

WHAT DO CLIMATE ADAPTATION AND RESILIENCE MEAN FOR THE INITIATION AND DELIVERY OF MAJOR PROJECTS?



Highlights from the Major Projects Association event held on 16 October 2014

Changing weather patterns and demographics present engineering challenges that need to be addressed. The Institution of Civil Engineers (ICE) *State of the Nation: Infrastructure 2014* identifies that energy, flood management and local transport are of particular concern, while three other sectors – water, waste and strategic transport – require future-proofing.

Imperatives for action:

1. Demographic changes, and specifically an ageing population, mean that in all probability there will be a declining number of taxpayers to pay for infrastructure, but more people wishing to use it.
2. The provision of infrastructure suffers from political uncertainty, particularly with infrastructure projects like energy and airports. Government needs to make decisions – even if the decision is not to proceed. Having made a decision, it is then essential to put in place the steps to ensure the plan is delivered.
3. Many of today's codes and standards are not fit for purpose. Extreme weather events show that the average has moved; and the shift in the bell curve means that the extremes have also shifted beyond our present design parameters. So practice has to change. And to ensure resilience of our infrastructure, codes need to be updated on a relatively short cycle; 10-15 years as at present is far too long.

Through the 2008 *Climate Change Act* the UK is already committed to a legally binding target to reduce the UK's greenhouse gas emissions by at least 80% from the 1990 baseline by 2050. The Act was supported by all the main political parties.

But while we have the overarching legal commitments, implementation is weaker. Despite our awareness of the potential impacts of climate change, and high-level legislation to mitigate it, industry is not set up to deal with the frequency and severity of conditions now being experienced and anticipated. If we design to the wrong standards, our clients' businesses will be at risk and may even fail. So how quickly can we introduce new and efficient approaches?

'Insurers and bankers have a much better handle on risk than anyone else.'

John Twichen, Copper Consultancy

'We have to cope with climate whether it's changing or not. But there are other pressures too: increasing population, rising expectations, and growing interdependence which is a source of fragility. For all those reasons, we need to think about resilience.'

Sir Tim Laurence, Major Projects Association

ACTION PLAN

Demonstrate commitment. It is vital to convince politicians that we have a commitment to adopting best practices in relation to climate change resilience. We need to avoid denying the science behind climate change. Crucially, we need to avoid being seen to argue against improvements in environmental performance, such as raising energy efficiency standards or sustainable urban drainage systems.

Identify a set of clear priorities. We need to map a range of actions about what we do as a sector, and what society should do, to respond to the challenges we face in relation to climate change. We need to identify priorities, as well as risks and rewards. We should be indicating directions and providing enabling tools.

Whatever we do needs to be achievable. The sustainability agenda has grown to include a huge range of issues, most of which lie beyond our sphere of influence. We cannot fix every environmental problem, and should concentrate on those that lie within our capacity to solve. If you try to do everything, you risk doing nothing.

INFRASTRUCTURE IS POLITICAL

Despite the privatisation of the railways and energy utilities, the damage to the railway line at Dawlish in February 2014 was regarded as a political problem. Following flooding of the Somerset Levels, also in 2014, the Prime Minister said money was no object. And when domestic energy prices rise, politicians say they will deal with it.

Impact of the political cycle – there is a poor match between on the one hand the needs of long-term planning and infrastructure investment, and on the other the short-term political cycle. Politicians may be reluctant to take unpopular and/or costly decisions, however vital these may be to long-term societal needs.

What is the appropriate cycle time for projects and for standards? These obviously vary, with some projects, such as rail, having long gestation periods. But changes can occur rapidly too; when Thameslink introduced 12-car trains, immediately the system reached its full capacity. On the other hand, Docklands Light Railway was known at the time of its construction to be way below any standard; it was constructed simply to stake out the ground. Similarly, M25 bridges are already being rebuilt to accommodate additional motorway lanes as, for good reasons at the time, no spare capacity was built in.

CLIENTS, STANDARDS AND RISK

Sophisticated UK clients for major projects are world-class and know about appropriate standards, about whole-life cost and value, and about future risk. But less sophisticated clients with smaller projects are not in the same position, and it is the responsibility of the supply chain to help them to understand the limitations of standards, their (and society's) tolerance to risk, and where best to spend their money.

'The opportunity that major projects like Crossrail provide is to give the impetus to get the standards right – which can then be used on all projects.'

Richard Adam, CH2M HILL (on secondment to HS2)

CALL TO CLIENTS

The ICE State of the Nation report reminds clients not to build anything new unless they can maintain what they've got. While this may be against our best interests as designers of new projects, facilities need to be either maintained or replaced.

For some clients and with their agreement, it may be appropriate to design for a short, specific design life, and to ensure that repairs or upgrades can be speedily effected at reasonable cost and with minimum disruption.

'Are we seeing the end of the "one-size-fits-all" standard? Do we need something more flexible that deals with uncertainty over the future effects of climate change, rather than standards that necessarily look at past experience?'

Ian Allison, Mott MacDonald

EDUCATION AND SKILLS

Crossrail has one third of its engineering staff from outside the UK; their skills are superior to the UK pool. Our universities need to change the skills they are developing, and accreditation processes need to recognise the sophisticated multi-disciplinary skills we need in future. Students need to be trained to focus on taking appropriate decisions that are relevant to project sponsors and the delivery of value, leading to long-term benefits and positive social, economic and environmental outcomes.

POINTS FOR FURTHER DISCUSSION:

- What proportion of our current codes take climate change projections into account?
- How quickly can we undertake the necessary research and reset our codes and standards?
- How quickly can we improve the efficiency of our designs to give a product that mitigates climate change and is more resilient?
- How best can we support the education of clients?
- Can we establish a new, integrated, performance-based, whole-life approach to projects, with sufficient momentum that it becomes the new norm?

Managing the risks of extreme events and disasters to advance climate change adaptation

(Intergovernmental Panel on Climate Change, 2012)

Annual climate statement 2013

(Australian Bureau of Meteorology)

Climate Change 2013: the physical science base

(Intergovernmental Panel on Climate Change)

more › 'Should we cultivate resilience?'

(FT Magazine, 3 October 2014)

'What is the true value of major projects?'

(Major Projects Association evening debate, March 2014)

Resilient Cities: a Grosvenor Research Report

(Grosvenor House)

UK Infrastructure Transitions Research Consortium

(UK Infrastructure Transitions Research Consortium, Environmental Change Institute, University of Oxford)

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