ARUP

Engineering a post COVID future: The challenges for global infrastructure

FIDIC Conference Session 3: Delivering a green recovery and achieving net zero

Where does this pandemic and its economic aftershocks leave the green infrastructure agenda and the sustainable development goals (SDGs)?

We are certainly in interesting times.

Much of the world prior to the COVID19 pandemic was on a committed course towards decarbonisation. Hopefully it still is.

The three key parts to this are the decarbonisation of transport, industry and heat. The construction sector needs to both respond to these markets and also needs to have its own decarbonisation agenda.

One of the obvious discussion points in setting the overall context is whether there is a new norm. We in Arup have been doing some work on four scenarios defined by two axes, with a high:low position of each so giving the four scenarios through a 2x2 matrix.

One axis is looking at the epidemiological aspects – whether the virus is contained and managed, or not.

The other being the economic and policy implications – short term recession, or long term depression

What we have seen so far has been less of an economic meltdown than might have been expected and a continued commitment from many governments to push on with green agendas. There has been a tendency for governments so far to avoid punitive economic austerity measures – luckily because the price of borrowing has been globally low and also in part because most nations are in a similar position.

By contrast the control and containment of the virus to-date has been a lot less certain. The new norm does not seem to be a clear stability but fluidity and uncertainty. At neither end of the spectrum

The consequent big challenge is jobs and employment. So for central public funding, this is tending to take dominance over decarbonisation. Therefore, the decarbonisation agenda needs to help push and create employment – it needs to be an active contributor to the jobs agenda.

Mobility is the other big issue. It has not been the economic but the epidemiological ups and downs that are severely impacting on mobility. Without mobility much societal activity cannot happen, so the associated revenues and tax receipts do not accrue and publicly funded infrastructure is inevitably constrained. We have seen that it is hard to justify airport expansion and new linear transport infrastructure if there is continued constrained mobility. Lack of mobility in turn constrains tourism, leisure, entertainment. The function and purpose of cities, the value of green space, retail centres and entertainment are all being rethought.

Interestingly this reduced mobility has enabled remarkably quick recovery and improvements in air quality and emissions. Even wildlife such as bee populations have recovered. These have been welcomed and society would like these to be maintained. If mobility is to ramp back up there is strong public societal pressure for it to be green. For instance, EVs are on a roll. As is the hydrogen economy. Pre-lockdown up to 40% of all food transported into cities was wasted – during lockdown that was halved.

These factors are combining to challenge the need and desirability of new transport infrastructure, airport expansion, etc – the sector that has been so fundamental in recent decades for construction.

However, the desire for resilience of critical infrastructure such as utilities has gained in importance – shock events such as COVID19 are now seen to be more real and likely, so needing to be addressed. There is a greater recognition and willingness to avert other extreme events. Resilience also needs greater attention to national self-sufficiency in supply chains.

Logistics, healthcare, digital and data, tech, pharmaceutical, energy, data centres, on-line purchasing and distribution are all well positioned as a consequence of COVID19. Many of these are financed in the private sector and project opportunities for them are strong. Also, many of the techs and smart industry sectors have made big commitments to going green, having massive revenues to fund this. Thanks to on-line consumer demand, much of industry and manufacturing has held up.

The construction sector needs to flex to these new demands and emphasis.

What is FIDIC's role in communicating best practice in this area?

The construction sector and its contracts need to be more outcomes focused – performance in use.

So there is a need to include more about consequences and benefits, and not just to build and handover.

Picking up on resilience and logistics, societal infrastructure and data are meaning that whole system thinking and sector-coupling are relevant. Combining energy with industry or domestic heating are growing sectors that are directly aligned with decarbonisation. The boundaries between energy and other sectors such as transport (eg. EVs) are more fluid so traditional regulators may not be fit for purpose.

To achieve this, digital twin approaches should be integrated as the norm.

Contracts should include incorporating whole life data capture and application.

For our sector this needs reduced fragmentation of supply chains to enable better end-to-end understanding – back to whole system thinking.

Programmes are increasingly subject to the evolution of Sustainable and Resilient Investment.

The sustainable finance market is large and complex, with different investor archetypes incorporating varying degrees of adoption of Environmental, Social & Corporate Governance (ESG) approaches driving sustainability and resilience. The construction sector needs to understand these and have the expertise to build the associated business case arguments.

Then finally, construction itself needs to decarbonise, not just help other sectors to do so.

Clean construction - from clean energy in materials manufacturing to transporting to site and then non-fossil fuelled construction plant.

Reduced waste on site and improved recycling is possible – assisted by real time data from digital twins.

Improved understanding of risk, enabling an increased commitment to innovation – with clients realising that procurement and contracts asking for evidence of having done it before is the trap of just asking for repeats of the 'same old' and not in reality helping innovation.

In all this, FIDIC has a role to play in taking forward the right forms of contract.

"Unless you are learning as fast as your world is changing you are going backwards."

Ian Gardner
Arup Fellow | Director
Global Energy Leader

Arup