

OUR JOURNEY TO NET ZERO

Taking action through
innovation to put our
planet first



TATA CHEMICALS EUROPE



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WELCOME BY TATA CHEMICALS EUROPE'S MD MARTIN ASHCROFT



Tata Chemicals Europe has a long and proud track record of reducing our carbon emissions; long before many were even talking about it, we were doing it.

Over the last couple of years, we've made a hugely significant step in that journey with our new Carbon Capture & Utilisation (CCU) plant, which represents the culmination of vision, commitment and hard work.

Before you see some of the highlights of our net zero journey, I would like to provide the context for how the carbon reduction commitment is at the heart of our future direction and operations.

We are proud to have been manufacturing successfully in Cheshire for 150 years and have been a core contributor to the community - providing high value, high wage technical jobs both directly and indirectly in the area.

At its heart, our business is about a passion for manufacturing products that we all use every single day. Our core products - sodium carbonate, sodium bicarbonate and white salt - are used as key raw materials or ingredients in products as diverse as glass, detergents, food, animal feed, pharmaceuticals, kidney dialysis, water treatment, brine purification and many others.

Our products are also helping with the global effort in decarbonisation. Many key renewable technologies and approaches such as insulation and multiple glazing require our products for manufacture. The incredibly versatile sodium bicarbonate is used to help clean flue gas emissions and our used brine cavities are used for natural gas storage, and in the future, potentially alternative fuels such as hydrogen.

I hope this document gives you a good insight into just how much decarbonisation is at the centre of our plans and has been for a long time.

I truly believe that, provided those of us who are passionate about manufacturing are given the space, opportunity and supporting UK regulatory environment to transition and deliver our carbon reduction roadmaps, we will make huge and genuine strides in reducing global carbon emissions, rather than exporting them elsewhere in the world.

Martin, Managing Director

OUR ROADMAP TO DECARBONISATION

Our goal? To be a net zero manufacturer by 2035. With a clear strategy and an ambitious plan targeted around 4 key pillars, we're committed to closing the gap to reach net zero manufacturing via:

ENERGY EFFICIENCY PROJECTS

With smart technologies and innovations in equipment, drives and controls we aim to make significant energy savings across our operations. These energy projects are at the heart of our ongoing capital investments, seeking to uphold excellence in everything we do.



HYDROGEN

By far the most impactful change will come from substituting natural gas with hydrogen.

We will be one of the first industries in the North West to benefit from the supply of blue hydrogen (natural gas + CCUS) and, eventually, green hydrogen (from renewable electricity).



CARBON CAPTURE & UTILISATION

Our industrial scale Carbon Capture and Utilisation plant is the first large-scale CCU project of its kind in the UK and represents a world first in capturing carbon dioxide from our combined heat and power plant emissions, purifying it to pharmaceutical standards and using it as a key raw material in the manufacture of high purity sodium bicarbonate.

We have plans for a second CCU plant to further reduce our overall carbon footprint.



RENEWABLE ENERGY

We are always looking for ways we can make a difference, to bring new expertise and inward investment. As a result, we have secured £480m investment to build an Energy from Waste plant on land at Lostock, we are now working towards over 60 MWp of solar developments on TCE brownfield land, where 1,550 houses are planned.



MAJOR MILESTONES

Achieving net zero manufacturing is a goal we are tirelessly committed to. And we're already making great strides. Since 2000, we've reduced the carbon intensity of our manufacturing by 55% by innovating and evolving our projects and processes to reduce our environmental footprint.

TAKE A LOOK AT OUR JOURNEY SO FAR...

2014

Following the closure of the Winnington soda ash plant and an investment of £5m, TCE created the world's first standalone sodium bicarbonate plant that used purified & liquefied CO₂ enabling the manufacture of high quality, pharmaceutical grade products.

2018-2020

A £10m investment in state-of-the-art high-pressure boilers and associated infrastructure at British Salt in Middlewich. These boilers have helped future-proof the Middlewich site, increased operational reliability and efficiency, and even reduced emissions by 10%.

2022

A UK-first. Capturing carbon since 2021 & officially opened in 2022, the patented Carbon Capture and Utilisation (CCU) plant captures 40kte of CO₂ a year, which is used to make high purity sodium bicarbonate.



2000

The closure of two large coal power plants and an investment of £140m into our 96MWe state-of-the-art gas-fired combined heat and power plant (CHP). The CHP powers processes across TCE's production sites.



2016

The construction of our £5.5m steam turbine, which sits in our CHP plant. The electricity that the turbine helps to generate saves 48 kte of CO₂ in the UK.



2019

Construction commenced on the Lostock Energy from Waste (EfW) plant which recovers energy from residual waste left over after re-usable and recyclable material has been removed. One of the largest investments at £480m, this is a milestone for the waste treatment industry here in the UK.



A WORLD FIRST

The first large-scale, industrial carbon capture and usage plant of its kind in the UK, our CCU represents a world first in capturing carbon dioxide from power generation plant emissions, purifying it to pharmaceutical standards and using it in the manufacture of high purity sodium bicarbonate.

The project is helping unlock the future of carbon capture in the UK as it demonstrates the viability of the technology to remove carbon dioxide from power plant emissions and to use it in high end manufacturing applications.



ECOKARB®

With the purified CO₂ captured from energy generation emissions, we make sodium bicarbonate: Ekokarb®.

Ekokarb® is exported to over 60 countries around the world. It is a vital ingredient in some pharmaceutical products, for example, it is used in haemodialysis which helps treat people living with kidney disease



LEADING THE WAY WITH OUR CARBON CAPTURE & UTILISATION PLANT

WORKING TOGETHER

The carbon capture plant, which was supported with a £4.2m grant through the Department of Business, Energy and Industrial Strategy's ("BEIS") Energy Innovation Programme, marks a major step towards sustainable manufacturing which will see TCE manufacture low-carbon sodium bicarbonate and one of the lowest carbon footprint synthetic sodium carbonate products in Europe.



HOW DOES IT WORK?

In a unique and patented application of CCU technology, the TCE plant captures carbon dioxide from the flue gases of TCE's Combined Heat and Power (CHP) plant which supplies steam and electricity to our Northwich operations and to other industrial businesses in the area.

The CCU plant then purifies and liquefies the captured carbon dioxide which is then used in the manufacture of sodium bicarbonate.

REDUCING TCE'S CARBON EMISSIONS BY MORE THAN 10%

The plant allows us to capture and use 40,000 tonnes of CO₂ emissions the equivalent of taking 20,000 cars off the road each year.

CARBON REDUCTION

As a low carbon producer, we pride ourselves in playing our part to help the UK Government reach targets for the reduction of carbon emissions, but we're not done yet! Our team are dedicated to finding innovative ways to reach greener goals together. Aside from our CCU plant, here are some other ways we are working towards carbon reduction...



THE POWER OF STEAM

Our combined heat and power plant (CHP) on our Winnington site is one of the most efficient in the UK. It generates 96MW of electricity and up to 400MW of heat in the form of steam, which then in turn powers our £5.5m steam turbine and produces electricity, saving the UK 48 kte of CO₂.



RENEWABLE ENERGY

With a 150-year history of evolving our manufacturing in Cheshire, we're committed to finding effective use for land and buildings that are no longer required for our operations. Exciting opportunities for renewable energy projects have resulted from our innovative thinking in this space.

Between 2010 and 2019, TCE played a pivotal role, resulting in a £480m investment to build the Lostock Energy from Waste plant. Alongside the creation of hundreds of new jobs in the area, this generates enough renewable electricity to power around 125,000 homes.

One of our latest projects will see us transform old lime beds into a solar power generation and storage facility. The brownfield land will be regenerated to produce a commercial scale photovoltaic solar array, with the capacity to generate 20MW. That's the equivalent to the annual electricity consumption of approximately 8,000 homes. It will mean that TCE can deliver 100% renewable energy to the national grid.



ALTERNATIVE FUELS

By far the most impactful change will be switching fuel from natural gas to hydrogen. To support our goals, in 2023, we signed an agreement with EET for the supply of low carbon hydrogen (blue hydrogen) – produced using natural gas with CO₂ capture and storage to minimise emissions. Our plan is to be one of the first industries in the North West to adopt this fuel on an industrial scale.

EXPLORING ALTERNATIVE FUELS

We caught up with Head of Energy and Carbon Capture Rob Hudson and found out all about the use of hydrogen and how it's forming a fundamental pillar in TCE's roadmap to decarbonisation.

CAN YOU TELL US ABOUT TCE'S PLANS FOR INVESTING IN HYDROGEN?

TCE has already invested in Carbon Capture and Usage (CCU) technology to capture over 10% of its emissions but doesn't have the CO₂ demand to meet its full decarbonisation targets with the CCU alone. As a result, TCE is aiming to switch some of its input fuel from natural gas to hydrogen, which will emit water rather than CO₂, thus reducing our carbon emissions. A key enabler for this is the HyNet cluster and TCE's partnership with EET, the producer of the Blue Hydrogen.

HOW IS TCE SET TO USE HYDROGEN?

TCE will use hydrogen as a direct replacement for natural gas to fuel our CHP. This will help us to reduce and eventually eliminate our CO₂ emissions from this plant, moving us further along our carbon reduction journey.

WHAT IS BLUE HYDROGEN?

Blue hydrogen is derived from natural gas using a process called Steam Methane Reforming (SMR). Simplistically, natural gas is reacted with high pressure steam in the presence of a catalyst to form H₂ and CO₂ (and CO). What makes this low carbon is that the CO₂ is then captured and sequestered, in HyNet's case, in the Irish Sea. The hydrogen is then transported via pipeline to end users.

WHAT WILL THIS MEAN FOR TCE, CUSTOMERS, AND THE PLANET?

Roughly 360,000 tonnes of CO₂ which would otherwise have been emitted to the atmosphere will be abated by switching to hydrogen. This is equivalent to taking about 220,000 petrol cars off the road. The use of hydrogen is the next step in our journey towards net zero as well as supporting our customers' own sustainability credentials.



OUR PEOPLE INVESTED IN SUSTAINABILITY

Here at TCE protecting the planet is everyone's job. It's one of our core values. We are a dedicated team of individuals working together to minimise our impact on the planet and spearhead long lasting change within the industry and beyond.

"By running highly efficient systems and processes, wherever we can, we eliminate waste at source and reuse or recycle raw material.

"We recycle at least 95% of the ammonia that we use - which is fed back into the process and chemical waste such as burnt lime can be used for soil enrichment on farmland, for making cement and neutralising battery acid.

"Aside from our production, we recycle damaged pallets which are collected, repaired and resold. We also encourage our staff to recycle their own waste and have big skips across site for plastic, wood, metal and paper.

"By our very nature, our processes, our permits and our CCU (which is the first of its kind) we prove that we follow through on delivery and our credentials are clear.

"At TCE, looking after the planet is everyone's job. From the people on plant, to head office, to contractors, to members of the local community and even the Environmental Agency, we all need to be working hand in hand to reduce our environmental impacts.

"It's not just about making money, it's about creating a place for those, like me, who started here young and want to see the business grow and develop and to do that we need to be taking compliance seriously."

Steve McGuinness



"For businesses around the world, sustainability has been top of the agenda for many years now, but it's an area where we at TCE have "walked the walk" and not just "talked the talk".

"As a global brand, there are various frameworks and policies to which we adhere when it comes to sustainable practices and decarbonisation. This is becoming even more important to our customers, and we should be really proud of our achievements to date, but the journey doesn't end here, and we plan to remain at the forefront of decarbonisation in manufacturing by continuing to evolve and adopt best practices. Our customers know and value this, and we have the data to prove it. Our track record is there for all to see, and the results speak for themselves."

Rob Hudson, Head of Energy and Carbon Capture



"We follow through on delivery and our credentials are clear."

OUR MISSION: SERVING SOCIETY THROUGH SCIENCE

Here at TCE our values underpin everything we do and that includes our journey to net zero. Our mission is to serve society through science - and that includes harnessing science to drive sustainability. From innovating to push the boundaries of carbon reduction, to continuously setting and maintaining the greatest standards of excellence, our core principles are upheld throughout our sustainability journey.

OUR VISION:

To operate a profitable, sustainable and ethical chemicals business that:

- Employees recommend
- Customers prefer
- Suppliers value



STRATEGY:

- To grow our manufacturing base of high quality products from Cheshire salt
- Be a global supplier choice for our customers
- Build on the work we've already done and achieve net zero manufacturing by 2035
- Provide a strong outcome for all our stakeholders



To find out more about our sustainability projects and products, get in touch!

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