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World HBI market development

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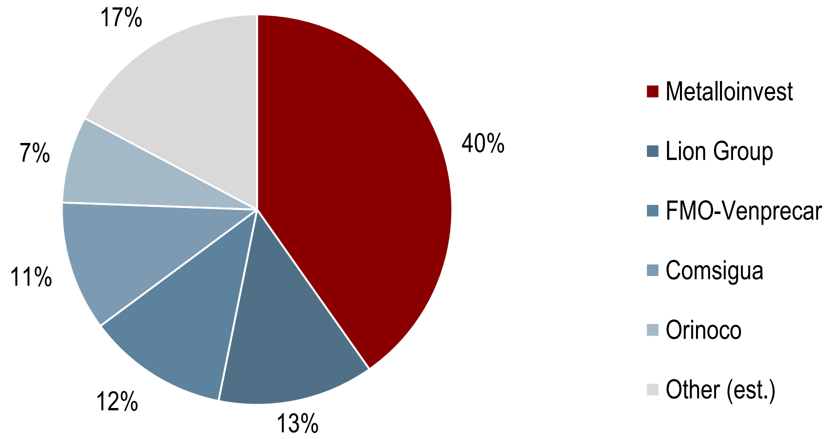
Agenda

Metalloinvest is the global HBI leader

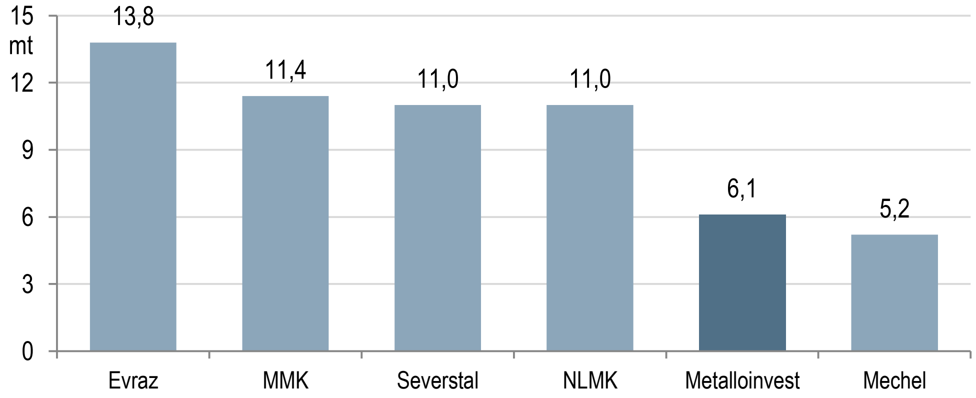
The second largest producer of metallics (HBI/DRI) globally

Note: 2009 data

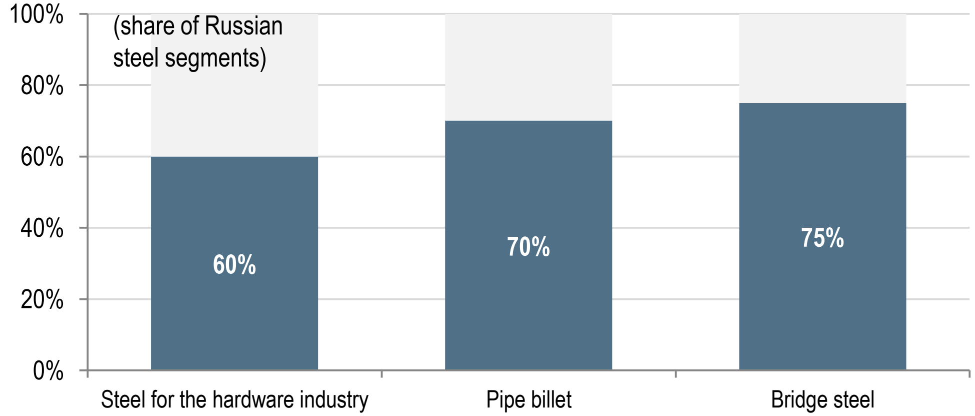
First largest producer of merchant HBI globally



The fifth largest steel producer in Russia



Leading positions in high margin niche products



Source: Chermet, Midrex, Companies data 2009-2010

- Metalloinvest is one of the largest suppliers of metallics (HBI) globally
- Company specialize in high-quality steel products and is the key supplier for a number Russian industries

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Brief characteristic of HBI

Brief characteristic of metallics

There are 3 types of metallics for steel production

Characteristic	Hot metal/pig iron	HBI/DRI	Scrap
Main processes	Blast Furnace, Finex, Corex	Midrex, HYL, SL/RN, Finmet, Circored	Recycling
Feed stock	Agglomerated and non-agglomerated iron ores	High grade pellets or fines	Used steel (vehicles, ships, equipment etc.), production waste (engineering plants) and home scrap at steel works
Fuel (reducer)	Coke or coal	Natural gas or thermal coal	
Share in global consumption	64%	5%	32%
Limitations	Need coking coal	Need natural gas/(gasified) coal and usually high grade ores	Need developed infrastructure & Engineering based enterprises
Steel technology (main)	Basic oxygen furnace	Electric arc furnace	Electric arc furnace
Feature	Hot iron is used at integrated steel works in liquid form Pig iron is cold merchant iron used in BOF and EAF	DRI (H(ot)DRI) is used mainly as captive metallics in EAF HBI is merchant briquetted DRI	

Source: WorldSteel, AME

- Total 2010 metallics consumption estimated at 1.6 bn tonnes

Typical residuals level in metallics

Metallic	Fe (total), %	C,%	S, %	Gangue, %	SiO_2, %	Bulk Density, tn/m^3	Cu, %	Ni, %	Other*,%
Pig iron	95-96	4	0.015	0	< 0.5	3.2	0	0	<1.7 (Mn)
HBI/DRI	90-92	1-1.5	0.010	Up to 7	Up to 6	2.6	0.002	0.009	0.01
3A	95-98	< 0.20	0.250	0	< 0.2	0.6-0.8	0.300	0.250	0.6-0.8
Shredded	>98	< 0.03	0.030	0	< 0.1	< 1.5	0.160	0.100	0.6-0.8
#1 HMS	>98	< 0.03	0.033	0	< 0.1	0.8-1.0	0.180	0.150	0.6-0.8

* other non-ferrous metal impurities

Source: WorldSteel, GOST

- High grade scrap is commonly used in EAF process but its availability is very limited, prices usually too high and it has inherent residual problems
- HBI/DRI has advantages over scrap due to low impurities of non-ferrous metals, availability for continuous charging and high bulk density that cause reduction in buckets charged
- HBI/DRI has disadvantages in comparison with scrap due to lower Fe and high slag content

Definitions

Direct Reduced Iron (DRI): Iron oxide pellets and/or lump ores of fines that have been reduced without reaching the molten stage resulting in a high purity, metallic product

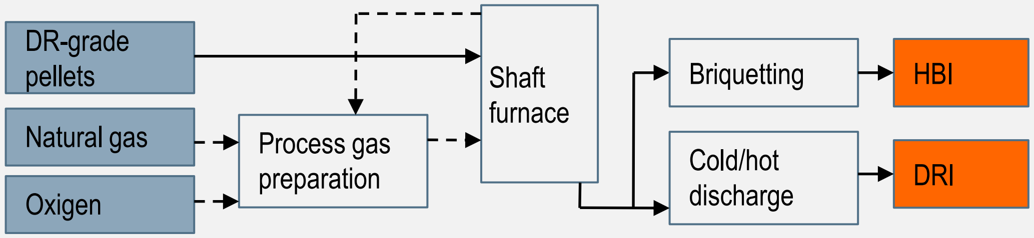
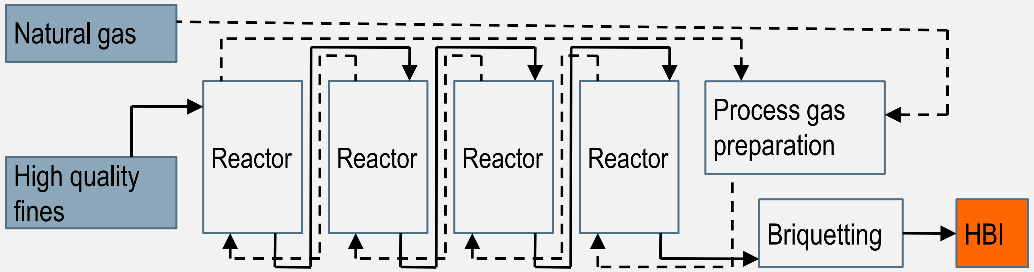
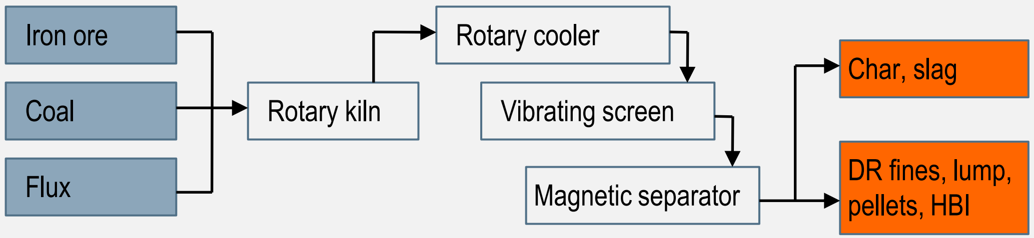
Hot Briquetted Iron (HBI): An enhanced form of DRI that has been compacted at temperature at or above 650 C° and has a density greater than 5.0 grams per cubic centimeter (g/cm3).

Partial Briquettes: The result of breakage during processing, handling, and screening. Particle size typically ranges from 12-25 mm.

Fines and Chips: The result of physical degradation of iron oxide pellets/lump ore during reduction or HBI during handling and screening. Particle size ranges up to 12 mm with metallic iron content of 1-88% by weight.

Source: IIMA

Direct reduction technologies

Technologies	Feed stock	Fuel	Share in production, %	Flow chart
Midrex, HYL	DR-grade pellets	Natural gas	72%	
Finmet	High quality fines & lump	Natural gas	3%	
SL/RN	BF-grade pellets, fines lump	Thermal coal	25%	

Input products | Technology | Output products

- Total HBI / DRI production in 2010 estimated at 71 Mt (+10%)

HBI strength over the scrap

- Controlled chemistry
- Easy to store and handle
- Reliable long-term supply

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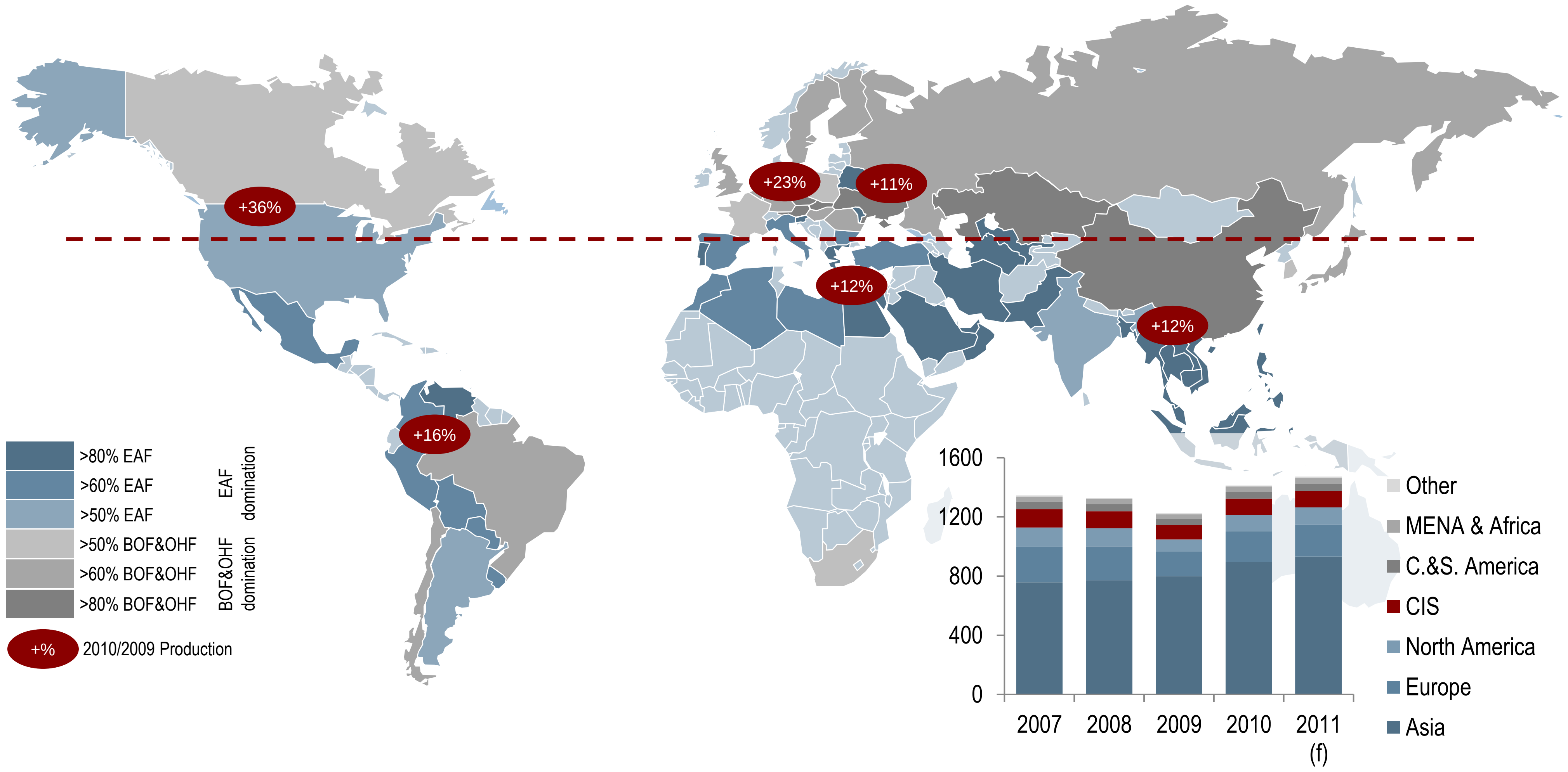
Metallics market outlook

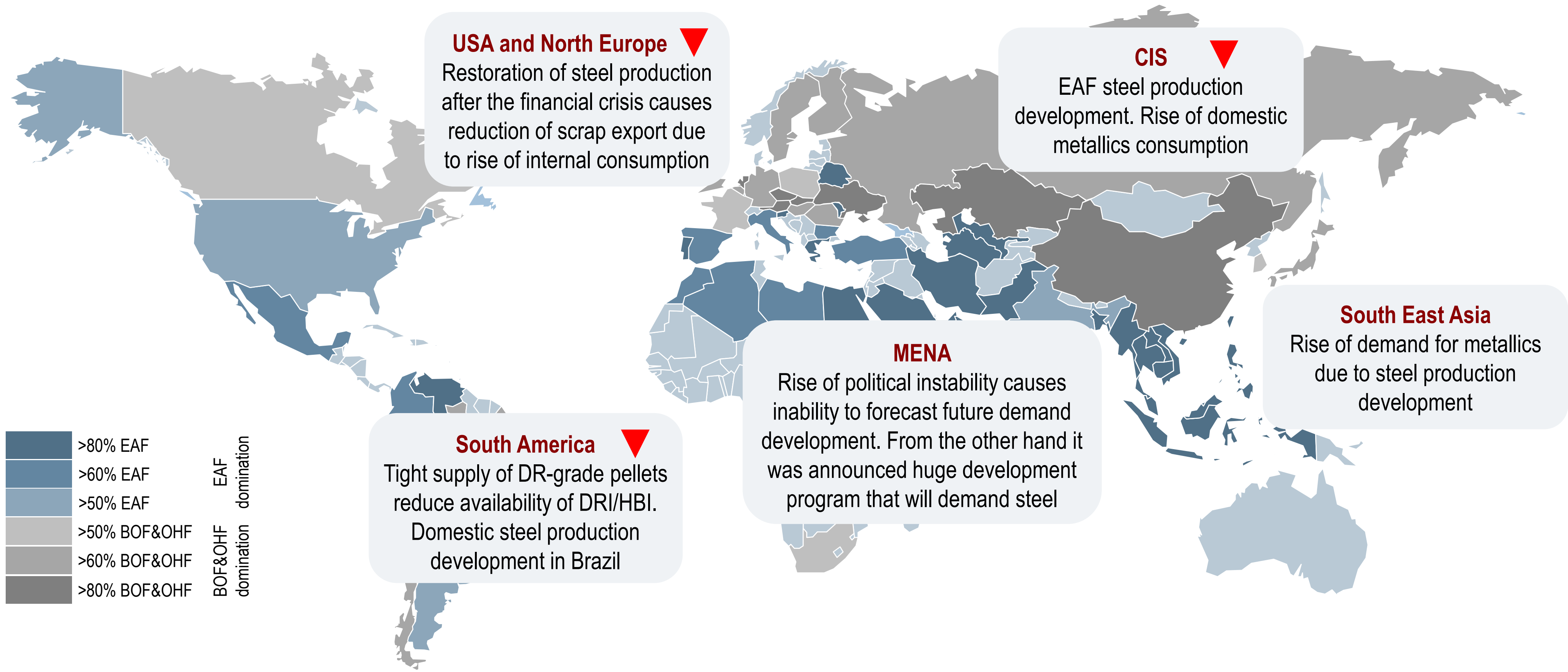
Crude steel production



Source: AME, WorldSteel

- Crude steel production is recovering very fast since 2009. Crude steel production in 2010 surpass pre-crisis level and was the highest in history
- In CIS increase of production followed by replacement of old OHF with EAFs that also stimulates domestic scrap consumption

World metallics market outlook

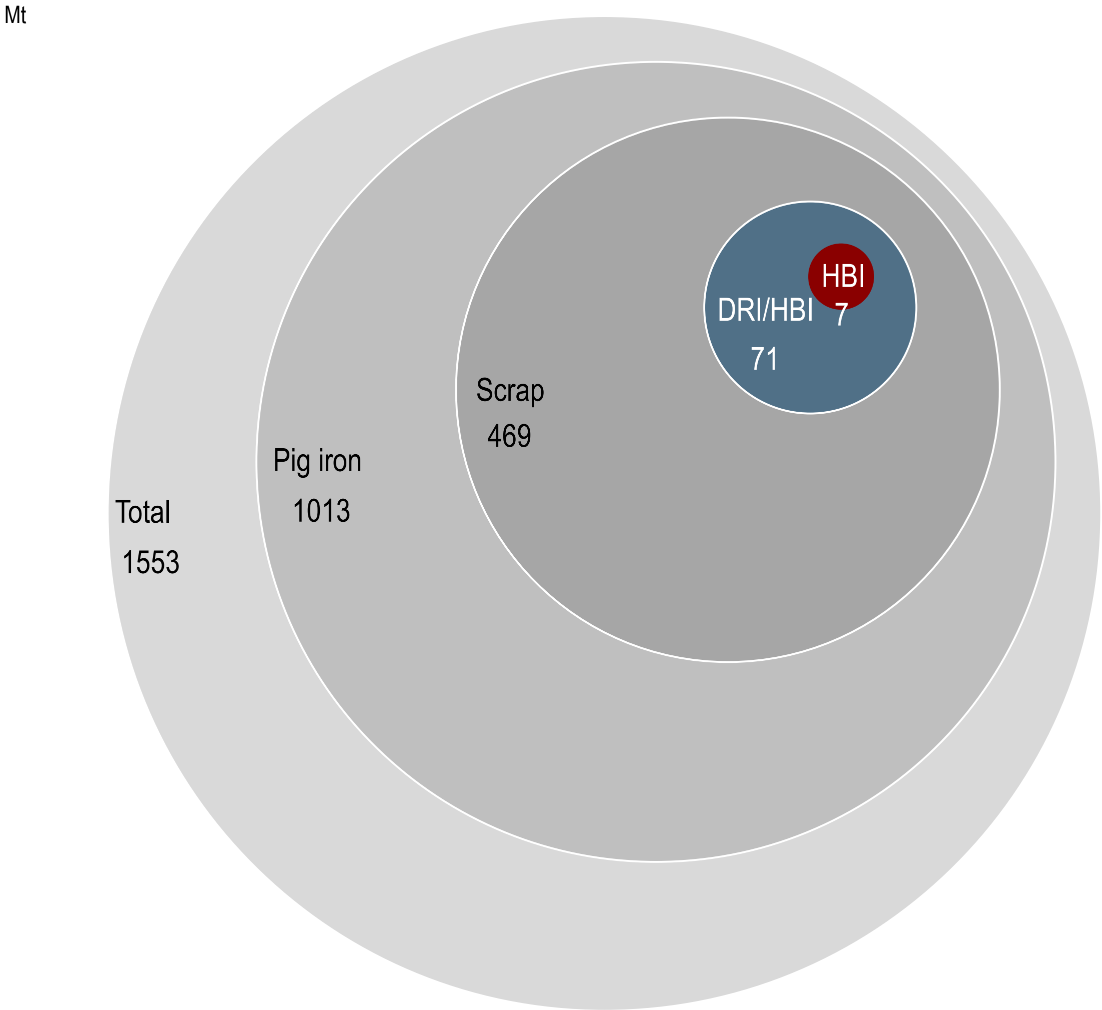


Source: WorldSteel

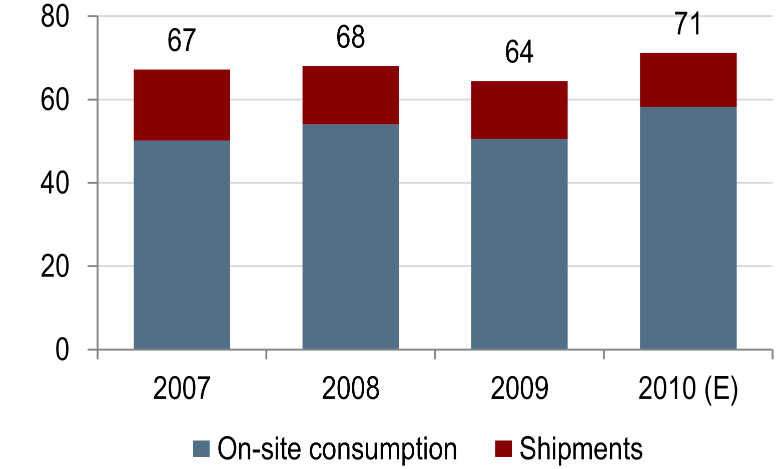
- There is currently a process of replacing OHF with EAF in Russia. OHF production will stop in Russia in the near future. In Ukraine situation is the same. There is the process of replacement of outdated OHFs
- It is very hard to forecast what will be exact numbers of the world metallics trade as reduction in supply followed by uncertainty in demand. We can only say that urbanization process in the MENA and SEA region will continue with South and Central Africa to be the next demand driver

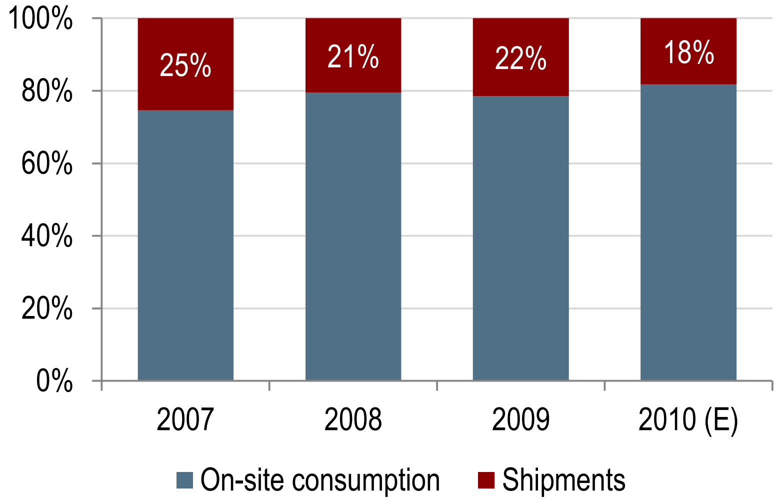
World metallics consumption

Metallics consumption



HBI/DRI production





- In total metallics consumption HBI/DRI takes about 4,6% and HBI itself less then 1%
- Most of HBI/DRI consumed captive. Less then 20% goes to the market

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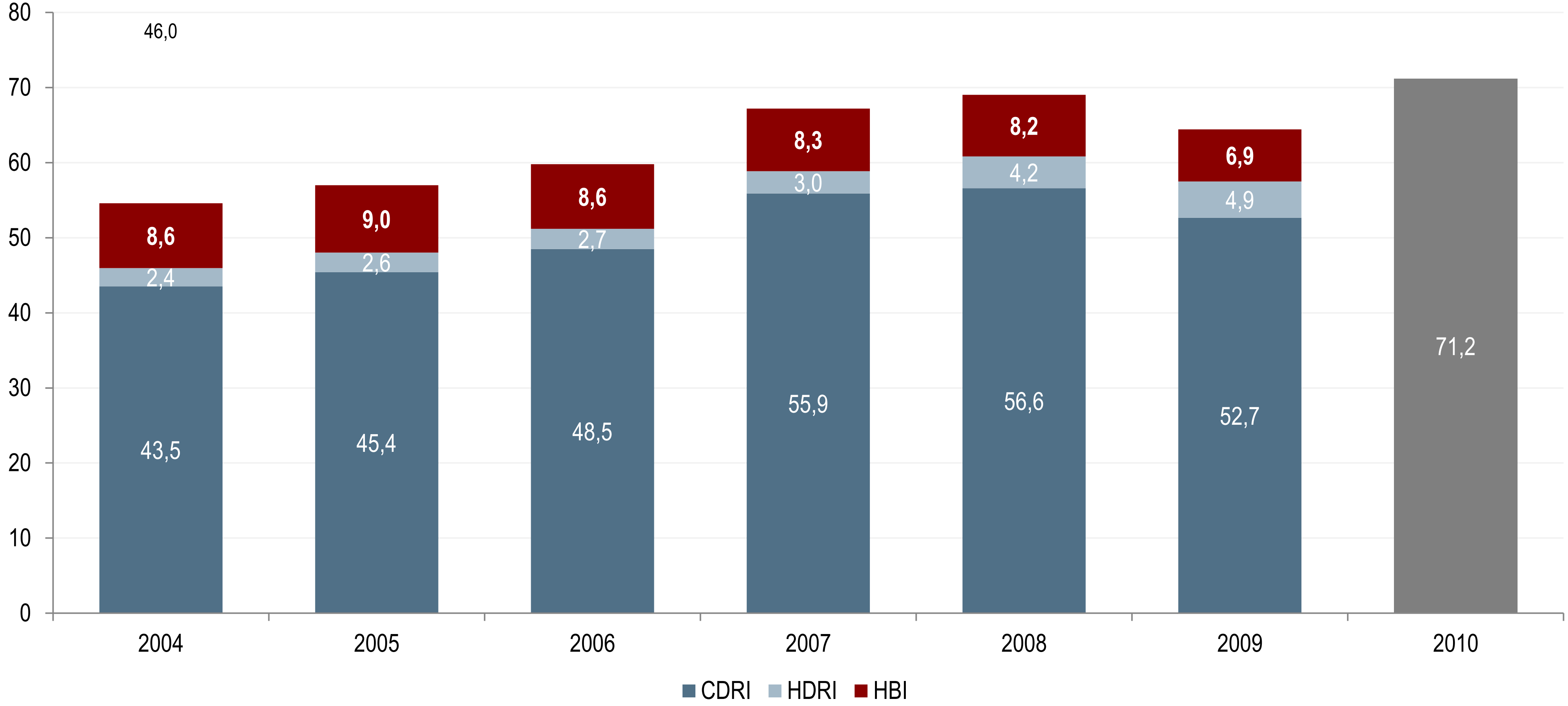
World HBI market

HBI/DRI production

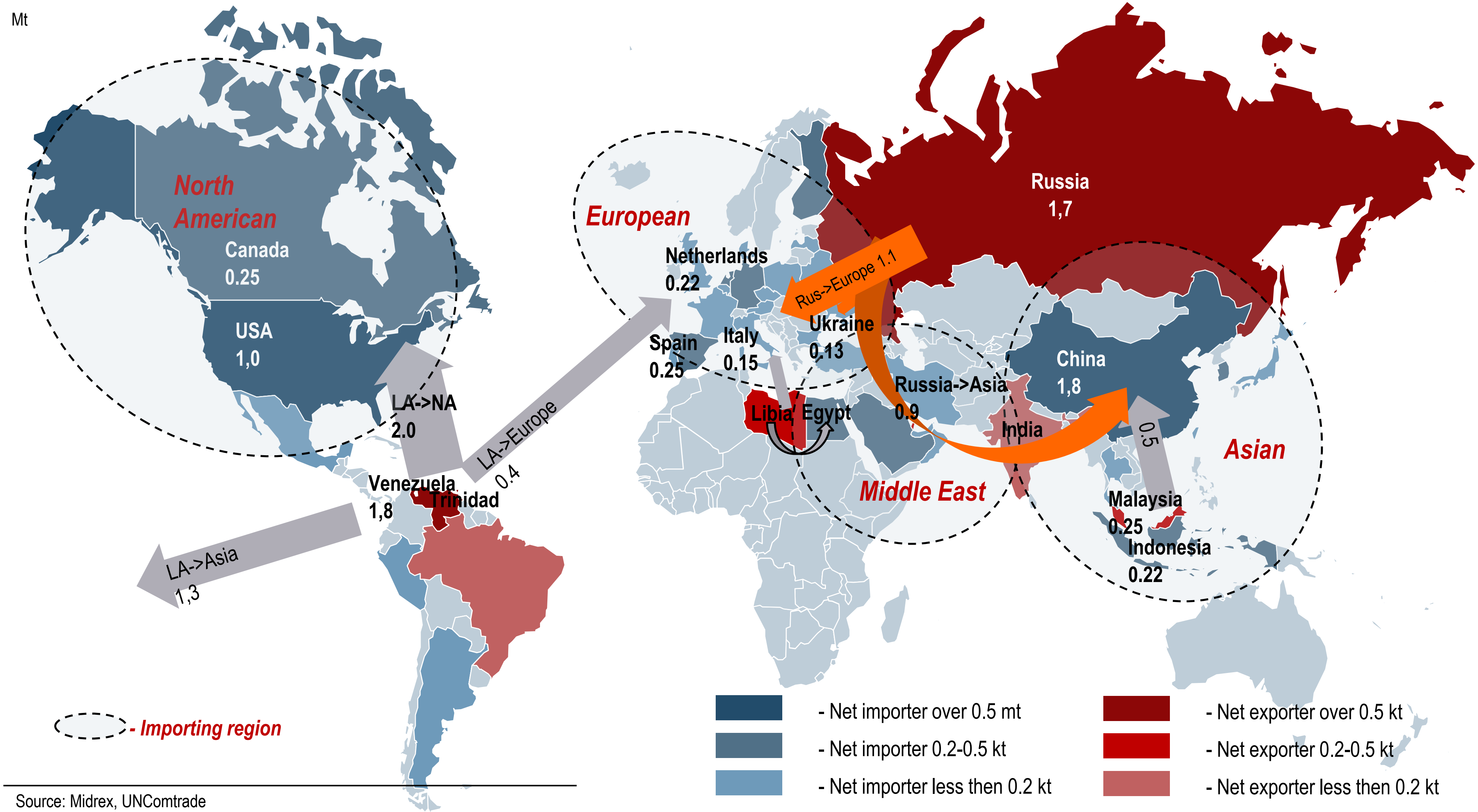
HBI/DRI production, 2004-2010



Source: Midrex, AME

- HBI/DRI production industry successfully pass through the financial crisis
- Production figures for 2010 estimated on historically highest level – 71 Mt

HBI/DRI world trade flows in 2009



Source: Midrex, UNComtrade

- According to Midrex data the total merchant HBI/DRI world trade was 13.9 mt in 2009 (including land and domestic shipments)
- In 2009 approximately 6 million tons of HBI were shipped internationally according to IIMA

HBI/DRI plants construction pipeline

Plant	Location	Capacity (Mt/y)	Technology	Product	Start-up	Status
MENA						
Emirates Steel I (GHC)	Abu Dhabi, UAE	1.60	HYL	HDRI	2010	S
HOSCO I & II	Bandar Abbas, Iran	1.65	MIDREX	DRI	2010	S
Al Tuwairqi (Tuwairqi Steel Mills)	Karachi, Pakistan	1.28	MIDREX	HDRI/DRI	2010	S
IMPADCO	Khorasan (Mashad), Iran	0.80	MIDREX	DRI	2010	S
ESISCO (Beshay Steel)	Sadat City, Egypt	1.76	MIDREX	HDRI/DRI	2010	S
IGISCO	Ardakan (Yazd), Iran	0.80	MIDREX	DRI	2010	S
Gulf Sponge Iron	Abu Dhabi, UAE	0.20	HYL	DRI	2010	S
Arfa Iron and Steel	Ardakan (Yazd), Iran	0.80	MIDREX	DRI	2010	S
Khorasan Steel	Khorasan (Mashad), Iran	0.80	MIDREX	DRI	2011	S
Shadeed (Jindal Steel & Power)	Sohar, Oman	1.50	MIDREX	HDRI/DRI	2011	S
Beshay Steel	Egypt	1.76	MIDREX	DRI	2011	C
EZDK 4 (Ezz Rolling Mills)	Egypt	1.90	HYL	DRI	2011	C
Samangan Steel	Samangan, Iran	0.82	MIDREX	DRI	2011	C
Emirates Steel II (GHC)	Abu Dhabi, UAE	1.60	HYL	HDRI	2012	C
Gulf United Steel Holding	Foulath, Bahrain	1.50	MIDREX	HBI/DRI	2012	C
Suez Steel Mill	Egypt	1.60	HYL	DRI	2013	C
TOTAL STARTED-UP		**11.19**				
TOTAL BEING COSTRUCTED		**9.18**				

Source: Midrex, company data

- Nowadays the vast HBI/DRI plants constructed in MENA region
- Most of HBI/DRI produced in MENA region is consumed captive or local

HBI/DRI plants construction pipeline cont.

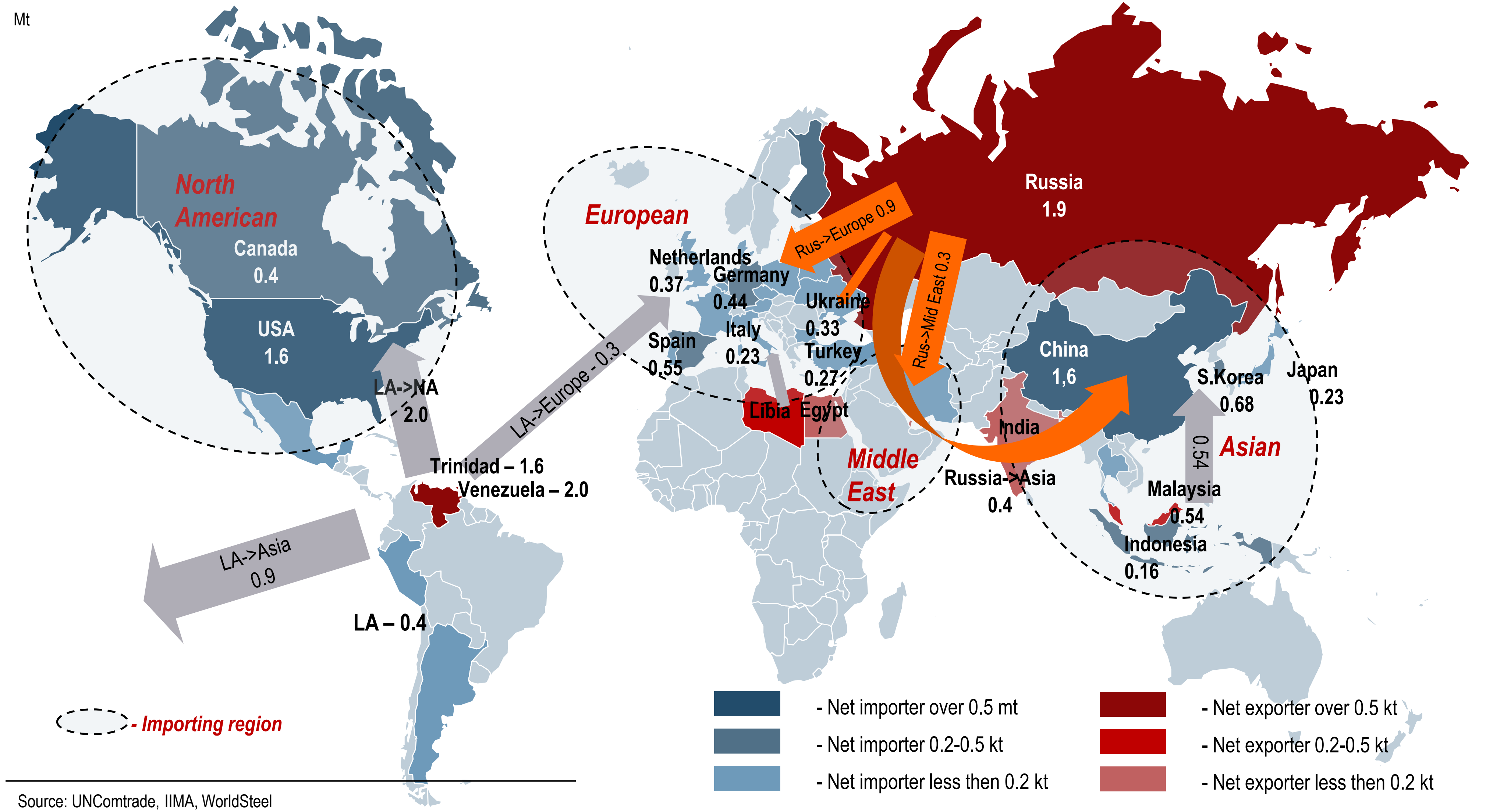
Plant	Location	Capacity (Mt/y)	Technology	Product	Start-up	Status
ASIA						
Essar Steel VI	Hazira, India	1.70	MIDREX	HBI/HDRI	2010	S
Prakash Industries	Champa, India	0.60	SL/RN	DRI	2011	S
Jindal Steel & Power	Angul, India	1.80	MIDREX	HDRI/DRI	2012	C
POSCO 3	Pohang, Korea	2.00	FINEX	DRI	2013	A
Jindal Steel & Power	Angul, India	1.80	MIDREX	HBI/DRI	Shelved	A
NORTH & SOUTH AMERICA						
Sidor	Matanzas, Venezuela	0.80	HYL	DRI	2010	S
SDI	Hoyt Lakes, USA	0.50	ITmk3	Nuggets	2010	S
Nucor	St. James Parish, USA	2.50	HYL	CDRI	2013	A
Bolivian Steel	Bolivia	6.00	n.a.	HBI/DRI	Shelved	A
CIS						
SSGPO	Rudny, Kazakhstan	1.80	MIDREX	HBI	2014	A
SSGPO	Rudny, Kazakhstan	2.80	MIDREX	HBI	Shelved	A
Aktubinsky Steel Plant	Aktubinsk, Kazakhstan	1.50	ITmk3	Nuggets	Shelved	A
Vorskla-Steel	Komsomolsk, Ukraine	3.40	MIDREX	DRI	Shelved	A
IRC	Russia	2.50	ITmk3	Nuggets	Shelved	A
TOTAL STARTED-UP		**2.60**				
TOTAL BEING COSTRUCTED		**1.80**				
TOTAL ANNOUNCED		**24.30**				

Source: Midrex, company data

- Untill 2013 total world HBI/DRI capacity will increase up to 10.98 Mt
- Before the financial crisis it was announced a lot of new projects, especially in CIS (12 Mt)
- Almost all of announced projects are shelved now

HBI/DRI world trade flows in 2010

Mt

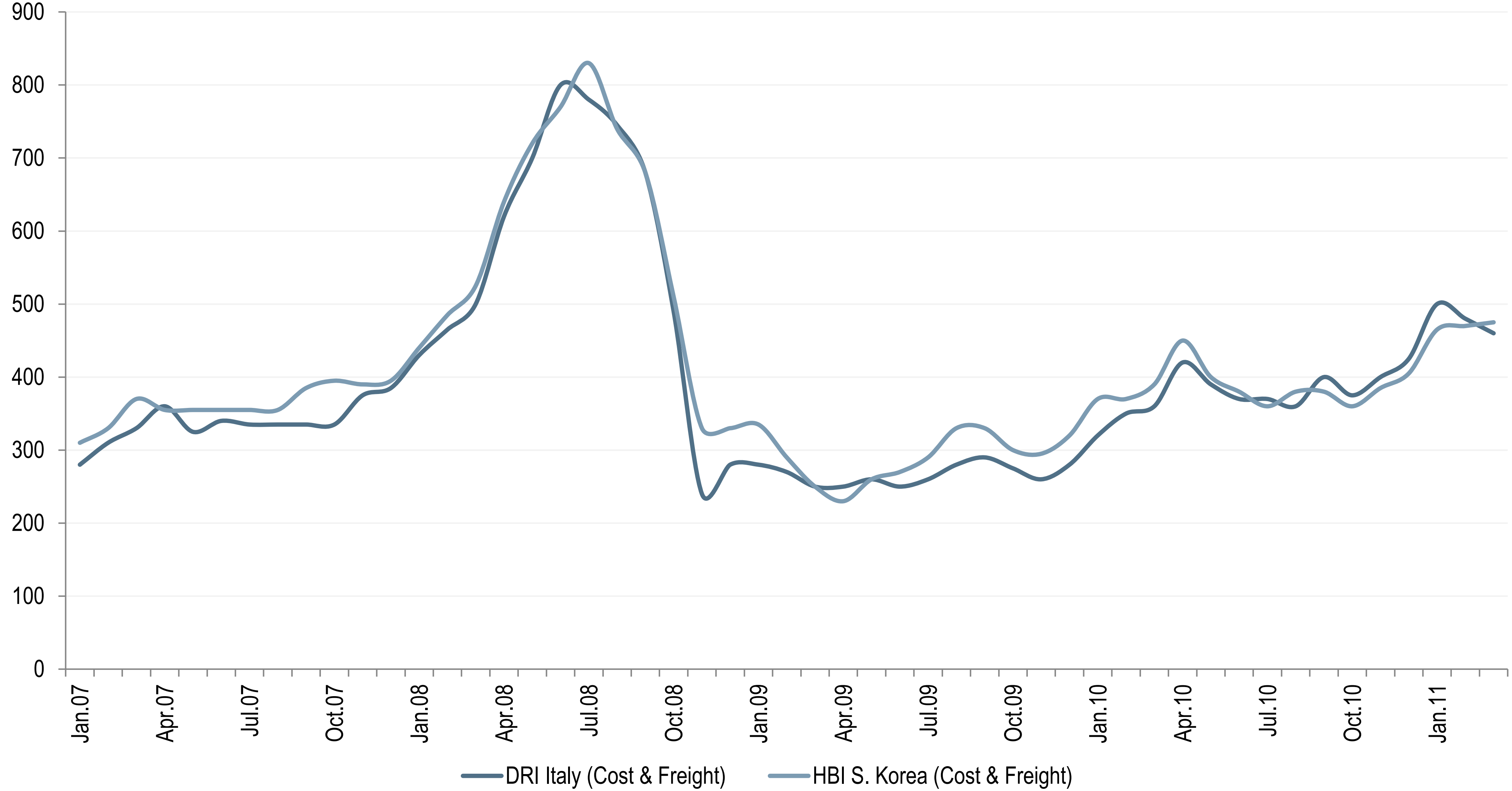


Source: UNComtrade, IIMA, WorldSteel

- In 2010 approximately 7.3 million tons of HBI/DRI were internationally traded according to WorldSteel and IIMA data
- Estimated international HBI shipments for 2010 is 4.5-5.0 million tons with Metalloinvest's share 37-40%

HBI/DRI prices

HBI/DRI prices, 2007-2011



Source: CRU

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Thank you

Q&A