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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. The views and opinions expressed in this article are solely those of World Steel Dynamics and not necessarily those of AIST.



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Global Steel Production in 2050: Not Much Change

WSD's forecast for "possible" global steel production in 2050 is about 1.887 billion metric tons; or, up 14 million metric tons from the 1.873 billion metric tons produced in 2019. Chinese output falls 19.7% to 800 million metric tons from 996 million metric tons in 2019; Advanced Country output in 2050 declines 5.0% to 435 million metric tons from 458 million metric tons; and the Rest of World (ROW) output rises 55.6% to 652 million metric tons from 419 million metric tons. The highest growth is for ROW at 1.4% per year compounded over the 31 years.

- The only Advanced Country with a rise in production is South Korea because North Korea is included in the total — with total Korean output in 2050 at 90 million metric tons versus 73 million metric tons in 2019. Once there is a merging of the two economies, WSD expects a massive gain in steel demand in North Korea. Similar to Vietnam, South Korea, Japan, Taiwan, Indonesia and China, North Korea has deepwater ports on its east and west coasts that would be a great location for a new mega-sized steel plant.
- In the ROW, the largest gain in steel output takes place in India, with estimated output in 2050 at 250 million metric tons versus 110 million metric tons in 2019. Yet, WSD's Indian forecast is at least 125 million metric tons below the expectation of many pundits in India and elsewhere.

- In China, although output declines to 800 million metric tons in 2050 versus 996 million metric tons in 2019, electric furnace steelmaking output rises to 200 million metric tons versus 107 million metric tons in 2019.

Global basic oxygen furnace steel production in 2050 is forecast at 1.124 billion metric tons, down 17% from 1.355 billion metric tons in 2019. Advanced Country output falls 28.7% to 194 million metric tons from 273 million metric tons; Chinese output plummets 32.5% to 600 million metric tons from 889 million metric tons; and ROW rises 59.0% to 307 million metric tons from 193 million metric tons.

Global electric arc furnace steel production in 2050 is forecast at 763 million metric tons, up 47.3% from 518 million metric tons. Advanced Country output rises 29.6% to 241 million metric tons from 186 million metric tons; Chinese output surges 87% to 200 million metric tons from 107 million metric tons; and ROW output increases 43% to 322 million metric tons from 225 million metric tons.

Obsolete steel scrap generation will surge by 2050 since the global reservoir of this scrap, which is 10–40 years old, will have more than doubled to about 32 billion metric tons from 14.4 billion metric tons in 2019. If we divide these figures by 31 to take into account the 10- to 40-year-old age of the reservoir, obsolete steel scrap generation in 2050 is more than 500 million metric tons higher per annum than in 2019.

Table 1

World Steel Dynamics' Preliminary Crude Steel, BOF, EAF and DRI Forecast 2050 (million metric tons)

	2019						2050e						Change from 2019		
	Year	BOF	EAF	DRI	BOF %	EAF %	Year	BOF	EAF	DRI	BOF %	EAF %	BOF	EAF	DRI
Advanced Countries	458	273	186	5.0	59.0	41.0	435	194	241	37.0	45.0	55.0	(79.0)	55.0	32.0
Japan	100.0	76.0	24.0	0	76.0	24.0	85.0	50.0	35.0	3.0	58.8	41.2	(26.0)	11.0	3.0
South Korea	73.0	49.0	24.0	0	67.1	32.9	90.0	50.0	40.0	6.0	55.6	44.4	1.0	16.0	6.0
Western Europe	133.0	80.0	53.0	0.5	60.2	39.8	120.0	50.0	70.0	15.0	41.7	58.3	(30.0)	17.0	14.5
United States	87.0	27.0	60.0	3.2	31.0	69.0	80.0	20.0	60.0	10.0	25.0	75.0	(7.0)	0	6.8
Small Cap. Adv.	65.0	40.5	24.5	1.4	62.3	37.7	60.0	24.0	36.0	3.0	40.0	60.0	(16.5)	11.5	1.6
China*	996	889	107	0	890	11.0	800	600	200	100	75.0	25.0	(289)	93.0	100
Rest of the World	419	194	225	103	46.0	54.0	652	330	322	135	51.0	49.0	137	97.0	32.0
Africa	4.0	1.6	2.4	0.7	40.0	60.0	11.0	3.0	8.0	10.0	27.3	72.7	1.4	5.6	9.3
Brazil	32.8	25.6	7.2	0	78.0	22.0	41.0	28.0	13.0	3.0	68.3	31.7	2.4	5.8	3.0
CIS	98.0	66.0	32.0	8.0	67.3	32.7	115.0	65.0	50.0	17.0	56.5	43.5	(1.0)	18.0	9.0
Eastern Europe	18.0	6.8	11.2	0	37.8	62.2	20.0	3.0	17.0	5.0	15.0	85.0	(3.8)	5.8	5.0
Developing Asia	36.3	13.8	22.5	0.6	38.0	62.0	75.0	30.0	45.0	7.0	40.0	60.0	16.2	22.5	6.4
India	110.0	49.0	61.0	33.7	44.5	55.5	250.0	170.0	80.0	20.0	68.0	32.0	121.0	19.0	(13.7)
Latin America	37.5	16.5	21.0	9.8	44.0	56.0	40.0	15.0	25.0	10.0	37.5	62.5	(1.5)	4.0	0.2
MENA	48.3	2.4	45.9	50.1	5.0	95.0	55.0	3.0	52.0	60.0	5.5	94.5	0.6	6.1	9.9
Turkey	33.7	11.8	21.9	0	35.0	65.0	45.0	13.0	32.0	3.0	28.9	71.1	1.2	10.1	3.0
World Total	1,873	1,355	518	108	72.0	28.0	1,887	1,124	763	272	60.0	40.0	(231)	245	164
World Ex-China	877	466	411	108	53.0	47.0	1,087	524	563	172	48.0	52.0	58.0	152	64.0

*Includes WSD's estimates for induction furnace production. Source: WSD estimates, World Steel Association.

Direct reduced iron (DRI) output rises to about 272 million metric tons in 2050 versus 108 million metric tons in 2019. Granted that electrolyzers are able to produce hydrogen at low cost via electrolysis, because they have been designed to generate huge quantities of hydrogen using bargain-priced renewable electric power, more than 50% of the rise in DRI output is carbon free — because it's hydrogen based.

The 164-million-metric-ton-per-annum rise in DRI output by 2050 consists of 100 million metric tons in China, 32 million metric tons in the Advanced Countries and 32 million metric tons in the Rest of World.

This report includes forward-looking statements that are based on current expectations about future events and are subject to uncertainties and factors relating to operations and the business environment, all of which are difficult to predict. Although WSD believes that the expectations reflected in its forward-looking statements are reasonable, they can be affected by inaccurate assumptions made or by known or unknown risks and uncertainties, including, among other things, changes in prices, shifts in demand, variations in supply, movements in international currency, developments in technology, actions by governments and/or other factors. ◆