

# Is the Center of Steel Production Shifting Again?



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## An Overview of Global Steel Production

With applications in almost all major industries such as energy, construction, automotive & transportation, infrastructure, and more, steel is the second-largest industry in the world, generating over USD 900 billion in revenue every year, globally.

While world GDP peaked at 19x in the 20th century, steel production surged, growing by more than 30x during the same period. Since the beginning of the 21st century as well, while world GDP grew by nearly 2.2 times (till 2015), steel production kept pace and almost doubled during the same period.

Although global steel production has grown steadily over the past few decades, there has been a gradual but discernible shift in where the world's steel comes from, particularly over the past 15-20 years.

A combination of several factors has led to developing countries like China and India replacing traditional steel-producing countries such as the US, Japan, and Germany.

## Steel Production Has Shifted to Low-cost Countries Over the Past Decade

Steel consumption in developed countries has dropped due to a decline in domestic manufacturing.

For instance, domestic automobile production between 2001 and 2013 dropped by 0.3%, 0.4%, and 0.1% in the US, UK, and Japan respectively, as manufacturers shifted base to low-cost countries.

### CAGR % (2000-2015)

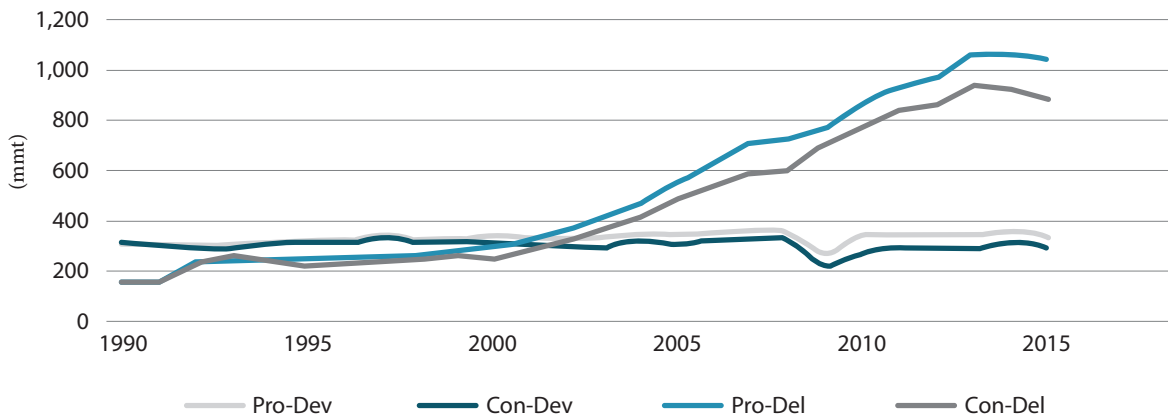
	Production	Consumption
<b>Developed Countries</b>		
South Korea	3.26%	2.53%
Germany	-0.55%	0.35%
Japan	-0.08%	-1.26%
US	-1.69%	-1.20%
UK	-2.17%	-1.66%
<b>Developing Countries</b>		
China	13.00%	11.90%
India	8.30%	7.70%
Turkey	5.40%	6.90%
Russia	1.20%	3.20%
Brazil	1.20%	2.00%
Mexico	1.10%	3.70%

Several factors such as a slowdown in domestic construction activity (primarily due to a contraction in private housing activities) and declining investments contributed to a drop in steel consumption among developed countries. Other factors, however, such as growth in shipbuilding and the automotive sector in South Korea as well as the automotive and construction sectors in Germany have contributed to a marginal rise in steel consumption in the two countries.

With increased globalization, steel production in key developed countries declined over the years due to the emergence of low-cost production centers. These new steel production centers provided competitive raw material, labor, and power costs.

With a decline in domestic steel consumption and easy access to cheaper steel, developed countries lost their numero uno position in steel production to newer avenues such as China and India.

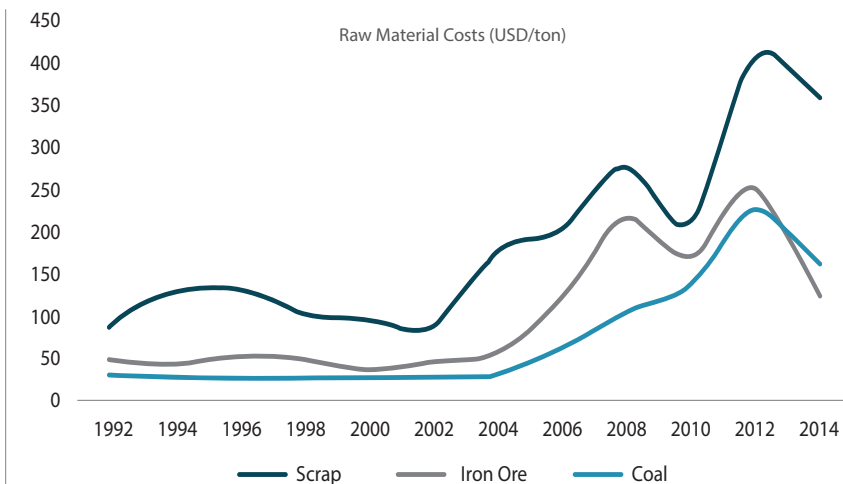
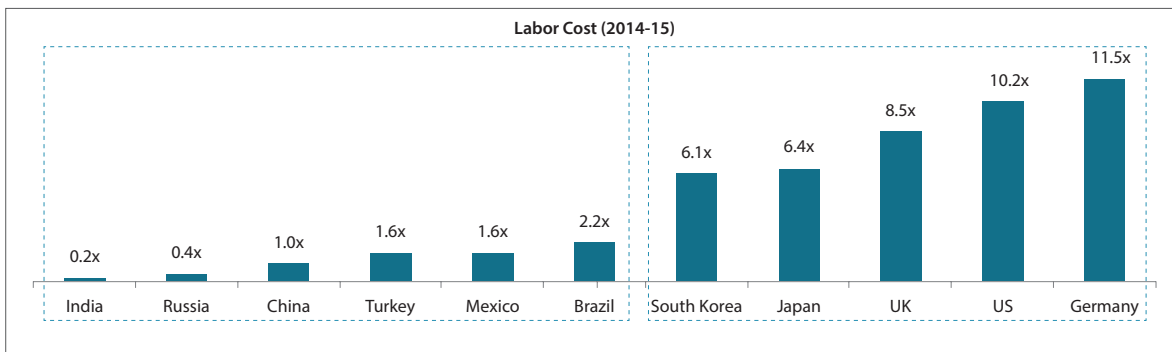
## Steel Production (Pro) and Consumption (Con) in Developed (Dev) and Developing (Del) Countries



Source: World Steel Association

Growing economies, infrastructure developments, and a shift in the manufacturing base among major OEMs also resulted in increased steel consumption among developing economies such as India and China. Domestic automotive production in China and India grew at 19.5% and 12.7% respectively between 2001 and 2014, further boosting demand in their local markets.

The growing demand for steel, coupled with the right structural enablers such as the availability of raw materials, cheap labor, and power, have established countries like India and China as the new centers for steel production.



### Countries Power Cost (2014-15)

Russia	0.3x
India	0.5x
South Korea	0.5x
US	0.6x
Turkey	0.8x
China	1.0x
Germany	1.1x
UK	1.2x
Japan	1.3x
Mexico	1.8x
Brazil	3.3x

Note: The developing countries are highlighted.  
Source: Desk Research



Apart from India and China, other developing countries also witnessed similar growth dynamics. Domestic automobile production in Turkey, Brazil, and Mexico grew at a rate of 7.4%, 4.3%, and 4.8% respectively between 2001 and 2014.

Increased government spending on infrastructure development, rising urbanization, and growing populations drove steel consumption as well. For instance, the construction sector in Brazil and Russia grew on account of the 2016 Rio Olympics and the 2018 FIFA World Cup respectively. Investments in China's construction sector grew by 20-25% annually between 2004 and 2012.

## Future Outlook — Will the Center of Steel Production Shift Again?

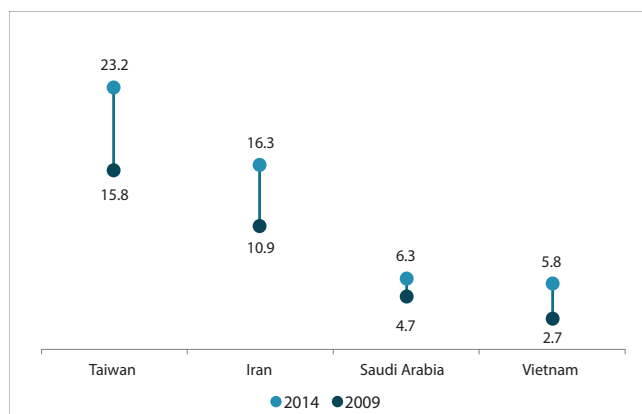
Steel production in developed countries has been flat over the past 15-20 years. A similar pattern has emerged among steel-producing developing countries over the past 2-3 years as well.

Coal, a major source of energy in the Blast Oxygen Furnace (BOF) method of steel production favored by developing countries, is facing mounting pressure in light of growing carbon emissions. The Electric Arc Furnace (EAF) method of steel production, however, does not require coal, depending instead on electricity.

Countries such as India and China (which use the BOF method) have found it difficult to shift to EAF due to abundant coal reserves coupled with the high cost of electricity. In addition, China plans to shut down unprofitable steel companies gradually.

There exists, however, a new group of countries that has ramped up steel production, leveraging the EAF method, especially over the past 5-6 years.

### Steel Production in Emerging Countries (million tons)



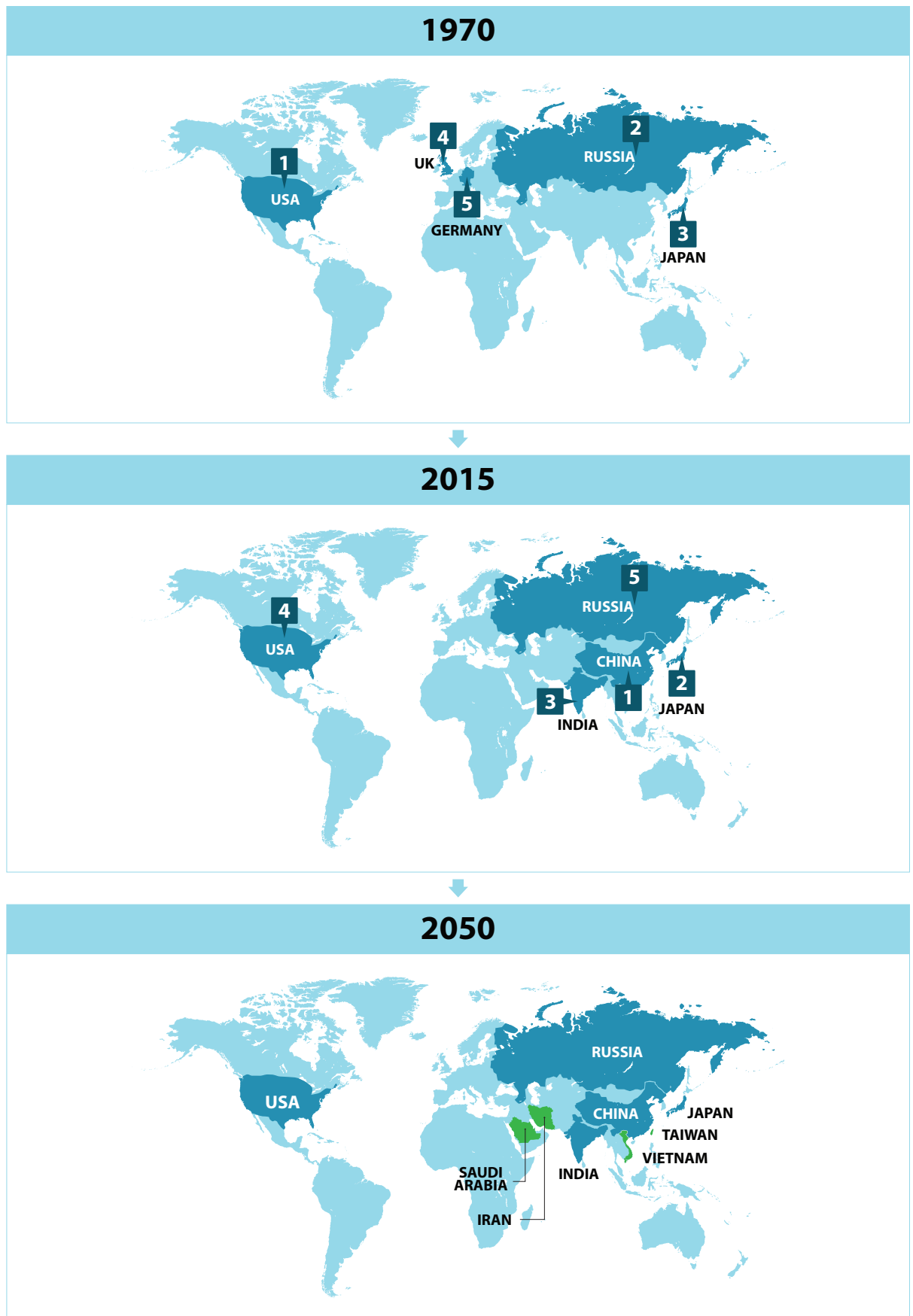
Emerging Countries	Power Cost	Production-CAGR % (2009–2014)
Taiwan	0.8x	8.0%
Iran	0.5x	8.4%
Saudi Arabia	0.5x	6.0%
Vietnam	0.0x	16.7%
China*	1.0x	7.4%

\*Note- China is not part of the new emerging countries group. It has been used only for benchmarking the power costs in the new countries. The above mentioned emerging countries have growth rate greater than 5% and production greater than 5 million tons  
Source: World Steel Association, Desk Research

Countries such as the KSA, Iran, and Vietnam enjoy low power costs as compared to other developing countries, and hence, are best equipped to leverage the shift to EAF. Except for Taiwan, all other countries produce more than 85% of their steel through EAF as opposed to only ~25% globally.

From a consumption perspective as well, per capita steel usage in Vietnam and Iran is less than 250 kg. as compared to an average of around 460 kg. in key developed countries.

## Centers of Steel Production, Over Time (1970-2050)



Given the KSA and Iran's current focus on diversification into non-oil revenues, these countries are expected to create their space in the global steel ecosystem over the coming years.

Time will tell whether these countries would be able to replace current steel producing giants.

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