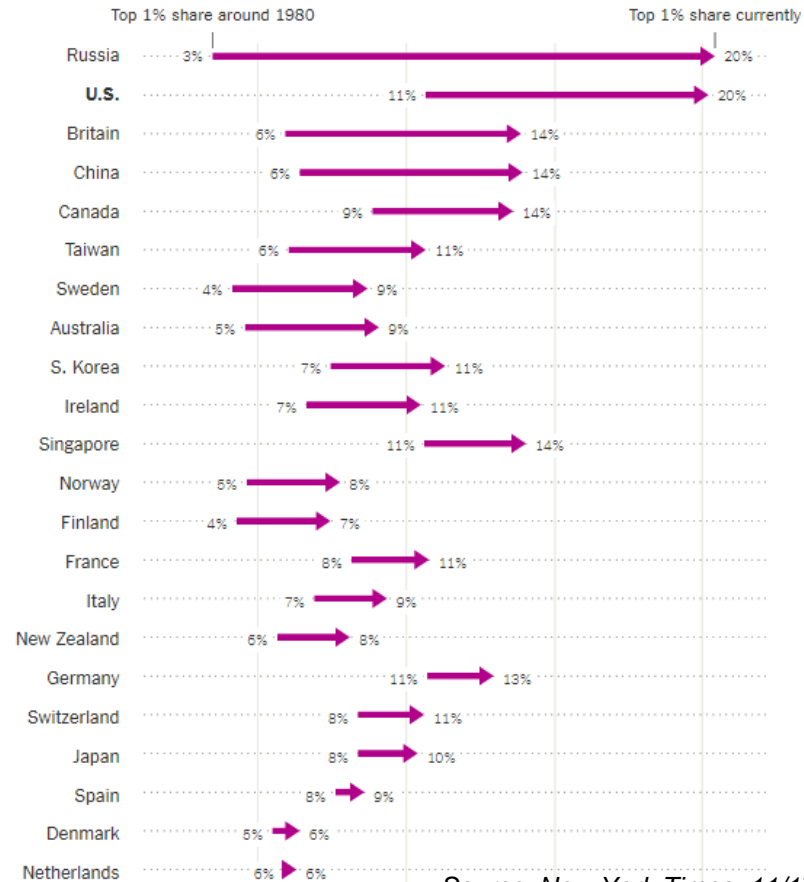
-- *Fortune*, November 2017

# *Fall of Labor, Rise of Income Inequality*



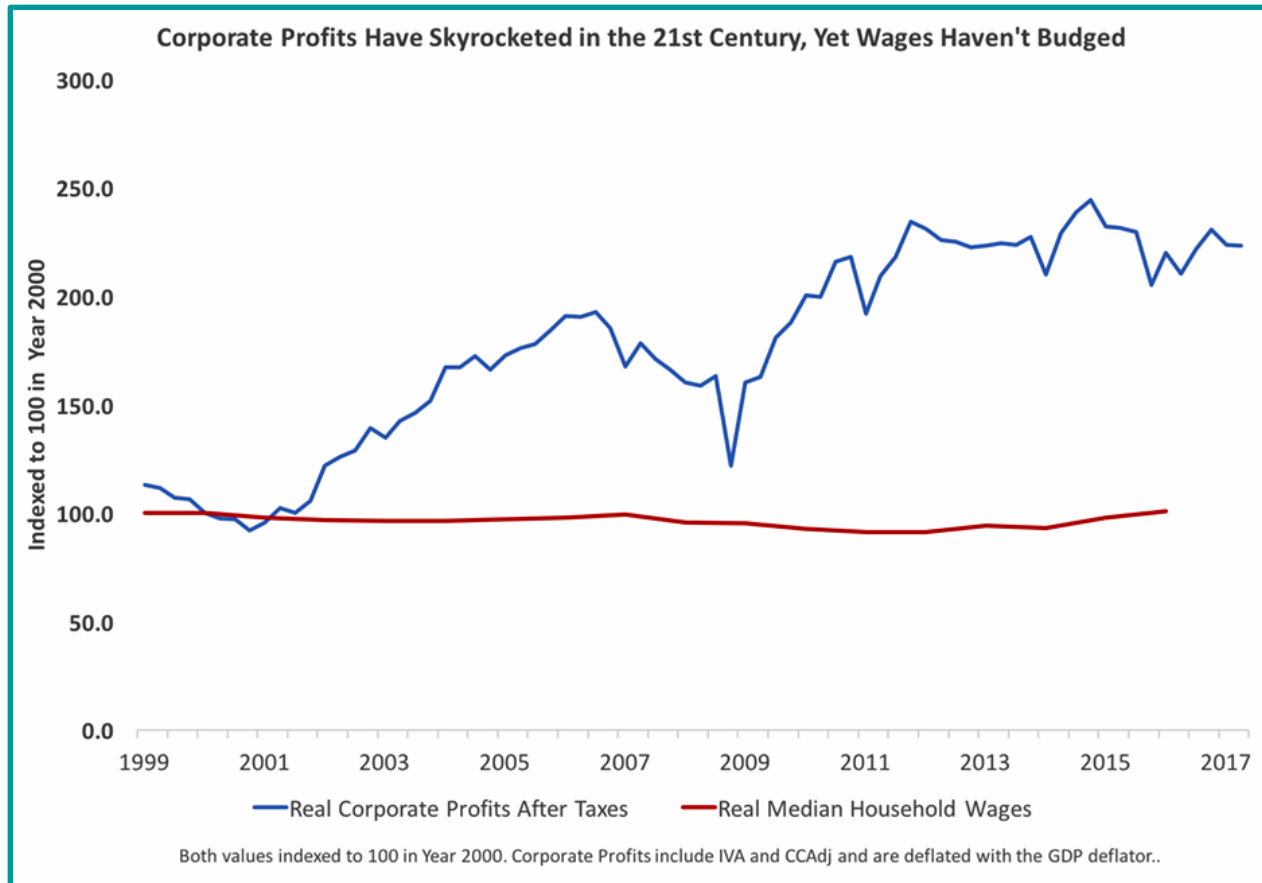
# Where the 1% Have Gained the Most

No other O.E.C.D. nation is as unequal as the U.S., and none have experienced such a sharp rise in the 1 percent's share of national income. (Russia is not a member of the O.E.C.D.)



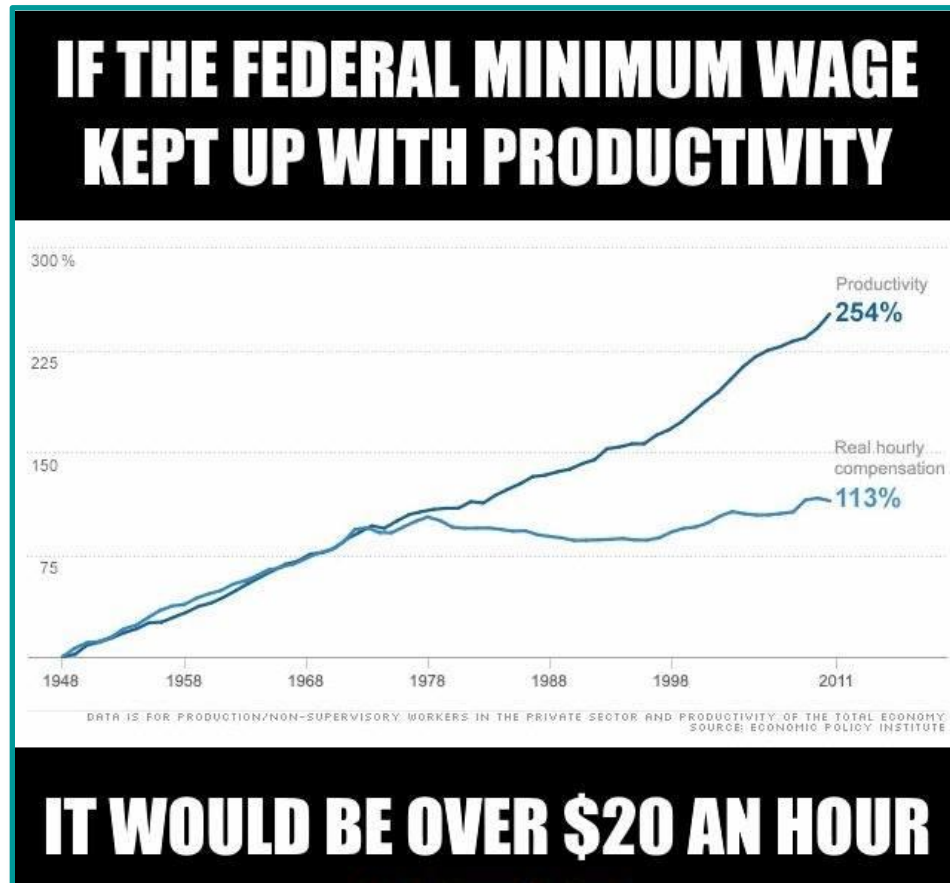
Source: New York Times, 11/17/17

# Corporate Profits vs Wages, 1999-2017



Source: *The Institute on Taxation and Economic Policy*

# Fed Minimum Wage vs Productivity



Source: *The Institute on Taxation and Economic Policy*

# Does Apple Need a Tax Break?



Source: MarketWarch.com, October 2017

# Does GE Deserve a Tax Break?



Source: MarketWatch.com, October 2017



# ***The Rise of the Robots***

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In the 1st quarter of '17, N.A. manufacturers spent \$516 million on **industrial robots**, a 32 percent jump from the same period a year earlier. A study published by the Brookings Institution shows many of them are ending up in steel and auto manufacturing centers such as Indiana, Michigan and Ohio. According to the report, there are **9 industrial robots for every 1,000 workers** in Toledo and Detroit -- *three times* the figure for 2010. -- *Bloomberg Businessweek*, October 23, 2017.

# **Locker Associates: Client Services**

Serving unions on business issues, campaigns and education

## **Over 35 years of experience**

- 245 U.S. and Canadian engagements focused on steel & other metals, as well as manufacturing, construction and distribution
- Major union clients: USW, UAW, CWA, IBT, IAM, Unite-HERE, Boilermakers, IUE, Ironworkers, NYC Building Trades, independent steel locals and others
- Emphasis on reorganizations requiring operating improvements
  - Joint labor-management efforts to enhance performance
  - Identify & negotiate with union-friendly buyers for distressed companies
  - Evaluate company business & market plans, as well as cap ex
  - Economic and industry analysis for contract negotiations
- Extensive experience protecting union interests in bankruptcies
- Experts on organizing and directing corporate campaigns