ICE submission to Scotland's Construction Sector Inquiry

ICE is pleased to respond to this important inquiry into Scotland's construction sector. The sector is of significant importance to Scotland's wider economy. Ensuring access to finance, improving skills provision and procurement practices, whilst unlocking innovation across the sector are each critical in order that it is able to grow sustainably and support other industries across Scotland.

About ICE

Established in 1818 and with over 92,000 members worldwide, ICE is a leading source of expertise in infrastructure and engineering policy and is widely seen as the independent voice of infrastructure. ICE provides advice to all political parties and works with industry to ensure that civil engineering and construction remain major contributors to the UK economy.

Economic impact of the sector

1. How important is the construction sector in Scotland as an economic enabler? If possible, please provide evidence of knock-on multiplier impacts at local, regional and national levels, and explore the impact of the sector on national GDP performance.

The construction sector is a key plank in Scotland's economy. It employs over 186,000 people[1], with the most recently available figures highlighting that it represents approximately 6% of Scotland's overall economy.[2] During the third quarter of 2018 output from construction increased 2.7% on the previous three months, contributing 0.16 percentage points to GDP.[3]

2. What are the causes of the sector's productivity challenges? Can you suggest possible solutions?

Low levels of productivity in construction are not just damaging to the sector itself. As an enabling sector, there are direct links between the performance of construction and the potential for other parts of the Scottish economy to grow.

[1] ICE (2018) State of the Nation Scotland 2018: Infrastructure Investment
[2] Scottish Government (2018) Scotland's Gross Domestic Product, Quarter 3 2018
[3] Ibid

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Causal factors for low levels of productivity include lack of targeted investment in research and development, a culture of risk aversion, fragmented leadership and the prioritisation of performance measured by cost-driven outputs rather than wider socio-economic outcomes.[4]

The sector must do more to move away from traditional methods of procurement, whereby key contracts are frequently awarded based on lowest cost rather than the ability of bidders to address the causal factors outlined above. Regulatory frameworks that incentivise this change in behaviour are also required.

There is a pressing need for the sector to more effectively embrace digital transformation. This includes, the more effective use of smart technologies, along with data and analytics, to re-invent approaches to project delivery rather than simply digitising tried and tested methods. For example, technologies like AI and the Internet of Things will enable improved and more reliable decision making; reducing waste and improving key components of delivery across construction projects.

3. How effective is Scotland's construction supply chain? Explore areas of gaps, duplication, etc.

The traditional business models that underpin the construction sector have led to fragmented and unsustainable supply chain relationships. Transactional in their nature, these models have created a cycle of low capital reserves, poor margins and limited investment in skills right across the construction supply chain.

Working with the Infrastructure Client Group the ICE has developed a new approach to major project and programme delivery known as Project 13.[5] Based on a collaborative approach, Project 13 seeks to boost certainty and productivity in delivery, improve long-term value in operation and support a more sustainable, innovative and highly skilled industry.

4. What is the future economic outlook and implications of Brexit on the sector?

Brexit is causing widespread economic uncertainty in terms of the ongoing ability of the sector to attract foreign investment. As a consequence, there is also concern around the capacity of the sector to deliver the sustainable levels of output that fuel growth in other areas of the economy.

Recent research conducted by the Scottish Building Federation has highlighted that 57% of contractors are worried that Brexit will drive up labour costs.[6] It also highlighted the distinct possibility that large parts of the construction workforce in Scotland could relocate to London to take advantage of opportunities vacated by EU nationals. Such a scenario would likely stall a number of projects and programmes, with knock-on impacts for local growth and regeneration across Scotland.

[4] ICE (2017) State of the Nation 2017: Digital Transformation
[5] Infrastructure Client Group (2018) What is Project 13?
[6] The Construction Index (2018) Brexit fears deepen among Scottish construction employers

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5. The UK Industrial Strategy Challenge Fund and the linked Sector Deal for construction aim to address issues such as improving procurement practices, skills, exports and innovation. How do these impact on Scotland?

There are a range of opportunities associated with the UK Industrial Strategy Challenge Fund that organisations carrying out research and development in Scotland are eligible to bid into. Referred to as 'challenges' there is biddable funding available in the areas of transforming construction, manufacturing and future materials, plus smarter energy.[7]

UK Government and associated agencies, working with their Scottish counterparts, must do more to actively promote these opportunities in Scotland. Likewise, there is more work required to promote the aims and objectives of the Construction Sector Deal; specifically, in terms of how the sector in Scotland can benefit.

Access to finance

6. What are the sources of and barriers to accessing finance in the sector? We would welcome perspectives from all sizes of businesses from micro through to Tier 1.

Access to finance, particularly for SMEs, is often impeded by structural barriers such as the difficulty and cost of calculating the financial health of companies with a limited credit history. Evidence also suggests that, regardless of their size, construction companies struggle to access finance because there is a greater perceived risk of investing in projects associated with a low profit sector.[8]

A major concern for ICE and the sector more widely is that access to finance provided by the European Investment Bank (EIB) is lost following the UK's exit from the European Union (EU). The EIB, as an anchor investor, helps projects with risk profiles that might not appeal to other institutional investors reach financial close.

Scotland has benefited hugely from the EIB investing some €31.3bn in the UK economy between 2012 and 2016.[9] Specific construction projects that have received support include MeyGen phase 1B[10] and a £525m loan to support the development of the Beatrice offshore wind farm. However, since the EU referendum EIB finance to the UK has fallen dramatically – finance made available in 2017 was 72% less than that in 2016.[11]

[7] UKRI (2018) Industrial Strategy Challenge Fund
[8] House of Commons (2016) BEIS Select Committee, Access to Finance
[9] EIB (2018) United Kingdom and the EIB
[10] The next phase of the MeyGen tidal array, to be built adjacent to the existing 6MW MeyGen Phase 1A in the Pentland Firth, Scotland.
[11] EIB (2018) United Kingdom and the EIB

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The Scottish Government has already announced that it will setup a National Investment Bank to drive inclusive economic growth, with approximately £340m being set aside for 2019-21.[12] However, this does not mitigate the risk of a loss of UK access to the EIB. The optimal long-term outcome is that the construction sector in Scotland can continue to access EIB finance.

7. What are your views on payment terms and payment behaviours across the sector?

There is an improving trend in payment behaviours at the top end of the supply chain (in the UK as a whole), with faster payments being made to tier 1 contractors by government clients and other large infrastructure owners.[13] However, prompt payment further down the supply chain remains a significant challenge. As such, a culture of 'pay when paid' continues to cause cascade delays to payments and other associated contractual obligations.

8. How effective is the financial management of large scale infrastructure projects and the mechanisms used e.g. project bank accounts?

The financial management of large scale infrastructure projects continues to be challenging for the sector. Constrained profit margins remain a common feature amongst the largest tier 1 contractors, whilst a tendency for many large-scale projects to be procured on a fixed-price basis only serves to transfer risk to the supply chain; often leading to scope creep with insufficient contingency to accommodate such.[14]

Project bank accounts can improve the financial management of large scale infrastructure projects, but they are not a silver bullet.[15] They enable a better comprehension of actual costs as the accumulation and availability of funds is more transparent to client organisations. Likewise, determining funds as those belonging to a project rather than the primary/tier 1 contracting organisation itself, removes a potential barrier to faster payment.

However, on smaller projects, this type of accounting can be difficult to implement when there are conflicting financial reporting and corporate governance requirements in place.

Skills

9. Does the sector's skills planning model allow it to realise its full potential, in terms of attracting talent, meeting skill shortages, preparing for technological change?

Ensuring the provision of appropriate and relevant skills within the construction sector, whilst addressing shortages and the challenges that disruptive change poses, is an ongoing endeavor.

[12] ICE (2018) State of the Nation Scotland 2018: Infrastructure Investment
[13] ICE (2018) Government Construction Strategy – 2018 update
[14] ICE (2018) Where do Tier 1 contractors make their money?
[15] ICE (2018) Government Construction Strategy – 2018 update

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In 2018 the ICE undertook a skills review[16] to pinpoint what is needed to ensure that civil engineering and key associated professions continue to address the needs of the construction sector. The review concluded that more must be done to:

- Increase access to quality life-long learning opportunities to ensure the ongoing relevance and competence of civil engineers
- Boost technical skills across the sector in view of the growth of digital and automated technologies
- Ensure that people from non-engineering backgrounds are able to enter the profession and support the construction sector where there is greatest need
- Promote and embed soft skills at all levels of career development

This step change requires investment in training and development by employers, alongside greater collaboration between industry and academic partners, all geared at delivering a sustainable and targeted pipeline of construction skills.

10. How does Scotland's apprenticeship system contribute to the sector? Is it doing enough to meet equality challenges in the sector?

Latest Engineering UK figures reveal that there were 8,539 engineering-related modern apprenticeship starts in Scotland for the academic year 2015-16, which reflected growth of 6.8% based on the previous year.[17] There was only a negligible lag on England and Wales who saw growth of 7.4% and 7.8% respectively.[18] Of the total starts in Scotland it is encouraging that 3,487 were in construction stated roles, equating to over 50% of total engineering starts.[19]

However, female engineering-related starts in Scotland for the same period were only 324 equating to a mere 3.8% of total starts. In the context of other sectors where female representation was above 40%, this is particularly poor.[20] There is a pressing need to re-double efforts to improve gender representation in STEM education, so that there is a more balanced pipeline of talent coming through.

ICE supports the Scottish Government's Gender Balance project for schools, but this would be more ambitious if guided by specific targets, rather than simply aiming to 'significantly reduce' the gender gap in STEM learning by 2022.[21] More could also be done to highlight, support and emulate some of the excellent initiatives being run by educational organisations to address the issue. For example, the University of Strathclyde's summer engineering schools programmes for S3 girls studying in Scottish secondary schools.[22]

[16] ICE (2018) ICE Professional Skills – A Report by the Skills Review Group
[17] Engineering UK (2018) The state of engineering
[18] Engineering UK (2018) The state of engineering – synopsis and recommendations
[19] Engineering UK (2018) The state of engineering
[20] Ibid
[21] Scottish Government (2019) STEM - Education and Training Strategy for Scotland, First Annual Report
[22] University of Strathclyde (2019) Engineering the future for girls

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Procurement

11. How do public procurement practices and procedures impact on the sector?

Current procurement practices and procedures in the construction sector often fail to look beyond cost. This renders other important factors such as quality, sustainability, contribution to growth or innovation i.e. the wider socio-economic outcomes associated with a project(s) as second rate priorities.

The net outcome of this approach to procurement is a sector locked in a 'race to the bottom' on lowest price, which itself contributes to poor and stagnating profit margins. Indeed, average pre-tax profit margins for the top UK tier 1 contractors were -0.9% based on accounts filed at the end of 2018.[23]

12. Do you have any suggestions on opportunities to enhance procurement practices across the sector?

The Project 13 approach to procurement has the potential to drive improvements in behaviour. It puts forward a model whereby value appraisal is considered in terms of whole life cost, plus the wider outcomes and benefits of a given project.[24]

Procurement is a collaborative activity undertaken by an enterprise made up of each of the key stakeholders associated with a project, as opposed to a transactional process between client and chief contractor. The purpose is to ensure a more equitable distribution of risk from the outset, whilst putting in place appropriate incentives and rewards based on performance.[25]

The principles of Project 13 are already being trialed by six early adopters, which are: Anglian Water on their Capital Delivery Alliances programme; the Environment Agency's Next Generation Supplier Agreements; National Grid's London Power Tunnels; expansion at Heathrow; Network Rail's Track Alliances; and Sellafield.[26]

Infrastructure investment

13. Considering the national infrastructure construction pipeline, is the planned pipeline sufficient? And has the sector got to the ability to meet the country's infrastructure needs to drive growth?

Although in principle the National Infrastructure and Construction Pipeline covers the UK as a whole the majority of the investment that it details is concentrated in England; given that many areas of infrastructure policy are devolved matters.[27] However, as recent announcements have indicated the

[23] Construction News (2018) CN100 2018: The top 100 UK contractors
[24] ICE (2018) Project 13 Blueprint
[25] ICE (2018) Government Construction Strategy – 2018 update
[26] Infrastructure Client Group (2018) Early Adopters
[27] IPA (2018) Analysis of the National Infrastructure and Construction Pipeline

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scale of future investment in Scottish infrastructure is ambitious. These have included the appointment of an Infrastructure Commission to provide advice to Government on projects worth up to £7bn[28] and a commitment to boosting annual spending on infrastructure by £1.56bn by 2025-26.[29]

The ability of the sector to effectively deliver this level of investment is tied to the improvements that it must make itself and the stability of the wider economic environment in which it operates. As detailed in this submission that includes unlocking better approaches to procurement, ensuring the appropriate provision of skills, the availability of finance and the resilience of the sector to the uncertainty created by Brexit.

Innovation

14. What are your views on the Construction Scotland Innovation Centre?

The Construction Scotland Innovation Centre (CSIC) is performing an important role both in terms of developing its own projects and in bringing together key parts of the construction sector to collaborate on innovative approaches and technologies that can have a transformational impact. It also provides a valuable platform for showcasing advances that are being made in innovation more widely; thus, encouraging effective knowledge transfer. There is an onus on the sector (including the supply chain, professional and trade bodies) to better promote the work of the CSCI so that all players, large and small, can contribute and benefit from the work that is taking place.

15. Where are the opportunities for growth within sub-sectors, e.g. offsite construction?

As the sector is increasingly challenged to improve its own performance – in terms of balancing the out-turn costs of projects against the delivery of wider socio-economic outcomes, investing in skills development, mitigating the impact of the sector on the environment – it is critical that growth in innovative sub-sectors is leveraged.

There are a range of opportunities for construction to achieve these outcomes in the development of effective use of technologies such as robotics and machine learning, predictive analytics, the greater use of offsite construction and manufacturing. Each has the potential to improve the efficiency of delivering core construction activities, which in turn raises productivity levels.

For example, the use of offsite techniques and standardised components meant the construction of Dumfries and Galloway Royal Infirmary was delivered six months ahead of schedule; resulting in significant savings on overheads and labour costs.[30] In addition, the application of 'Design for Manufacture and Assembly' saved approximately 40,000 manhours in platform construction at the Liverpool Street Crossrail station in London versus the traditional solutions that were used for Tottenham Court Road.[31]

[28] Scottish Government (2018) Infrastructure Commission
[29] Scottish Government (2018) Infrastructure Investment: evidence summary
[30] House of Lords Science and Technology Committee (2018) Offsite manufacture for construction: Building for change
[31] Ibid

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16. How will technological changes (e.g. robotics, automation) impact on the sector? How can Scotland take advantage of this change?

As outlined above technological changes could have a substantial impact on the sector in terms of both performance and productivity. ICE surveyed a cross-section of its membership in 2017 to gauge views on how AI technologies could improve the execution of a range of construction and/or infrastructure delivery processes.[32]

Of those surveyed 71% of respondents felt that AI would have a positive impact on design and optioneering, 69% on construction operations and 58% on risk and crisis management. At the opposite end of the spectrum only 22% of respondents thought that AI would impact positively on dispute management.

Although constrained margins are common place in the sector, it must do more to build in funding for research and trialing of new technologies (such as AI) that sit outside the scope of active projects.[33] This requires a significant cultural change in the way in which the sector understands and manages risk, whilst there is also a role for government to do more to incentivise this change in behaviour.

[32] ICE (2017) Artificial Intelligence – Shaping the future of the built environment
[33] ICE (2018) Improving approaches to risk in the built environment sector

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