# BUSINESSiQ

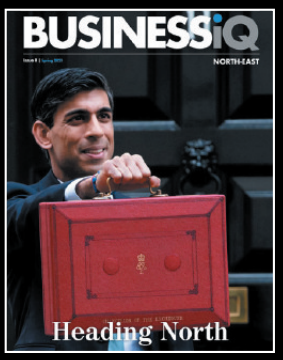
Issue 20 | Spring 2024

NORTH EAST
















20th EDITION CELEBRATION

Whessoe, Bank of England, bp, Darlington Building Society, Andy Preston

# WELCOME

# CHANGE, GROWTH AND INNOVATION – THAT'S THE NORTH EAST MESSAGE

From the first issue of this magazine we have talked about change and what the future holds. That's the nature of the North East – there's always something to talk about because investors see what is going on here and want to be part of it.

So as part of our 20th anniversary, I've had a brief glance over my shoulder at the people and businesses who have made the front page and who helped epitomise the region's resilience. But it's not all about looking back...

As well as catching up with our first cover star Andy Preston, I have talked in-depth to more of the people who are making this amazing place tick.

People like Joanna Wake – who's ADHD diagnosis helped her make sense of her life, either at Baltic Apprenticeships or gig-hopping around Teesside. Or Caroline Theobald, who for many years, has been "a convener and a persuader", making and growing essential business connections. Or there is the mighty Whessoe Engineering, which once took over a large slice of the town and is about to once again revolutionise its sector with a hydrogen storage system.

I also had the chance to spend some time with the Bank of England's Jonathan Haskell, an external member of the Monetary Policy Committee which decides interest rates. He was in the region to get feedback from business leaders.

These are all people who are influencers, and our region would not be the same without them.

At the second BUSINESSiQ Awards on April 25, we will be applauding outstanding business success. It will be an amazing night, but putting success in the spotlight is something we do here all year round. Online, in print in *The Northern Echo*, in this magazine or at our live events, we will always stand up for our businesses and back them in any way we can.

Mike

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*BUSINESSiQ* is published by Newsquest Media Group Ltd of Loudwater Mill, Station Road, High Wycombe HP10 9TY, registered in England and Wales with company number 01676637

**EDITORIAL**
MIKE HUGHES PETER BARRON HEATHER BARRON

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# As you grow, we grow



The most important business conversation in the North East just got louder, with **5,000 copies** of BUSINESSiQ magazine now sent to more than **400 locations** every quarter, full of in-depth interviews, analysis and opinion.

Tell us about your successes and challenges as BUSINESSiQ provides the essential platform for this remarkable region to write the next chapter for a new generation.

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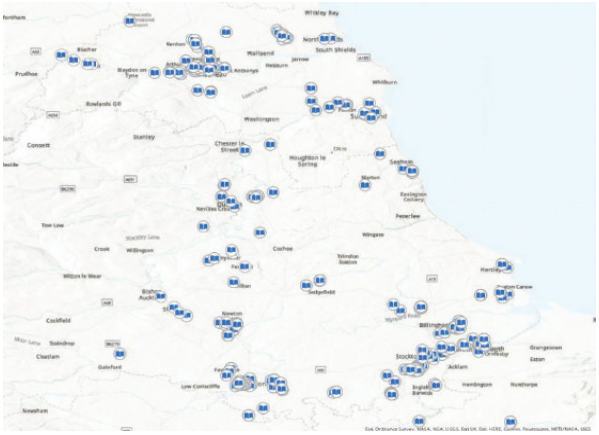

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# Pushing the frontiers

**Whessoe is preparing a breakthrough that will recharge its impeccable reputation. Mike Hughes met technology director Greg Arnold and Dr David Costello to hear more**

Pictures by Sarah Caldecott

David Costello and Greg Arnold

When you travel to the furthest corners of the globe and then out into some of he most desolate and challenging landscapes, and find something vast, metallic and made in Darlington, it's probably one of Whessoe's.

As one of the images in this article shows, in this case we are talking about a 100-year-old Whessoe whale oil tank left on Deception Island, on the edge of Antarctica, but if you wanted liquid or gas storing in a tank, most of the world turned to the experts at Brinkburn Road.

The *Northern Echo*'s Chris Lloyd tells us Whessoe began in Tubwell Row, Darlington, in 1790 when William Kitching opened an ironmonger's shop. Six years later, he began a foundry at the rear of his premises to making castings for chimneys and agricultural implements. His son, also William, became involved in the Stockton & Darlington Railway and by 1831, William and his brother, Alfred moved to a bigger site at Hopetown, near North Road station.

Towards the end of the 19th century, Whessoe began moving into tanks to hold oil or gas, becoming one of the biggest tank manufacturing businesses in the world, employing 3,000 people at the huge Darlington site.

However, as engineering struggled in the UK post-war, Whessoe downsized, stopped making things and started specialising in design. Brinkburn Road was cleared in 1992 for housing, but the Whessoe name still lives on, now based at Morton Palms and owned by South Korean giants Samsung.

The manufacturing might have stopped, but the ideas keep on coming – and the latest is a big one. It involves 40,000m³ tank of liquified hydrogen that would dwarf not only the substantial Whessoe building at Morton Palms, but also anything else their rivals could offer.

As we know, hydrogen is the key element in the new Teesside formula, and Whessoe aims to be a vital component in the pipeline.

Technology director Greg Arnold seems like the best person to talk to about tanks. He is obsessed with them, shouting from the top of the nearest LPG holder that his company remain unique pioneers, doing the things others haven't managed yet and designing products that didn't seem possible.

"We don't manufacture anymore because it's simply cheaper for other people around the world to do that ," he tells me.

"We have many Indian partners and companies that we work with. They have the brightest of brains, but they are paid $25 an hour. Our rates, typically for UK engineering across the entire board is £80 to £120 depending on seniority and specialisms. And that's not just us, that's everyone.

"So we've had to reinvent ourselves and move away from the EPC (Engineering, Procurement, and Construction) and the heavy engineering and just do the brand new stuff where we design it and make sure it works so you get the process correct.

"We've always been doing things that nobody else has done before, working out

**We have many Indian partners and companies that we work with. They have the brightest of brains, but they are paid $25 an hour. Our rates, typically for UK engineering across the entire board is £80 to £120 depending on seniority and specialisms...**

HISTORY: a 100-year-old Whessoe whale oil tank on Deception island

how to do it first, and in that respect, this is another first. NASA, for example, have at the moment one of the world's largest liquified hydrogen tanks at about 4,700m³. The design we have on the desk in front of us is 40,000."

His pride is evident and well-founded. As hydrogen and carbon capture change the world, Whessoe is not only speaking the language, it's writing the dictionary.

Greg's colleague Dr David Costello is also pretty good at translation, and can spot from a mile away a business journalist trying to get his 63-year-old brain around something challenging. He steps in to explain: "Look out of the window at the height of this building. It's about 20 to 25 metres to the top eaves. With the project that we're looking at here, the outer sphere is 46 metres in diameter, so twice the height of the building we are in, with another sphere inside it.

Puzzled journalist adds: "Why does it need to be that size? Why not have two or three smaller ones?"

"It just comes out as the economics," says David. "The more you have the more it costs basically."

"Why isn't it square or triangular?"

"Well, because that's the way these things work, operating under high pressure and if you have corners, then there is stress in there that you don't want, but if it is this spherical shape, everything's nicely distributed and it's easier to deal with."

I was tempted to ask why the sky is blue, but thought I wouldn't push my luck.

Greg and David had quickly assessed my brainpower and, with great enthusiasm born out of generations of patient Whessoe staff, started drawing diagrams, and windmills, to illustrate the impact this new project could have.

"We've been using spheres in the gas industry for a long time – the whole world has – but for liquefied petroleum gases, butane, propane and that's not anywhere near as cool," said Greg.

"We're talking at worst -50°C, and this would be -250°C. Mind boggling temperatures.

"Now lots of things come with that challenge, from changes in density right down to molecular changes. All of these things have a problem, especially when it comes to the heat leak – that is the heat from the outside getting in.

**NASA, for example, have at the moment one of the world's largest liquified hydrogen tanks at about 4,700m³. The design we have on the desk in front of us is 40,000**

"If you imagine you've spent a lot of money liquefying such a large volume and getting it down to that temperature, it costs money and energy to do that. But we do that in the same way we do it for LNG. We turn it into a liquid because as a liquid we can easily transport it around the world.

"As a gas, it's 600 times bigger, so instead of one ship, I need 600 ships. That just doesn't work. So it's about transportation and this is what the whole green energy chain is about now. It's not about having a windmill and then plugging your phone charger into the windmill, because if you can do that you would do it wherever you can generate renewably.

"There are probably more windmills in China than the entirety of Europe, but they're not connected because they simply can't find a way of getting that power from the high hills where they built them down to the cities, because electricity very rarely travels much more than 150 miles, otherwise you get huge losses in transit.

"So if you have a windmill, how do I get the electricity from there to the car in America or France or the UK? Well, I could put it in a battery, but the point is, all of these different routes have issues,

so we electrolyse water and make hydrogen, which is clean, because when you burn the hydrogen you just get water."

David tags in to take me through the next few rounds.

"What we're talking about today is a demonstration project that we've got, which means we've got a design for 40,000m³ which we took to DNV (an international accredited registrar and classification society based in Norway) and got them to review our design so we could demonstrate to our clients that we have the technical capability.

"That storage could be at the production level so that your ship comes and you fill from there. Because clearly you can't have that ship sitting there for several weeks while it gets filled. The ship wants to come and be filled straight away, so you need a storage facility which means the ship goes away perhaps on the same day and you know you've got enough hydrogen to last you for a couple of weeks."

It's no wonder so many eyes are focussing on hydrogen at the moment. It is a currency that is transforming the global energy economy.

Researchandmarkets.com reports: "The global hydrogen gas market is poised for significant expansion, with market analysis projecting an increase from 105.58 million tons in 2023 to a substantial 127.53 million tons by 2028. This remarkable growth trajectory underscores the pivotal role of hydrogen gas in various industry verticals.

"Following a recovery from the impact of the Covid-19 pandemic, the market has witnessed a resurgence in production levels and is set to continue growing steadily over the coming years. Notwithstanding the high production costs associated with blue and green hydrogen, this essential gas remains key in multiple transformative technologies shaping the future.

"The competitive landscape of the hydrogen gas market remains consolidated with a handful of key industry players. These market leaders are playing a monumental role in addressing the burgeoning demand for hydrogen gas across various sectors, including chemicals, refining, and emerging clean technologies."

Greg is clearly on the same wavelength, telling me that the perfecting of the liquification was a new chapter, but a vital part of the story.

"Generally speaking, the liquid hydrogen industry is effectively at its infancy, three to six months old at best. It's barely walking, still on the first floor. There are some places in the world that use it, but it's been so expensive to liquefy it, because why would you spend $4billion on a plant and production facility when you can spend $1 billion and get exactly the same.

"But that is the economics of climate change until governments and taxations globally change this environment. I'm pleased to say the likes of Whessoe and the industry as a whole is going ahead and trying to get away from hydrocarbon gas fuels into greener fuels and we're doing it as best we can without government help.

"There are so many companies that are investing and spending their money and doing

Whessoe Works

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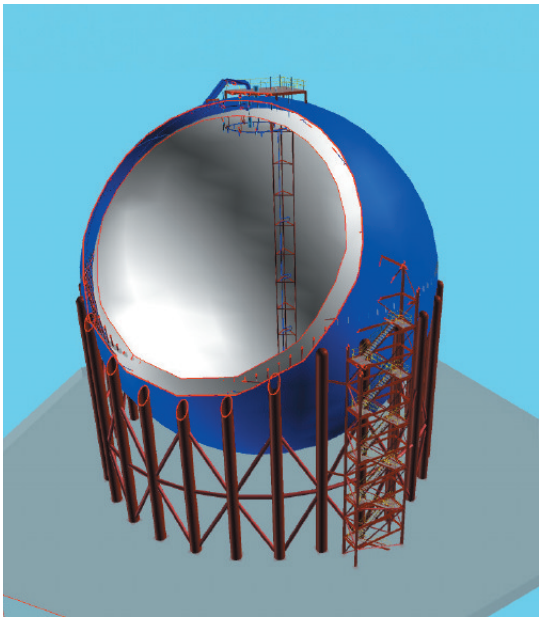


How the tank would look

it anyway, regardless of the fact that the economics might not work."

Those companies need their own supply of Gregs and Davids as well. So where do they come from, and how easily can they be plumbed in to a pipeline that leads to a hydrogen-based economy?

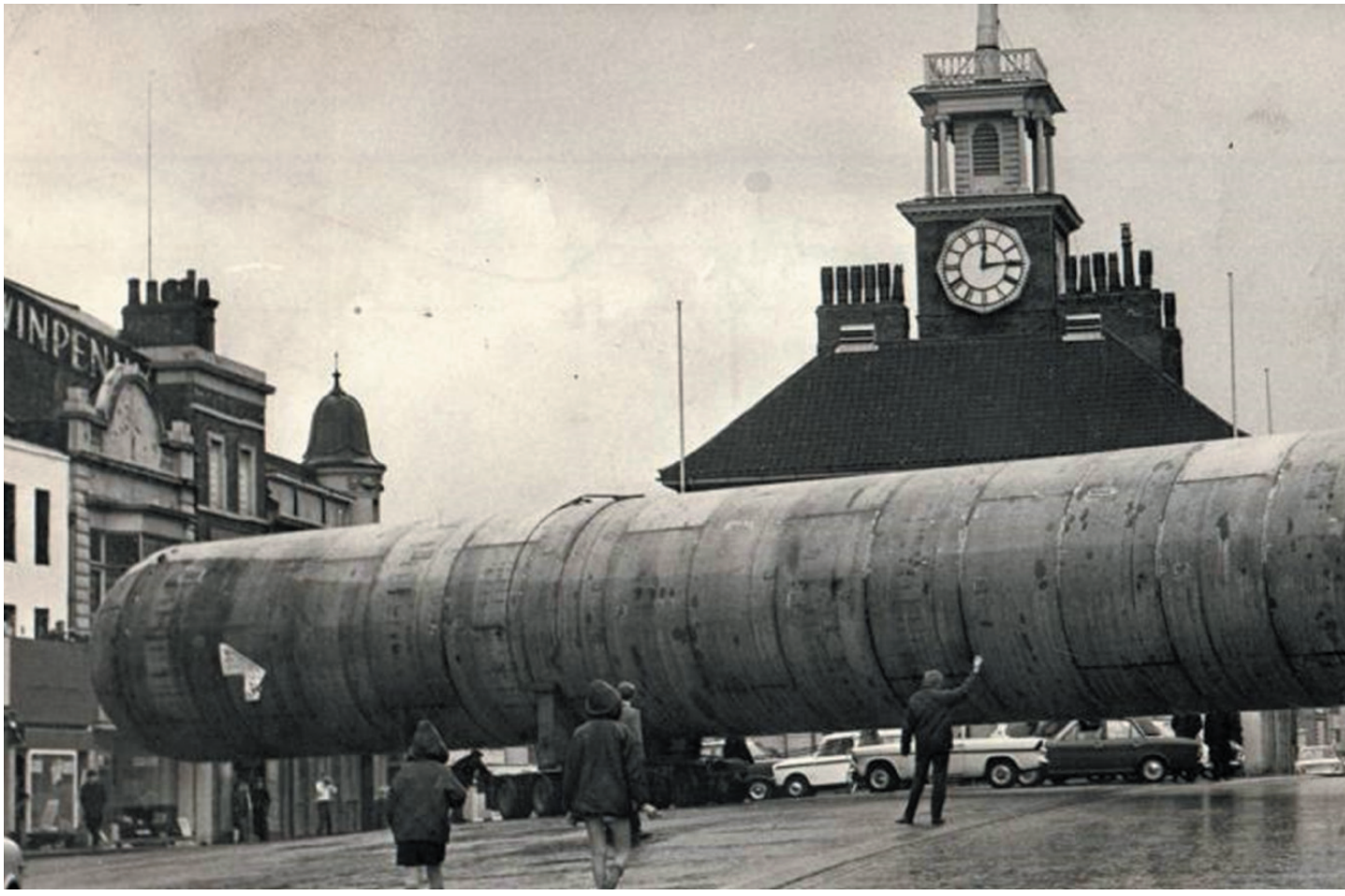
"It's getting harder and harder to find the right skills and sometimes it seems that they just don't exist," says David.

"But we won't be too pessimistic because in this whole area of Teesside there are a lot of engineers working on chemicals, oil & gas. There are always engineers coming through, and even though we don't perhaps have the industry we used to have we still have a lot of very bright people. It is getting harder, but it doesn't mean to say that it's impossible. You just have to spread your wings a little bit further afield.

"Looking it from our own viewpoint as a tank and storage designer, as well from a wider engineering field, part of our growth plan is to increase the number of people and to increase the workload through this new green technology and that search for new talent and the right skills is all part of our business.

"So much so that other companies are coming to Whessoe and asking to borrow our engineers because they can't find their own – and we're actually making contracts and money out of that.

"A lot of kids don't see the career path I saw when I started engineering school. They don't have the industry or the opportunities around them that I used to have. That's simply because we're not as big as a company or as an industry so we are less visible. So getting the best and brightest is a major project in itself."



The Whessoe tank makes it way past Stockton Town Hall in June 1970.

These two get more animated as the conversation goes on, revealing the fact that there is excitement and a proper buzz as well as the academia and maths.

The world they inhabit is extraordinary, filled with special effects that actually exist, and at various moments it seems to dawn on them and ignites a spark.

"When you stand inside a liquefied natural gas tank it is just awesome – it dwarfs you," says Greg.

"These things are colossal, and then you get a sense of pride of turning it on, commissioning it and getting it to work and making all the problems that you had in the many years of the project worthwhile.

"Every engineer would tell you that they always want to go from the beginning and see it right to the end because it is exciting and this is what actually still captures most engineers. They enjoy what they do.

"The admin and everything else that goes with it almost gets in the way and that's the frustration of it.

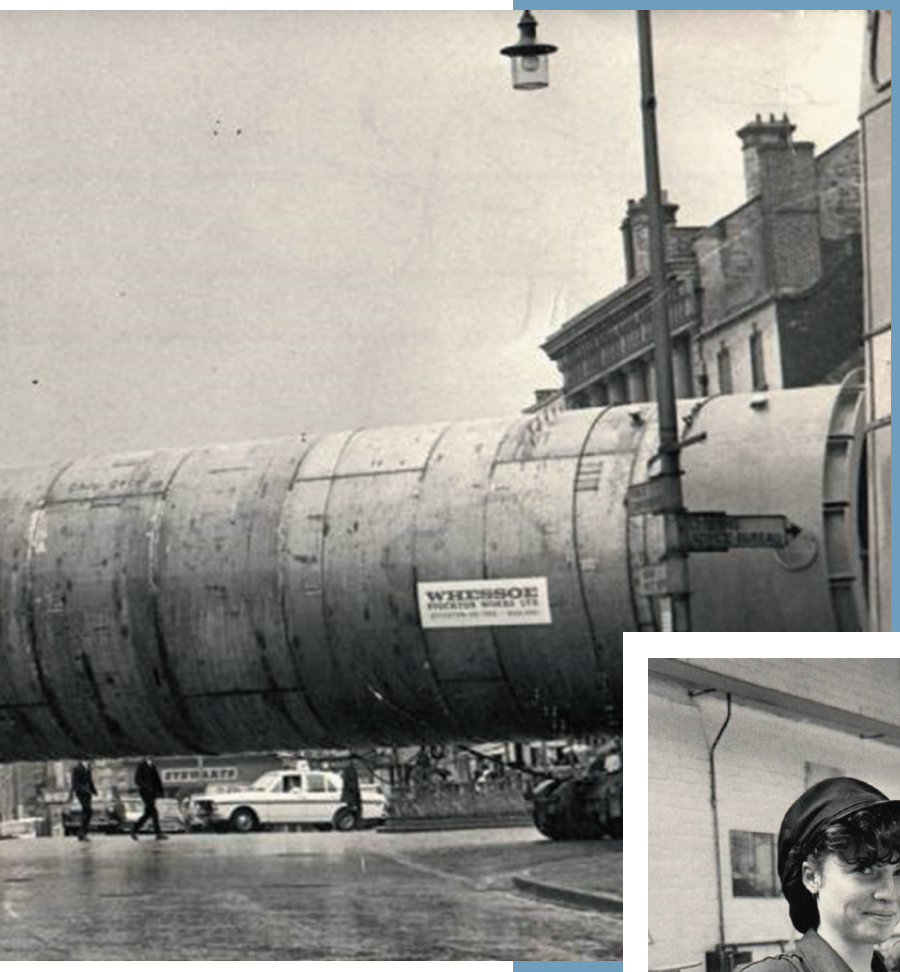
"The actual technical 'how do I solve this problem' has always been a good thing in the UK, and I think Whessoe embodies that because we are constantly reinventing and pushing the frontiers.

"For now, we are exploring where we can put the tanks, so we are going out and seeing which companies want them. And at the same time we are getting other companies coming to us saying 'How about a small one of these? As well as talking about how we can do it for big ships.

"We now have the design, we're doing some more testing on potential challenges, and we've got solutions to them and we are right in the process of people asking how much it will be and we're starting the initial negotiations."

As the business has changed, it has built up some powerful partnerships with manufacturers and that will stand them in good stead when the projects start being assembled.

"We don't have the whopping great metal presses anymore that we had in




> **For now, we are exploring where we can put the tanks, so we are going out and seeing which companies want them**

Whessoe's first female apprentice technicians, in September 1979 Melanie Bevan and Jeanette Hall

David Costello

the 50s and 60s. They moved overseas effectively to other countries, but we have partners through Samsung and its Korea connection, and also other construction partners that effectively become a joint venture to the client.

"They get the best designer and one of the world's best fabricating and constructing companies and we work together. Can't get any better than that."

Greg and David know their company is doing something important for the future. You need to establish yourself at the infancy of a new sector if you want to be at the forefront as it grows and take the lead on R&D and contracts.

Pause or get diverted for a year or so and the advantage is lost.

That's been the Whessoe way since William Kitching's foundry in 1796 and it is reassuring and energising to see it in full flow more than 200 years later.