COUNTDOWN TO CARBON ZERO

CONVERSATION SERIES:
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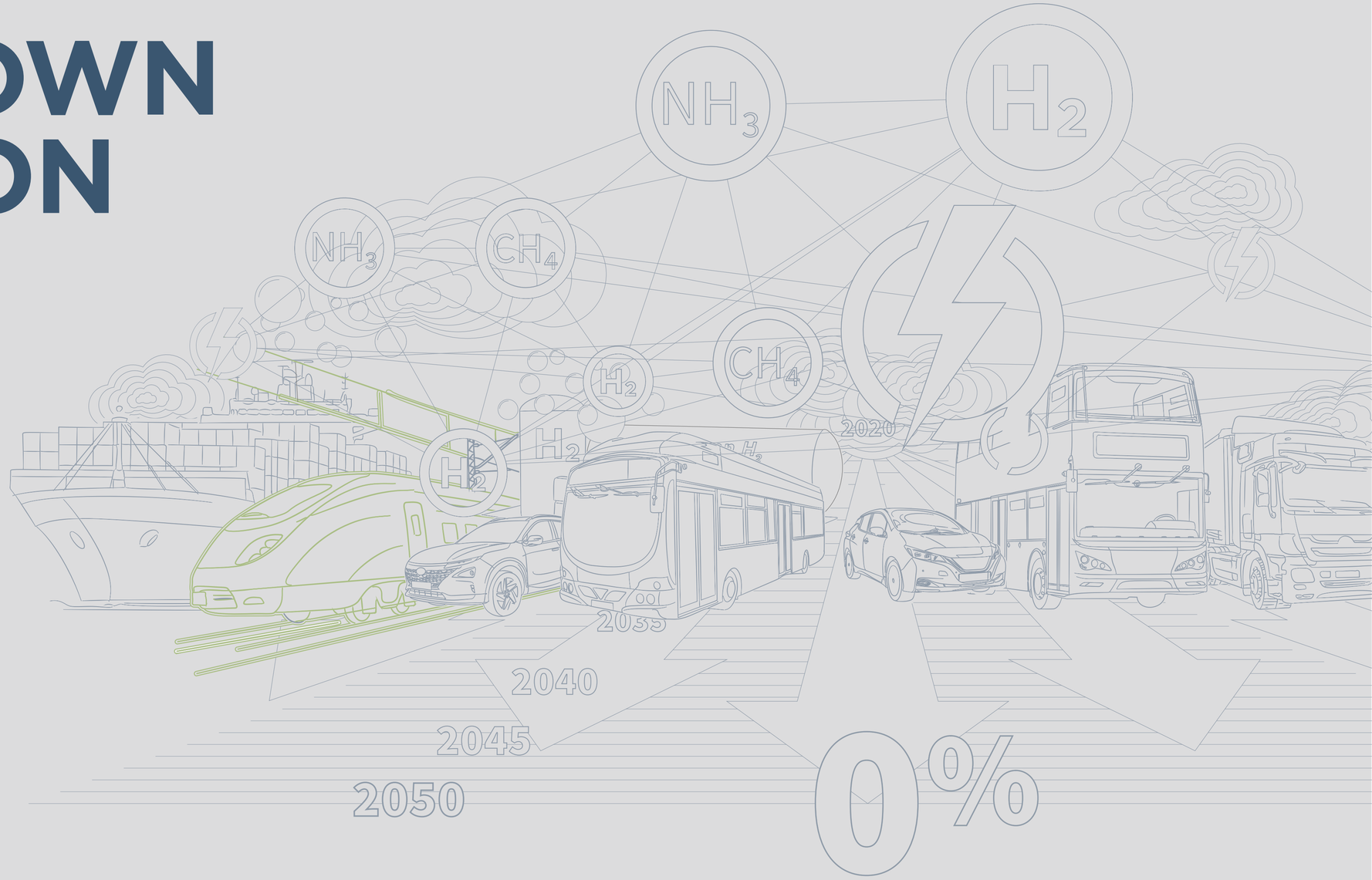

ADDLESHAW GODDARD

TALKING CARBON ZERO

DRIVING CHANGE IN THE SUPPLY CHAIN

“Network Rail can play a leading role in creating a circular economy, encouraging suppliers to sign up to ambitious, science-based targets.” says **Martin Frobisher – Group Safety & Engineering Director, Technical Authority for Network Rail**. We hear him in conversation with **Anna Heaton, Head of Transport at Addleshaw Goddard**.

Network Rail published their new environmental sustainability strategy in 2020. What is the scale of the challenge that you are facing? And how does this fit with the scale of the challenge for the rail industry as a whole?

One thing that’s very clear to me is that it’s impossible to separate railway infrastructure from rolling stock. As we decarbonise the network, the projects are about both infrastructure and rolling stock. So we’re in this together and the scale of the challenge is massive on many, many fronts. Decarbonisation is going to change the shape and feel of the whole railway system for decades to come.

In the context of the current economic situation, how do you ensure that Network Rail projects put sustainability high on the agenda?

Large infrastructure projects can really help the economy in the current climate and they also have a strong business case. If you look at previous electrification projects, they were all done for economic rather than environmental reasons. A little lightweight electric train, for example, is far more cost effective than a heavy diesel train. So electrification projects have a payback as well as offering environmental benefits – we just have to make a good case for them.

What role is there for private sector funders in decarbonising the railway?

I think there are all sorts of possibilities. These range from really complicated deals – where an investor would, say, put up the wires, and lease them back – to more conventional arrangements where the private sector is invested in technology and we then apply this technology in the schemes we’re building. However, as a wholly owned subsidiary of the Department of Transport, we’re subject to the Managing Public Money Regulations so any formal lease agreement for a major asset would be subject to approval by the Treasury.

Rolling stock manufacturers have long asked for clarity on whether the solution on the railway is going to be hydrogen or battery electric. Is the picture becoming clearer?

I think it’s now quite clear that on main lines that carry freight, particularly those that carry heavy freight, the power to weight ratio of a freight locomotive is such that it really needs overhead line high voltage electricity. However, on branch lines, batteries and hydrogen can work well and potentially other new and creative technologies too.

One option that may be suitable for heavy freight locomotives is ammonia engines. I understand that the shipping industry is looking at these as a potential alternative to diesel, but the technology is not yet well developed.

> **IF YOU LOOK AT OUR CARBON EMISSIONS, FOR EXAMPLE, 97% OF OUR CARBON FOOTPRINT IS IN OUR SUPPLY CHAIN**

Your strategy makes lots of references to the circular economy. Do you think that Network Rail will be able to lead in terms of what the supply chain should be doing?

When I first started looking at this project, my expectation was that a railway was all about traction fuel and that the big game in town was electrifying the network and the rest would be relatively peripheral activities. But once you start looking at the data, you realise that’s just not the case.

If you look at our carbon emissions, for example, 97% of our carbon footprint is in our supply chain but only a third of that is traction diesel. The remaining two-thirds are in our supply chain – the embedded carbon in what we build. So if we are going to be successful in achieving carbon zero, we need our suppliers to sign up to ambitious science- based targets and report on these targets in all our projects. The same applies to waste and recycling.

How do you modernise stations, depots, and other fixed infrastructure so that they’re environmentally friendly?

Creative architectural solutions are what it’s all about. We’ve been running some good design competitions recently for new footbridges and station designs.

Is there a challenge in getting across all this work? There’s a lot to achieve over the next few decades – are you going to need people with new skills?

Part of our strategy is about improving biodiversity on railway linesides so one important area where we need to invest is in the skills needed to manage habitats effectively. At the moment, we’ve got lots of low-grade sycamore forests and they’re not great in terms of biodiversity.

What do you see the environment around railway lines looking like in the next few years?

Our vision is to have wild grasslands with lots of natural wild flowers very close to the railway line and then as we get further away from the railway towards neighbours’ boundaries, we want to coppice and hedge trees to provide a screen for neighbours. By doing this, we believe we can create corridors of biodiversity and pollinating insects coming into cities and throughout the land. We think there’s a real virtuous circle we can create here that’s great for the environment, great for neighbours and great for passengers too.

TALKING CARBON ZERO

How are you going to measure the biodiversity in these habitats?

We've found some amazing satellite technology and intelligent IT systems which will allow us to scan vast areas of the country and grade and rank the habitats that we've created for biodiversity.

What are the challenges of our Victorian railway infrastructure as we adapt to changing weather patterns?

The steepness of our cuttings and embankments are an inherent risk so we need to progressively change this infrastructure to make it more resilient. We're trying to do this in a very logical and scientific way, focusing our efforts on assets that are most likely to fail.

In your strategy, you talk about Network Rail having science-based targets. Can you explain what these are?

Essentially, they're about applying science to our operations – looking at what we need to do to contain global warming at one and half degrees centigrade level and then putting in place detailed action plans and measurements to make sure we achieve our commitments.

In the journey towards carbon zero, how important is it to measure progress?

One of the dangers we face across the industry is to think we've got plenty of time before these 2045 or 2050 deadlines – but we don't. For big infrastructure projects, we've got to start now. So when we developed our own strategy, we were very clear that we wanted lots of early milestones. We wanted to break the problem down to road maps for each topic area and then set commitments year by year.

Your strategy sets out your commitment to improving air quality at a local level. Can you say more about this?

We've made commitments about how we will measure and improve air quality at a local level in key locations. However, the science is really tricky. Things like oxides of nitrogen can change very significantly depending on whether it's a sunny or cloudy day. So getting consistent measurements in place at a local level across a long period of time and then making sure that we've put effective engineering solutions in place is a big piece of work. But this is an area in which Network Rail can show the way for local authorities and others working on similar challenges.

Your strategy talks about bidding for an environmental sustainability fund. Tell us about this.

As we look towards our next five-year funding cycle, we believe we need to bid for an environmental fund that will allow us to really accelerate our sustainability projects. So we're going to be putting together a business case and are very keen to work with the private sector in areas where there's great technology or innovation.

Looking ahead, you have a big mountain to climb. Are there any projects happening that give you hope that the challenge is achievable?

One thing I've been really pleased with is the work our electrification teams have done to reduce the clearance between overhead line wires and bridges and tunnels.

When you're electrifying the railway network, you might think the project is about wires, but it isn't – it's a massive civil engineering project, boring tunnels through hillsides and rebuilding bridges. The technology we've been developing has been about reducing the clearance between tunnels and bridges and the wires and we've been able to get the clearance between a metal earth structure and a 25,000-volt wire down to four inches. This is a game changer because it significantly reduces the amount of civil engineering that we will need to do in order to electrify the network.

So yes there's lot to do but there's some clever research and technical developments happening which will make a massive difference to the deliverability of the work.