



How a fast-track standard helps reduce infrastructure carbon emissions

PAS 2080 became the world's first standard for managing infrastructure carbon

The story at a glance

- A government-commissioned review by the Green Construction Board found that infrastructure is responsible for over 50% of the UK's carbon emissions.
- The review recommended the creation of a new carbon management specification to help reduce the whole industry's carbon emissions across the value chain.
- Led by BSI, a steering group of stakeholders developed a fast-track standard - PAS 2080 - to provide a clear and consistent framework.
- **PAS 2080 became the world's first standard for managing infrastructure carbon and has been pivotal in helping companies to reduce carbon use and costs.**

The starting point

In response to growing concern about the infrastructure sector's high carbon emissions and the associated costs involved, HM Treasury and The Department for Business, Innovation and Skills (now the Department for Business, Energy and Industrial Strategy (BEIS) commissioned an [Infrastructure Carbon Review](#). **The review found that infrastructure is responsible for over 50% of the UK's carbon emissions.**

Cutting carbon is vital for the environment, but it also cuts costs. Reducing the carbon footprint of an infrastructure project creates efficiencies in materials, energy and labour that reduce capital and operational costs, bringing savings at every stage.

However, the industry lacked a consistent approach to assessing and managing whole life carbon emissions. **So one of the review's specific recommendations was to create a new carbon management specification** that would provide the guidance needed to turn this opportunity into a reality.

“The real power of PAS 2080 is not just that it’s a common framework, but also product suppliers, contractors, designers and asset owners can all be verified to it. When you’ve got the whole value chain operating in the same way, that’s where the magic happens in releasing lower carbon solutions.”

David Riley,
Head of Carbon Neutrality, Anglian Water

The challenge

The challenge for the infrastructure sector was huge. To reflect the 2008 Climate Change Act, **it needed to achieve a reduction of around 75% over the whole life cycle of projects [1].**

That meant the new standard would need to provide a framework that covered the whole value chain, reducing both carbon and costs through more intelligent design, construction and use. It also needed to ensure that carbon would be consistently and transparently measured at key points in infrastructure delivery.

The solution

Sponsored by the Green Construction Board’s Infrastructure Working Group, PAS 2080 was developed by a steering group that included Mott MacDonald and Arup, and was facilitated by BSI.

This group included practitioners and experts from different sectors and parts of the value chain, including asset owners, suppliers and academics. In addition, a technical group was on hand to make sure the document was fit for purpose and would be understood by its users.

David Riley, Head of Carbon Neutrality at Anglian Water, was part of the steering group. “We had representatives from many important organizations and the diverse views were very

useful,” he explains. “Groups like this can get a bit heated at times, but the end result is that everyone understands the issues throughout the whole sector and can agree on the best way forward. The method also gives the PAS credibility so that people have confidence in it.”

At the end of this proven development process, the group reached consensus and PAS 2080 Carbon management in infrastructure was published, together with a guidance document that gives users practical examples of how to act on the framework’s principles.

The fast-track standard covers:

- Setting appropriate carbon reduction targets
- Determining baselines against which to assess carbon reduction performance
- Establishing metrics (e.g. Key Performance Indicators) for credible carbon emissions quantification and reporting
- Selecting carbon emissions quantification methodologies (to include defining boundaries and cut-off rules)
- Reporting at appropriate work stages to enable visibility of performance
- Continual improvement of carbon management and performance

[1] <https://www.ice.org.uk/news-and-insight/the-civil-engineer/june-2016/cut-carbon-to-cut-costs>



The result

PAS 2080 provides a common framework that all parts of the value chain can apply, helping them reduce both carbon use and costs throughout a project.

For example, Anglian Water achieved a 61% reduction in capital carbon and a 22% reduction in capital expenditure by following the methodologies of the PAS which it helped to create through David Riley's participation in the steering group. It also helped them become the first company to issue a sterling green bond. "The auditors expressly said that the fact we have PAS 2080 in place gave them clarity and certainty about what we were doing," says David Riley.

HS2 is also minimizing the carbon footprint of its major transport project by applying PAS 2080 principles. Carbon Manager Mark Fenton gives just one example: "Our designers achieved a 27% reduction in the structural steel use to build the

roof of the Old Oak Common station. That equates to 2,700 tonnes of carbon and a cost saving of £7m."

Importantly, the fast-track standard also encourages organizations to work collaboratively and more effectively by managing the whole life cycle of carbon use.

"The benefit of having cascaded it into our Tier one contractors is that we are working within a common framework, which means that we're speaking the same language, we're developing complimentary processes and working well together," confirms Mark Fenton.

"The great thing about a PAS is the speed that it can be completed, so vital, in this case, to help to rapidly meet the key objective of reducing carbon in infrastructure."

Alison Walker,

Climate Change Manager at HS2, was also on the steering group and part of the group who instigated the PAS.

The benefits of using PAS 2080

The standard helps organizations to:

- **Gain clarity.** The PAS defines what constitutes good carbon management and the key drivers of carbon reduction, with leadership being foremost.
- **Be consistent.** Following the PAS ensures carbon is consistently and transparently quantified at key points in delivery, so that data can be shared along the supply chain.
- **Reduce carbon emissions and costs.** The collaborative working the PAS promotes helps organizations to align processes, offer enhanced service solutions through their supply chain, and thereby reduce their costs.
- **Win tenders.** Demonstrating compliance establishes their commitment to carbon reduction and enhances their reputation, helping them stand out from their competitors both in the UK and overseas.
- **Innovate.** PAS 2080 encourages innovation by asking adopters to ensure that they are challenging, promoting and innovating lower carbon solutions.
- **Tackle climate change.** With infrastructure accounting for around 50% of the UK's carbon footprint, PAS 2080 compliance helps the UK meet its carbon reduction targets.

David Riley sits on several judging panels for carbon-related and sustainable awards. "It's interesting to see how many winning entries reference PAS 2080 as a tool," he notes. "I'm also seeing positive stories on the PAS coming out of agencies like the Environment Agency and Ofwat."

The benefits of PAS 2080 verification

"The real power of PAS 2080 is that not only is it a common framework, but also that product suppliers, contractors, designers and asset owners can all be verified to it," says David Riley. **"When you've got the whole value chain operating in the same way, that's where the magic happens in releasing lower carbon solutions."**

Organizations that become verified to the PAS can:

- Demonstrate their commitment to carbon reduction
- Measure and monitor carbon reduction
- Collaborate on projects across the supply chain
- Gain a competitive edge when bidding for tenders

A good example is Skanska UK. The construction company wanted to play its part in meeting the government's carbon reduction targets, and to lead the way in reducing the whole industry's carbon output. "Reducing carbon will reduce our costs, which in turn makes us more efficient and effective," says Executive Vice President Thomas Faulkner. "We then deliver better outcomes to our customers, and make better returns and profit for our shareholders. So it's a win-win for the sector."

Conor McCone, Skanska's Carbon Manager, adds: "PAS 2080 is really important for us as a business because it increases our operational efficiency and allows us to collaborate well within disciplines." Director of Environment Adam Crossley agrees. "PAS 2080 provides a common framework and guidance for the whole value chain to tackle the carbon challenge. It is essential for clients, designers, contractors and suppliers to work together if we are going to a low-carbon future."



About the sponsor

This PAS standard was commissioned by the Green Construction Board. The Green Construction Board was established in 2012 to drive forward the actions set out in the UK government's Low Carbon Construction Action Plan. The board includes government representatives and senior industry leaders. As well as providing leadership on the Action Plan, it acts as a sounding board for government departments for new or challenging green construction issues, and advises on the impact and implementation of policies related to green construction.

Acknowledgement is also given to the following organizations that were involved in the development of this PAS, as members of the Steering Group:

Anglian Water Services Limited, Carbon Trust, High Speed Two (HS2) Limited, Arup Group

Limited, J.N. Bentley Limited, Balfour Beatty plc, London Underground, BRE Group, Mott McDonald, Cambridge University, MWH Global, CEMEX UK, National Grid, Clancy Group, Responsible-Solutions, Construction Products Association, SKANSKA UK plc, Costain Group plc, Tata Steel, Department for Business, Innovation and Skills (BIS), Transport for London, HM Treasury

Next steps for PAS 2080

PAS 2080 is currently being revised and is due to be published in 2022. The revised specification will incorporate learnings from user experience, provide further clarity in some of the clauses, and will help the value chain accelerate towards net zero. It is expected to include additional guidance around systems-thinking for whole life decarbonization and carbon sequestration, as well as relevant nature-based solutions.

Why BSI?

BSI leads the world in standards and our trademark Kitemark™ is recognized globally as a symbol of quality and safety. For a standard to be accepted and adopted by governments, industry, trade associations and businesses of all sizes it must be built on consensus and credibility. The PAS is developed through a rigorous consensus-based process, evolved by BSI over more than 100 years.

Our aim

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