The Future of Housing

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Future Factors:

- *Future Population & Housing*
- *Future Possible Expectations*
- *Future Demographic Changes*

- *Future Household Sizes*
- *Future Skills Workforce*
- *Future Methodologies*

- *Future Materials*
- *Future Technologies*

Technical Director Issues

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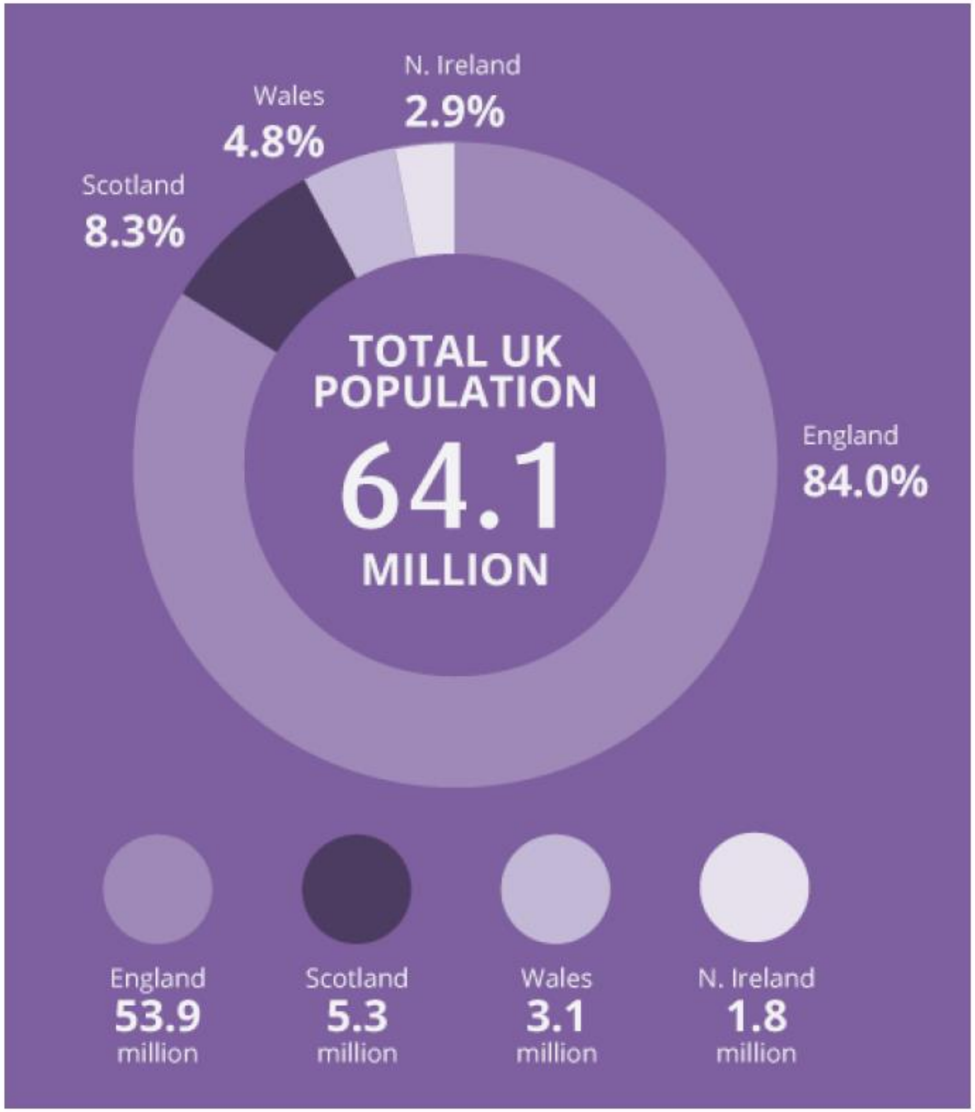

UK Population to increase to
74 million by 2037

=

9.5 million increase
4 million homes (2.37/home)
But current ratio already 2.1

=

4,523,810 (homes)

=

226,200 (homes per year)

+

(1.8 million households)
90,000 (homes per year)
=

316,200 per year

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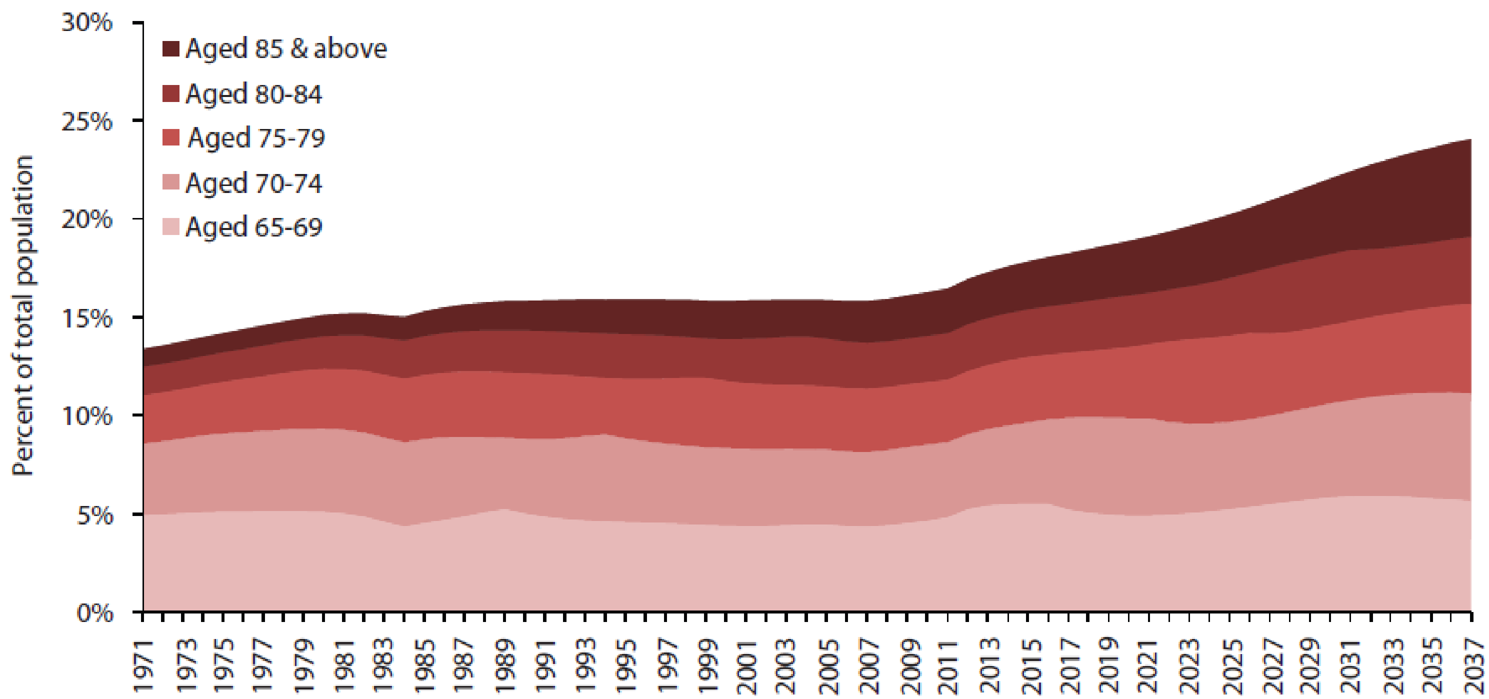

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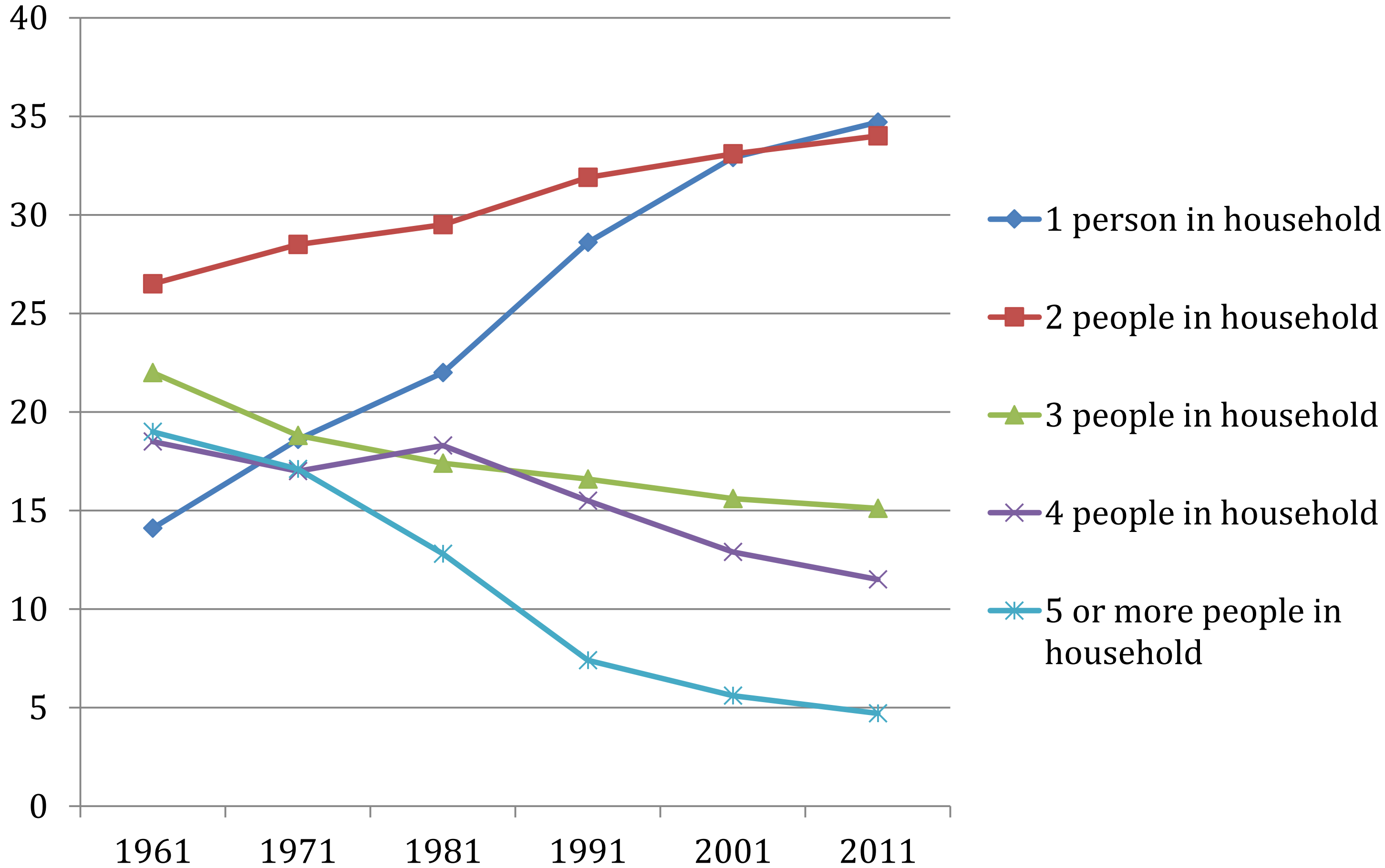

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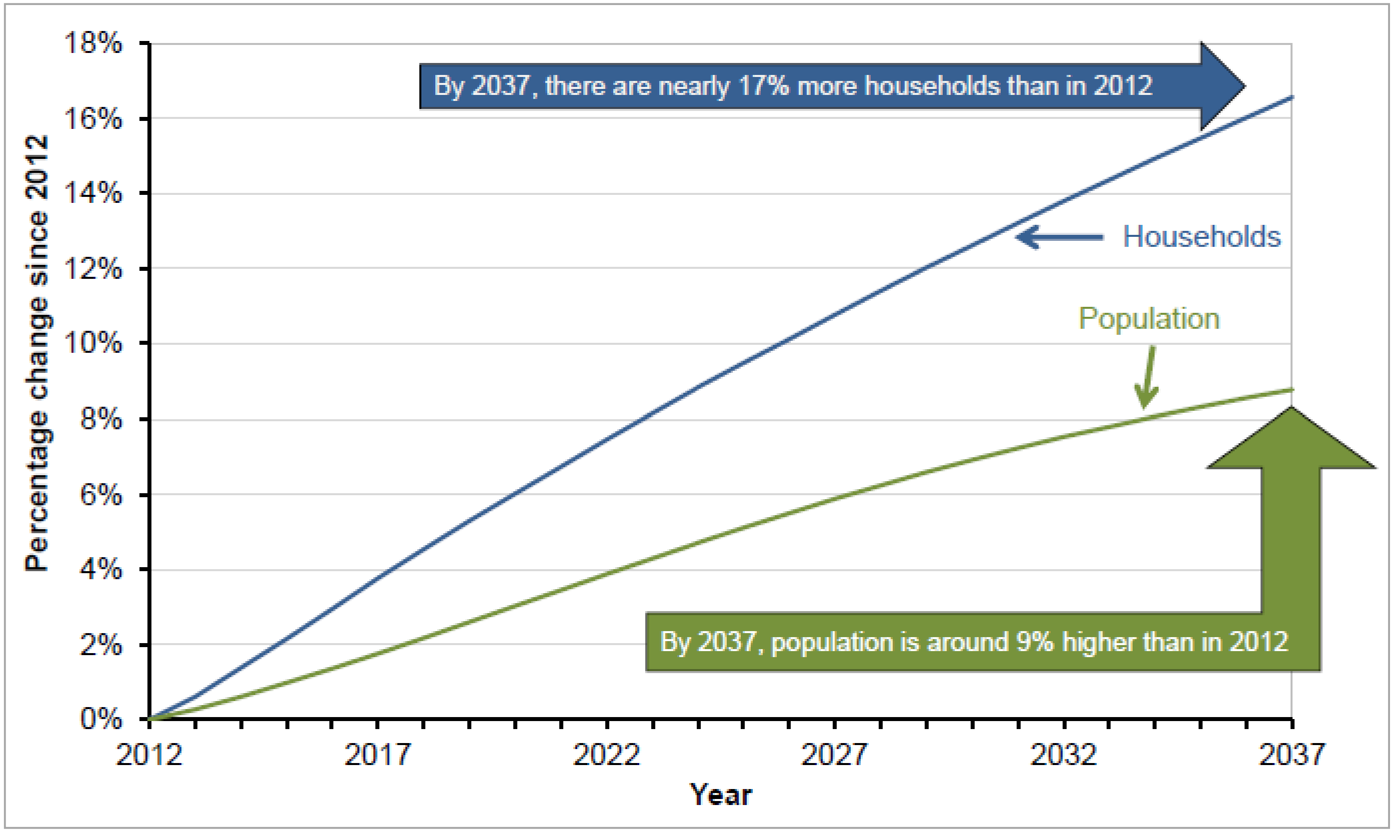

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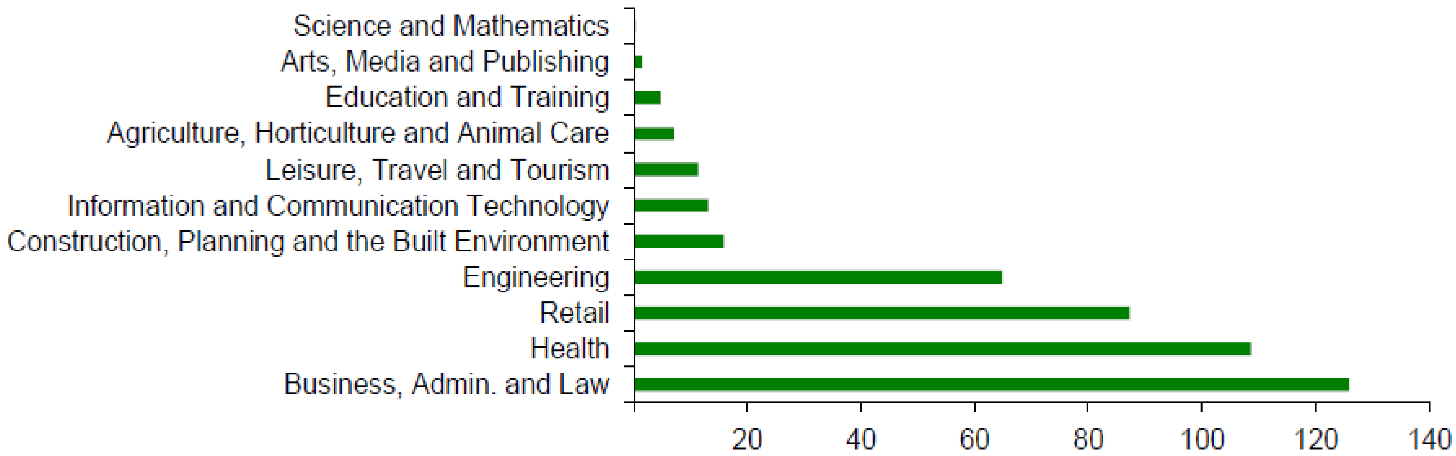
Apprenticeship starts by sector subject, thousands
England (2013/14)



Apprenticeship starts by sector subject area, thousands

	09/10	10/11	11/12	12/13	13/14	*14/15**	Change 2009/10 to 2013/14 Level	%
Business, Administration and Law	77	134	165	160	126	*66*	49	64%
Health, Public Services and Care	44	90	109	123	109	*56*	64	146%
Retail and Commercial Enterprise	62	103	108	101	87	*43*	26	42%
Engineering & Manufacturing Technologies	43	55	70	66	65	*46*	22	52%
Construction, Planning & Built Environment	21	22	14	14	16	*13*	-5	-23%
Information& Communication Technology	13	20	19	14	13	*13*	0	4%
Leisure, Travel and Tourism	15	22	20	14	11	*7*	-3	-23%
Agriculture, Horticulture and Animal Care	6	7	8	7	7	*7*	1	24%
Education and Training	1	4	8	8	5	*5*	4	452%
Arts, Media and Publishing	0	1	1	1	1	*1*	1	220%
Science and Mathematics	-	0	0	0	0	*0*	0	n/a

* Data for 2014/15 are for August to January only.

Cumulative loss of **22,000 (2011-2014)** not taking up CPBE apprenticeships

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Table 2.1: Construction employment by sub-sector 2008-2012

Sub-sector	2008	2009	2010	2011	2012	2013	Change	%
Specialised construction	93,200	82,200	69,800	80,000	66,100	80,300	-12,900	-14%
Construction of buildings	48,300	40,500	42,500	40,200	36,900	37,300	-11,000	-23%
Architectural and engineering	24,400	25,900	23,600	23,100	22,000	25,700	1,300	5%
Civil engineering	27,200	23,800	23,100	20,100	21,900	19,900	-7,300	-27%
Manufacture construction goods	14,200	12,500	10,600	11,800	12,200	10,400	-3,800	-27%
Retail of construction goods	5,100	4,300	5,000	4,100	5,100	4,700	-400	-8%

Source: Business Register and Employment Survey

Table 2.2: Business base by sub-sector

Sub-sector	2009	2010	2011	2012	2013	2014	Change	%
Specialised construction	12,790	12,615	12,335	12,710	12,535	12,685	-105	-1%
Architectural and engineering	4,460	4,560	4,685	5,140	5,515	7,050	2,590	58%
Construction of buildings	5,420	5,000	4,765	4,750	4,375	4,420	-1,000	-18%
Civil engineering	1,550	1,490	1,395	1,345	1,365	1,425	-125	-8%
Manufacture construction goods	790	775	740	760	750	755	-35	-4%
Retail of construction goods	455	455	455	450	465	470	15	3%
Total	25,465	24,895	24,375	25,155	25,005	26,801	10	2.0%

Source: Office of National Statistics, The Inter-Departmental Business Register

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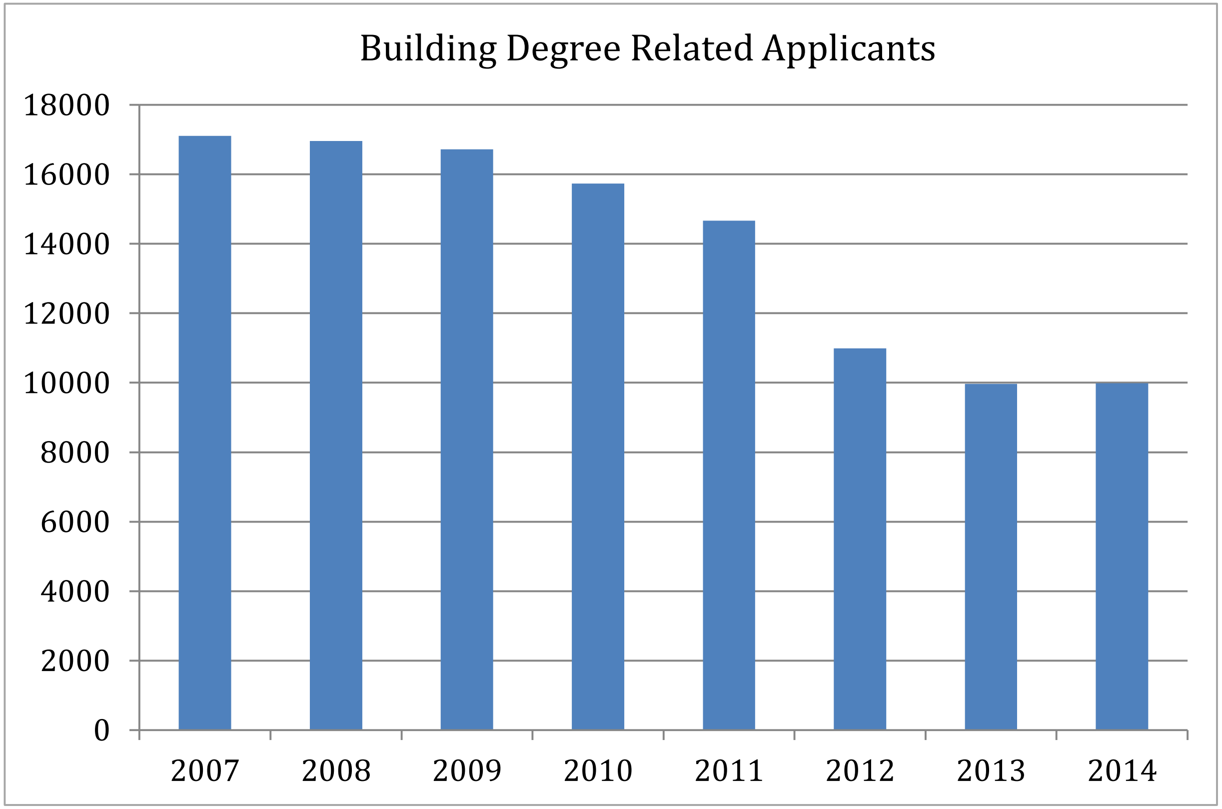
Subjects	2009/10	2010/11	2011/12	2012/13	2013/14	%
Surveying/Planning/ Development	122	105	111	92	80	-27%
Built Environment (general)	1,298	1,355	1,173	854	765	-39%
Building Design/Architecture	332	238	332	332	307	-7%
Construction (general)	11,455	9,759	8,230	7,132	6,716	-44%
Construction Management	208	206	212	350	322	56%
Building/Construction Operations	4,442	4,036	3,886	3,619	3,020	-29%
Building Services	3,063	2,459	2,225	2,039	2,170	-25%
Interior Design/Fitting/Decoration	786	646	659	652	553	-27%
Construction Site Work	472	595	503	363	199	-56%
Civil Engineering	767	636	556	502	509	-32%
Structural Engineering	56	44	36	43	44	-20%
Totals	**23,001**	**20,079**	**17,923**	**15,978**	**14,685**	**-35%**

Source: Scottish Funding Council Infact Database



Cumulative loss of **24,700 school leavers** since 2008 not entering the sector to study Building, Construction Management, QS, Surveying, Estate Management, Facilities Management and Project Management

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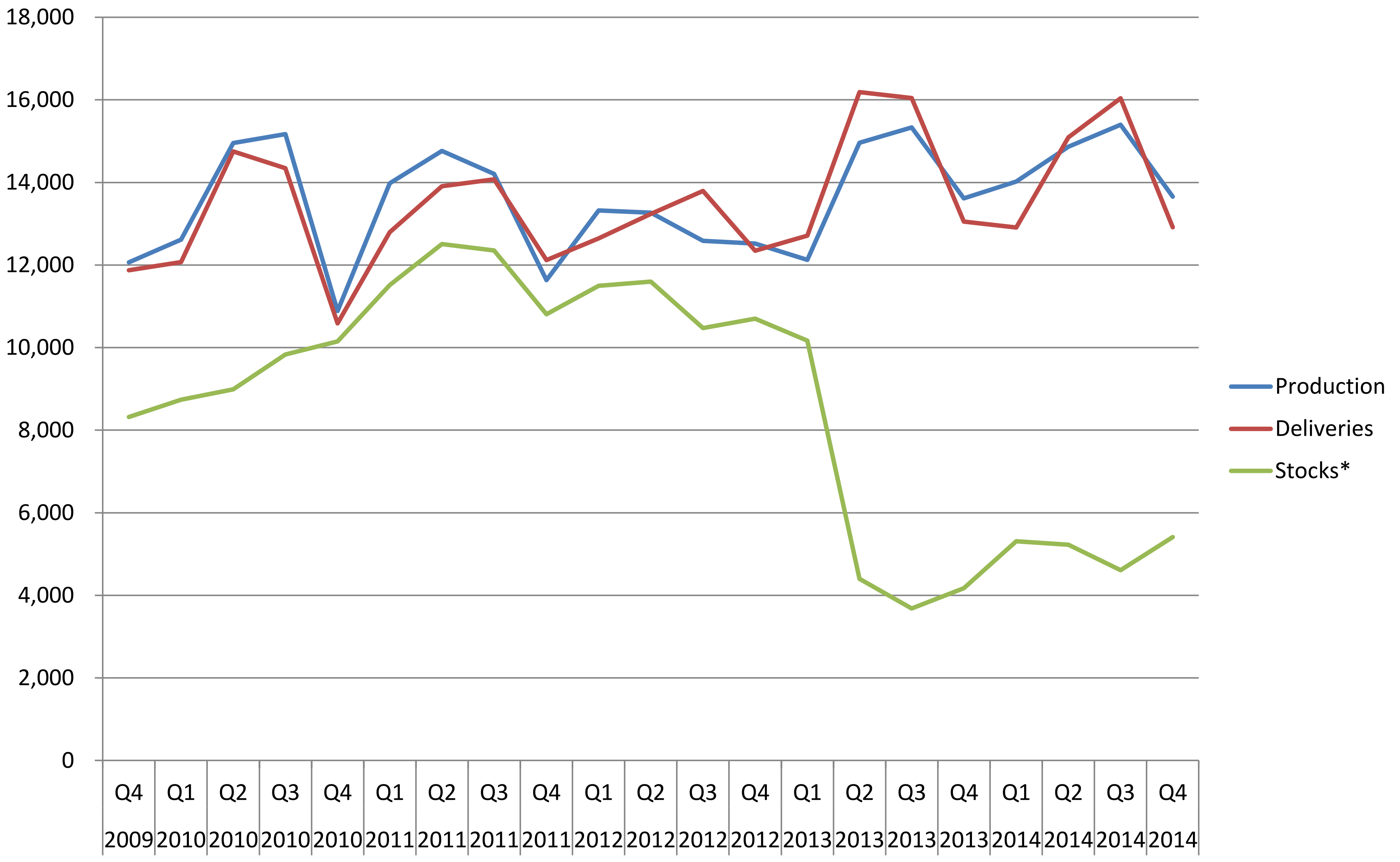
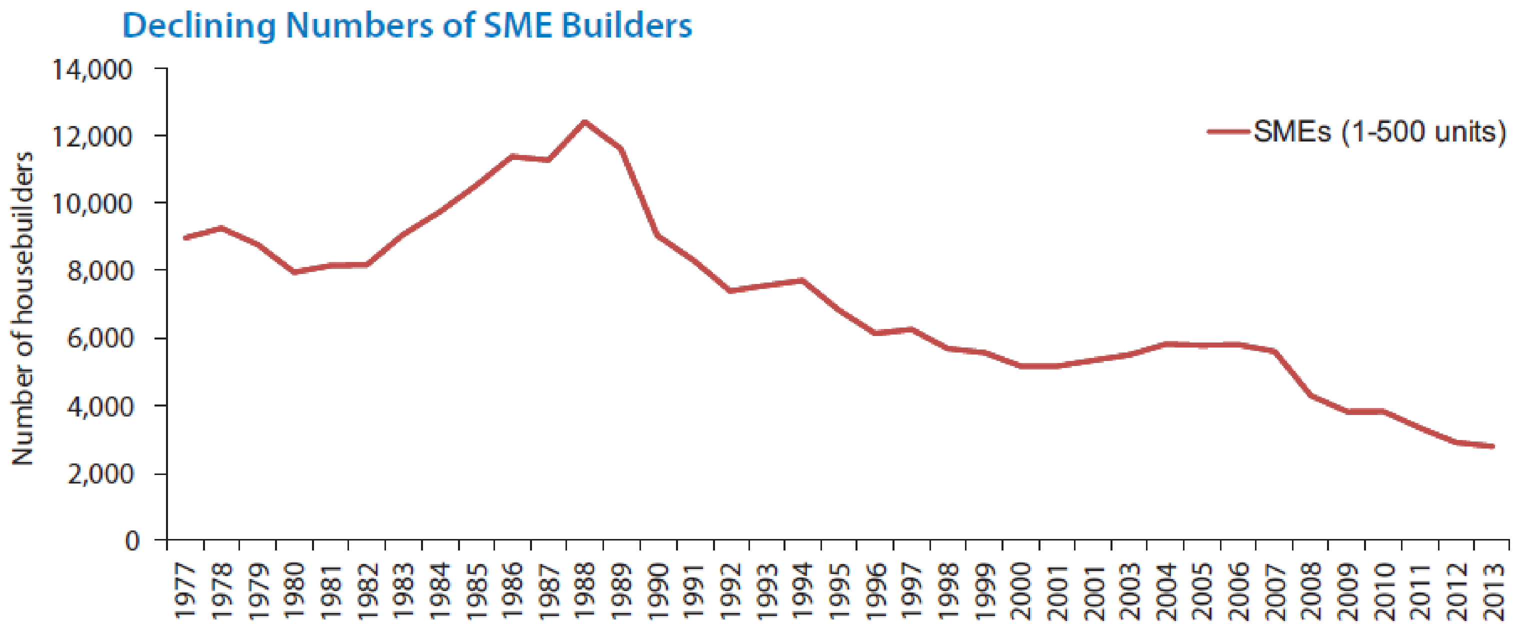
UK Block Manufacturing
(Thousand m^2)
BIS Statistics





Source: NHBC

Estimates of 7,600 dormant SME house builders

Drivers include:

- Costs to consultants and specialists for small applications
- Accessing finance and delays over build programme (e.g. materials, skills shortages)
- Costs of regulations and technical standards performance

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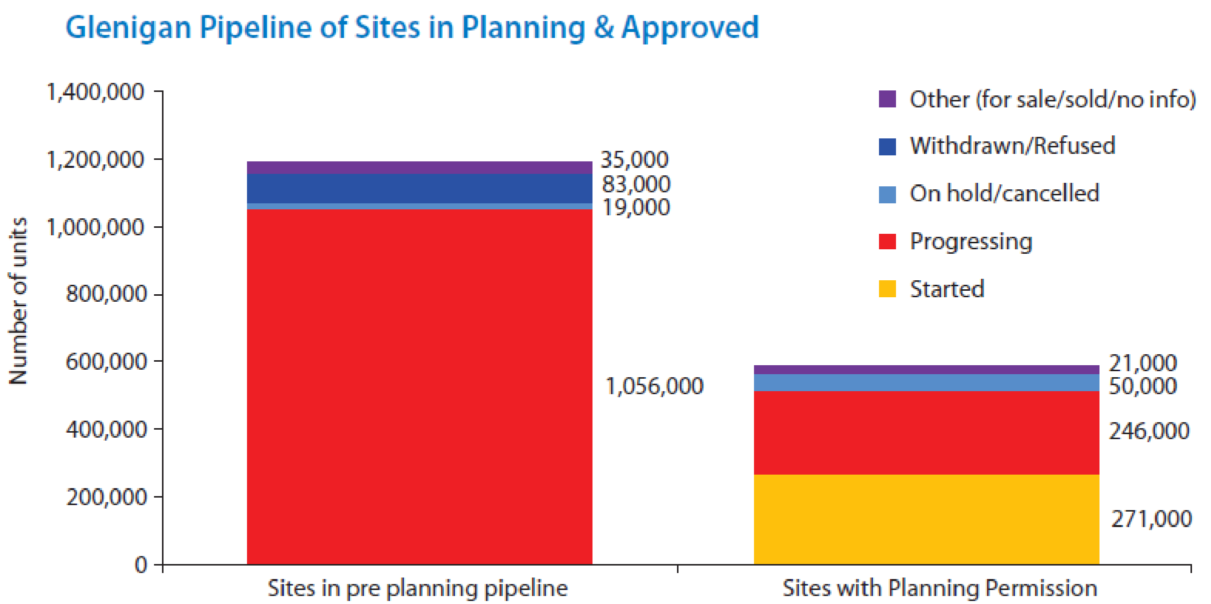
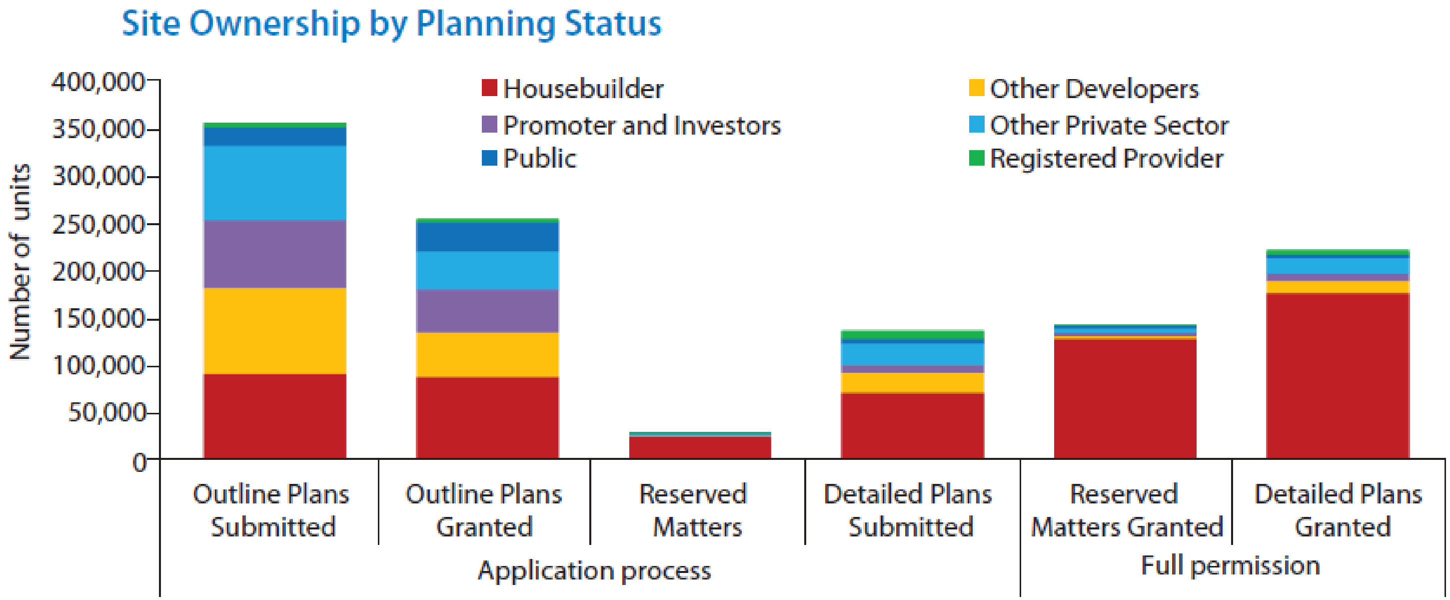


Source: Lyons Housing Review using Glenigan data



Source: Savills using Glenigan Data

Note the swing towards non-house builder plans being submitted

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UK Government land released

Sites now released for future housing

Potential for 103,000 homes

Gov depts:

- Ministry of Defence – enough land for 38,661 homes, released ahead of schedule
- Homes and Communities Agency – enough land for 18,307 homes
- Department of Health and NHS – enough land for 13,039 homes
- Department for Environment, Food and Rural Affairs – enough land for 11,675 homes
- London Legacy Development Corporation – enough land for 6,321 homes
- Department for Transport – enough land for 4,653 homes
- Public Corporations, such as Crown Estates – enough land for 4,113 homes
- Greater London Authority – enough land for 2,652 homes
- Ministry of Justice – enough land for 1,804 homes
- other smaller departments – enough land for 1,967 homes

- On top of this, there are plans to release land with capacity for 150,000 homes between 2015 and 2020

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UK – Retirement Residential Care

Residential Revenue	2011	2020	2030	2040
Public	964,637,690	1,957,310,722	3,018,903,170	4,426,904,755
Private	12,822,253,790	18,722,686,966	28,758,055,555	42,081,763,598
Total	**13,786,891,480**	**20,679,997,688**	**31,776,958,725**	**46,508,668,353**
Non-Residential Revenue	**2011**	**2020**	**2030**	**2040**
Public	5,527,026,212	8,278,478,551	12,627,195,819	17,074,876,558
Private	1,053,249,005	1,580,297,628	2,400,174,169	3,249,403,857
Total	**6,580,275,217**	**9,858,776,179**	**15,027,369,988**	**20,324,280,415**
Total Revenue	**2011**	**2020**	**2030**	**2040**
Public	6,491,663,903	10,235,789,273	15,646,098,988	21,501,781,314
Private	13,875,502,795	20,302,984,594	31,158,229,724	45,331,167,455
Total	**20,367,166,697**	**30,538,773,867**	**46,804,328,712**	**66,832,948,768**

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Changing Prices

Some Materials - 5 to 15% increase in last 12 months

Labour shortages

Oil prices – still likely to be low

New Materials / Systems / Technologies

Multi-function or dual function

Textiles & sensors

Intelligent House – Net of Things

Also……improving existing approaches

More & More energy POE and data being accessible by the consumer

Branding of energy performance

Some news home energy bills £500 to £1,100 savings versus existing homes

That's 2 – 5 years off a mortgage*

**dependent on initial value and energy prices*

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UK – Regulations / Standards - Energy

"The government does not intend to proceed with the zero carbon Allowable Solutions carbon offsetting scheme, or the proposed 2016 increase in on-site energy efficiency standards, but will keep energy efficiency standards under review, recognising that existing measures to increase energy efficiency of new buildings should be allowed time to become established"

Fixing the Foundations, HM Treasury, July 2015 (23)

- Reaching "Boundary limits" on fabric
- Target of 0.11 U-value seen by some as the "final" target
- Design (Not Equal) to Performance
- "Performance gap" – industry needs time to address

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Key Changes on route:

Source	Sector	Description	Target year for implementation 2016	2017	2018	2019	2020
EU	All Public Funded Projects	EU Procurement Reform Bill - increasing use of innovation, social and environmental measures	*ALL EU States to adopt (1)*				
UK	BIM UK	BIM level 2 UK Government funded infrastructure projects	(2a)				
Scotland	BIM Scotland	BIM Level 2 Scottish Government funded infrastructure projects		*Expected April 2017 (2b)*			
EU	Energy Public Buildings	ENERGY - EPBD (Energy Performance Buildings Directive 2010/31/EU), requires ALL PUBLIC Buildings newbuild and retrofit towards near zero energy buildings			(3a)		
EU	Energy All Buildings	ENERGY - EPBD (Energy Performance Buildings Directive 2010/31/EU), requires ALL newbuild and retrofit towards near zero energy buildings					(3b)
EU	Resource Efficiency	Resource Efficiency Directive - proposals info due in Autumn 2015					Linked to EU Strategy 2020 (4)

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- UK Offsite Sector (contribution) was valued approx **£1.25 billion** (2012)
- Forecast by others to increase to **£6 billion**

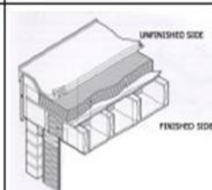
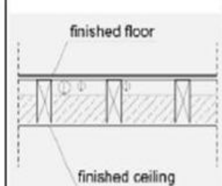
based on 7% of £90 billion sector

- Scottish Offsite Sector was valued at **£154 million** (2012)
- Industry anticipates this to grow to **£260 million** (2018)

based on manufacturing base alone

Anticipate more **Imported Offsite systems** entering UK market

- *Housing*
- *Care*
- *Schools*
- *Halls of Residence*

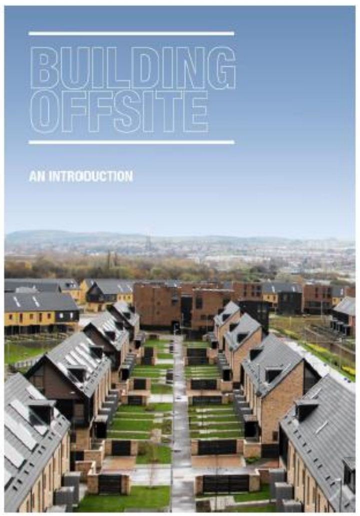
		CATEGORIES							
		2-D Elements						3-D Modules	
		walls		floors		Roofs			
SUBCATEGORIES	0		Uninsulated open panels: with first skin on only one side (e.g. OSB on one side of timber panels).		Uninsulated floor panels with decking only on one side and exposed joists/beams.		Uninsulated open panels: with first skin on only one side (e.g. OSB on one side of timber panels).		Uninsulated modules whose surfaces have first skin on only one side.
	1		Insulated open or closed panels without finished linings (e.g. SIPs).		Insulated floor panels without finishes.		Insulated open or closed panels without finished linings.		Insulated modules without finished linings.
	2		Insulated closed panels finished on one side (either internally or externally).		Insulated floor panels finished on one side (either upper or lower side).		Insulated closed panels finished on one side (either internally or externally).		Insulated modules with finished lining on one side (either internally or externally).
	3		Insulated closed panels fully finished internally and externally, with integration of services (i.e. with electrical and mechanical services, windows and doors).		Insulated floor panels fully finished on the upper and lower sides, with integration of services (i.e. with electrical and mechanical services).		Insulated closed panels fully finished internally and externally, with integration of services (i.e. with electrical and mechanical services, windows).		Modules fully finished on all sides, with integrated services (i.e. with electrical and mechanical services, windows and doors).

Edinburgh Napier UNIVERSITY

Centre for Offsite Construction & Innovative Structures

CONSTRUCTION SCOTLAND INNOVATION CENTRE

Offsite HUB



RIBA

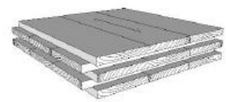
SaltireFoundation

THE UNIVERSITY OF UTAH

ITAC

CCG

CLT



heraldscotland


Company has ambition on Titanic scale

EPSRC

Engineering and Physical Sciences Research Council

TEKLA

A TRIMBLE COMPANY

UKCES

UK COMMISSION FOR EMPLOYMENT AND SKILLS

Offsite HUB

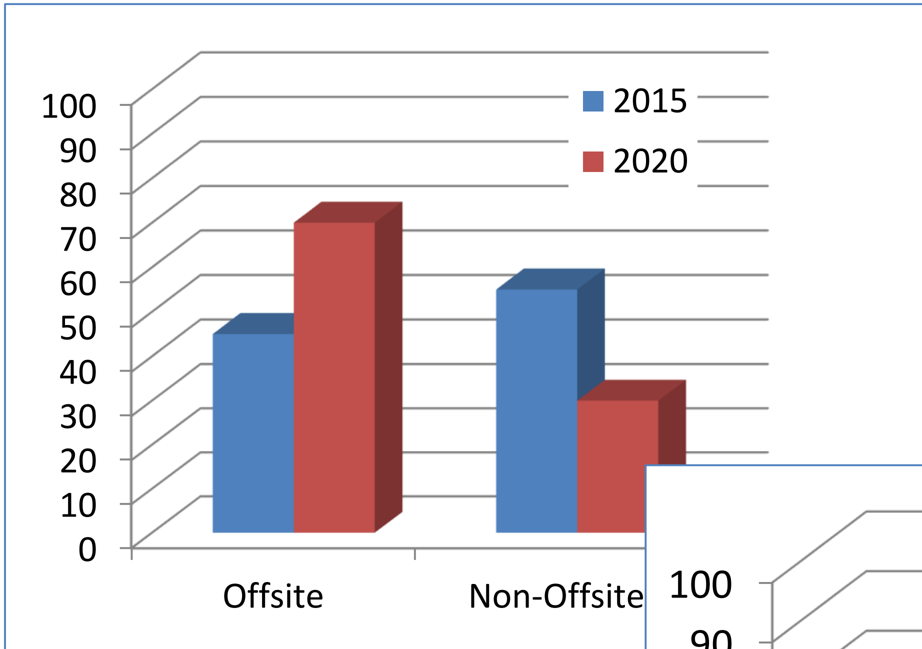
International

GREEN BUILD

INTERNATIONAL CONFERENCE AND EXPO

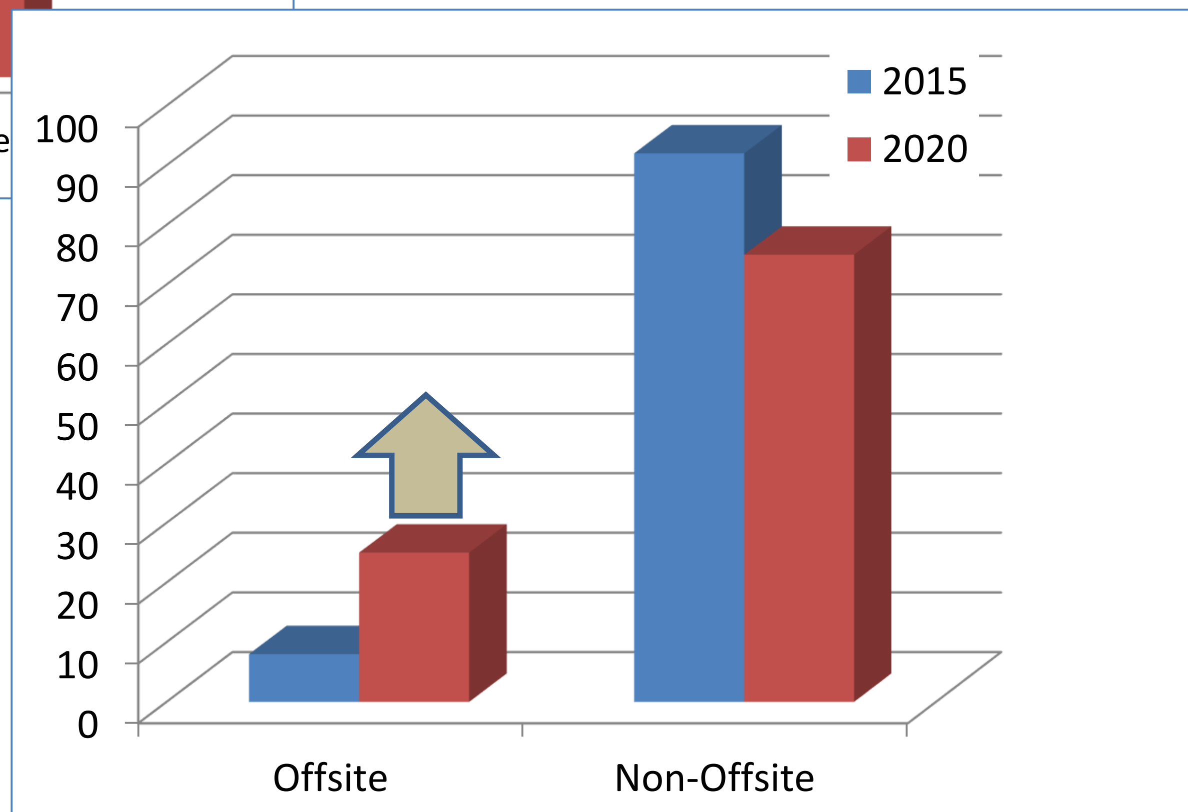
WASHINGTON, DC

2015



Scotland: 2015-2020

England: 2015-2020



PLOT RENEWAL

Process of identifying areas:

- very run down
- due for demolition
- or major brownfield regeneration

Key Outcomes

Reuse of plot
Gap fill between plots
Reuse of main services
Reuse of street/road infrastructure
Increases density of homes provided
Designed for local community needs
Designed for local household sizes
Accelerated Planning
Saves 25% to 35% in build costs

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construction scotland innovation centre

The VISION

CONSTRUCTION SCOTLAND

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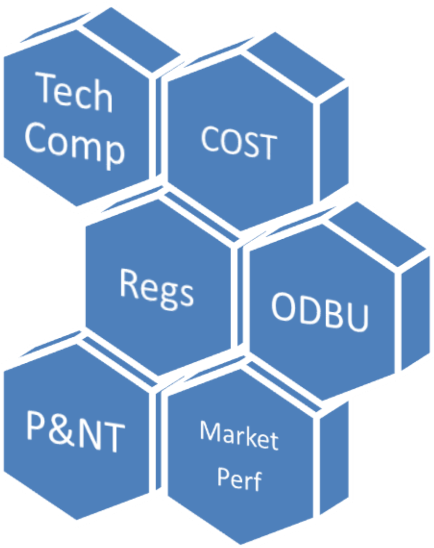
The NEED for innovation in construction

Construction Innovation Drivers

- Cost and Project Client Budgets
- Performance and Market Advantage
- Regulatory and Standards Requirements
- Operational Design, Build and Use
- Process and New Technologies
- Technical Compatibility



Regulatory Market Intelligence

CONSTRUCTION SCOTLAND

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Industry / HEI partnerships

5 Thematic Areas

- Design & Performance
- Advanced Construction
- Infrastructure
- Energy & ICT
- Environment

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Edinburgh Napier University
University of Strathclyde
The University of Edinburgh
UWS University of the West of Scotland
Robert Gordon University Aberdeen
The Glasgow School of Art
GCU Glasgow Caledonian University
Heriot Watt University
University of the Highlands and Islands
Oilthigh na Gàidhealtachd agus nan Eilean
University of Aberdeen
University of Dundee

Opportunities

BIM

- Growth in Offsite construction
- Demand side energy management
- New products from waste streams
- Resource Efficiency Directive (RED)
- Smart Technologies
- Tracking Innovation Centres
- Near zero carbon directions
- Building Information Modelling (BIM)

CHANGING TIMES: *Last week…..*

EU Court of Justice ruling on "start location/time of work"
Interlinked to EU Work Time Directive

Construction Staff Categories:

- Office based staff
- Site domain based staff
- Sub contractors (visiting multi-sites) with no official office/address domain as starting point
- Regional/Sales/Multi-site staff
- Transport / Deliveries / Imports / Site erection
- Offsite

Possible impacts:

- Increase cost of sub-contractors
- HR departments / Line managers being clear as to work location
- More localised sourcing of labour
- More offsite (higher value done off site)

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SUMMARY

Great to see the industry back in gear and moving forward

However:

- Skills shortages (54,000) not entered sector during last 4-5 years
- Competing with other sectors
- Consumer / client base more aware of performance factors

Future coming years:

- Branding of technical system may become a key feature
- Industry has time to improve fabric performance and overall performance for energy
- Watch the BIM “value” levels being set for public funded projects across the 4 nations

The Future of Housing

Create the legacy and contribute to attracting young people to the sector

Each one of us can play our part

Professor Sean Smith

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