



CREATING CARBON FREE CONSTRUCTION SITES

Climate change is the most critical issue of our time. Urgent action is needed now if we are to protect our future. The construction industry generates 23% of global carbon emissions with 5.5% of that coming from the fossil fuels used to power construction machinery and commitment.

As industry leaders, Lendlease is committed to leading the way in decarbonising construction and has embarked on 'Mission Zero', their plan to achieve net zero carbon emissions by 2025 and absolute zero by 2040.

Lendlease partnered with the University of Queensland (UQ) to investigate ways to reduce emissions by electrifying construction machinery and utilising alternative fuels. UQ prepared an evidence-based research report, 'Planning a Transition to Low and Zero Emission Construction Machinery'. Lendlease's companion report 'Stepping up the Pace: Fossil Fuel Free Construction' presents an action plan drawing on UQ's research to create fossil fuel free construction sites.

The transition will be challenging however there are promising signs. Based on current policies and plans, UQ has projected that 40% of construction machinery and equipment (by energy use) can be electrified by 2030, growing to 60% by 2040. While the ownership costs of electric vehicles are more upfront initially, they are significantly cheaper to maintain over their lifetime, so the overall cost of ownership is less.

Currently not all construction equipment has a suitable battery-electric option. However UQ's research has shown that renewable diesel, once established, can plug the gaps. A two-step approach prioritising

electrification and supported by renewable diesel has the potential to remove a large portion of a construction site's fossil fuel consumption.

Thanks to pioneers like Lendlease many of the green building features that were once considered leading edge are now business as usual. Now 'Stepping up the Pace: Fossil Fuel Free Construction' is set to be another area where Australia's largest construction company will lead the entire market.

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Electric digger at Manchester Town Hall restoration project.

Q&A WITH LENDLEASE'S ANN AUSTIN

Ann Austin, Head of Sustainability at Lendlease, elaborates on Lendlease's initiative and the critical importance of achieving the goal of fossil fuel free construction sites.

Why has Lendlease embarked on this initiative and how does it link back to the 'Mission Zero' approach?

We're absolutely committed to climate action and the challenge to achieve our Mission Zero targets has now begun in earnest. This report is part of that journey. It zeroes in on a single action within our Mission Zero Roadmap: 'Zero Use of Fossil Fuels in Construction'. With the help of the University of Queensland we explored how quickly we can electrify construction machinery and what alternative low carbon fuels are viable.

How does this initiative build on Lendlease's previous work on sustainability?

As a global industry leader, Lendlease takes its responsibility to the planet seriously. Our Mission Zero targets are among the industry's most ambitious and will only be achieved if our construction sites are fossil fuel free. We have been exploring ways to reduce emissions in construction for a number of years, mandating the use of 5% biodiesel in diesel in 2020 and trialling a 20% biodiesel blend (B20) on some of our sites. Renewable diesel and electrification take this work to a whole other level and much closer to zero.

Do you see Lendlease as having a social responsibility to promote a low-carbon approach and how does this initiative respond to that?

Absolutely. We have a responsibility and obligation to take an industry-leading position. Lendlease has set ambitious targets of reaching

'absolute zero carbon' by 2040 and to do that, we must find a way to eliminate all emissions from construction sites – without the use of carbon offsets. We're also cognisant that not one party can fix it, it needs to be a team effort that involves all players: clients need to request zero emissions, contractors need to assess their supply chain, suppliers need to be able to innovate, while designers need to test and try new things.

Does Lendlease perceive an increasing market demand for more sustainable projects?

Yes. We have seen a steady increase in sustainability expectations from customers and investors that has significantly spiked in the last two years.

Sustainability excellence and particularly carbon neutrality is already critical to attract both capital partners and quality tenants. Buildings that integrate the physical risks of climate change will increasingly contribute to investment performance and provide a competitive advantage.

The signposts are all pointing Australia in one clear direction. The question is how quickly we can introduce policies that support an orderly transition towards the inevitable fossil fuel free future.

What are the main barriers preventing fossil fuel free construction?

The main barriers to fossil fuel construction in Australia relate to the limited local availability of two essential fossil fuel free construction ingredients: renewable diesel and electric equipment and machinery.

Renewable diesel is a critical transition fuel made from animal fats, vegetable oils and agricultural waste. It is chemically identical to conventional diesel and is being used across several of our construction projects in the UK, including Google's headquarters in London.

Currently renewable diesel is not manufactured in Australia and can only be imported at a significant cost. However two renewable diesel

Ann joined Lendlease in 1992 and has worked in a variety of project and people management roles. She established Lendlease's first suite of sustainability metrics, guided by the Global Reporting Initiative framework, and is passionate about nurturing a culture that supports a consistent approach to sustainability excellence across all aspects of its business.

Ann chaired the award-winning Miller's Point Youth and Employment Partnership, was the 2003 National Association of Women in Construction NSW Vision Award winner, the 2005 National Crystal Vision Award runner-up and the 2011 Contribution to Sustainability winner. Ann currently sits on the leadership group for MECLA, the Materials and Embodied Carbon Leaders Alliance.



Electric boom lift

refineries in Australia are expected to be in production by 2025, one in Queensland and one in Western Australia.

Electrification is the surest path to decarbonising construction but there is still limited availability of electric construction equipment and machinery in Australia. There are no battery-electric models currently available for a significant amount of construction equipment within typical trades such as civil, demolition and piling.

Added to this electrification challenge are grid constraints including a lack of capacity and the inability to manage 'peak loads' from individual construction machines such as cranes. Urgent upgrades to grid infrastructure are required to meet Australia's transition to a low carbon economy.

Australia has no policies currently to support either electrification or renewable diesel, no national biofuel programme and no government subsidies. If we are to take a serious step change towards decarbonising construction, renewable diesel must be manufactured locally and electrification must be supported and accelerated.

Does fossil fuel free construction increase costs? Is this changing over time?

Electric construction equipment and machinery is expensive to buy but the total cost of ownership is less. The high upfront costs can be mitigated by low-interest green financing and significant ongoing operational savings. Imported renewable diesel is also expensive but local manufacturing will provide a clean fuel option that is commercially competitive with mineral diesel.

How urgent is it for the construction industry to become more sustainable? Do we have time for gradual change or do we need a step change now?

We have learned that gradual change is insufficient to meet decarbonisation pathways that keep us on target to achieve 1.5 degrees. We need to significantly accelerate the electrification of construction machinery and equipment. This is a challenge that can only be solved systemically – it's one of those wicked problems no single party can 'fix'.

However, rather than let this deter us, understanding the nature of our challenge can give us direction. Now, with UQ's help, we know we are a 'hard to abate sector' and what change is needed.

With this initiative, do you see Lendlease as setting an example for the wider construction industry to follow?

Our hope in publishing this paper is firstly to allow the issues to be understood and secondly inspire collective action to decarbonise construction. There's a sense of urgency about the work our sector needs to do around fossil free fuels and we need to shift our focus now.



For more information visit:
www.lendlease.com/au/better-places/stepping-up-the-pace-fossil-fuel-free-construction/

or Scan the QR code