



Construction
Leadership
Council

PROCURING FOR VALUE

OUTCOME BASED, TRANSPARENT AND EFFICIENT

A whole life integrated industry will improve productivity and end-user satisfaction, and produce wider societal benefits

JULY 2018

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INTRODUCTION

Construction matters. Over 10% of the UK workforce is employed in construction and allied supply and maintenance industries, yet its impact goes even further as an enabler of other economic activity – worth almost £600bn to the economy per annum.¹

In November 2017 Business and Energy Secretary Greg Clark launched the Industrial Strategy, a landmark deal between Government and industry. The impact on the construction sector is set-out in the Construction Sector Deal² which could add an estimated £4 billion to the UK economy.

The ambition of the Construction Sector Deal is to deliver:

- **Better-performing buildings** that are built more quickly and at lower cost;
- **Lower energy use** and cheaper bills from homes and workplaces;
- **Better jobs**, including an increase to 25,000 apprenticeships a year by 2020;
- **Better value for taxpayers** and investors from the £600bn infrastructure and construction pipeline; and
- **A globally-competitive sector** that exports more, targeting the \$2.5tn global infrastructure market.

This report – produced by the Construction Leadership Council (CLC)'s Business Models and Supply Chains Workstream – provides recommendations on how government, clients and the industry can maximise the impact of the sector deal by a change in approach to procurement. Construction regularly comes under a critical spotlight and it is unequivocal that productivity increases in the sector have fallen short of most other sectors in the UK economy. Over the past five years the Government has developed Construction 2025: Industrial Strategy³, an updated Government Construction Strategy 2016-2020⁴, Building our Industrial Strategy⁵ and has now published the Industrial Strategy Construction Sector Deal. The Industrial Strategy sets out the government's ambition to embed a more strategic approach to procurement. In the same period the National Infrastructure Commission (NIC) has been created and the Infrastructure and Projects Authority has been formed from the merger of Infrastructure UK (IUK) and the Major Projects Authority (MPA), which are all important steps towards improvement.

This report builds on the Farmer Review, published by the CLC in October 2016⁶ and provides practical steps to implement the Construction Sector Deal by extending existing government policy and industry best practice. The single, overwhelming observation which comes from the report is that there is a systematic lack of "joined-up" action within the industry – on the part of government, clients and suppliers. And yet the potential prize is huge. Simply bringing the whole industry up to the current average productivity level would lead to £15bn savings per annum⁷.

Add to that whole-life efficiency, economies of scale, quality and health and safety improvements that could be delivered through standardisation and manufacturing, together with the opportunities that digital technologies present for changing the fundamental structure of the industry, and it can be seen that the industry is on the cusp of structural change. This paper builds on much work done in the past, and attempts to give some anchor points for clients, government and suppliers as the industry adapts and adopts new ways of working.

Ann Bentley, July 2018

Construction Leadership Council Member and Global Board Director Rider Levett Bucknall

¹ HM Government. Construction Sector Infographic. 2015.

² DHM Government. Industrial Strategy Construction Sector Deal. July 2018.

³ Department of Business, Innovation & Skills. Construction 2025: Industrial Strategy. HM Government, 2013.

⁴ Infrastructure and Projects Authority. Government Construction Strategy 2016-2020. 2016.

⁵ Department of Business, Energy & Industrial Strategy. Building our Industrial Strategy. HM Government, 2017.

⁶ Farmer, Mark: Modernise or Die, The Farmer Review of the UK Construction Labour Model, CLC 2016.

⁷ Construction Leadership Council. Sector Narrative Presentation. 11 July 2017.

EXECUTIVE SUMMARY AND RECOMMENDATIONS

SUMMARY

Significant productivity gains can be made across the whole construction sector – from infrastructure to housebuilding and from design, through construction to maintenance, repair and occupation – with a relatively small change in approach and behaviour.

A whole-life integrated industry would improve productivity and end-user satisfaction and produce wider societal benefits.

This can only be done by the industry, clients and government (as both client and regulator) working together. In the November 2017 Budget, government made commitments to build 300,000 houses, unprecedented levels of investment in infrastructure and financial support to a Construction Sector Deal⁸. Procuring for Value is a key theme of the sector deal and the themes of Procuring for Value are:

Theme 1: Client Pull – Outcome Based Procurement

Use outcome based procurement to drive capital programme delivery and lifetime performance. To do this, models of value must be defined which are broader than capital cost.

Theme 2: Increase Transparency on the Performance of Suppliers and Assets

The industry has become so entrenched in minimising the capital cost of the built asset that little attention is given to the performance of either suppliers or assets.

Theme 3: Supplier Push – Improve Procurement Efficiency and ‘Get the Basics Right’

Whilst clients are often unhappy about the performance of the sector, there are also compelling supply-side issues around risk, profit and uncertainty.

RECOMMENDATIONS

Industry Offer

Industry bodies, institutions and companies will:

1. Develop an industry-wide definition of value that takes into account more than capital cost
2. Produce a universal methodology for procurement and promote common and consistent standards across industry
3. Work with the Infrastructure and Projects Authority (IPA) on the development of cost and performance benchmarks for assets and suppliers. Create an industry dashboard which is routinely updated as part of an on-going process and demonstrates we have increased capacity, productivity and Pre-Manufactured Value (PMV) and reduced embedded and operational carbon
4. Create end-user rating system for built assets
5. Remove bureaucracy from the procurement process by developing a cross-industry pre-qualification process
6. Consider with government how to increase the capability of the i3P consortium to support innovation and best practice in the construction sector.

⁸ HM Treasury. Autumn Budget 2017. November 2017.

Government Offer

IPA and other government departments will:

1. Work to embed the Procuring for Value approach in public procurement and build capability to do this
2. Work with the industry on a set of cost and performance benchmarks for assets and contractors
3. Support the development of a standardised Pre-Qualification Questionnaire (PQQ) that can be adopted across the public and private sectors
4. Undertake consultations on the practice of retention payments in the construction sector and the 2011 Amendments to the Construction Act, and work with construction clients and firms in the construction sector to build a consensus position on fair payment practices. Ensure there are good payment practices throughout the construction supply chain on publicly funded projects
5. Promote the use of un-amended forms of contract on publicly funded projects.

Outcomes

The objectives of Procuring for Value are:

- 2018: conclude consultations on payment practices and develop an approach to payment practices and retentions
- 2019: develop an industry-wide definition of value and a universal methodology for procurement
- 2020: implement a standardised industry pre-qualification process
- By 2025: end the practice of retention payments within the construction sector.

CONSTRUCTION LEADERSHIP COUNCIL (CLC): CONTEXT

The over-arching objective of the government’s *Construction 2025: Industrial Strategy*⁹ is to improve the performance of the UK’s construction sector. It sets out ambitious targets to reduce the cost, time and carbon emissions of construction projects, and to increase exports from the sector.

January 2017 saw the launch of the government’s Green Paper *Building our Industrial Strategy*¹⁰ followed in November 2017 by the corresponding White Paper.

The White Paper sets out how government and industry will work together to take forward proposals that will drive economic growth and deliver improved standards of living across the UK.

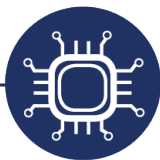
The government has committed to increase investment in innovation, skills and capital equipment in sectors which are able to present a compelling strategy to improve productivity. These Sector Deals form the basis of long term partnerships between government and the sector, ensuring the UK is able to compete in the global economy as a prosperous trading nation.

“The objective of our modern industrial strategy is to improve living standards and economic growth by increasing productivity and driving growth across the whole country.”

Building our Industrial Strategy Green Paper, January 2017

The CLC’s vision is to change the industry by delivering three strategic outcomes:

*More houses *More rail capacity *Improved car journeys *Cheaper energy *Better public services



DIGITAL

Delivering better, more certain outcomes using digital technologies



MANUFACTURING

Improving productivity, quality and safety by increasing the use of manufacturing



PERFORMANCE

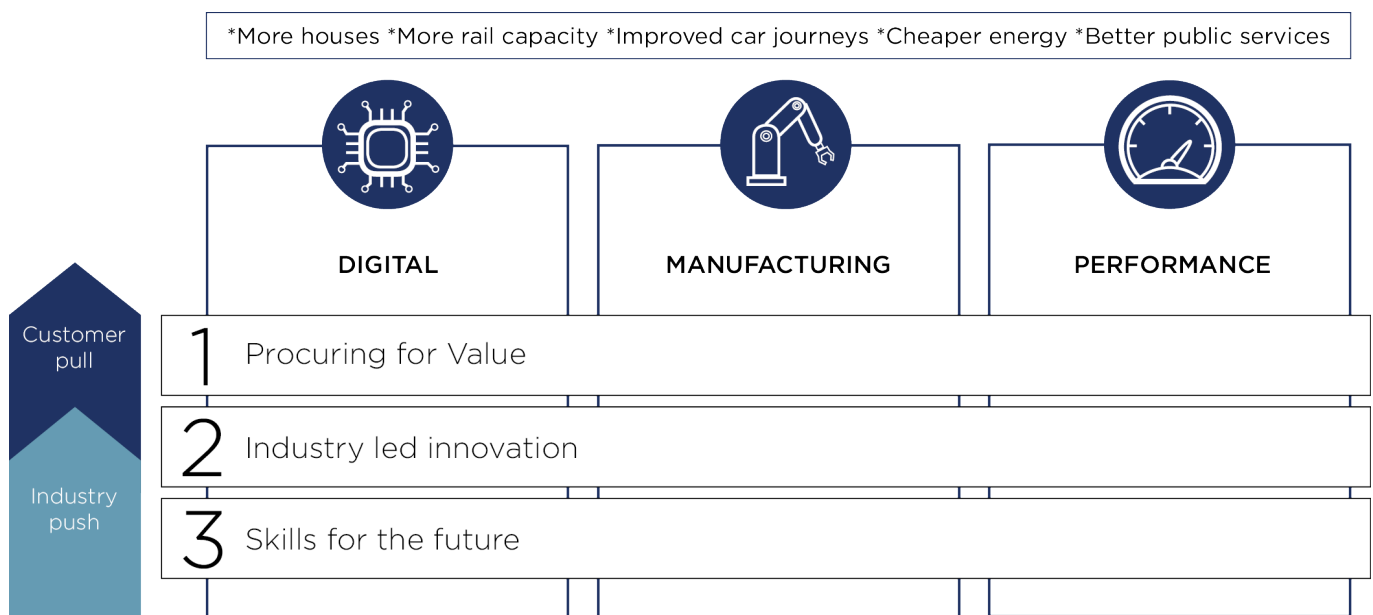
Optimising through-life performance through the development of smart assets

⁹ Department of Business, Innovation & Skills. *Construction 2025: Industrial Strategy*. HM Government, 2013.

¹⁰ Department of Business, Energy & Industrial Strategy. *Building our Industrial Strategy*. HM Government, 2017.

The CLC’s role is to maximise the impact of the Industrial Strategy throughout the built environment, by a series of recommended interventions – brought together in the CLC spearheaded bid for an Industrial Strategy Sector Deal¹¹ for construction. This bid led to one the first sector deals to get government support and funding.

Delivered through three key enablers:



¹¹ Our Opportunity- the Construction Industry Sector Deal. 18 July 2017. <http://www.constructionleadershipcouncil.co.uk/news/our-opportunity-the-construction-industry-sector-deal/>

PROCURING FOR VALUE - CONTEXT

WHY PROCUREMENT MATTERS

The CLC’s Supply Chain and Business Models workstream’s focus is on procuring for value. By procuring with different outcomes in mind, clients can direct the industry to work more efficiently and effectively, thus delivering higher productivity and better outcomes for end users.

Publicly funded and regulated work accounts for approximately 30%¹² of all construction. If this is fully harnessed it could massively influence the concept of Value. This ‘Customer Pull’ could happen very quickly with little short-term cost and huge long-term gain.

It would, however, change the cash-flow of projects and will only be delivered if mind-sets move to whole life value and procurement is firmly part of the project team - not a process that has to be undertaken. This chimes with the drive to embed a strategic approach to procurement signalled in the Industrial Strategy White Paper.

The task of the CLC workstream is to make practical recommendations that will not only maintain competitive advantage, but actively encourage changes in behaviour in the whole supply chain.

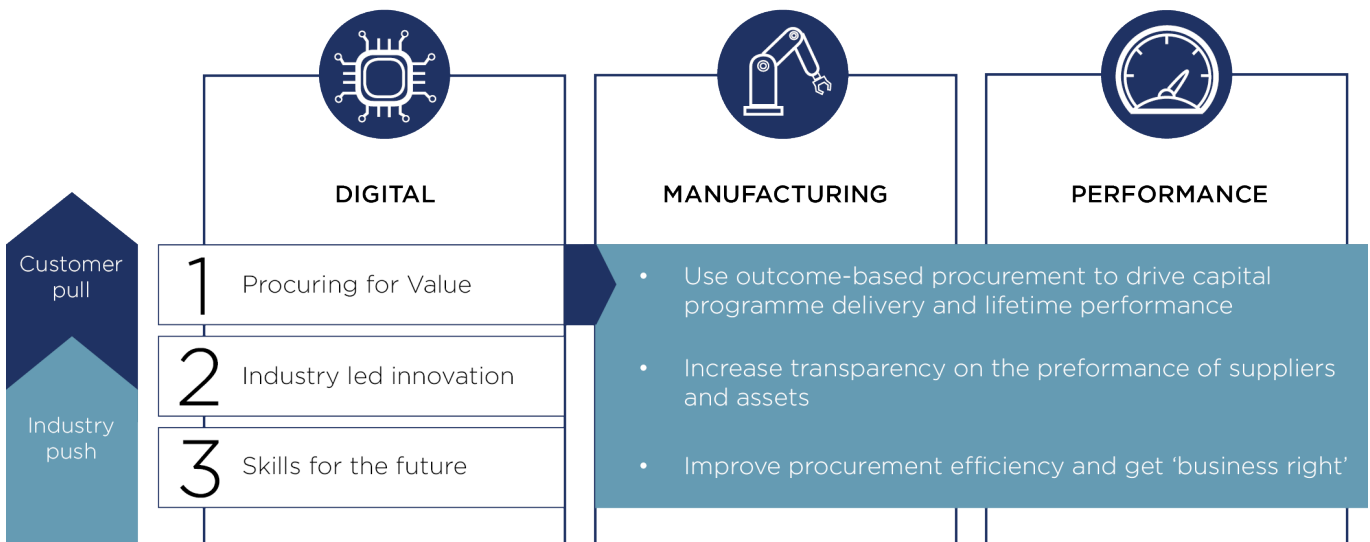
Industrial Strategy

We will maximise the contribution that... investments can make to growth and productivity by strengthening consideration of broad strategic outcomes at the earliest stage... and then carrying them through all subsequent parts of the design and procurement process.

Industrial Strategy White Paper, 2017

The focus is on three themes:

*More houses *More rail capacity *Improved car journeys *Cheaper energy *Better public services

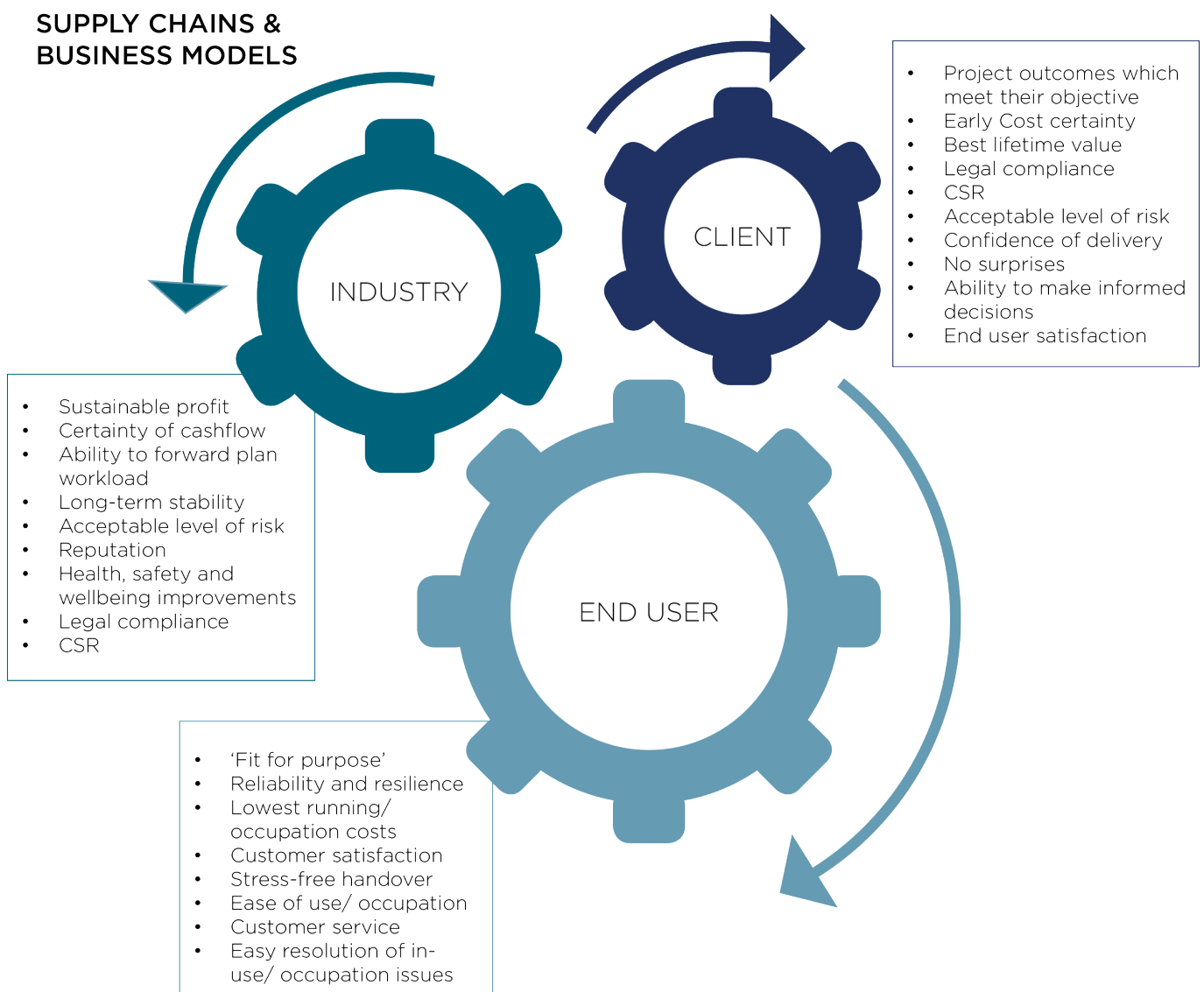


- Client Pull: **Use outcome-based procurement** to drive capital programme delivery and lifetime performance
- Client Pull: Increase **transparency** on the performance of suppliers and assets
- Supplier Push: Improve **procurement efficiency** and get the basics right

¹² Office of National Statistics. Construction Statistics Annual: Number 18, 2017 Edition. Newport, 2017.

Unaligned Objectives

The current business model is highly transactional with little motivation for the 100s of designers, contractors and suppliers to engage with each other at the early stages of a project or to stay attached to, and learn from, the asset once it's in use. This leads to repetition of mistakes, failure to adopt best practice and often the delivery of a sub-optimal end-product.



Procurement systems should align the objectives of multiple project stakeholders to maximise value creation

VALUE AND PRODUCTIVITY

Construction is a particularly cyclical industry, with an estimated 250,000 jobs lost during the last recession¹³.

In the wider economy the recovery since 2013 has been jobs rich, but productivity poor. Overall productivity is slightly below the pre-recession peak (Q1 2008) and productivity in Q2 2017, measured by output per hour, was 17.2% below a continuation of the pre-crisis trend. In the same period, construction has made a small (0.2%) productivity gain¹⁴. Major contributors to this poor performance are: skills shortages, low skilled labour - widely available and relatively cheap - and resources diverted to winning, rather than delivering contracts.

However, productivity of engineering, construction and built-environment projects in the UK is very variable, up to 30% better or worse than average¹⁵. This variability far exceeds the gap between the UK and other countries. Similarly in the general economy, the most productive area of the UK is now almost three times more productive than the least¹⁶.

The variability could be addressed by a much more consistent approach to projects and the implementation of known best practice.

The definition of productivity in construction is a very narrow one. It does not reflect many of the areas where improvements have been made, the value of design, materials and components and much of the plant and machinery used on site is not counted in productivity figures. Nor are improvements in quality, the fall in the number of site deaths or the cost to suppliers of winning the work in the first place¹⁷.

¹³ Rhodes, Chris. Construction Industry: Statistics and Policy. House of Commons Library, 2015.

¹⁴ Office of National Statistics. "Labour Productivity: April to June 2017." 2017.

¹⁵ Gibson, Mark. Changing to Compete. Department of Business, Innovation & Skills, 2009.

¹⁶ Green, Brian. Productivity in Construction: Creating a Framework for the Industry to Thrive. CIOB, 2016.

¹⁷ CBI. "Unlocking Regional Growth." 2016.

THEME 1: CLIENT PULL: OUTCOME-BASED PROCUREMENT

Use outcome-based procurement to drive capital programme delivery and lifetime performance.

To achieve better value, models of Value must be defined which are broader than capital cost.

Not only is the industry highly cyclical and massively variable in its productivity, it also delivers a variable product¹⁸. Being both world-class and yet plagued with examples of assets which clients aren't happy with and projects which fail to deliver their early promise.

Public and private sector clients broadly agree what they want from the industry are:

- Project outcomes which meet their business case objectives
- Adequate data on which to make informed decisions e.g:
 - early cost accuracy
 - alternative solutions
- Functional performance – built to an agreed timescale and quality
- Value for money
- Quantified levels of risk
- No surprises
- Legal compliance
- End-user satisfaction
- No reputational damage

These are issues which clients can, and should, influence and control by using their buying power and by defining what Value actually means to them as a client or asset owner.

High-profile case studies demonstrate that this is a workable proposition.

CASE STUDY: Network Rail - Wessex Capacity Programme



To deliver the challenging £400 million Wessex Capacity Programme in one of the busiest stations in Europe, Network Rail opted for an alliancing procurement model. Part of the tender evaluation process used included a behavioural assessment to determine the ability of suppliers to work in a collaborative and integrated manner. This procurement model helped Network Rail to select the team with the best capabilities to deliver the complex project, to increase the peak capacity of the station by 30%, while still allowing parts of Waterloo Station to remain open throughout the whole length of the programme.

Network Rail's Wessex Alliance Selection Process: Choosing for Collaboration

¹⁸ Dobbs, Richard, et al. Infrastructure productivity: How to save \$1 trillion a year. McKinsey Global Institute and McKinsey Infrastructure Practice, January 2013.



CASE STUDY: London 2012 Olympic and Paralympic Games

To achieve the strategic goals of the London Organising Committee of the Olympic and Paralympic Games, a sustainable procurement strategy was implemented by the Olympic Delivery Authority for all construction projects. To achieve this: early supplier engagement, the use of a Balanced Score Card at both the Pre-Qualification and Award Stage, sustainability contract requirements and rigorous post-contract award KPI compliance monitoring were utilised. Ultimately, the Games were delivered to meet key budget, sustainability and social targets and serve as an example of an innovative world class programme.

London 2012 Olympic and Paralympic Games: The Legacy - Sustainable Procurement for Construction Projects



Rider Levett Bucknall supplied cost management and health and safety consultancy services to LOCOG to support the delivery of the temporary overlay for the London 2012 Olympic Games

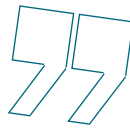
Value

To improve the impact of capital programmes, their delivery and lifetime performance, Value must be captured and demanded as part of the procurement exercise. This approach is at the heart of the Transforming Infrastructure Performance (TIP) programme launched by the Infrastructure and Projects Authority in December 2017. This seeks to improve the process of designing, procuring and delivering infrastructure projects procured by the Government, through integrating programmes, exploiting new technologies and encouraging a focus on delivering the greatest value throughout the life of the project.

Improving procurement

We have already improved our approach to procurement through the 'balanced scorecard' which requires procurers to consider relevant social and economic objectives, such as skills development, diverse supply chains and sustainability, alongside cost effectiveness.

Industrial Strategy White Paper, 2017



Public sector buying power is explicitly recognised in the Industrial Strategy White Paper but the public purse is not a single entity – there are hundreds of procuring bodies, ranging from Ministerial Departments and Devolved Administrations, through to government agencies and local authorities.

Best practice procurement guidance already exists from the Infrastructure and Projects Authority (IPA), Crown Commercial Services, the Local Government Association and a whole range of public sector and regulated bodies, but these are not consistent nor

are they comprehensively or uniformly adopted and they do not all advocate the same definition of Value.

The “Balanced Scorecard¹⁹” referred to in the Industrial Strategy is a clear starting point for a new definition of Value, but its themes are broad and open to interpretation and too many clients (or their advisors) see it as a tick-box exercise to be overcome, rather than a project or programme enhancing tool.

A particular issue with the current interpretation of the balanced scorecard approach, are the marking systems that are commonly used. It is very rare to see any financial value put on any factors other than capital cost – everything else becomes a measure of “quality”. Most bidders are adept enough at working within the system that they score at least 80% for quality – essentially then making the competition still about lowest capital cost. There are demonstrable benefits to government, other clients and the wider industry in full implementation of a balanced scorecard approach. We already know that there is at least a 30% productivity gap between the most and least efficient projects in the sector²⁰.

¹⁹ Crown Commercial Service and Cabinet Office. Procuring for Growth Balanced Scorecard. 14 October 2016.

²⁰ Green, Brian. Productivity in Construction: Creating a Framework for the Industry to Thrive. CIOB, 2016.

Balanced Scorecard Strategic Themes

Solution Quality

- Output/Outcome quality
- Production/Delivery/Construction Process
- On-time delivery

Cost

- Whole-life cost

Supply Chain

- Supply chain accessibility
- Supply chain management
- Supplier organisational learning and continuous improvement

Employment/Skills

- Employment
- Workforce skills

Environmental Sustainability

- Energy Efficiency/Climate change impact
- Resource Efficiency
- Waste/Re-cycling

Health and Safety Outcome Benefits

- Community Benefits
- Legacy

Procuring Growth Balanced Scorecard, Crown Commercial Services, October 2016

Case studies now coming out of the @one Alliance at Anglian Water are demonstrating that significant levels of improvement can be made, not just on capital programmes but also the TOTEX budget²¹.



Case Study: Anglian Water One Alliance

For the delivery of the AMP4 (Asset Management Plan), Anglian Water used the Government Project Initiation Routemap to review the procurement of the project alliance and supply chain. Key project stakeholders were engaged in the review process to help achieve strategic alignment in the procurement of the project and develop a contracting model that enables supply chain integration and innovation. The use of this strategic procurement methodology has enabled Anglian Water to achieve 2-3% of annual savings, while at the same time improving customer service delivery and reducing capital carbon.

Anglian Water's Alliance - A Strategy for Success Anglian Water @one Alliance

It is also well documented that the sector is facing a looming labour and skills shortage. Defining Value in this wider way will enable limited cash and resources to go further and will enable and release the value of digitally-enabled offsite production.

Over-complex and prescriptive forms of procurement block innovation and even prevent access to existing better options. But to implement this wider definition of Value and so deliver outcome based procurement it is essential that there is a standardised methodology.

²¹ Streetly, Mike. AMP6: Encouraging change and innovation. Institution of Civil Engineers, 2016

RECOMMENDATION 1: VALUE AND PROCUREMENT

To capture the maximum benefit that projects or programmes can achieve, the definition of Value must be expanded to include areas such as:

- Whole-life value
- Capital and Operational Carbon Emissions
- Digital effectiveness, BIM and data capture
- Use of standard components and pre-manufactured value²²
- Design Quality Indicators
- Collaborative behaviour and supply-chain integration
- Apportionment of risk and reward
- Government Soft Landings
- Social Value of the construction process
- Health, Safety and Well-being during construction
- R&D and Innovation
 - Supply chain incentivisation for delivery innovation.
 - Sharing of innovation risk between client and suppliers

See appendix A for linkages to existing programmes.

Actions to make the recommendation stick

Why isn't this being done anyway?

- No cross-industry common standards
- Lack of client and advisor knowledge and expertise
- Fear of the unknown – no-one wants to be first
- Deep in-built conviction that lowest price gives the best value
- It is required, but no-one is checking
- Time pressure on procurement
- Annual budget pressures

Solutions?

- Development of a common definition of value and a consistent procurement methodology
- Enhanced competences in both clients and advisors
- Evidence-based case studies
- A consistent digital platform to capture and analyse the bid information; and
- An audit or oversight function with teeth.

²² Farmer, Mark. Modernize or Die: The Farmer Review of the UK Construction Labour Model. Construction Leadership Council, 2016.

DEFINITION OF VALUE AND A CONSISTENT PROCUREMENT METHODOLOGY

What industry can do:

Develop Definition of Value and Procurement Methodology:

Professional and representative bodies and industry practitioners will come together and convene an inter-company group. This will make and develop proposals on what this wider definition of Value and the associated procurement process will look like, how it will work, and how it will be implemented.

What government can do:

Build on Common Standards:

Support this industry-led development with wider consultation on, and testing of, the recommendations.

What government and industry can do together:

Drive Adoption of Common Standards:

Government and industry can drive wider adoption of this definition of Value by engaging across key client influencer groups:

Government – through BEIS, IPA and Government Construction Board:

- Government departments: e.g. NHS, MoJ, DfE, MoD etc.
- National Infrastructure Commission
- Homes and Communities Agency
- Local Government Association
- Statutory regulators
- Enforcement bodies e.g. HSE
- Infrastructure Client Group – including regulated industries
- Crown Commercial Services

CLC with BEIS support to host a consultation meeting with major clients and media:

- Major private sector clients
- Major housing clients
- Trade and client media



Thames Tower, Reading

RLB provided quantity surveying and project management services on the refurbishment of one of Reading's most prominent office buildings

What government can do:

Mandate the Use of Common Standards:

Use of the balanced score-card is already mandatory on procurement of projects with a capital cost greater than £10m. This should be reinforced by mandating and enforcing the use of the new Procurement Methodology for whole-life value.

This is an extension of the Government Construction Strategy 2016 – 2020²³, and aligns with the IPA's Transforming Infrastructure Performance programme²⁴.

LACK OF CLIENT AND ADVISOR KNOWLEDGE

Professional capability

A common definition of value and a consistent procurement methodology are of little use if no-one knows about them. Recent studies have concluded that the construction industry professions are not moving as quickly as other parts of the industry.

The former Chief Construction Officer, Paul Morrell, warned that the standing and perceived value of the professions is being challenged, with detractors seeing in their conduct and practice a tendency towards protectionism, resistance to change, and the reinforcement and preservation of silos²⁵.

The construction sector ranks in the lower ranges of sophistication in the Global Purchasing Excellence Survey, suggesting ample room for improvement.²⁶

The law firm, Pinsent Masons^{27 28} recommend the evolution of the quantity surveying role to include greater emphasis on long-term asset value and life-cycle costs, and additional training for industry professionals, particularly architects, quantity surveyors and project managers, in collaborative techniques and the benefits of effective team working.

Long-term issues such as artificial intelligence, smart contracts, Level 3 BIM, sensing data from the internet of things and blockchain - allowing commercial transactions via BIM models – will have an even greater impact on these professions.

Within the infrastructure sector, most of the major clients are developing their own programmes to fill what they see as a gap left by the professional institutions, and the housing sector is demanding skills development in smart construction to meet the future needs of the industry.

What industry can do:

Joint action from professional institutions, service providers and academia to:

- Use the proposed new procurement methodology for whole-life value as a focal point for cross-industry professional standards and qualifications

²³ Infrastructure and Projects Authority. Government Construction Strategy 2016-2020. 2016.

²⁴ Infrastructure and Projects Authority. Transforming infrastructure performance. December 2017

²⁵ Morrell, Paul. Collaboration for Change. The Edge, 2015.

²⁶ Barbosa, Filipe, et al. Reinventing Construction: A Route to Higher Productivity. McKinsey Global Institute, 2017.

²⁷ Roberts, Martin, Nigel Blundell, Richard Dartnell, and Russell Poynter-Brown. Collaborative Construction: More myth than reality? Pinsent Masons, 2016.

²⁸ Roberts, Martin et al, Collaborative Construction 2: "Now or Never?" Pinsent Masons 2017

- Update key professional skills coming through academic institutions, particularly– TOTEX Cost Modelling and Cost Planning and Value Based Procurement
- Accelerate digital solutions as an overall management tool to improve:
 - Management capability
 - Planning
 - Buildability
 - Understanding and placement of risk
 - Cash-flow management
 - Contract management
- Client value, understanding funding and the placement of risk – should be mandatory modules of all construction and built environment related undergraduate courses and professional qualifications.

The Construction Industry Council (CIC) is the over-arching body for the professional institutions and it is appropriate that they play a key role in implementing this joint action.

What government can do:

Build capacity and capability

Parallel training in the proposed new procurement methodology. A significant programme of sponsor training has already been implemented by the IPA and this could simply form another module of this training.

What industry can do:

Create an industry knowledge platform

The widespread and consistent use of industry best practice would produce immediate productivity gains across the whole sector. A digital, industry-wide, knowledge platform, where best practice is curated, shared and challenged, that is easy to understand and that is accessible does not currently exist.

The i3P²⁹ research, development and innovation platform for the infrastructure sector forms part of the ideas section of the Construction Sector Deal and the Innovation in Buildings Workstream are working with Innovate UK to create an innovation hub, linked to centres of expertise via a virtual network. There are already examples of knowledge platforms - the work done by UKCRIC (UK Collaboratorium for Research in Infrastructure and Cities)³⁰ and the Building Wiki which is supported by ICE, BRE, CIOB, BSRIA and CIAT³¹. But combining resources and making the systems more easily accessible and free to use would make them so much more powerful.

This will require coordination between government, standards agencies, client bodies, professional institutions, research bodies, best practice groups, innovation platforms and academic institutions.

²⁹ i3P Collaborate to Innovate. <https://www.i3p.org.uk/about/>

³⁰ UCL Engineering. UCL coordinates a £138 million investment in UK infrastructure research. 19 March 2015.

³¹ Designing Buildings Wiki. About Designing Buildings. https://designingbuildings.co.uk/wiki/User:Designing_Buildings

What government can do:

Subscribe to and populate the knowledge platform

Government's input should be to provide matched funding to develop the digital framework for the knowledge platform and to ensure that all government funded standards, guidance, best practice etc. is properly curated and held on the platform.

There is evidence that government money is being used to create several, similar, such bodies within different departments, so this is unlikely to be a significant cost.

What government and industry can do together:

Develop case studies, best practice and champions for outcome-based approaches

There are many examples within the industry, and examples from other industries, which we could highlight and build upon.

Further development of these case studies and guidance is required within the sector to support clients, consultants, contractors, funders and lenders. A simple requirement to publish best-practice narratives on the knowledge platform for all publicly funded projects would have a significant impact.

FEAR OF THE UNKNOWN AND IN-BUILT CONVICTION THAT LOWEST PRICE GIVES BEST VALUE - THE ROLE OF PROJECT FUNDERS

A new procurement methodology for whole-life value, delivered by engaged and well-trained clients and advisors, will go some way to overcoming the fear of the unknown and will demonstrate that lowest capital cost does not necessarily give best value.

Within the private sector funders play a very significant role in the way projects are set-up and managed, contract structures and the allocation (or perceived allocation) of risk.

The extension of Energy Performance Certificates in 2012 for non-dwellings³² made a real difference to the way prospective occupiers perceived the running cost of commercial buildings, which then had an impact on the way that buildings were specified and designed. Greater steps could be taken to more fully embed whole life value into commercial buildings. Currently funders and lenders are not focused on the lifecycle performance of assets when they assess schemes.

What industry can do:

Create demand

The CLC's Innovation in Buildings workstream is working with lenders, mortgage companies and insurers to enable financing of homes built using different construction methods.

The industry can build on the work of the Green Construction Board and Digital Built Britain to form a narrative based on hard data, which creates a demand and encourages funders/lenders to procure for whole-life performance.

³² Department for Communities and Local Government. "Energy Performance Certificates for the construction, sale and let of non-dwellings ." December 2012.

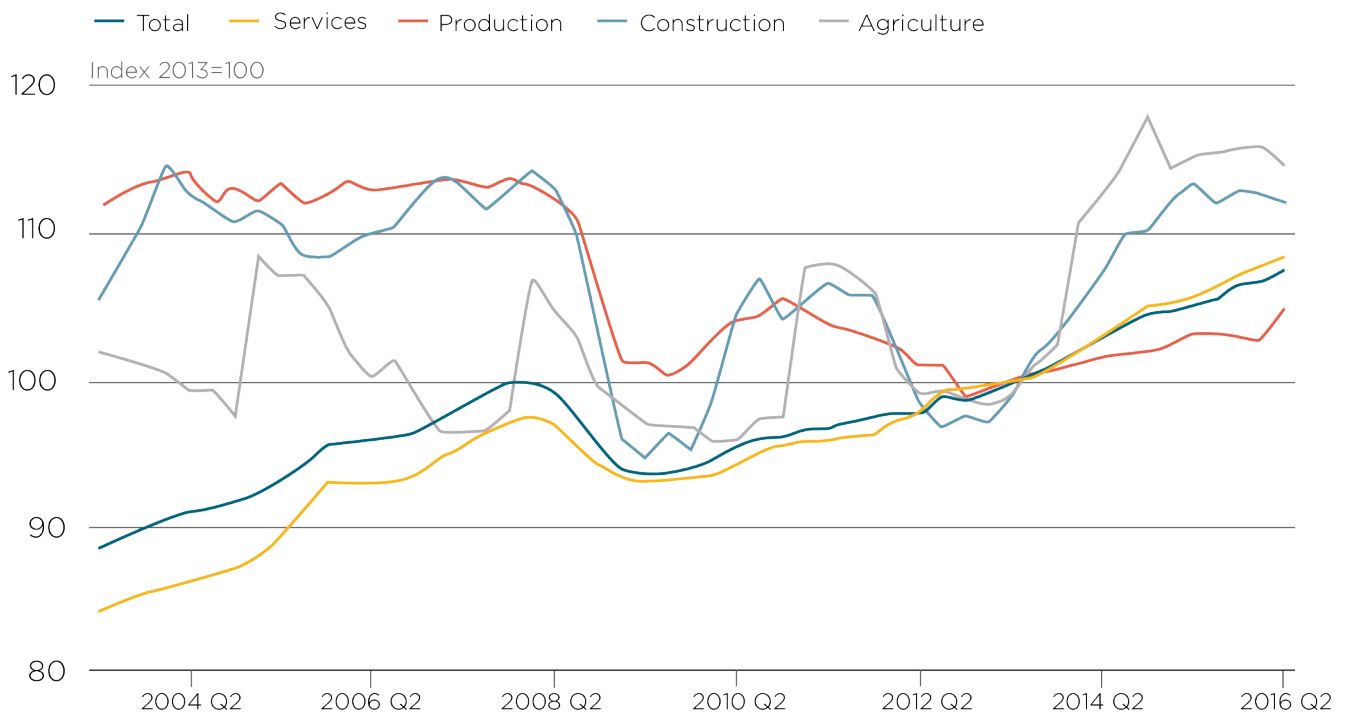
PRESSURE ON ANNUAL BUDGETS AND PROCUREMENT TIMESCALES

Clients would also improve the performance of the sector by taking a much longer term view, and providing greater certainty of work-load over the medium to long term. This is being addressed to some extent through the Infrastructure and Projects Authority and the National Infrastructure Commission³³, but not by all government spending departments, or local authorities.

Without a reasonable level of certainty about future workload, businesses will not invest and we will continue to see the low levels of innovation and skills development by which the industry is currently defined. This is widely recognised as having a major impact.

In a CBI poll³⁴ of Members of Parliament and construction industry companies, the policy which both groups believed was most likely to have a positive impact on construction productivity was public sector investment in construction projects during recessions. Construction typically lags 16 months behind the general economy in a recession, and has more pronounced peaks and troughs³⁵ (See Figure 1).

UK, 2003 - 2016



Source: Office for National Statistics

Figure 1: UK GDP and main components: 2003-2016

³³ Infrastructure and Projects Authority. "National Infrastructure Delivery Plan 2016-2021." 2016.

³⁴ Green, Brian. Productivity in Construction: Creating a Framework for the Industry to Thrive. CIOB, 2016.

³⁵ Office for National Statistics. "Gross domestic product, preliminary estimate: Apr to June 2016." 2016.

Main areas with potential to realise savings include improving stop-start investment programmes and the lack of a visible and continuous pipeline of forward work

Infrastructure Cost Review: HM Treasury and Infrastructure UK, 2010

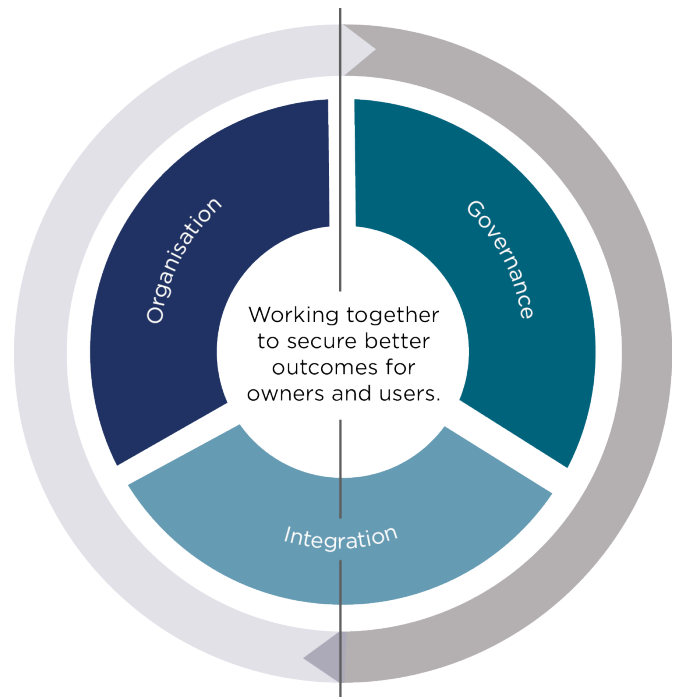
What industry can do:

Move from transaction to enterprise

The Infrastructure Client Group (ICG) and the Institution of Civil Engineers (ICE) have launched a new approach to delivering high performing infrastructure - Project 13³⁶: From Transaction to Enterprise.

At the core of this approach is a shift away from the procurement of new infrastructure as a series of individual projects, each procured independently in the market. In its place it advocates the creation of a shared enterprise.

This project is being led by the ICG and the ICE, with members of the CLC sitting on project groups.



What government can do:

Develop and implement the work done by the ICG and ICE to encompass all government departments which spend in the construction sector.

The approach developed by ICG is similar to the approaches being developed in several government departments, with much wider, long-term frameworks and programmes being developed in the Ministry of Justice, the Education and Skills Funding Agency and the Ministry of Defence amongst others.

Project 13 should provide a structure for the Government Construction Board to implement this enterprise approach across all departments.

"Hastily arranged one-off subcontract arrangements are not supply chains. Without repeat supply chains it has proved difficult to achieve sustained improvements in construction."

Don Ward – CEO, Constructing Excellence


³⁶ Infrastructure Client Group. From Transactions to Enterprises: a new approach to delivering high performing infrastructure. ICE, 2017

THEME 2: INCREASE TRANSPARENCY ON THE PERFORMANCE OF SUPPLIERS AND ASSETS

Increase transparency on the performance of suppliers and assets

The industry has become so entrenched in minimising the capital cost of the built asset that little attention is given to the performance of either suppliers or assets. Whilst in the private sector a poor performing supplier with poor financial integrity would simply never be used again, in the public sector poor performance and financial instability are not, in themselves, a barrier to repeat work from the same client.

Similarly, there is almost no publicly available evidence on the lifetime performance of assets once they have been handed over. Individual asset owners record this to some extent, but comparisons between assets appears to be almost non-existent, particularly the relationship between the original brief and the end-user outcome.



The construction industry must introduce independent and objective assessments of performance, comparable to the Which report or the JD Power survey that can be used by its customers to understand the industry's products and choose between them.

Rethinking Construction: Sir John Egan, 1998

Over the recent years there has been a lot of research carried out to establish the direct link between the impact of the built environment and the well-being of end users³⁷. But the value of these benefits is yet to be fully captured both in the public and private sector. The integration of Post Occupancy Evaluation into the procurement process would help to bridge the gap between performance and business case expectations.

Some individual clients are very sophisticated at measuring and benchmarking both cost and value, but this is less prevalent in the public sector. And yet data is now so easy to collect and so cheap to store that performance data should make valuable contribution to client decision making.

CASE STUDY: Impact of classroom design on pupils' learning



A study by the University of Salford School of the Built Environment revealed that school classroom design quality has a direct impact on the performance of students. The factors analysed in the study using statistical modelling included: air quality, light, temperature, complexity and colour. The results showed a 16% variation in learning rates, due to changes in these parameters. An important conclusion of the study is that there is an impact of building design on user performance and well-being and that further research must be undertaken to develop ways to capture the value created by the built environment for users.

The Impact of Classroom Design on Pupils' Learning: Final results of a holistic, multi-level analysis

³⁷ UK Green Building Council. "Health and Wellbeing in Homes." July 2016.



CASE STUDY: Alder Hey Children’s Hospital

Opened in 2015, Liverpool’s Alder Hey Children’s Hospital treats 270,000 children a year. The procurement process for the £237 million project to re-build the hospital included a design review of the medical facility in terms of improving the well-being of patients and their families. In the end, a design was selected to maximise daylight and natural light, provide tranquil indoor and outdoor green spaces for patients and their families to find respite, and achieve an innovative clinical design to improve patient care. In 2016, the project won the Prime Minister’s Better Public Building Award in recognition of the value brought to improve patient recovery.



©Design Council

RECOMMENDATION 2: COST AND PERFORMANCE BENCHMARKS

To build on best practice and to eradicate the worst practice, public comparisons must be available. Therefore, the recommendation is to collect and publish cost and performance benchmark data for publicly funded construction and infrastructure projects. Singapore is an example of a city which has developed construction benchmarks that the government publishes on a biannual basis and benchmarks against the high-level construction costs for various cities in South East Asia.

Actions to make the recommendation stick

Why isn't this being done anyway?

- No consistent standards on how asset performance is measured
- No requirement to capture the data
- No national rating system for performance of suppliers
- No consistent standards for measuring end user satisfaction, or performance of asset against original brief.

Solutions?

CONSISTENT STANDARDS

What industry can do:

1. Develop consistent, simple, benchmarking approaches for measuring actual asset performance versus specification and projected performance.
2. Create an end-user rating system, which enables end-user satisfaction to be measured and defined as part of the overall Value.

What government can do:

Requirement to capture data

Collect and publish cost and performance data on publicly owned assets.

As part of the Department for Transport efficiency drive³⁸ the DfT has engaged consultants to produce benchmarks – this could be a starting point for a cross department initiative.

The National Infrastructure Commission has also started to look at this in their overall metrics for defining system level infrastructure performance, and there could also be a way to capture value realisation in the IPA's post project appraisals.

Upon the successful implementation of pre-qualification reform (see Recommendation 3), this should be extended to include a feedback loop – so that good performance can be rewarded and poor performance can mean the removal of accreditation.

³⁸ The department for Transport. Transport Infrastructure Efficiency Strategy December 2017

What industry can do:

Measurement of supplier performance

As part of the standardised pre-qualification process that is being developed by Build UK in consultation with other industry representatives, (see Recommendation 3), a feedback loop will be created which acknowledges both good and poor performance which will then inform future decision making.

The Infrastructure Client Group also has measurement of supplier performance in their work programme.

What government can do:

Extend this further to become a formal construction industry licensing scheme, register or league table, similar to those operated in Germany and Belgium.

MEASUREMENT OF SUCCESS

What industry can do:

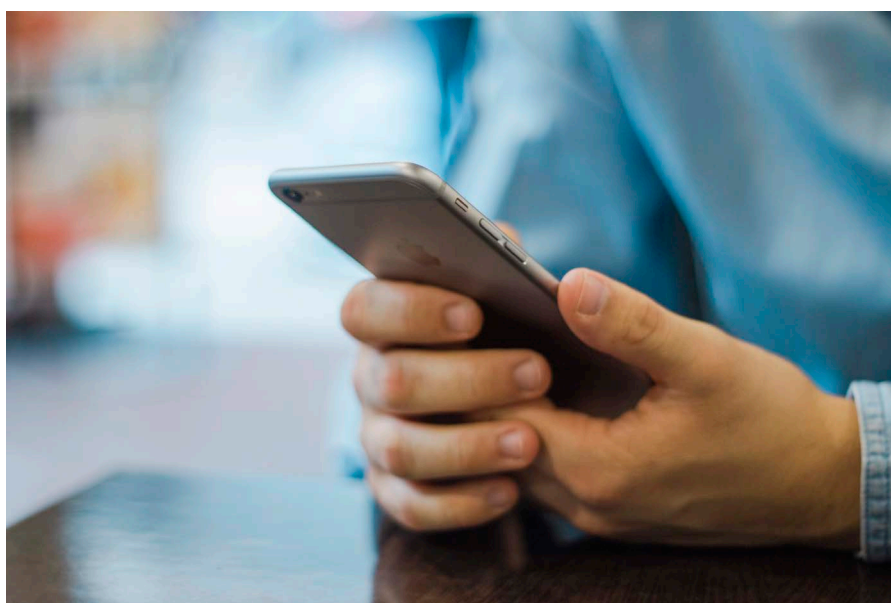
Establish an industry dashboard consistent with the CLC's Innovation in Buildings workstream, which is routinely updated as part of an established industry process and demonstrates that better value has been delivered through these changes in procurement.

This would be a very useful tool for the CLC to manage the overall programme of initiatives.

What government can do:

Agree targets and collect data. To be effective there needs to be an over-arching body which co-ordinates this.

RLB Field is RLB's unique solution to data capture and reporting. A mobile data capture app utilising tablet technology, giving mobile users the ability to capture live data instantly from site and send it to their clients via bespoke reports and dashboards.



THEME 3: SUPPLIER PUSH – IMPROVE PROCUREMENT EFFICIENCY

Improve procurement efficiency and “get the basics right”

We can make the industry healthier by ‘getting the basics right’. Whilst clients are often unhappy about the performance of the sector, there are also compelling supply-side issues:

- Profit
- Debt
- Uncertainty
- Payment
- Liability
- Bankruptcy
- Insurance
- Health and Safety
- Work-force demographic
- New entrants

In 2013 the Department for Business, Innovation and Skills produced a comprehensive report into the construction sector³⁹. Five years later many of the conclusions delivered in that report still hold true.

- The UK construction and construction products sector is characterised by high levels of fragmentation - it is made up of over 280,000 businesses, employing approximately 2.9 million people. Of these, fewer than 300 businesses employ more than 250 people, and **230,000 businesses have a single employee**.
- Construction contracting SMEs face more difficulties than other SMEs in **accessing finance from banks**. This is partly because construction businesses are considered to be of higher risk due to low levels of fixed capital, smaller firm size and traditional low profit.
- **Late payment or partial payment is the single most important issue** affecting construction businesses, with only 5% of specialist contractors being paid in full within 30 days.
- **Tier 2 firms are net providers of trade credit**, while tier 1 firms are net receivers of trade credit - that is they receive more trade credit from suppliers (including tier 2 firms) than they offer to construction clients.
- Typical profit margins in the largest 10 companies in the construction sector (excluding house builders) are less than 1% of turnover.

This matters at a macro-economic level - for the UK to perform on a global stage it needs a high-performing built environment sector to sustain long-term industrial growth and social cohesion⁴⁰.

But the industry is:

- Introverted - only 6% of contractors export
- Fragmented - 99% SMEs
- Highly disaggregated - supply chains average 70 packages over 4-5 tiers
- Broad - sector spend is 10:80:10 Build: Occupy: Dismantle, with the majority of SMEs working in the maintenance and refurbishment arena, rather than in new-build⁴¹.

³⁹ Department for Business, Innovation & Skills. “UK Construction: An economic analysis of the sector.” July 2013.

⁴⁰ BESA. BESA calls for special sector deal. May 2017.

⁴¹ Department of Business, Innovation & Skills. “Supply Chain Analysis into the Construction Industry: a report for the Construction Industrial Strategy.” October 2013.

The Government has introduced a number of measures over the last 10 years to lay the foundations for companies working in the construction sector, including:

- Public Contracts Regulations
- Support for Project Bank Accounts
- Prompt Payment Code: Supply Chain Charter
- Late Payment Legislation
- Late payment Interest Regulations
- A Commitment to acting on Retentions
- Small Business Act Commissioner
- Mystery Shopper
- Construction Act
- Enterprise Act: Payment Reporting
- Public Contract Regulations: 30 Day Payment Rule

But there is a strong feeling within, and evidence from, the industry that these tools need to be integrated to have appreciable impact, that the supply chain carries a disproportionate amount of project and payment risk for the reward that it takes out and that 80% of the industry (those working in maintenance and demolition) are largely forgotten by industry policy makers.

Industry Representation

Trade bodies provide companies with advice and give them collective representation and lobbying power.

- Build UK, which brings together 27 of the industry's largest main contractors and 40 leading trade associations representing over 11,500 specialist contractors.
- The Construction Alliance, which is a grouping of major construction trade organisations, representing over 13,500 individual companies and organisations involved in the construction industry. The founding members were:
 - The Federation of Master Builders (FMB)
 - The National Federation of Builders (NFB)
 - The Civil Engineering Contractors Association (CECA)
 - The Scottish Building Federation (SBF)
- The Construction Clients' Forum, which sits within Constructing Excellence and has representation from
 - British Property Federation
 - Government Construction Board
 - Local Government Association
 - Infrastructure UK Client Group
- The Construction Industry Council (CIC), the representative forum for the professional bodies, research organisations and specialist business associations in the construction industry, with collective membership of 500,000 individual professionals and more than 25,000 firms of construction consultants.

- The Construction Products Association (CPA) representing the UK's manufacturers and distributors of products and materials. Its membership includes large multinationals together with 40 trade associations.
- The Specialist Engineering Contractors (SEC) Group which brings together six representative groups in the engineering sector, whose members operate extensively in maintenance and repair - the largest sector of UK construction by value. It represents 8,000 firms largely SMEs which together employ 60,000 employees.



Debenhams Oxford Street

RLB provided cost management & quantity surveying, and advisory services, working closely with acclaimed artist, Ned Kahn, to produce a unique facade design.

RECOMMENDATION 3: A COMMON APPROACH

The CLC should work with these representative groups to agree a common approach on fair payment, retentions, standardised pre-qualification, and contractual arrangements.

Actions to make the recommendation stick

Why isn't this being done anyway?

- Each group represents a different membership and the priorities of the memberships are not the same.
- The different groups have developed alternative solutions to the issues – which is diluting the overall impact of their collective representation.
- There is no working forum for the different groups to come together in a meaningful and constructive way.

Solutions?

What industry and government can do together:

Agree on a consensus position. BEIS and the IPA, supported by CLC members, are planning a series of consultation workshops with the main representative bodies on payment and retention issues. The current BEIS sponsored consultation on retentions will be the catalyst for this, but the consultation will be wider. The key issues on which consensus must be reached include:

- Inefficient pre-qualification and tendering practices
- Transparency/fairness of cash-flow
- Retentions
- Forms of contract

CHANGE INEFFICIENT PRE-QUALIFICATION AND TENDERING PRACTICES

A 2010 survey of SEC Group⁴² members alone showed that they spend £50m per annum on pre-qualification. This suggests that the industry as a whole spends in excess of £500m on fruitless pre-qualification.

Build UK and CECA, actively supported by ECA/ BESA are currently working on a proposal for PQQ Reform⁴³, which is endorsed by the CLC. Its objective is to develop and implement a solution to the current bureaucratic and repetitive process of pre-qualification that meets the needs of clients and other stakeholders, and is beneficial to the construction supply chain.

Develop a business case for how to remove bureaucracy from the construction procurement process by adopting standard PQQs and applying them through the supply chain.



Construction Strategy 2025:

⁴² Klein, Rudi. Briefing Note. SEC Group, 2016.

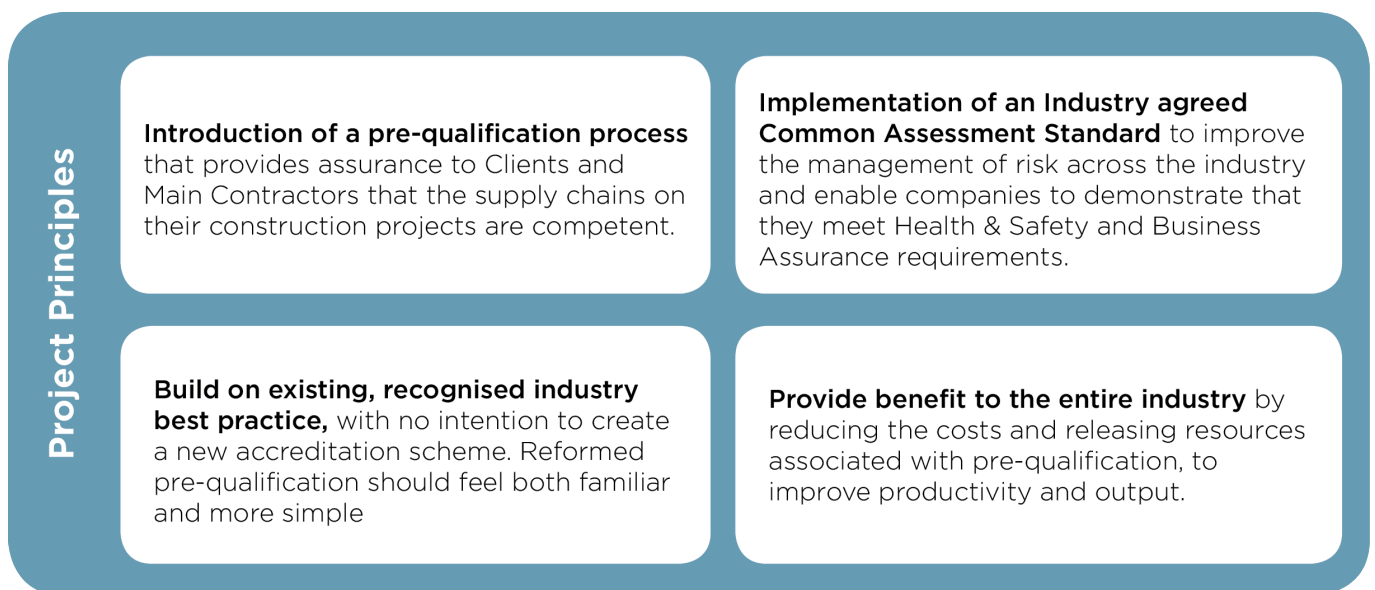
⁴³ CECA and Build UK. "Proposal for PQQ Reform." 2016.

The Pre-qualification Reform Project

Mission Statement & Principles

The Build UK & CECA Pre-qualification Reform Project aims to deliver against the following mission statement outlined in the Build UK Action Plan:

"Develop and implement a solution to the current bureaucratic and repetitive process of pre-qualification that meets the needs of clients and other stakeholders and is beneficial to the construction supply chain"



What industry can do:

The CLC will continue to support the development of the standard by Build UK and CECA, and with BEIS will encourage other industry representatives to support this initiative. The CLC will bring together its workstreams to ensure that a common approach also works for the housing sector.

What government can do:

When jointly endorsed across representative groups, require this standard to be used in all public procurement.

TRANSPARENCY/FAIRNESS OF CASH-FLOW

Small and medium sized businesses comprise 99% of the 280,000 UK construction and built environment businesses. These small businesses spend on average 130 hours each year, at an average cost of £1,500 per business, chasing payment, whilst incurring £180m in debt interest charges – a total cost to UK businesses of £600m. Late payment is a primary or major factor in 20% of industry insolvencies⁴⁴.

⁴⁴ CE Funding and Finance Group. The Payments Minefield. Constructing Excellence, 2016

Improving cash-flow along the supply chain remains the overriding concern for SMEs in the industry. Much attention has been given to payment in the construction industry, and following work done by the construction industry task force the Supply Chain Payment Charter⁴⁵ was launched in 2014. This is a voluntary scheme, supported by Build UK, run by the Chartered Institute of Credit Management on behalf of BEIS. Unfortunately, in the two years since the first registration, in 2015, only 39 companies signed up to it and there is no evidence that it is being actively promoted in any public sector procurement.

A possible solution is to encourage the wider use of Project Bank Accounts (PBA) by public and private sector clients. The UK Government's policy is that PBAs should be used unless there are 'compelling' reasons not to do so. PBAs are mandated on centrally procured projects over a certain value by the Scottish Parliament⁴⁶ and the Northern Ireland Executive and the Welsh Government Assembly is planning to follow suit early in 2018.⁴⁷



CASE STUDY: A164 Humber Bridge to Beverley Route Improvement Scheme

The A164 project is evidence that there can be financial benefits of using PBAs for all parties. Actual savings of 0.43% were made in the project, based on re-tender of received supply chain subcontract packages with a PBA. This was due to the fact that subcontractors decreased their prices when PBAs were used, since no additional funds to cover delayed payments by the main contractor were required. Another advantage from PBAs was that payment times for the supply chain were less than 30 days. This minimised the risk to the employer from insolvency in the contractor's supply chain. Lastly, setting up the PBA was not expensive or timely for Yorkshire Council, since they used the same bank they had an established credit history and accounts with. The Council has benefited from the experience of using PBAs and plans to use them for future major projects.

Project Bank Account Case Study A164 Humber Bridge to Beverley Route Improvement Scheme

What industry can do:

Develop the work that has been undertaken by a number of construction trade associations and produce a simple, enforceable, digitally enabled, industry-wide payment process which could be mandated by public sector clients and utilised for auditing, enforcement and big data analysis. This must include:

- Risk transfer and project interfaces
- Recognition of early contractor involvement
- Project Bank Accounts
- Technology solutions / electronic banking
- Timing of payments and ensuring these are not subject to unreasonable terms or delays in payment
- Payments for off-site materials and manufacture.

This must be done by a cross-industry group.

⁴⁵ Department for Business, Innovation & Skills. Government and industry agree new construction payment charter. 22 April 2014.

⁴⁶ Scottish Government. PBAs. <http://www.gov.scot/Topics/Government/Procurement/Policy/ReviewProcConstruction/projectbankaccounts>

⁴⁷ Constructing Excellence in Wales. "Project Bank Accounts". Bridgend, March 2017.

RETENTIONS

Retention payments have long been a controversial issue within the construction sector. Whilst the original purpose for which they were devised – providing surety against defective work and supply chain insolvency – remains a valid one, retentions can also be misused by clients and contractors, either to support their own cash flow or as financial leverage to ensure that projects are delivered within budget and that profit margins are protected.

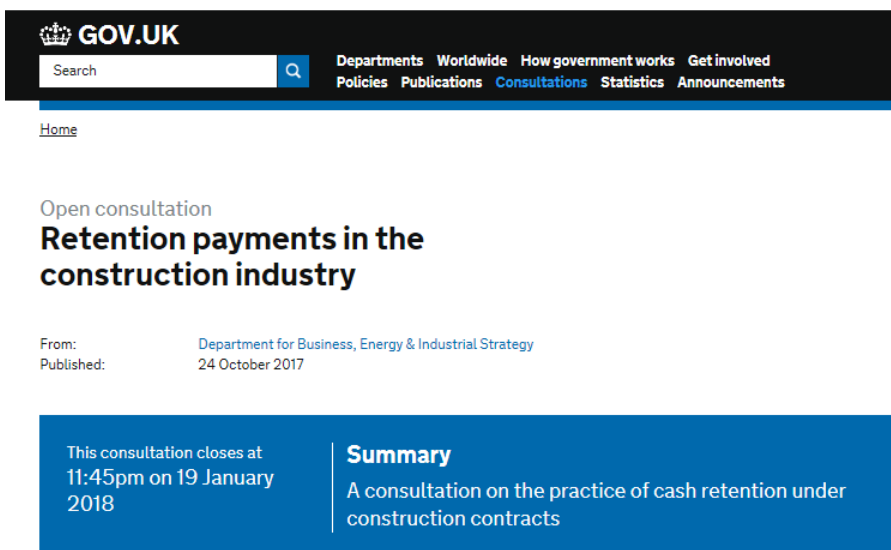
In 2015 small firms across the UK lost £45m worth of retentions because of up-stream insolvencies. The failure of Carillion in 2018 means that the figure this year is likely to be much higher. Retentions are withheld in other countries, and there are many examples of how retention monies can be protected and ring-fenced. Alternatives to retentions, including insurance backed bonds and collective insurance schemes, of the type found in the lift sector, also offer alternatives to retentions payments.

The industry has collectively committed to abolishing the practice of retentions by 2025. The CLC supports this objective, which is consistent with its strategic approach of procuring for value, and increasing the adoption of digital and offsite manufacturing technologies. New construction techniques will lead to more sustainable and profitable enterprises in the sector, and minimise the risk of defective construction work, eliminating the need for retentions, and encouraging their replacement with alternative mechanisms for guaranteeing the quality of work undertaken.

What government can do:

BEIS commenced an open consultation on retentions in October 2017⁴⁸. BEIS will work closely with industry groups, clients and businesses to form a consensus position on proposals for an alternative to the current retention structure which protects sub-contractor cash.

The objective should be to have a statutory mechanism that protects cash retentions and to eliminate retentions completely by 2025.



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Open consultation

Retention payments in the construction industry

From: Department for Business, Energy & Industrial Strategy
Published: 24 October 2017

This consultation closes at 11:45pm on 19 January 2018

Summary

A consultation on the practice of cash retention under construction contracts

⁴⁸ Department of Business, Energy & Industrial Strategy. "Retention Payments in the Construction Industry: A Consultation." 2017.



Case Study: LEA Retention Replacement Scheme

The Lift and Escalator Association has removed cash retentions with a Contract Guarantee Scheme. The LEA's view is that the cash retention system used in the construction industry is an outdated practice, which is based on the assumption that there will be a non-performance.

The Contract Guarantee Scheme utilises a conditional bond which gives clients protection in a similar way to retentions, both during the work prior to Practical Completion and during the Defects Liability Period. The key difference is that a sum only has to be paid if there is a contractual non-performance.

LEA Contract Guarantee Scheme: A Scheme to Replace the Retention System

FORMS OF CONTRACT AND PROCUREMENT

The McKinsey Global Institute recommends that one of the steps that construction can take to catch up with the total economy is by "re-wiring" the contractual framework⁴⁹. That is, move away from the traditional hostile contracting environment that characterises many construction projects to a system focused on collaboration and problem solving. Establishing a "single source of truth" on projects for early monitoring of progress, supported by collaborative technology, will help to minimise misalignments and enable joint corrective action.

In the last ten years, the industry has improved the way projects and programmes of work are procured and delivered, particularly in the public and regulated sector, with adoption of partnering contracts such as NEC3 and PPC2000. This is continuing to develop with the issue of NEC4⁵¹ and the TAC-1 Term Alliance Contract⁵¹ and FAC-1 Framework Alliance Contract⁵².

Government Construction Trial Projects⁵³ on Integrated Project Insurance (IPI), Two-stage Open Book and Cost-Led Procurement have been run to test a wider range of procurement routes. These trial projects have delivered up to 25% savings plus improved workflow and profitability.

The recent trial project at Dudley College of IPI has been subject to significant external scrutiny by the University of Reading⁵⁴.

However, the experience of contractors and quantity surveyors is that new forms of procurement are often very poorly understood within the supply chain and it is very rare for an un-amended form of contract to be used⁵⁵.

⁴⁹ Barbosa, Filipe, et al. Reinventing Construction: A Route to Higher Productivity. McKinsey Global Institute, 2017.

⁵⁰ NEC. "NEC 4: The Next Generation: An explanation of challenges and benefits." 2017.

⁵¹ Association of Consultant Architects. TAC-1 Term Alliance Contract. Published 2016

⁵² Association of Consultant Architects. FAC-1 Framework Alliance Contract Published 02 June 2016 . n.d. <http://acarchitects.co.uk/fac-1-framework-alliance-contract-published-02-june-2016/> (accessed October 12, 2017).

⁵³ Cabinet Office. "Government Construction: Construction Trial Projects." July 2012.

⁵⁴ University of Reading Innovate UK / TSB Project Ref: 101345. Delivering more for less under the IPI model, final research report February 2018

⁵⁵ Rider Levett Bucknall and Build UK. "Walking in each other's shoes." 2016.



Case Study: Futures Housing Group

Futures Housing Group has been chosen by King's College London as a focus of new academic research into the impact of a pioneering approach to procurement.

The research, led by the College's Centre of Construction Law and Dispute Resolution, will look at how Futures, its partners and customers have been impacted by the new Framework Alliance Contract (FAC-1) which gives smaller businesses the chance to secure large contracts with organisations.

Futures, a housing provider which manages around 9,100 homes throughout the East Midlands, was the first organisation in the world in August 2016 to adopt the new FAC-1 standard form framework agreement which was authored by Professor David Mosey at King's College. The FAC-1 has now been used in numerous procurements, with values ranging from £7.5m to £2.8bn and Futures has already seen a reduction in the amount it spends on contractors.

Academics at King's have been impressed by the way Futures have used the contract for value for money but also the social value impact. The research will be published in academic journals and it is hoped the approach will help reduce industrial contractual disputes in future.

© *Futures Housing Group*.⁵⁶



Ocean Estate Regeneration, London

RLB Provided Employer's agent and cost management services on 819 homes, with 707 new apartments (423 private sale, 296 social rent, 78 shared ownership and 22 shared equity) and 112 refurbished dwellings.

⁵⁶ Academics to Focus on Futures for Research Project. March 2017. <https://futureshg.co.uk/procurement/academics-focus-futures-research-project/>.



Case Study: Cookham Wood Young Offenders Centre Trial Project

The Ministry of Justice's (MoJ) Cookham Wood Trial Project combined collaborative working, using Two Stage Open Book, with the adoption of BIM, Project Bank Accounts and informal implementation of Government Soft Landings. A fully integrated team worked to a tight timescale to deliver a £20m new build Young Offenders Institution that exceeded cost saving targets.

MoJ adopted the PPC2000 standard form of contract (with minimum amendments) to define its processes for Early Contractor Involvement (ECI) under Two Stage Open Book. MoJ considered that PPC2000 actively promotes collaborative working at all stages. They also concluded that PPC2000 does not require any amendments to provide for BIM Level 2 or any contractual BIM Protocol.

Despite problems on site with severe weather, the originally contracted project works were completed within both the agreed timetable and the Agreed Maximum Price

- Baseline Benchmark: £2910 per square metre for a comparable project
- Target Benchmark: £2411 per square metre
- Actual Benchmark: £2332 per square metre

Collaboration between the main contractor, Interserve and its specialist contractor SSC, resulted in a pre-cast volumetric cell proposal for the construction of the project. This enabled a reduction in the construction programme from 50 to 44 weeks.

© **Constructing Excellence** ⁵⁷

⁵⁷ Constructing Excellence, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/325950/Cookham_Wood_case_study__CE_format__130614.pdf

The choice and administration of contracts is something which many clients appear to abdicate, relying heavily on the advice of legal advisors with an enormous focus on the theoretical transfer of risk downwards, rather than the placement of risk. Poor contract administration and a failure of both clients and suppliers to fully understand their obligations under the contract, coupled with commercial pressures exerted to ignore the contract (payment terms being the best example of this) create a very uncertain landscape in which some construction activity takes place.

The lack of contractual recognition of the whole-life value and the failure to incorporate whole-life risks mean that there is a growing view that current industry forms of contract will not meet future requirements. Contractual models need to be versatile enough to accommodate pre-construction, modularisation, offsite manufacturing, BIM, wearable tech, drones, 5D cloud based modelling and other evolutionary changes within the sector.

The theme of “contracting for success” as opposed to contracting for possible failure is at the heart of the issue. While contracts continue to be structured to allow blame and risk to be passed down the supply chain, rather than evaluated and placed, and whilst parties are still not incentivised to work together to achieve the ultimate outcomes identified at the outset of the project, it will be difficult to change the blame culture that still dominates the industry.

What industry can do:

The current forms - based on how the industry has always delivered - will not facilitate innovations, but a new form supported by technology solutions may be a way forward for SMART connected contracts. There is a real opportunity to make the next generation of contracts wholly cloud based - a contract that creates a living set of priced risks where every bilateral relationship has transparency.

Industry should investigate how contractual forms within the built environment can become digitally enabled and SMART-cloud based to introduce transparency and whole-life project focus.

Industry should move to the integration of digital procurement, pre-qualification, tendering, contract negotiations and price, execution and project management.

What industry and government can do together:

Contracts influence the behaviour of clients and suppliers. Clients should:

- Broaden their understanding of the appropriate form of contract and chose the form that is most likely to help deliver their project objectives, rather than the form that is the most familiar
- Promote un-amended forms of contract
- Build on Alliancing and Framework work already being used in the regulated industries to promote continuity of work and build-up of team experience
- Incentivise performance against the pre-defined Value. There are rarely adequate performance incentives in contracts.

DELIVERING THE SECTOR DEAL

SEQUENCING

The Procuring for Value element of the Sector Deal will seek to deliver the following outcomes:

- By 2018, conclude consultations on payment practices and develop an approach to payment practices and retentions
- By 2019, develop an industry-wide definition of value and a universal methodology for procurement
- By 2020, develop a standardised industry pre-qualification process
- By 2025, end the practice of retention payments within the construction sector.

GOVERNANCE

The Sector Deal represents a partnership between government and the sector. Government, clients and suppliers will have to work in alignment to ensure that it is delivered. A governance mechanism will be established under the CLC, to oversee the delivery of the Sector Deal, liaising with key trade bodies and professional institutions, firms across the construction sector, and other organisations that will have an important role in delivering the commitments made in the Sector Deal.

DELIVERY PLAN

The CLC will publish a delivery plan for implementing the Sector Deal. This will cover the key objectives, overall timetable and milestones. The Delivery Plan will be updated regularly, and will inform the development of an annual report on the progress in implementing the Sector Deal.

SUCCESS CRITERIA

The CLC will also assess the wider effect the Sector Deal initiatives in terms of their economic and social impact. These metrics will indicate the strategic direction of the sector, and the progress being made towards the objectives.

REPORTING

The CLC will publish an annual report on the progress made. This will report on progress in relation to the specific commitments made in the Sector Deal, and also the progress made towards the delivery of the wider Construction 2025 objectives of saving time and cost, reducing carbon emissions and delivering productivity gains worth £4 billion a year.

ACKNOWLEDGEMENT AND THANKS

The CLC is a voluntary body of senior industry figures, brought together through a collective vision, but the construction and built environment sector is much broader than the CLC. In researching the back-ground to this report I received help from many individuals, bodies and institutions. I would like to give particular thanks to the people and organisations below who read and gave feedback on my first draft report.

Academia	
Birmingham City University www.bcu.ac.uk/	Professor David Boyd, School of Engineering and the built environment
King's College, London www.kcl.ac.uk/	Professor David Mosey Director, Centre of Construction Law and Dispute Resolution
Loughborough University www.lboro.ac.uk/	Professor Jacqueline Glass Associate Dean Enterprise School of Civil and Building Engineering
Government Departments	
Department for Business, Energy and Industrial Strategy www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy	Fergus Harradence, Deputy Director, Construction Team, Infrastructure & Materials
Infrastructure and Projects Authority https://www.gov.uk/government/organisations/infrastructure-and-projects-authority	Keith Waller, Senior Advisor
Industry Bodies	
Constructing Excellence http://www.constructingexcellence.org.uk	Don Ward, Chief Executive
Construction Leadership Council Innovations in Building Workstream www.constructionleadershipcouncil.co.uk/workstream/innovation/	Jade Lewis, Director of Advocacy, St Gobain www.saint-gobain.co.uk Adam Locke, Partnership and Innovation Leader, Engineering Excellence Group, Laing O'Rourke www.laingorourke.com/
Infrastructure Client Group - Project 13 www.ice.org.uk/about-ice/what-we-do/infrastructure-client-group	Simon Murray, Advisor
Professional Bodies	
Construction Industry Council www.cic.org.uk	Professor John Nolan, Chairman Graham Watts OBE, Chief Executive

Royal Institution for Chartered Surveyors www.rics.org	Alan Muse, Global Director of Built Environment Professional Groups
Royal Institution of Civil Engineers www.ice.org.uk	Nick Baveystock, Director General and Secretary Hannah Vickers, Head of Policy and External Affairs
Professional Services Companies	
Arcadis www.arcadis.com	Peter Madden, Chief Operating Officer Simon Rawlinson, Head of Strategic Research and Insight
Arup www.arup.com	Geoff Hunt, Director - Chief Operating Officer UK, Middle East + Africa
Gardiner and Theobald http://www.gardiner.com/	Tony Burton, Partner
KPMG www.kpmg.com	Richard Threlfall Partner
Mott MacDonald www.mottmac.com	Mark Enzer, Chief Technical Officer
Pinsent Mason www.pinsentmasons.com	Martin Roberts Consultant
Representative Organisations	
Building Engineering Services Association www.theBESA.com	Rob Driscoll, Director of Legal and Commercial Solicitor
Build UK www.BuildUK.org	Suzannah Nichol MBE, Chief Executive
Civil Engineering Contractors Association www.ceca.co.uk/	Alasdair Reisner, Chief Executive
Confederation of British Industry www.cbi.org.uk/	George McFarlane, Sector Development Director
Construction Products Association www.cbi.org.uk/	Diana Montgomery, Chief Executive
Specialist Engineering Contractors' Group www.secgroup.org.uk	Rudi Klein, Chief Executive
Rider Levett Bucknall	
www.RLB.com	Marina Ikonomova Daniel Dalton Jack Barron

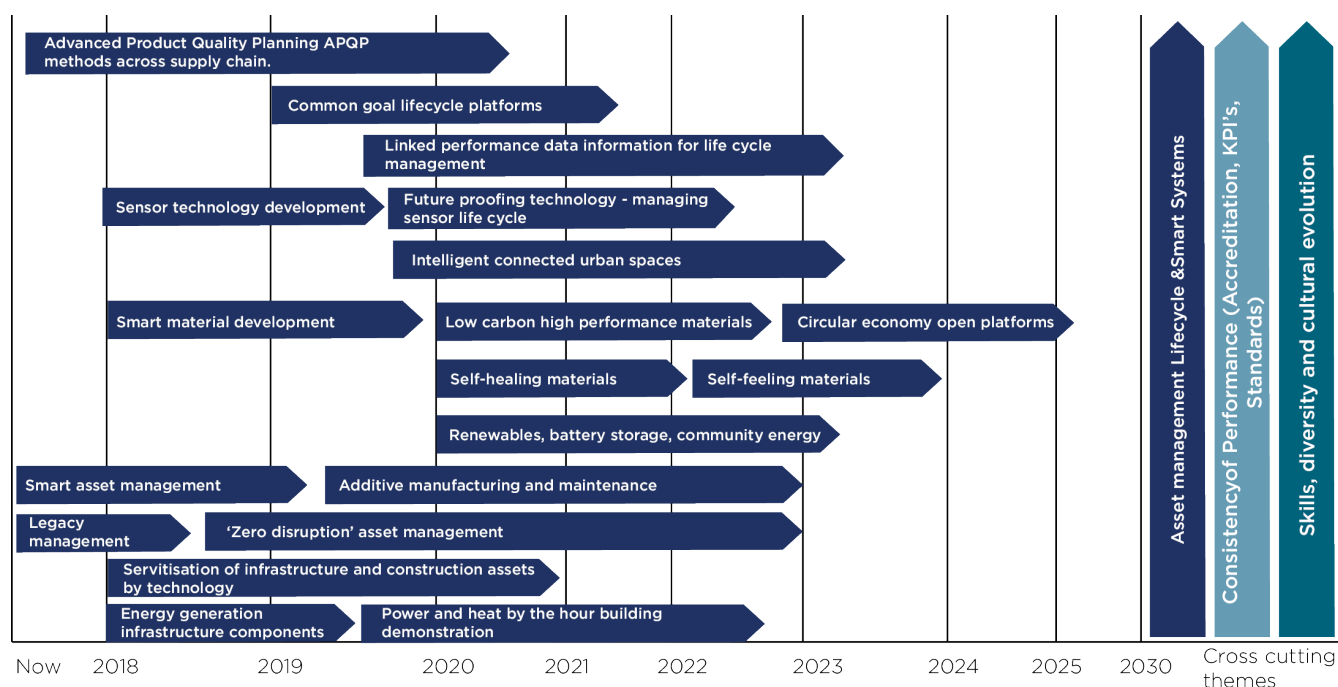
APPENDIX A: LINKAGES TO EXISTING PROGRAMMES

- Whole-life value
- Capital and Operational Carbon Emissions
- Digital effectiveness, BIM and data capture
- Use of standard components and pre-manufactured value⁵⁷
- Design Quality Indicators
- Collaborative behaviour and supply-chain integration
- Government Soft Landings
- Social Value of the construction process
- Health, Safety and Well-being during construction
- R&D and Innovation
- Supply chain incentivisation for delivery innovation.
- Sharing of innovation risk between client and suppliers

Whole Life Value

i3P: Strategic Theme 3 – Lifecycle Performance

The use of Lifecycle Performance measures allows for the improvement of user well-being, asset quality, and resource and operational efficiency and are essential for determining the long-term environmental impact of buildings. A gap still has to be filled between theory and practice before life-cycle concepts can be fully implemented in design of buildings and civil infrastructure, but procuring for value will move this forwards much more quickly.



⁵⁷ Farmer, Mark. Modernize or Die: The Farmer Review of the UK Construction Labour Model. Construction Leadership Council, 2016.

Launched in October 2016, the Infrastructure Industry Innovation Platform (i3P)⁵⁸ is an independent innovation community governed by representatives from its member organisations. Membership is open to clients (currently major infrastructure projects and construction programmes) and their supply chains (Tier 1 contractors and consultants) across the infrastructure industry.

As a driver for innovation in the UK infrastructure industry, i3P will help transform ideas into opportunities and practical solutions; providing a mechanism for strategically directing innovation to address the major challenges facing the infrastructure industry.

Capital and Operational Carbon Emissions

The Green Construction Board’s Low Carbon Routemap for the Built Environment⁵⁹ highlights the increase in built environment carbon emissions from 2009 to 2012 and a widening of the gap towards achieving a 50% sector reduction as set out in the Construction 2025: Industrial Strategy⁶⁰ (See Figure 2).

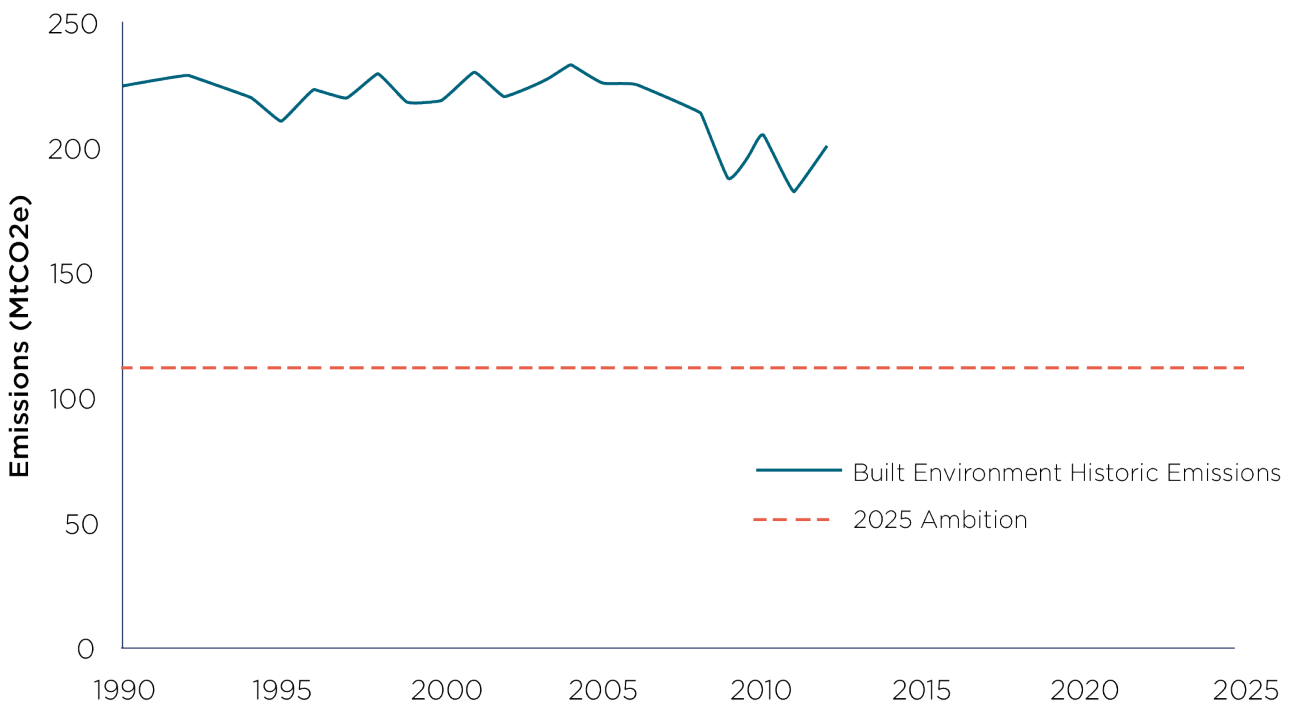


Figure 2: Actual built environment carbon emissions against the 2025 50% reduction target

The report also reveals differences in the trends of the components of built environment carbon emissions. While, overall operational carbon has a downward trend, non-domestic operational carbon is at an upward trend and is growing at a rate of 0.2Mt CO₂ per year. The Green Construction Board also concludes that the results, showing a decrease in overall carbon emissions from 2007 to 2013, are due to a decrease in economic activity, as opposed to efficiency and process improvements. Therefore, if the industry sees an increase in output compared to 2012, then there is no evidence that capital carbon emissions will not decrease. In order to achieve the built environment carbon targets, the Green Construction Board suggests that significant changes have to be implemented.

⁵⁸ i3P Collaborate to Innovate. <https://www.i3p.org.uk/about/>

⁵⁹ Green Construction Board. "Green Construction Board Low Carbon Routemap for the Built Environment." December 2015.

⁶⁰ Department of Business, Innovation & Skills. Construction 2025: Industrial Strategy. HM Government, 2013.

These include:

- Operational efficiency improvements
- Low carbon heat delivery
- The de-carbonisation of the electrical grid
- An industry focus on low carbon infrastructure and buildings
- The establishment of a built environment sector budget.

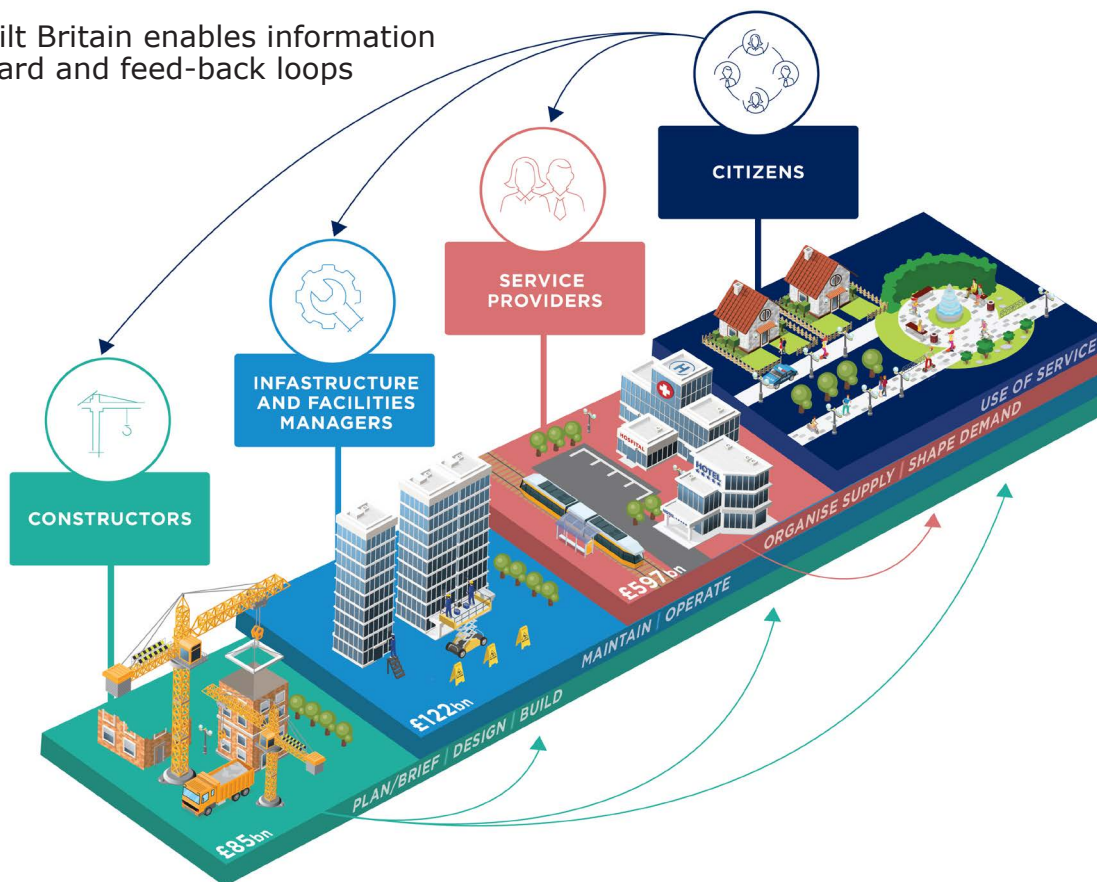
The use of sustainable procurement models can play a key role in changing the industry by strategically aligning project goals with the construction sector carbon targets. However, the value that can be gained from them is yet to be captured within the industry.

Digital Effectiveness and BIM

BIM was identified as a significant contributor to the savings of £804m in construction costs in 2013/14 announced at the Government Construction Summit in July 2014.

Digital Built Britain⁶¹ seeks to create a mature digital economy for the built environment which delivers high performing assets and exceptional client value. This is an ambitious world class programme based on significant progress demonstrated through BIM Level 2.

Digital Built Britain enables information feed-forward and feed-back loops



⁶¹ Digital Built Britain. Digital Built Britain: About Us. n.d. <http://digital-built-britain.com/about> (accessed 11 29, 2017).

Standard Components and Pre-Manufactured Value



"Industry, clients and government should work together leveraging CLC's Business Models workstream activity, to improve relationships and increase levels of investment in R&D and innovation in construction by changing commissioning trends from traditional to pre-manufactured approaches. The housing sector (spanning all tenures) should be used as a scalable pilot programme for this more integrated approach".

Farmer Review: October 2016

The CLC's Innovation in Buildings workstream's November 2017 report which sets out key actions designed to unlock the supply and demand conundrum affecting the provision of additional housing adopting smart construction.

Produced in collaboration with government, the report "Demand creation, investment and volume surety"⁶² sets out a compelling proposition for housing clients to increase demand for smart construction and provide volume surety to enable greater investment in industrialisation.

The proposed strategy seeks to focus on where additional capacity is most needed and is underserved through existing supply chains and where government has most influence to affect the adoption of smarter methods. This is through the housing programmes of city and regional administrations, the Homes and Communities Agency (HCA), and also the Private Rental Sector. (PRS). The strategy has three key aspects:

- Aggregate demand within city regions and HCA programmes to provide visibility to the supply chain of future volume requirements.
- Move to long-term (three to five year plus) strategic partnerships and contracts to progressively improve performance and capacity managed collaboratively between client and supply chain stakeholders.
- These longer term arrangements support initial investments in products, processes, and people that can be recouped over a longer period managing affordability for all stakeholders.
- Standardisation of requirements/specifications including space/pattern books – development of industry level guidance, and common standards supporting enhanced quality, and pre-manufactured value in delivery through-out the supply chain.
- Procurement – enabling achievement of this strategy through revised procurement guidance and model forms of contract, with appropriate measures to manage risk investment and reward collaboratively and transparently.

The strategy aims to unlock private sector investment through coordination of public sector requirements. This will support the Industrial Strategy and Construction 2025, both meeting national housing needs as well as putting the UK at the forefront of housing industrialisation creating jobs, wealth and export potential.

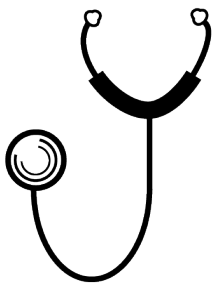
⁶² CLC Innovation in Buildings Workstream. "Demand Creation, investment and volume surety." May 2017.

Design Quality Indicators

The use of Design Quality Indicators can help project teams to focus on the project goals and the needs of the end users. This is a process “that enables every aspect of design quality to be assessed at each stage of the construction process, from inception to post occupancy analysis”⁶³. Design Quality assessments are made by an Independent Accredited Facilitators, who work with the client to ensure that the design meets the client’s goals.

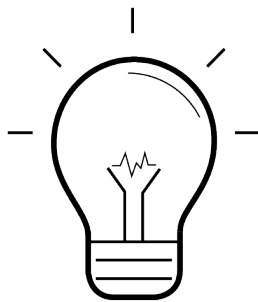
DQIs have the potential to increase efficiency in the industry and make it an attractive investment opportunity⁶⁴. DQIs improve project performance by allowing clients and the supply chain to measure, report and share data.

High quality buildings can:



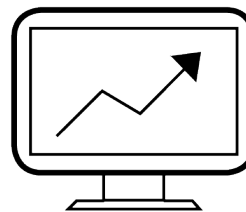
Speed up recovery
in hospital by

27%*



Improve learning
in schools

10%*



Increase productivity in
the workplace

20%*



Help to reduce
crime rates

67%*

*The value of good design: How buildings and spaces create economic and social value
Commission for Architecture & the Built Environment

The future use of DQIs relies on the experience of end users of built assets who will assess their whole life value and drive continuous improvement. Ultimately, DQIs will be used as a measure for the value of projects and their success.

⁶³ Construction Industry Council. Design Quality Indicators . n.d. <http://cic.org.uk/services/the-design-quality-indicator-dqi.php> (accessed 10 31, 2017).

⁶⁴ Design Quality Indicator. How does DQI work? n.d. <http://dqi.org.uk/howdoesdqiwork.php> (accessed October 31, 2017).

The future use of DQIs relies on the experience of end users of built assets who will assess their whole life value and drive continuous improvement. Ultimately, DQIs will be used as a measure for the value of projects and their success.

Government Soft Landings (GSL)⁶⁵

This approach addresses outcomes required and how they will be delivered and assessed. It encompasses:

- Operational input and challenge to construction and design to ensure that operational costs are minimised
- Using BIM visualisation to test users and operators' perceptions and assist with modifications to asset use and impact on lifecycle costs.
- Delivering commissioning, training and handover processes that optimise operational performance. BIM provides a fully populated asset data set into CAFM systems thereby reducing time wasted in obtaining and populating asset information.



Case Study: King's College Champion Hill Redevelopment

The £40m Champion Hill project included the construction of four new-build residential blocks and the renovation of a Grade II Listed Building. Both BIM and the Government Soft Landings approach were used in the project to achieve the optimum operational efficiency. For the best BIM outcome, data generated within BIM, during the design and construction stages, was utilised during commissioning and in the O&M manuals. BIM data was also exported into the computer-aided facilities management system.

Full training of maintenance staff was part of the project programme to ensure that the building will be efficiently managed post-handover. Building Management Systems using energy meters were installed to monitor differences between predictions at the design stage and actual energy use. The utilization of BIM as part of the wider Soft Landings Strategy helped to achieve a BREEAM Outstanding Rating and an EPC (A) rating which are evidence that an excellent operational outcome was achieved.



RLB King's College London Champion Hill Flyer

⁶⁵ BIM Task Group. Government Soft Landings. n.d. <http://www.bimtaskgroup.org/gsl/> (accessed November 2017).

Social Value:⁶⁶

Social Value is a way of thinking about how scarce resources are allocated and used. It involves looking beyond the price of each individual contract and looking at what the collective benefit to a community is when a public body chooses to award a contract.

Social value asks the question: If £1 is spent on the delivery of services, can the same £1 be used to also produce a wider benefit to the community. All English and some Welsh bodies have to comply with the law, including Local Authorities, Government Departments, NHS Trusts, PCTs, fire and rescue services and housing associations.

It applies to all public service contracts and those public supply contracts with only an element of goods or works.

R&D and Innovation

The Construction Industry Innovation Strategy Challenge Fund proposal brings together construction, manufacturing, energy and digital to transform the UK's building performance - increasing the uptake of smart, manufactured component-based construction to deliver higher performing assets. It is a coordinated approach that will encourage the adoption of smart components in the design, assembly and management of assets, as well as the generation of energy that buildings and other assets use. The ISCF includes investment in the Manufacturing Technology Centre⁶⁷, a RegTech⁶⁸ centre, the development of Digital Built Britain and the integration of the SPECIFIC initiative of energy-generating buildings.⁶⁹



Case Study: Tideway Health and Safety

Thames Tideway has introduced an innovative approach to improve the health and safety training which serves as a model for the wider industry. A research study conducted by Tideway in 2013 revealed that a large proportion of accidents on site are due to workers misunderstanding health and safety instructions or communication.

Following these findings, Tideway formed a research partnership with Loughborough and Glasgow Caledonian University to create a framework for a health and safety communication standard, based on the European Framework of Reference for Language. In September 2015, Tideway launched communication tutorials and assessments for employees, which help to ensure that all staff have the required level of understanding of health and safety rules and instructions. The assessments and tutorials are continuously improved and updated, to meet individual staff needs and help their learning experience.

Employees, who cannot meet the required health and safety knowledge level, receive further support through schemes such as buddying or the use of interpreters. This new approach has helped Tideway to improve health and safety training and is starting to be implemented within the wider industry.

Thames Tideway: Better Communication for a Better Project

⁶⁶ Cabinet Office, Efficiency and Reform Group, and Crown Commercial Service. "Procurement policy note 10/12: The Public Services (Social Value) Act 2012." December 2012.

⁶⁷ Manufacturing Technology Centre. All About Us. n.d. <http://www.the-mtc.org/who-we-are/all-about-us> (accessed November 2017).

⁶⁸ Financial Conduct Authority. About Us. 2017. <https://www.fca.org.uk/about>.

⁶⁹ Engineering and Physical Sciences Research Council. Buildings as power stations concept creates UK's first carbon positive energy house. 20 July 2017. <https://www.epsrc.ac.uk/newsevents/news/buildingsaspowerstations/>.

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