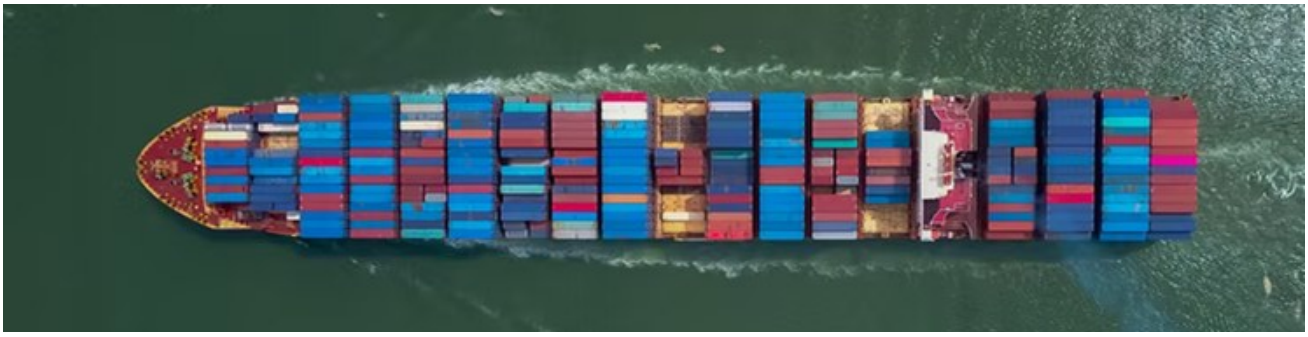
Human Innovation - A Thought Leadership Series

Part 8 - Key Net Zero Challenges #5 Decarbonising Difficult Loads

This innovation thought leadership series has so far shown that:

- Human innovation has been an intrinsic part our evolution as a species for at least 2.4 million years or 86% of our time on planet Earth;
- A brief examination of history in the electricity sector has shown that not much has fundamentally changed from the 1880s; and
- As a result of successes in the Scientific, Technological and Industrial Eras this has given rise to becoming a victim of our successes and given rise to our current Sustainability Era where we are aiming to combat climate change to pre-Industrial emissions levels. One of the end states of this era aims to achieve net zero emissions by at least year 2050.

However, in order to achieve net zero by 2050, we foresee at least **five** key challenges - #1 Balancing the Grid, #2 Energy Independence , #3 The Geopolitics of Supply Chains, #4 People Resourcing of Net Zero and we conclude with the final key challenge which we see as #5 Decarbonising Difficult Loads.



#5 Decarbonising Difficult Loads

Some of the known loads that have been historically difficult to decarbonise are shown in the infographic on the next page

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Loads that are difficult to decarbonise	
Transportation	
	Aviation
	Heavy vehicle
	Marine
	Rail
High emission industries	
	Metallics: Iron, steel, aluminium, copper
	Chemical: Refineries, plastics, fertilisers
	Non-metallic minerals: cement and lime, ceramics, glass, pulp, paper, textiles, leather, food processing and mining

Much of the difficult load, can however, be addressed through using the innovation of green hydrogen as either a direct fuel source for transportation or as fuel in Combined Heat and Power / Combined Cooling and Power/ Trigeneration schemes. We believe that cost reductions in existing capex for electrolysers and opex of power required in these schemes will be key to unlocking its mainstream affordability and bankability.

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Difficult loads are also widely accepted to include Greenhouse Gas Scope 3 emissions up and down corporations' value chains. These loads are simultaneously difficult to identify, quantify and mitigate. Solutions are required and innovation along upstream and downstream supply chain must play an affordable role.

Conclusions

Innovation has been at the heart of human civilisation for some 2.4 million years; representing at least 86% of our history since human life began. There is therefore something powerfully intrinsic about innovation as a human species. Today, we need answers that are both innovative and ethical.

With innovation as a core value at ITPEnergised we have now paired our significant intellectual capital with new digital capital and have developed a unique digital platform, called the Net Zero Accelerator ® comprising a suite of market leading digital products and digitally enabled consulting services. These are used in conjunction with our trusted technical services, and we hope this powerful combination will help our clients accelerate their net zero journeys at lower cost and effort. The minimum aim of our digital platform and associated consulting services is to help you achieve an increase in time to value by at least 50x, with extremely short payback cycles.

More generally, and as a humanity, we need to tap into this unique ability to innovate to solve for Net Zero and safeguard our planet for the generations to come. We identify five key Net Zero challenges of grid balancing with rising intermittent renewables, energy independence, the geopolitics of supply chains, resourcing Net Zero and decarbonising difficult loads in this article. What would be your top challenges? What role do you think innovation can play in these challenges?

We remain, however, expectant, undaunted and somewhat jubilant that human innovation, that has served us well throughout our history on planet earth, will once again triumph in the face of the vast Net Zero planetary scale challenge that waits in front of us.

"It's better to give back more to the world than we take out of it."

For action on electricity sector innovation and how we can help your organisation accelerate Net Zero through digitisation please contact Peter Lo, Digital Strategy and Innovation Director at ITPEnergised: peter.lo@itpenergised.com