

ENTER THE DRAGONS

INEOS achieves another world first as it brings US shale gas to Europe on board its Dragon class carriers



ISSUE 10. 2016

WHO DARES WINS

How INEOS triumphed in the face of critics who dismissed vision as pure fantasy

EVEREST

Ten years on, INEOS catches up with Rhys Jones the youngest person to climb the highest summits on 7 continents

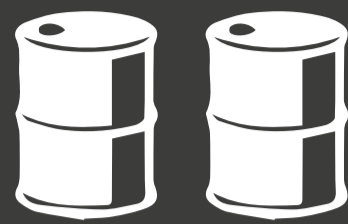
RUNAWAY SUCCESS

6000 children get active as GO Run For Fun goes stateside

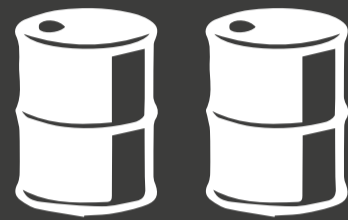
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FACTS + FIGURES



40,000
BARRELS



INEOS will move 40,000 barrels of shale gas every day for the next 15 years



Each Dragon ship weighs 20,000 tonnes



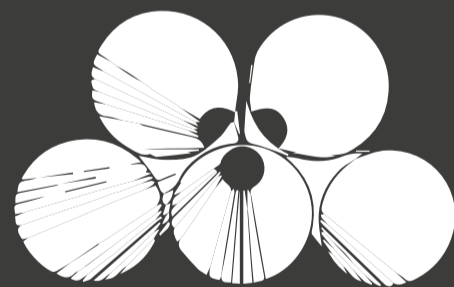
The Dragon ships are the world's largest ethane gas carriers ever built



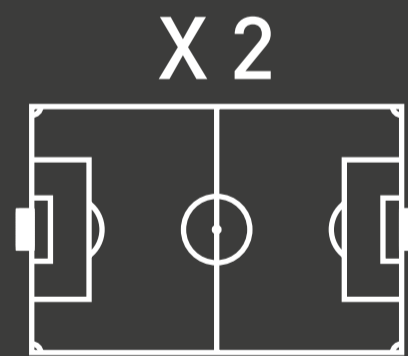
Ethane has never been shipped in these quantities ever before



Over the next 15 years, each vessel will travel the equivalent of five return journeys from the Earth to the Moon



The gas being shipped to Europe first has to be piped 300 miles from the Marcellus Shale in Western Pennsylvania to Marcus Hook in Philadelphia on the east coast of America



Each ship is the length of two football pitches



You could park 15 BMW 525s side by side across the deck of each ship



If the cargo tanks were removed, each ship could fit more than 5,700 Mini Coopers into the space



Almost 140 Mini Cooper Ds would be needed to produce the same power as a Dragon ship's main engine

INTRODUCTION



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ATHLETES thrive on competition. It's what helps them to grow. It what sets them apart. And, ultimately, it's what helps them to break records.

For years no one had thought it was humanly possible to run a mile in less than four minutes. Experts said it was impossible.

But then on the 6th May 1954, British medical student Roger Bannister broke through that illusive barrier, clocking three minutes 59.4 seconds in an historic race at Iffley Road track in Oxford, and, in doing so, proved everyone wrong.

The 25-year-old had believed he could do it. And suddenly others believed they could do it too.

The following month Australian John Landy broke Bannister's world record, shaving 1.4 seconds off his time.

The same is true in business.

Competition is healthy. It encourages us to work smarter, dream bigger, think the unthinkable and move quicker than the rest of the pack. It drives innovation and it kills complacency.

Competition is also vital for growth.

As a company INEOS thrives on competition. It often sets the pace for others to follow.

In March the first shipments of low-cost ethane from America docked at INEOS' Rafnes site in Norway.

Many on both sides of the Atlantic had dismissed INEOS' vision – to ship US economics to Europe – as pure fantasy. No one is doubting the plan now.

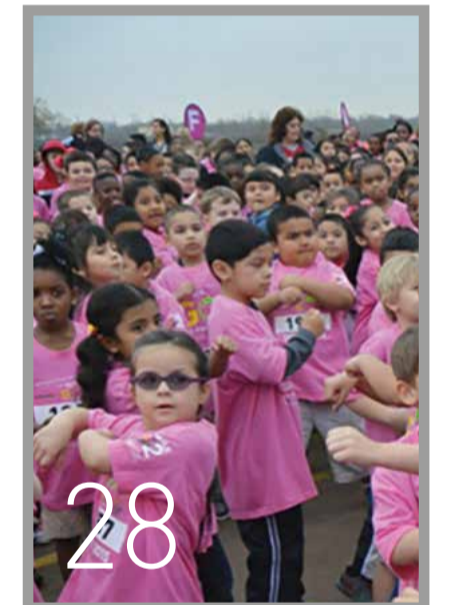
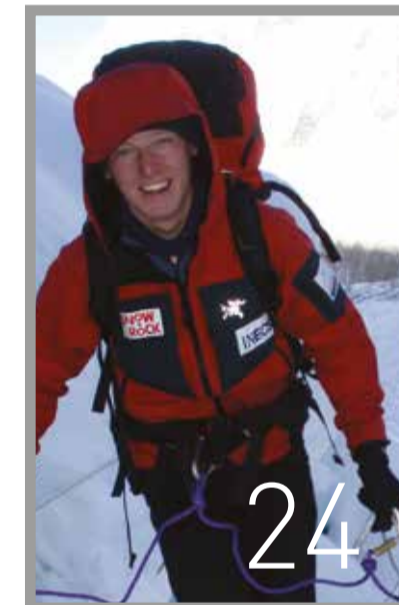
Also in this edition, we look at the demise of manufacturing in Britain, due to spiralling energy costs, and compare it to what is happening in America where access to vast reserves of low-cost shale gas continues to drive its manufacturing and chemical industries.

Outside the business, we chat to Rhys Jones who is still reaching for the stars 10 years after INEOS helped him to climb Everest.

We celebrate the launch of a dedicated team to run GO Run For Fun in America and continue with our work to publicise a former head teacher's campaign to get British children running a mile in school every day.

It is an edition dedicated to competition and growth. For they go hand in hand.

After all, as many have said, the bigger the challenge, the bigger the opportunity.



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ENTER THE DRAGONS

US SHALE GAS ARRIVES IN EUROPE FOR THE FIRST TIME ON BOARD INEOS INTREPID

“As she passed closer to us she sounded her horns, which made the hairs on the back of your neck stand on end”

David Thompson

INEOS has done it. After five years in the planning, the arrival of its first Dragon class carrier heralds the start of a new era for the European chemical industry

As INEOS Intrepid, the world's largest multi gas carrier, slipped into the harbour at Rafnes, Norway, the feeling was one of immense pride.

The sight of this huge vessel – with Shale Gas for Progress emblazoned on its 180-metre hull – moored safely was as breath-taking as the precious cargo it had transported 3,800 miles across the Atlantic.

This was history in the making.

For the first time ever ethane from US shale gas had been shipped to Europe.

For INEOS, the company which had had the vision to make it happen, it represented the culmination of a \$2 billion investment.

For David, the man given the task of overseeing the project, it was quite emotional to see the ship appear on the horizon.

“Outsiders had said it could not be done but at that moment when the INEOS Intrepid came into view all doubt faded away,” he said. ***“It was the culmination of five years of hard work by an incredible group of people across seven countries.”***

He said he felt incredibly proud as the ship entered the fjord escorted by two tugs spraying water cannons 50 metres into the air, forming a rainbow across the bow.

“As she passed closer to us she sounded her horns, which made the hairs on the back of your neck stand on end,” he said. ***“At that point I remember thinking ‘We have done it.’”***

Chairman and INEOS founder Jim Ratcliffe said the ship's arrival – after 14 days at sea – was a strategically important day for INEOS and Europe.

“We have seen how shale gas has revitalised US manufacturing and for the first time ever Europe can access this essential energy and raw material source too,” he said. ***“European manufacturing is becoming less and less competitive and we believe that US shale gas could help turn this around.”***

He added: ***“I am incredibly proud of everyone involved in it. I believe that INEOS is one of very few companies in the world that could have successfully pulled this off.”***

INEOS had been planning for this day for five years.

The vessels are incredibly complex. No one has ever built ships like these before. They are the very first ships capable of moving huge quantities of ethane gas over thousands of miles of ocean.

Each ship has a message written down its side – Shale Gas for Manufacturing, Shale Gas For Chemicals, Shale Gas For Europe and Shale Gas for Progress.

The common theme is shale gas, which has led to the manufacturing renaissance and boom in America.

So far four of INEOS' fleet of eight Dragon class vessels have been built. Together they will be moving 40,000 barrels of US shale gas a day, every day, for the next 15 years to its two petrochemical sites in Norway and Grangemouth in Scotland in the UK.

By 2020, INEOS hopes to be importing about eight shipments a month from the US to supply its European petrochemical facilities and an ethylene plant owned by Exxon Mobil Corporation in Scotland.

When the first shipments of liquefied ethane, cooled to -90°C, finally arrive at Grangemouth later this year, the plant will move from loss making to profitable literally overnight.

“It will move it back into the world's premier league of petrochemical facilities,” said Jim.

INEOS' gas crackers in Norway and Scotland have, in the past, relied on gas from the North Sea but those supplies have been dwindling. The gas from the US will complement the reducing gas feed from the North Sea.

The ethane storage tank at Rafnes can hold 19,000 tonnes of liquefied gas; the one at Grangemouth is capable of storing 33,000 tonnes.

MOTHBALLED UNIT TO REOPEN

A MANUFACTURING unit at INEOS' Grangemouth site is to reopen eight years after it was mothballed.

The plant has successfully completed rigorous recommissioning trials to prepare for the arrival of US shale gas ethane.

INEOS announced the news shortly after the first shipment of US shale gas arrived at its neighbouring gas cracker in Rafnes, Norway. The first deliveries are expected at

Grangemouth in the autumn.

"We are now in great shape to finally run the Grangemouth plant at full rate," says Gordon Milne, INEOS Grangemouth Operations Director.

INEOS was left with no option but to close the second manufacturing unit at the KG ethylene cracker in 2008 after it could not operate it at full capacity.

The arrival of US ethane changes everything.

"When the gas finally arrives here, this plant will move into the premier league of European petrochemical plants," said Gordon.

The US liquid gas will be stored in a specially-built ethane tank – the biggest in Europe – and make up for dwindling North Sea supplies.



WHY SHALE GAS FROM THE US STILL WORKS WITH \$30 OIL

THE collapse in oil prices does not trouble INEOS, which has just invested \$2 billion to transport US shale gas to Europe.

Tom Crotty, INEOS' Group Communications Director, said outsiders had questioned the viability of importing US gas when oil prices were now so low.

But he said it did not matter because INEOS owned both gas and oil crackers.

"For us, the fact that we've now got much lower oil prices hasn't impacted the viability of bringing that gas in from America at all," he said. **"Instead, it has improved the profitability of our oil-based crackers."**

Tom said there had been some ill-informed commentary.

"Some have said that companies like INEOS must be mad to bring in ethane from the US when oil prices are so low but they are missing the point," he said. **"If you've got a gas cracker, you cannot use naphtha. You have to use gas. So the issue is not one of gas versus naphtha. It's gas versus gas."**

The availability of low-cost ethane, a natural gas derived from shale gas, has revitalised America's chemical industry and given it an advantage over many competitors around the world which rely on naphtha, a more expensive oil-based feedstock.

But with the collapse in oil prices, that advantage has narrowed.

"The European petrochemical industry has done very, very well as a result of low oil prices, because the price of

naphtha has fallen dramatically," said Tom. **"So margins have come back into naphtha crackers big time. If you've got both types of crackers, like us, then you have reason to feel very happy."**

INEOS, which relies on ethane gas for its crackers in Norway and Grangemouth, said it was still cheaper to import gas from the US than buy it in Europe.

"The other issue is that we cannot get gas in Europe," said Tom. **"Our Grangemouth cracker has been running at 40% output for the past three years because we haven't got ethane. Ethane is running out fast in the North Sea. So your choice there is really simple. You need to either run a cracker or you don't."**



“There was a lot of industry scepticism, with people saying it could not be done. But we were optimistic, and we have a great partnership with INEOS. They’ve done everything they said they were going to do and more. It’s been a real global collaboration”

Chad Stephens, Senior Vice President of Corporate Development, Range Resources



WHO DARES WINS

HOW INEOS TRIUMPHED IN THE FACE OF CRITICS WHO DISMISSED VISION AS PURE FANTASY



“INEOS is truly at the forefront on all parts of the olefins value chain. Securing and co-operating with companies providing upstream resources, pipelines, terminal infrastructure and Evergas, for the seaborne pipeline, is just mind-blowing. And INEOS has truly been visionary in all these aspects”

Steffen Jacobsen, CEO, Evergas



“One of the underlying factors for the success of this project has been the fact that Wärtsilä and INEOS genuinely share the same values. The two companies are both entrepreneurial and ground breaking in their approach”

Timo Koponen, Vice President, Flow and Gas Solutions, Wärtsilä Marine Solutions

The world said it couldn't be done. The world doesn't know INEOS or the company it keeps

The world has just witnessed a truly significant moment in the history of petrochemicals.

Those shipments of liquefied ethane, which finally docked at Rafnes in Norway in March, will breathe life into INEOS' European businesses.

But forget the years, many million man hours and 5,000 construction workers it took to build the first two 'Dragon Ships' transporting this precious cargo. For those ships are just part of this incredibly inspirational story that is global in scale, breathtaking in its vision.

It is also a story that many on both sides of the Atlantic had dismissed as pure fantasy.

“It had never been done, and many said it couldn't be done,” said Chad Stephens, Senior Vice President of Corporate Development at Range Resources, which is providing INEOS with the gas it needs.

The arrival of these world-leading vessels, which were built in China, heralds a new era in the transportation of ethane gas.

“Not often do you witness revolutionary moments in our industry, but this is one of them,” said Peter Clarkson, head of investor relations at INEOS.

The difference this competitively-priced ethane will make to INEOS' European petrochemical business is staggering, both in terms of energy and raw materials. INEOS will use it to power its plants as it turns it into ethylene, one of the world's most important petrochemicals.

“Shipping US ethane gas to Europe will safeguard our petrochemicals assets in Europe for many years to come,” said John McNally, CEO of INEOS Olefins & Polymers UK.

The story, though, really began six years ago when INEOS dared to think the unthinkable. In 2010 Europe was reeling from the effects of the financial crisis. Energy prices were higher than ever and North Sea gas stocks were dwindling. In America, a revolution was underway. Shale gas had led to low energy and feedstock prices which had revitalised its manufacturing industry. But America had a problem. It had so much ethane that it did not know what to do with it.

A plan was hatched at INEOS' offices in Rolle, Switzerland, to create a virtual, transatlantic pipeline and bring the gas it desperately needed to secure the future of its European crackers.

But how would INEOS do it?

No one had attempted anything on this scale before.

There was no way to get the gas from the shale wells in south western Pennsylvania to Philadelphia 300 miles away on the east coast of America.

There were no export facilities in the US and no one had ever tried to ship ethane gas in such huge quantities.

To INEOS Chairman Jim Ratcliffe, none of that mattered.

“People said we couldn't do it,” he said. **“But at INEOS we have always believed that anything is possible.”**

As INEOS ploughed ahead with its ambitious plans and assembled a team of international partners, spanning three continents, others watched and waited.

“The technology didn't exist so we had to create it,” said INEOS Director Andy Currie.

David Thompson, Chief Operating Officer INEOS Trading & Shipping, was the man given the task of overseeing the project.

“It has quite simply been one of the biggest engineering projects in the world,” he said. **“We are pioneers in this. We have been involved in the pipelines, the fractionation, the terminals, the infrastructure and the ships. We have had to do it all.”**

That bold, pioneering plan has now become a reality.

To do it, INEOS struck 15-year deals with ethane suppliers, including Range Resources, to provide the gas, MarkWest to process the gas and Sunoco to pipe it hundreds of miles to the Marcus Hook Industrial Complex where it will be cooled to minus 140 degrees Fahrenheit before being shipped to Norway and later this year Grangemouth in Scotland.

There was no doubt in the minds of all those involved. This was not a problem. This was an opportunity. An opportunity to safeguard the future of businesses in Europe and breathe life back into once-thriving communities in America.

In America work began to convert a former oil products pipeline to carry the ethane on most of its journey from the Marcellus Shale to Marcus Hook, a once bustling oil and gas refinery which had closed in 2011.

Sunoco, which still owned the rusting refinery, began pumping billions of dollars into transforming it into a world-beating chemical production, gas storage and distribution centre to enable INEOS' fleet of 'Dragon Ships' to be loaded with cargo. Elsewhere, 50 miles of new pipes were laid and a new pumping station was installed.

Over in Europe, INEOS partnered with Danish shipping giant Evergas to design ships capable of such a mammoth task.

“It was an enormous task but Evergas understood perhaps better than anyone else what it would take to transport ethane in the quantities sought by INEOS over the distances required,” said Chad.

Evergas did indeed.

“Ethane-capable vessels existed,” said CEO Steffen Jacobsen. **“But Evergas, together with its many stakeholders, created the largest and most sophisticated ethane-carriers to date. That ambitious vision from INEOS and Evergas is what has made this shipping project possible.”**

In Hamburg, Germany, HSWA worked on an optimised hull to meet the special needs involved in transporting ethane and Wärtsilä in Finland invented engines that could run entirely on ethane, which not only allowed more room for cargo but would reduce harmful emissions.

Once the designs were complete, Sinopacific Offshore and Engineering, one of the biggest shipbuilders in the world, was given the final piece in the jigsaw. It had to build the ships.

As work began in China, TGE Gas Engineering, one of the world's leading contractors for the engineering and project management of gas storage, began building another ethane storage tank and infrastructure at INEOS' Rafnes site to enable it to

import ethane from the North American shale gas fields.

Work also began on the construction of new shipping and storage facilities to handle imports of ethane at INEOS' Grangemouth plant.

For staff at Grangemouth, after months of uncertainty, the feeling of a bright, new dawn was palpable. For just months before that loss-making petrochemical plant had been threatened with closure amid a bitter industrial dispute during which staff had initially rejected the company's survival plan.

A change of heart eventually paved the way for major investment and a £230 million loan guarantee from the UK Government which meant INEOS could raise the money it needed to build one of the largest ethane storage tanks in Europe. Once built the ethylene cracker will be able to double production.

It has been a mammoth task. But as Jim stood on the bridge of the first 'Dragon Ship', aptly named INEOS Ingenuity, he could not disguise his delight.

“It's wonderful when a plan comes together,” he said. **“And it makes you feel very proud to have accomplished something that no one has ever done before.”**

A WORLD FIRST FOR INEOS

HOW INEOS AND ITS PARTNERS CREATED SOMETHING THE WORLD HAS NEVER SEEN BEFORE

What do you do when you need the best? You turn to the best

THE North Atlantic is not a place for the fainthearted.

It is a potentially hostile environment for any ship, let alone one that is carrying liquid ethane.

INEOS knew that – and that is why it turned to Evergas, a world leader in gas transportation.

On the surface, INEOS' brief was simple. It needed a ship that would be capable of transporting huge quantities of liquefied ethane gas at -90°C more than 1,000 miles across a deep, cold ocean, plagued by icebergs, dense fog, 50ft waves and severe storms. And it had to do it more efficiently than had been ever done before.

The answer was anything but simple. But the result was the largest, most flexible, environmentally sustainable, multi-gas carrier ever built.

"There is not a ship like this in the world," said Hans Weverbergh, Operations Manager at Danish shipping company Evergas. **"There were no ships that had pressurised tanks that could carry this amount of ethane. It was something that had never been done before."**

Liquid natural gas has been shipped around the world for decades. Ethane though is a different matter. It had only ever been shipped in small vessels on short routes. Crossing the Atlantic would need much bigger boats. Other companies felt it simply wasn't viable. But INEOS saw the opportunity and had the vision to make it happen.

"These vessels are truly unique," said Evergas CEO Steffen Jacobsen who has worked in the shipping industry for 35 years. **"No-one has ever tried to ship ethane in these quantities and over this distance before. To do this, we have had to invent completely new ways of doing things."**

INEOS wanted the 'Dragon Ships' to be able to be powered by the cargo it was carrying.

For that it turned to Finnish company Wärtsilä, which set a new standard in fuel flexibility. It designed dual-fuel engines which were capable of seamlessly switching between liquefied natural gas, ethane, light fuel oil or heavy fuel oil without any loss of power.

"It was a technological breakthrough," said Timo Koponen, Vice President, Flow and Gas Solutions, Wärtsilä Marine Solutions.

If INEOS' engines run on ethane, there will not only be more room for cargo, but the vessels will produce 25% less CO₂, 99% less sulphur dioxide and meet the International Maritime Organisation's Tier III regulations.

Each ship is also equipped with two engines to ensure the cargo gets through no matter what.

The ships are the biggest ever designed of its kind. In layman's terms each is the length of two football pitches and if you removed the cargo tanks, could hold 5,750 Mini Cooper cars.

The tanks are located in the hull of each vessel, and each is capable of holding 11 swimming pools' worth of liquefied ethane.

HSVA, the German-based hull design specialists employed to maximise the efficiency of these immense vessels, tested scale models of the ships in realistic environments.

The first two ships were built in a dry dock in Qidong, near Shanghai, by Sinopacific Offshore and Engineering, one of the biggest shipbuilders in the world.

"SOE is one of very few companies that had the skills and construction facilities to take on the building of these massively complex vessels," said CEO/Chairman Simon Liang.

"When I actually saw those first two ships nose to nose at the dock, I thought 'Man, these guys know what they're doing,'" said Chad Stephens, Range Resources' Senior Vice President of Corporate Development, who was invited to the naming ceremony.

It was a momentous moment too for Evergas.

"I felt so proud of all the people involved both internally and externally, all of whom had brought these vessels to life," said Steffen.

The naming ceremony marked another landmark in INEOS' \$2 billion global project to bring shale gas from the USA to its manufacturing plants in Norway and Scotland.

INEOS is the first company in the world to opt to ship shale-gas derived ethane from America where the gas has led to a manufacturing renaissance.

"No-one has ever tried to ship ethane in these quantities and over this distance before. These vessels are truly unique"

Evergas CEO Steffen Jacobsen



THE GIFT THAT KEEPS ON GIVING

AMERICA CONTINUES TO BENEFIT FROM SHALE GAS REVOLUTION



The shale revolution has been described as the most remarkable energy success story in US history, and possibly the world. When you look across the Atlantic to America's shores, it's easy to see why

NO ONE could have predicted how one man's persistence would change the course of history.

But the ripple effects of engineer Nick Steinsberger's work in the Barnett shale gas field – where, 20 years ago, he finally discovered the perfect liquid mix to extract gas from shale two miles underground – are still being felt today, not only in America, but all over the world.

"I don't quite feel as if it's down to me and initially I never thought this would happen," he told INCH magazine from his office in Fort Worth, Texas. ***"At the time I was just trying to make something work. But over time, I realised the enormity of what we had achieved and it feels good to have helped to provide the world with so much cheap gas."***

This revolution – described as the most remarkable energy success story in US history – created enormous benefits in the US. For the petrochemical industry, one of the world's biggest consumers of gas. For manufacturing which has undergone a renaissance. For communities hardest hit by the

recession. And, perhaps most surprisingly of all, for the environment.

Twenty years ago there were 250 wells searching for shale gas and oil in the Barnett gas field; today there are more than 200,000.

For America's petrochemical industry, the discovery of these vast, untapped reserves of shale gas has been phenomenal.

"US chemical investment linked to shale gas has now topped \$158 billion," said Cal Dooley, President and CEO of the American Chemistry Council.

As of January this year, 262 projects including new factories, expansions and process changes to increase capacity, had been announced.

The petrochemical industry needs natural gas to heat and power its manufacturing plants. But that gas is not just a fuel for energy. It is also a raw material used to make thousands of essential products that we all rely on each day. Without it, there would be no

plastic, car parts, packaging, medical supplies, tyres, glass, clothes, or iPad screens.

"That's often forgotten when we see heated debates about the merits of continuing to use gas," said Greet Van Eetvelde, INEOS Head of Energy and Innovation Policy. ***"Many components of renewables, such as the blades of wind turbines and the lubricants in their gearboxes, also cannot be made without gas and oil."***

And shale gas is making it a lot cheaper to do it.

"The US chemical industry renaissance is just getting started," Kevin Swift, chief economist of the American Chemistry Council, wrote in the trade group's Year-End 2015 Chemical Industry Situation and Outlook. ***"The fundamentals are strong. Key domestic end-use markets expanded, consumer spending accelerated, the job market began to firm, and households enjoyed extra savings from lower energy costs."***

And INEOS, which has 17 manufacturing sites in the US, is sharing in that good fortune.

Later this year INEOS and Sasol's new plant at INEOS Battleground Manufacturing Complex at LaPorte in Texas is expected to start paying its way.

The plant, which is a 50/50 joint venture, will be able to produce 470,000 tonnes of high density polyethylene a year for the American market. With the site expected to grow, INEOS is also poised to finalise plans to invest in a more fuel-efficient combined heat and power system which will also help to reduce CO₂ emissions.

In December The Boston Consulting Group published a report, Made In America, Again.

"The number of companies actively moving production back to the US continues to increase," said a spokesman. ***"In fact the US has surpassed China as the most likely destination for new manufacturing capacity."***

Part of the reason is lower energy costs, driven by shale, coupled with rising wages in China.

Apple, the world's largest technology company, cited those reasons for its decision to manufacture its Mac Pro personal computer – described as the most

powerful Mac ever built – in Texas.

It is all so different to a decade ago when the US was among the most costly places in the world for plastics producers.

"Today, America is one of the most attractive places in the world to invest in plastics manufacturing," Steve Russell, ACC's vice president of plastics, said last year. ***"Even after recent declines in oil prices, our nation has a decisive edge."***

America is now looking to capitalise on all those investments and sell to the world, a move described by Cal Dooley last year as the 'surest path to a stronger economy and new jobs'.

Global adviser Nexant is forecasting dramatic growth in US chemical exports over the next 15 years.

In its 2015 Fuelling Export Growth report, it suggested sales of \$123 billion by 2030 – more than double what chemical manufacturers exported in 2014.

But there is also a growing appetite among Americans for products 'Made in the USA'.

One who understands that is Harry Moser, a veteran of the manufacturing industry and former president

"The US chemical industry renaissance is just getting started"

Kevin Swift, chief economist of the American Chemistry Council

of machine tool maker GF AgieCharmilles, who in 2010 founded Reshoring Initiative to help companies re-evaluate whether to come home,

"I had watched with dismay as more and more US jobs went, at first, to Japan, then Mexico, Taiwan, Korea and finally China," he said. ***"The impact on the US economy was horrible with the loss of millions of manufacturing jobs. The United States used to be the world's industrial powerhouse, and I had grown up experiencing its glory."***

Since he founded Reshoring Initiative, about 1,000 companies have come home, bringing with them almost 100,000 jobs.

"I am delighted with the response of the nation and many companies," he said. ***"Sadly, though, many companies are still trapped in the 'buy at the cheapest price' mode instead of considering the total cost. It will take decades to overcome the MBA mentality."***

Apple's decision to manufacture its Mac Pro in America was also part Chief Executive Officer Tim Cook's \$100 million Made-in-the-USA push.

"We don't want to just assemble the Mac Pro here," he said. ***"We want to make the***

whole thing here. This is a big deal.

In January this year America's oldest hatmaker Bollman announced that it was moving 41 jobs back from China to its plant in Adamstown, Pennsylvania. It had launched an appeal in November for the public's help in raising \$100,000 to import 80 knitting machines, built in 1938, that weave the fabric for its famous Kangol 504. The public took its hat off to the company's attitude – and responded.

“Reshoring is the fastest and most efficient way to strengthen the US economy because it demonstrates that manufacturing is a growth career,” said Harry. **“And without manufacturing, a country becomes progressively poorer.”**

But it is not just industry which has benefited from low-cost feedstock and energy prices.

Shale gas has revitalised communities, including some hardest hit by the recession.

The Associated Petroleum Industries of Pennsylvania said natural gas development had supported hundreds of thousands of jobs in Pennsylvania, contributed \$34.7 billion annually to the state economy and had boosted profits in more than 1,300 businesses of all sizes up and down the energy supply chain.

“Safe, responsible natural gas development has been good for the state economy, good for local economies and good for Pennsylvanians,” said Executive Director Stephanie Catarino Wissman. **“And we want to keep it that way.”**

At Marcus Hook, the site of a former crude oil refinery which closed in 2011 with the loss of 500 jobs, there is now a real sense of excitement.

The former refinery, which had produced gasoline, diesel and kerosene for 109 years, is being transformed into a major centre for processing and shipping natural gas liquids thanks to its links with the Marcellus shale industry.

“The idling of the Marcus Hook Refinery was a difficult time for the Borough of Marcus Hook, for the Sunoco family, and for the whole region,” said Hank Alexander, vice-president, business development of Sunoco Logistics Partners LP. **“But now the town is buzzing again, from downtown restaurants to local contractor facilities. And some of the workers who lost their jobs in 2011 are back working at the plant.”**

Sunoco Logistics had bought the old refinery in 2013, with the intention of linking it to the Marcellus shale, which now produces almost 20% of America's natural gas, compared to nothing 10 years ago.

Management believed the existing infrastructure for ship, rail, truck and pipeline positioned it as a hub for natural gas liquids.

“We wanted to develop manufacturing enterprises that would recapture jobs and help revitalise manufacturing in the region,” said Hank. **“The shale gas boom had re-animated towns such as Marcus Hook.”**

Mario Giambone owns Italiano's restaurant in Marcus Hook. **“You can talk about it anyway you like in terms of the number of hoagies and pizzas but this is a godsend for this town and my business,”** he told the Pennsylvania Manufacturers' Association.

David Taylor is President of that association, which is the leading voice for manufacturing in Pennsylvania. **“The energy sector has almost single-handedly kept Pennsylvania's economy afloat during the recession and over the past few years,”** he said.

Developing energy from the Marcellus shale has also turned nearby Williamsport into the seventh fastest-growing metropolitan area in America.

Dr Vince Matteo, President and CEO of Williamsport Lycoming Chamber of Commerce and Industrial Properties Corporation, said the vast majority of people locally had embraced the shale gas boom.

“It was a game-changer for us,” he said. **“I had never seen anything like it. At one point more than 85 businesses moved to the county, which led to the opening of countless restaurants and four new hotels.”**

Meanwhile, Williston, a once sleepy town in North Dakota, suddenly became the fastest-growing small city in America due to the oil boom again with new restaurants, new shops and new faces.

Communities also benefited from the unexpected revenue streams from companies drilling for shale gas, which allowed them to make improvements that otherwise might not have been possible.

“Having that funding source has been a tremendous boom to us,” Lisa Cessna, the executive director of the local planning commission in Washington County, just outside Pittsburgh, told The Associated Press. **“It has helped build fishing piers, playgrounds and walking trails.”**

She told the Associated Press that there had been complaints about drilling sites on public land but said the end result outweighed the negatives.

“You can make it work,” she said. **“There are going to be bumps in the road. You're going to upset some people. We insisted on special legal language that gives us control over many aspects of the drilling process. We approve every pipeline, well pad, access road. It's labour intensive, but it's worth it. The most important message is to maintain full control.”**

But one of the biggest surprises of all has been the effect of shale gas on the air we breathe with America's CO₂ emissions falling to their lowest level for 20 years in 2012.

The reason? Gas, which became the fuel of choice to generate electricity instead of coal which emits twice the CO₂.

Despite all the benefits, though, not all – even those in incredibly high places – are championing shale gas.

“President Obama's animosity to fossil fuels prevents him from recognising the most remarkable energy success story in US history, maybe in all of world history,” said Dr Mark Perry, a scholar at the American Enterprise Institute and professor of economics at the University of Michigan. **“But we need a president who will acknowledge it.”**

Dr Perry said shale oil had:

Significantly reduced America's dependence on foreign oil and petroleum from often unstable parts of the world.

Helped to bring down gasoline prices and prevented the Great Recession from being even worse and lasting much longer.

“Domestic energy production creates US jobs and generates royalties for landowners and tax revenues for the governments, state, local and federal,” he said. **“And the drop in US gas prices to a seven-year low will save American consumers more than \$100 billion in lower energy costs this year.”**

THE \$64,000 QUESTION

CHEMICAL INDUSTRY'S CHALLENGE IS TO INFORM PEOPLE

No one should ever underestimate the importance of the chemical industry to manufacturing. For without one, the other would not exist

FOR an atheist, Professor Peter Atkins has a great deal of faith.

But his faith lies not in God, but in the chemical industry. And the important contribution it can make to today's and tomorrow's world.

"Without the chemical industry, the world would lack colour," he said. **"We would live in Stone Age conditions, underfed, dressed in skins, without the many devices that ease our lives and entertain us. Our lives would be short and painful."**

The retired chemistry professor from Oxford University in the UK says chemistry is hugely important for all of us.

Its problem is that it is often misunderstood.

"Most people know absolutely nothing about how the everyday products they use are made," said Lawrence D. Sloan, President and CEO, Society of Chemical Manufacturers and Affiliates. **"And having been a part of the chemical industry my entire professional life, it is extremely frustrating."**

The petrochemical industry converts raw materials such as water, oil, natural gas, air, metals, and minerals into more valuable products that manufacturers then use to make – in essence – all the products we want, need and use every day. To put it into context, over 96% of everything made in the world is based on chemicals.

But part of the problem for the chemical industry is that the public doesn't view it as one of the most important industries in the world – and that's a perception that must change.

"How that can be changed remains the \$64,000 question," said Lawrence. **"Our organisation, and others like it, has a major PR challenge to regularly 'educate to advocate' our elected officials so they understand the critical impact our industry has on society. Because not one industry contributes as much as we do to the modern world."**

He described the chemical industry as the 'unsung hero'.

"Too many feel the industry bears no responsibility for the health and welfare of its employees or for the environment," he said. **"But it's foolhardy to think the industry wants to inflict harm on itself just to try to increase its margins by an incremental percentage point or two."**

At the Annual Dinner of the Chemical Industries Association, INEOS Communications Director Tom Crotty told delegates: **"If government is genuinely committed to a manufacturing resurgence they need to understand that a thriving chemical industry is vital."**

For it is the chemical industry's products and technologies that are used to make everything from paints to plastics, textiles to technology, and medicines to mobile phones.

But as an energy-intensive industry, it needs access to competitively-priced energy supplies if it is to survive.

That is not a problem in America which is currently enjoying a manufacturing renaissance thanks to the abundant supplies of low-cost shale gas, which have driven down the cost of the raw materials that manufacturers need.

But it is for Europe where energy costs are spiralling out of control, leaving manufacturers struggling to compete in global markets.

Tom, who is also President of the CIA, said Britain urgently needed to address its energy base if it wanted a thriving UK chemical industry.

During a recent survey of the UK's glass and glazing industry by Pilkingtons UK, the rising cost of materials – due to energy costs – emerged as the 'greatest obstacle' currently facing their businesses. And it was, they said, their biggest challenge over the next two years.

The importance of the chemical industry, which supplies raw materials to manufacturers, therefore cannot be underestimated. The two are linked inextricably. And it is very often where innovation starts.

"Folks take for granted the incredible scientific discoveries the specialty chemical industry continues to make to help create the electronics, life-saving drugs, and smart energy homes we have come to enjoy and depend upon," said Lawrence.

INEOS, which employs 17,000 people at 65 sites in 16 countries, is proud of what it does to make people's lives easier and more comfortable.

It alone makes:

Solvents that are used in the production of insulin and antibiotics.

Efficient and effective biofuels to improve the sustainability of modern transport.

Chlorine to purify drinking water.

Synthetic oils that help to reduce CO₂ emissions.

Modern, strong but lightweight plastics to package, protect and preserve food and drink.

Materials to insulate houses, offices, electrical and telecommunications cables.

Products that have helped car manufacturers to make cars stronger and lighter and more fuel efficient, which have again helped to reduce CO₂ emissions.

The list goes on – as does the work behind the scenes to seek innovative solutions to many of the challenges facing society today.

"Chemical products and technologies are used in almost every area of the world economy," said a spokesman for International Congress and Convention Association (ICCA), the worldwide voice of the chemical industry. **"And as the global economy grows, it will increase the demand for the chemical industry's products. This growth drives product innovation, and the industry creates new products every year while striving to improve production processes and use resources more efficiently."**

In 2014, American Chemistry invested \$59 billion in research and development, the equivalent of more than \$185 per person in the United States.

"We invest more to innovate than the electronic, automobile, and healthcare industries," said Cal Dooley, CEO and President of the American Chemistry Council. **"The business of chemistry excels at continuously bringing new, imaginative and innovative ideas to market—and tomorrow will be no different."**

The American Chemistry Council says, though, for its chemical industry to continue its ground-breaking work, the US must also adopt an energy strategy that takes advantage of its home-grown energy resources, including its vast reserves of shale gas.

It is a view shared by Steve Elliott, Chief Executive of the CIA.

He wants Britain's \$50 billion chemical industry to take advantage of the energy under its feet rather than rely on imported gas.

"The UK's own shale reserves will contribute to more secure gas supplies and support jobs and growth," he said. **"Without this, gas imports are projected to reach 75% of needs by 2030. UK shale gas will help to keep the lights on while the UK makes its transition to a green economy."**

As one of the world's largest industries – in 2014 its revenues exceeded \$5.4 trillion – the chemical industry has a profound effect on the world we live in and will do in the future as society strives to create a healthier, safer and more sustainable world.

"Unfortunately, the word 'green' means different things to people," said Lawrence. **"Some may feel that no chemical plant is 'green' by nature of the fact that it is handling chemicals, which in their minds is bad."**

The chemical industry knows that it needs to change the public's perception if it wants them to understand where the industry fits into modern life.

"Strong, competitive chemical industries underpin all great manufacturing nations in the developed world because chemicals and materials are the essential component on which manufacturing is built," said Steve. **"Without its processes and 'building block' products, most of the rest of manufacturing could not take place."**

He said although the industry was energy-intensive, its products, in their lifetime, saved more than twice the energy it took to make them.

"We are delivering the green future," he said.

"Without the chemical industry, the world would lack colour. We would live in Stone Age conditions, underfed, dressed in skins, without the many devices that ease our lives and entertain us. Our lives would be short and painful"

Professor Peter Atkins

TROUBLED TIMES

INEOS CHAIRMAN SPEAKS OUT AS UK MANUFACTURING FALLS TO AN ALL-TIME LOW

Britain was once the powerhouse of the world. It pioneered international trade, it established trade routes around the world and it led the Industrial Revolution. For several centuries it was one of the world's largest economies. So what went wrong?

FOR a nation that blazed the path to industrialisation and mass production in the 18th and 19th centuries, the truth is hard to bear.

For the first time ever, the UK's manufacturing share of the UK economy fell to 9.4% – the lowest point on record.

For INEOS Founder and Chairman Jim Ratcliffe, who grew up in the industrial North of England, it troubles him greatly.

"We are watching the slow death of manufacturing in this country," he said. **"We have lost half of our manufacturing in a single generation."**

Twenty years ago, he said, it was on a par with Germany where manufacturing is still strong.

"This seismic shift in UK manufacturing may seem like a minor tremor in 'services rich' London, and much of the southern counties, but it is a catastrophe in slow motion in many parts of the North of England, Wales and Scotland," he said.

In October last year the Redcar steelworks on Teesside shut down with the loss of 2,200 jobs after Sahaviriya Steel Industries UK, the plant's Thai owners, went into liquidation. Labour MP Anna Turley described it in The Northern Echo newspaper as a 'human and industrial tragedy'.

"Steelmaking is finished on Teesside," said one man who had worked at the plant for 30 years.

In the 1970s, more than 200,000 people worked in the UK steel industry. Today there are about 30,000 but their jobs are no longer safe.

In January more job cuts were announced. Tata Steel confirmed 750 job losses at Port Talbot in Wales with hundreds of others facing the axe at its plants in Scunthorpe, Trostre, Corby and Hartlepool. A flood of cheap Chinese imports – steel production is subsidised in China – the strength of the British pound, and high energy costs in the UK have been blamed.

Whatever the reason, it's a worrying trend.

"If we want to arrest the decline in manufacturing, or even return to growth, we need to give corporations reasons to invest in Britain," said Jim. **"We need competitively-priced energy, a skilled workforce, attractive taxes and a government that wants to make it happen."**

He said Britain needed what the marketing men called USPs – unique selling points.

"Germany has them," he said. **"It has a highly skilled workforce, it is seated in the heart of Europe and it has great manufacturing infrastructure and competent suppliers. America has cheap energy thanks to shale gas, a skilled workforce and the world's largest market. China has growth, cheap labour and a huge market."**

It is not the first time Jim has spoken out about Britain's failure to sell itself to investors.

Three years ago he warned that Britain was not an attractive place to manufacture. In an interview with Alistair Osborne, The Daily Telegraph's business editor, he cited the high price of energy. And understandably so, given that INEOS' Runcorn plant, which provides the chlorine for 95% of Britain's water, consumes as much energy as the city of Liverpool.

He said the UK had to look at what it had to offer if it wanted to understand why it had fallen so woefully behind the pack.

"It would be nice if there was a simple crisp answer but there is not," he said. **"To maintain or grow manufacturing, one needs a constant stream of investment as plants grow old and products grow old. New plants and new products need investment."**

Britain, he said, needed cheap or at least competitively-priced energy.

"We cannot offer that at the moment. And, with the North Sea running out of gas, the position is likely to get worse," he said. **"But we are sitting on huge shale gas deposits which could change everything."**

In the 18th century, Britain built its wealth on its coal reserves which were abundant and easily mined. And it triggered the Industrial Revolution, with Britain very much at the forefront of change.

Access to cheap energy, though, is not the only thing worrying the UK's manufacturing industry today.

Jim also highlighted the need for a skilled workforce.

"We used to have excellent apprenticeship schemes, Polytechnics and Technical Colleges," he said. **"But government decided all young people needed to become graduates."**

That concern is shared by many. A recent survey of British manufacturers – published in the Annual Manufacturing Report 2016 – shows the shortage of skills remains their greatest fear.

"To put it bluntly, our education system is failing our youngsters and, consequently, creating problems for industry," said Callum Bentley, Editor of The Manufacturer.

"No one expects a fresh-faced youngster will have the skills and experience of a veteran but this is about being poorly prepared for work and it has been going on for decades," he said. **"The longer it continues the more it will compromise our competitiveness. The gap in understanding between schools and workplaces must be bridged, for the sake of our manufacturing base and for our people themselves."**

Jim said it had been 'uplifting' to hear talk of a Northern Powerhouse – a Government initiative to redress the North-South economic imbalance – and described the current UK Conservative government as the most pro-manufacturing for many years.

But, he said, to actually make a difference, Britain needed to attract investors.

"Investors can afford to be very 'picky' in today's highly competitive world," he said. **"INEOS has chosen to invest much of its capital in the USA. Many other companies have chosen the Far East."**

Jim called on the British Government to offer 100% capital allowances for manufacturing capital expenditure and a single digit tax rate for manufacturing.

"In today's globalised world investment decisions are always compared and contrasted with alternative locations abroad. The UK is not currently a target for manufacturing investment because it lacks USPs. It needs some."

Late last year ResPublica, an independent, non-partisan think tank based in Westminster, said a huge increase in exports was needed to revitalise British manufacturing and move the economy away from a 'dangerous reliance on service industries'.

Director Phillip Bond said foreigners buying UK property had driven up the value of the pound, making life harder for manufacturers to export.

"The recent collapse of the British steel industry has highlighted the worrying fact that our economy is over-reliant on services and external finance," he said. **"Growth needs to come from the long-neglected manufacturing sector where exports have been hit by a strong pound. Sterling has a key role to play in helping exports and we need to address the problem of unfavourable exchange rates for British business."**

One who would agree with this is Jim.

"Any balanced economy needs to reflect to some extent the manner in which its inhabitants spend the money in their pockets. If the inhabitants buy 'things' with their earnings, we need to make 'things' in our domestic economy. If not we have to bring all manufactured goods in from overseas and pay for them in foreign currency."

BRITAIN MUST RE-INDUSTRIALISE

A FORMER journalist on the Financial Times said INEOS Chairman Jim Ratcliffe was right to be concerned about the state of manufacturing in the UK.

Peter Marsh said both the steel industry and the chemical industry had faced extreme problems.

"De-industrialisation – manufacturing's shrinking share of the UK's economic output – has gone far enough," he said. **"If we are to have sustainable economic growth and higher living standards, Britain must re-industrialise."**

But Mr Marsh, a former manufacturing editor on the FT, said although Britain had lost ground, it was still a big manufacturer of niche products, such as specialist analytical instruments, and goods which it didn't make sense to import.

"That can be anything from foodstuffs to mattresses and building materials," he said.

According to the latest UN figures, Britain is the 10th biggest manufacturer in the world, making just under 2% of the world's manufactured goods – compared to 1895 when it made 18% of all goods.

"Britain is not anything like as big as it was but for a country with 1 per cent of the global population it still punches above its weight," he said. **"China has come from a lowly position in the past 20 years and now is responsible for about 20% of total factory made goods. But it does have 20% of the world population."**

Mr Marsh is now a lecturer and author of The New Industrial Revolution: Consumers Globalization and the End of Mass Production. He also recently set up a website for UK manufacturing www.madeherenow.com

KEEPING THE LIGHTS ON: INEOS SEEKS TO DISPEL SHALE GAS MYTHS

IT TURNS TO LOCAL PEOPLE TO SHARE ITS MESSAGE

THE UK could become the first country in Europe to benefit from a thriving shale gas industry. First, though, INEOS – the company with more shale gas licences than any other – must win the hearts and minds of those communities that live and work close to its operations

INEOS is now one of the biggest companies in the UK's shale gas industry.

But it knows it is easy to be the biggest.

It's quite another to be the best and the most trusted.

With trust in big business, banks and politicians now at an all-time low, it has never been more important to win back the respect of the people.

In April last year INEOS Shale, which now has government licences to explore one million acres in the UK for shale gas, began its quest to show communities that its intentions are honourable.

"We are in this for the long-term," said CEO Gary Haywood. ***"It's not just about making money. We want to help lead a manufacturing renaissance in Britain and we believe an indigenous shale gas industry can do that."***

It has already begun talking to communities in Scotland where it has licences to explore thousands of acres close to its manufacturing plant in Grangemouth.

But as it waits for Scotland to lift its current ban on fracking, pending further inquiries, INEOS Shale has moved south – into England – where it hopes to convince people in Cheshire, Yorkshire, Derbyshire and the East Midlands of the benefits that a domestic shale gas industry could bring.

"We understand that people in these areas are concerned," said Gary. ***"And that is partly because there are so many myths about shale gas extraction. But we want to show that this can be done well and safely, and we want to meet the people in areas where we hold licences."***

Exhibitions are being arranged to allow local people the opportunity to talk directly to INEOS – and ask any questions – about what it plans to do near their homes.

INEOS Shale has also produced a series of films to dispel fears that people may have. They will be screened at the exhibitions where experts will explain what it means for communities which have been promised 6% of shale gas revenues by INEOS to improve local facilities.

As INCH went to press, INEOS was planning thorough 2D and 3D studies of the rock in each county to check whether gas is present and accessible. If the results from that look promising, permission will

be sought to drill 600ft vertical wells to take three-inch wide core samples of the rock to access the quality and quantity of oil and gas in the shale.

"It is effectively like coring an apple," said Tom Pickering, Operations Director INEOS Upstream. ***"It's a cautious approach, led by science, but it is important that we get it right."***

Once INEOS has all the detailed data it needs, a decision will be made whether it is economically sound – and safe – to frack the well using 98% water, 1.5% sand and 0.5% additives, which will prevent the build-up of scale and sterilise the well.

"Some people say that 600 poisonous chemicals are used in fracking but that is just not true," said Tom. ***"Most wells require between six and 12 chemicals. All chemicals used will have to be described openly in planning applications and permits."***

INEOS Shale knows that its decision to pursue shale gas exploration has set it on a collision course with environmentalists who claim fracking is dangerous, causes earthquakes, poisons drinking water and affects the air we breathe.

But the company has never been one to run from a challenging situation especially when it believes there is a strong economic and environmental case.

"A home-grown thriving shale gas industry will not only revolutionise manufacturing in Britain, but it will give the UK energy security for the first time in many years and create thousands of jobs in areas which have been hit hardest," said Gary. ***"If we can do that and reassure people that the industry can operate without long-term damage to the environment or their way of life, it's a win-win situation for all."***

Professor Peter Styles, one of three experts commissioned by the UK Government in 2011 to write an independent report after fracking by another company caused minor tremors in Lancashire, believes Britain's long-term future depends on the vast reserves of shale gas buried deep beneath the ground.

"I don't think people realise how extremely vulnerable we are in the UK," he said. ***"At the moment about 80% of UK domestic heating and cooking is gas and we import half of it. Some of it comes from Norway, which is probably all right, but a lot of it comes from***

Siberia which has not been the most secure form of supply over the years."

In January 2009, a dispute between Ukraine and Russia over natural gas prices led to deliveries to a number of European countries being cut off entirely.

"We were down to two days' supply," he said. ***"And when that happens, companies like INEOS ChlorVinyls in Runcorn, which is the third biggest user of gas in Britain, get switched off to protect the domestic supplies."***

INEOS not only uses gas, though, to heat and power its manufacturing plants. Gas is also a vital raw material used to make thousands of essential products that we all rely on each day. Without it, there would be no plastic, medicines, buildings, cars, computers, clothes, or iPad screens.

"That's often forgotten when we see heated debates about the merits of continuing to use fossil fuels," said Greet Van Eetvelde, INEOS Manager of Cleantech Initiatives. ***"Many renewables, such as the important components in wind turbines and solar panels, cannot be made without gas. We will still need gas to make things even when we have switched to a low-carbon energy."***

INEOS Shale, which holds more licences than any other company in the UK, believes most people are open-minded about shale gas development.

"That is all we want," said Tom. ***"We are not complacent. We do understand people's concerns but many of the things people may have read about shale gas simply aren't true. We are happy to be challenged if people think we are wrong. Understandably, they just want more information. And that is what we hope to provide at these meetings."***

It will be an uphill battle because the anti-fracking groups have hijacked social media.

But INEOS hopes to show that he who shouts the loudest, isn't necessarily the most knowledgeable.

WHY INEOS IS THE RIGHT COMPANY TO EXTRACT SHALE GAS IN THE UK

FEW companies come with as much expertise as INEOS.

In addition to its expertise above ground, handling flammable gases across its 65 manufacturing sites all over the world, the company also has expertise below ground.

In November, INEOS acquired gas platforms in the North Sea – and, with them, a team of drilling experts who already supply enough gas to heat one in 10 homes in the UK.

INEOS also employs the team who pioneered the development of shale gas in the US with more than 20 years of industry experience.

Chairman Jim Ratcliffe said he could not understand why it was still so hard to convince people that shale gas extraction was safe.

"There is such a wealth of experience of drilling and fracking for shale in North America that it should have dispelled all the concerns and ghosts," he said. ***"In America they have now drilled and fracked in excess of one million wells over the past 10 years and it has produced an immense amount of hydrocarbons."***

MISTAKES were made in the early days of shale gas exploration in America.

Faulty well construction led to water contamination and waste water from fracked oil wells was left in open, unlined pits.

"We have studied all of these cases to ensure we do things differently," said Tom Pickering, Chief Operating Officer of INEOS Shale.

Some US companies had used only one layer of steel in the well.

INEOS will be using up to four layers of steel cemented one inside the other.

Other companies had reused old wells. INEOS will use only new wells.

The waste water was left in open ponds.

INEOS' waste water will be enclosed in double skinned storage tanks before being recycled.

"It is important to acknowledge that there have been some issues but they happened in the early days of shale gas exploration in America and we don't live in America," said Tom. ***"This is the UK where we have one of the most rigorous regulatory regimes in the world."***

Having reviewed the available evidence, the Royal Society and Royal Academy of Engineering have concluded that shale gas can be extracted safely with appropriate regulation. Extracting shale gas is not risk free and has to be done carefully, but the risks are manageable and comparable to other practices.



“ Safety and efficiency are paramount to us”

Doug Scott, head of drilling at INEOS Breagh

EXPERTISE COMES TO THE SURFACE

INEOS' NEWEST TEAM HAVE BEEN FRACKING FOR GAS FOR YEARS

Off-shore the drilling and fracking for gas goes on quietly and unnoticed. On-shore it's not quite so simple. But the team who works for INEOS Breagh – INEOS' new oil and gas business – is confident of one thing. If anyone has the experience, expertise and drive to become Europe's leader in this new and exciting shale gas industry, it is INEOS

INEOS Upstream may be INEOS' newest business.

But the people driving its new energy business are not new to fracking. On or off shore.

On shore, INEOS is working with the three Americans who pioneered the development of shale gas in the US which has led to a manufacturing renaissance.

Off shore, they have acquired a team who has been drilling and fracking safely for natural gas for years.

All are confident that INEOS – with its expertise above ground, handling flammable gases across its 65 manufacturing sites – can become the first company in the UK to safely extract the vast reserves of shale gas currently trapped in rocks thousands of feet underground – and, in doing so, change public perception.

“We think we can bring something unique to the emerging shale gas industry,” said Tom Pickering, INEOS Shale's Chief Operating Officer who worked on a North Sea oil rig for years.

Doug Scott is head of drilling at INEOS Breagh, a subsidiary of INEOS Upstream.

“We have been one of the most active exploiters of fracking in tight sandstone gas fields in the southern North Sea over the past four years,” he said. **“We have used the technique to get the gas out quicker and to access gas that was previously uneconomical to extract.”**

Shale gas is the same as North Sea gas. They are both natural gas. The only difference is the North Sea gas is extracted from sandstone situated around 3km (almost 2 miles) under the seabed and on shore INEOS would be extracting it from shale up to 5km (3 miles) underground.

Doug and his team had – up until October – been working for DEA. That changed when INEOS bought the German firm for several hundred million dollars, and, with it, the responsibility for ensuring the supply of gas for 1 in 10 homes across the UK.

INEOS Breagh operates four platforms in the

southern North Sea and owns interest in 16 exploration licences.

INEOS' decision to buy – when all around seemed to be selling – has been seen as a ground-breaking move into the energy sector.

Where others saw troubled waters – brought on by rising costs and plummeting profits – INEOS saw a huge wave of opportunity.

That opportunity to acquire an immense amount of expertise – while improving the life and efficiency of these platforms without compromising on safety – was too good to miss.

To help grow the business, INEOS will be relying on its new team of geologists, geophysicists and well construction experts who are now working for INEOS Breagh.

The new team work well with INEOS Group because they share a similar ethos.

“Safety and efficiency are paramount to us,” said Doug. **“The design and planning work we did before we fracked our very first well was critical to its success and it cannot be overestimated. The time you spend to get everything right pays dividends during the operational phase.”**

He said the plans – and contingencies agreed in the event of something going wrong – ensured the team could manage the inherent uncertainties of drilling and fracking wells.

“As always during the operational phase, in the event that operational progress conflicts with safety, safety always takes priority,” he said.

Doug said safe and efficient operations relied on team competency and effective communication between those operating the rig, the track vessel and the platform.

“That is critical to ensure everyone is doing what they should be doing at the right time,” he said.

The INEOS Breagh team also has a habit of looking for ways of working more efficiently or new ways of working.

At INEOS Breagh they fitted essentially a filter

in the well to stop the proppant (primarily the sand) from reaching the surface during gas production. It meant the fracked well could be put on line 12 months ahead of an alternative technical solution being found.

“The downhole screens were a first for fracked wells in the UK's continental shelf in the southern North Sea,” said Doug. **“But this simple technology potentially opens up all sorts of opportunities for our future fracked gas field developments.”**

And at Clipper South they sold the clean-up gas from the well instead of flaring it.

“That was a first for us as well,” said Doug. **“It took an enormous amount of effort and collaboration within the organisation to integrate the safety and production systems, but by doing that, we not only captured about 300 tonnes of CO₂, but it also created £4.3 million in revenue from the sales gas.”**

The platforms, which INEOS inherited as part of the deal, are relatively new, well managed and remotely controlled.

“That was part of the appeal,” said Geir Tuft, CEO of INEOS Breagh.

As INEOS moves further into the energy business, INEOS Shale will be hoping to learn valuable lessons from the team at INEOS Breagh.

“We will be looking to take advantage of the new family ties in all areas by sharing resources and experiences,” said Geir.

Since the acquisition, he has been working on a robust plan to improve the efficiency of the business, especially in light of falling oil and gas prices.

Three years ago oil was selling at \$110 a barrel; today it is below \$40.

“We need to be able to manage reduced cash flows to ensure the business is robust in all conditions,” he said.

EVEREST. INEOS ON TOP OF THE WORLD.

WHY RHYS WILL ALWAYS BE GRATEFUL TO INEOS FOR HAVING FAITH IN HIS DREAMS

Chance research led Rhys Jones to INEOS' door 10 years ago. He was in search of money to help him become the youngest person to scale the highest mountains in each of the world's seven continents. He came away with the money, climbed Everest and broke the world record on the day of his 20th birthday. But that meeting with INEOS chairman Jim Ratcliffe had a profound effect on him, as INCH discovered

IT'S hard to come down to earth when you have stood on the roof of the world.

One who knows that from experience is Rhys Jones who conquered Mount Everest, the world's highest mountain, on his 20th birthday.

He had dreamed of that moment for eight years after listening to a talk as a 12-year-old Scout. In a sense, his work was now done and he had no desire to climb it again.

"Once was enough for many reasons," he said. **"But in many ways I guess I never really came down. I can relive any part of the climb any time I close my eyes. It's something I will never forget."**

A few years ago, Rhys, who now runs his own luxury expedition company with his wife Laura, was asked to lead an expedition into the 'death zone' and on to the summit of Mount Everest.

"I said 'no' because I couldn't put a price on that experience," he said. **"You really have to want it to endure the hardship and danger, and I'm not sure that a pay cheque would drive me enough for that."**

It was, however, a 'pay cheque' that got him there in 2006.

"I don't know what made me approach INEOS all those years ago for funding," he said. **"It was just chance research. But I had spread the net far and wide writing to sponsors, including Stannah Stairlifts which gave me £100."**

He was on the verge of giving up when INEOS chairman Jim Ratcliffe agreed to meet the then 19-year-old. After an hour-long meeting Rhys walked out of the door with the money he needed to complete the expedition in his pocket – and an INEOS flag to plant on the summit.

"I would not have been able to do it without INEOS' help," he said. **"It was all the money I needed but it also**

meant much more to me. It was a huge boost to my confidence that Jim believed in me and it's what pushed me to keep going on the mountain. I vividly remember taking the final steps to the summit a few months later, and having an overriding thought that I'd promised Jim a photograph of the INEOS flag on the top."



Rhys returned to the UK with a confidence and dogged determination. But he sensed something was missing.

"It had been a target for so long that I missed having that goal to strive for," he said.

He started giving regular talks at dinners and events and working with schools.

"I felt it was important to explain to children that I was very average when I set myself these goals," he said. **"I wasn't a high flier. I was one of the 80% of students who turn up, do the minimum work to avoid trouble, and go home again. I was very anonymous, and couldn't wait for the weekends when I could go climbing. But I was able to make things happen because I had the right approach."**

He recalled how surprised his teachers were when he climbed Denali, the highest peak in North America, 12 months after sitting his GCSEs.

"In one of my old school reports I had been advised to work on my fitness so that I could enjoy my PE lessons more," he said. **"No wonder they**

were surprised."

He also led expeditions for travel companies and charities.

"It was fun but I always felt like I was short changing myself by working for a middle man," he said.

So he quit and set up his first company RJ7 Expeditions from an office in Dubai in the Middle East.

He is now back in the UK and heading up new venture Manix Adventures, which specialises in guiding people to some of the most difficult-to-reach places on earth.

And for those seeking such thrills, his experience is invaluable.

"I've had some low ebbs on expeditions," he said. **"I fell into a crevasse in Greenland and broke my arm. But we all face challenges in our lives. When things are tough, I remind myself that nothing lasts forever, no matter how steep, how complicated, or how difficult it appears."**

As for the INEOS flag, which he unravelled during the five minutes he spent on the 29,035ft summit on May 17 2006, he hopes that it's in an INEOS office somewhere in the world.

"Who knows, seeing that may inspire someone else to follow in my footsteps," he said.

DO WE NEED GAS?



Governments agree that global warming now poses the greatest threat to life on earth. What they cannot agree on is how best to tackle it with the debate over renewable energy v fossil fuels far from over. INEOS, as one of the world's biggest consumers of energy, believes renewables are not yet up to the job. But is it a view shared by others?

ENERGY strategy in Britain has three big goals; keeping the lights on, keeping the bills down, and moving to a clean energy future. We need to meet the UK's demand for energy, using clean and low carbon energy sources if we are to continue to combat climate change and grow the economy. But this isn't something which will simply happen overnight. It will take time as we start to move to more renewable and low carbon energy sources. Moving from coal to gas would make a huge contribution to reducing our carbon footprint, and is the 'bridge' we need for many years to come. The anti-fracking lobby seem to think there is a bottomless pit of bill-payers' money to fund renewable energy generation. There isn't, and even if there was, we would still need gas – as a reliable source of electricity when the sun doesn't shine or the wind doesn't blow.

Andrea Leadsom, Energy and Climate Change Minister, UK Government

THE pursuit of shale gas is a fool's errand when renewables can deliver what's needed for an energy revolution. This is especially true for the 1.3 billion globally who lack any access to electricity, and for those who live 'off-grid' who need decentralised and locally appropriate technologies, but it's also true for energy systems in the global North. Like new coal and new nuclear power, investment in unconventional gas is a serious distraction from badly-needed investment in renewable energy. There has been some research from the US which indicates that extracting shale gas via fracking could have a bigger total greenhouse gas footprint than coal. Apart from the climate impacts, gas extraction is the source of serious environmental and social conflicts around the world. Development of gas pipelines and infrastructure drive land grabbing and we believe threatens water resources and biodiversity in many places. Furthermore, we believe there are significant risks of water contamination and air pollution from fracking.

Friends of the Earth International

IT is incontrovertible that in the long-term we must move to as low carbon as practicable technologies but the tools for this (carbon capture and storage and renewable energy technologies) are not currently ready to satisfy global energy demand and poverty alleviation needs and some may never be economical or implementable. Shale gas has the potential, if managed and regulated with diligence and authority, to provide some of the necessary reduction in CO₂ while delivering energy to a rapidly growing but carbon-constrained world.

Professor Peter Styles, a British geologist and professor of Applied and Environmental Geophysics at Keele University

ALTERNATIVE sources of energy can become a satisfactory substitute for fossil fuels if we put as much effort and genius in the effort as we did in producing the first atomic bomb. The most satisfactory single alternative would be hydrogen fusion but that quasi-miracle may be beyond our capability. We may discover that wind, solar, biomass, etc., all piled on top of each other, may have to do, but their success may turn out to require an effort that started a generation ago. Essential to any and all success is the realisation on our part that we may be able to do anything, which includes fail.

Alfred W. Crosby, Professor Emeritus of History, Geography, and American Studies at the University of Texas

FOR the past four months, natural gas, which is cleaner than coal, has generated the largest share of America's electricity. But some, including the US Environmental Protection Agency, believe it's already time to begin replacing natural gas with wind and solar energy. These renewables are growing, but from a very small base, and only with billions of dollars of taxpayer subsidies. Wind and solar have other issues: the wind does not always blow nor the sun shine. So, renewables need backup energy, mostly from natural gas. Instead of relying on government mandates to transform our energy sector, let's allow the marketplace to work. America's huge, low-cost supply of natural gas is the product of innovation and entrepreneurship. This American form of problem-solving has produced a market-competitive solution to help us turn the corner on energy costs and emissions which are now at their lowest level for 27 years. No other country has been able to replicate this American success story. Of course, many renewable energy advocates would like to see us abandon market principles altogether. But if we do, we not only drive up energy prices, but slow the pace of innovation.

Dr J Winston Porter, former EPA assistant administrator in Washington DC. He is now an energy and environmental consultant, based in Savannah, Georgia, USA

FOR more than a year the Task Force on Shale Gas has explored the potential impacts, positive and negative, of creating a shale gas industry in the UK. In December we published our final recommendations. We are convinced that gas is required as part of the UK's energy mix for the short and medium term. It is simply not feasible to create a renewables industry that can meet all our energy needs in the short term. Gas represents an environmentally cleaner alternative to coal. The adverse climate impact of shale gas is similar to conventional gas and less than LNG. Our conclusion from all the evidence we have gathered over the past year is clear. The risk from shale gas to the local environment or to public health is no greater than that associated with comparable industries provided, as with all industrial works, that operators follow best practice.

Lord Chris Smith, Chairman, Task Force on Shale Gas to UK Government

THE International Energy Agency sees renewables providing an ever-greater share of the global energy supply, but fossil fuels are not going away soon. In the central scenario of our flagship World Energy Outlook, global energy demand rises about one third by 2040. Renewables will contribute to that surge, to be sure, but so will natural gas: in fact, under all WEO scenarios, gas has at least a one fourth share of global energy in 2040. Shale gas has increased the shift of some electricity generation from coal, and further development of natural gas, along with renewables, is critical to a diverse, secure and sustainable energy supply in the coming decades.

Laszlo Varro, Chief Economist, The International Energy Agency

THE US experiment with shale gas has shown that, given the right resources and massive drilling efforts, significant amounts of natural gas can be produced. However, it has also shown that production tends to be short-term (wells deplete rapidly), that resources vary greatly in quality (only the 'sweet spots' are profitable), that water and air pollution can result from drilling, and that methane leaks erase any climate benefit of shale gas over coal. In contrast, renewable energy resources represent the future of energy – with declining costs and far lower environmental impacts.

Richard Heinberg, Senior Fellow, Post Carbon Institute

WE want to be very clear: solar cells, wind turbines, and biomass-for-energy plantations can never replace even a small fraction of the highly reliable, 24-hours-a-day, 365-days-a-year, nuclear, fossil, and hydroelectric power stations. Claims to the contrary are popular, but irresponsible. We live in a hydrocarbon-limited world, generate too much CO₂, and major hydropower opportunities have been exhausted worldwide.

Tad W. Patzek, Chairman of the Petroleum and Geosystems Engineering Department at the University of Texas at Austin

PRESIDENT Barack Obama's Clean Power Plan is a regulation designed by the Environmental Protection Agency to reduce US power sector CO₂ emissions 32% below 2005 levels. Because each state has a unique energy mix, the Clean Power Plan sets state-specific reduction goals and provides the flexibility to meet them through individual compliance plans. No matter how states choose to implement the plan, it is well understood that natural gas is the most cost-effective way to advance our clean energy goals while ensuring continued economic growth. That is why natural gas will continue to be an essential component of how America produces energy for years to come. In fact, the Energy Information Administration reported that in April power sector carbon emissions had reached the lowest level since 1988. Not coincidentally, April was the first time in history that natural gas overtook coal as the number one fuel source for electricity.

America's National Gas Alliance



THE DAILY MILE GAINS GROUND

MORE AND MORE SCHOOLS SIGN UP TO FOLLOW IN ELAINE'S FOOTSTEPS

A FORMER headteacher's vision to get every child in every school in the UK running a mile for fun every day has turned a corner – thanks, in part, to the GO Run For Fun Foundation.

Four years ago Elaine Wyllie's primary school in Stirling, Scotland, was the only UK school running what she christened The Daily Mile.

But today her campaign to produce a healthier and leaner generation has been formally endorsed by the Scottish Government for all its primary schools – and more schools from all corners of the UK are signing up every day.

"We are working to build a national network and already, we know from social media of hundreds of schools that are picking it up," said Ursula Heath, Group Communications Officer, who also works with GO Run For Fun Foundation.

"We are working with Elaine and our GO Run For Fun network to turn it into a

national programme," said Ursula. **"It's hugely exciting to see this take off, and to know that we are working towards improving the health and wellbeing of the UK's children for years to come."**

Elaine, who is now retired, is working to encourage more headteachers to get involved.

"It's ultimately the headteachers who lead the adoption of The Daily Mile, and Elaine's stellar teaching CV and passion for her cause inspire others to embrace the initiative," said Ursula.

On March 17, The Daily Mile Foundation was officially launched at Hallfield Primary School in Westminster, London, supported by the GO Run For Fun Foundation.

"Our dream is that one day every child in the UK will have the chance to run daily at school," said Ursula.

The immediate hope is that the British Government will also see the benefits of incorporating The Daily Mile into the national school curriculum as a way of helping to tackle the UK's growing obesity crisis.

It is believed one in three children in the UK are now classed as overweight or obese.

"We think this campaign can make a huge difference in addressing that problem," said Ursula.

Visit The Daily Mile Website at: www.thedailymile.co.uk. Also follow the campaign on Twitter @thedailymile and Facebook www.facebook.com/thedailymileforschools



SCAN HERE TO VIEW THE DAILY MILE LAUNCH FILM



RUNAWAY SUCCESS

GO RUN FOR FUN FINDS PERMANENT FOOHOLD IN AMERICA

INEOS has a habit of backing winners. And its GO Run For Fun campaign is proving to be another

A WORLDWIDE campaign to get children up and running has found a permanent foothold in America.

Reaction to GO Run For Fun's inaugural events in Texas last year was so positive that the UK-based organisation has set up a dedicated team to host the runs in the US.

This year the US team hopes to persuade 10,000 children from 17 schools to take part in one of the 34 runs in the Houston area.

"That's our target but we could easily do 20,000 this year because the demand is there," said Kathryn Shuler, Manager of Community Relations and Special Projects at INEOS Olefins & Polymers USA. **"But this will be our first official year and we need to make sure we can deliver the high-quality programme that everyone expects from GO Run For Fun."**

The US team will also be charged taking the campaign to Chicago close to INEOS' Styrolution and Technologies sites.

Almost one in five high school students in Texas are now classed as overweight. But GO Run For Fun is already helping to address that.

Karla Klyng, the assistant principal at Alvin Elementary School in Alvin, Texas, told INEOS that 155 children – instead of the expected 65 – joined its Mighty Milers after-school running club after taking part in a GO Run For Fun event last year.

"The kids cannot wait to do GO Run For Fun again this year," she said.

GO Run For Fun was founded in the UK by INEOS chairman Jim Ratcliffe, a keen runner himself who wanted to encourage children to run for fun – and get fit at the same time.

It has already been making inroads in the UK and mainland Europe where thousands of children have taken part in one of the hundreds of short distance running events. And now America, which knows it has a weight problem, is following in its footsteps.

"Fast food restaurants now list calorie counts for their menu items, and there's focus at the government level that kids need 60 minutes of exercise every day," said Kathryn.

But food is not the only problem weighing heavily on the minds of PE teachers in the US.

"They say video games are also a

dangerous distraction," said Kathryn.

Mary Meyer, a PE teacher at Longfellow Elementary in Alvin, Texas, told INEOS: **"The kids are so used to playing video games that when they go outside to recess they just sit. They don't even know how to run and play anymore."**

But the teams behind what has become the biggest children's running initiative in the world believe that where there's a will to succeed, there's a way.

The US campaign has already won an army of inspirational supporters including 1000 metre champion Bernard Lagat, Olympic sprinter Wallace Spearmon and astronaut Mario Runco who took part in three Space Shuttle missions during the nineties.

Last year Wallace Spearmon, who is currently the seventh fastest runner in the world, attended several GO Run For Fun events in Texas. He told children how he had twice failed to win a place in his high school track team. **"It was only because of my father's encouragement that I stuck with running and continued to practise,"** he said. **"It was hard but I worked at it."** Eventually he won a place on the US Olympic team.



To ensure the long-term success of the US GO Run For Fun campaign, it too has set up a charitable foundation.

The key initiative of the INEOS ICAN Foundation, which is a volunteer organisation for fitness and community outreach, will be GO Run For Fun but the Foundation will also facilitate INEOS Olefins & Polymers USA's annual employee-driven, fund-raising golf tournament and provide grants for schools to extend the teaching of science, technology, engineering and maths in their classrooms.

The Houston Marathon Foundation is already an official supporter, along with Houston's professional women's soccer team, the Houston Dash, which has sent inspirational ambassadors to the events so far this Spring.

"That way we can show kids that running is not only an inexpensive and fun activity on its own, but it's also an integral part of so many great sports," said Kathryn.

Many parents are also excited to help the campaign.

"Unfortunately some of our target schools don't have as many parent volunteers as

others," said Kathryn. **"And many of those are in areas where parents work more than one job to make ends meet. But it's really important to help all parents understand the need to support good exercise habits in these areas."**

To help drive home the message about the benefits of running and exercise to the body and soul, INEOS will be producing informative leaflets printed in English and Spanish.

Events will be delivered to 17 public elementary schools in the Alvin, Clear Lake and La Porte school districts this year, with 9 days of runs having already taken place in the Alvin School District this April.

But INEOS is already looking to the future, and has set its heart on attracting 15,000 children by 2017 and 20,000 by 2018. And with a team as passionate as it is, that should be easily achieved.

"I'm very excited about the opportunity to help motivate kids to be more physically active," said Dennis Seith, CEO INEOS Olefins & Polymers USA. **"Healthy, active kids tend to be better engaged, and more successful in school,"** he said. **"Being active in athletic activities also teaches the values of**

teamwork, accountability, fair play, and a drive for doing your best."

One who seconds that is GO Run For Fun ambassador Bernard Lagat. "Running has provided me with a fantastic opportunity to travel the world," he said. **"But this campaign is more than just a fun run. It teaches children the importance of a healthy lifestyle."**



SCAN HERE TO VIEW FILM: GRFF IN TEXAS



YOUTH CULTURE

HOW INEOS CHAMPIONS THE YOUNG TO HELP THEM ACHIEVE IN LIFE

As a company INEOS has always championed the importance of sport to the mind, body and soul. So it's no wonder it does so much to help others, especially young people, with a similar mindset, as INCH discovered

AS supporters go, INEOS is in a league of its own.

But that's not INEOS' verdict; it's the word on the ground where INEOS does so much to help develop a healthy interest in sport, particularly among the young.

And it's in any sport. Ice hockey. Football. Rugby. Running. And, seemingly, in every country where it does business. The US, the UK, Germany, France, Switzerland and Belgium.

"INEOS revolutionised our club," said Sacha Weibel, Chief Executive Officer of Lausanne Hockey Club. **"We are now in the first division and one of the top 10 teams in the country."**

INEOS approached the club in 2010 – the year it uprooted 80 families and moved its headquarters from the UK to Rolle in Switzerland.

"They wanted to be a part of the community, which was wonderful," said Sacha. **"We wish more people thought like that."**

But it wasn't just financial support on offer.

"INEOS wanted to be totally involved," said Sacha.

That meant regularly attending matches at the 8,000-seater stadium – and staging their own friendlies before the club's official games.

Are they any good?

"No, they are terrible," he said with a smile. **"But it is to be expected. Kids here skate as soon as they can walk."**

Ice hockey is the biggest spectator sport in

Switzerland and one of the most difficult sports to master. You not only need to be able to skate well, which takes skill, but competitors also need to be able to run, shoot, pass and block shots at high speed.

INEOS may not cut it on the ice, but off it, the company's support has proved invaluable.

"It really helped us to transform the whole company," said Sacha.

Over the past four years the club has enjoyed a spectacular comeback and now competes in the top tier of Swiss hockey. And season after season, it gets better.

"It really is inspirational working with INEOS," said Sacha. **"Their way of working rubs off on us all."**

Of course, that's not all.

As a company, it also produces the raw, building block chemicals that can be found in hockey helmets, sticks and keep ice rinks cold.

INEOS is also a big supporter of sports clubs where its own staff – or employees' children – spend their spare time, training, coaching or playing.

"We are always proud of our employees who actively get involved in clubs to help other people," said Dr Anne-Gret Iturriaga Abarzua, head of the communications department at INEOS Köln.

In January the site teamed up with one of Germany's biggest athletic clubs.

Part of its work with ASV Cologne will be to organise the GO Run For Fun events in June.

The INEOS-inspired GO Run For Fun is now a global running campaign. Over 1,000 schools across the UK, mainland Europe and the US have hosted a 2km fun run thanks to INEOS' initial investment of £1.5 million (€1.9m, \$2.5m).

And that work – to instil a healthy approach to exercise and nutrition – goes on.

Anne-Gret said INEOS financially supported countless sports clubs for children close to the Köln site.

"INEOS likes to support those with a desire to lend a hand in the community," she said.

One who is out there in all weathers is Bill Faulds, who manages the Under 16s Falkirk rugby team in Scotland, UK.

The Infrastructure Technical Manager at INEOS' Grangemouth site has been involved with the club since he was a student in 1985 and spends up to three nights a week coaching the youngsters.

"It is so rewarding to see children develop their skills and confidence," he said. **"And INEOS has been very supportive with an annual grant, which matched my time. Their support meant we could buy training gear."**

INEOS will always find ways to support those who champion sport and understand how important it is to the development of young people.

Or as former US president John F Kennedy put it: "Physical fitness is not only one of the most important keys to a healthy body, it is the basis of dynamic and creative intellectual activity."

IN THE HEADLINES

NEWS FROM
AROUND INEOS

INEOS decides to go it alone

A JOINT venture between INEOS and Solvay is to end later this year – two years ahead of schedule.

The two companies have achieved so much since they formed INOVYN in July 2015 that Solvay has agreed to leave INEOS in control of the 3.5 billion Euro business.

"Thanks to the fast and efficient integration of its teams and assets, INOVYN is now a sound and sustainable chlorvinyls player," said Jean-Pierre Clamadieu, CEO of Solvay.

Belgian company Solvay had always intended to leave INEOS as sole owner of the business but that had originally been planned for July 2018.

INEOS chairman Jim Ratcliffe said INEOS was comfortable with the early exit.

"Chlorvinyls businesses are core to large petrochemicals companies such as ours," he said. **"And through this planned acquisition INOVYN will have an owner with a long-term vision that provides stability for its business and employees."**

The two companies' decision to merge their chlorvinyls businesses in 2015 created a winning combination. It turned newly-named INOVYN into one of the top three PVC producers in the world and meant the business was well placed to respond rapidly to changing European markets.

INOVYN, which is headquartered in London, employs 4,300 people at 18 manufacturing sites in eight countries.

Every year it manufactures 40 million tonnes of chemicals which find use in almost every aspect of modern life, keeping people housed, healthy and connected.

inovyn



INEOS buys factory on Spanish coast

INEOS has bought a sulphuric acid factory at one of the most important logistics centres in Europe. The acquisition of the plant in Bilbao, Spain, complements INEOS' existing sulphur chemicals business in Runcorn in the UK and effectively doubles its production capacity.

Sulphuric acid is one of the most important, basic compounds manufactured by the chemical industry. It is used to make, literally, hundreds of compounds needed by almost every industrial sector including fertilisers, detergents, water treatment and batteries.

"In days of old, sulphuric acid consumption was a measure of a country's GDP," said Ashley Reed, CEO INEOS Enterprises. **"Demand was very much linked to the economic health of a country."**

That may also be true today.

Last year Spain was the second fastest growing economy in Europe with GDP growth of 3.2% and the International Monetary Fund believes Spain's recovery will continue.

"That is good news for us and should provide a strong platform for sales growth in the local markets," said Ashley.

The Spanish plant, which makes about 340,000 metric tonnes of sulphuric acid every year, is one of the most modern in Europe and is close to

the Bilbao Refinery which supplies most of the plant's key raw material, sulphur.

"Sulphur is often an unwanted by-product in the production of refinery products so it is a way for them to dispose of it," said Ashley.

About 25% of the plant's revenue comes from co-generation of electricity which is produced through burning sulphur in air. Electricity prices in Spain are amongst the highest in the world and under new Spanish legislation to encourage renewable energy production, the Spanish government will underwrite the electricity prices for the business for the next 25 years.

"That was one of the reasons why INEOS was interested in the plant," said Ashley.

The plant is strategically located in Bilbao port which makes it ideally poised to export around the world.

"There is no other sulphuric acid producer within 400km of the port," said Ashley. **"And because transport costs make up a major proportion of the sulphuric acid price, having the right location is vital for the success of a sulphur chemicals business."**

RECORD-BREAKERS

INEOS enjoyed a record performance last year.

Its earnings before interest, taxes, depreciation, and amortization was €2,210 million – up €307 million from 2014.

In the US, INEOS was able to maintain healthy margins by using cheaper feedstocks and in Europe, market conditions, bolstered by the continued weakness of the Euro, were good.

The poorest markets were in Asia, and in particular China.

PLAYMOBIL figures INEOS' solution is the best

GERMANY'S biggest toymaker PLAYMOBIL figured INEOS could help – and they were right.

The company needed a hard-wearing, flexible material for three new special characters – an ice dragon, a transparent pink robot and a pirate.

PLAYMOBIL knew what INEOS could do because they have worked with the company for years. But this time they needed a material that was tough, easy to mould and transparent.

INEOS Styrolution, the global leader in styrenics, suggested Zylar, one of its specialty chemicals – and the match was perfect.

"They were demanding requirements but we have always aimed to find the right solution, no matter who the customer is," said Julia Herzog, Marketing Communications Manager.

PLAYMOBIL characters first appeared on the scene in 1974. At that time there were

just three of them – a construction worker in striped bib, a knight with a silver helmet and an American Indian with a feather in his hair.

Since then, about 4,000 different designs have come off the production lines in Malta and almost 3 billion plastic figures have been made.

"Zylar has become more and more a material of choice for toys," said Peter Rath, Director Sales Construction, Distribution, Compounding & Others,

INEOS Styrolution. **"Without plastics many toys and all kinds of sporting gear wouldn't exist."**

He said INEOS felt honoured to work with such an iconic toymaker.

Zylar is currently used for medical devices but can be found in a multitude of household applications including water filters or coffee machine water containers.

SPREAD THE WORD

If you would like to contribute an article to a future issue of INCH or have a topic that you would like covered, then contact us at info@inchnews.com

All submissions are welcome!



***“Competition is always a good thing.
It forces us to do our best. A monopoly
renders people complacent and
satisfied with mediocrity”***

Nancy Pearcey, best-selling and critically acclaimed American author