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**ISSUE 19. 2020**

**INEOS**

# WE ARE ALL IN THIS TOGETHER

*Every single one of us has been affected by the current crisis. Countries are shutting down as they try to stop the spread of this deadly, new, invisible killer.*

INEOS took steps early on to protect its workforce, so it could continue to produce the essential chemicals that the world now needs more than ever. Our plants are working flat out to meet that unprecedented global demand for medical equipment, supplies and disinfectants.

And we have built three plants in less than 10 days – one in the UK, one in Germany and one in France – to produce hospital-grade hand sanitiser on an industrial scale to meet the current shortage across Europe.

But INEOS is confident we can all get through this if we follow the advice of governments, scientists and The World Health Organisation. After all, INEOS has never feared change. It sees it as a chance to do things differently. A chance to do things better. A chance to work together for the common good – and a chance to inspire others to challenge their own thinking.

The world – and INEOS' efforts – are, for now, focused primarily on fighting COVID-19.

But in this edition of INCH, we don't want to lose sight of how INEOS' partnerships with companies around the world are making a difference in many areas.

Whether it's working with the best Formula One team in the world to show no human or machine is limited, or with pioneering recycling companies determined to tackle plastic waste, or with those who care deeply about the future of the North Atlantic salmon, INEOS believes together we can – and will – overcome any challenges.

And that includes another of the greatest challenges facing the world today: climate change. In essence, we are all in this together. INEOS understands the problems of global warming. It understands what's at stake.

That's why as a business it is driven by innovation and the need to find alternative raw materials to fossil fuels. Oil and gas won't be around forever but neither will INEOS if it fails to act now.

As a business it needs to be more energy efficient, and share resources and ideas. And it is constantly striving to be. Some of the challenges INEOS faces may seem unsurmountable. But, as the late American philosopher Ralph Waldo Emerson once said, difficulties exist to be surmounted.

"Do not go where the path may lead," he said. "Go instead where there is no path and leave a trail."



08

Discover how INEOS' new technical partnership and sponsorship deal with Mercedes-AMG Petronas F1 team will provide a cutting edge to our cycling and sailing teams



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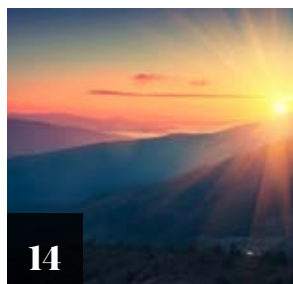
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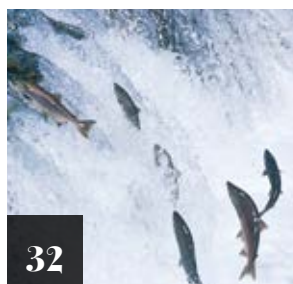
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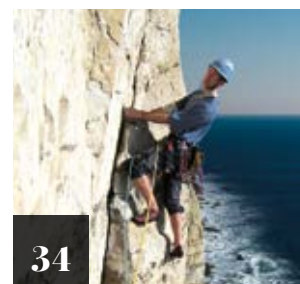
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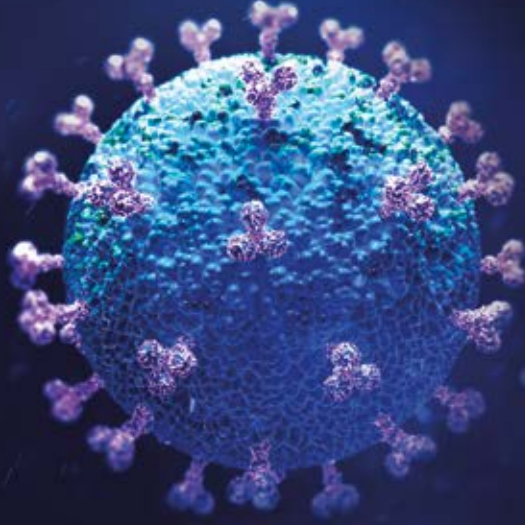
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# THE FIGHTBACK AGAINST COVID-19

INEOS IS WORKING FLAT OUT TO MEET THE UNPRECEDENTED  
DEMAND FOR MEDICAL AND PROTECTIVE EQUIPMENT,  
DISINFECTANT AND SUPPLIES



# INEOS BUILDS PLANTS IN 10 DAYS

HAND SANITISERS WILL BE DELIVERED FREE TO  
HOSPITALS TO HELP FIGHT THE DISEASE

**INEOS is now manufacturing hand sanitiser on an industrial scale to help with the critical shortage across Europe. It has built a new plant in Newton Aycliffe in the UK, Herne in Germany, and Lavera in France - each of them are churning out one million bottles a month.**

"INEOS is a company with enormous resources and manufacturing skills," said Chairman sir Jim Ratcliffe. "If we can find other ways to help in the coronavirus battle, we are absolutely committed to playing our part."

The hand sanitisers will be provided free to NHS and hospitals to help fight COVID-19.

The public will be able to buy the INEOS-branded product from pharmacies and supermarkets.

INEOS, which built each of the plants in under 10 days, is Europe's largest producer of the two core ingredients needed for hospital grade hand sanitiser. Its sites in Grangemouth, Scotland, and in northern Germany and Southern France normally produce almost

one million tonnes of isopropyl alcohol (IPA) and ethanol every year. And has been diverting more production to the new hand sanitiser plants.

It is hoped these three plants – built in record time – will help to meet the shortfall.

INEOS intends to produce both standard and the increasingly popular 'pocket-sized' hand sanitisers.

COVID-19 is a highly contagious disease and is most often spread when people, with unwashed hands, touch their own faces, especially their mouth, nose and eyes. Hand sanitisers can stop this. ➤

**The INEOS hand gel website is  
now open and taking orders from hospitals,  
national supermarket chains and wholesalers.**

**[INEOSHANDGEL.COM](http://INEOSHANDGEL.COM)**

A WORLDWIDE WAR IS ON TO KILL HUMANITY'S NEWEST  
AND MOST FEARED ENEMY: THE CORONAVIRUS.

# ESSENTIAL CHEMISTRY

AND THERE IS ONE INDUSTRY WHICH CAN SUPPLY THE  
AMMUNITION THAT WILL DEFEAT IT: IT IS THE CHEMICAL INDUSTRY.

*All of INEOS' nine polymer and chemical divisions supply products used in medical and pharmaceutical applications. They play a very important role in these sectors, supplying over 300 products. These are typically EU/US Pharmacopoeia and US FDA approved. Many are active in some way in slowing the spread of COVID-19, treating those infected, or finding a cure.*

**P**RODUCTION has been ramped up at INEOS' sites to cope with the unprecedented, global demand for chemicals to slow the spread of COVID-19 and help treat those infected. INEOS is now working round-the-clock.

It has diverted resources away from non-essential work at sites in America, mainland Europe and the UK to keep the flow of essential chemicals to those making vital medical materials, disinfectants and equipment.

"We have never experienced demand for products that support health and hygiene like this," said INEOS' Group Communications Director Tom Crotty.

But INEOS took early steps to protect

its staff. It was concerned that its businesses, those which provide the raw materials to run the plants and the hauliers, could continue to run through the pandemic.

"Health workers are key but so are we," said Roger Mottram, Environmental & Regulatory Affairs Manager for INOVYN, an INEOS business.

"If our production is stopped, so is the production of protective gloves, antiseptic wipes, hand gels, syringes, drips and more. Health workers won't have protection or equipment to work with. The knock-on effect of that would be catastrophic."

In Germany, INEOS' plants are running at full capacity to produce isopropyl alcohol - one of the two core ingredients in antiseptic hand sanitiser.

Ethanol from its plants in Grangemouth

(UK), Herne (Germany and Lavera (France) will supply the other crucial ingredient. "We are looking to redirect additional production to address the current shortage," said Tom. "But we have to be careful not to risk the reliability of either plant. Our responsibility and our focus is to ensure our plants remain operational."

In under 10 days INEOS has built three new hand sanitiser plants to directly produce, bottle and distribute three million bottles a month of hand sanitiser. It will give these to the NHS and hospitals free of charge.

"I am extremely proud of the INEOS team who have built these major production facilities in literally a few days," said INEOS Chairman Sir Jim Ratcliffe. "I believe these hand sanitisers will play a key role in the fight

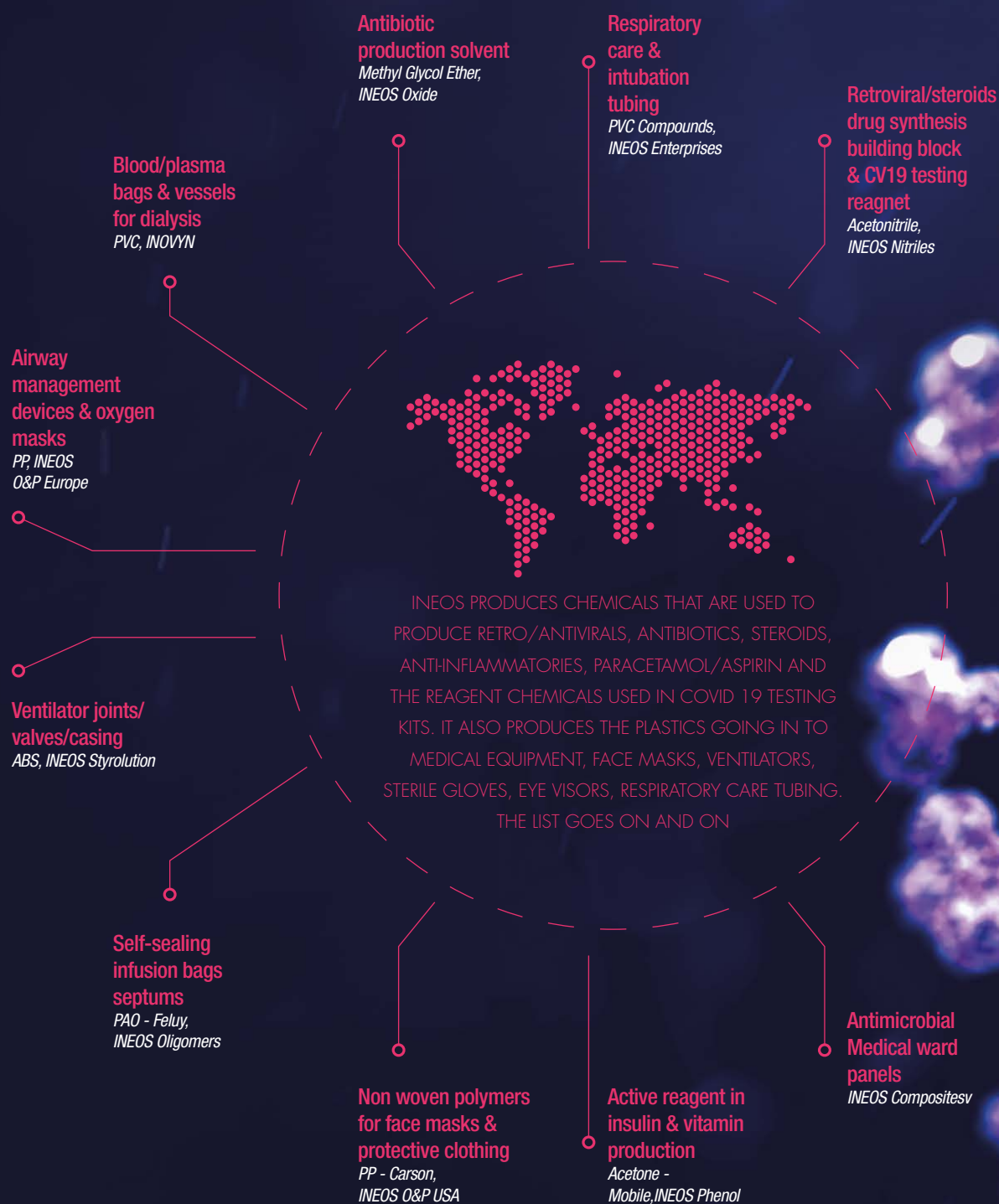
against the coronavirus and will help protect our NHS frontline staff who deserve all the help we can give them."

At INOVYN across Europe, the INEOS-owned plants are running continuously to produce sodium hypochlorite, which we all know as household bleach.

Again, it is needed now more than ever after it was recognised by the World Health Organisation and UNICEF as the best and quickest way to kill COVID-19 on hard surfaces.

CEFIC, the voice of the chemical industry in Europe, said it was being asked daily by governments about possible shortages.

"Despite the difficulties, the chemical industry is showing its many strengths, in supplying critical chemicals into medical, health, environmental and food supply



chains," said Cefic president Daniele Ferrari. "Our industry is part of the fabric that will keep society running."

The demand for single-use plastics to control the spread of infection is also recognised more than ever.

Hospitals desperately need PVC IV bags, blood bags, protective face masks, gloves, ventilators, aprons, goggles, surgical gowns, nasal cannulas and medical tubing.

"We are doing everything we can and more," said Roger. "We know our products are essential to help control the spread of this disease and protect people's health."

From basic chlor-alkali chemicals that are used to make soap, to phenol used to produce aspirin and paracetamol, to the acetonitrile that being used in pharmaceutical analysis essential in procedures nec-

essary to find a vaccine, INEOS products are playing an essential role.

Countries are also concerned about protecting their drinking water supplies.

In the US, utilities companies require INEOS' acrylamide and polyacrylamide to purify America's water.

And UK water companies have also contacted INEOS, which provides the chlorine necessary to keep 98% of Britain's water safe to drink.

"We have reassured them that we have the necessary contingency plans in place to continue supplying these vital chemicals," said Tom.

The Malaysian government recently ordered the closure of most of its industries.

But one of INEOS' biggest customers has been instructed to remain operational

because it produces nitrile rubber for surgical rubber gloves needed in hospitals.

Plastic packaging – known to keep food fresher for longer – is now coming into its own as the public have been told to stay at home. Fewer trips to the supermarket means food has to last longer.

INEOS is working closely with governments across the countries it operates.

It is providing them and the European Commission with confidential information about its production capabilities and whether it can guarantee that supply.

"They want to make sure that there are enough disinfectants available to help slow the spread of COVID-19," said Roger.

INEOS has imposed strict measures across the company to protect its own staff from the virus, which has so far killed many

thousands of people across the world.

All office-based staff have been told to work from home where they can, all non-essential travel has been stopped and all non-essential maintenance on plant has been redirected to plants that are essential.

"By doing this we can keep our people safe and ensure the continued operation of our plants and businesses through the coming weeks and months," said Sir Jim.

INEOS is the world's third largest chemical company and employs 22,000 people at 186 sites in 26 countries, including China where the virus originated.



# DELIVERING THE GOODS

INEOS ENLISTS SIR DAVE BRAILSFORD AND HIS WINNING  
CYCLING ORGANISATION TO DELIVER NEW HAND SANITISER  
FREE TO HOSPITALS ACROSS EUROPE





01



02



03



04



01. From a standing start, to production of one million bottles a month, all in under 10 days. INEOS gears up to meet the needs of hospitals across Europe.

02. John Goodenough, deputy chief nurse at Warrington & Halton Hospital, was on hand to receive the first delivery in the UK.

03. Dr Martin Bongartz, senior physician and hygiene officer at St Josef Hospital in Moers, Germany.

04. A million bottles a month are being produced at each of the INEOS sites.

Millions of bottles of INEOS' new hand sanitiser have started being delivered free to hospitals across Europe. Warrington & Halton Hospital in England was the first UK hospital to receive 450 litres to help keep its frontline workers safe in the fight against COVID-19.

"It's absolutely fantastic that British manufacturers have stepped up to fight against coronavirus," said Deputy Chief Nurse John Goodenough.

The INEOS hand sanitiser project, initiated by Chairman Sir Jim Ratcliffe, has enlisted the support of Sir Dave Brailsford and his winning Tour de France cycling team.

"This major initiative has brought together the very best of all INEOS and its teams in a race against the clock," said Sir Jim.

As team principal of Team INEOS, Sir Dave is more used to managing the world's best cycling team.

His logistics team is highly efficient at

moving lots of cycling equipment, supplies and support crews around the world.

Now Dave and his team are liaising directly with NHS trusts and hospitals across Europe, co-ordinating shipments to where they are needed most.

"Usually it's the sports stars who everyone comes to watch and support," he said. "But the tables have turned. Now the performers are the health workers and the frontline hospital staff and they are the ones who everyone is admiring at the minute. We are the fans."

Working closely with NHS Trusts, INEOS hand sanitisers will be delivered to 28 hospitals across the UK including Grangemouth, Halton, Teesside, Derby and London.

Wider distribution will follow as the production plant at Newton Aycliffe in the North East of England reaches full capacity.

Similar plants in Herne, Germany, and Lavera in France are also delivering free vital

supplies directly to hospitals.

The three plants were built in less than 10 days. A fourth - at Étain, France - will start production imminently.

INEOS' initial priority is to meet the needs of frontline medical and care services before supplying pocket-sized hand sanitisers for the public.

All will be produced to World Health Organisation specifications.

Hand-to-mouth contamination is one of the main ways that the virus spreads and there is a critical shortage of hand sanitisers across the UK and mainland Europe.

"We knew speed was crucial in addressing this shortage," said Sir Jim. "That said, getting the hand sanitiser into production in just 10 days was a huge team effort and Team INEOS, led by Sir Dave Brailsford, have made a great contribution alongside the rest of the INEOS family."

INEOS produces chemicals that go into anti-biotics, paracetamol, anti-inflamato-

ries, anti-virals and aspirin, and the re-agent chemicals that go into testing kits.

It also produces the plastics that go into medical equipment, face masks, sterile gloves and eye visors. The list goes on and on and on.

The US Department of Homeland Security has described many as being 'critical to national resilience' from basic sanitation through to the search for a vaccine.

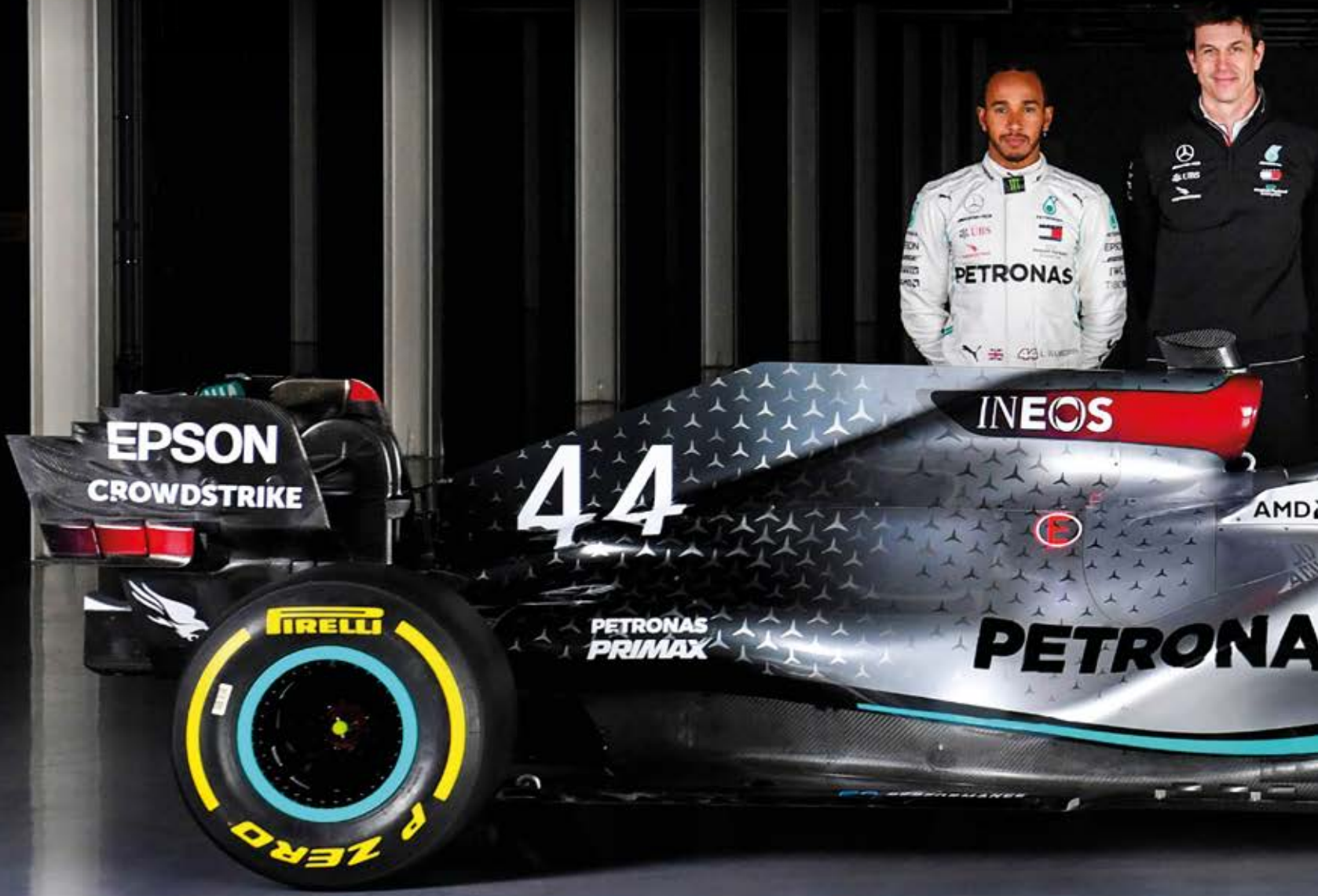
The latest project combines INEOS' know-how in engineering, chemical production and safety, with Team INEOS' logistical expertise.

"If we can find other ways to help in the coronavirus battle, we remain absolutely committed to playing our part," said Sir Jim. ●

[WWW.INEOSHANDGEL.COM](http://WWW.INEOSHANDGEL.COM)

# WINNING

*INEOS IS DRAWN TO THE FINEST. THE BRAVEST. THE ONES WHO BELIEVE ANYTHING IS POSSIBLE*



# FORMULA

*SO IT WAS ONLY A MATTER OF TIME BEFORE IT STARTED WORKING WITH THE BEST F1 TEAM IN THE WORLD*

Discover how INEOS' new technical partnership and sponsorship deal with Mercedes-AMG Petronas F1 team will provide a cutting edge to our cycling and sailing teams.



**RACING POSTPONED UNTIL FURTHER NOTICE BUT THERE IS LOTS STILL HAPPENING**



**THREE OF THE GREATEST RACING TEAMS IN THE WORLD ARE NOW WORKING TOGETHER TO BECOME UNBEATABLE**



**Great minds from INEOS' British challenger for The America's Cup, TEAM INEOS and Mercedes' F1 team are now working together to become unbeatable.**

What appealed to INEOS, in signing the technical partnership, was Mercedes' grit and determination to re-define what is humanly possible.

What Mercedes-AMG Petronas F1 team likes about INEOS is its dynamism and entrepreneurial flair.

"What unites us is the ambition and the competitiveness," said Toto Wolff, Team Principal and CEO of Mercedes-AMG Petronas F1 team. "We are very excited about this agreement's potential."

At the heart of these three teams is a shared passion to drive, sail and pedal faster than anyone else in the world. And work has already started.

Eighteen technical engineers from Mercedes' applied science division are now working full-time at INEOS TEAM UK's headquarters in Portsmouth to help INEOS build a race boat to win next year's America's Cup for the first time in the competition's 170-year history.

They are pooling their expertise and showing they work almost as quickly off the track as they do on it.

"The rate of development is astonishing for the top teams," said Graham Miller, who is leading the partnership from Mercedes' side. "One of the things we can offer is the ability to fast-track developments."

At Brackley, Mercedes has an enormous manufacturing capability with some of the world's best manufacturing tools and the ability to fit 170 aerodynamicists around a 16ft x 5ft car.

*"There's an incredible amount of synergy across of all the sports, Formula 1, cycling and the America's Cup. It's a fascinating mixture of pushing the boundaries of technical innovation alongside sporting prowess."*

— Sir Ben Ainslie, Team Principal and Skipper of INEOS TEAM UK

"The benefit back to the team is the rate of development," said Graham. "Some of it is reactionary, if the team faces issues, but some is proactive and planned development."

Mercedes' team will be looking at aerodynamics, simulation and the planning precision and processes needed from concept to design to manufacturing.

"You can have the best design in the world but if you don't leave enough time to produce it, it's no good to anyone," said Graham. "You have to strike that balance between the point you have to release that concept to detail design, to the point you have to release that detailed design drawing to manufacturing and then release it from manufacturing to assembly."

Late last year The America's Cup team launched their first AC75 race boat – a foiling monohull that flies on wings.

"Our boat really shouldn't sail because it is effectively a 10-storey building sailing on a coffee table," said INEOS Chairman Sir Jim Ratcliffe. It has, he said, been a technical challenge. Graham said his team from Mercedes would be able to learn valuable lessons from that.

"Formula 1 is all about minimising weight and maximising stiffness," he said. "But the hydrodynamic loads in the boat are just enormous. Just to be able to help design in that environment with such extreme loads is

potentially useful for us in the future because you get exposed to different materials."

A second race boat will be launched this year. It will be the most technical ever built with an estimated 30,000 component parts needed to work in perfect symmetry to allow the 75ft boat and 11-man crew to fly during the race itself.

The crossover between aviation and F1 racing already exists. "We sometimes describe our cars as low-flying aircraft," said Graham.

Simulation will also be critical, said Graham, so that the British sailing crew can test what works and ultimately learn how to sail, or rather fly, the boat.

"It's a platform that has never been sailed before so simulation is a critical developmental tool," said Graham. "The more they use the simulator and develop it, the more that will lead to performance development on the water and speed."

Aerodynamics have been the focus of F1 teams for years in the drive for efficiency and performance. "A 2004 Formula 1 car looks like a complete brick compared to modern day cars," said Graham.

Over the years the changes have come down to minute, microscopic developments. "Because of the limited resource we have always had, we have tended to look at the big rocks in the field and how we can manipulate those," said INEOS TEAM UK's chief designer Nick Holroyd.

"Mercedes have allowed us, both by helping us with the resource and by mindset, to drill down into a fine level and shown that when you get a lot of those details right, they can actually add up to quite a significant gain. "Although the focus is primarily on The America's Cup team, Mercedes will also be working with TEAM INEOS, formerly TEAM SKY, which has dominated The Tour de France for years.

"We cannot wait to get started," said team principal Sir Dave Brailsford. "Our unrelenting determination to outwit the ever-improving competition will benefit hugely from this partnership."

Meanwhile, Sir Ben Ainslie, who will skipper the 75ft monohull in next year's America's Cup race, said Mercedes' involvement had been a huge boost to his team.

"There's an incredible amount of synergy across all the sports, Formula 1, cycling and the America's Cup," he said. "It's a fascinating mixture of pushing the boundaries of technical innovation alongside sporting prowess."

What has surprised Graham most, though, so far, is how the rules change from one America's Cup race to the next.

"In one, the crew may race in a catamaran, the next in a 75ft monohull," he said. "We may have big rule changes in F1, but ultimately you've always got four wheels, a front wing and a back wing. It would be like us going from a motorbike to a car to a truck." ➤





INEOS Chairman Sir Jim Ratcliffe and Toto Wolff, Team Principal and CEO of Mercedes-AMG Petronas, began discussing a potential partnership when they met at a pre-season F1 testing in Barcelona last year.

INEOS believes the two companies can learn from each other to improve performances on the race track, the road and in the water.

## INEOS SIGNS AS PRINCIPAL PARTNER WITH FORMULA 1 TEAM

**T**HE BEST Formula One team in the world also has a new partner in the driving seat. INEOS is now sponsoring Mercedes-AMG Petronas F1 team. INEOS Chairman and Founder Sir Jim Ratcliffe said it was a fantastic engineering company. "They have consistently shown that they are at the forefront of technological innovation and human performance," he said.

INEOS, which already owns the world's most successful cycling team and is the British challenger for the 36th America's Cup, believes the two companies can learn from each other to help improve performances on the race track, the road and in the water.

Lewis Hamilton is a six-time Formula One champion and is one of Mercedes' drivers, alongside teammate Valtteri Bottas.

At a press conference to announce the partnership, Sir Jim said he had only met Lewis – and his dog – for about five minutes.

"I don't know him, but I am a great admirer," he said. "I think he is one of the finest drivers who has ever strode the earth," he said.

Sir Jim and Toto Wolff, Team Principal and CEO of Mercedes-AMG Petronas, began discussing a potential partnership when they met at a pre-season F1 testing in Barcelona last year.

The F1 team's new car, with INEOS' logo, was unveiled at the press conference.

INEOS' name appears on the airbox above the driver's head, the front and rear wing, as well as on the team's clothing and drivers' overalls. ➤

■ We were able to reduce a process that could take years down to a matter of days ■

– Professor Tim Baker  
of University College  
London's mechanical  
engineering department



The state-of-the-art breathing aid has been approved for use in the UK's NHS hospitals.





# MERCEDES F1 TEAM COME TO THE AID OF NHS



**E**NGINEERS from Mercedes' F1 team have – in less than 100 hours – helped to develop a breathing aid that can keep coronavirus patients out of intensive care. The team worked around-the-clock with engineers from University College London and clinicians at UCL Hospital to further improve an existing respiratory device that has been used in Chinese and Italian hospitals.

The result is a state-of-the-art version, which has been approved for use by the UK's NHS, and adapted so it can be mass produced.

"We were privileged to be able to call on the capability of Formula 1," said Professor Tim Baker of UCL's mechanical engineering department. "We were able to reduce a process that could take years down to a matter of days."

The device, which pushes oxygen into the lungs to keep them open, reduces the effort needed to breathe in, especially when the air sacs in the lungs have collapsed due to COVID-19.

It will help coronavirus patients with serious lung infections to breathe and

negates the need for invasive mechanical ventilation, which requires patients to be heavily sedated.

"From being given the brief, we worked all hours of the day, disassembling and analysing an off-patent device," said Tim. "Using computer simulations, we improved the device further to create a state-of-the-art version suited to mass production."

Mercedes-AMG-HPP will soon be producing up to 1,000 per day.

The new device will help to save lives by ensuring that ventilators, which are in short supply, are used to treat only the worst-affected patients.

It is thought the UK alone could need 20,000 extra ventilators to deal with the pandemic. Mercedes has also been working with the six other UK-based F1 teams, as part of Project Pitlane, to bolster the UK's efforts to treat COVID-19 patients with severe breathing difficulties.

They are using their engineering expertise to manufacture other medical equipment, which is urgently needed in intensive care units.

"The Formula 1 community has shown an impressive response to the call for support," said Andy Cowell, Mercedes HPP's Managing Director.

What sets all F1 teams apart is their ability to rapidly design and manufacture

complex products quickly.

Meanwhile, INEOS TEAM UK, who had been focused on building their racing boat for next year's America's Cup challenge at their base in Portsmouth, have also joined in the fight to help stop the spread of COVID-19.

"In these circumstances, preventing the spread of COVID-19 has to be everyone's top priority," said skipper Sir Ben Ainslie. "Everyone has a part to play."

There is a nationwide initiative to ease the pressure on hospitals by creating 'red zone' surgeries where low-risk patients, showing COVID-19 symptoms, can be examined.

INEOS TEAM UK will be supplying personal protective equipment through their suppliers including respirators, gloves and safety goggles, to their local 'red zone' surgery.

The team are also using their manufacturing capacity and 3D printer at their base in Portsmouth to produce 50 PPE re-useable masks per week which will be sent to the same surgery.

In addition, the team's design co-ordinator, Jonathan Nichols, and James Roche, head of simulation, have been supporting a team at Imperial College London in designing new ventilators.

"Although their project wasn't chosen

by the UK government, Imperial College will continue to look into developing the ventilator," said a team spokesman. "And we have put them in touch with a long list of suppliers and experts to help them." ●

[MERCEDSAMGF1.COM](http://MERCEDSAMGF1.COM)

## INEOS TEAM UK MANUFACTURE PPE FACE SHIELDS TO SUPPORT FIGHT AGAINST COVID-19

INEOS TEAM UK is supporting the fight against the ongoing COVID-19 pandemic by manufacturing PPE face shields for key workers in the local area around their team base in Portsmouth.

Utilising the manufacturing capacity and resource within the team base, including 3D printers and sailmakers, together with additional resource from the existing team partnership with Mercedes-Benz Applied Science (MBAS), INEOS TEAM UK and MBAS will together be producing an initial total of over 100 PPE face shields a day.



A  
CLIMATE  
OF  
CHANGE

*INEOS is playing its part in  
tackling climate change*





**Our climate is changing – and we are all to blame. Global demand for fresh food and water, clothes, electronics, medicines, cars, planes and construction materials all ensures the continual burning of fossil fuels.**

It's easy to say ban them; it's harder to achieve.

"We cannot just turn off the tap," says Dr Peter Williams, INEOS' Group Technical Director. "Many of our products, which are made with gas and oil, are being used to build wind turbines,

*Story continues overleaf* ➤

solar panels and other renewable technologies.”

That doesn't mean INEOS is blind to the problems of global warming which threaten the planet. Far from it.

It understands what's at stake. “As a business, INEOS is driven by innovation and the need to find alternative raw materials and fuel,” said Dr Greet Van Eetvelde, INEOS' Group head of Energy and Innovation Policy and lead of CEN, INEOS' Carbon and Energy Network. “And staff are not doing it because they have to. They are doing it because they want to.”

*“All this is moving us to a circular economy which will increase resource efficiency, reduce greenhouse gas emissions and provide an outlet for plastic waste.”*

– Dr Peter Williams,  
INEOS' Group Technical Director

At INEOS' Zwijndrecht site – the birthplace of INEOS - staff have, for years, been cutting greenhouse gas emissions by capturing carbon dioxide to be reused in other on-site processes. That work goes on.

But INEOS is also: WORKING with pioneering recycling companies so it can use fewer resources – gas and oil – to make its products.

STARTING to replace gas and oil, where it can, with renewable raw materials and

REINVESTING its profits in state-of-the-art manufacturing plants to improve their efficiency – and cut greenhouse gas emissions. On that score, it is proud of its record.

“Optimising our sites to make them more efficient is something we are really good at,” said Greet.

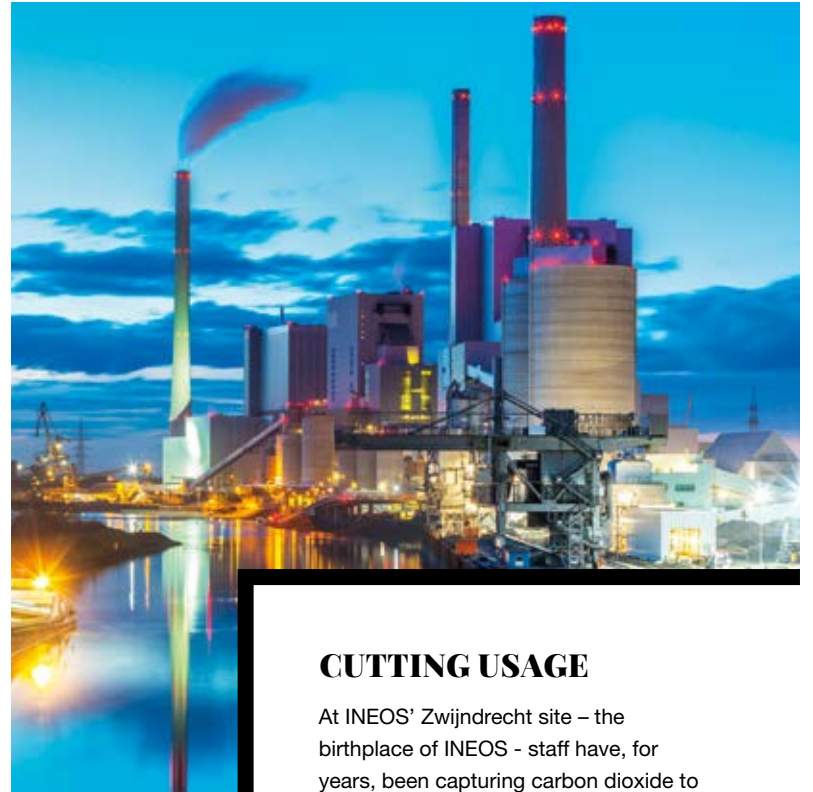
But INEOS is not just focusing on what it has done. What matters is what it intends to do now and in the future.

It has set itself clear targets to use more recycled plastics to make its products by 2025.

And it's making good progress already with many new products now on sale.

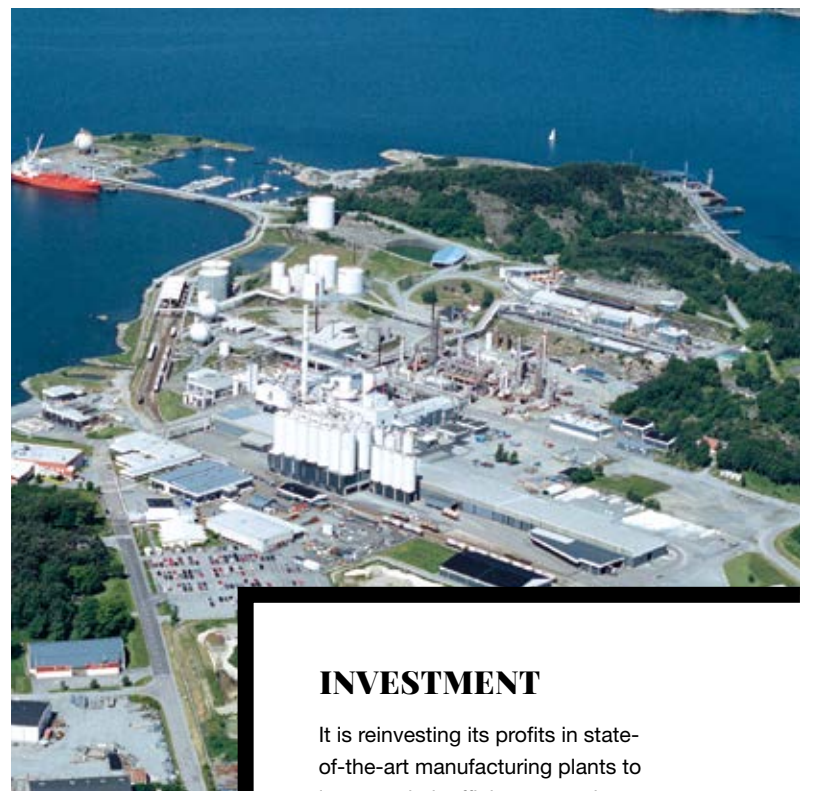
“All this is moving us to a circular economy which will increase resource efficiency, reduce greenhouse gas emissions and provide an outlet for plastic waste,” said Peter.

As it looks to the future, it believes hydrogen will be the answer to many people's prayers for cleaner air and its businesses in the UK, Germany and Belgium are all now involved in projects. ●



### CUTTING USAGE

At INEOS' Zwijndrecht site – the birthplace of INEOS - staff have, for years, been capturing carbon dioxide to be reused in other on-site processes.



### INVESTMENT

It is reinvesting its profits in state-of-the-art manufacturing plants to improve their efficiency – and, as a result, cut greenhouse gas emissions.



**MORE RENEWABLES**

INEOS has started replacing gas and oil, where it can, with renewable raw materials to make its products.



**NEW TECHNOLOGIES**

INEOS is working in partnership with pioneering recycling companies so it can use fewer resources to make its products.



**TARGET-DRIVEN**

INEOS has set itself clear targets to use more recycled plastics to make its products by 2025. And it's making good progress already with many new products now on sale.



**ALTERNATIVE ENERGY**

INEOS' businesses in the UK, Germany and Belgium are all now involved in projects to smooth the road to an economy fuelled by hydrogen which produces zero emissions.

# Closing the loop

*Partnerships are being forged with recycling companies all over the world to ensure plastic waste is collected and then turned into raw materials, which INEOS can use in its manufacturing processes.*

**CORONAVIRUS may have given single-use plastics a reprieve as we all realise the value they bring to public health by preventing the spread of the virus. But when the crisis is over, what then? INEOS hopes people will see that not all plastic is the problem, it's how we treat plastic waste. For years now, INEOS has been calling for a change in mind - set - and trying to explain its thinking.**

Now it is forging partnerships with recycling companies in America, the UK, Italy and Austria.

PLASTIC ENERGY, Forever Plast, Viridor, Agilyx, Pyrowave and GreenMantra – all leaders in their own fields – are all now working with INEOS to close the loop and create a circular economy where nothing goes to waste.

As a result, plastic waste, much of which was once destined for landfill, is now being turned into a raw material that INEOS can use.

INEOS has also found a way to reduce its reliance on fossil fuels by making a new generation of bio-based plastics from a residue from the pulp industry.

Instead of 100% gas and oil, it is using that renewable raw material from Finland instead. And the plastic that is made from this bio-attributed raw material has a 90% reduction in greenhouse gas emissions compared to traditional plastic.

And it is on the brink of a partnership in a plant that will take the plastic no one wants – and using a UK company's patented technology – turn it into a recycled raw material that can make virgin plastics. And crucially, interest in all these newly-engineered high quality, plastic products is flooding in from all corners of the globe. As part of its own commitment to a new circular economy, INEOS set itself four ambitious targets to meet by 2025. One promised to use 325,000 tonnes of recycled polymer in its products. It is now doing that. Another pledged to offer products containing at least 50% of recycled content. That too is happening.

“We don't wait to see what happens,” said INEOS Communications Director Tom Crotty. “We make it happen.” >

## INEOS Composites

BRAZIL  
CHINA  
FINLAND  
FRANCE  
GERMANY  
INDIA  
POLAND  
SPAIN  
UNITED STATES

agilyx

UNITED STATES



**GREENMANTRA<sup>®</sup>**  
TECHNOLOGIES  
CANADA



**PYROWAVE<sup>®</sup>**  
CLOSING THE LOOP  
CANADA



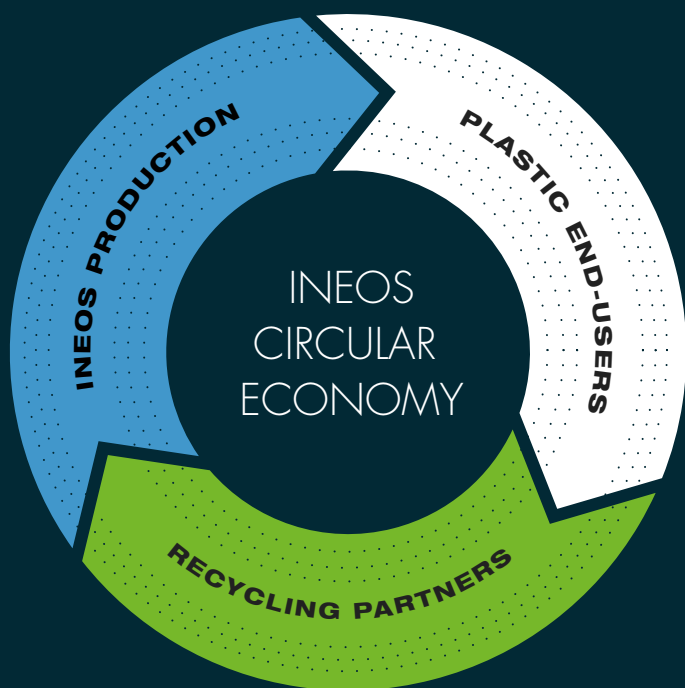
**PLASTIC<sup>®</sup>**  
ENERGY

SPAIN

**INEOS has teamed up with a UK-based global company to develop an advanced recycling plant to turn plastics, which no one else can yet recycle, into a new raw material that INEOS will be using instead of fossil fuels.**



FULL STORY  
**P22**



**Forever Plast**

ITALY

**In a world first, led by INEOS, billions of caps from plastic drinks bottles are now being recycled into perfectly-formed, colourful new ones.**



FULL STORY  
**P26**

**UPMBIOFUELS**

FINLAND

**INEOS is planning to make a new range of plastics out of residue from the pulp industry.**



FULL STORY  
**P24**

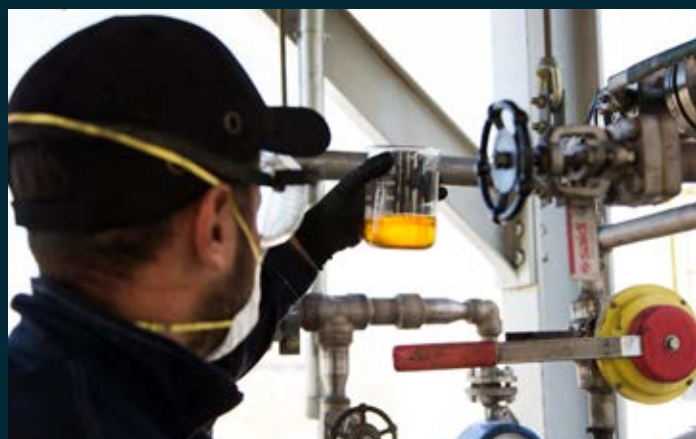
**Viridor**

UNITED KINGDOM

*INEOS teams up  
with UK-based  
global company,  
PLASTIC ENERGY,  
to develop an  
advanced recycling  
plant to turn used  
plastic into a raw  
material for  
new plastic.*

# The solution to end pollution





*A member of staff at PLASTIC ENERGY checks the quality of TACOIL*



**TACOIL IS A RECYCLED OIL WHICH CAN BE USED IN PETROCHEMICAL PLANTS TO MAKE ETHYLENE AND PROPYLENE – THE KEY BUILDING BLOCKS FOR PLASTICS.**

#### **THERMAL ANAEROBIC CONVERSION (TAC)**

Patented TAC technology converts end-of-life plastic waste into a TACOIL to create clean recycled plastics or alternative low-carbon fuels.

#### **TAC PROCESS**

Plastic waste is heated in the absence of oxygen until it melts and the polymer molecules break down to form a rich saturated hydrocarbon vapour.

As a result of this TAC process, the condensable gases are converted to hydrocarbon products while the non-condensable gases are collected separately and combusted to process energy.

#### **TACOIL**

For every tonne of end-of-life plastic waste processed, 850 litres of chemical feedstock TACOIL are produced.

**INEOS is now working with a visionary company that has developed and currently operates a unique process to recycle plastic that no one else can.**

It has signed an agreement with PLASTIC ENERGY to develop a recycling plant to convert difficult-to-recycle plastic waste into clean, recycled plastics, with production due to start in 2023.

The two companies, who share a vision of a world where plastic is valued, will use their expertise and industry knowledge to decide on the best location.

“This really will help us to make a difference to a world where using plastic is no longer a threat,” said Carlos Monreal, founder and CEO of PLASTIC ENERGY.

His company has spent the past 10 years developing the patented recycling technology which turns plastics, traditionally destined for landfill or incineration sites, into TACOIL.

TACOIL is a recycled oil which can be used in petrochemical plants to make ethylene and propylene – the key building blocks for plastics.

Currently chemical companies, like INEOS, make those building blocks with gas and oil and then convert those into polyolefins.

PLASTIC ENERGY already owns and operates two plants in Spain where the technology is in use 24 hours a day, 330 days a year.

“It is not science fiction or a project or a dream,” said Carlos. “It is a reality and something we would like to share with the world.”

Rob Ingram, CEO INEOS Olefins & Polymers, said the agreement to build an advanced recycling plant marked another important milestone in INEOS’ sustainability strategy.

“To take plastic waste back to virgin plastic is the ultimate definition of recycling and helps us to move towards a circular future for plastics,” he said. ➤



Waste from the pulp industry is now being used to make plastic

## UPM BIOFUELS

**THE RENEWABLE RAW MATERIAL FOR UPM BIOVERNO NAPHTHA IS CRUDE TALL OIL, A RESIDUE OF THE PULP MAKING PROCESS.**

### UPM CLIMATE POSITIVE FARMING

Our feedstocks are cultivated within existing agricultural systems and requires no additional farmland for their cultivation. These feedstocks are introduced as an additional high biomass cover crop within an existing main crop rotation during seasons where land is not typically in productive use.

**INEOS is planning to make a new range of plastics out of residue from the pulp industry. It has signed a long-term agreement with a company in Finland for its biofuel, which will be used as a raw material instead of purely gas and oil to make plastic food packaging, medical supplies and pipes.**

UPM Biofuels' wood-based residue is already being used by INEOS O&P to produce raw materials for their colleagues at INOVYN, who recently unveiled the world's first commercially available PVC, partly made with the residue that would otherwise be burned as a fuel.

This latest deal is seen as another great stride along the road to a greener economy.

"INEOS is interested in delivering a low carbon, circular economy," said Gabriella Isidro, Business Development Manager at INEOS O&P Europe North. "The carbon footprint of our products has got huge scrutiny at the moment so we are really looking at how we can reduce our greenhouse gas emissions and have a more positive impact on the environment."

The new range of 'bio-attributed' polyolefins will be produced at INEOS' site in Köln, Germany.

And they have already received the blessing of the globally-respected Roundtable on Sustainable Biomaterials.

It has certified each step in the process, starting from UPM Biofuels converting the wood-based residue into hydrocarbons, through to the final polymer.

"INEOS has really raised the bar for the plastics industry," said Nicola Noponen, technical advisor for The Roundtable on Sustainable Biomaterials.

"By selecting the most stringent sustainability system for their certification, they can demonstrate that their products carry high levels of sustainability, they result in greenhouse gas emissions' reductions and displace fossil resources."

The result are products which have

a proven positive impact on the environment without sacrificing any product performance.

The other beauty of UPM's biofuel is that it is not only renewable but it also does not compete with the food chain.

The biofuel will be shipped by barge to O&P's plant in Köln where it will be turned into bio-ethylene in its existing cracker.

"By replacing fossil-based raw materials in the cracker, our products will be contributing to a significant reduction in carbon emissions," said Rob Ingram, CEO INEOS O&P Europe North. UPM, which has been making products from wood at its site in Lappeenranta for more than 100 years, is excited to be working with INEOS.

"INEOS' and our commitment to RSB certification creates a strong common ground to build on," said Maiju Helin, Head of Sustainability and Market Development at UPM Biofuels.

As a company, it was forced to transform itself in a bold way and look for new business in 2008 as the demand for news print began to fall.

In 2012 it built the world's first bio-refinery producing wood-based, renewable diesel and hasn't looked back. ➤

*"By replacing fossil-based raw materials in the cracker, our products will be contributing to a significant reduction in carbon emissions."*

– Rob Ingram,  
CEO INEOS O&P Europe North





# Pulp power

*The natural solution for renewable plastic. UPM Biofuels' deal with INEOS is another great stride on road to greener economy*

# Top priority

*Our new  
partnership to  
recycle old bottle  
tops into new  
bottle tops –  
INEOS Olefins &  
Polymers South  
O&P South*





## OVER THE NEXT FIVE YEARS, 6.5 BILLION BOTTLE CAPS WILL BE RECYCLED

### RECYCLING PROCESS

1. PET recyclers collect bottles.
2. The plastic bottles are sorted and crushed into huge bales.
3. The plastic is shredded and placed in water.
4. The former bottles, which are made of PET, sink.
5. The former bottle caps, which are made from high density polyethylene, float.
6. The multi-coloured flakes (the former bottle top caps) can then be skimmed off the surface.
7. Those flakes are sent to Forever Plast where they are put in a machine which can sort the the flakes into different colours.
8. They are then cleaned, ground into pellets and finally blended with highly-engineered virgin chemicals from INEOS.

**BILLIONS of caps from plastic drinks bottles – destined for landfill – are now being recycled into perfectly-formed, colourful new ones. INEOS, which is behind the move, says it has never been done before.**

“It is a step change but it is what was needed,” said Bruce Debell, business director of INEOS Olefins & Polymers South. “We have proven to the world that you can use recycled products to create high quality ones.”

Over the next five years, 6.5 billion bottle caps will be recycled.

O&P is working in partnership with a privately-owned Italian company which specialises in recycling high density polyethylene and has developed a system that allows the different coloured bottle tops to be separated and cleaned.

In the past, this highly-versatile plastic, which can be moulded into almost any shape, was either sent to landfill or turned into such things as plant pots and garden furniture. But Bruce said that was a waste of a highly-engineered plastic that deserved better. “Other, lower grade plastics can be used for those things,” he said.

INEOS and Forever Plast in Milan already have popular brands lined up, wanting to buy the new bottle tops.

The changes are in direct response to consumers, demanding recycled products from companies amid concern for the environment.

“In doing this we are using fewer fossil fuels to make our products,” said Bruce.

Forever Plast blends 50% of the recycled bottle tops with highly-engineered speciality chemicals, which have been developed at INEOS’ plant in Tuscany.

The end result mirrors INEOS’ virgin grades of high density polyethylene.

Currently the new tops, which will be made with 50% of recycled material, cannot be used on food containers or drink bottles due to regulations. But

that’s the ultimate goal. “It’s difficult, but we are not ruling it out,” said Bruce.

“We are now working towards being able to use these products so they can be in contact with food again because, if we can do that, there’s a huge market out there.”

Over the years bottle caps have got lighter without losing any of their qualities.

It may seem trivial but with billions of bottle tops being produced every year, using fewer resources to make them, can make a huge difference.

“All that has been achieved through science,” said Bruce. ●

*“For a while PET bottles have been increasingly recycled but this is one of the first circular developments to tackle the caps. By doing this, we are ensuring used bottle caps are recycled and returned to the market rather than being thrown away or wasted.”*

– Iain Hogan,  
CEO INEOS O&P

# Gathering steam

*Hydrogen will play a huge part in powering economy and cutting greenhouse gases, says INEOS*

**H**YDROGEN has the power to change the world in ways we can only imagine. It already powers the sun, which, in turn, powers the world. But it can also power transport, businesses, even homes – and slash harmful greenhouse gas emissions.

"Most people agree that if society is to achieve net-zero emissions, the hydrogen economy must be given a huge boost," said Dr Peter Williams, INEOS' Group Technology Director. "And INEOS has the skills, capabilities and desire to help achieve this."

INEOS' businesses in the UK, Germany and Belgium are all now involved in hydrogen projects.

In the UK, INEOS-owned INOVYN, which produces thousands of tonnes of hydrogen a year as a co-product, is looking at how the gas could be used to run buses, cars and lorries and significantly improve the air quality in towns and cities.

INEOS could reuse the hydrogen it co-produces more widely, and also link its electrolysis technology to renewable energy to produce greater amounts of green hydrogen for transport, industry and homes.

INOVYN is a member of the UK-based North West Hydrogen Alliance which believes hydrogen is a workable, economically-viable alternative to fossil fuels. "Unlike fossil fuels, hydrogen will never run out," said a spokesman. Hydrogen can be made from electrolysis of water, which produces the hydrogen as well as oxygen as a co-product.

The alliance's aim is to have 25 hydrogen-powered buses, producing zero emissions, on the streets of Liverpool by the end of this year.

A number of INOVYN sites, including Run-corn, already have co-fired (hydrogen) boilers and have been using hydrogen that way to make steam for decades.

At INEOS' Koln site in Germany, the power plant is also co-fired with hydrogen next to natural gas, and staff are looking at how they could feed

hydrogen into the region's power network so that it could be used to run inner-city public transport.

That all fits with Germany's desire to build an economy based on hydrogen instead of fossil fuels so it can meet its Paris Agreement goals.

The UK is also looking at whether it can make hydrogen from natural gas. Unlike hydrogen produced from water, this would result in some carbon that would need to be captured directly then stored deep underground. "That could enable us to halve the emissions at our Grangemouth site in Scotland," said Peter.

Carbon capture and storage is not always necessary with hydrogen production but, where it is, INEOS is well placed.

At the Port of Antwerp in Belgium, INEOS is working with a host of firms, including BASF, Total and ExxonMobil, on plans for carbon capture and storage. "INEOS can bring its experience because it is already capturing half of the Oxide process emissions in Antwerp," said Dr Greet Van Eetvelde, INEOS' Group head of Energy and Innovation Policy and lead of CEN, INEOS' Carbon and Energy Network.

The technology to capture carbon is evolving rapidly and is on the verge of becoming economically viable. INEOS is also working on storage.

The Danish Council on Climate Change believes carbon capture could begin in 2025 and that storage could have a real influence in 2030.

"That's also our target," said Johan Byskov Svendsen, INEOS Denmark Developing Assets Manager. "We're working from the assumption that it will be possible to store CO<sub>2</sub> from the second half of this decade." He added: "No other company operating in the country has made it as far with a CCS project as INEOS."

So INEOS, which is planning to build the most energy-efficient ethylene cracker in Europe, will be well prepared. Once built, INEOS' €3 billion ethylene cracker and world-scale PDH unit in Antwerp will emit half the CO<sub>2</sub> emissions of similar-sized, ageing plants elsewhere in Europe because co-produced hydrogen will be used as fuel instead of natural gas. "This will be a pioneer in terms of technologies used, environmental impact and efficiency," said Peter. ●



## Enviro400 Hydrogen Double Decker Bus

*Up to 25 fuel cell buses will hit Liverpool City region's roads sometime in 2020.*

**“Most people agree that if society is to achieve net-zero emissions, the hydrogen economy must be given a huge boost, and INEOS has the skills, capabilities and desire to help achieve this.”**

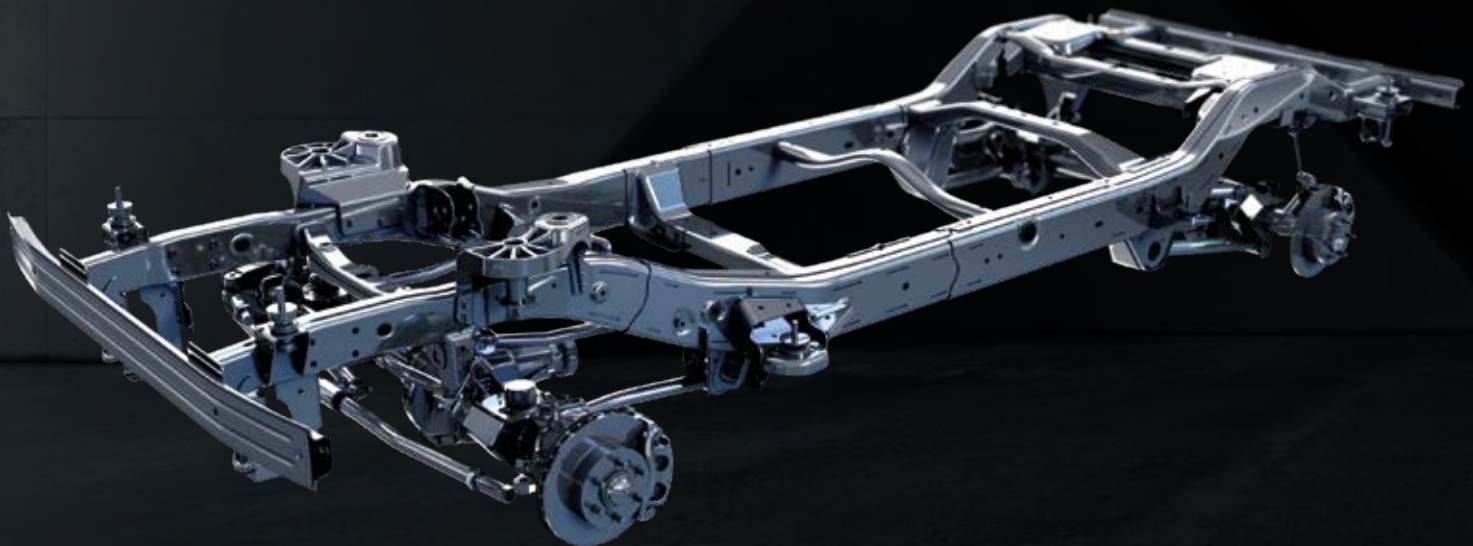
– Dr Peter Williams, INEOS' Group Technical Director





# FRAME AND AXLES

BUILDING THE GRENADIER



**INEOS is building a super-strong 4x4 that's capable of getting the job done no matter how punishing the conditions. The world now knows that.**

What it doesn't know is what the new Grenadier will look like. That burning question, though, is one which INEOS will seek to answer this year.

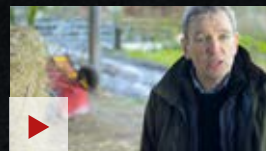
Over the next 12 months, it will be revealing sections of the 4x4 for the very first time – bit by bit.

INEOS is creating the ladder frame in partnership with a highly-experienced vehicle manufacturing company that has a proven pedigree of making ladder frames that can tackle the toughest environments.

And it has partnered with Carraro, which has a long history in building tough 4x4 vehicles, to develop the front and rear axles.

**“THE AMBITION IS CLEAR. THE GRENADIER IS BEING BUILT FROM THE GROUND UP WITH EVERY COMPONENT CHOSEN BY ENGINEERS AT THE TOP OF THEIR GAME.”**

– MARK EVANS, ENGINEERING JOURNALIST



VIEW VIDEO  
[INEOSGRENADIER.COM](https://www.ineosgrenadier.com)

## LADDER FRAME

A proper off-road 4X4, made to tackle the toughest terrain, needs a box-section ladder frame.

So why would we choose anything else? Super strong, rugged, simple and stable.

### SERIOUS TOWING CAPABILITY

A stable platform.  
Balanced load distribution.  
3.5 tonne capacity.

### MULTI-LAYERED ANTI-CORROSION PROTECTION

Able to withstand water, snow, road salt or sand.

### SUPERB RIGIDITY

High-tensile steel for torsional strength. Up to 4mm wall thickness. Able to withstand high levels of stress under load.

### PURE STRENGTH

Trees, rocks, or termite mounds. Contact that might stop a unibody SUV shouldn't stop the Grenadier.



## BEAM AXLES

Beam axles belong on the Grenadier. And there are lots of reasons why. Since the first ever 4X4s appeared, beam axles have proven to offer better ground clearance, articulation and load carrying ability than independent suspension. They're simpler and easier to fix. With the greatest strength and all round off-road capability.

### IMPROVED RIDE COMFORT

In combination with the suspension, beam axles offer better ride comfort on the harshest terrain.

### TRACTION YOU CAN TRUST

When one end or side goes up, the opposite pushes into the ground for greater grip.

### LOAD CARRYING

Traction, braking and tyre wear don't change as suspension is compressed, compared to independent. Great when carrying heavy loads.

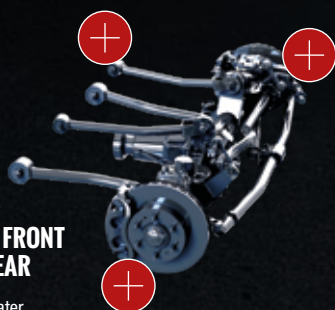


### HIGHER GROUND CLEARANCE

Easily clears larger objects when driving across rocky, off-road terrain.

### FITTED FRONT AND REAR

Even greater articulation and strength. Robust constant velocity joints.



## THE ROAD TO A NEW FUTURE?

**INEOS is determined to one day build a hydrogen-powered 4x4 that can cope with life in the great outdoors. It has spent the past nine months exploring the best ways to do it without affecting The Grenadier's ability to survive in the harshest conditions.**

"All the work we have done re-affirms our belief that a hydrogen-powered vehicle represents the best solution for developing a zero emission version of a rugged 4x4," said Antony Walker, Head of Finance at INEOS Automotive.

"We fully intend to press ahead with our developments."

The feasibility study was funded with a £124,000 grant from Innovate UK.

"It still remains a very long journey from this feasibility study to a fully-fledged, and costed, development programme for a hydrogen fuel cell vehicle," said Mark Tennant, Commercial Director at INEOS Automotive.

The project began in July last year and has involved engineers from Germany, UK-based procurement, commercial and finance staff and technical experts from project partners AVL Powertrain UK.

INEOS Automotive is uniquely positioned to help develop the infrastructure needed to support hydrogen-fuelled vehicles as currently there are only 16 hydrogen stations in the UK.

It is working closely with INEOS' chemical businesses, which produce about 250,000 tonnes of hydrogen a year in the UK and Europe from making chlorine and cracking gas and oil.

INEOS currently uses most of it but believes hydrogen could be more widely used to help clean up the air in towns and cities where pollution is a problem.

"There has been a significant global shift towards a low carbon economy, and the automotive sector presents a major opportunity to reduce emissions," said Antony.

The beauty of hydrogen is that when used as a fuel, it produces only water that's so pure you could drink it.

And filling a tank is almost as quick as refilling it with petrol and diesel.

Electric vehicles are currently being presented as alternatives to petrol and diesel. But they are heavy, the batteries don't last long and they take hours to recharge.

"These technological shortcomings mean battery-powered vehicles are not currently practical for heavy haulage, construction, and off-road usage," said Antony.



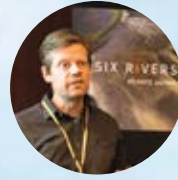
### Academics

PhD students from The Marine and Freshwater Research Institute and Imperial College London have been comparing new data against old data, gathered by the institute over the past 75 years.



### Conservationists

Millions of salmon eggs have been planted into the gravel in rivers further upstream to help breed a healthier and stronger stock. And salmon ladders have been built to allow salmon to reach new spawning grounds further up the rivers.



### Scientists

About 1,000 smolts – maturing salmon – have been tagged so that scientists can track and monitor their behaviour.



### Botanists

Biologists, who specialise in plants, have been planting trees to enrich the soil around the rivers because healthier vegetation leads to a healthier environment for the organisms that live in the rivers.



### Strengur Angling Club

All profits from the club, which provides the best-quality fly-fishing in the world, are now being reinvested back into salmon conservation in North East Iceland.



*The Six Rivers Project, now in year 4 of development, is making good progress. Our aim: to protect the North Atlantic Salmon, now endangered. The means: a self-funding entity undertaking long-term conservation initiatives. The actions: annual salmon egg planting, revegetation/tree planting, salmon ladder building, at a scale never attempted before. The underpin: world-leading research. These initiatives will provide a real boost to the salmon population in North East Iceland. Nature will take her time, but we are already seeing positive signs. Lots more to come – Bill Reid, Six Rivers & Strengur Board.*



# A MEETING OF MINDS

## *Saving the Atlantic Salmon*

Passions run deep as world experts  
debate best way to save Atlantic salmon  
from extinction

**WORLD experts agree that they must work together if the wild North Atlantic salmon is to survive. At an international conference in Iceland, hosted by INEOS, the importance of sharing knowledge was laid bare as they discussed the alarming decline in salmon and efforts to bring this iconic fish back from the brink of extinction.**

Scientists, academics and conservationists from Iceland, the UK, Norway, Ireland and Canada realised it is only when they get together that real change can happen.

"They are all doing amazing things, so what we wanted to do was bring them all together," said Dr Peter Williams, INEOS Group Technical Director.

"By having a forum to share what we, and other researchers, are doing, we can help each other and create a bigger picture that adds to our understanding and allows us to focus our work and communicate it much more effectively."

The numbers of North Atlantic salmon have fallen by 70% over the past 30 years and it is now endangered.

During the summit, Dr Colin Bull, from The Missing Salmon Alliance, said there was a 'crying need' for an initiative to collate all the information that was already out there.

"I believe there is a way we can pull everything together across disciplines, to turn the plethora of research and management data on salmon and its environment into a cohesive resource to focus and drive forward our collective efforts," he said.

Gudni Gudbergsson, head of the freshwater division at The Marine and Freshwater Research Institute in Iceland, said there was already extensive co-operation between ICIS and NASCO, but both organisations had specific remits.

"As a backbone organisation that is okay, but new thinking and co-operation is needed and that is what we are doing here today," he said.

Dr James Rosindell, a reader in biodiversity theory at Imperial College London, said academic and practical research data needed to be shared. "The research is often carried out by different groups who sometimes don't want to give it up," he said. He called for an overhaul of the traditional, academic system. "It is stressful and inefficient to be fighting

against others to get funding, then reinventing the wheel, and then publishing papers that sit on the shelf collecting dust," he said.

January's summit in Reykjavik ended with a pledge to rapidly establish new conservation strategies to reverse the decline.

Many of those strategies are already being tested in Iceland, home of The Six Rivers Conservation Project founded by INEOS Chairman Sir Jim Ratcliffe. "It's a holistic programme, backed by science," said Peter.

As part of the project, botanists have been planting trees to enrich the soil around the rivers because healthier vegetation leads to a healthier environment for the organisms that live in the rivers.

About 1,000 smolts – maturing salmon – have been tagged so that scientists can track and monitor their behaviour.

And millions of salmon eggs have been planted into the gravel in rivers further upstream to help breed a healthier and stronger stock.

In addition, PhD students from The Marine and Freshwater Research Institute and Imperial College London have been comparing new data and the old data, gathered by the institute over the past 75 years. "We believe the Six Rivers project will help inform conservation in other countries," said Peter.

Gisli Asgeirsson, CEO Strengur Angling Club, said the work was vital to help understand why the Atlantic salmon were disappearing – and what needed to be done to stop it. "Once we have this information, we can start to put in place measures that will help the salmon not only survive, but thrive," he said.

Sir Jim, who is an expert fly-fisherman, has been working with Strengur for years.

All profits from Strengur, which provides the best quality fly-fishing in the world, are now being reinvested back into salmon conservation in North East Iceland. ●

*For more information and photos  
from the symposium go to:*

**SIXRIVERS.IS/EN/SYMPOSIUM**

## SYMPOSIUM KEY SPEAKERS

January 23rd,  
The Hilton Nordica,  
Reykjavik, Iceland



Peter S. Williams, B.A., D.Phil,  
INEOS Group Technical  
Director



Dr Colin Bull,  
The Missing Salmon Alliance



Prof Guy Woodward,  
Professor of Ecology and the  
Deputy Head of Life Sciences  
at Imperial College London



Dr Rasmus Lauridsen,  
Head of Fisheries Research  
at Game & Wildlife  
Conservation Trust



Else Möller,  
Forester MSc at Austurbru



Prof Nikolai Friberg,  
Research Director for  
Biodiversity at the Norwegian  
Institute for Water Research  
NIVA in Oslo, Norway



Gudni Gudbergsson,  
freshwater division of the  
Marine and Freshwater  
Research in Reykjavik



James Rvosindell,  
Reader in Biodiversity Theory  
at Imperial College London



Mark Saunders,  
Director, International Year of  
the Salmon – North Pacific  
Region



Philip McGinnity,  
Research Professor with the  
Environmental Research Institute  
at University College Cork

# 20 PRINCIPLES

## BEHAVIOURAL SAFETY

## PROCESS SAFETY

**01** WE BELIEVE ALL INCIDENTS AND INJURIES CAN BE PREVENTED

**01** THE ASSET OPERATING MANAGER IS RESPONSIBLE FOR ITS OVERALL INTEGRITY

**02** EVERYONE'S FIRST RESPONSIBILITY IS TO ENSURE THEY WORK SAFELY

**02** THE ASSET ENGINEERS ARE RESPONSIBLE FOR MAINTAINING THE ASSET AND PROTECTIVE SYSTEMS INTEGRITY

**03** EVERYONE HAS THE DUTY TO STOP WORK IF THEY FEEL THE SITUATION IS UNSAFE

**03** THE RESPONSIBILITIES IN THE ORGANISATION FOR DEFINING AND MAINTAINING THE CORRECT OPERATING ENVELOPES MUST BE CLEAR

**04** THE EXPECTATIONS AND STANDARDS ARE THE SAME FOR EVERYONE ON THE SITE

**04** OPERATING PROCEDURES AND ENVELOPES MUST BE OBSERVED. DEVIATIONS MUST BE REPORTED AND INVESTIGATED

**05** RULES AND PROCEDURES MUST BE OBSERVED AND RESPECTED

**05** ANY CHANGES MUST BE PROPERLY RISK ASSESSED AND SUBJECTED TO MOC PROCEDURES

**06** WE SHOULD LOOK OUT FOR EACH OTHER'S SAFETY AND UNSAFE SITUATIONS

**06** PROCESS HAZARDS ARE SYSTEMATICALLY IDENTIFIED, RISK ASSESSED, REVIEWED AND MANAGED

**07** ALL INJURIES AND INCIDENT / NEAR MISSES MUST BE REPORTED AND INVESTIGATED

**07** ALL ASSETS MUST BE SUBJECT TO PERIODIC INSPECTION DESIGNED TO ENSURE THEIR INTEGRITY AND THE RELIABILITY OF THEIR PROTECTIVE SYSTEMS

**08** RISK ASSESSMENT MUST BE CARRIED OUT PRIOR TO, DURING AND ON COMPLETION OF WORK

**08** OPERATIONS MUST ALWAYS PLACE THE SAFE OPERATION OR SHUTDOWN OF THE ASSET AHEAD OF PRODUCTION

**09** ALL TEAM LEADERS HAVE A SPECIAL RESPONSIBILITY FOR PROMOTING AND UPHOLDING THESE PRINCIPLES

**09** WHEN IN DOUBT THE ASSET MUST ALWAYS BE TAKEN TO ITS SAFEST STATE

**10** WE MUST ALWAYS WORK WITHIN THE LIMIT OF OUR COMPETENCY AND TRAINING

**10** WE HAVE EMERGENCY PLANS BASED ON ASSESSED RISKS WHICH ARE REGULARLY TESTED



# S A F E

SAFETY WORKS WHEN PEOPLE WORK TOGETHER. AND AT INEOS IT WORKS INCREDIBLY WELL, THANKS TO TEAMS WHO REALISE THAT THE POWER IS IN THEIR OWN HANDS

# H A N D S

**INEOS used to look to the very best in the chemical industry for inspiration. Those companies helped it to focus on where it wanted – and needed – to be when it came to its safety record. Today, it looks to itself.**

"We cannot look to others anymore because we are now right up there with the best," said Simon Laker, INEOS Group Operations Director.

The OSHA figures show that INEOS last year recorded its best-ever performance, falling from 0.91 in 2009 to 0.16.

"We don't like to say we are the world's best, but we are world class," said Simon.

Top of the class for INEOS was the Oil & Gas UK business which recorded zero.

What the figures don't show is what it took for INEOS to achieve that level of excellence. Over the years it has developed numerous systems to address each problem as it has arisen.

There are few group-wide systems in INEOS, but safety is one of them. All sites are regularly audited against the 20 Principles, which cover everything from how to control work to how to control change.

Staff, seeking solutions, can find the best performing sites and hence the answers easily. "That really is the power of INEOS," said Simon.

There is a bonus structure that is inextricably linked to a site's safety performance, including how tidy it is and how well maintained. "The gate to the bonus won't open if the site's housekeeping is not in order," said Simon.

That changed after INEOS introduced the AsCare audit system following a poor standard of housekeeping and maintenance

on one of its French assets.

"Today if you go on to any site, you can tell which parts are owned by INEOS because they are spotless," he said.

*There are few group-wide systems in INEOS, but safety is one of them. All sites are regularly audited against the 20 Principles, which cover everything from how to control work to how to control change.*

Sites that perform badly – in terms of such things as injuries, leaks and environmental breaches – are placed on a RED list. "We deem a RED list site as having an unacceptable risk for INEOS," said Simon. Each RED site is given two years to fix the problems. If it cannot be brought up to the required standard, the site is shut down and closed.

"We don't want to close sites but we just cannot run a site that can potentially hurt people," said Simon. "It could lead to a catastrophe and that's abhorrent. It is those sort of things that really do keep us awake at night."

In 2012 INEOS introduced 20 basic safety principles covering processes and staff's behaviour.

Those messages have helped to drive down reportable incidents and produce INEOS' best-ever safety performance.

But not everyone always follows them.

"Every time there is an incident, it is reviewed to see if any one of the 20 principles has been broken," he said.

"I have yet to find one incident where that's not happened. If we always followed those principles, we would never have another incident in INEOS."

Huge improvements have been made over the years, as can be seen by the safety performance, but there are a few critical activities that are so important that any breach will result in instant dismissal. These are the life-saving rules.

"Other companies may give them more chances, but why would we allow people a second chance to kill themselves or one of their colleagues?" said Simon. "We cannot have people like that in our organisation."

INEOS has achieved its best-ever OSHA performance, despite acquiring more businesses whose procedures and rules on safety and standards often differ.

"We do assess the risk when we are looking to buy new companies," said Simon. "Most have a worse safety performance than us. The first priority when they join us is to get their safety levels to where INEOS' are."

But that mixed heritage – and there are people working in INEOS who have come from BP, BASF, ICI and many others – does bring certain advantages.

"Others may see it as a weakness," said Simon. "But we see it that somewhere amongst all these heritages is the answer to any problem."

Each month INEOS Chairman Sir Jim Ratcliffe is given a detailed report, showing the number of such things as safety critical alarms or overdue inspections.

It has been known for some sites, acquired by INEOS, to report hundreds of such alarms and missed inspections in just a month. "Within one or two years they are back to what we expect in INEOS," said Simon.

For INEOS, though, the work never stops. "When a business' performance improves, we move the goalposts to encourage it to do even better," he said. "It all comes back down to the fear of complacency. As soon as you think you're there, you're not." ●



**Simon Laker**  
INEOS Group Operations Director

**For almost 28 years I've worked as a maintenance technician at the Newton Aycliffe compounds site in the North East of England.**

**It is also the site of one of INEOS' new hand sanitiser plants, producing one million bottles of hospital-grade hand gel every month.**

**My partner is a nurse in the A&E department at Darlington Hospital in the UK and is now working harder than ever to keep people safe from the COVID-19 virus.**

**Yesterday my 15-year-old daughter painted me a picture to display in my window to show her support for everyone – and demonstrate how proud she is of what the NHS and INEOS are doing to help fight COVID-19:**

*Shaun James  
INEOS Maintenance Technician*

