

Understanding the Chinese Steel Sector

Miss New Zealand



Threats and Opportunities

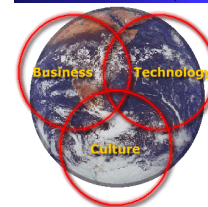
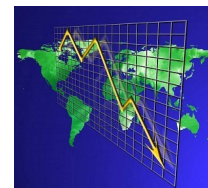
Daniel Pillai – AWI Group

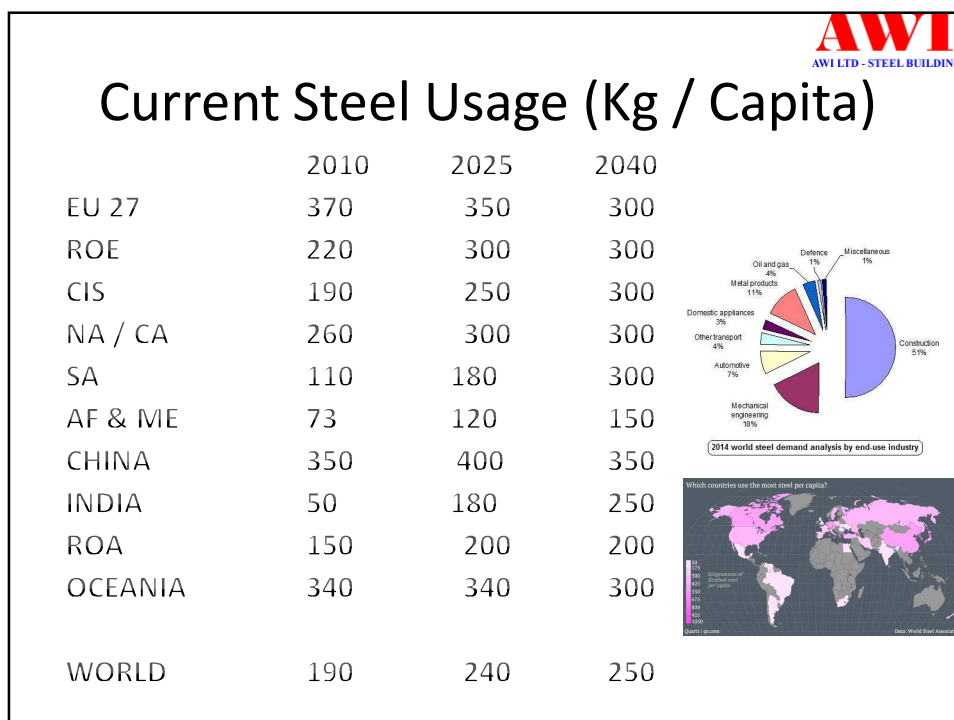
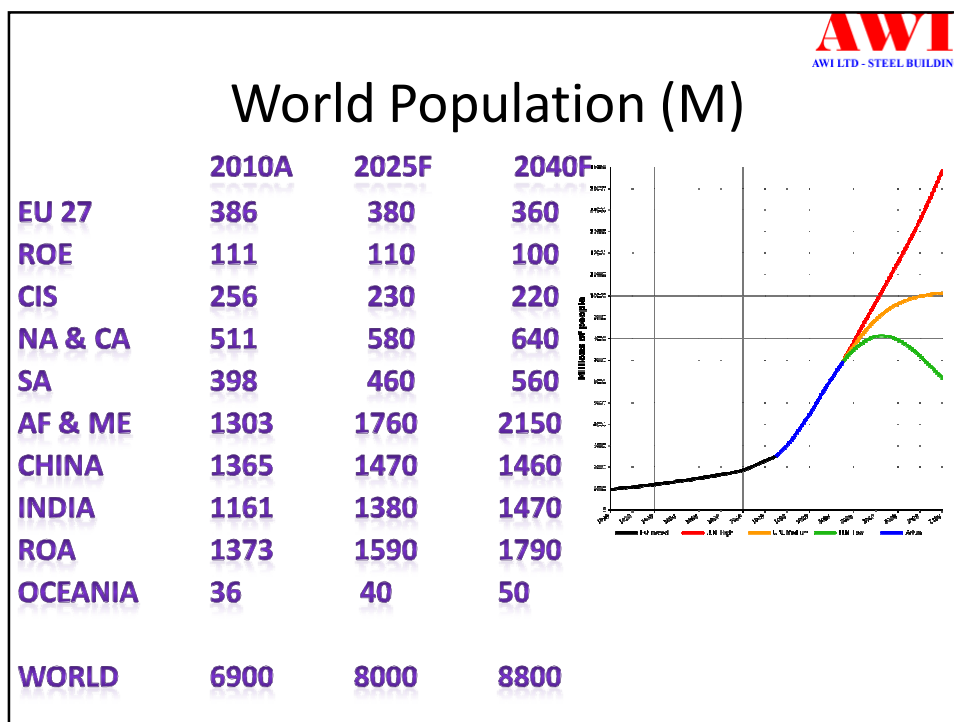
Miss China



Structural Steel and the Economy

- Structural Steel is in the investment sector of the economy.
- Peaks and troughs in demand, repetitive & exaggerated and through generations.
- Globalisation and & flight of money :
changing the way how steel is traded and structural steel and steel transacted.
- Regulations, Sustainability and social conscience matter.
- What are the opportunities.
- How some companies and countries / regions are shaping the the way ahead to raise standards, create level playing field while delivering value to the purchasers and users and capturing added value within their offerings to help combat the threat of cheap offerings.





Elasticity of Steel Utilisation

Steel consumption

Growth at a higher rate than the world economy's GDP due to high elasticity in steel utilization in developing economies.



Future Steel Demand (MT)

	2010	2025	2040
EU 27	143	133	108
ROE	24	33	30
CIS	48	57	66
NA / CA	130	174	192
SA	43	83	168
AF & ME	152	264	387
CHINA	478	588	584
INDIA	58	248	294
ROA	206	318	358
OCEANIA	12	14	17
WORLD	1311	1912	2204
		+46%	+68%

Assumptions

- No major catastrophes ??
- No major substitution for steel - Graphine ??
- More efficient use of steel. Higher grades and better designs will counter some of the volume increases. Necessary to avoid resource depletion
- Sustainability achieved and global warming at bay.





Steel Making vs Structural Steel Fabrication

Global consolidation in steel making: Driven by fear of take overs and the theory that size matters for large capital intensive businesses ????

- Arcelor Mittal grown organically and by acquisition
- Tata Steel – Corus, Nat Steel
- Thiessen in Brazil
- Bluescope all over Asia
- Fabrication is generally much more local and fragmented with minor exceptions.



World top ten steel exporters & importers

Million tonnes

EXPORT			
Position 2014	2013	2014	% change 2014 on 2013
1 China	57.8	88.6	53
2 Japan	42.1	40.9	-3
3 EU	34.9	35.	21
4 S Korea	28.1	31.1	11
5 Russia	23.5	26.7	14
6 Ukraine	24.6	21.4	- 13
7 Turkey	17.0	15.9	- 7
8 Taiwan	11.3	11.8	5
9 USA	11.8	11.2	-5
10 Brazil	8.0	9.7	21
Other	35.9	28.7	-20
Total	295.1	321.	29





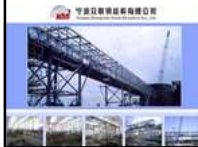
- Sharp slowdown in Chinese economic growth, their steel industry has been left with excess capacity – estimated at around 200 million tonnes, which is larger than the entire output of the EU.
- This in turn has resulted in markets around the world being flooded with cheap Chinese exports. Last year alone, China's total exports grew by 53%.
- Since 2009, their exports have soared by over 300%. To put this in context, at 90 million tonnes,
- China's 2014 exports exceeded the combined output of the UK, Germany, France and Spain.

Source UK Annual Steel Review 2015

Importing / Exporting Steelwork



- 15 -20 years ago AWI exported 50% of UK production worldwide.
- By 2003 importing into EU from China.
- While the export dried up, importing into EU from China and other low cost economies remains very small.
- 'Exporting' within economic zones is more common. Justifying the benefits of economic zones or the success of their 'walling in' policies.
- Exceptions: Very large and complex projects with very high labor content and long lead in. Worth mobilizing for all parties.
- Smaller captive markets where importing works better as there are no real local alternatives. Iceland and Baltics.
- Why is this? What can we learn from this?



The UK Market The lessons learnt



- Current estimated UK capacity – **1,000,000 tonnes**
- Total UK production of constructional steelwork – **848,000 tonnes**

Some of UK output is shipped to EU and some exported but it is a very small amount

This means import including EU is about 25%

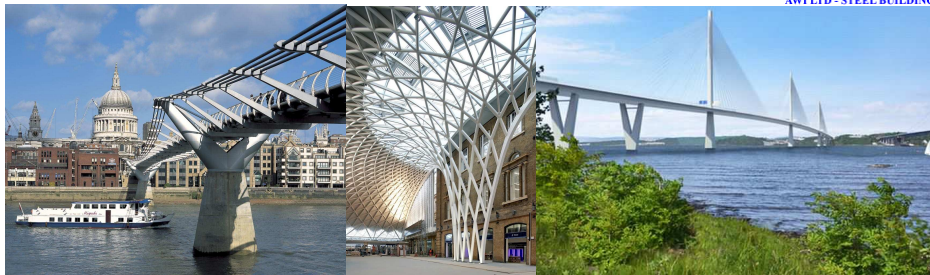
Source: BCSA



UK Market: The case



- Very efficient in design and fabrication
- Design specification around BS sections.
- Volume justifies automation and efficient throughput
- 5-6 man hours per tonne for portal frames from sections and 3 -5 hours per tonne for beam and column frames. AWI China factory 30- 40 hours per tonne for heavier sections and 40 -60 hours for light sections. Product less standard.
- Fast lead times from mills and good range of stock means fast turnaround of projects.
- Good design and build capability within fabricators.
- Value engineering capability to deliver savings to client.
- Advanced composite floor slab and beam design and Fire engineering.
- Understanding of regulatory requirements compliments Design and Build capability.
- Tight control of costs and make a lot of it variable to ride the economic roller coaster
- This gives the UK fabricator an advantage.



Some these advantages are eroded in long lead time complex projects with high labor content and high value.

Major overseas fabricators can mobilise in partnership with local main contractors or consortiums to displace local fabricators (Millenium Bridge, Forth Road Bridge, Kings Cross Station are examples)

More than half of the steel to be used on the new Forth bridge will be made in China, with the balance coming from Poland and Spain.



The EU specification for structural steel explicitly states that it applies only to “non-alloy steels”. To qualify as “non-alloy”, a steel must comply with strict limits on the quantity of other metallic elements it contains. This “non-alloy” classification amongst other things ensures that the steel is readily weldable without the need to apply any special welding parameters

UK Steel warns about Chinese structural steels
Published: 06/03/2015

Ian Rodgers, Director of UK Steel, said: “For the past few months it has become increasingly clear that some imported steel plates and sections from China are being supplied into the UK market which are not fully compliant with the requirements of the relevant standard. This follows earlier warnings regarding potential quality issues affecting Chinese concrete reinforcement bars.”

Tata Steel recently made a case for anti dumping of pre painted steel.

What else is helping UK?



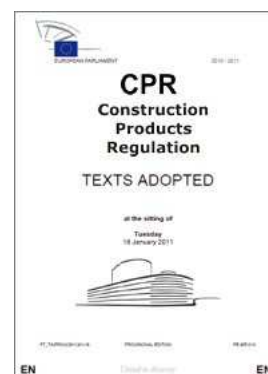
- Four pillars
- BES (triple bottom line)
- BREEAM
- EU marking (quality and level playing field, health and safety)
- EPD
- Battle against other material - Timber not always green, circular economy of steel.
- Thermal mass is a blunt instrument. Light weight building don't over heat if designed properly.

From 1st July 2013 it is legal requirement to CE Mark construction products that are covered by a harmonised standard (CE Marking standard) or a European Technical Assessment (an alternative CE marking procedure for proprietary products) that is in force.



Construction Products Regulation

- Places obligations on the supply chain
 - Manufacturer
 - Distributor
 - Importer
- Limited to products made in the 'factory'
- Does not apply to 'site based' activities
 - Erection
 - Concreting
 - Assembly
 - Modification



Construction Products Regulation

Article 4 of the Construction Products Regulation states:

‘Where a construction product is covered by a harmonised standard or a European Technical Assessment has been issued for it, the manufacturer shall draw up a declaration of performance when such a product is placed on the market.’

Products Covered by CE Marking

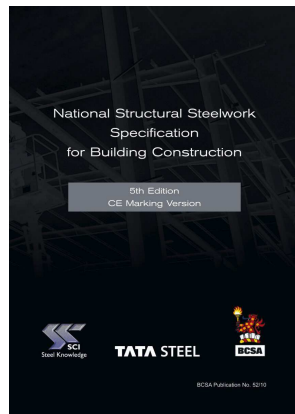


• **Recommendations for determining Execution Class are given in EN 1090-2.**

• **There are four Execution Classes:**

- Execution Class 1 (Farm Buildings) ‘Lowest’
- Execution Class 2 (Building, NSSS)
- Execution Class 3 (Bridges)
- Execution Class 4 (Special structures) ‘Highest’
(*extreme consequences of structural failure*)

BCSA Publications covering the works



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Choosing a Steelwork Contractor

Selection Process

- Identify the Execution Class (1 to 4) of the structure (Note Execution class can apply to the structure, detail and component).
- Building – Execution Class 2
- Bridges – Execution Class 3
- Select a steelwork contractor with CE Marking capabilities and the correct Execution Class.

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What makes up CE Certificate

CE Marking is supported by the following certificates:

- Declaration of Performance
- Issued by the manufacturer
- Based on the FPC certificate

- Factory Production Control Certificate
- Issued by a Notified Body

- Welding Certificate (BS EN 1090-1 only)
- Issued by a Notified Body



How has the fabrication industry responded?

BCSA Policy


- BCSA required all of its Members to be CE Marked by 1st July 2014


BCSA Categories

–Based on

- Competence (people and systems)
 - Physical capability (workshop)
 - Capacity
 - Financial resources
- Aligned to Execution Class









BCSA Categories - Buildings

EXC1

L – Architectural steelwork for staircases, balconies, canopies etc

S – Lighter fabrications including fire escapes, ladders and catwalks.





BCSA Categories - Buildings

EXC2

Q – Specialist fabrication services (e.g. Bending, cellular/castellated beams, plate girders)

J – Tubular steelwork where tubular construction forms a major part of the structure

K – Towers and masts

H – Large span trusswork (over 20m)

E – Large span portal frames (over 30m)

M – Frames for machinery, supports for plant and conveyors

G – Medium rise buildings (from 5 to 15 storeys)

F – Medium/small span portals (up to 30m) and low rise buildings (up to 4 storeys)

BCSA Categories - Buildings

EXC3

- C – Heavy industrial platework for plant structure, bunkers, hoppers, silos etc
- D – High rise buildings (office etc over 15 storeys)
- H – Large grandstands and stadia (over 5000 persons).

BCSA Categories - Bridges

EXC2

- RF – Bridge refurbishment
- FG – Footbridges and sign gantries

EXC3

- CM – Cable-supporting bridges (eg. Cable-stayed or suspension) and other major structures (eg 100 m span)
- BA – Bridges with stiffened complex platework (eg in desk, box girders or arch boxes)
- MB – Moving bridges
- TW – Bridges made principally from trusswork
- PG – Bridges made principally from plate girders.



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The BES 6001 Framework Standard for the Responsible Sourcing of Construction Products

The steel industry is lobbying hard to have this standard developed by the Building Research Institute adopted across the supply chain.




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What is responsible sourcing?

Responsible Sourcing is an ethos of supply chain management and product stewardship, encompassing and encouraging positive social, economic and environmental dimensions

Society	Economics	Environment
		



Environmental	Social	Economic
<ul style="list-style-type: none"> • Recyclability and recycled content • Renewability • Harvesting or extraction impacts • Greenhouse gas emissions • Energy usage • Water usage • Transport impacts • Biodiversity • Eco toxicity • Land remediation • Waste management 	<ul style="list-style-type: none"> • Workers conditions • Safe and healthy working conditions • Slave labour • Child labour • Fair wages • Working hours and holidays • Freedom to join trade unions (freedom of association) • Equality in respect of gender, ethnicity, religion, political persuasion • Complaints and prosecutions • Skills and training • Community relations 	<ul style="list-style-type: none"> • Contribution to the built environment • Ethical business practice • Contribution to diversity and stability of the local economy • Long-term financial viability



<h2>Responsible sourcing in construction</h2> <h3>Drivers</h3> <ul style="list-style-type: none"> • Increasing awareness and demand across professions and at home: • Timber: Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC) • Fisheries: Marine Stewardship Council • Food: Fairtrade, Rainforest Alliance etc
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Responsible sourcing in construction

Drivers

- Creating a level playing field
- the need for a generic responsible sourcing standard.
- Until recently there was limited scope for demonstrating Responsible sourcing performance outside the timber sector.

Responsible sourcing in construction

Drivers

- Industry-backed Government target that 25% of construction products be responsibly sourced by 2012 (Not far off the target)
- UK Contractors Group target that by 2015 75% will be sustainable and responsibly sourced



Requirements of BES 6001

Assessed against requirements within three categories:

- Organisational Management Requirements
- Supply Chain Management Requirements
- Environmental and Social Requirements

Some requirements are compulsory and all these must be met in order to

Additional points are awarded for voluntary performance beyond

Supply Chain Management Requirements (1)



Compulsory

- **60% constituent materials traceable** by BS EN ISO 9001
- Traceable constituent materials from supply chain organisations with **documented EMS**
- Constituent materials from supply chain organisations with **documented H&S management system**

Supply Chain Management Requirements (2)

Voluntary

- **75% or 90%** constituent materials traceable through the supply chain, typically by BS EN ISO 9001
- **60%, 75% or 90%** traceable constituent materials from supply chain organisations with certified EMS (eg BS EN ISO 14001)
- **60%, 75% or 90%** traceable constituent materials from supply chain organisations HAVING certified H&S management system (eg OHSAS 18001)



Environmental/Social Requirements

Compulsory with additional voluntary points from:

- Greenhouse gas emissions
- Resource use

Voluntary points from:

Waste management

- Water extraction
- Life Cycle Analysis
- Transport impacts
- Employment and skills
- Local communities
- Typical hierarchy:
- Policy and metrics
- Objectives and targets
- Reporting to stakeholders
- External verification

Key benefits of BES 6001 certification

Benefit 1

BES 6001 provides specifiers with a means for gaining credits within BREEAM and Code for Sustainable Homes.

Non-EU supply chain organisations

For supply chain organisations outside the EU, or from states not declaring adherence to the OECD Guidelines for Multinational Enterprises, BES 6001 requires that the client organisation undertakes risk assessments and due diligence to monitor compliance with the ILO Declaration on Fundamental Principles and Rights at Work.

- **Participation in the following schemes are considered appropriate to demonstrate this:**
- Ethical Trade Initiative
- UN Global Compact
- Certification to the SAI SA 8000 standard



Key benefits of BES 6001 certification
Benefit 2 - BES 6001 delivers competitive advantage and marketing opportunity for those businesses with certified products

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- All certified products carry the BRE Global Certification Mark
- Become more competitive to increase opportunities and prospects
- Make more informed decisions when selecting suppliers
- Improve overall social and environmental performance
- Gain access to schemes such as BREEAM and Code for Sustainable Homes

BREEAM
CODE FOR A SUSTAINABLE BUILT ENVIRONMENT
BRE GLOBAL

BREEAM (Avg 00)

Category	Percentage
Health & Wellbeing	15%
Management	12%
Transport	8%
Pollution	10%
Land & Ecology	10%
Construction Waste	7%
Materials	13%
Water	6%
Energy	19%

breeam
responsible sourcing
GB LISTED

THE CODE FOR SUSTAINABLE HOMES™

Excellent
Good
Average
Poor

SKANSKA

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Zero loss-making projects

Zero environmental incidents

Zero accidents

Zero ethical breaches

Zero defects

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<p>Vanilla: Construction progress or product performance is compliance with law, regulations, codes and standards</p>	<p>Green: Construction process or product performance is beyond compliance, but not yet at a point where what we construct and how we construct it can be considered to have near-zero impact</p>	<p>Deep Green: Construction process or product performance is future proofed - for example, it consumes zero net energy and produces zero waste</p>
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SKANSKA

Skanska sustainable procurement

Incorporating policies for:

- Supply Chain Health and Safety
- Equal Opportunity
- Supply Chain Integrity, diversity and inclusion
- Environmental and green sourcing
- Anti-Corruption

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China story

- Rapid growth since 90s and growth pain
- Many companies have got into it.
- Some with little experience
- Some good, some have built fantastic stuff
- Other have messed up big times. What is our experience?
- Check check and check all the way.
- Position QA inspector at fabricators place.
- Don't assume things will happen.
- It is can be a competitive source of good steel and structural steel

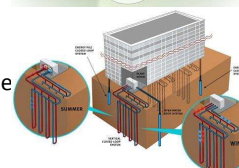
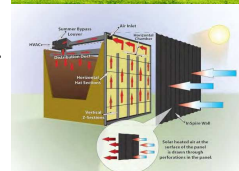


China Prices Ex Works						
1. Raw Material Supply						
No.	Item	Spec.	Grade	UOM	Rate	Remark
1.1	Steel plate	5mm~10mm	Q235B	T	¥3150~¥3500	Market price, valid with 5 days
1.2	Steel plate	15mm~30mm	Q235B	T	¥3000~¥3300	Market price, valid with 5 days
1.3	Steel plate	15mm~30mm	Q345B	T	¥3050~¥3530	Market price, valid with 5 days
1.4	Angles	5#~40#	Q235B	T	¥3100~¥3380	Market price, valid with 5 days
1.5	Channels	25*3~200*20	Q235B	T	¥3100~¥3380	Market price, valid with 5 days
1.6	HW/M/N sections	150mm~400mm	Q235B	T	¥3100~¥3350	Market price, valid with 5 days
1.7	HW/M/N sections	150mm~400mm	Q345B	T	¥3130~¥3530	Market price, valid with 5 days
1.8	HW/M/N sections	400mm~600mm	Q345B	T	¥3450~¥3650	Market price, valid with 5 days
2. Fabricated Steelwork						
2.1	Portal shed HR steel	Primer only, local epoxy coat 70um	Q235B	T	¥7,650.00	Baoliang's price, valid with 15 days
2.2	Medium-rise HR steel	Primer only, local epoxy coat 70um	Q345B	T	¥7450~¥7550	Baoliang's price, valid with 15 days
2.3	Stairs	Primer only, local epoxy coat 70um	Q235B	T	¥8,200.00	Baoliang's price, valid with 15 days
3. Other Items						
3.1	CR purlins and rails	≤1.6mm thick, Z275g/m2	Q345	T	¥4,300.00	Beststeel's price, valid with 7 days
3.2	CR purlins and rails	≥2.0mm thick, Z275g/m2	Q345	T	¥4,200.00	Beststeel's price, valid with 7 days
3.3	Steel decking	1.2mm thick, Z275g/m2	Q345	m2	¥59.50	Beststeel's price, valid with 7 days
3.4	Shipping 40ft GP container	CIF Shanghai to Auckland NZ		Ea	\$1,849	This price is valid with 15 days

What are future opportunities for structural steel

Sustainability and energy efficiency both in terms of embodied energy and operational Energy are key drivers.

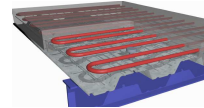
- Envelope first approach – Well insulated air tight buildings –
- Steel framed building systems and offsite construction offers huge potential.
- Use the steel envelope to actively capture the solar heat and power.
- Store the generated energy within the hollow structure or underground through steel piles
- Use steel deck / linings to dissipate heat instead of radiators.
- External surfaces to capture energy and internal surfaces to dissipate



Opportunities

Sustainability and the energy trilemma

- Off site construction and all its benefits
- Bring value into the factory
- Control quality, add value and deliver value
- Shortage of site skills
- Lightweight construction, reduce embodied energy.
- Energy generation, storage and dissipation.
- Make structural steel and the steel envelope to multi task. Create the space, define the market and deliver value and improve your profits and well and enjoy the journey too.
- Change does not need not be unpleasant. It is invigorating and will sort the men from the boys. The fittest are not the biggest and the strongest, it is the ones best able to adapt.
- The destination is going to be worth the effort too.



CARPE DIEM