

# ICIS Special Supplement

**INEOS INVESTMENT**  
**DRIVING**  
**GROWTH**

Strategic vision steers  
chemical major to success





# Building for the future

Record results, a new headquarters and unprecedented investment mark the start of a new era for one of the world's largest chemical producers

ANDY BRICE LONDON

The unveiling of its new headquarters at the end of 2016 was hugely symbolic for INEOS.

Some six years after relocating to Switzerland, more favourable trading conditions saw one of Britain's biggest manufacturers return to UK shores with renewed ambition and plenty of optimism.

The move came at the end of a landmark year for INEOS, the business announcing record profits and a flurry of projects and acquisitions across the globe. INEOS posted full-year 2016 earnings before interest, tax, depreciation and amortisation (EBITDA) of €4.3bn, raised €1.4bn of new loans and refinanced €3bn of its existing debts, saving around €100m/year.

"These figures confirm that INEOS is doing

better than ever," says chairman Jim Ratcliffe. "All the businesses are performing well and our successful refinancing shows that the market is clearly recognising this fact."

Despite the tough economic conditions, feedstock volatility and increased competition that has tested the industry these past few years, Ratcliffe and his team have still secured INEOS's position among the elite – ranked within the top 10 chemical companies in the world.

The unveiling of the new headquarters in London, itself reflects the company's renewed confidence – both in Europe and the UK, where it has announced a raft of new projects.

A lot has improved since the company was last resident, particularly with regards the current government's commitment and support towards manufacturing, he says.

The UK has been a hive of activity for

INEOS this past year, notably with the development of its oil and gas business in the North Sea, the successful integration of INOVYN and plans to break into the automotive sector. The relocation therefore seemed logical, he says.

## PLENTY OF POTENTIAL

"As an organisation we're very focused on growth and can see lots of opportunities in this portfolio," says Ratcliffe.

"Whilst INEOS is an Anglo-Swiss company, our new base in London reflects our British roots. The future for INEOS is very bright and much of this optimism comes from our UK based operations," he adds. "We currently supply millions of British homes with gas, we have a growing trading and shipping business and our chlorvinyls business has doubled in size. We are also planning to extract shale gas in the north of England and to grow the newly revitalised Grangemouth site."

Yet Ratcliffe insists none of this was possible without the company's \$1bn investment into its Dragon ships programme – a "virtual gas pipeline" to import large volumes of ethane and liquefied petroleum gas (LPG) from the US.

The groundwork was laid in 2012 when

**JIM RATCLIFFE**  
Chairman, INEOS

**"As an organisation we're very focused on growth and can see lots of opportunities in this portfolio"**



INEOS first decided to create the link between the UK and US. By March 2016 it had become a reality, with the first of eight purpose-built Dragon-class ships crossing the Atlantic to provide a steady flow of advantaged feedstock.

The success of what some thought impossible has indeed helped change the company's fortunes, asserts director of corporate affairs, Tom Crotty.

### CORNERSTONE FOR SUCCESS

"The Dragon ships certainly laid the foundations for all our renewed expansion and investment. They've been transformational for the business," he says.

"When we launched the project almost five years ago, we couldn't have anticipated that the price of oil would fall but for us it was a win-win situation. Some said the drop undermined the logic of our Dragon ships but that misses the fundamental point; if you've got a gas cracker, the differential between gas and oil is academic.

"The project has remained as significant for us as it did before, regardless of the oil price. This gas is coming in at a lower price than we could have sourced locally. We've now got our gas crackers profitable and it's made our naphtha crackers more competitive too."

The programme's success has since led to the first substantial investments in the European chemicals industry for some time, he notes.

Among the highlights this past year has been the acquisition of Arkema's oxo alcohol business, which include Arkema's stake in Oxochimie, the joint venture at Lavera between INEOS and Arkema. And there were even more ambitious plans to follow.

A bold new move into the automotive market soon stole the headlines, with a commitment to build "the world's best 4x4" off-road vehicle, replacing the now retired Land Rover Defender.

INEOS then revealed it was to build the region's largest-ever butane storage tank in the Port of Antwerp. At 135,000 cubic metres, it will store competitively-priced imported butane. The move would position INEOS as a major player in the global LPG market.

This was followed by an approach to buy the 235 mile Forties Pipeline System (FPS) business from BP, strengthening its foothold in the UK oil and gas market. The FPS delivers almost 40% of the UK's North Sea oil and gas, and importantly, supplies feedstock to Grangemouth.

"Our North Sea activity is a key area for us so that's why we've acquired the FPS from BP. The logic is back integration in the supply chain," notes Crotty.

"The acquisition includes the Kinneil gas processing plant, which means the entire Grangemouth site is under one owner again. We've now secured our own supply base back through to the North Sea and can manage it effectively. There are efficiency gains to be

### TOM CROTTY

Director of corporate affairs, INEOS

**"We are very much a global business and we are profitable. We've seen some fantastic results this past year and expect the same, if not better, next year"**



made and it's great business for us."

The entire oil and gas business from Denmark's DONG Energy was subsequently targeted and completion of that deal was imminent at time of publication. This will allow INEOS to significantly expand its trading and shipping activities and become a major trader in the sector – and the fastest-growing entrant in this key energy basin.

### A MEANINGFUL MOVE

"It's a great business that gets us into new sectors of the North Sea," adds Crotty. "We've been in the southern area through the Breagh acquisition these past three years but now we can also focus on the Danish offshore area, Ormen Lange field off Norway and the west of Shetland – all exciting areas for gas exploration. It's a pretty meaningful move for us as it catapults us into the top 10 operators in the North Sea."

To meet growing demand and improve self-sufficiency, INEOS has also allocated funds to ramp up capacity at two crackers in the region and build a new world-scale propane dehydrogenation (PDH) unit.

"We've always run short on ethylene and propylene into our downstream businesses but those levels have grown over the years as demand increased. That's brought a certain level of discomfort," Crotty explains. "We wanted to reduce those levels and now have the capability with these investments to do that effectively."

Antwerp, Belgium, has been mooted as the most likely location for the construction of the

PDH plant, which will produce 750,000 tonnes/year of propylene and cost around \$1bn.

Some 900,000 tonnes/year of ethylene – equivalent to a new cracker – is to be added at its Grangemouth and Rafnes, Norway, sites. Each expansion is likely to cost around \$500m.

The company also plans to build a 300,000 tonne/year vinyl acetate monomer (VAM) plant, with the location yet to be decided.

Investment is by no means confined to Europe either, says Crotty, with both the US and Asia remaining key areas of focus too.

INEOS remains committed to exploiting the shale gas developments in the US and the low cost base that exists there to increase its presence upstream. The business has also seen polyethylene (PE) projects undertaken through its JV partnership with Sasol, as well as the purchase of high density polyethylene (HDPE) pipe producer WL Plastics.

In Asia, meanwhile, INEOS Styrolution recently made its first acquisition, the K-Resin styrene-butadiene copolymers business further enhancing its styrenics portfolio.

"It's been a really great time for us," says Crotty. "We are very much a global business and we are profitable. We've seen some fantastic results this past year and expect the same, if not better, next year."

INEOS now comprises 21 businesses across 80 sites in 16 countries, and employs 18,500 people. There have been many highlights this past year and there is a real sense of optimism moving forward. Challenges remain for the industry but both Ratcliffe and Crotty are confident that things are changing for the better and plenty of opportunities lie ahead.

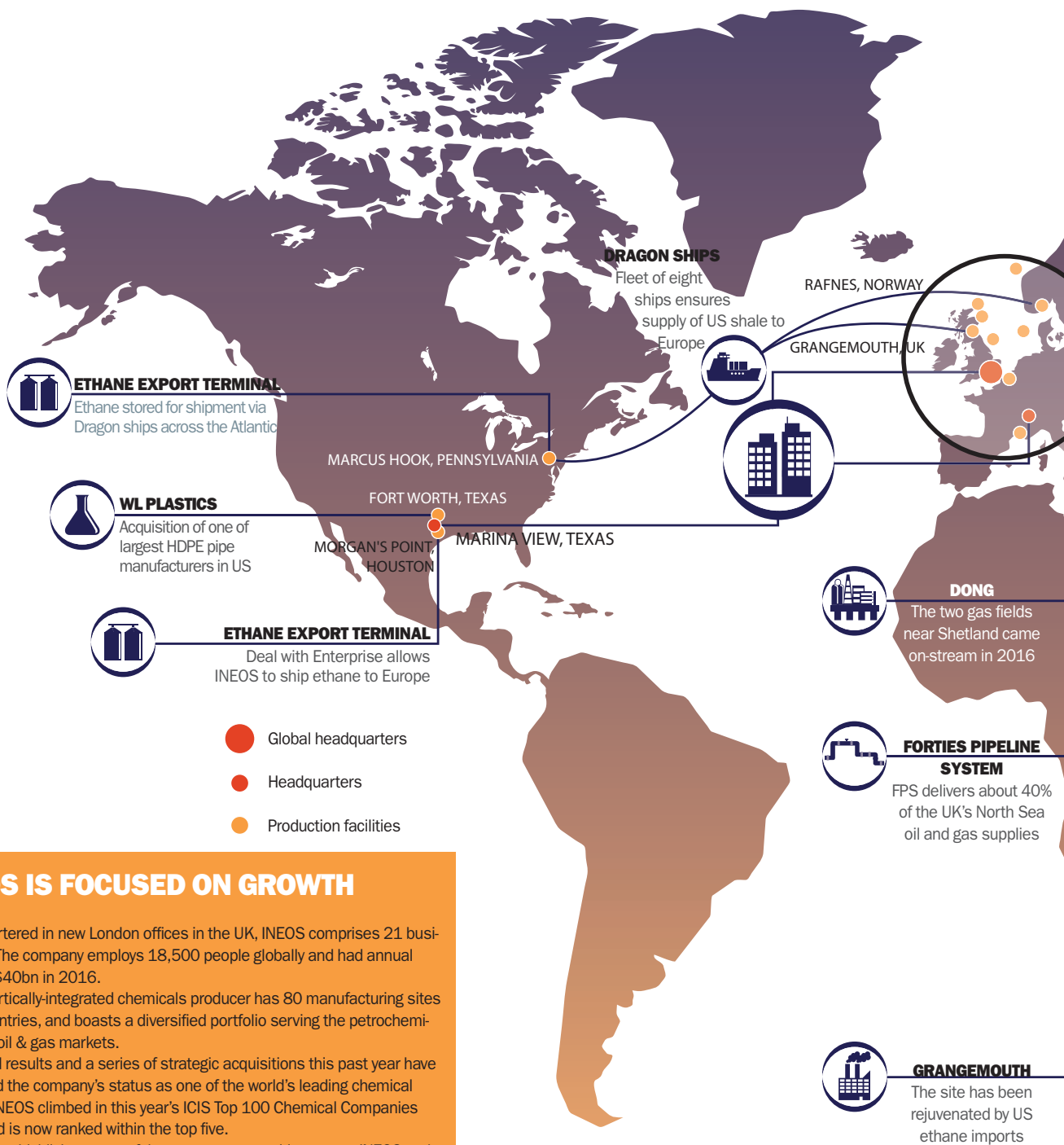
Even initial resistance to fracking and shale gas exploration in the UK, or the ongoing Brexit negotiations and looming departure from the EU have done little to dampen their spirits.

From the Dragon ships project to the rejuvenation of Grangemouth, INEOS has proven that whatever the challenges, it is more than capable of overcoming them. ■



The Dragon ships and the completion of the "virtual pipeline" rejuvenated INEOS's sites

# A world of opportunities



**INEOS IS FOCUSED ON GROWTH**

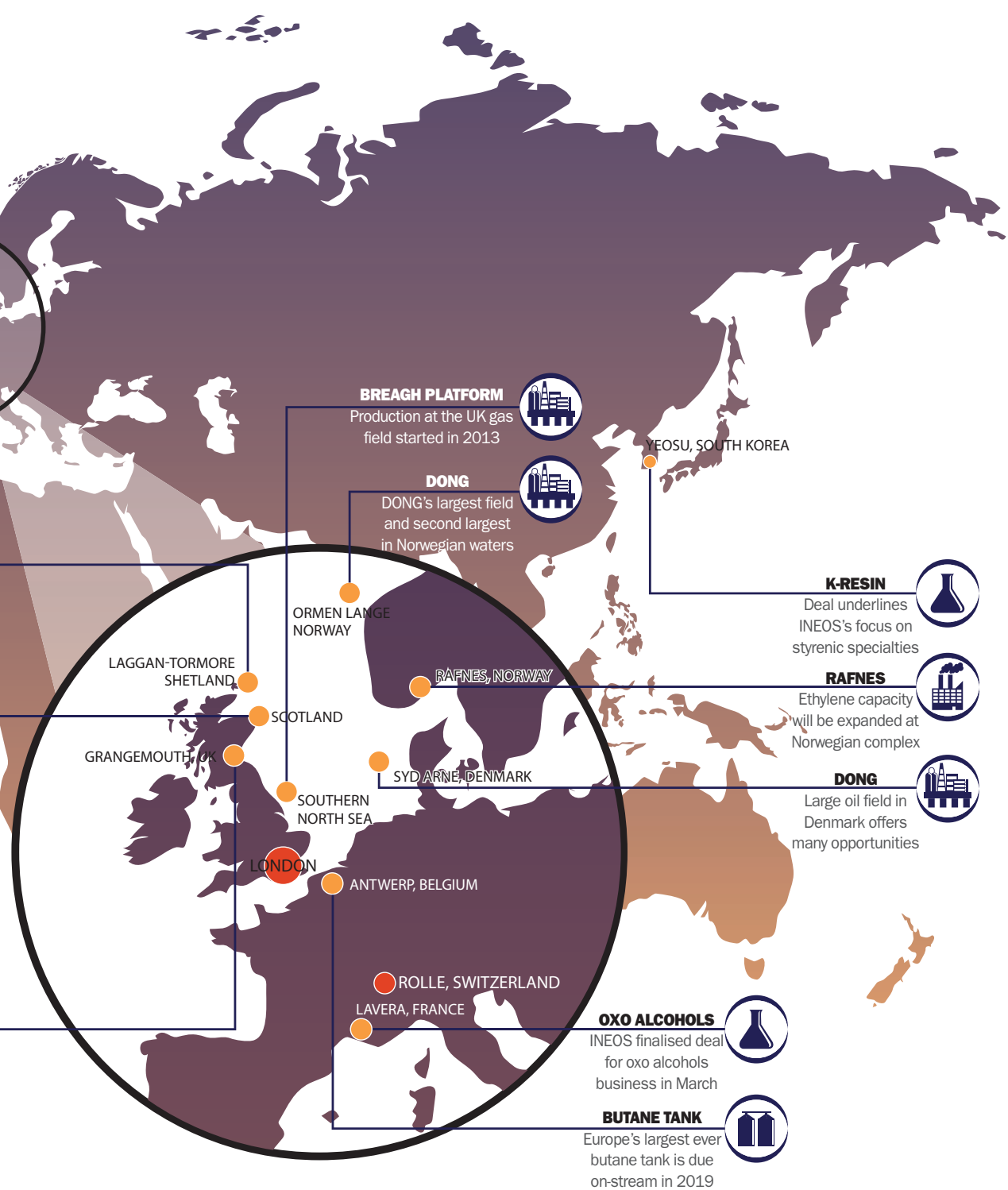
Headquartered in new London offices in the UK, INEOS comprises 21 businesses. The company employs 18,500 people globally and had annual sales of \$40bn in 2016.

The vertically-integrated chemicals producer has 80 manufacturing sites in 16 countries, and boasts a diversified portfolio serving the petrochemicals and oil & gas markets.

Record results and a series of strategic acquisitions this past year have cemented the company's status as one of the world's leading chemical majors. INEOS climbed in this year's ICIS Top 100 Chemical Companies listing and is now ranked within the top five.

This map highlights some of the current opportunities across INEOS and showcases some of the company's most recent investments and projects. ■

ties



**BREAGH PLATFORM**

Production at the UK gas field started in 2013



**DONG**

DONG's largest field and second largest in Norwegian waters



YEOSU, SOUTH KOREA

**K-RESIN**

Deal underlines INEOS's focus on styrenic specialties



**RAFNES**

Ethylene capacity will be expanded at Norwegian complex



**DONG**

Large oil field in Denmark offers many opportunities



ORMEN LANGE NORWAY

LAGGAN-TORMORE SHETLAND

RAFNES, NORWAY

SCOTLAND

GRANGEMOUTH, UK

SYD ARNE, DENMARK

SOUTHERN NORTH SEA

LONDON

ANTWERP, BELGIUM

ROLLE, SWITZERLAND

LAVERA, FRANCE

**OXO ALCOHOLS**

INEOS finalised deal for oxo alcohols business in March



**BUTANE TANK**

Europe's largest ever butane tank is due on-stream in 2019



# Adding value in Europe

INEOS's ambitions in Europe are gathering pace both upstream and downstream. The group has announced a major expansion programme in Europe and is entering new industry sectors as it leverages newfound abilities



Huge investment is planned across the continent in the coming years

ELAINE BURRIDGE LONDON

Gaining feedstock flexibility and adding value to its operations is INEOS's mantra, underpinning its strategy and growth plans across the different divisions that make up its business. Its ground-breaking move to ship shale gas from the US to Europe has paved the way for new investments, both in olefins and derivative production.

INEOS produces nearly 4.5m tonnes/year of ethylene and propylene across Europe but is still the region's largest buyer of the olefins with a shortfall of around 1m tonnes/year of ethylene and more than 0.5m tonnes/year of propylene. In order to address this shortage and increase its self-sufficiency, the company announced in June it would spend \$2bn to build a 750,000 tonne/year propane dehydrogenation (PDH) plant and expand cracker capacity at Grangemouth, UK, and Rafnes, Norway, to more than 1m tonnes/year each.

A location for the PDH plant has not yet

been decided but Antwerp, Belgium, is seen as a likely choice. Work to expand the crackers is expected to start in 2019.

"Without access to cost advantaged raw materials these investments could not be possible" says Gerd Franken, CEO of INEOS Olefins & Polymers North. "The use of competitive raw materials to increase the self-sufficiency of our European businesses will support our position in Europe and help to protect our businesses against pressure from imported products" he says. "This will become increasingly

**GERD FRANKEN**  
CEO, INEOS Olefins & Polymers North

**"The use of competitive raw materials to increase the self-sufficiency of our European businesses will support our position and help to protect our businesses"**



important as significant new capacities come on-line in the US over the coming years."

John McNally, CEO of INEOS Olefins & Polymers UK, says capacity at Grangemouth could be expanded easily by 100,000 tonnes/year in a first stage to be ready in 2020-2021. A team of people is also studying how another 300,000-400,000 tonnes/year could be added later.

This year, after enduring several years in survival mode with pay and budget freezes, the Grangemouth business has been able to look at opportunities to expand. McNally says INEOS is seeking further investment at the site, which has plenty of space available, and talks are currently ongoing with various third parties, as well as with the Scottish and UK governments.

In March, INEOS announced that it had signed an agreement with Oil Tanking Antwerp Gas Terminal (OTAGT) to build Europe's largest butane storage tank. The facility will be commissioned in 2019 and used to import butane from the US for INEOS's cracker complex in Cologne, Germany, and possibly open up some optionality at Lavera, France.

## PLANS UNDERWAY

A new vinyl acetate monomer (VAM) plant will be another asset to add value to the group's olefin streams. INEOS Oxide's CEO, Graham Beesley, says it is studying either rebuilding the Hull facility, which closed in late 2013, or building a new plant in Cologne or Antwerp. "We have the confidence to re-enter the market with a world-scale plant, with a potential start-up date of 2020," he says.

Since buying out partner Arkema's share in its Oxochimie joint venture in March, Beesley says INEOS now has the freedom to more easily make investment decisions that focus on meeting the needs of the customer base. As an example, INEOS Oxide has started a study on producing further oxo derivatives, such as 2-ethylhexanoic acid and trimethylolpropane (TMP). A decision to proceed with the project and finalise a location will be taken by the end of this year.

INEOS Oxide is busy with further growth projects including a 100,000 tonne/year expansion of ethyl acetate capacity at Hull, UK, which is expected on stream in early 2018, alongside, for the first time, tank infrastructure to enable the import of feedstock acetic acid.

INEOS Oxide's largest asset at Zwijndrecht, Antwerp, is also in the middle of the growth story. A 2,000 tonne/year expansion of ethylene oxide (EO) storage capacity at Antwerp, which is due for completion at the end of 2018, will enable further growth of on-site EO consumption, starting with the commissioning of a sixth alkoxylation unit on the site at the same time.

Beesley's eyes are also focused on growth in North America. He comments: "If you look at EO, our backbone molecule, we are strong in Europe, but less so in North America. We want

to grow in EO and derivatives where we have upstream feedstock strength and market pull. Both acquisition and own build remain options in the mix for us to expand beyond our base ethanalamine business in North America.”

Another INEOS business looking at growth opportunities is INOVYN, the former joint venture with Solvay. Having bought out partner Solvay’s 50% stake in July 2016, INOVYN is now starting to invest for the future, mostly through debottleneckings.

**SIGNIFICANT INVESTMENT**

One of INEOS’s largest businesses by turnover and people, and Europe’s leading polyvinyl chloride (PVC) producer, INOVYN has been investing heavily in new membrane technology across its remaining chlor-alkali plants as the deadline to phase out mercury technology comes into force in December 2017.

At Lillo/Antwerp, a 160,000 tonne/year chlorine/potassium hydroxide plant is due to start up in Q2 2018, as is INOVYN’s plant at Stenungsund, Sweden, which is being converted to membrane technology. So far, the company has decided not to convert its remaining mercury cell room at Martorell, Spain, to membrane production. INOVYN CEO, Chris Tane, says it may convert the plant in the future, if the economic climate is right. Spain has historically

**DAVID THOMPSON**  
CEO, INEOS Trading & Shipping

**“We want to become a player in those trading markets because we have a unique position in terms of supply and infrastructure capability in Europe and the US”**



had high energy costs, which has been a major factor behind INOVYN’s decision not to invest.

Tane is cautiously optimistic about the PVC market, noting that there have been signs of a recovery in demand during the past 12-18 months, albeit slow. “Nobody will be rushing to make investments,” he says, although INOVYN will continue to debottleneck capacity where it makes sense.

More money will also be spent on innovation and developing new PVC products. Tane remarks: “We want to invest quite heavily in R&D and look at new and better applications for PVC.” He says some exciting new applications for PVC emerged at INOVYN’s 2016 awards, including 3D printing, sustainable healthcare recycling and custom vinyl flooring.

Optimising assets is not just confined to INEOS’s chemicals capacity. Now that the Dragon ships have demonstrated the viability, reliability and flexibility of the transatlantic pipeline, INEOS Trading & Shipping is ready to start building up its trading activities for ethane and LPGs. “We want to become a player in those trading markets because we have a unique position in terms of supply and infrastructure capability in Europe and the US, and have multiple load options,” says David Thompson, CEO of INEOS Trading & Shipping.

INEOS’s deal to supply US ethane to Exxon-Mobil and Shell Chemicals at Mossmorran, UK, started in September and Thompson expects that a similar deal with another company will be announced very soon.

Thompson says INEOS will develop its global ethane trading position and leverage into LPG. The group is looking at shipping options for LPG and the availability of very large gas carriers (VLGCs), which are three times the size of Dragon vessels. Thompson says it is a good time to get into the growing LPG shipping market and prices for vessels have come down following a lot of newbuilds during the past two years.

The company is also looking to expand into energy trading, which would be another string to INEOS’s bow. ■

**OFFSHORE ELAINE BURRIDGE LONDON**

**INEOS BREAGH EXPLORES GAS POTENTIAL**

INEOS’S PURCHASE of 12 gas fields in the UK North Sea in November 2015 from German firm DEA was a strategically bold move and a game-changer for the company. The acquisition brought significant expertise in exploration and subsurface, geology and seismology that INEOS did not possess, says Geir Tuft, CEO of INEOS Breagh.

Fast forward to 2017, and INEOS is buying the Forties Pipeline System (FPS) and associated pipelines and facilities from BP for \$250m as well as Denmark’s DONG Oil & Gas for over \$1bn. Both deals are expected to complete in the third quarter.

The FPS links 85 North Sea oil and gas assets to the UK mainland and INEOS’s site in Grangemouth while DONG Oil & Gas adds reserves

in Denmark, Norway and the UK (West of Shetland). Tuft says these two deals represent another major step-change for INEOS, providing access to some very interesting and sizeable projects.

**GREATER LONGEVITY**

In addition to ongoing and proposed drilling projects in the North Sea’s Breagh field, INEOS is undertaking a major project to replumb Clipper South gas supplies from the Theddlethorpe Gas Processing plant and route it to Bacton. This will be completed by the end of 2018, extending the plant’s life by another seven to nine years

As part of its strategy to grow its upstream business, INEOS is

also stepping in to the services sector, a capability that Tuft says goes beyond that traditionally offered by oil and gas companies. He says INEOS has acquired some equipment and established an upstream service company to supply services firstly to the onshore-oriented INEOS Shale business, as well as to third parties.

Ultimately, the business will extend its offering to offshore services and INEOS is currently looking at key assets such as vessels and drilling rigs. “Our ambition in services will continue to grow as we increase our presence in the oil and gas industry,” he states.

After completing these recent acquisitions, INEOS Oil & Gas will have over 100,000 boe (barrel of oil equivalent)/day of production and close to 300mm boe of reserves. It will comprise five different businesses from INEOS Shale focused on onshore gas development, INEOS Breagh operating in the UK southern North Sea,



**The Breagh offshore platform is 65km off the English coast**

INEOS FPS, INEOS Upstream Services as well as the business acquired from DONG with activities west of Shetland, in Denmark and Norway. All in all, there will be over 900 employees and capabilities to take on further projects and growth. ■

**GEIR TUFT**  
CEO, INEOS Breagh

**“Our ambition in services will continue to grow as we increase our presence in the oil and gas industry”**



# US market thrives

INEOS Olefins & Polymers USA is focusing on a move upstream in oil and gas to secure feedstock supplies. The Oligomers business has invested in significant capacity expansions to meet rising demand in PE and synthetic lubricants markets

ELAINE BURRIDGE LONDON

**T**he burgeoning US oil and gas industry, which has been transformed by the development of shale, continues to create opportunities and INEOS Olefins & Polymers USA is ready to exploit them.

The company is considering a move upstream and entering exploration and production, following in its footsteps in the UK. CEO Dennis Seith says adding gas exploration and production activities in the US would be a natural extension for the group, which already has midstream assets in the country. These include the Hobbs fractionating complex located in Texas near the town of Seminole. INEOS also owns and operates product and feedstock pipelines on the US Gulf Coast (USGC) as well as salt dome storage for its operations at Stratton Ridge.

INEOS's interest is focused on providing gas and natural gas liquids (NGLs) to feed its petrochemical operations. It is actively looking at acquisition opportunities in the oil and gas sector. Seith notes it is a good time to buy, as prices have been depressed and a number of oil and gas companies have become distressed, with good assets available to add value to INEOS's existing production.

The company has enjoyed a strong first-half year as a consequence of robust demand for ethylene, polyethylene (PE) and polypropylene (PP). Delays in some ethylene capacity starting up has benefitted utilisation rates and kept supply and demand tighter than expected.

INEOS has strengthened through debottlenecks and expansion with a new build of 470,000 tonnes/year of high density polyethylene (HDPE) at its Battleground, Texas, site through the joint venture with South Africa's Sasol. "The company's strategy has been to invest more heavily in the ethylene/derivative chain in the US," Seith says. Operations at the

**DENNIS SEITH**  
CEO, INEOS Olefins & Polymers USA

**"The company's strategy has been to invest more heavily in the ethylene/derivative chain in the US"**



bimodal HDPE plant based on *Innovene S* process technology will start in the fourth quarter.

Seith indicates that debottlenecks through the addition of a new furnace, capacity creep by smaller investments as well as a focus on efficiency and reliability increased capacity at its Chocolate Bayou site in Texas, by nearly 10%.

Another ethylene expansion at Chocolate Bayou will go onstream in 2020, adding 250,000 tonnes/year of capacity. Seith says front end engineering design (FEED) is underway and a decision to proceed will be made in January 2018.

Other investments have seen the addition of a cogeneration plant at Chocolate Bayou, the acquisition of a Cogen Facility at Battleground and more pipeline capacity and infrastructure.

## SHALE DEVELOPMENTS

INEOS has also added two terminals via agreements with Sunoco at Marcus Hook in the North East and Enterprise at Morgan's Point on the USGC to ship ethane and other NGLs to support European operations with US shale gas.

Its acquisition of WL Plastics is also highly complementary to its expanding HDPE business. WL Plastics produces bimodal HDPE pipe for oil, gas mining, conduit and municipal water and sewage applications and Seith says the company is a great fit. He adds INEOS has seen a tremendous rebound in the oil and gas sector that has benefitted the business in Texas, notably from developments in the Permian basin.

With regard to PP, Seith says INEOS has appraised possible debottlenecks ranging from 68,000 tonnes/year to 136,000 tonnes/year for potential start-up in 2020-2021.

INEOS Oligomers is investing in new linear alpha olefins (LAO) capacity to meet demand from the PE industry, where they are used as comonomers in HDPE and linear low density polyethylene (LLDPE). Bob Learman, CEO of INEOS Oligomers, says the additional LAO output will support the needs of the US PE industry, where production is set to expand by more than 30% from 2016-2019.

Construction of the 420,000 tonne/year LAO facility at Chocolate Bayou started in 2016 and mechanical completion is anticipated for October 2018. A second 20,000 tonne/year high-viscosity polyalpha olefin (PAO) plant at LaPorte was completed in July 2017 with on-spec material now available for sampling.

A third project will see a 120,000 tonne/year single-train low-viscosity PAO plant installed at Chocolate Bayou with mechanical completion expected in mid-2019. The project's final approval is due in the fourth quarter.

Learman says there is strong demand for PAO into synthetic lubricants, which are mostly used in passenger car motor oil and wind turbines. The wind turbine market is growing rapidly as global wind capacity expands, particularly in China, which accounted for 40% of the world's installations in 2016. ■



The styrenics market is now seeing improved demand growth and margins



# Asia targets new growth

As global markets show signs of recovering from the onslaught of new capacity in Asia over the past few years, INEOS Styrolution is starting to focus on expansion in key growth regions and industries

ELAINE BURRIDGE LONDON

**A** tightening of the global styrenics supply/demand balance and healthy consumption augurs well for INEOS Styrolution in the years ahead.

An onslaught of new styrene and acrylonitrile-butadiene-styrene (ABS) capacities in Asia three to four years ago has largely been absorbed and demand has grown strongly with producers' margins also improving, according to Kevin McQuade, CEO of INEOS Styrolution.

McQuade believes the time is now right to consider future capacity expansions as the company focuses on growing the business in target areas as part of its Triple Shift strategy.

"We are focusing on investment and acquisitions on ABS and specialties because we see stronger overall demand growth and better margins. Overall, we believe that the global styrenics market is growing at 2-3%/year; we are trying to grow our specialty styrenics and ABS business at twice that rate," he says.

INEOS Styrolution has a focus on five core industries: automotive, healthcare, electronics,

construction, and household appliances. It is targeting expansion in emerging regions, specifically Asia, which McQuade says accounts for 70% of overall demand growth for styrenics.

"We are very much focused on building up our Asian platform and strengthening all our businesses in the region. We will continue to look for bolt-on acquisitions as well as investing in our own facilities," he says.

A major step forward in the group's plans was the acquisition of the global K-Resin styrene-butadiene copolymers (SBC) business from Chevron Phillips Chemical and Daelium Industrial. The deal, which closed in February, gave INEOS Styrolution its first SBC manufacturing plant in Asia – at the Yeosu petrochemi-

**KEVIN MCQUADE**  
CEO, INEOS Styrolution

**"We are very much focused on building up our Asian platform and strengthening all our businesses in the region"**



cal complex in South Korea – complementing existing production in Antwerp, Belgium, and Altamira, Mexico.

It also provided a very strong position in the medical market, which opened up a lot of potential for INEOS Styrolution, as well as a strong technology platform the company aims to deploy across its SBC plants in Europe and the Americas.

INEOS Styrolution announced plans in August to expand its styrenic polymers compounding capacity in India, raising output at its Moxi plant in Gujarat by 34,000 tonnes/year to 100,000 tonnes/year. Completion of the \$20m project is expected in 2019.

An engineering study is also looking into doubling production of ABS in India. McQuade says India is probably growing the fastest of Asia's emerging economies at over 7%/year, with its ABS market up by about 10%/year.

INEOS Styrolution has also just finished a project in Map Ta Phut, Thailand, where it has upgraded the facility to increase its output of specialty styrenics by 60,000 tonnes/year.

An expansion in Altamira, Mexico, is underway to meet growing demand in the Americas. The copolymer plant produces a range of ABS and acrylonitrile styrene acrylate (ASA) products and overall capacity will increase by 20,000 tonnes/year to 180,000 tonnes/year with start-up anticipated by the first quarter of 2018.

A new 100,000 tonne/year plant for specialty product ASA is planned at the Bayport, Texas, site for start-up in late 2020. The Altamira plant will then focus on ABS, allowing for an additional 70,000 tonnes/year of ABS capacity.

## FOCUSED ON SUSTAINABILITY

Sustainability is a major driver and McQuade says INEOS Styrolution has a very deep innovation pipeline for the next two to three years. Ideas are garnered from the company's industry-focused teams that meet on an annual basis with key customers from industries such as automotive and electronics to collaboratively determine how specialty styrenics can help them address their sustainability challenges. For instance, light-weighting of vehicles is an area of ongoing innovation and McQuade says work continues on using styrenic materials to replace heavy plastics and metals in many car components.

The company has also recently embarked on a project for the chemical recycling of polystyrene (PS). Several companies and industry organisations in Europe and the Americas are currently working on processes to recycle PS, a lot of which is used in disposable packaging such as foam cups.

INEOS Styrolution says it fully supports the drive for a Circular Economy, not just in R&D/product design and using styrenics to bring long-term societal benefits, but also at their end of life and their reintroduction into the styrenics production cycle. ■

# Auto plans are on track

As a standard bearer for manufacturing in the UK, INEOS has seized the opportunity to resurrect a British icon and drive new growth

ANDY BRICE LONDON

**H**aving conquered the seas with its fleet of Dragon ships, INEOS announced in July 2016 it had turned its attention to land for its next endeavour.

After months of speculation that the petrochemical major was set to break into the automotive sector, the company confirmed the launch of a feasibility study to develop its own unique 4x4 off-road vehicle.

The brainchild of chairman Jim Ratcliffe, the aim was to fill the void left following the decision by Jaguar Land Rover (JLR) to cease production of its current Defender



Plans to build the spiritual successor to the iconic Defender off-road vehicle are underway and steering INEOS into a new market

model – enshrined in history as one of Britain’s most versatile, rugged and iconic cars.

Ratcliffe’s vision was to produce an uncompromising 4x4 off-road vehicle that set a new benchmark, improving on both build quality and reliability.

Despite INEOS being one of the largest manufacturers in the world, this will be its first foray into car production. But as proven with the launch of its groundbreaking Dragon ship gas carriers last year, the company has never shied away from a challenge. Far from a vanity project, INEOS sees this as an opportunity.

“This is a unique project,” says Tom Crotty, INEOS’s director of corporate affairs. “It’s not every day a company that’s never been in the automotive industry decides it’s going to make a car. INEOS bashes the table hard about manufacturing and bringing it back to Britain, and this project is all about putting our money where our mouth is.”

### LEADING BY EXAMPLE

“We firmly believe the principles of good manufacturing apply across all product areas – those that apply to a chemical manufacturer are exactly the same as the ones that apply to running an automotive operation. This project is a real-life test of that assumption.”

The introduction of more stringent fuel emission rules led JLR to announce the Defender’s demise in 2013 and as the last car rolled off the production line at the UK’s famous Solihull plant three years later, it marked the end of a legacy dating back almost seven decades.

The much-loved vehicle combined simplicity with raw power, capable of traversing all terrains in even the most testing environments. Over the decades, it became the vehicle of choice for farmers, adventurers and the military.

Although JLR announced plans to launch a replacement model in 2019, INEOS was intent on designing a true spiritual successor.

“We saw a gap in the market,” says Crotty. “There remains a niche demand for an uncompromising off-road vehicle – whether you’re a farmer, explorer or even a safari operator.

“Although a new version is being produced by JLR, in our view it’s actually a completely new car. It doesn’t stick to the off-road capability of the original vehicle and won’t have all the elements that made it distinctive, like the

### TOM CROTTY

Director of corporate affairs, INEOS

**“We firmly believe the principles of good manufacturing apply across all product areas. This project is a real-life test of that assumption”**



INEOS chairman Jim Ratcliffe believes there is a gap in the market for a rugged 4x4

separate chassis and fixed axle suspension. Instead, it will be just like all the other off-road vehicles you already see in the market.”

The new model will retain the trademark qualities of the Defender but have its own identity, he says. “For us, it’s about distilling the essence of this classic vehicle with all the modern requirements for crash protection and pedestrian safety, and that meets the latest emissions standards. We want to capture the feel of the Defender but offer the reliability of a Toyota.”

Branding is yet to be decided, but the venture has been given the moniker Projekt Grenadier – a reference to the Grenadier pub a short walk from INEOS’s headquarters in London, where the plans for a Defender-inspired vehicle were first discussed. The spelling of “Projekt” is a nod to the German engineering involved in its development.

INEOS is investing in excess of £500m in the project and has established a new automotive division, headed by Dirk Heilmann – formerly head of engineering and technology.

“We’re setting this up as a separate stand-alone business but where there are synergies with other parts of our business then clearly we will exploit them,” notes Crotty.

INEOS hopes to build the vehicles in the UK but is also looking at sites across Europe. It has already entered high level discussions with the government and received international interest.

“Our ambition is to create a greenfield operation in the UK but since we announced this project we’ve been courted by a lot of existing factories around Europe, either offering us a facility to convert or space on their site, so we’re looking at those options too.”

Importantly, INEOS intends to target the very audience who helped ensure its legacy and insists the car will be affordable – expecting the basic model to retail for around €35,000.

“We’d completed six months of research by the end of the fourth quarter last year, where we’d asked automotive experts how feasible it would be to produce a vehicle that met modern regulations without losing the spirit of the Defender.

“We wanted to find out whether we’d be able to sell it at an affordable price and still make money. We understand the payback will not be rapid but it has to be profitable; there’s no point in providing the technology and proving we’re a great manufacturer only to lose money every time we sell one. Profitless prosperity is not worth having.”

The results were positive and proved the dream was both realistic and achievable.

### CLOSE COLLABORATION

“While this meant we could start motoring on with some of the engineering and design work, we were not naïve enough to bluster around and do this on our own so we engaged some of the best people in the automotive industry to help us. We’re now recruiting to build our team and are developing supplier partnerships to work on the engineering and approvals.”

Initially, the company says production will be on a relatively small scale, totalling around 25,000 vehicles each year, but Crotty insists there is plenty of potential for future expansion.

“Land Rover excluded itself from the biggest market in the world 20 years ago – it hasn’t sold Defenders in the US since the early 1990s because it couldn’t meet the airbag regulations. For us, this is a global product and from day one, we’ll be targeting markets like America and Australia. Of course we hope that because we’re opening up a much bigger market, that 25,000 figure will prove to be conservative. If that’s the case, then we’ll look to grow.”

The first vehicles are expected to hit the market by the end of 2020. ■



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Headquartered in new London offices in the UK, INEOS comprises 21 businesses. The company employs 18,500 people globally with annual sales of \$40bn in 2016. The vertically-integrated chemicals producer has 80 manufacturing sites in 16 countries, and boasts a diversified portfolio serving the petrochemicals and oil & gas markets.

INEOS Group Headquarters  
38 Hans Cres  
Knightsbridge  
London SW1X 0LZ  
UK

[www.ineos.com](http://www.ineos.com)  
Twitter: @INEOS