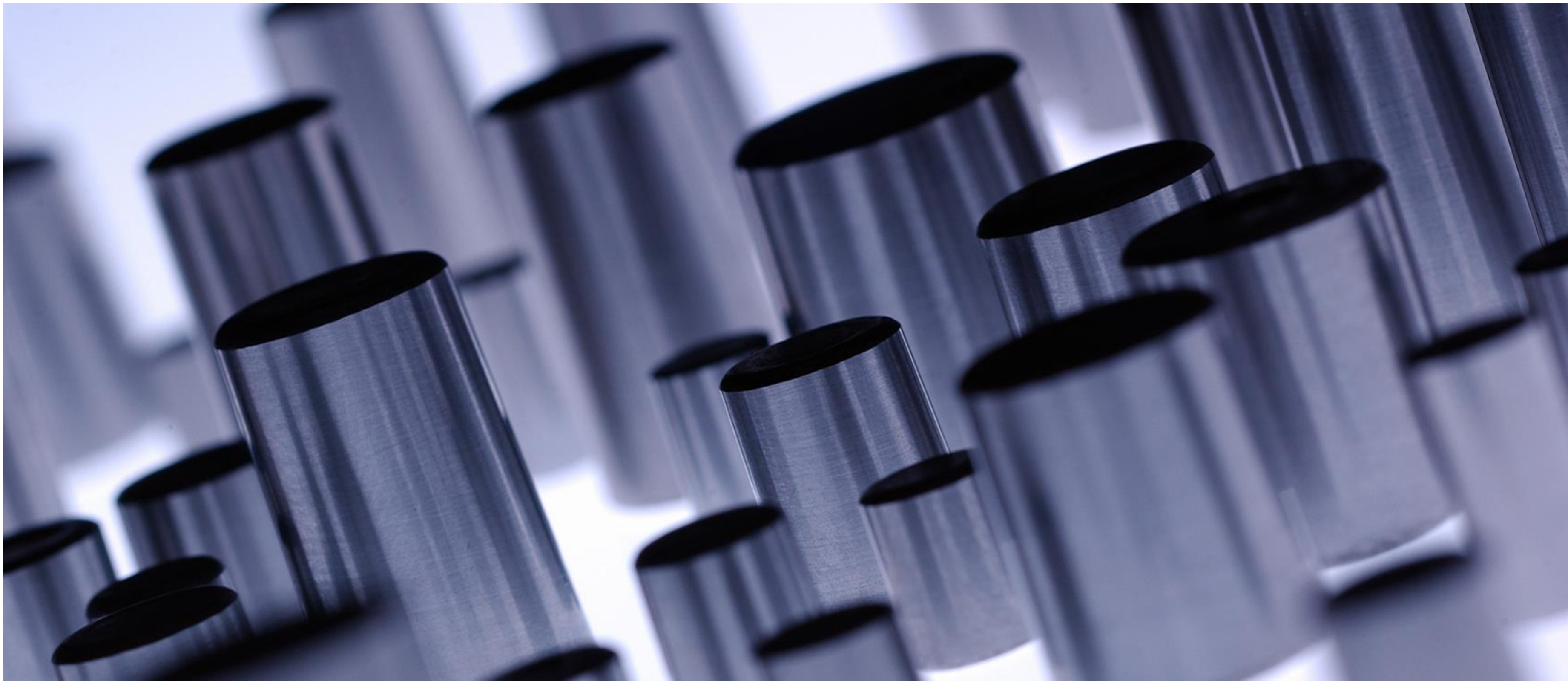
worldsteel ASSOCIATION

worldsteelconstruct

Terrence Busuttil, USCC, 13 December 2016



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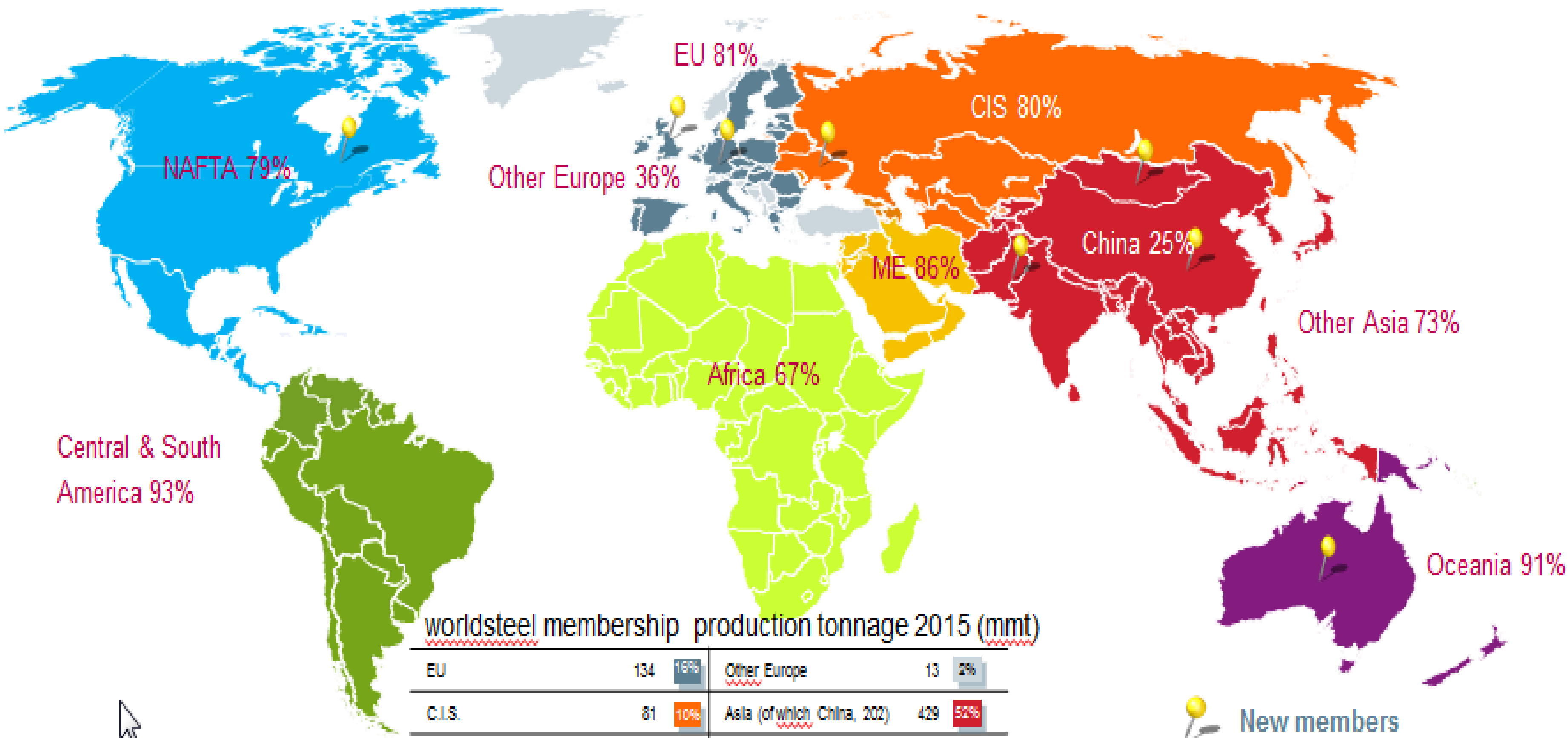
What is our role?

- The World Steel Association (worldsteel) acts as the focal point for the steel industry.
- worldsteel provides global leadership on all major strategic issues affecting the industry, particularly focusing on economic, environmental and social sustainability.
- worldsteel promotes steel and the steel industry to customers, the industry, media, financial markets and the general public.
- worldsteel assists its members to develop the market for steel, managing major projects in a range of industry sectors.

Membership in 2016

% of worldsteel members vs. regional raw steel production



worldsteel membership production tonnage 2015 (mmt)

EU	134	16%	Other Europe	13	2%
C.I.S.	81	10%	Asia (of which China, 202)	429	52%
Middle East	25	3%	Oceania	5	
North America	87	11%	Central & South America	42	5%
Africa	10	1%	worldsteel membership	826 (100%)	
World	1,622		% worldsteel vs. World	51%	

Regular : 73 (incl. Baotao, Citic Pacific & British Steel)

Associate: 35 (incl. The Rani Re-Rolling Mills)

Affiliated: 53 (incl. ASI, CISC-ICCA, FEhS & UKRMETALURGRPROM)

Key facts – Benefits of membership

- Access to the latest technical and economic data on industry trends and performance affecting the steel industry through the member-only extranet.
- worldsteel regularly produces member-only data, reports, publications and authoritative works on specialist subjects.
- Become involved at an international level in common market development programmes and initiatives.
- Networking with other steel industry professionals from around the world at meetings, events and the annual conference.
- Join major industry wide working groups, forums and committees.

Some worldsteel steel-producing members

ArcelorMittal
NIPPON STEEL & SUMITOMO METAL
BAOSTEEL
posco
JFE
U. S. Steel
武汉钢铁(集团)公司
WUHAN IRON AND STEEL(GROUP) CORP.
ANSTEEL
GERDAU
NUCOR
EVRAZ GROUP
HYUNDAI STEEL
Çolakoğlu Metalurji
Severstal
Achieve more together
TATA
TATA STEEL
METINVEST®
CHINASTEEL
HBIS
ThyssenKrupp Steel
सेल SAIL
IMIDRO
NLMK
MAGNITOGORSK IRON & STEEL WORKS
TECHINT
voestalpine
ONE STEP AHEAD.
JSW
CELSA GROUP™
NISSHIN STEEL
ERDEMIR
JINDAL STEEL & POWER
SALZGITTER AG
Stahl und Technologie
حديد
hadeed
Dongbu Steel
قطر ستيل
QATAR STEEL
Duferco
CSN
Companhia Siderúrgica Nacional
USIMINAS
SSAB
TŘINECKÉ ŽELEZÁRNY
ezzsteel
حديد عز
RINL
VIZAG STEEL
Pride of Steel
KOBELCO
KOBE STEEL GROUP
AICHI STEEL
BLUESCOPE STEEL

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Summary - worldsteelconstruct initiative

- Concern:
  - Perceived market share loss of steel in construction by worldsteel members. Appointed worldsteel to investigate

- Field study:
  - Surveyed / interviewed regional and national stakeholders in construction including those using complementary materials Q1Q2 2015
  - Followed up in detail (primarily EU28, CIS, secondary in Brazil, India) Q3Q4 2015

- Results:
  - Steel faces stiff competition from alternative materials, partly due to lack of coordinated promotion of steel in construction coupled by reduced funding
  - The steel industry is behind alternative materials in promotion, education and standard setting in the building and construction industry

- Way forward:
  - Information gathering: statistics measuring market shares need to be collected
  - Promotion: worldsteel bringing together stakeholders to coordinate promotion programmes
  - Capacity building: worldsteel creates bridges for increased coordination among regions

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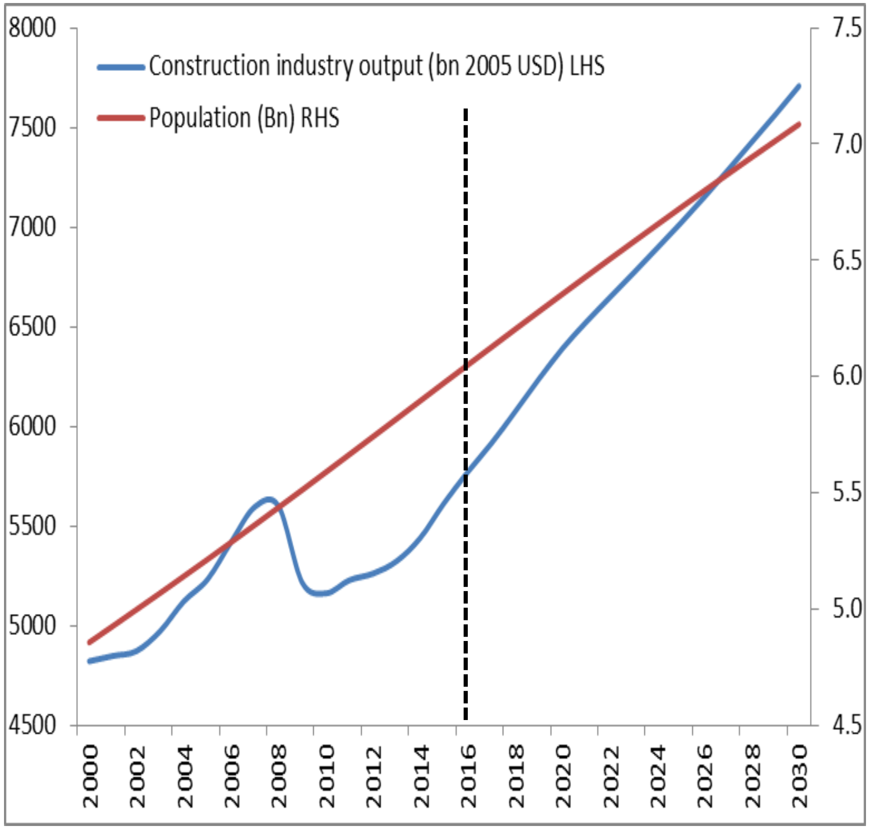
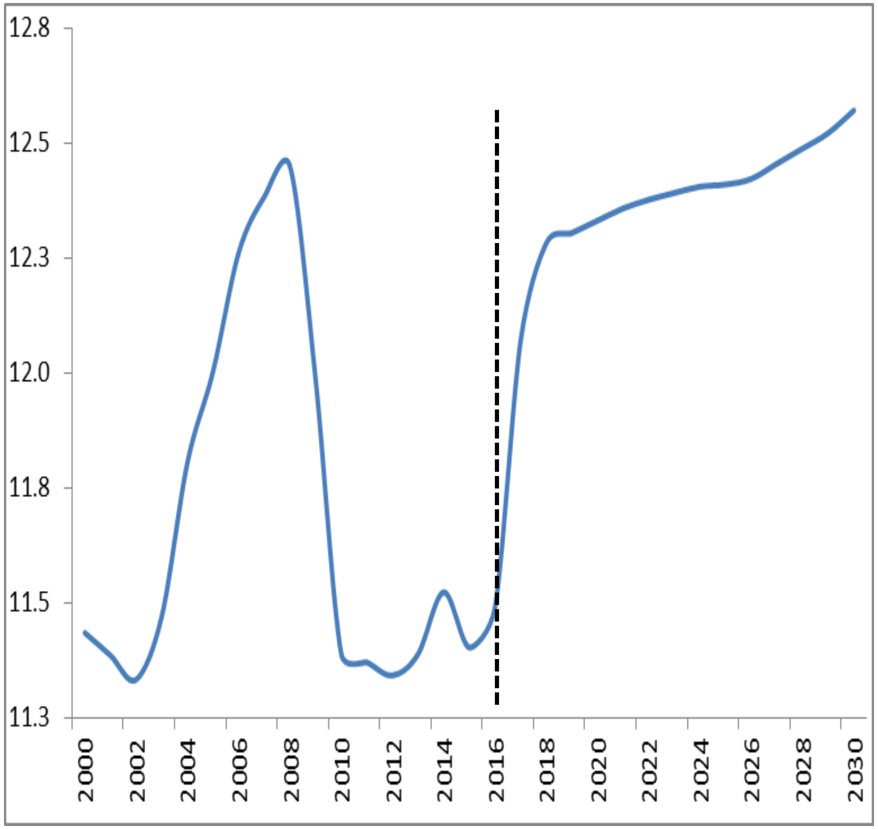
Strong fundamental drivers underpin construction outlook

World exc. China : Real construction industry output & population



World exc. China : Construction (% of nominal GDP)



Source: *IHS Global Insight, UN*

- Population & real GDP growth are the single most important drivers of construction
- Construction is expected to see stronger growth vis a vis automotive output

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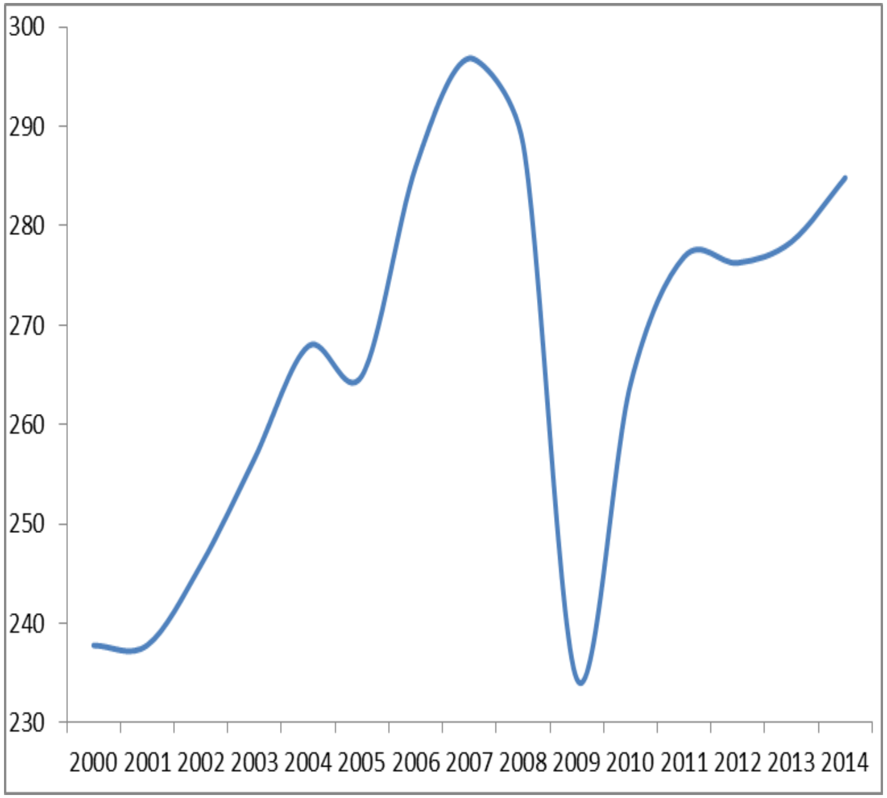
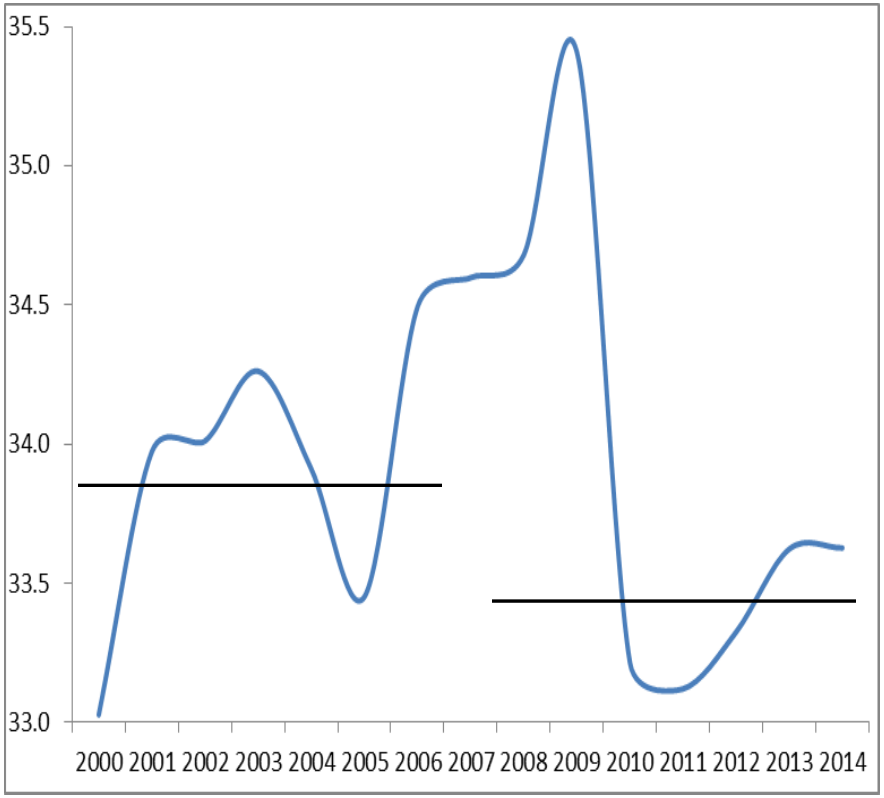
- The role of worldsteel
- Summary - Worldsteelconstruct initiative
- Megatrends
- Steel construction industry
- Learnings from the beams market
- Worldsteel workplan

Headline steel construction appears healthy…

World exc. China steel construction volumes* (Mt)



World exc. China : steel construction volumes (% of production)



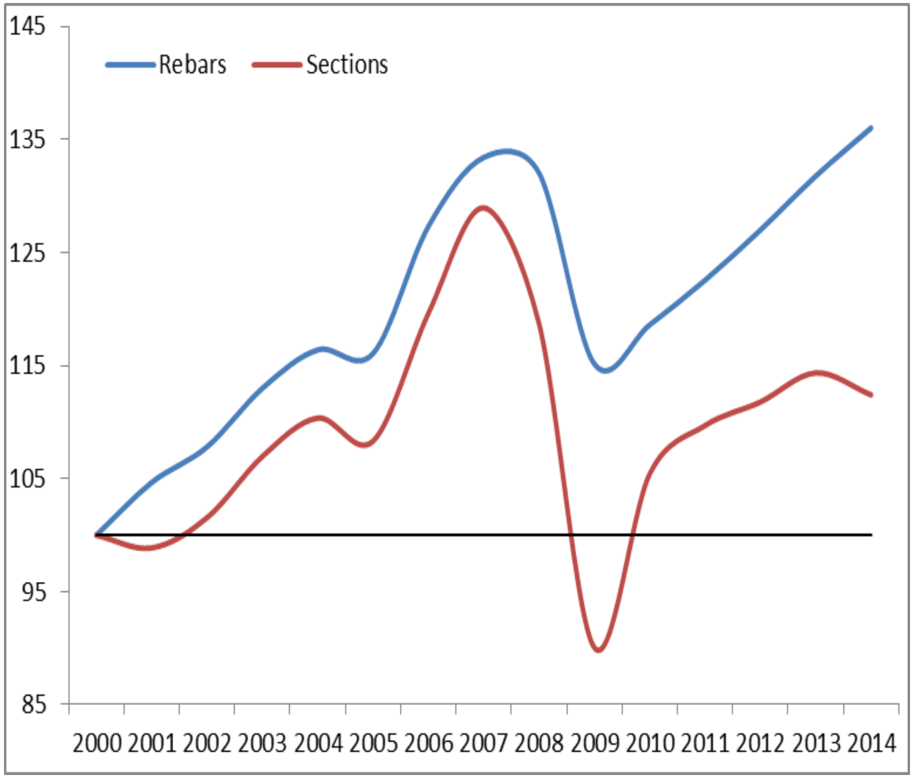
Source: *Worldsteel*

- Headline construction steel production continues to recover but its share in total crude production appears to be lower than pre-crisis levels

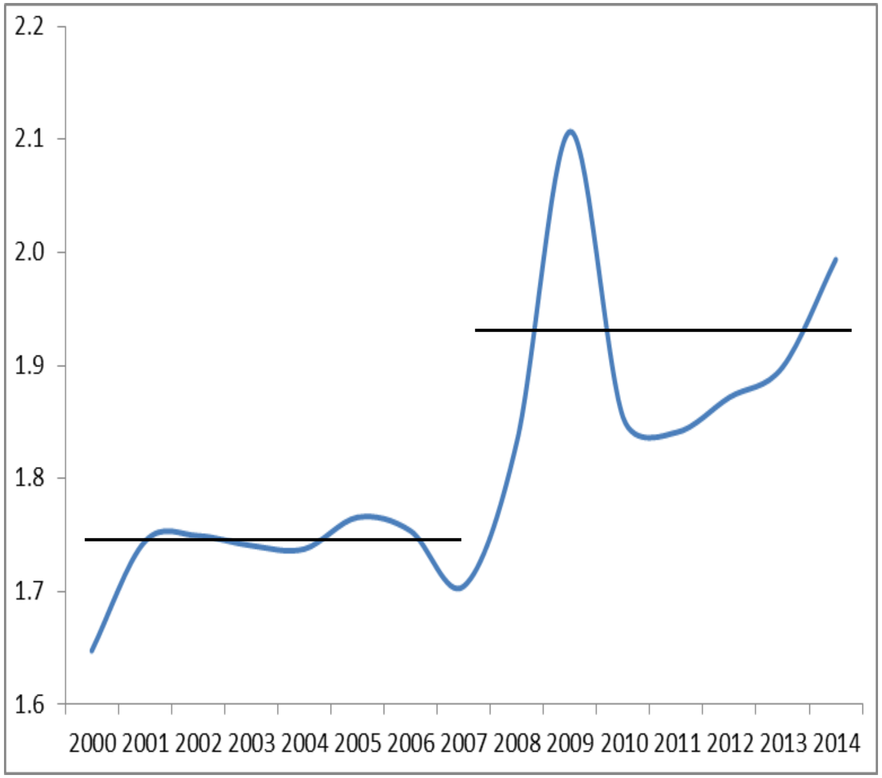
* Includes: rebars, sections, other bars (ex rebars), wire rod, hot rolled plate, HDG and organic coated but excludes tubes. Missing data or failure to report data means that steel use in construction may be 20% higher or 40% of crude steel production

…but is mainly rebar driven

World exc. China steel construction volumes products: Rebar vs sections (2000=100)



World exc. China steel construction volumes products: Rebar vs sections (ratio)

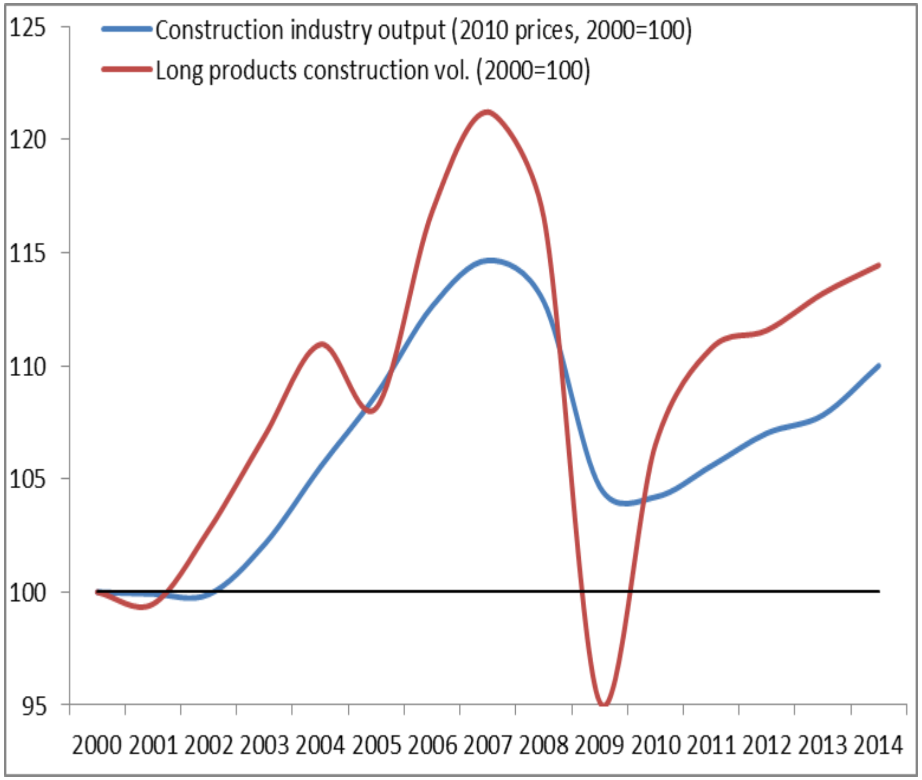


Source: *Worldsteel*

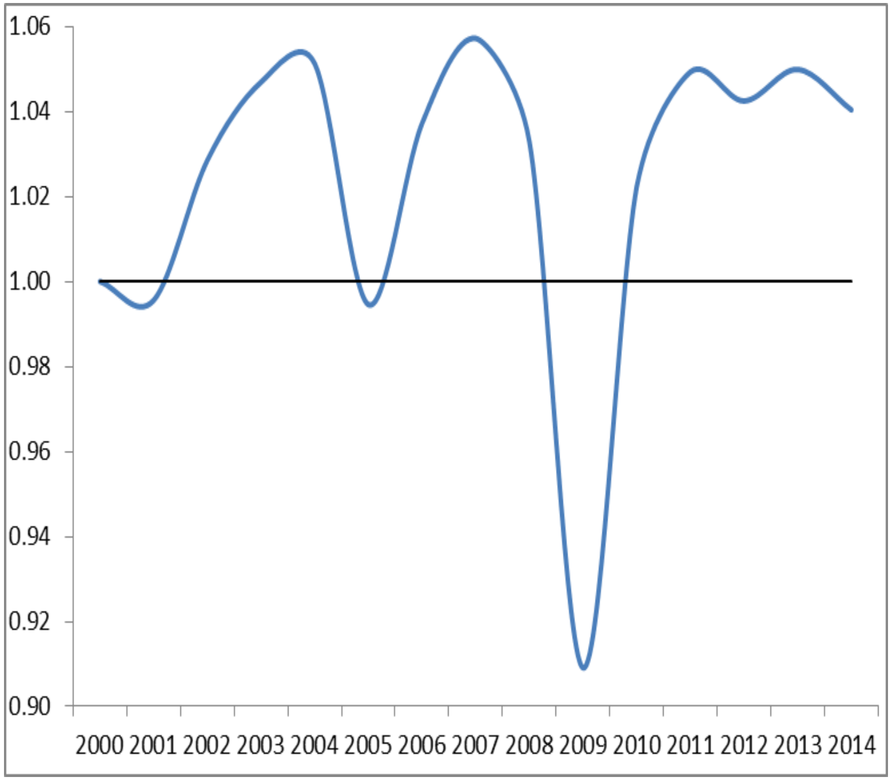
- Sections are up by 12% in 2014 vs 2000 to 43 Mt but rebar is up 35% to 85 Mt making the latter the largest steel construction product produced and consumed
- Subsequent to the economic crisis, the widening of the two products has increased and shows no signs of narrowing.

…and helping steel construction maintain its share relative to construction output in volume terms…

World exc. China : Real construction industry output vs long products construction volumes (2000=100)



World exc. China : Long products construction volumes / real construction industry output (2000=100)

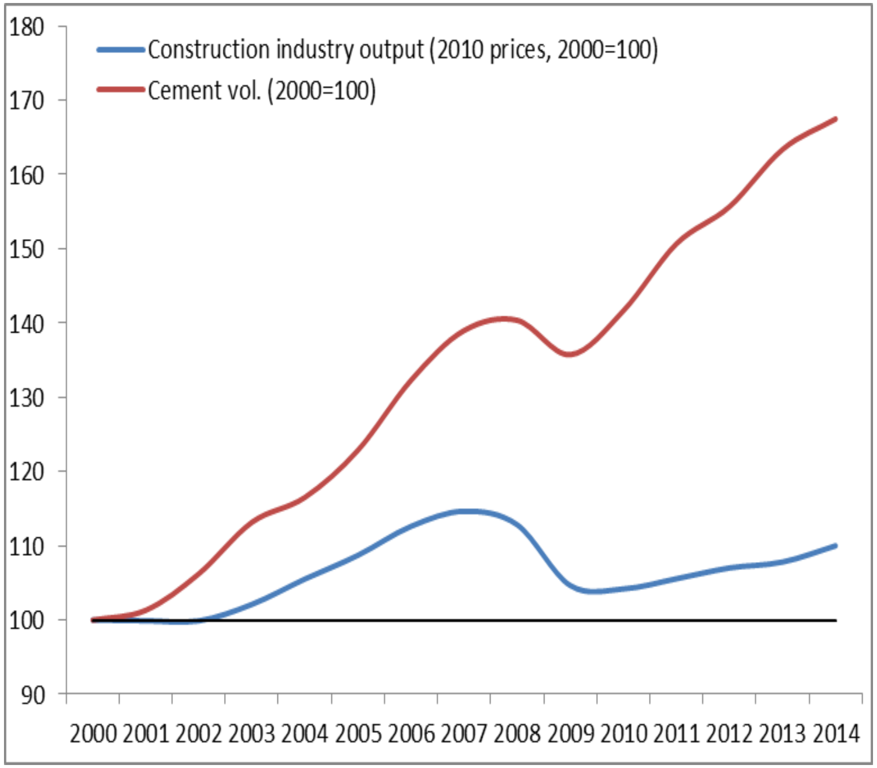


Source: *Worldsteel, IHS global insight*

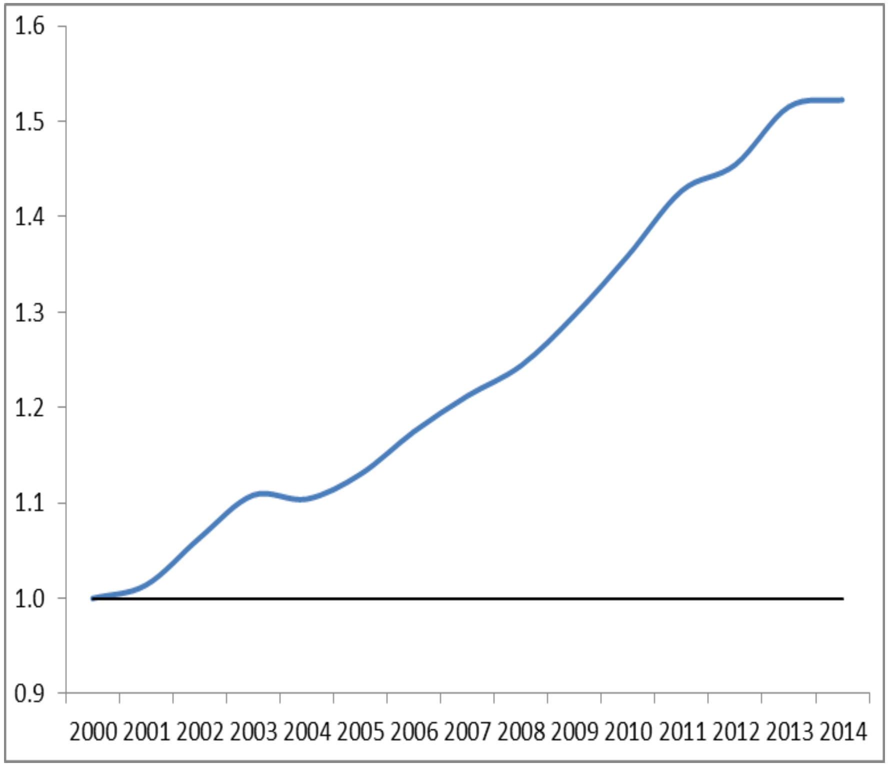
- Historically, long products construction <u>volume</u> has followed the trend in construction industry output <u>volume</u> meaning that the intensity of use has remained unchanged

Cement volume has seen strong growth relative to construction volume…

World exc. China : Real construction industry output vs cement volume (2000=100)



World exc. China : Cement volume / real construction industry output (2000=100)

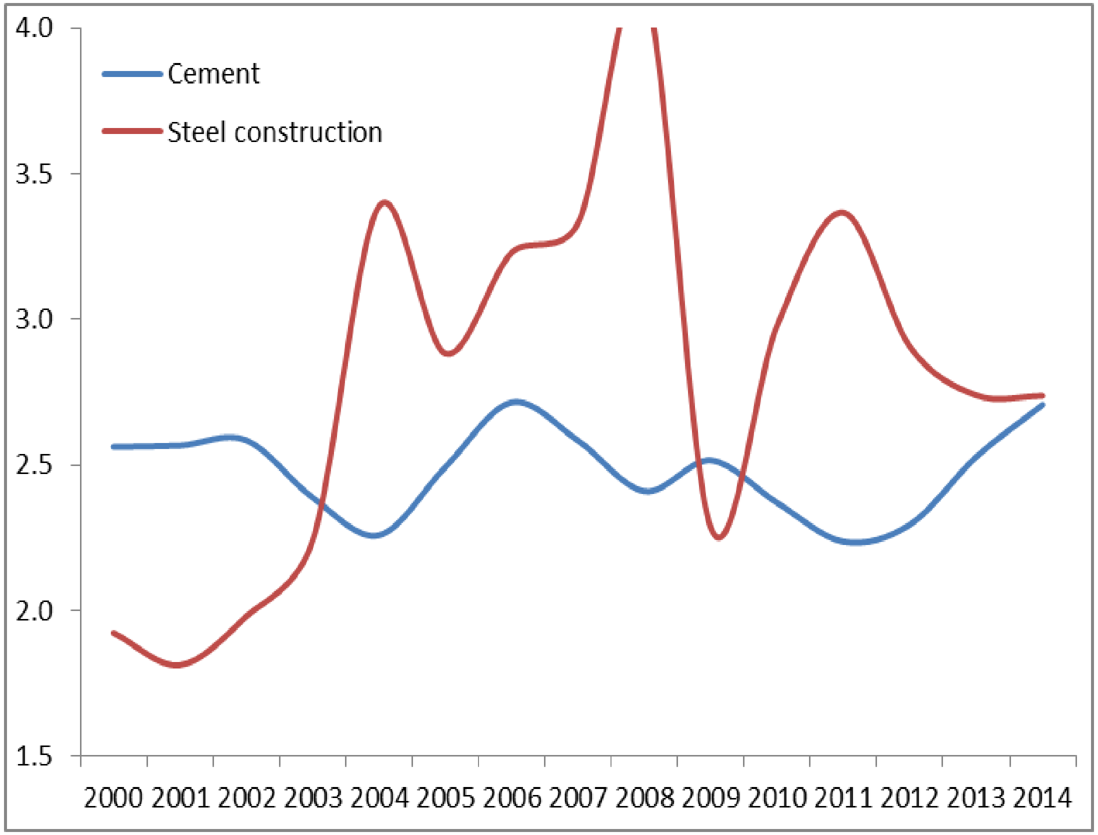


Source: *CEMBUREAU, IHS global insight*

- Historically, cement volume growth has outpaced construction output volume growth meaning that unlike in steel construction, the intensity of cement per unit of construction has surged.

…meaning that unlike steel construction, cement is gaining an increasing share in the construction value chain

World exc. China : Cement vs steel construction (% of nominal construction industry output)



Source: *worldsteel, CEMBUREAU*

- Cement's share in the construction value chain is increasing
- Steel construction commands a very small share of the construction industry

…helped by reduced promotional spending in Europe

Promotion spending per capita (euros)

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Germany	Structural steel	0.013	0.017	0.016	0.022	0.019	0.018	0.017	0.017	0.018	0.018	0.017
	Cement	0.252	0.348	0.329	0.430	0.388	0.362	0.349	0.349	0.369	0.369	0.334
	Timber											0.050
Holland	Structural steel	0.072	0.101	0.091	0.073	0.054	0.045	0.043	0.045	0.048	0.025	0.025
	Cement				0.484							0.295
	Timber											
Italy	Structural steel	0.019	0.018	0.015	0.018	0.012	0.010	0.010	0.011	0.011	0.011	0.011
	Cement*										0.017	
	Timber										0.079	

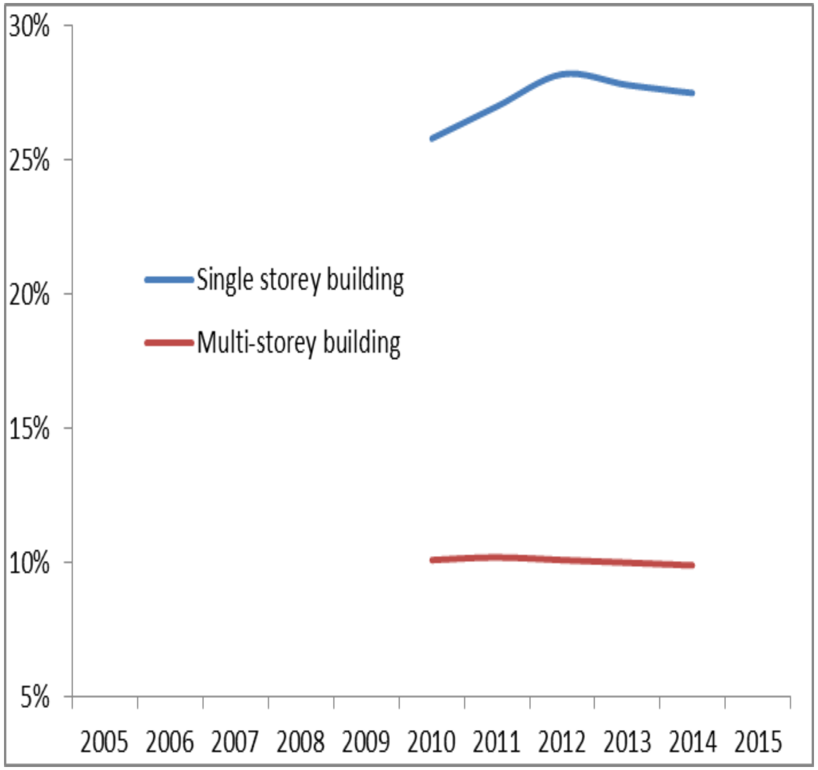
Source: *European Independent Promotional Organisations; Cement promotion spending in Germany & Holland is estimated*

* *Cement lobbying only*

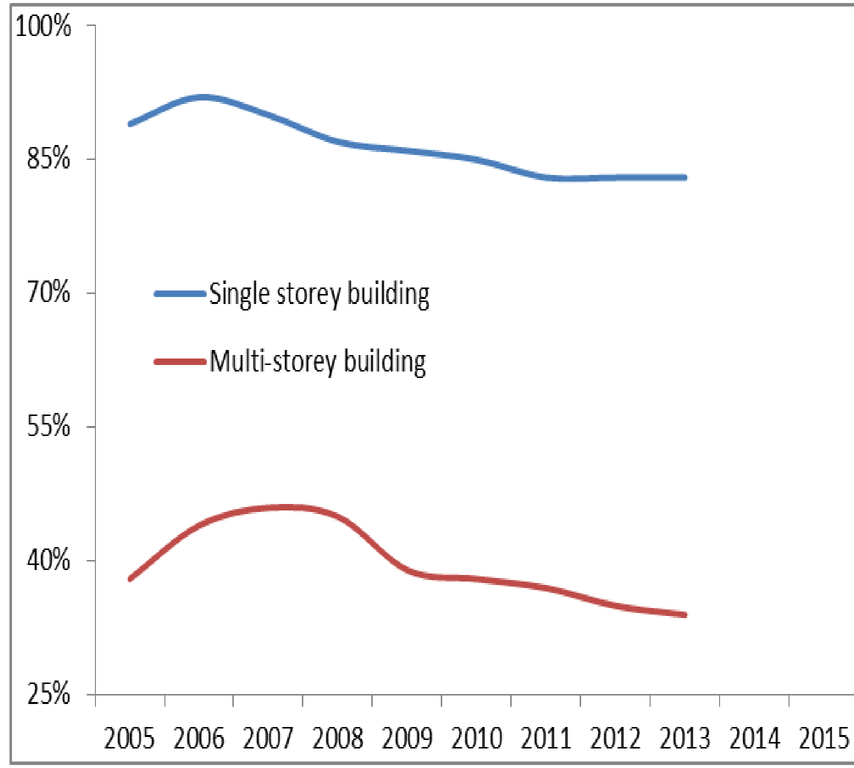
- On a per capita basis and compared to structural steel promotion, cement spending is 20 times in Germany; 7 times in Holland
- In Italy timber spends 7 times more on promotion vs structural steel. Cement spends 1.5 times more on lobbying only

…resulting in stagnant or declining structural steel market share in total floor area

Germany: Structural steel market share (% of floor area, commercial buildings)



Holland: Structural steel market share (% of floor area, commercial buildings)

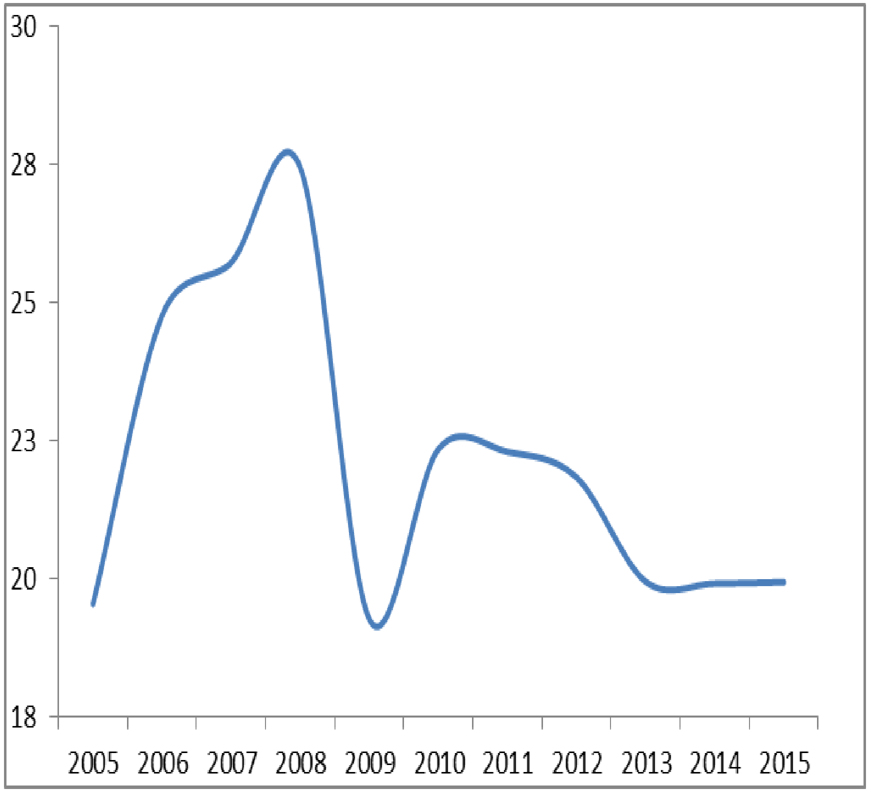


Source: *European Independent Promotional Organisations*

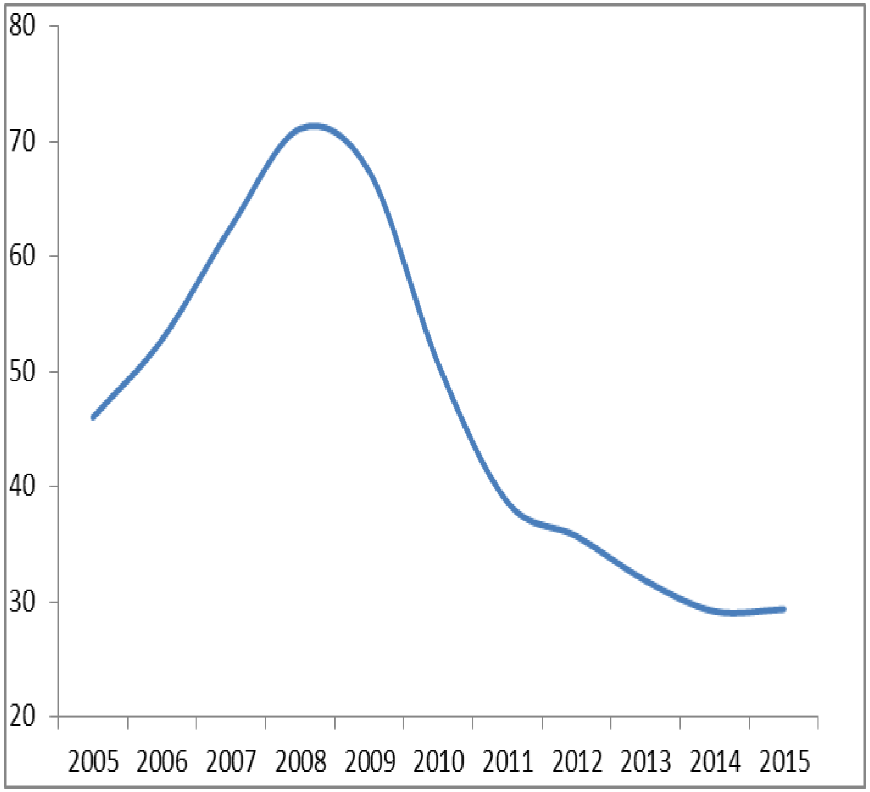
- Already low market shares in Germany are under further pressure
- In Holland declining market shares in both single & multiple storey is clearly evident

…and falling structural steel use per capita

Germany: Structural steel use per capita (kg)



Holland: Structural steel use per capita (kg)



Source: *European Independent Promotional Organisations*

- In both countries the decline of structural steel use per capita has been greater than the decline in overall ASU per capita

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Construction faces a complex decision making chain

Construction Decision Making Chain

	Regulators, EU and country Associations (Eurofer, ECCA, AIMCC,..)	Architects, Engineers	General Contractors	Steel customers (Profiles, panels) / Distribution	Contractors installers	Investors, End Users
FOCUS by stakeholder	Respect of norms & standards Sustainability	Product Performance Innovation Aesthetics Cost / Value range vs project specifications Efficient technical support	Extra price the end user is willing to pay Availability, lead times, OTIF on projects Product range	Cost / value Differentiation vs competitors Technical support Availability, lead times, stock, OTIF on projects Financial services	Availability, lead times, OTIF on projects Well designed systems	Guarantees, risks Product performances Aesthetics Cost / Value Total cost of ownership Reach Energy Targets / Green value
NEED	PREPARE - INFLUENCE	INFORM - FACILITATE	Inform & Convince			CONVINCE vs VALUE

Complex iterative decision making chain with important actors playing a crucial role <u>other</u> than steel consumers.

Global survey results: Constraints to using steel

- Awareness and understanding of building codes for steel design
- Other construction industries development has been extensive
- Lack of steel construction engineering knowledge
- Lack of skill in design, engineering and project management
- On site construction high skill level required
- Perceived high cost, corrosion issues, low fire resistance
- Steel industry insufficiently focused on construction
- Quality of steel products concern in developing countries (uncertainty)
- Steel products price volatility
- Customer expectations led by other building materials

Developing initiatives

National Steel Construction associations initiatives ranking 1-4 (4 - HIGHEST importance 1 - LOWEST importance)												
Grouping	Focus	Austria AT	Belgium BE	Germany DE	Italy IT	Holland NL	Norway N	Russia RU	Ukraine UA	United Kingdom UK	Arithmetic average	Initiatives to develop (>=65% or 2.6)
A Education & Knowledge transfer	1 Architects (professionals)	2	4	4	4	4	2	3	4	3	3.3	YES
	2 Architects (students)	2	2	3	4	3	4	2	3	1	2.7	YES
	3 Structural engineers (professionals)	1	4	3	4	4	4	4	3	3	3.3	YES
	4 Structural engineers (students)	1	2	3	4	3	4	2	2	2	2.6	
	5 Construction managers (professionals)	3	4	2	3	2	2	2	1	3	2.4	
	6 Construction managers (students)	2	1	3	3	1	2	2	1	1	1.8	
	7 Investors	4	4	2	4	3	1	3	4	2	3.0	YES
B Promotion	1 "European Steel Prize" as online platform for voting and	3	1	4	2	3	1	2	2	1	2.1	
	2 Supporting a positive image of steel in construction	1	3	3	4	4	4	2	4	2	3.0	YES
	3 Attracting bright young people to the steel construction sector	1	3	2	4	4	1	2	1	1	2.1	
	4 Architectural freedom and flexibility	2	4	2	1	2	1	2	1	3	2.0	
C Knowledge	1 Online Information Management with FAQ/Advisor Tool	3	3	4	4	4	1	3	2	1	2.8	YES
	2 Cost	1	4	3	4	2	3	4	4	4	3.2	YES
	3 Fire engineering	1	4	3	4	3	1	3	3	2	2.7	YES
	4 Corrosion protection	3	3	2	2	3	1	2	1	2	2.1	
	5 Seismic design	3	1	1	3	2	1	2	1	1	1.7	
	6 High end products e.g. high strength or new coatings	3	4	1	1	3	2	2	3	1	2.2	
	7 Renovation of existing buildings and structures	1	3	3	3	2	3	2	2	1	2.2	
	8 Circular economy	1	2	4	4	3	4	1	2	3	2.7	YES
	9 Design tools & apps	2	2	4	3	3	3	1	2	4	2.7	YES
D Standardisation	1 Short run: simplified design guides	2	3	4	4	3	2	1	1	1	2.3	
	2 Long run: harmonisation of Eurocode design rules	1	1	2	4	2	3	1	1	1	1.8	
E Technology	1 Industry standards for structures/connections	1	1	3	3	3	2	1	2	1	1.9	
	2 Industrialisation of fabrication - Industry 4.0	4	3	3	3	3	2	1	2	1	2.4	
	3 Digital planning and construction - BIM, EDI	1	3	4	4	3	3	1	2	2	2.6	
F Market development	1 Value chain breakdown	1	3	2	2	2	1	1	4	1	1.9	
	2 Development of segments:											
	i Single storey	4	3	3	3	4	1	1	2	3	2.7	YES
	ii Multi storey	1	4	4	3	3	3	4	4	4	3.3	YES
	iii Tertiary eg. Leisure	2	4	1	3	3	1	3	2	3	2.4	
	iv Infrastructure	1	2	2	4	2	3	1	2	3	2.2	

Source: *European Independent Promotional Organisations & USCC & APCC*

Summary of initiatives needed

- **Education & knowledge transfer**: Architects (professionals), Architects (students), Structural Engineers (professionals) and Investors;
- **Promotion**: Marketing campaigns, sponsoring;
- **Knowledge**: Online Information Management tool with FAQ; Cost Models; Fire Engineering; Circular Economy; Design Apps;
- **Market development**: Single & Multi Story, and Infrastructure, new and renewal
- **Standardization**: Short-run: Simplified Design Codes;
- **Technology**: Digital Planning & Construction: BIM modelling;

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Worldsteel work plan (via national construction associations)

1. Information analytics
   - Statistics collection – collect & invest in statistics measuring steel (by product) in construction (by end use) **(USCC)***
2. Promotion (initialy structural steel)
   - Ease of use in structural steel- project started in Germany which uses 20% of eurocodes to address 80% of the market
   - Frequently asked question tool (FAQ) – each country in Europe creates its own FAQ tool on relevant topics (e.g. acoustic, fire, seismic)
   - Education & training- bachelor & masters courses in steel construction **(USCC)***
   - Regional steel award – in addition to current bridge award **(USCC)***
   - WorldSteelConstruct website –being developed as a central portal for steel construction information & to launch worldsteel initiatives **(USCC)***
   - East meets West conference – conference organized by worldsteel in Q2'2017 bringing steel construction stakeholders from West/East Europe together to promote business interests **(USCC)***
3. Capacity building
   - Support construction globally – put construction on the global agenda via international bodies e.g. World Economic Forum
   - Coalitions building – worldsteel plays role in creating bridges between CIS & W.Europe **(USCC)***
   - In-depth survey of the value chain (steel vs concrete) **(USCC)***
   - Undertake a study in the use of Light Gauge Steel Framing **(USCC)***

*** Involvement of Ukrainian Steel Construction Center (USCC) necessary**

Key takeaways

- The construction industry will remain the fastest growing steel using sector supported by population growth.
- Headline construction steel production is growing but strong intra material competition has displaced structural steel.
- EU steel producers have reduced support to steel construction associations while the cement industry has increased support.
- The role of the steel construction association is <u>very</u> important: there is a direct relationship between promotion & market share.
- Survey results indicate that more needs to be done along the steel construction value chain: promotion, education, statistics collection.
- Worldsteel is supporting via steel construction associations. Our role is to provide the framework for coordination & financially support initiatives.
- In 2017 worldsteel will undertake an evaluation of the Light Gauge market and study in greater detail the construction value chain.

Thank you for your attention.

For further information contact:

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worldsteel
ASSOCIATION

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