

World Steel Dynamics (WSD) is a leading steel information service in Englewood Cliffs, N.J. WSD's steel experience, steel database and availability of steel statistics are the principles for performing steel forecasts, studies and analysis for international clients. WSD seeks to understand how the "pricing power" of steel companies the world over will be impacted by changes in the steel industry's structure.



WORLD
STEEL
DYNAMICS

Q: Given the Chinese government's recent efforts to reduce the rate of economic expansion, what is WSD's outlook for Chinese steel consumption in the near term (the second half of 2011 through 2012), and what is WSD's longer-term view on Chinese steel consumption?

A. China's steel demand growth seems likely to be perhaps at least 3% per annum beyond 2011–2012 because: (a) China's real GDP growth in the period to 2020 is likely to be, on average, at least 7% per annum; and (b) because gross fixed capital formation (GFCF) is currently such a high share of GDP (about 50%) that even if it declines to 40% of GDP in 2020 versus 49% in 2010, it will still be growing about 4.7% per year. Fixed asset investment growth is the key to Chinese steel demand growth because it's about 10 times more steel-intensive than is housing spending in the country.

The 2010 apparent steel demand (on a crude steel equivalent basis) in China was 603 million tonnes versus 90 million tonnes in the U.S. — or 6.7 times the U.S. figure. Looking ahead to 2020, if steel demand grows 3.7% per year, compounded, in China (the midpoint figure assuming 7.0% per annum growth of real GDP) and 2.0% per year in the U.S., the multiplier rises to 8.0 times; i.e., apparent steel consumption at 815 million tonnes in China and 110 million tonnes in the United States.

In the accompanying exhibits on the next page (Tables 1 and 2), WSD selects three growth rates for real GDP from 2010 to 2020, which are 5.5%, 7.0% and 8.5% per year, compounded. Then, assumptions are made about: (a) the ratio of GFCF and household consumption to GDP, and (b) apparent steel consumption per unit of GFCF and household consumption. Even though the growth of GFCF is well below that of the economy (4.7% per year to 2020), and apparent consumption per unit of gross fixed capital spending (and per unit of GDP) declines, the sizable underlying growth of the economy still results in a fair rise in apparent steel demand.

(Note: The foundation of this analysis is WSD's belief — as put forth previously in the Global Income Shift Paradigm theory — that fixed asset investment, not population size or growth, is the principal driver of steel demand. Steel consumption per capita is largely a function of the steel consumption tied to gross fixed capital formation divided by the number of people in the country.)

As indicated in Table 1, for China in 2010, it can be estimated that 93.4% of apparent steel consumption was tied to adjusted fixed asset investment (i.e., GFCF) in the country. For the U.S., the figure is 75.6%. For China in 2020, in the midpoint case, 89.4% of Chinese steel consumption is tied to GFCF.

- GFCF in China in 2010 amounted to 48.7% of GDP. By 2020, even if GFCF declines to 39.8% of GDP, but GDP rises 7.0% per year, GFCF still rises 5.0% per year, compounded.
- Steel demand in China from 2010 to 2020 would rise 5.0% per year if there were no decline in steel intensity (apparent steel consumption per trillion dollars of gross fixed capital formation or GDP). If steel intensity per trillion dollars of GFCF drops from 195 million tonnes in 2010 to 165 million tonnes in 2020 (the "most likely" assumption), which is a decline of 1.7% per year, compounded, apparent steel consumption still rises 3.2% per year.



- *Peter F. Marcus*, managing partner, World Steel Dynamics, pmarcus@worldsteeldynamics.com, +1.201.503.0902
- *Phil Englin*, manager — special projects, World Steel Dynamics, penglin@worldsteeldynamics.com, +1.201.503.0908

To submit your questions for WSD, email WSD@aist.org.

Please include your full name, company name, mailing address and email in all correspondence.

Table 1**China Versus United States in 2010: Economic Indices Versus Apparent Steel Consumption**

	China					United States					Ratio: China/USA	
	US\$bil.	% of GDP	ASC	% of ASC	ASC/GDP mt/US\$bil.	US\$bil.	% of GDP	ASC	% of ASC	ASC/GDP mt/US\$bil.	GFCF	ASC
Gross fixed capital formation	2,877	48.7%	563	93.4%	0.196	1,756	12.0%	68	75.6%	0.039	1.64	8.28
Non-residential	2,049	34.6%	413	68.5%	0.202	1,366	9.3%	51	56.7%	0.037	1.50	8.10
Commercial and health care	23	0.4%	3	0.5%	0.128	92.8	0.6%	4	4.4%	0.043	0.25	0.75
Industrial equipment	286	4.8%	90	14.9%	0.315	160.7	1.1%	3	3.3%	0.019	1.78	30.00
Information processing	28	0.5%	3	0.5%	0.105	600.1	4.1%	1	1.1%	0.002	0.05	3.00
Manufacturing	888	15.0%	175	29.0%	0.197	41.8	0.3%	16	17.8%	0.383	21.25	10.94
Mining exploration, shafts and wells	115	1.9%	23	3.8%	0.200	105.8	0.7%	4	4.4%	0.038	1.09	5.75
Power and communication	153	2.6%	26	4.3%	0.170	84.1	0.6%	7	7.8%	0.083	1.82	3.71
Transportation	332	5.6%	71	11.8%	0.214	113	0.8%	11	12.2%	0.097	2.93	6.45
Other equipment	223	3.8%	22	3.6%	0.099	167.2	1.1%	5	5.6%	0.030	1.34	4.40
Residential	829	14.0%	150	24.9%	0.181	390	2.7%	17	18.9%	0.044	2.12	8.82
Housing (all but social)	652	11.0%	120	19.9%	0.184	126.6	0.9%	12	13.3%	0.095	5.15	10.00
Social housing	34	0.6%	5	0.8%	0.147	—	—	—	—	—	—	—
Other structures	143	2.4%	25	4.1%	0.175	263.8	1.8%	5	5.6%	0.019	0.54	5.00
Household consumption	2,158	36.5%	38	6.3%	0.018	10,350	70.6%	24	26.7%	0.002	0.21	1.58
Auto and parts	300	5.1%	20	3.3%	0.067	343	2.3%	18	20.0%	0.052	0.87	1.11
Appliance and furnishings	94	1.6%	12	2.0%	0.128	260	1.8%	3	3.3%	0.012	0.36	4.00
Others	1,764	29.8%	6	1.0%	0.003	9,747	66.5%	3	3.3%	0.000	0.18	2.00
Government consumption	693	11.7%	1	0.2%	0.001	3,005	20.5%	1	1.1%	0.000	0.23	1.00
Net export	186	3.1%	1	0.2%	0.005	-452	-3.1%	-2	-2.2%	0.004	-0.41	-0.50
Total GDP or ASC	5,914	100.0%	603	100.0%	0.102	14,660	100.0%	91	101.1%	0.006	0.40	6.63
Population (million persons)	1,341					311					4.31	
Total rebar consumption (million t)	115					6					19.17	
GDP per capita (US\$/person)	4,410					47,138					0.09	
ASC per capita (kg/person)	450					293					1.54	
Rebar consumption per capita (kg/person)	86					19					4.45	

* Detailed Chinese GFCF figures are based on fixed asset income figures reduced by 30% to make them comparable with reported GFCF as a share of GDP.

Source: WSD estimates, preliminary

Table 2**Chinese Apparent Steel Demand in 2020 (million tonnes)**

		Steel intensity per unit GDP				
		High	Mid-high	Mid	Low	
ASC/GFCF		195 kg	185 kg	165 kg	145 kg	
ASC/GDP		102 kg	89 kg	74 kg	60 kg	
GDP growth 2010–2020 CAGR	Odds	12%	18%	44%	26%	
Low – 5.5%	20%	ASC	1,056	927	767	624
		CAGR to 2020	5.8%	4.4%	2.4%	0.3%
		Odds	2%	3%	7%	8%
Mid – 7.0%	50%	ASC	1,199	1,053	871	709
		CAGR to 2020	7.1%	5.7%	3.7%	1.6%
		Odds	5%	5%	30%	10%
High – 8.5%	30%	ASC	1,359	1,194	987	804
		CAGR to 2020	8.5%	7.1%	5.1%	2.9%
		Odds	5%	10%	7%	8%